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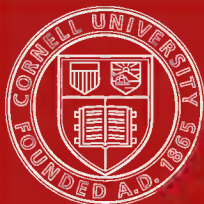
LABORATORY APPARATUS
AND
REAGENTS

ARTHUR H. THOMAS COMPANY
WEST WASHINGTON SQUARE
PHILADELPHIA
U. S. A.

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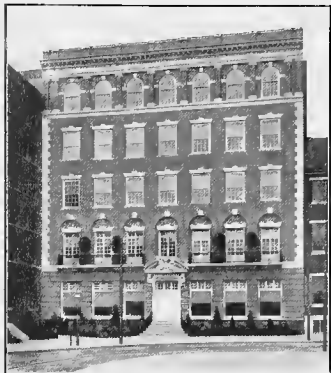
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LABORATORY APPARATUS AND REAGENTS

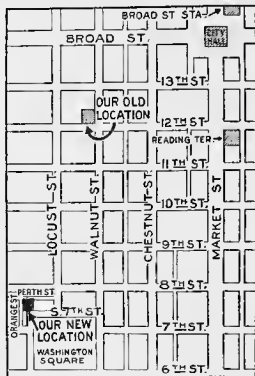
SELECTED FOR LABORATORIES OF
CHEMISTRY AND BIOLOGY
IN THEIR APPLICATION TO
EDUCATION, THE INDUSTRIES, MEDICINE AND
THE PUBLIC HEALTH
INCLUDING SOME EQUIPMENT FOR
METALLURGY, MINERALOGY, THE TESTING OF
MATERIALS, AND OPTICAL PROJECTION

EDITION OF 1914
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ARTHUR H. THOMAS COMPANY

ARTHUR H. THOMAS COMPANY
WEST WASHINGTON SQUARE
(230 SOUTH SEVENTH ST.)
PHILADELPHIA
U. S. A.



Washington Square Front of Building



How to Find Us

In December, 1912, we moved to the Farm Journal Building, a new concrete, fire-proof structure located on West Washington Square (230-2-4 South Seventh Street), a neighborhood which has become the publishing centre of Philadelphia. The fourth and fifth floors of the building and a portion of the basement were designed and built with special reference to the requirements of our business. The increase of our total floor space to 40,000 sq. ft. (two and one-half times that occupied by us at Twelfth and Walnut Sts.) has distinctly increased the general efficiency of our service.

Of the above mentioned space approximately 8400 sq. ft. is devoted to salesroom and offices. In this salesroom we maintain a permanent exhibit of over 6,000 different pieces of Laboratory Apparatus, all conveniently arranged for inspection and handling by our visitors. A dark room is provided for the demonstration of Projection and Photo-Micrographic Apparatus. Our office space is well lighted and ventilated and contributes to the comfort and welfare of our employees as well as to the thoroughness of their work. Some interior views of our establishment are to be found on various pages throughout the catalogue



Washington Square Side of Showroom Looking North

PREFACE.

We believe that the principles underlying the organization and daily conduct of our business are understood and generally endorsed by those familiar with them. The following discussion is, therefore, offered chiefly for the information of those hitherto without experience in dealing with us.

PRICES—The prices throughout this catalogue are subject to change without notice. This is largely because the goods listed originate in over twelve hundred factories and in many instances we have no control over either the cost or the selling price. Certain discounts are allowed from our list prices to Institutions, State, City and U. S. Government Departments, Industrial Concerns and other organized establishments, conducting regular laboratory work, because of their aggregate annual purchasing power. These discounts are not allowed on occasional purchases of a few items only by those not regularly connected with laboratory work. Our discount sheet will be published at frequent intervals and important changes in both list price and discount noted therein. Prices on items not regularly carried in stock and designated "Duty Free" and "Duty Paid" are subject to more variation than regular stock prices because they are directly dependent upon the size of the individual order. (See also paragraph "Duty Free Importation" below.) They are printed for the guidance of customers in ascertaining the cost of individual items apart from large importation orders and in most instances the prices given apply to the importation of a single item of the article listed.

BREAKAGE AND SHORTAGE—We make no claim as to our infallibility and, while our goods are checked and packed by experienced employees under rigid control, breakages and shortages occasionally occur because of defective packing or of our mistakes. When such claims are clearly and promptly presented to us it is our custom to adjust them without undue argument as we desire to subordinate literal terms of contract to an underlying spirit of fairness and to maintain our interest in each transaction until our customer receives full satisfaction and value, no matter where or when our technical responsibility may end. We further assist in presenting established claims against the transportation companies from which we hold receipts for shipments. Customers will greatly facilitate the adjustment of such claims by refusing to receipt for goods received in damaged condition, until they have been examined and condition noted by the local freight or express agent.

STOCK—Unless otherwise designated the goods in this catalogue are mostly in stock for immediate delivery. A few domestic items of great weight or bulk are not always on hand but prompt factory delivery is usually possible. In addition, there are certain articles of European origin listed with both duty free and duty paid prices. Such designation indicates that they are not regularly carried in stock, usually because the demand for them is confined to institutions entitled to duty free importation. Where the word "Stock" is used the article is regularly carried in stock and the duty free price printed for the convenience of those entitled to it.

DUTY FREE IMPORTATION SERVICE—Under Paragraphs 573 and 654 of the Tariff Act of 1913 apparatus of foreign origin may be imported for Educational Institutions free of U. S. Customs duties under certain regulations established by the U. S. Treasury Department. The conduct of such importations is a special feature of our business and we believe our service in the carrying out of the many technicalities required is a great convenience to our customers. Duty free importations through our medium are usually handled at less expense, frequently at some saving in time and always with much less trouble, than when orders are placed directly. Duty Free prices f.o.b. Philadelphia on general lists of apparatus can not be printed either in our catalogue or on our discount sheet as ocean freights on such goods are mostly paid by the cubic meter and the delivered rate per unit of foreign currency depends, therefore, directly upon the relation between the bulk and value of any given shipment. All duty free quotations are made subject to the rulings of the Collector of the Port at which entry is made and the prevailing regulations established by the U. S. Treasury Department, and we do not guarantee duty free entry under any circumstances. Under the present ruling of the U. S. Treasury Department, which has been supported in the U. S. Courts, Hospitals, even when training schools for nurses are connected therewith, may not import free of duty.

RETURN OF GOODS—Customers are requested not to return goods for any reason until after communication is had with us. When the return is arranged suitable tags are sent which when attached to the articles in question insure prompt credit, repair or exchange, as indicated. The time involved in such preliminary arrangement is insignificant compared with the time and labor required to establish the identity and disposal of goods sent us without such precaution.

SHIPMENTS—Where no instructions are furnished with order we exercise our own judgment as to method of shipment, i.e., via rail, boat, parcel post, etc. All shipments are made in accordance with the regulations of the Interstate Commerce Commission and insurance only effected when specific directions are given, except in parcel post shipments which are automatically insured against both loss and breakage under a blanket policy, the small charge for such insurance being included on bills.

Our business is confined to the buying and selling of Apparatus and Reagents, mostly within the limits mentioned on the title page of this catalogue. We are not scientists, inventors or manufacturers and we are not equipped to design and experimentally develop scientific apparatus. We believe such work is properly done by the scientist in his laboratory, the manufacturer in his shop, or by the two in cooperation and that the function of the dealer advantageously begins only after such work is completed. We are ready whenever possible to facilitate cooperation between the scientist with ideas for development and selected manufacturers with facilities applying thereto. We own no patents, have part in no monopolies and all of the merchandise offered herein is obtainable either directly from the makers or through other dealers whenever our services fail in their operation toward the convenience, economy and general satisfaction of the purchaser.

A preface applying specifically to our business in Reagents is printed with the Reagent section of this Catalogue.

ARTHUR H. THOMAS COMPANY.



Bausch & Lomb Optical Company Works

BAUSCH & LOMB OPTICAL COMPANY—Under an arrangement in successful operation for the past fourteen years, we carry in stock in Philadelphia a complete line of Microscopes, Microtomes, Projection and Photo-Micrographic Apparatus as manufactured by the Bausch & Lomb Optical Company, of Rochester, N. Y. We distribute these products in Pennsylvania, New Jersey and the Southern states, at original factory prices, thereby saving customers in this territory both time and transportation expense. While nearly all of these goods are listed in this catalogue, we have for free distribution the following original Bausch and Lomb catalogues in editions specially prepared for us.

Microscopes and Accessories
Microtomes

Photo-Micrographic Apparatus
Projection Apparatus



Carl Zeiss Works

CARL ZEISS, JENA—Since 1899 we have been direct importers of all Zeiss products as applied to laboratory work. We carry in duty paid stock for immediate delivery a large assortment of Microscopes and Accessories, Refractometers, Haemocytometers, etc., at factory prices plus duty and transportation. All duty free importations of Zeiss products are handled by us at the minimum rate of 25¢ per Mark, f.o.b. Philadelphia. The catalogues, pamphlets and reprints of scientific articles published by the firm of Carl Zeiss constitute a distinct addition to scientific literature. We carry a complete assortment of these publications on hand for immediate distribution free of charge to scientists in the United States and publish from time to time a complete list thereof. We mention some of the more important catalogues and pamphlets as follows:—

Mikro 184. Microscopes and Accessories.
Mikro 227-231. Ultra-Microscopy and Dark-ground Illumination Apparatus.
Mikro 264. Photo-Micrographic Apparatus.
Mikro 239. Large Projection Apparatus.
Mikro 170 and 234. Photo-Micrographic Outfit for Ultra-Violet Light and Supplement to same.

Mikro 243. Epidiascope for the Projection of Opaque Objects. Microscopic Objects and Lantern Slides.
Mess. 160. Optical Measuring Instruments.
Mess. 165. Dipping Refractometer.
Mess. 172. Abbe Refractometer.
Mess. 173. Butter Refractometer.
Mess. 188. Pulfrich Refractometer.

IMPORTATION SERVICE FROM SPECIFIED EUROPEAN MAKERS

An important feature of our business is the importation service from specified European manufacturers of scientific instruments whose catalogues we supply to intending purchasers and whose goods we furnish at net factory prices plus our actual cost of importation, which is in most instances distinctly less than when orders are placed directly. This service is for obvious reasons much wider in its scope than is our business as described on the title page of this catalogue and we maintain a reference file containing catalogues from over seven hundred European manufacturers. Our profit on importation orders from specified makers is confined to the discount allowed us by the maker and in no case do we advance the factory prices except by the addition of U. S. Customs duty in duty paid importations, and in all importations by the addition of transportation charges. We mention below a few European makers of reputation whose catalogues are regularly supplied us for distribution.

- Eugen Albrecht, Physiological Apparatus after Hurtle, etc.
 Montaudon, Anzoux Models of Human and Comparative Anatomy.
 R. Brendel, Botanical and Zoological Models.
 Cambridge Scientific Instrument Co., Electrical Measuring Instruments, Duddell Oscillograph, Einthoven Galvanometers, Electro-Cardiographic Apparatus, etc.
 Deyrolle et Fils, Models of Human and Comparative Anatomy, and other Anatomical Preparations.
 Dr. Th. Edelman, Electrical Measuring Instruments, Einthoven Galvanometers, Electro-Cardiographic Apparatus.
 Ferdinand Ernecke, General Physical Apparatus.
 R. Fuess, Petrographical Microscopes, Goniometers, Refractometers, Meteorological Apparatus. Precision Thermometers, etc.
 Robert Goetze, Apparatus for Physical Chemistry and Precision Thermometers.
 Greiner & Friedrichs, Fine graduated and lamp-blown Chemical Glassware.
 Dr. G. Grubler & Co., Stains for Biological Work.
 Emil Gundelach, Fine Chemical Glassware, Vacuum Tubes, etc.
 Hartmann & Braun, Electrical Measuring Instruments.
 Chas. Hearson & Co., Ltd., Bacteriological Incubators and Paraffine Baths.
 Adam Hilger, Ltd., Wavelength Spectrometers and Spectrographs, Refractometers, Interferometers Goniometers, Spectrophotometers and Diffraction Gratings.
 R. Jung, Physiological Apparatus, Microtomes, etc.
 C. A. F. Kahlbaum, High Grade Chemicals and Reagents.
 Max Kohl, Physical Apparatus. Comprehensive catalogue of 822 pp.
 Fritz Köhler, Apparatus for Physical, Electro- and Photo-Chemistry.
 Königliche Porzellan-Manufaktur, Porcelain Ware for laboratory and manufacturing purposes.
 Dr. F. Krantz, Crystal Models and Mineralogical Preparations and Collections.
 A. Krüss, Spectroscopes, Spectrometers, Spectrophotometers, Colorimeters, etc.
 F. & M. Lautenschlaeger, Bacteriological and General Laboratory Apparatus. A large general catalogue of 713 pages.
 E. Leybold's Nach., Physical Apparatus, Gaede Vacuum Pump, Gaede Molecular Pump, etc.
 C. F. Palmer & Co., Physiological Apparatus.
 Ph. Pellin, Polariscopes, Colorimeters, Spectroscopes, Le Chatelier Metallurgical Microscope, etc.
 Wilh. Petzold, Physiological Apparatus.
 Pulsometer Engineering Co., Geryk Vacuum Pump.
 W. G. Pye & Co., Physical Apparatus.
 Carl Reichert, Polariscopes, Metallurgical Microscopes, etc.
 Max Rinck, Physiological Apparatus.
 Alb. Rueprecht & Sohn, Analytical Balances and Weights.
 Gebr. Ruhstrat, Laboratory Resistances.
 F. Sartorius, Analytical Balances, Microtomes, etc.
 Schmidt & Haensch, Spectroscopes, Spectrometers, Polariscopes, Photometers, Spectrophotometers, Colorimeters, etc.
 Schott & Gen., Jena Laboratory Glassware.
 Dr. Siebert & Kuhn, Fine Thermometers.
 Société Gènevoise, Optical Measuring Instruments, Dividing Engines, Physical Apparatus.
 Spindler & Hoyer, Apparatus for Physiology and Psychology. Radio-Chemistry etc.
 Steeg & Reuter, Mineral Preparations.
 Tramond, Models of Human and Comparative Anatomy, Osteological Preparations.
 Otto Wolf, Electrical Measuring Instruments, Designs of the Physikalisch-Technische Reichsanstalt.
 Carl Zeiss, Microscopes and Optical Measuring Instruments (See Special Announcement page IV).
 E. Zimmerman, Apparatus for Physiology and Psychology.

A very complete index is to be found on page 558 of the catalogue.

The arrangement of this catalogue is based upon convenience rather than consistency. All systematic plans level if completely carried out to inconvenient location of certain articles. The general arrangement is alphabetical but in a number of instances the group system has been followed as a more convenient arrangement.

GROUP ARRANGEMENT

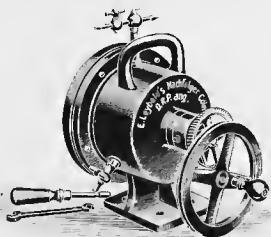
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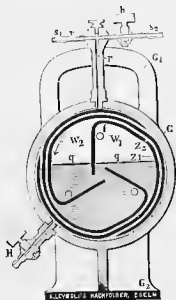
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20000.	Absorption Blocks, of paper purified with acids and used in calorimetric determinations to absorb difficult combustible liquids.			
	Height, mm.....	15	13	16
	Diameter, mm.....	7	10	14
	Per 100, net.....	1.10	1.10	1.10
20004.	Acetometer, Otto. For determining the percentage of acetic acid in vinegar, on wooden base.....			5.00
20008.	Acid Basins, of porcelain.			
	Diameter, mm.....	115	130	155
	Each.....	1.10	1.25	1.50
20012.	Acid Pitchers, of stoneware.			
	Capacity, cc.....	1000	2000	4000
	Each.....	.30	.60	1.00
20016.	Acid Pump, for drawing acids, ammonia, etc., from carboys and large containers. A foot power blower or other form of blast apparatus is necessary for use in connection with it.....			5.00
20020.	Acid Pump, with force pump attached. Suitable for bottles and carboys with inside diameter of mouth 1½ to 2½ inches.....			5.00
20024.	Adapters, curved; light wall, lamp blown; for connecting retorts with receivers.			
	Length, mm.....	130	150	200
	Diameter at large end, mm.....	22	30	40
	Each.....	.20	.30	.35
20028.	Adapters, straight; light wall, lamp blown.			
	Length, mm.....	130	150	200
	Diameter at large end, mm.....	22	30	40
	Each.....	.20	.30	.35
20032.	Air Pump, Vacuum and Pressure, of brass, nickel plated. Mounted on oak base, with chamber 16 inches long by 2½ inches in diameter. With two valves and two nipples for inlet and outlet of air.....			8.00
20036.	Air Pump, "Geryk" No. 0, fast running type, with new patented improvements, with 1½ inch cylinder by 5 inch stroke, with 7 inch plate and vacuum gauge; giving a vacuum to .3 mm less than perfect vacuum as measured by the MacLeod Gauge. All the ordinary phenomena can be produced, such as the freezing of water by evaporation, and other school work.			
	Duty Free.....	30.00		
	Duty Paid.....			36.00

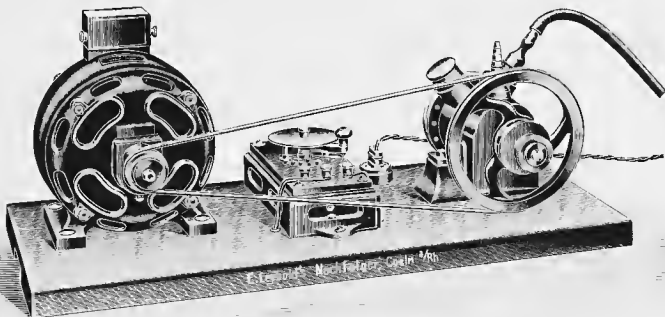


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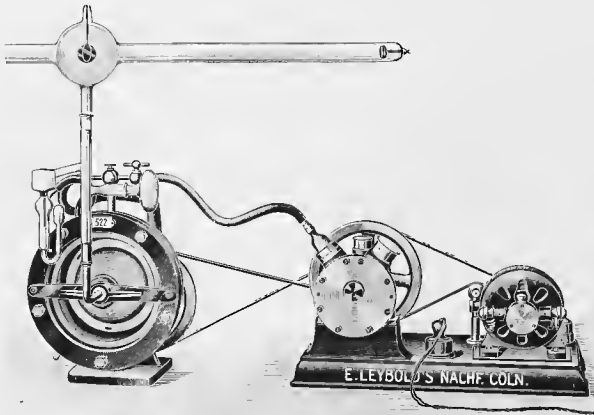
No. 20052

20052. **Air Pump, Gaede High Vacuum.** Consists of an iron chamber half filled with mercury in which a porcelain drum rotates. This pump will exhaust a 6 liter flask after it has been brought down to a vacuum of 10 mm by preliminary exhaust (by means of a filter pump or preferably with Gaede's Rotary Pump No. 20056) to .004 mm in 5 minutes, to .0001 mm in 10 minutes and to .00001 mm in 15 minutes. See *Gaede, Physikalische Zeitschrift, 1907, VIII, p. 853*. Complete with new patented valve drum and glass connection, but without mercury.
- | | | | |
|---------------------|--------|---------------------|--------|
| Duty Free | 120.00 | Duty Paid | 160.00 |
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No. 20056

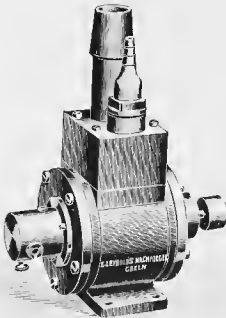
20056. **Air Pump, Gaede Rotary.** Particularly recommended for use as an auxiliary pump in creating the preliminary vacuum necessary with the Gaede High Vacuum Pump. This pump works dry by means of a valve placed eccentrically in a metallic case. **This pump is equally suitable for the production of blast as well as vacuum** and on this account has wide application in laboratory work. It will evacuate a 6 liter flask from 1 atmosphere to 3 mm in 1 minute, to .01 mm in 2 minutes, to .15 mm in 3 minutes, to .035 mm in 8 minutes, to .012 mm in 10 minutes and to .006 mm in 15 minutes. As a pressure pump it will give a pressure of 1 atmosphere above the pressure of the atmosphere in which it is operated. For hand driving.
- | | | | |
|---------------------|--------|---------------------|--------|
| Duty Free | 186.00 | Duty Paid | 248.00 |
|---------------------|--------|---------------------|--------|
20060. **Air Pump, Gaede Rotary, with Electric Motor.** Same as 20056 but mounted on base board with electric motor of 1/4 h. p. and starting rheostat. Motor arranged for continuous operation. Voltage must be specified in ordering.
- | | | |
|---------------------|--------|-------------|
| Current | Direct | Alternating |
| Duty Free | 195.00 | 210.00 |
| Duty Paid | 260.00 | 280.00 |



No. 20064

20064. **Air Pump, Combination Outfit**, consisting of Gaede High Vacuum and Gaede Rotary Pumps, the latter mounted on same base with electric motor. By means of belt connection the pumps are operated simultaneously by the same motor. Voltage must be specified in ordering. Motor supplied with this outfit is not intended for continuous operation.

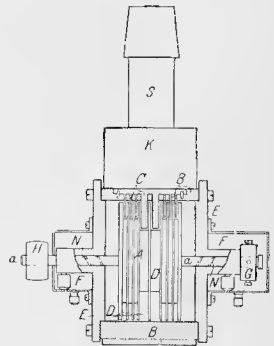
Current	Direct	Alternating
Duty Free	300.00	330.00
Duty Paid	400.00	440.00



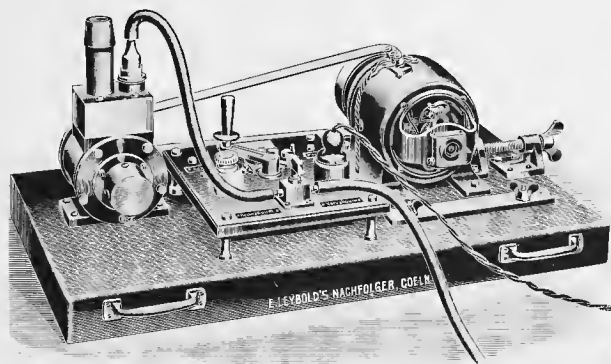
No. 20065

20065. **Air Pump, Gaede Molecular**. A new high vacuum pump which removes all vapors as well as gases. Will exhaust a 6 liter flask starting with a pressure of 10 mm and using the Gaede Rotary Pump as an auxiliary, to .0003 mm in 2 minutes, to .00001 mm in 3 minutes and to .000002 mm in 4 minutes. In other words, this pump will exhaust to the same degree of vacuum in 3 minutes that the Gaede High Vacuum Pump reaches in 15 minutes. The Molecular Pump is built on an entirely new plan, being without piston of any kind and the communication between the rotor and the primary vacuum through the grooves and channels of the pump is at no time closed. The movement of the rotor acts on the movement of the gas molecules in the grooves of the rotor or the casing and produces a region containing fewer molecules, i.e., a vacuum, at the suction nozzle of the pump. This pump requires an electric motor with a speed of 3000 r. p. m. and a pulley 135 mm in diameter to give the required speed, i. e., 8000 r.p.m. Pump only, without motor.

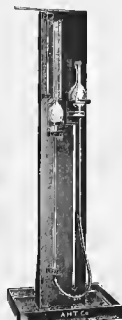
Duty Free	198.00	Duty Paid	264.00
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No. 20068



No. 20072



No. 20076

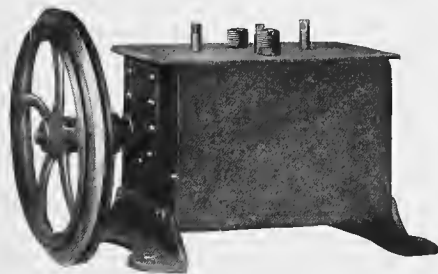
20072. Air Pump, Gaede Molecular with Electric Motor. Same as 20068 but with electric motor and starting rheostat mounted on same base with pump. Voltage must be specified in ordering.

Current	Direct	Alternating
Duty Free	300.00	330.00
Duty Paid	400.00	440.00

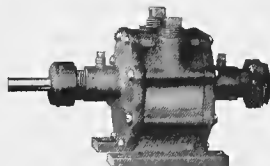
Note.—The Gaede Molecular Pump should always be backed by another pump which will exhaust into the atmosphere in order to secure maximum effect. In practical work in the manufacture of Roentgen tubes the Gaede pump is frequently backed by such a pump as the McNeill Rotary, which is in turn backed by a piston pump such as the Geryk, such a series being very much more efficient and rapid when so arranged.

20076. MacLeod's Vacuum Gauge for use with Gaede and other apparatus.

Duty Free	24.00	Duty Paid	35.20
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No. 20080



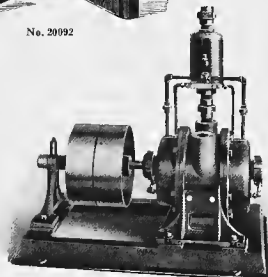
No. 20082

20080. Air Pump, Crowell Rotary Type O-D, will exhaust to a vacuum of from 29 to 30 inches of mercury and can be used either totally immersed in oil in the oil box or without the oil box as shown. The capacity of this pump is 2 cubic feet of free air per minute. The inlet and outlet tubes are tapped for 3/8-inch pipe size and about 1/4 h. p. is required for operation; weight with the oil box 50 lbs., without oil box 20 lbs. As used in many college laboratories and in the Nutrition Laboratory of the Carnegie Institution of Washington. Can be used for blast as well as suction. Complete with oil box. 45.00

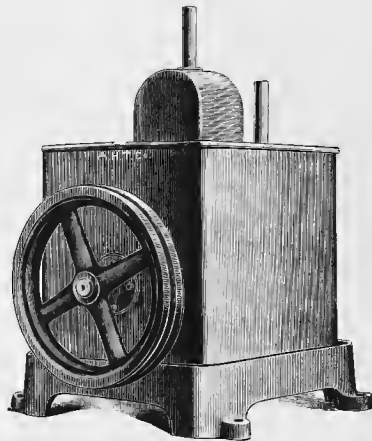
20082. Air Pump, Crowell Rotary Type O-D, as above, but without oil box 35.00



No. 20992



No. 20084



No. 20088

20084. Air Pump and Compressor, Crowell Rotary. Exhausts under ordinary conditions of atmosphere to a vacuum of 29 or 30 inches of mercury. Can be used for pressure or blast up to 25 lbs. to the square inch. There are no valves, springs, gears or unbalanced parts and the direction of rotation is not alternated when changed from use as a compressor to a vacuum pump. Very satisfactory for supplying suction throughout a laboratory for filtrations, etc., or air pressure for blast lamps. For illustration of receiver, see page 73. In ordering please state whether receiver is to be included

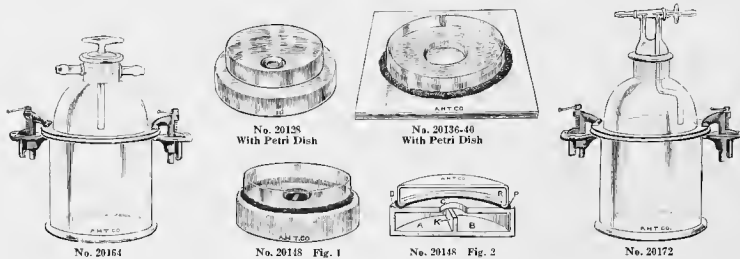
SIZE NUMBER	CUBIC INCHES PER REVOLU- TION	CUBIC FEET PER MINUTE AT MERCU- RY PRESS- URE	MAXIMUM SPEED REVOLUTIONS PER MINUTE	APPROXIMATE P. AT 15 IN. MERCURY 29 INCHES OF VACUUM	PULSES TIGHT AND LOOSE, INCHES	APPROXIMATE NET WEIGHT, POUNDS	PIPE SIZE, INLET AND OUTLET	FLY WHEEL DIAMETER, INCHES	PRICE OF PUMP	PRICE OF RE- CEIVER WITH BRIEF VALVE
1-D	15	4 3/4	500	1/4	6 x 2	70	1 1/2 "	13 x 18	\$40.00	\$8.00
2-D	40	9 3/4	400	1/2	8 x 2 1/2	115	1 1/2 "	14 x 22	60.00	8.00
3-D	100	17 1/2	300	1	12 x 4	250	1 1/2 "	19 x 34	90.00	10.00
4-D	280	40 5/8	250	2	14 x 4	425	1 1/2 "	23 x 38	150.00	10.00
5-D	400	46.0	200	3	18 x 6	580	2 "	26 x 44	170.00	18.00
6-D	600	69 1/4	200	6 1/2	18 x 8	725	2 "	26 x 53	225.00	18.00

20088. Air Pump, McNeill Rotary, for High Vacuum. When properly backed by a pump exhausting into the atmosphere produces a vacuum of .0003 mm and under favorable circumstances will do even better. This pump is widely used in the manufacture of tungsten and other electric lamps and, as it will not exhaust directly into the atmosphere, must be backed by a pump producing a vacuum of at least 1 mm of mercury. In lamp factories a Geryk pump is frequently used for this purpose. The McNeill pump is also used in the manufacture of Roentgen tubes, etc., as an auxiliary to the Gaede Molecular Pump, in which combination it must also be backed by a pump exhausting into the atmosphere 100.00

20090. Special Oil, per gallon. 1.00
 Note—Five gallons of the special oil should be purchased with each Pump.

20092. Air Pump Plates, on tripod base, with heavy plate glass top and two-way stopcock. Without bell jar. For Bell Jars suitable for use with these plates see No. 21920.

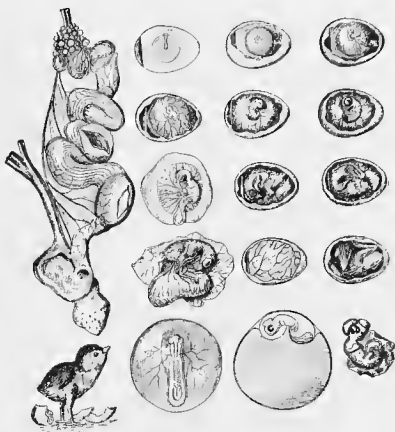
Diameter, mm.	200	250	300
Each	10.00	12.00	15.00



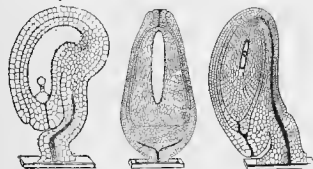
20128.	Anaerobic Culture Apparatus, Küster, consisting of a glass absorption capsule, 120 mm in diameter by 15 mm high, entirely closed over with the exception of a small hole in the top. Absorbent material such as pyrogallie acid, etc., is placed in the dish to a depth of about 5 mm. The Petri dish containing the culture is then placed over the opening in an inverted position and sealed down with plasticine. When the usual 100 mm Petri dishes are used, about 150 cc of air must be absorbed by the acid. Two parts of sodium hydrosulphite or pyrogallie acid are dissolved in 20 parts of distilled water and poured into the absorption capsule and, just before placing the Petri dish above the capsule, 20 cc. of a 10% solution of potassium hydroxide is added. Absorption takes place very rapidly because of the large absorbing surface and may be hastened by slight shaking. See <i>Centralblatt f. Bakt. Referate 57 Bd. No. 14-22, p. 269-271.</i> Absorption capsule only.....	.40
	Anaerobic Culture Apparatus, Lentz, consisting of a 125 mm square glass plate and a cellulose absorbent ring. The Petri dish containing the culture is placed in an inverted position over the cellulose ring after same has been soaked in pyrogallie acid, the dish being sealed to the glass plate by means of plasticine. Immediately before using the cellulose ring should be moistened with 1% potassium hydroxide. The rings are 85 mm in diameter, being intended for convenient use with a 100 mm Petri dish. See <i>Centralblatt f. Bakt., 1910, Bd. 53, 1 & 3.</i>	
20136.	Cellulose Rings, as described, per box of 10.....	2.00
20140.	Glass Plates, 125 mm square. Each.....	.06
20144.	Plasticine, in conveniently shaped rods. Per box of 25 rods.....	1.25
20148.	Anaerobic Culture Apparatus, McLeod, consisting of two parts, a porcelain capsule to contain the pyrogallie acid and caustic soda solutions and a special Petri dish which has its free margin turned inward and upwards. The porcelain dish is a hollow chamber. It is bisected in the lower two-thirds of its depth by a vertical partition and there is a circular aperture in the center of its upper surface. Around the margin of the upper surface is a small groove which is filled with plasticine. In using the apparatus 5 cc to 7 cc of a 15% solution of pyrogallie acid is run into the compartment of the chamber marked A in Fig. 2. This can most easily be done with a large pipette, 5 cc to 7 cc of a 10% solution of caustic potash is then introduced into compartment B. The Petri dish is then pressed down into the plasticine in the groove and the plasticine is pushed up against its outer margin to insure the proper sealing of the chamber. As soon as the access of fresh oxygen from without has thus been cut off, a mixture of the pyrogallie acid and caustic potash solutions is effected by tilting the porcelain dish so that the solutions run over the partition at the point K in Fig. 2 and react with one another. The Petri dish is shown in Fig. 1 ready for use in contact with the plasticine. Any condensation water which may form is retained in the groove R. See <i>Journal of Pathology and Bacteriology (British), Vol. 4, April 1913, p. 454.</i> Complete with both porcelain dish and special Petri dish.....	1.25
20152.	Porcelain Capsule, only.....	1.00
20156.	Special Petri Dish, only.....	.25
	Note.—For Plasticine see No. 20144.	
20160.	Anaerobic Culture Apparatus, Novy, with removable top permitting the use of Petri dishes. For use by either gas or pyrogallate methods. The two sections have wide ground flanges which, with the rubber bands, form an air-tight connection when held in place by clamps. The lower section is 150 mm high by 140 mm in diameter. Glass parts only, with rubber band but without metal clamps.....	4.50
20164.	Anaerobic Culture Apparatus, Novy, same as No. 20160 but with clamps.....	5.00
20168.	“ “ “ “ improved form, for the culture of anaerobic bacteria by either vacuum, gas or pyrogallate methods. With stopcock supported horizontally by glass tubes above the regular stopper, relieving the large stopper from pressure and thus permitting the use of the vacuum method. Otherwise identical with No. 20160. Glass parts only, with rubber band but without metal clamps.....	5.50
20172.	Anaerobic Culture Apparatus, Novy, same as No. 20168 but with clamps.....	6.00



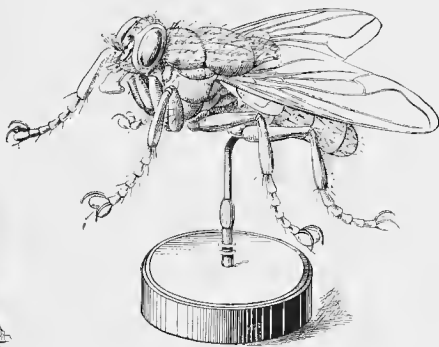
Model of Man with dissectible heart, etc.
Duty Free \$150.00



Development of Chick
Duty Free \$37.50

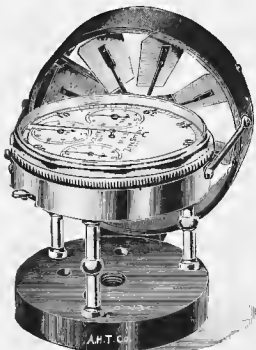


Fundamental Ovule Formations in Angiosperms
Duty Free .. \$18.00

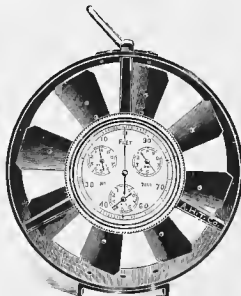


Model of House Fly
Duty Free \$15.00

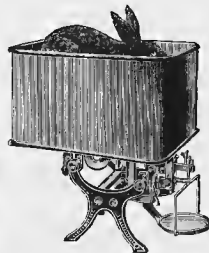
ANATOMICAL MODELS, illustrating Human and Comparative Anatomy, Embryology, Botany, Pathology, Veterinary Science, etc. Our experience in the importation of models and natural history specimens is extensive and we offer prospective customers the original catalogues of the leading European manufacturers in these lines. As practically all of our sales are to institutions entitled to duty free importations, it is not practical to carry the goods in duty paid stock and our experience indicates that customers prefer to order directly from manufacturers' catalogues which are sent upon request.



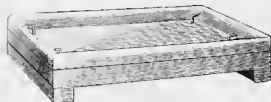
No. 20176



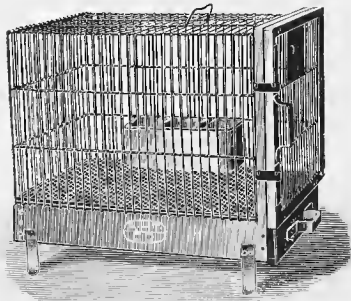
No. 20180



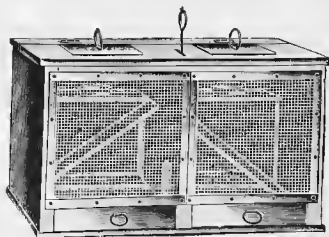
No. 20184



No. 20188

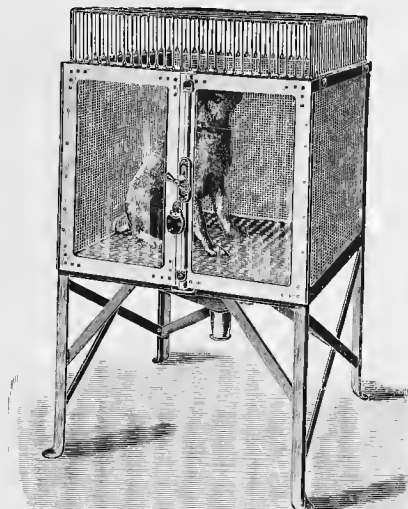


No. 20192

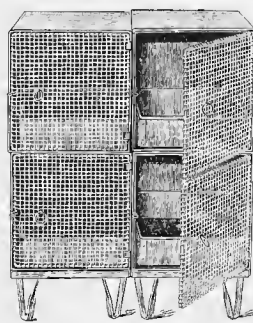


No. 20196

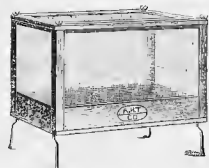
20176. Anemometer for the measurement of air currents through mines, tunnels, sewers and in the ventilation shafts of hospitals, schools and other public buildings. With four dials reading to 100,000 ft. and with zero setting attachment. Best London make. 30.00
20180. Anemometer, Biram pattern, with four dials reading to 100,000 ft. Best London make. 28.00
20184. Animal Balance, for conveniently weighing animals in the bacteriological laboratory. A decimal balance, very sensitive, with removable animal pan and tare weight for same so that balance can be used for other purposes. Capacity 20 kilos. Without weights 13.00
20188. Animal Board, of wood, with hooks in each corner. Very convenient for animal experiments. Small size is intended for guinea pigs and rats and the larger size for small dogs, cats, etc.
- | | | |
|---------------------|------|------|
| Length, mm. | 320 | 650 |
| Width, mm. | 200 | 300 |
| Each | 1.50 | 3.00 |
20192. Animal Cage, extra heavy, with removable drawer, feeding trough, etc.
- | | | |
|---------------------|-------|-------|
| Height, mm. | 300 | 450 |
| Length, mm. | 400 | 600 |
| Width, mm. | 300 | 400 |
| Duty Free. | 11.55 | 15.50 |
| Duty Paid. | 14.00 | 18.80 |
20196. Animal Cage, Heim. Designed specially as a breeding cage for mice, with two compartments, etc. Of wood with metal fittings, 500 x 300 x 300 mm.
- | | | | |
|--------------------|-------|---------------------|-------|
| Duty Free. | 11.10 | Duty Paid | 13.45 |
|--------------------|-------|---------------------|-------|



No. 2020



No. 20204



No. 20208



No. 20216



No. 20224



No. 20212

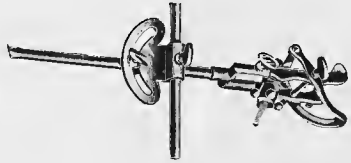


No. 20220

20200. **Animal Cage, Aberdalden.** Designed specially for metabolism experiments, etc. The sides and back are of wire glass, with doors of plate glass. A perforated bottom, easily removable for cleaning, supports the animal over the conical bottom for collection of urine, etc. Heavily made throughout.
- | | | | |
|-----------------|-------|-------|-------|
| Height, mm..... | 600 | 700 | 800 |
| Length, mm..... | 600 | 700 | 800 |
| Width, mm..... | 600 | 700 | 800 |
| Duty Free | 44.55 | 48.85 | 52.80 |
| Duty Paid | 54.00 | 59.25 | 64.00 |
20204. **Animal Cage, Phipps Institute Model,** as designed by Dr. Paul A. Lewis. Of heavy galvanized sheet iron. The new feature of these cages is the arrangement for bolting together the units in stacks of two, four, etc., as shown in illustration. Height 14 inches, length 14 inches, width 16 inches. Supports only, for above, 6½ in. high, each. 1.50
20205. **Animal Cage, Vaughan.** Collapsible for convenience in sterilization or storage, the sides, top and bottom being in separate parts. Height (not including legs) 12 inches, total height 17 inches, length 20 inches, width 15 inches. 8.50
20208. **Animal Holder, Vaughan.** Collapsible for convenience in sterilization or storage, the sides, top and bottom being in separate parts. Height (not including legs) 12 inches, total height 17 inches, length 20 inches, width 15 inches. 8.50
20212. **Animal Holder, for mice.** Made entirely of metal; for inoculating mice; with adjustable clamp for holding the tail of the animal. The conical wire cage is detachable. 1.25
20216. **Animal Holder, Kitasato,** for mice; nickel plated metal plate with spring clamp for fastening the animal by the skin of the neck and a spring clip for holding the tail or leg. The plate may be supported in any position by ball and socket joint. 4.00
20220. **Animal Holder, Voqe,** for guinea pigs. Useful for taking temperatures, inoculations, etc. Of zinc.
- | | | |
|-------------------|-----|-----|
| Height, mm..... | 180 | 200 |
| Diameter, mm..... | 60 | 80 |
| Each | .60 | .75 |
20224. **Animal Jar,** for mice, consisting of glass battery jar 5 x 7 inches with wire mesh top and weight. 1.25



No. 20228

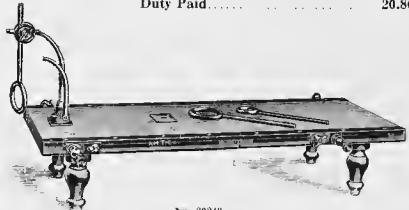


No. 20232

20228. **Animal Jar.** The smaller sizes are intended for mice and the larger sizes for guinea pigs and rabbits. Top is made of heavy galvanized wire with weight. The same jars may be fitted with close-fitting tops of mosquito and flea proof gauze at an additional price. For prices of jars only, see Aquaria No. 20276.
- | | | | |
|----------------------------|------|------|-------|
| Height, inches | 7 | 10 | 12 |
| Diameter, inches | 8½ | 11 | 16 |
| Each | 2.75 | 4.75 | 11.00 |
20232. **Animal Head Holder, with clamp, large model for dogs, jaws upholstered with leather.**
- | | | | |
|---------------------|-------|---------------------|-------|
| Duty Free | 17.25 | Duty Paid | 20.80 |
|---------------------|-------|---------------------|-------|

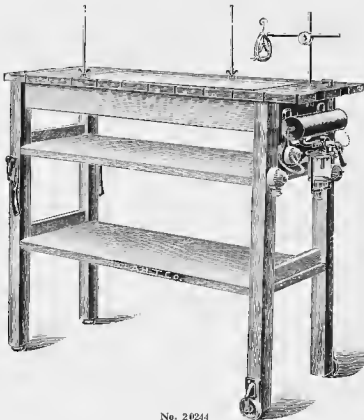


No. 20236



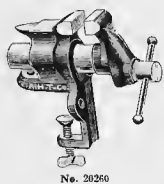
No. 20240

20236. **Animal Holder, Tatin, of metal, for guinea pigs, rats, etc., with two head holders as shown in illustration.**
- | | | | |
|---------------------|------|---------------------|-------|
| Duty Free | 8.95 | Duty Paid | 10.80 |
|---------------------|------|---------------------|-------|
20240. **Animal Holder, new model, of wood. With adjustable metal fittings on the sides for fastening the legs. This apparatus is suitable for a great variety of work and is sufficiently adjustable to be used for either guinea pigs or dogs. Complete.**
- | | | | |
|---------------------|-------|---------------------|-------|
| Duty Free | 24.75 | Duty Paid | 30.00 |
|---------------------|-------|---------------------|-------|



No. 20244

20244. **Animal Table, Brodie, with a top 51 x 18 inches, and 40 inches high. With cleats for the easy attaching of the holding cords. Near the center and flush with the top is a copper hot plate, 30 x 12 inches, heated by two electric lamps, each having its own independent switch. With two upright rods working in slots. At the end is attached Dr. Brodie's anaesthetic bottle and air warmer (see No. 43048), with a bent tube projecting through the table to supply air to the animal. Table is complete with animal holder, four control switches, main switch and plug. Voltage must be specified in ordering.**
- | | |
|---------------------|-------|
| Duty Free | 70.00 |
| Duty Paid | 85.00 |



No. 20260



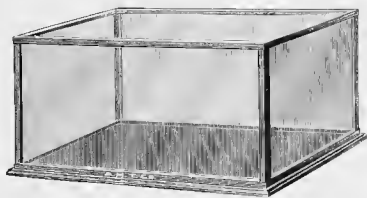
No. 20252



No. 20256



No. 20214



No. 20272



No. 20268

20248.	Annealing Cups, Denver Fire Clay Company's make; of fine, white selected clay; largely used for silica fusions.								
	Number.....		0	1	2				
	Size, inches.....		1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2				
	Per dozen.....		1.00	1.00	1.00				
	Covers, per dozen.....		.25	.25	.25				
20252.	Anvil, steel, with mirror polished face; 4 1/2 inches long; weight 1 lb.								1.00
20256.	" " square, mirror polished face. Size of face, inches.....		1	1 1/2	2				
	Each.....		.65	1.00	1.25				
20260.	Anvil, with vise. A well made tool, very convenient in the laboratory.								
	Width of jaws, inches.....		1 1/2	2	2 1/2				
	Weight, lbs.....		1 1/2	4 1/2	9 1/2				
	Each.....		.75	1.50	3.00				
20264.	Aprons, laboratory; acid proof, light and pliable								1.00
20268.	Aquaria, oblong, of heavy, clear, white glass, without base.								
	Capacity, gallons.....			2 1/2	5				
	Length, inches.....			10 1/2	13				
	Width, inches.....			6 1/2	8				
	Height, inches.....			10 1/2	13				
	Each.....			3.00	8.00				
20270.	Aquaria, as above, with base, each.....			5.50	11.00				
20272.	Aquaria, rectangular, of plate glass set in wrought iron frame, with slate bottom. As furnished by us to the laboratories of the U. S. Bureau of Fisheries. Boxing charged extra at cost. Special sizes made to order; prices upon application.								
	Length, inches.....	18	21	23 1/2	29	33	43 1/2		
	Width, inches.....	10 1/2	12	13 1/2	17	19	21		
	Height, inches.....	11 1/2	12 1/2	13 1/2	16	18	21		
	Each.....	6.00	8.00	9.60	16.00	20.00	32.00		
20276.	Aquaria, high form, of heavy, clear, white glass; with ground rim and groove near top. Boxing charged extra except when ordered in original factory packages as indicated below.								
	Capacity, gallons.....	1/2	1	1 1/2	2	4	8	12	
	Height, inches.....	8 1/2	7	8	10	14	12	12	
	Diameter, inches.....	6	7	8 1/2	9	11	14	16	
	Each.....	.60	.90	1.25	1.50	2.75	6.00	8.00	
	Number in original case.....	18	16	12	5	3	2	1	
	Each, in original case.....	.55	.80	1.12	1.35	2.50	5.40	8.00	
20280.	Aquaria, low form, of heavy clear, white glass, with ground rim and groove near top. Boxing charged extra except when ordered in original factory packages as indicated below.								
	Capacity, gallons.....	1/2	1	2	3	4 1/2	7	10	
	Diameter, inches.....	7	8	10	12	14	16	18	
	Height, inches.....	4 1/2	5	6 1/2	7 1/2	8 1/2	9 1/2	10 1/2	
	Each.....	.65	.85	1.25	1.75	2.50	4.50	8.00	
	Number in original case.....	18	12	6	4	2	2	1	
	Each, in original case.....	.60	.75	1.12	1.65	2.25	4.00	8.00	



No. 20276



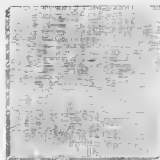
No. 20280



No. 20284



No. 20288



No. 20301



No. 20316

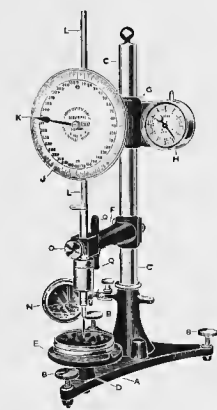


No. 20320



No. 20324

20284.	Arsenic Apparatus, Fresenius, for the detection of arsenic, without support.									1 00
20288.	" Tubes, of Bohemian glass									
	Style.....		A	B	C	D				
	Each.....		.04	.04	.04	.04				
20292.	Arsenic Tubes, Transparent Silica, 3 inches long by $\frac{1}{8}$ inch outside diameter with bulb $\frac{3}{8}$ inch diameter.....									.25
20296.	Asbestos Aprons, made of pure asbestos, canvas lined, complete with strap and buckle fasteners. State size in ordering. A medium size is sent unless otherwise specified.....									7.50
20300.	Asbestos Board, in mill size sheets, 42 x 48 inches. The board is carried in stock in the following thicknesses for which approximate weights are given. On small orders, particularly when shipped alone, necessary crating is charged extra at cost because of the small value of the article itself.									
	Thickness, inches.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
	Weight, lbs.....	2	4	7	10	13	18	24	35	35
	Per lb.....	.10	.10	.10	.10	.10	.10	.10	.10	.10
20304.	Asbestos Board, in squares, for use under beakers, dishes, etc.									
	Thickness, inches.....		$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$
	Size, inches.....		4	5	6					
	Each.....		.04	.05	.06					
20308.	Asbestos Cement, ready for use. Per 5 lb. can.....									.50
20312.	Asbestos Cord, with strong, hard-twisted strands; convenient in the laboratory for supporting retorts, crucibles, etc., in contact with fire or heat; sizes $\frac{1}{8}$ th to $\frac{3}{8}$ th incl diameter, in $\frac{1}{4}$ lb. balls. Per ball.....									.50
20316.	Asbestos Gloves, with four fingers and thumb, made of asbestos cloth, with either asbestos or leather gauntlet. Per pair.....									4.00
20320.	Asbestos Mat, circular, $8\frac{1}{2}$ inches in diameter, so-called "stove mats," with metal binding and ring for hanging up, very convenient in the laboratory.....									.15
20324.	Asbestos Mats, square, $\frac{1}{4}$ inch thick, neatly bound with metal to prevent fraying at the edges. Very convenient for use on table top and under burners to prevent scorching of wood etc. Special sizes made to order.									
	Size, inches.....	$8\frac{3}{8}$ x $8\frac{3}{8}$	11 x 11	9 x 14	15 x 15	10 x 16	12 x 15	14 x 24	24 x 30	
	Each.....	.20	.30	.30	.40	.50	.50	.50	1.20	
20328.	Asbestos Paper, of pure, white fiber, 36 inches wide. Cut any length. Per lb.....									.20



No. 20332



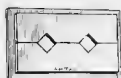
No. 20336



No. 20340



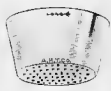
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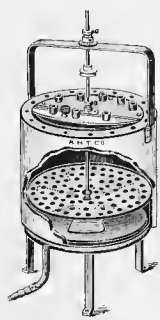
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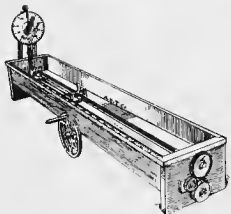
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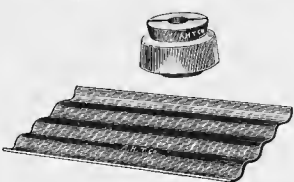
No. 20376



No. 20310



No. 20372



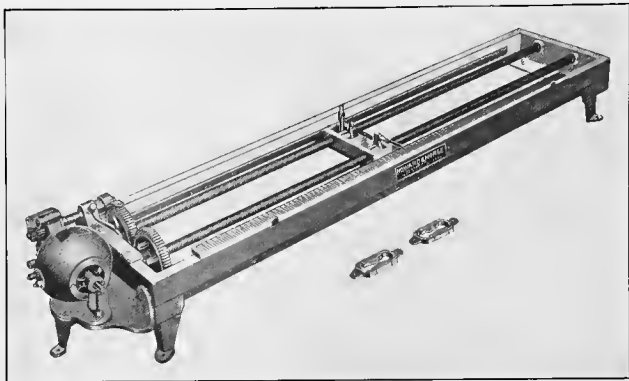
No. 20348



No. 20356

ASPALT AND TAR TESTING APPARATUS

- 20332. Penetrometer, Standard, New York Testing Laboratory Type, for measuring the depth of penetration of a standard needle into the material to be tested at 77° F. or 25° C in 5 seconds of time under a 100 gram weight; with standard clock reading in $\frac{1}{4}$ seconds and dial graduated to $\frac{1}{16}$ mm. A set of adjustable weights is provided permitting the use of either 50 or 100 gram loads in addition to the standard of 100 grams. See "The Modern Asphalt Pavement"..... 60.00
- 20336. Penetrometer, Miniature, exactly similar to the above but one-half the size and specially designed for engineers' portable use in making comparative tests, without clock..... 25.00
- 20340. Drying Oven, New York Testing Laboratory Type, for uniform temperatures, with fan in bottom and 10 inch ring burner; of copper with asbestos jacket, 20 inches high by 11 inches in diameter..... 35.00
- 20344. Drying Oven, same as above, but of Russia iron..... 25.00
- 20348. Asphalt Flow Plate and Mold, consisting of 3 plates each with four corrugations or 2 plates each with six corrugations and one mold. Type of plate must be specified in ordering..... 5.00
- 20352. Asphalt Viscosimeter, New York Testing Laboratory Type, consisting of a concave aluminum float with three standardized brass plugs; for testing the consistency or the fluidity of bituminous binders at 90° F..... 7.25
- Note—For testing the viscosity of bituminous compounds such as oils, or of asphaltic material at high temperatures, i. e., about 200° F., the Engler Viscosimeter is mostly used. See Oil Testing Apparatus.
- 20356. Adhesion Machine, Kirschbraun-Sargent, a double scale dynamometer graduated in grams up to 250 grains and in ounces up to 8 ounces. Two sample cups are provided, one for the standard sample and one for the unknown. As used in the Chicago Paving Laboratories..... 20.00
- 20360. Briquette Mould for Asphalt..... 4.00
- 20364. Cubical Brass Mould, with plate for melting point determination, $\frac{1}{4}$ inch..... 4.50
- 20368. Bitumen Holder, Draper model..... 3.00
- 20372. Cementation and Ductility Machine, Kirschbraun, for determining the relative cementation values of asphalt cements. May also be used for ductility and elongation tests under various conditions of temperature and speed..... 100.00
- 20376. Crucible, Royal Berlin Porcelain, of special shape, with large filtering surface, as used in the determination of soluble bitumen. Height 24 mm, width at top 45 mm, width at bottom 35 mm..... .50



No. 20384

20380. **Ductility Machine, Smith**, for hand power; made entirely of metal with box heavily plated and enamel painted, with right and left screws, slip nuts for carriage, etc., for tests up to 100 cm in length. The test is conducted at a standard speed of 5 cm per minute at a temperature of 77° F. 135.00

20384. **Ductility Machine, Smith**, as above but with directly connected, direct current electric motor. 175.00
 20388. **Ductility Machine, Electric Motor Drive, Chew Patent**, constructed entirely of metal. All exposed parts covered by water are made of brass or bronze. Warping and rusting are entirely prevented. The mechanism is strong, simple, durable and easily operated. The operation is smooth, uniform and accurate and reduces the personal equation of the operator to a minimum. This machine is adapted to testing all types of bituminous material which can be cast in moulds.

Tank—The tank or box in which the test specimens are immersed is made of iron heavily lined with white porcelain, which makes it possible to see at all times the finest thread to which the specimen may be pulled. It is of such width that three specimens may be tested simultaneously.

Moulds—Moulds for test specimens are of bronze, all parts being accurately machined and fitted. They are of standard dimension with a minimum cross section of one square centimeter. A set of three moulds is furnished with each machine. Additional sets may be procured if desired.

Carriage—The carriage is triangular in shape, specially designed to allow the operator freedom of access to the platform and posts which carry the moulds. It is supported on two tracks, one of which is slotted for its entire length and serves as a guide, thus insuring a perfect unidirectional pull free from chatter or vibration. The carriage is operated by a single heavy screw shaft placed close to the side of the box so as not to obstruct the manipulation of test specimens. The carriage may at any time be engaged or disengaged from the screw shaft by means of a small hand lever, which operates a two piece nut, even when the screw shaft is turning.

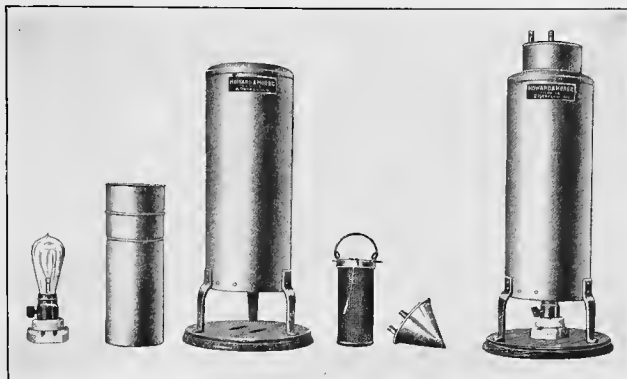
Drive—The screw shaft is operated by heavy bronze gears connected direct to the motor at one end of the tank by a worm drive. Either D.C. or A.C. electric motor is furnished as desired. The former is controlled by a rheostat; the latter is of the variable speed type. The motor is substantially mounted so as to reduce the vibration to a minimum.

Speed Indicator—The speed at which the test specimen is pulled apart is accurately indicated in reameters per minute by the Chew Speed Indicator which is attached to the operating shaft of the motor. This is a simple and unique device which makes it possible to operate and regulate the machine without recourse to any other timing device. It constitutes a novel and particularly desirable addition to the older type of machine. Once adjusted it is always reliable and absolutely prevents the possibility of error due to unknown variations in flow of current during the test. Any such variation is at once detected by the speed indicator and may be instantly corrected by adjusting the rheostat lever so that the speed indicator registers the exact speed desired.

Operation—After the test specimen has been brought to the desired temperature and attached to posts on carriage and platform, the carriage is disengaged from the screw shaft. The motor is then started and its speed regulated until the speed indicator registers exactly five centimeters per minute. The carriage is then engaged with the screw shaft while in motion. At the conclusion of the test the carriage is disengaged from the screw shaft and slid back to its original position.

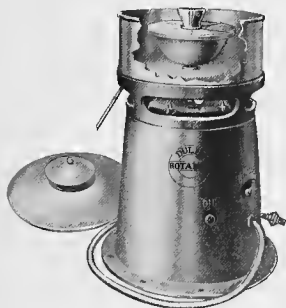
Full directions for making the ductility test are furnished with every machine. When placing order, be sure to state the type of current for which motor should be furnished. Price on application.

20392. **Extractor, New York Testing Laboratory Type**, for analysis of paving mixtures containing broken stone. The bituminous mixture should be warmed until it can be readily broken apart by hand, without fracturing any of the stony particles; 500 grams of the disintegrated mixture should be packed as tightly as possible in the wire basket and then covered with a disc of cotton or felt of $\frac{1}{4}$ inch to $\frac{1}{2}$ inch thickness; 175 to 200 cc of carbon disulphide, carbon tetrachloride, chloroform or benzole is placed in the inside vessel in which the wire basket is suspended. Cool water should be circulated through the inverted cone condenser which is also the cover of the apparatus and not intended to fit tight. A 16 c. p. carbon filament incandescent lamp is the source of heat. A 500 gram sample of the mixture should extract clean with carbon disulphide in about 3 hours. From 200 to 300 grams of asphalt black or Topeka type mixture is a sufficiently large sample for that type of mixture. After extraction, the solvent and matter removed from the sample during the analysis should be burnt to recover any fine mineral particles which may have passed into the extract. These extractors are made entirely of metal. Each, complete, but without incandescent lamp 30.00

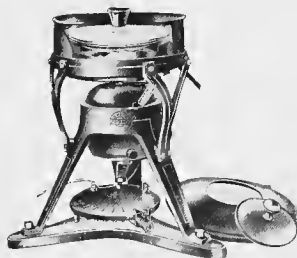


No. 20392

20396. Hydrometer, Sommer's Patent, for determining the specific gravity of asphalt, graduated from 0.85 to 1.3^o at 25° C., as recommended by the Committee of the American Society of Civil Engineers. Outfit with brass receptacle and fittings, with instructions for use..... 10.00
20400. Hydrometer, same as No. 20396 but graduated from 0.950 to 1.100 10.00

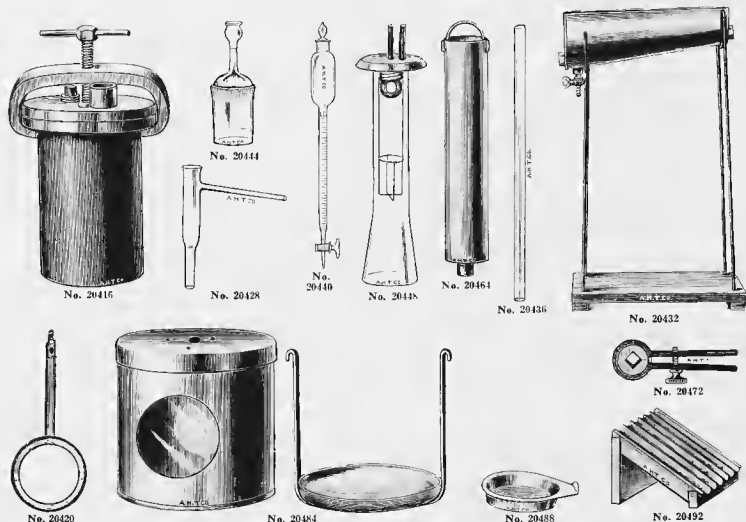


No. 20401



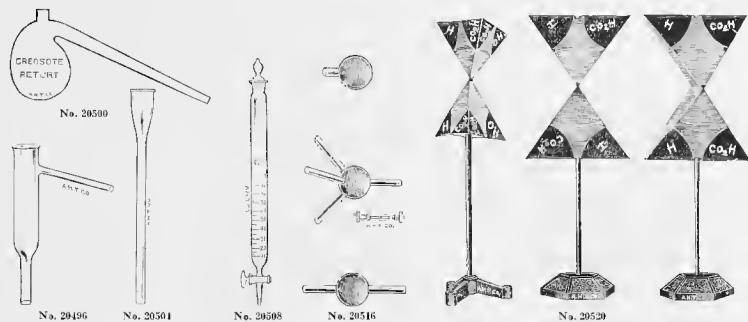
No. 20408

20404. Dulin Rotarex, Large Model with Universal Motor, for samples of 500 or 1000 grams. The advantage of using such a large sample will be readily apparent as it permits running samples which contain a large mineral aggregate as found in asphaltic, concrete or bitulithic pavements. It is also advantageous in securing a considerable amount of bitumen in the pavement which can be used for the penetration test. The machine is directly mounted on top of a universal vertical motor which is entirely enclosed in a cast-iron frame and operates on either 110 volts, 60 cycles, alternating current, or direct current 110 volts. The motor is fitted with a speed control, and may be used on 220 volt circuit with suitable resistance. The bowl in which the sample is placed is of aluminum with a cover of aluminum. The outside bowl or shell is of copper and fitted with a two-piece cover, the smaller of which is removed when adding additional solvent. All of the special features of the smaller type No. 20408 are incorporated in this machine..... 125.00
20408. Dulin Rotarex, Small Model, for determining the mineral aggregate in bitumen pavements. The asphalt receptacle of aluminum has a removable cover but solvent can be added as required without removing same. The solvent used is non-inflammable. Samples of 10, 25 or 50 grams may be run with accurate results. The motor used may be connected to any 110 volt direct or alternating current (except 25 cycles or less). Time for extraction is 5 minutes, leaving the mineral aggregate perfectly dry so that grades may be determined. 60.00



APPARATUS FOR TESTING COAL TAR AND REFINED TARS, OILS AND PITCHES DERIVED THEREFROM as adopted in the Standard Methods of the Barrett Manufacturing Company, New York. See *Journal of Industrial and Engineering Chemistry*, April, 1911, March, 1913, and May, 1914. The apparatus, listed below, is only the special apparatus required for these tests. The regular apparatus, such as tripods, burners, clamps, etc., are to be found under their respective headings throughout the catalogue. Complete lists of both the special and regular stock apparatus required for the various tests will be sent upon request.

	Special Apparatus required for Water in Tar Test	
20412.	Copper Still, with steel clamps, inside dimensions 6 x 3½ inches, with six paper gaskets.....	13.25
20416.	" " same as No. 20412, but larger size, i.e., inside dimensions 7½ x 5 inches.....	17.00
20420.	Ring Burner, brass, to fit small still No. 20412.....	1.90
20424.	" " " large " No. 20416.....	3.25
20428.	Connecting Tube, of glass.....	.25
20432.	Condenser Trough, of copper, on supports, with wooden base.....	8.60
20436.	" " Tuhe, of glass, to fit Condenser Trough No. 20432.....	.20
20440.	Separatory Funnel, with stopcock, capacity 120 cc.....	3.00
	Special Apparatus required for Specific Gravity Test	
20444.	Specific Gravity Bottle, Barrett modification of the Hubbard form, 50 cc capacity.....	.90
	Special Apparatus required for Free Carbon Test	
20448.	Extraction Apparatus, Barrett modification of the Cottle, or Underwriters' form. Complete with flask, cover, coil and basket of German silver wire.....	3.50
20452.	Glass Flasks, only, for above Extraction Apparatus.....	.40
20456.	Wire Basket, of German silver, only, for above Extraction Apparatus.....	.50
20460.	Cover and Coil, of block tin, only, for above Extraction Apparatus.....	2.60
	Special Apparatus required for Consistency of Refined Tars and Soft Pitch Test	
20464.	Schutte Penetrometer, with one plug.....	3.50
20468.	Plugs, only, for above Penetrometer, each.....	.25
	Special Apparatus required for Melting Point of Pitch Test	
20472.	Pitch Mould, consisting of iron clamps with brass block.....	5.00
20476.	Thermometer, for melting point, etched on stem, 0-80°C. in fths.....	4.50
20480.	" " " " " 60-140°C. in fths.....	4.50
	Special Apparatus required for Melting Point of Hard Pitch Test	
20484.	Air Melting Point Oven, of copper, with mica window, removable tray, etc.....	10.75
	Special Apparatus required for Evaporation Test	
20488.	Evaporating Dish, of pure nickel, with flange and handle.....	1.90
	Special Apparatus required for Slide Test	
20492.	Slide Box, of copper, with six corrugations.....	7.00



Special Apparatus required for Light Oil Test

20496. Hempel Distilling Tube 30

Special Apparatus required for Standard Creosote Oil Distillation.

20500. Retort, Resistance Glass, 250 cc capacity. Made to special dimensions and with neck set at special angle otherwise similar to regular retorts which, however, are not suited for this work. 45

20512. Asbestos Sheet, specially cut to fold into cover for retort 50

20514. Thermometer, graduated from 0 to 400° C in 1°. Made specially for this test. 5.00

20501. Condenser Tube 35

Special Apparatus Required for Additional Creosote Oil Tests

20508. Separatory Funnel, with ground glass stopper and stopcock, graduated to 100 cc; for heavy oils. . 2.50

20516. Atom Models, Kekule-von Baeyer, consisting of 15 nickel plated binding posts with two clamps, 20 black balls with four connecting posts, 10 red balls with two connecting posts, 30 white balls, 10 yellow balls, 10 green balls, 10 violet balls, and 10 silver colored balls, each with metallic tubulations to slip on posts.

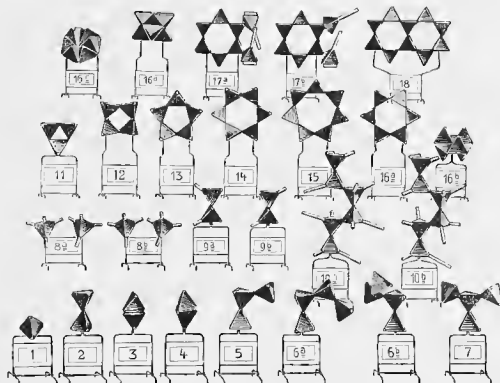
Duty Free 13.50

Stock 20.00

20520. Atom Models, Eilhart, consisting of six wooden models, six straight pins, six hinged pins, forty japanned tin caps, with formulae, etc.

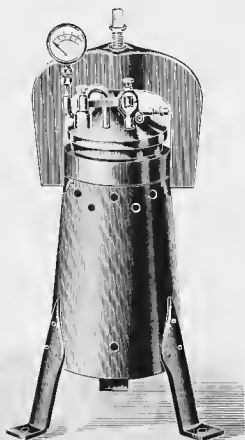
Duty Free 18.00

Duty Paid 27.00

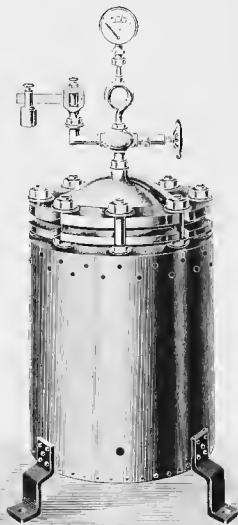


No. 20524

20524. Atom Configuration Models, Wislicenus, for organic chemistry; consisting of 26 models with wire supports; 5 cm size. Duty Free 20.00
 Single Carbon Atoms for use in the construction of special formulae. Duty Free, per 100 9.00



No. 20528



No. 20536



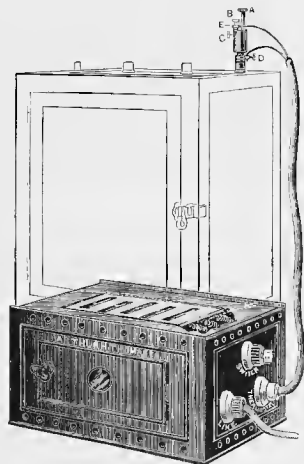
No. 20544

20528.	Autoclave, or Digester, for 25 atmospheres pressure. Retort is of hammered copper with lid of phosphor bronze. Pressures given are the steam test pressures, the working pressures being approximately 20% less. The working pressure is indicated on the manometer by means of a red mark. Without burner.		
	Inside Dimensions, mm.	100 x 200	125 x 250
	Capacity, liters	1½	3
	Duty Free	37.80	45.00
	Stock	50.40	60.00
20532.	Autoclave, same as No. 20528, but for 60 atmospheres pressure.		
	Inside Dimensions, mm.	100 x 200	125 x 250
	Capacity, liters	1½	3
	Duty Free	55.20	71.10
	Stock	73.60	94.80
20536.	Autoclave, or Digester, for 50 atmospheres pressure, with bolted lid. This construction is recommended for autoclaves of large capacity and for high pressure. Otherwise the construction is identical with No. 20528.		
	Inside Dimensions, mm.	200 x 250	225 x 350
	Capacity, liters	7½	13
	Duty Free	135.00	168.00
	Duty Paid	180.00	224.00
20540.	Autoclave, same as No. 20536 but for 100 atmospheres pressure.		
	Inside Dimensions, mm.	200 x 250	225 x 350
	Capacity, liters	7½	13
	Duty Free	234.00	288.00
	Duty Paid	312.00	384.00
	Note—The above autoclaves are furnished entirely of cast iron, for operation where ammonia is freed, on special order, at 5% less cost.		
20541.	Autoclave, or Digester, tested to 12 atmospheres pressure, with inside dimensions of 65 mm in diameter and 160 mm high. With bolted on lid, safety valve, manometer, etc., very convenient where small capacity is desired as it may be supported in an ordinary retort stand ring. This autoclave is also furnished entirely of cast iron on special order.		
	Duty Free	28.80	
	Stock		38.40

BACTERIOLOGICAL, HISTOLOGICAL AND SEROLOGICAL APPARATUS

AMERICAN STANDARD INCUBATORS are built under our personal direction in the first sheet metal factory in the U. S. to take up (some twenty years ago) the manufacture of sheet metal apparatus for bacteriological work, and they embody twenty years' experience in both the manufacture and selling of bacteriological apparatus. The incubators are made of heavy polished copper covered with a water-proof, non-conducting material. All are of the latest triple wall construction, which provides space for both warm air and water. The walls of the water jacket are thoroughly reinforced to prevent bulging, due to lateral pressure of the water, a defect very common in low priced utensils. The bottoms are conical in construction to evenly distribute heat, and to evenly heat the water spaces on all sides, by a circulation of hot air, thus giving equal and uniform temperature. The products of combustion and the hot air pass out by a side ventilator on top of the incubator. A glass water gauge with stopcock which shuts off the water from the gauge in case the tube is broken, is provided. A metallic tube through the air jacket connects the thermo-regulator with the burner and all burners furnished with incubators connect with this pipe by means of flexible metallic tubing instead of the rubber tubing previously used. This is an important feature and greatly minimizes the danger from fire. The closed in bases are of sheet-iron properly ventilated and furnished with a mica window for observing the flame. All incubators are furnished with carefully prepared instructions for installing and adjustment.

Any of our **American Standard Incubators**, whether for gas, oil or electric heating, can be used as paraffine embedding ovens at temperatures up to 70° C. In the cases of oil and electric heating this specification should be given at the time of ordering to insure proper adjustment of regulators.



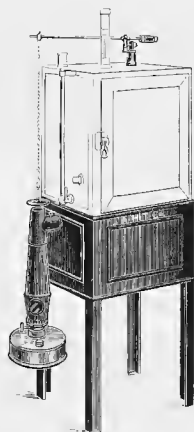
American Standard Incubator
with
Equipment Dd, for Electric Heating

This electric heating and temperature control operates equally well on direct or alternating current. Electric heating units can at any time be removed and incubator operated for gas heating. There are no exposed terminals and apparatus operates directly on the circuit. Before shipment each incubator is tested to maintain a constant temperature. In ordering it is necessary to state voltage and whether for direct or alternating current.

EQUIPMENT Aa consists of Roux bimetallic thermo-regulator, incubator thermometer, and Koch safety burner with flexible metallic tubing attached.

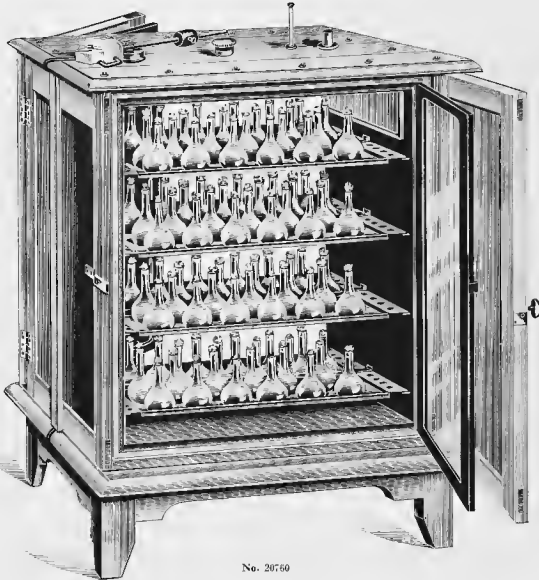
EQUIPMENT Cc consists of oil lamp heater, Roux bimetallic thermo-regulator and incubator thermometer.

EQUIPMENT Dd consists of incubator thermometer, and electric heating units with electric thermo-regulator.



American Standard Incubator
with
Equipment Cc, for Oil Heating

This device for oil heating incubators is entirely new and is much simpler in operation and control than anything heretofore offered. The regulator is on the principle of the Roux metallic which directly operates the damper over the lamp, permitting either the escape or the utilization of the heat. Under proper conditions will regulate to $\frac{1}{2}$ °.



No. 20760

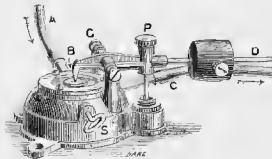
HEARSON INCUBATORS. These incubators consist of a water-jacketed chamber made of stout copper surrounded by insulating material and the whole encased in wood. They are provided with an inner door of glass and an outer one of panelled wood. In the two larger sizes the doors are double. The distinctive feature is the temperature control by means of a **metallic, hermetically sealed capsule** which contains a few drops of liquid having a boiling point at or near the temperature which it is desired to maintain in the heating chamber. The regulation is established by the expansion of this capsule owing to the boiling of its contents which provides the motive force for operating the control lever. This expansion takes place only at the predetermined temperature. The lever will only be acted upon when the critical temperature is reached, no sensible effect being produced at even one degree below that at which the capsule is desired to act. A sliding weight compensates for slight barometric variations and, in addition, controls within certain limits the boiling point of the capsule so that a range of 5° C. is possible with any particular capsule and the total range by means of these capsules is from 16° C. to 175° C.

This system of temperature control applies equally well to gas, oil or electric heating and also to the control of the low temperature incubator for gelatine cultures operating at 20° C.

These incubators, although comparatively new in the United States, have been used for a number of years with great success in leading European bacteriological laboratories, particularly those of the Pasteur Institute in Paris. Instructions for operating are furnished with each incubator.

HEARSON INCUBATORS FOR GAS HEATING. The Excelsior Gas Valve used in the control of incubators heated by gas and operates as follows:—

A is the inlet for gas; C the outlet to burner; **BD** a lever pivoted to standards at **G** and acted upon by the capsule, through the needle which enters the socket below the screw **P**. The construction of the acting portion of this valve is such that whenever the end **B** of the lever **BD** presses on the disc below the end **B**, the main supply of gas is entirely cut off. At such times, however, a very small quantity of gas passes from **A** to **C**, through an aperture inside the valve, the size of which aperture can be adjusted by the screw needle **S**, hence the gas flame below the incubator is never extinguished.



The expansion of the capsule, owing to the boiling of its contents, provides the motive force for acting upon the lever **BD**.



20812. Size 24



20812. Size 40

INCUBATORS, FREAS' PATENT ELECTRIC. These incubators have no water or water jacket and the adjustment is set at the temperature required by simply turning a milled head.

Construction—The incubators are constructed of heavy asbestos wood, with cast aluminum door and door frame. This asbestos wood is absolutely fire-proof and possesses unusual insulating qualities. This latter quality and the large thermal capacity of the body of the incubator assist the maintenance of an even temperature throughout the chamber; the air space between the inner and outer walls is filled with insulating material, which results in a very low heat loss, thereby reducing the current consumption to a minimum. The interior is fitted with aluminum racks, allowing the perforated metal shelves to be placed at any desired height. There is provided an inner door of heavy glass, fitted in an aluminum frame cushioned with felt to exclude air, thus permitting inspection of the chamber without opening the door and cooling the incubating chamber. An opening through the top of the incubator to the chamber is provided for a thermometer.

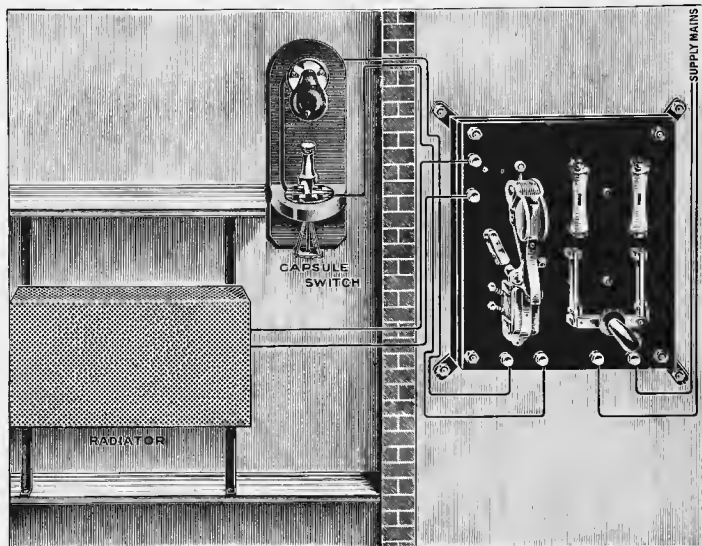
Regulation—The regulation device is made entirely of metal, substantially built, so that it is practically impossible for it to get out of order. Its action depends upon the expansion of a metal tube running through the chamber from top to bottom, operating a lever which "makes" and "breaks" a contact, with proper means to prevent arcing. The lever is extended to serve as an indicator, operating up and down the graduated temperature scale on the outside of the incubator. The indicator is moved to the temperature desired by turning the milled-head screw at the bottom of the scale. The regulation is sharp and accurate to a fraction of a degree and remains so indefinitely.

Temperature Range—The temperature range of the incubator is from a degree or so above the surrounding air temperature to 60° C.; the regulating device operates just as satisfactorily at lower as at higher temperatures.

Heating Element—The heating element consists of a wire wound resistance plate situated at the bottom of the incubator. While there may be no need to remove it, it can be very easily taken out if desired. The plate is wound for 75 watts, about 50 watts being required to maintain a temperature of 37°.

20812. Incubators, Freas' Electric.....	No. 20	22	24	26	28	32	36	40
Inside dimensions, inches.....	7x7x10	7x7x10	12x12x12	12x12x12	16x14x15	18x16x20	26x14x22	32x18x24
Each.....	52.50	57.50	80.00	87.50	140.00	190.00	225.00	270.00

Note—Nos. 22, 26, 28, 32, 36 and 40 are provided with switches, one for the current and the other for the electric lamp illuminating the chamber. Nos. 28, 32, 36 and 40 are furnished on high bases, as shown in illustration. Nos. 36 and 40 can be furnished with compartments for students' use. Prices on application.



No. 20816

Arrangement of Hearson Electric Incubating Room Temperature Control, showing Control Capsule, Automatic Switch and Blow-out

Directions for Constructing an Incubating Room and for Installing Electric Temperature Control.

The room should be constructed of brickwork 9 inches thick and perfectly square inside, 6 x 6 ft. and about 7 ft. high. There should not be any windows, but two doors, the outer door being closed before opening the inner door of the chamber. These doors should be made of white pine 2 inches thick and the walls glazed or covered with parian cement and the floor and ceiling insulated with slag wool. A 9-inch ventilator should be fixed near the ceiling and nine 1-inch holes in the bottom of each door.

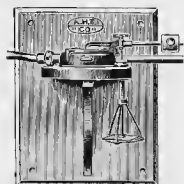
Attach the Automatic Switch and blow out on marble base outside the room to be heated, in a convenient position and bring the main supply to this switch and connect at the back of switch base. Place the four Radiators in the incubating room, one on each side between the first two shelves (not on the floor) and carry wires from the Automatic Switch to each Radiator in parallel and connect to the terminals indicated. Place the Capsule Switch with lamp about the height of the third shelf (not against the wall) and carry wires from this to the Automatic Blow-out Switch and connect to terminals indicated.

The installation is then complete and the current may be turned on. The Radiators will heat up and continue to do so until the Capsule expands and interrupts the current, when the magnetic coils will drop the armature and the current will cease to flow to the Radiators which will cool down until the Capsule again collapses when the current will be again switched on. This will continue automatically.

To increase the temperature screw down the milled head screw on Capsule Switch a turn or two at a time; to decrease the temperature reverse the process. See that the carbons on the Automatic Switch touch each other perfectly, otherwise a spark of eruption will occur and cause rapid deterioration. There must be no sparking except at the moment of breaking contact.

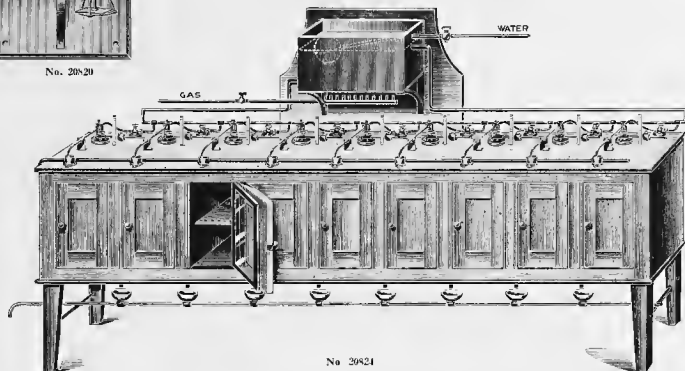
20816. Incubating Room Temperature Control for Electric Heating, Hearson, as above described. When the capsule is collapsed the lever arm is kept in position by the solenoid, and the current is free to pass to the heaters. Upon the expansion of the capsule contact is broken, the solenoid ceases to act, the lever arm drops suddenly and the current to the radiators is checked and by means of the electric blow-out, the sparking is reduced to a minimum. The current remains cut off until the temperature of the room is so reduced as to allow the capsule to contract and contact again be made. The outfit consists of capsule switch, four radiators and blow-out panel switch and is based on keeping a room 6 x 6 x 7 ft. at a constant temperature. Larger rooms must be supplied with additional radiators. Price of outfit for either direct or alternating current.

Duty Free 94.50 Duty Paid 141.75



No. 20820

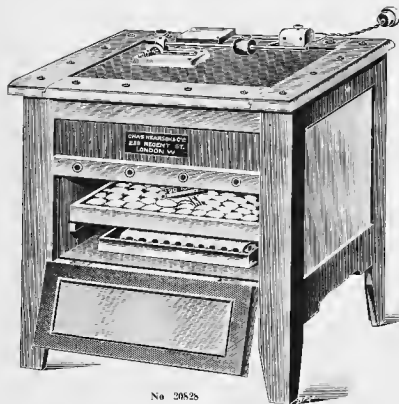
20820. Incubating Room Temperature Control for Gas Heating. With a well insulated room a uniform temperature can be maintained within 2° with the use of the gas valve regulator and a suitable gas stove. It is advisable to arrange ventilation in both the lower and upper parts of the room for the purpose of temperature equalization and avoidance of smell from the products of combustion and gases of fermentation, etc. The regulator may be placed at any convenient position, usually near the door. Price is for gas valve with capsule only. 13.50



No 20824

20824. Incubator, Hearson New Compartment. For either high or low temperatures. Consisting of nine compartments of copper, water-jacketed and insulated, each compartment being 7 x 8 x 6 inches. Temperature may be adjusted from 25-32° C., 32-40° C., 40-47° C., or any other predetermined range. Each compartment is fitted with a Hearson control capsule which automatically controls the entry of warm water from the heating tank either into the water jacket surrounding each compartment or to the waste. A difference in temperature of less than a degree in the compartment suffices to change the flow of warm water. A control capsule is connected with the heating tank also so that the supply of warm water is constantly under control. All the compartments may be operated independantly of one another.

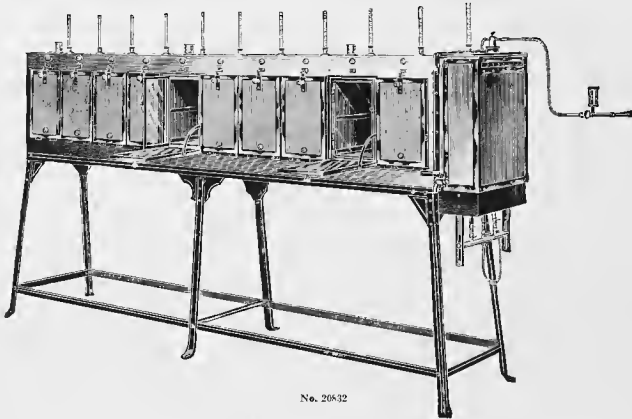
Duty Free. \$345.15 Duty Paid \$517.75



No 20825

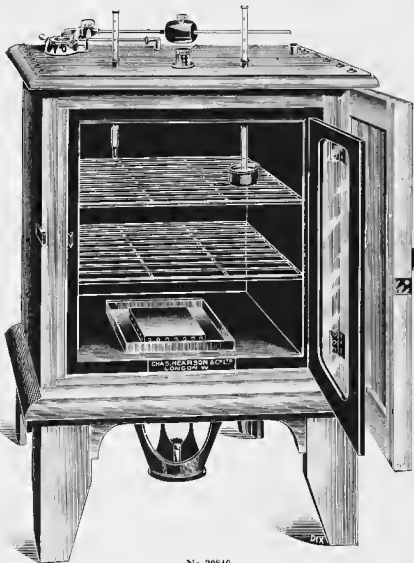
20828. Incubator, Embryological, Hearson Electric, operating on the same principle as the Hearson bacteriological incubators previously described, capacity 50 eggs. This is a very much more convenient apparatus than the usual chicken incubator used for embryological purposes. Voltage must be specified in ordering.

Duty Free. 37.80
Duty Paid. 56.70



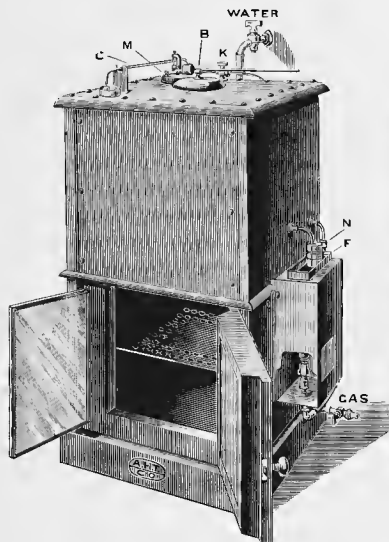
No. 20832

20832. Incubator, Compartment form, for different temperatures in the various compartments between 24° and 60° C. Each compartment is 30 x 20 x 25 cm. With both glass and metal doors. With burner, thermo-regulator, etc., but without thermometer. With ten compartments as shown in illustration.
 Duty Free 396.00 Duty Paid 480.00
20836. Incubator, Compartment form, same as above but for low temperatures, i. e., between 0 and 22° C. with ice box and ice water cooling arrangement.
 Duty Free 495.00 Duty Paid 600.00

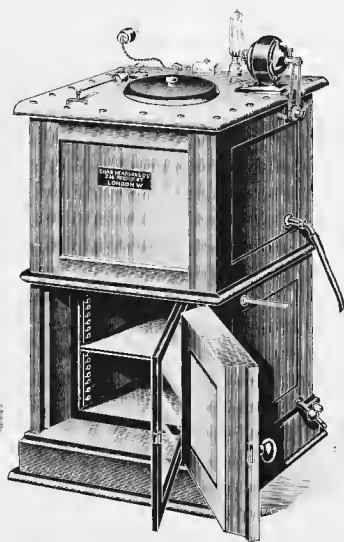


No. 20840

20840. Incubator, Hearson, Parasite, as suggested by Dr. Boycott of Guy's Hospital, London. With adjustable ventilator. The air is heated by passing through tubes in the warm water in the tank after which it passes over a water tube in order to take up sufficient moisture. With fitted thermometer and hygrometer to show moisture percentage in the interior of the incubating chamber. Size inside, 20 x 20 x 14 inches. Similar in construction and operation to the Hearson gas incubators.
 Duty Free 101.25
 Duty Paid 152.00



No. 2084K



No. 2086J

LOW TEMPERATURE INCUBATOR, HEARSON MODEL C, for operation with a constant flow of water. Most of the low temperature incubators can only be worked successfully as long as the external air is 10° below the temperature required in the incubating chamber, and the expedient sometimes resorted to of running cold water through them to keep the temperature down can, in summer time, be adopted with advantage, but the results are not altogether satisfactory, cultures being frequently spoiled by an unexpectedly warm day or night.

In summer, therefore, or in hot climates, cultivation of gelatine can only be considered safe in an incubator using ice, and the special feature of this incubator is that it will automatically remain constant at 20° Cent., or any other predetermined temperature, using only the theoretical amount of ice requisite to obtain this result, even though the external air may be 30 or 40 degrees above the temperature desired in the interior.

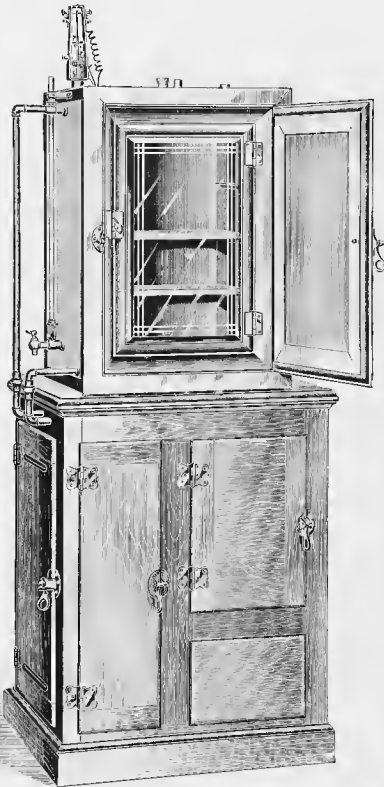
With capsule adjusted to 10° C. unless otherwise ordered, with thermometer, ice funnel, gas fittings and 4 ft. of flexible metallic tubing (or, if for oil lamp, 2 chimneys and 1 yd. wick) and packing. With suitable burner for either oil or gas heating. Please specify when ordering.

		Inside Measurements	Duty Free	Duty Paid
20844.	Low Temperature Incubator Model C	9 x 9 x 12 inches	\$65.25	\$97.90
20848.	" " " " " "	12 x 12 x 14 "	93.15	139.75
20852.	" " " " " "	15 x 15 x 18 "	117.30	175.95
20856.	" " " " " "	20 x 20 x 24 "	165.60	248.40

NOTE—This Low Temperature Incubator is one of the most satisfactory bacteriological utensils we have ever sold and it has been supplied by us to leading Universities, City and State Boards of Health and U. S. Government laboratories. All of these users are unanimous in reporting satisfactory service.

LOW TEMPERATURE ELECTRIC INCUBATOR, HEARSON MODEL G, for ice and electricity, working independently of any constant water supply as required in model C. This apparatus is identical with Model C except that an electric heater is provided which automatically operates when the room temperature is lower than the temperature required in the chamber and an electric motor which automatically circulates the water from melting ice to the water jacket when the temperature of the room is higher than the temperature required in the chamber. No connection with a water supply is required and the apparatus may be set to operate at any temperature from 10° to 37° C. and can be operated in any climate and in any place where water and electricity are available. Control is by the Hearson capsule and full operating directions are supplied with each utensil. Voltage must be specified in ordering.

		Inside Measurements	Duty Free	Duty Paid
20860.	Low Temperature Electric Incubator Model G	9 x 9 x 12 inches	94.50	141.75
20864.	" " " " " "	12 x 12 x 14 "	119.25	178.85
20868.	" " " " " "	15 x 15 x 18 "	159.00	238.50
20872.	" " " " " "	20 x 20 x 24 "	210.00	315.00



No. 20876

20876. Incubator, Low Temperature,

Giddings. The incubator proper is regular water-jacketed type with outer air space and covered with a heat insulating material. Beneath the incubator is an ice chest fitted with coils of pipe, which are connected to the water jacket of the incubator so that the water may circulate freely. In the pipe line is a pump operated by an electric motor. This motor is controlled by a thermostatic bar which makes and breaks the circuit through a solenoid switch, energized by the line, thus rendering the operator independent of the troublesome dry battery.

The regulation is effected as easily as with the ordinary electric incubator, the temperature for which the thermostat is adjusted remaining constant within $\frac{1}{2}^{\circ}$. All parts are readily accessible, and the construction is very simple. To put the equipment into operation it is only necessary to connect the feed wires and turn on the current.

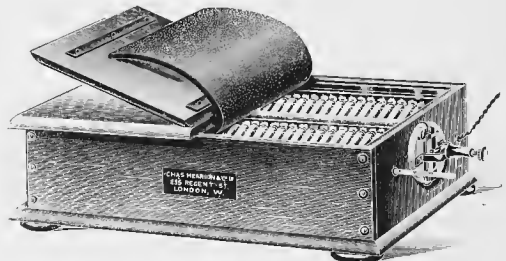
The cooling arrangement permits practically any desired temperature below that of the room to be maintained. If a temperature below the freezing point is required, cracked ice and sodium thiosulphate (hypo) are placed in the ice-chest, while from 4 to 12 liters of water are drawn off and replaced by a solution consisting of 50% of glycerine and 50% of alcohol (95%).

Please specify voltage and current in ordering. If for alternating current also state number of cycles. See *Phytopathology*, Vol. II, p. 106, 1912.

Size, cm.	45x75x35	70x45x35	48x45x35
Each	290.00	270.00	235.00
Size, cm.	48x45x24	48x30x24	24x30x24
Each	210.00	190.00	170.00

20880. Coagulator for Blood Serum (Inspissator), Hearson Anhydric Electric, operating exactly the same as Hearson Incubators. For 40 tubes. Voltage and temperature must be given when ordering. Complete with thermometer. Inside dimensions 22 1/2 inches long, 10 1/2 inches wide by 3 inches deep, holds four trays each containing 10 tubes.

Duty Free	39.00
Duty Paid	58.50



No. 20880



No. 20881

Hearson Cellular Incubator for Students' Use. This Incubator is heated by gas or electricity and the fittings for regulating the temperature are the same as in those previously described. Prices given below are for gas heating. Electric heating adds \$31.00 duty free and \$31 50 duty paid to the list prices printed below.

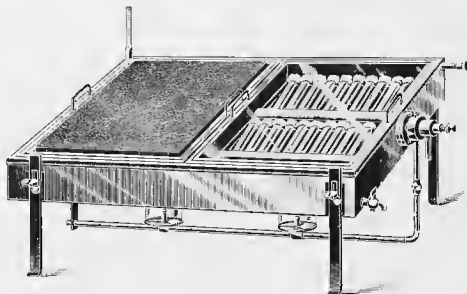
This utensil is designed for use in educational laboratories where it is desirable to provide each student with a separate incubating chamber or drawer which may be removed from the apparatus without affecting the temperature of the remaining drawers. The inside of the utensil is strongly made of heavy copper, firmly stayed at frequent intervals. Each drawer of the size $13\frac{1}{2} \times 8\frac{1}{2} \times 4\frac{1}{2}$ inches will accommodate about 60 culture tubes.

Seven flat copper tubes, extending the whole length of the drawers, form the sides and divide the apparatus into six vertical compartments; these are again sub-divided by eighteen terne-iron shelves, into four divisions horizontally, thus forming twenty-four pigeon holes water-jacketed in every case on two sides.

All the vertical tubes are joined to horizontal tanks at the top and bottom, so that the water is free to move up or down any of the tubes, or even up and down different parts of the same tube, thus equalising the temperature in all directions.

The drawers are made of terne-iron, which is not liable to rust, and each drawer has a thick varnished wood front, bearing a number which serves to show the order in which they should be replaced and enables the student to easily recognize the compartment allotted to him. The removal of one or more drawers does not appreciably affect the temperature of those which remain, and when the outer doors have been closed for a short time the temperature is practically the same in all parts.

					Duty Free	Duty Paid
20884.	Cellular Incubator, for Gas, with 24 drawers, each $13\frac{1}{2} \times 8\frac{1}{2} \times 4\frac{1}{2}$ inches.....				\$172.50	\$258.75
20888.	" " " " " 12 " " " 9 x $4\frac{3}{4}$ x 14 "				136.50	204.75
20892.	" " " " " 12 " " " 9 x $9\frac{1}{2}$ x 14 "				183.00	274.50



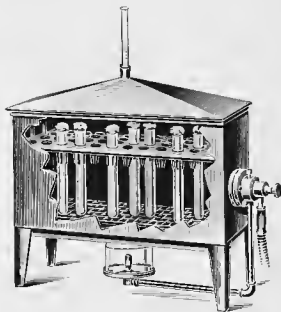
No. 20896

20896. Coagulator for Blood Serum (Inspissator), Hearson, with Patent capsule temperature control, for gas heating. The utensil is strongly made of copper, with trays holding serum tubes at a proper angle.

To hold, tubes	20	40
Duty Free	39.00	52.50
Duty Paid	58.50	73.75



No. 20900



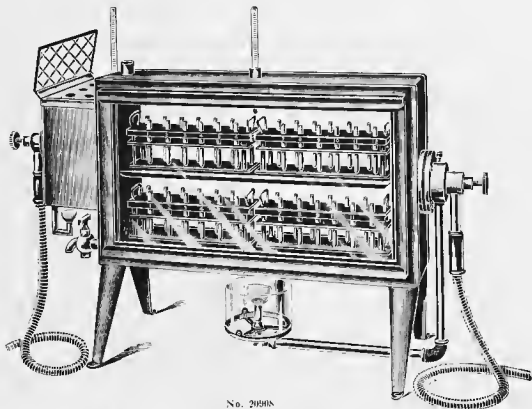
No. 20904

20900. Coagulator for Blood Serum (Inspissator). The two front legs are slotted so that the oven may be tilted for securing necessary slants to the test tubes. Of same construction as American Standard Incubators. Without thermometer, burner or thermo-regulator.

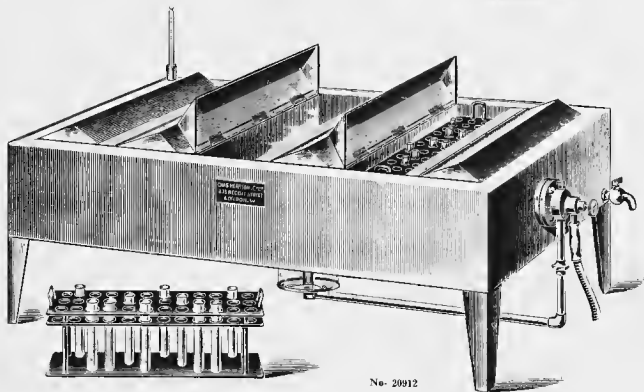
Inside dimensions, inches	12 x 10 x 2½	16 x 14 x 2½
Each	21.00	27.00

20904. Water Bath for Vaccine Cultures, Hearson, of heavy copper, with burner and Hearson Capsule for control, with removable rack for 48 test tubes.

Duty Free	26.25	Duty Paid	39.50
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No. 20908



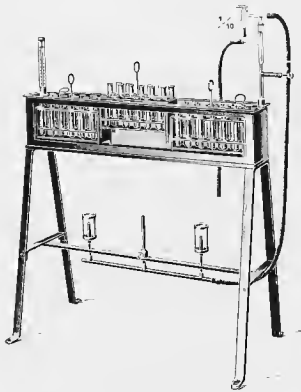
No. 20912

20908. **Water Bath and Incubator, Hearson, for Wasserman Test** This apparatus consists of a strong copper vessel, nickel-plated, on a stand. The incubator is a double sided reservoir and is provided with a glass front and back. It is intended to be used on a bench facing the light. On the side of the apparatus a small tank is fixed, to which Hearson's control capsule is attached. This is regulated for 56 to 60° C. for the sterilization of liquids, and is provided with two perforated plates, one to take ordinary test tubes and other for small tubes. It is also provided with a hinged cover held in place by a spring which is laid over the wadded stoppings of the reagent tubes in order that they may remain in the water. The incubator itself is fitted with Hearson's control capsule and is regulated for 38° C. Thermometers are provided for two compartments, also two racks. The whole forms a very useful and complete set for the study of the Wasserman process.

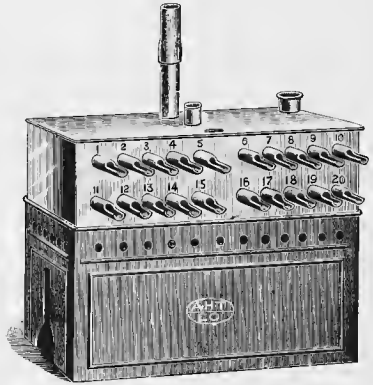
Duty Free.....	55.00	Duty Paid.....	80.00
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20912. **Water Bath, Hearson, for Wasserman Reactions, etc., with Hearson Patent Capsule control and removable test tube racks and covers for same while in the bath. Each tray holds 36 tubes.**

Number of trays.....	2	4	6
Duty Free.....	37.80	60.00	75.60
Duty Paid.....	56.70	90.00	113.40

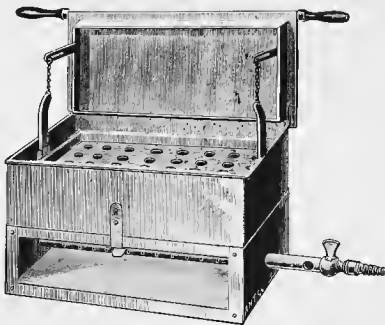


No. 20916

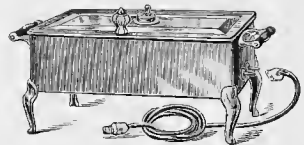


No. 20920

20916. **Water Bath, for Wasserman and other Serological Reactions, Liefmann-Meier;** with three metal test tube racks containing 72 tubes. The front wall of the bath is of glass and the back is finished in white to enable accurate observations of reactions without removing the trays. With two burners, thermo-regulator, and thermometer as shown in cut but without test tubes.
Duty Free 33.10 **Duty Paid** 40.05
20920. **Incubator, Opsonic,** with 20 tubulations for pipettes, each with serial number. Of heavy, polished copper, on sheet iron base 8 inches high; with tubulations for thermometer, gas regulator and filler, and a cup 1 x 3½ inches for holding instruments. Size 14 x 8 x 4 inches. 17.25
20924. **Incubator, Opsonic,** same as above, but including 6 tubes, ¼ inch diameter, in the top to hold test tubes 21.00



No. 20928

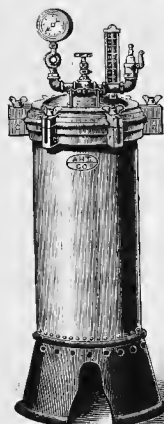


No. 20932

20928. **Sterilizer, Instrument,** convenient in the pathological and bacteriological laboratory for the sterilization of syringes, instruments for animal operations, etc. The tray carrying the syringes or instruments is lifted clear of the water when the lid is raised and supported in this position. Of copper, nickel plated, 10 x 5 x 3 inches. 15.00
20932. **Sterilizer, Instrument** for purposes similar to above but for electric heating. With automatic cut-out which cuts off the current if sterilizer is allowed to run dry. Complete with 5 ft. of cord, connector and lamp socket plug. Apparatus is of copper, nickel plated. Dimensions 10 x 4½ x 2 inches. With three heats. 18.00

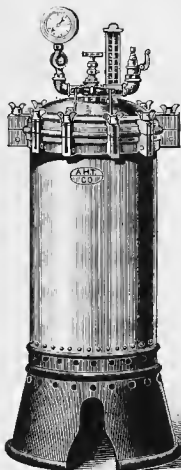


No. 20956

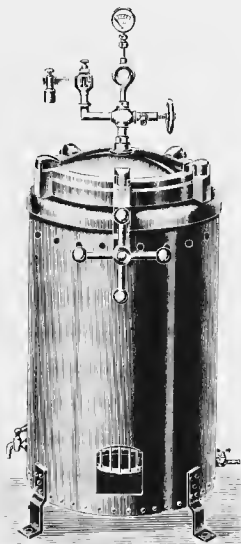


No. 20936

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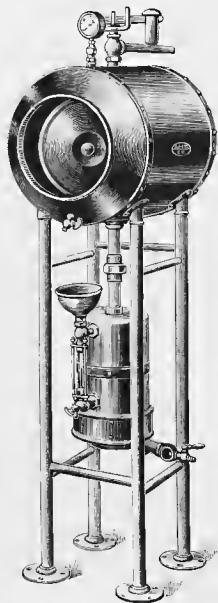


No. 20944

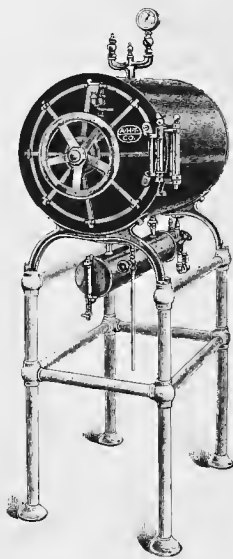


No. 20948

20936. **Autoclave or Vertical Steam Pressure Sterilizer, American Standard.** Of heavy polished copper tin lined. Lids of heavy cast brass, nickel plated and fitted with steam-tight, ground in bevel joint, obviating entirely the use of washers. This apparatus is the most widely used autoclave in bacteriological work and has been supplied by us to many leading laboratories for over fourteen years, with unflinching satisfaction. Each apparatus is tested and guaranteed to stand a pressure of 35 lbs. to the square inch, and is provided with proper gauge and thermometer, reading both in temperature degrees and pounds pressure, also safety valve. With six screw clamps on lid. Prices on gas and oil heated apparatus include suitable burners. Prices on electric heating include cord and plug and electric heater. Inside dimensions 11 inches diameter by 24 inches deep.
- | | With gas heating equipment | With oil heating equipment | With electric heating equipment |
|------|----------------------------|----------------------------|---------------------------------|
| Each | 60.00 | 64.65 | 100.00 |
20940. **Autoclave, same as No. 20936, but with hinged lid.**
- | | With gas heating equipment | With oil heating equipment | With electric heating equipment |
|------|----------------------------|----------------------------|---------------------------------|
| Each | 65.00 | 70.65 | 105.00 |
20944. **Autoclave, same as No. 20936, but with ten screw clamps on hinged lid.** Inside dimensions 14 inches diameter by 26 inches deep.
- | | With gas heating equipment | With oil heating equipment | With electric heating equipment |
|------|----------------------------|----------------------------|---------------------------------|
| Each | 90.00 | 97.00 | 130.00 |
20948. **Autoclave, or Vertical Steam Pressure Sterilizer, German type with instantaneous clamping device for lid, manometer, safety valve, drain cock, etc.; and burner permanently fixed in jacket of apparatus.** Boiler is of heavy, seamless hammered copper, heavily tinned on the inside, enclosed in enamelled iron outer ventilating jacket. Lid is of brass and all trimmings are heavily nickel plated. With tripod inside for supporting baskets, etc. Adjusted for a working pressure of 15 lbs., equal to a temperature of 121° C. Inside dimensions 200 x 400 mm.
- | | Duty Free | Stock | |
|--|-----------|-------|-------|
| | 63.00 | | 84.00 |
20952. **Autoclave, as above, with petroleum burner, for use where gas is not available.**
- | | Duty Free | Stock | |
|--|-----------|-------|-------|
| | 66.30 | | 88.80 |
20956. **Wire Basket, nickel plated, for above, with hinged lid, 200 mm diameter by 200 mm high, i. e., two baskets exactly fill autoclave. Very convenient for test tubes.**
- | | Duty Free | Stock | |
|--|-----------|-------|------|
| | 5.05 | | 6.75 |



No. 20960

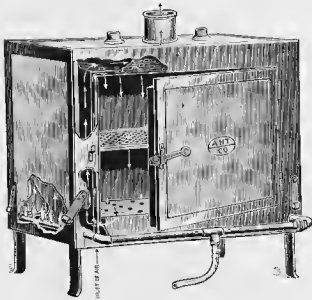


No. 20964

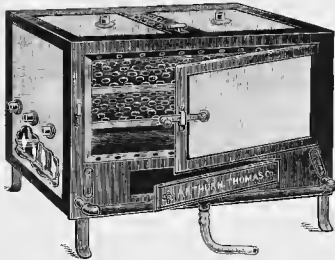
20960. Autoclave or Steam Pressure Sterilizer, Horizontal Form. No mechanical fastening whatever is used to secure the door and no packing or gasket is used to make the joint steam-tight. The steam pressure from within seals the door absolutely. The apparatus is made of heavy, polished copper with a double wall or jacket. Can be used for steam, gas or petroleum heating, but will be supplied for use with gas unless otherwise specified. Because of the double jacket the cotton plugs in the culture tubes are absolutely dry when the door is opened. When this sterilizer is supplied for direct steam connection the generator shown in illustration is not required, for which we make an allowance of from \$10.00 to \$17.00 depending upon the size of the sterilizer.
- | | | | | | |
|--------------------------------|---------|---------|---------|---------|---------|
| Inside dimensions, inches..... | 16 x 12 | 20 x 16 | 24 x 20 | 28 x 22 | 28 x 25 |
| Each..... | 130.00 | 150.00 | 175.00 | 250.00 | 333.00 |

20964. Autoclave or Steam Pressure Sterilizer, Horizontal Form, double cylinder type with steam space entirely surrounding except at the door of entrance. A particular feature of this sterilizer is the fact that the contents of the inner chamber become perfectly dry within one minute after the steam is withdrawn. Ebonized or enameled bronze door and frame with copper end, seamless drawn brass or copper shell (tinned internally) forming walls of sterilizing chamber, jacket and all fittings highly polished and nickel plated, mounted on white enameled tubular steel stand. Heating can be done by steam, gas or petroleum as ordered but will be supplied for gas heating unless otherwise specified.
- | | | | | | | |
|--------------------------------|--------|---------|---------|---------|---------|---------|
| Inside dimensions, inches..... | 9 x 19 | 12 x 20 | 14 x 22 | 16 x 24 | 20 x 28 | 24 x 32 |
| Each..... | 175.00 | 225.00 | 300.00 | 350.00 | 450.00 | 650.00 |

Note. When arranged for steam or gas heating, we recommend the use of the special auto-control valve, so designed that when the desired pressure is reached the supply is cut down just enough to maintain such pressure. This adds \$10.00 to the cost of each of the above sizes.



No. 20968



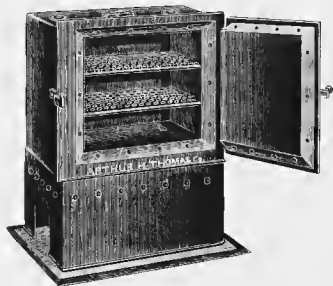
No. 20984



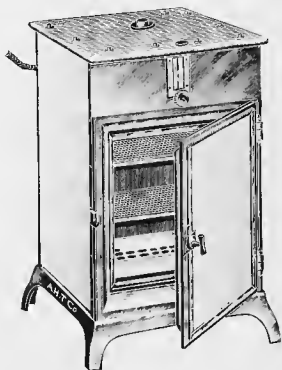
No. 20980

20968. **Hot Air Sterilizer, with Regenerative Heating System**, so-called "Lautenschläger" form. Of best Russia iron, covered with asbestos on the outside. With three walls, providing two air spaces. When heated by gas, a row of small Bunsen burners placed around the outside of the base creates a circulating hot air current which passes through the oven as indicated by the arrows in the illustration. When heated by petroleum blast burner, or by electric units placed in the base, the circulation occurs in the same way. The electric heating device provides one heat and includes cost of relay and regulator. A temperature of 360° F. (182° C.) may be had with the electric heater in 20 minutes. The gas heated sterilizer may be used for either gasoline gas or natural gas by the use of adjustable burners in place of the regular. These are furnished upon order at a slight extra charge. Inside dimensions 12 x 18 x 9 inches. On low base, with thermometer, range 200° C. Style.....

	With gas heating equipment	With oil heating equipment	With electric heating equipment
Each.....	47.75	59.00	100.25
20972. Hot Air Sterilizer , same as above, but with inside dimensions 18 x 24 x 14 inches on low base, with thermometer Style.....	65.00	77.75	130.25
20976. Hot Air Sterilizer , same as above, but with inside dimensions 24 x 30 x 18 inches on low base, with thermometer Style.....	110.00	128.75	173.75
20980. Hot Air Sterilizer , same as above, but on high base, with thermometer. Inside dimensions 30 x 36 x 20 inches Style.....	166.25	196.25	263.75
20984. Hot Air Sterilizer , double wall, asbestos covered, with built-in burners, for gas heating only, with thermometer.			
Inside dimensions, inches	12 x 24 x 12	19 x 12 x 9½	18 x 24 x 14
Each.....	38.75	31.25	46.25



No. 20988



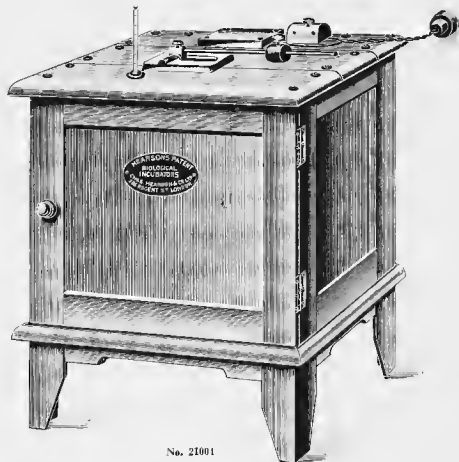
No. 21000

20988. Hot Air Sterilizer, double wall, of sheet iron, with enclosed base, asbestos mat, thermometer and burner. With two shelves. Inside dimensions 10 x 12 x 10 inches. 19.75
20992. Hot Air Sterilizer, same as No. 20988, but with one shelf and inside dimensions 9 x 9 x 6 inches. 13.10
20996. " " " of sheet iron, double wall. Wall form, with fork to hold burner. Including thermometer and burner. Inside dimensions 11 x 9 x 9 inches. 15.75
21000. Sterilizer, Freas Patent Electric. The general construction, regulating and heating of the Freas' Electric Dry Sterilizer is identical with that of the Freas' Electric Incubator, the only difference between them being that the Sterilizer is graduated for temperatures up to 175° C. and accordingly provided with heating plate wound for 600 watts. The Sterilizer is not provided with inside glass door, while the insulation space between the walls is greater than with the Incubator, on account of the higher temperatures maintained.

Inside dimensions, in. 7 x 7 x 10 12 x 12 x 12 14 x 17 x 18

Each 50.00 72.00 165.00

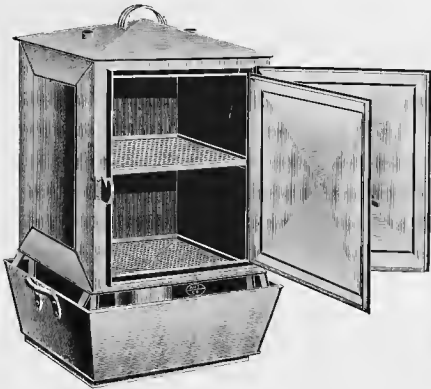
Note—Size 14 x 17 x 18 inches is mounted on heavy iron base with legs, total height about 5 ft.



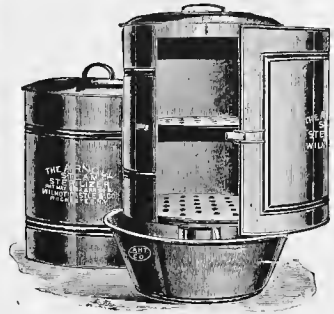
No. 21001

21004. Sterilizer, Hot Air, Hearson Electric, adjustable for temperatures from 150° to 175° C. The operation is similar to that of the Hearson Electric Incubators except that the heating unit is provided for higher temperatures and a better insulation is built in.

Inside dimensions, inches	Duty Free	Duty Paid
12 x 9 x 9	45.00	67.50
15 x 12 x 12	51.75	77.65
18 x 15 x 15	70.50	105.75
22 x 15 x 15	94.50	141.75



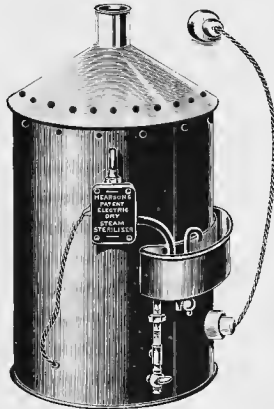
No. 21008



No. 21020

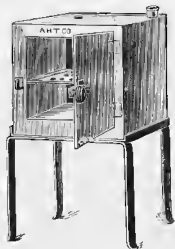
21008. **Arnold Steam Sterilizer, Boston Board of Health Form.** Of tin lined copper throughout. Without stand or burner.
 Inside dimensions, inches..... 16 x 12 x 12 13½ x 8 x 8
 Each 40.00 35.00
21012. **Arnold Steam Sterilizer, same as above but with rectangular sheet iron stand, 6 inches high, and Fletcher radial burner.**
 Inside dimensions, inches..... 16 x 12 x 12 13½ x 8 x 8
 Each 44.00 39.00
21016. **Hearson Automatic Electric Steam Sterilizer.** This Sterilizer is operated upon any ordinary lamp socket (voltage must be specified in ordering) and, in addition, connection established with a constant water supply with overflow to sink. The apparatus operates absolutely automatically from the moment the switch is turned on. When the water boils the current is automatically reduced and no more current is consumed than is required to keep the chamber full of steam. Where a constant water supply with sink for disposal of waste is not available, one pint of water will operate the sterilizer for twenty-four hours without attention. Flasks of media may be placed on the bottom of the sterilizer without danger of cracking and the filtration of agar effected without special precautions. The outfit is extremely economical in current consumption, gives off no fumes of any kind and allows no steam to escape.

Height, inches.....	10	22
Diameter, inches.....	8	12½
Duty Free.....	63.00	84.00
Duty Paid.....	94.50	126.00

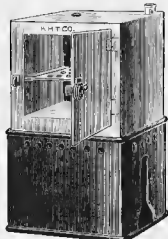


No. 21016

21020. **Arnold Steam Sterilizer, Cylindrical Form.** Automatically maintains a constant temperature of 100° C without attention. Of tin, with copper bottom.
 Inside dimensions, inches..... 7¼ x 8½ 10½ x 9½
 Each 3.50 4.50
 Inside dimensions, inches..... 11¼ x 10½ 12½ x 11¼
 Each 5.00 5.50
21024. **Arnold Steam Sterilizer, same as above but of copper throughout.**
 Inside dimensions, inches..... 7¼ x 8½ 10½ x 9½
 Each 9.25 13.75
 Inside dimensions, inches..... 11¼ x 10½ 12½ x 11¼
 Each 15.00 17.00



No. 21028

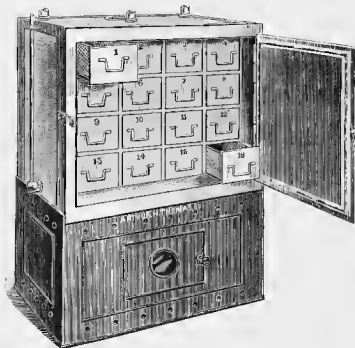


No. 21032

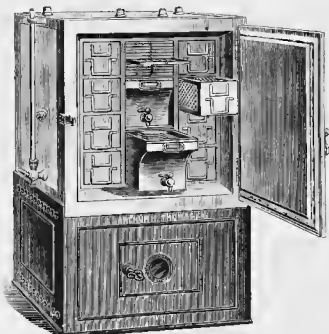


No. 21036

21028. **Paraffine Embedding Oven**, double wall, of heavy sheet copper, on wrought iron stand, with extra sheet iron bottom to prevent burning out. With perforated shelf, but without burner, thermometer or thermo-regulator.
 Inside dimensions, inches $5\frac{1}{2} \times 5\frac{1}{2}$ $7\frac{1}{2} \times 7\frac{1}{2}$ $9\frac{1}{2} \times 9\frac{1}{2}$
 Each 8.00 10.00 14.00
21032. **Paraffine Embedding Oven**, same as above but with enclosed sheet iron base to protect burner from drafts.
 Inside dimensions, inches. $5\frac{1}{2} \times 5\frac{1}{2}$ $7\frac{1}{2} \times 7\frac{1}{2}$ $9\frac{1}{2} \times 9\frac{1}{2}$
 Each 9.00 11.00 15.00
21036. **Extra for Copper Rings** to fit any size of Nos. 21028 or 21032 Ovens so that same may be used as a water bath 1.50

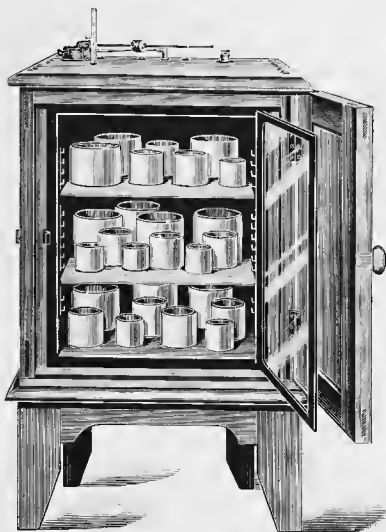


No. 21044

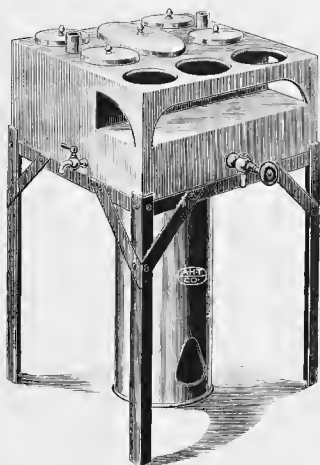


No. 21048

21040. **Paraffine Compartment Embedding Oven, Lillie**, of polished copper with double walls, of same general construction as American Standard Incubators. Drawers $10 \times 4 \times 3\frac{1}{2}$ inches with sides and back of perforated zinc. On sheet iron base $30\frac{1}{2}$ inches high. Gas heating equipment includes metallic connecting tube, Greenman burner, Greenman thermo-regulator and thermometer. Oil heating equipment includes oil lamp, regulating device and thermometer. Electric heat includes three heat disc for temperatures up to 60°C with relay and regulator.
- | | | | | |
|-----------------|-------------------|----------------------------|----------------------------|---------------------------------|
| Style | Without equipment | With gas heating equipment | With oil heating equipment | With electric heating equipment |
| Each | 72.00 | 91.25 | 110.25 | 135.85 |
21044. **Paraffine Embedding Oven**, same as No. 21040 but with 16 drawers.
- | | | | | |
|-----------------|-------------------|----------------------------|----------------------------|---------------------------------|
| Style | Without equipment | With gas heating equipment | With oil heating equipment | With electric heating equipment |
| Each | 102.00 | 121.25 | 138.25 | 168.85 |
21048. **Paraffine Compartment Oven, Lillie, Improved Model**, similar in construction and equipment to No. 21040. With 8 drawers and 2 receptacles with screw tops and stopcocks to enable the contents to be run into moulds as required. With 12 perforated trays for drying and fixing purposes. On base 15 inches high.
- | | | | | |
|-----------------|-------------------|----------------------------|----------------------------|---------------------------------|
| Style | Without equipment | With gas heating equipment | With oil heating equipment | With electric heating equipment |
| Each | 165.00 | 194.25 | 207.85 | 240.85 |



No. 21052



No. 21060

21052. **Paraffine Embedding Ovens, Hearson, for gas heating.** These utensils are identical with the Hearson bacteriological Incubators for gas heating listed on p. 24, excepting that the capsule is adjusted for operation at temperatures between 45° and 60° C. instead of 37½° to 40° as regularly supplied with the Incubators. These capsules can be used interchangeably with those supplied with the Incubators. Complete with burner and thermometer.

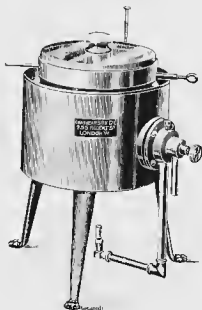
Inside measurements, inches	6 x 6 x 7	9 x 9 x 12	12 x 12 x 14	15 x 15 x 18	20 x 20 x 24
Duty Free	28.95	36.00	45.00	65.50	93.15
Duty Paid	43.45	54.00	67.50	98.35	140.00

21056. **Paraffine Embedding Ovens, Hearson, Anhydric Electric.** Adjusted for temperatures from 45° to 60° C. Works equally well on direct or alternating current but voltage must be stated in ordering. Identical in appearance and operation with Hearson Electric Incubators.

Size, inches	10 x 7 x 6	12 x 9 x 9
Duty Free	37.80	45.00
Duty Paid	56.70	67.50

21060. **Paraffine Embedding Bath, Coplin.** The bath is supplied with four independent cups of 3 inch diameter and one large central reservoir 7 inches in diameter, the latter connected with stopcock in front to draw off melted paraffine. Three spaces are supplied in front for heating material in glass vessels such as tall form slender dishes. On iron base 17 inches high, with cylindrical shield for the gas flame. Without burner, thermometer or thermo-regulator.

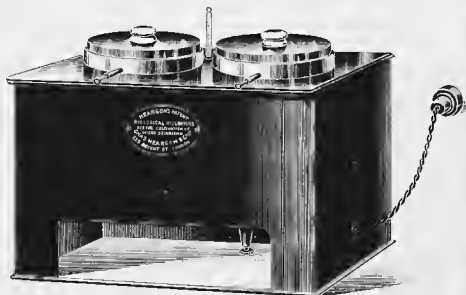
Outside dimensions, inches	12 x 12 x 23	24 x 12 x 23
Each	33.00	48.00



No. 21064

21064. **Vacuum Embedding Apparatus, Hearson,** consisting of a water bath with a heavy copper paraffine bath, 7 x 4½ inches, with thick plate glass lid made air-tight by means of a rubber ring. The apparatus may be used as an ordinary embedding bath, i.e., without exhaustion, or the paraffine bath proper may be exhausted by a few strokes of the air pump. The removal of all volatile reagents in which tissues have been soaked preparatory to embedding, is very much hastened by the use of this method. The control of the water bath is by Hearson's capsule. For gas heating. Price includes burner, flexible tubing and thermometer.

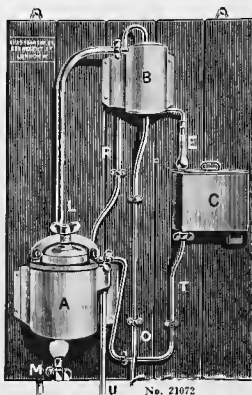
Duty Free	23.25
Duty Paid	31.50



No. 21068

21065. Vacuum Embedding Apparatus, Hearson. Electric, rectangular form, with two copper pans $5\frac{1}{2}$ inches in diameter. Complete with thermometer, flexible cord and wall plug. Duty Free . . . 40.50 Duty Paid . . . 60.75

21072. Dehydrator, Hearson, for Continuous Drying of Tissues in Alcohol. This dehydrator consists of a water bath, boiler, condenser and receiver. The boiler containing the spirit to be distilled is heated by means of a gas flame through the intermediary of the water bath, the water bath being constantly replenished with the hot water which comes from the condenser. A is the water bath supplied by the pipe F through the intermediary of a small reservoir B, the surplus water from which runs to waste at the pipe F. O is the supply for cold water for condensing the vapor of the spirit as fast as it is formed. E is a glass tube to enable the spirit to be seen as it leaves the condenser. C is the receiver which must always be full of spirit up to the overflow. The spirit, overflowing from the receiver, runs into the boiler through the pipe T. The action of the dehydrator is such that the container is always full of absolute, or nearly absolute, alcohol. Tissues placed in C are rapidly deprived of their moisture and the water thus abstracted is left behind in the boiler and there unites with the hydrate of soda, which, by combining with it, becomes liquified. When all the hydrate of soda becomes liquified more must be added, or the whole of the spirit may be distilled off and fresh hydrate of soda placed in the boiler and the spirit returned to it. The apparatus is substantially made in copper and brass. Duty Free 31.50 Duty Paid 47.25



No. 21072



View in Shipping Room



No. 21076



No. 21081

21076. Cold Closet, Large Model, for maintaining a constant temperature of -15°C ., as supplied by us to the laboratories of Henry Phipps Institute, Philadelphia, where it is giving the best of satisfaction. With careful management at ordinary room temperature the closet will maintain a temperature under the freezing point for six to eight days at a time with one filling of ice and salt.
- | | | |
|------------------------|--------------|---------------|
| Inside dimensions, cm. | 60 x 50 x 50 | 100 x 50 x 50 |
| Duty Free | 148.85 | 190.60 |
| Duty Paid | 180.40 | 231.00 |
21080. Cold Closet, "Frigo," for maintaining a constant temperature of -8 to -12°C . for the preservation of sera, ferments, urine and other biological products. Economical in use of ice and maintains temperatures much lower than ordinary refrigerators. Size 35 x 22 x 20 cm, inside dimensions.
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 46.75 | Duty Paid | 57.00 |
|-----------|-------|-----------|-------|
21084. Cold Closet, "Frigo," similar to above but 40 x 30 x 30 cm inside; for temperatures from -8 to -12°C .
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 136.15 | Duty Paid | 165.00 |
|-----------|--------|-----------|--------|



View in Stock Room

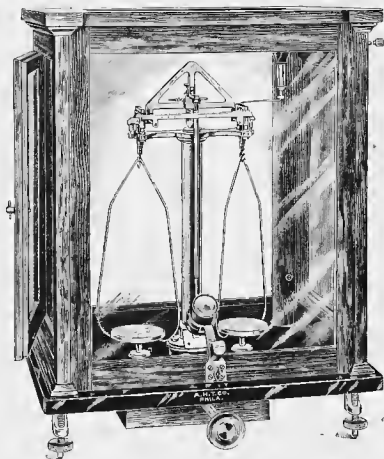


View in Packing Room

STAUDINGER ANALYTICAL BALANCES

The three **Staudinger Analytical Balances** herein listed were first introduced by us into the United States in 1890, since which time we have been the sole United States agents for the maker, Wilhelm Spoerhase of Giessen, Germany, successor to the old firm of Carl Staudinger, established in Giessen in 1842.

During this period we have supplied these Balances to practically every University, College and Technical School in the United States. In some of the larger Universities, such as the University of Pennsylvania, Cornell University, etc., there are upwards of seventy-five Balances in actual use, the same type of instrument having been repeatedly ordered year after year over a period of fifteen years.



No. 21304

21304. Balance, Staudinger Analytical No. 1. This Balance is designed for work in which high sensibility is required. In general construction it is the Staudinger modification of the usual German type, where the beam and pans are released simultaneously. By means of a patented rider sliding on the pointer varying degrees of sensibility are attainable and, for this reason, the No. 1 is adapted to a great variety of work. The scale is furnished with two divisions, one being for use with, and the other without, the reading microscope. The center of gravity of the system may be adjusted by the rider on the pointer so that 1 mg. equals 1 degree of the macro scale. The micro scale then divides this degree into tenths so that a direct reading to $\frac{1}{10}$ mg. is attained through the microscope. The action with this adjustment is very rapid and the sensibility remains constant under varying loads. By raising the rider on the pointer 1 mg. equals 5 and finally 10 degrees on the macro scale so that by using the microscope to read the subdivisions on the micro scale sensibilities of $\frac{1}{5}$ and $\frac{1}{10}$ mg. are readily available. The times of a complete double swing for the three sensibilities are as follows: $\frac{1}{10}$ mg. = 14 seconds; $\frac{1}{5}$ mg. = 20 seconds; $\frac{1}{3}$ mg. = 30 seconds.

Capacity—200 grams.

Sensibility—1.50 milligrams under full load.

Case—of well-seasoned mahogany, highly polished, with side doors and counterpoised front door.

Base—of highly polished and beveled black glass.

Beam—of hard welded magnesium, highly polished, 15 cm. long.

Knife Edges and Planes—of agate throughout.

Release and Arrest—by means of a centrally placed milled head, half turn of which simultaneously releases beam, hangers and pans.

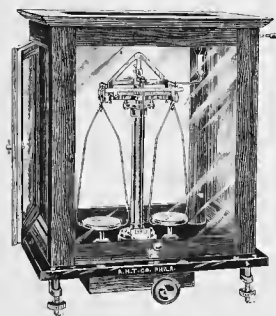
Rider Carrier—Patented Staudinger construction lifting the rider vertically in a straight line.

Pans—heavily platinum plated.

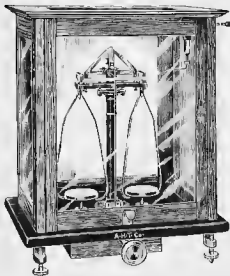
Finish—excepting magnesium beam all metal parts are heavily platinum plated or, if so specified, gold plated.

Duty Free	90.00	Stock	125.00
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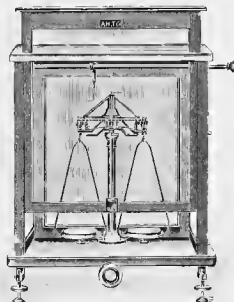
The stock prices of the Staudinger Balances have been materially reduced since the operation of the new Tariff Act of 1913.



No. 21306



No. 21308



No. 21320

21306. Balance, Staudinger Analytical No. 2. This Balance is of the same general construction as the No. 1, with some simplifications and generally more robust construction, designed to stand heavier work where such high sensibility is not required. It is used in many laboratories for advanced student work as well as in industrial laboratories.

Capacity—200 grams.
Sensibility—under full load 1-10 milligram.
Case—of polished mahogany, with side doors and counterpoised front door.
Base—of highly polished and beveled black glass.
Beam—of hard welded magnalium, highly polished, 13 cm long.
Knife Edges and Planes—of agate throughout.
Release and Arrest—by means of a centrally placed milled head half turn of which simultaneously releases beam, hangers and pans.
Rider Carrier—patented Staudinger construction lifting the rider vertically in a straight line.
Pans—heavily platinum plated.
Finish—heavily nickelled with the exception of polished magnalium beam and platinum pans.

Duty Free 50.00 **Stock** 70.00

21308. Balance, Staudinger Analytical No. 3. This Balance is deservedly the most popular of the three and has been supplied by us in the past fifteen years to most of the principal colleges and universities in the United States and to many other laboratories. It has been designed primarily for students' use in quantitative work, and over 75 instruments are in use in some of our largest universities in the East, having been repeatedly ordered over a period of fifteen years. All of the essential features of Staudinger construction and design are incorporated and the instrument differs from the preceding Balances only in the matter of simplicity of finish and construction and sensibility.

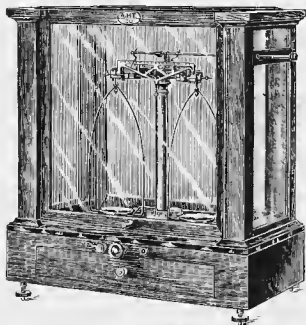
Capacity—200 grams.
Sensibility—regular adjustment is 1-5 mg equals 1 degree of scale. May be read to 1-10 mg. equals 1/3 degree of scale.
Case—of polished mahogany.
Base—of polished black slate.
Beam—of hard welded magnalium, highly polished, 13 cm long.
Knife Edges and Planes—of agate throughout.
Release and Arrest—by means of a centrally placed milled head half turn of which simultaneously releases beam, hangers and pans.
Rider Carrier—patented Staudinger construction lifting the rider vertically in a straight line.
Pans—heavily platinum plated.
Finish—with the exception of the pans which are platinum plated and the magnalium beam, all metal parts are lacquered in a dull black finish particularly resistant to laboratory fumes.

Duty Free 32.00 **Stock** 45.00

21320. Balance, Analytical, Sartorius Model "U. S. A." This new balance which has been specially designed for use in educational laboratories, has been very popular throughout the U. S. This Balance is of the German type, i. e., with simultaneous arrest of beam and pans and is fitted with Sartorius' patent compensation suspension and circular form of arrest as used on all Sartorius balances.

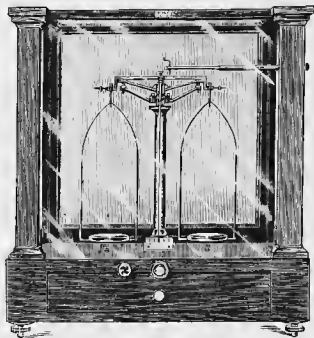
Capacity—200 grams.
Sensibility—1-10 milligram.
Case—of polished walnut.
Beam—of aluminum.
Knife Edges and Planes—of agate throughout.

Duty Free 39.00 **Stock** 50.00



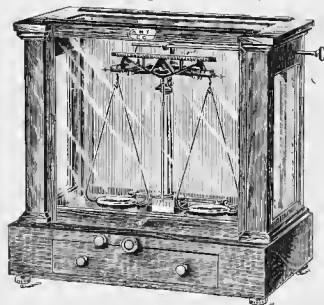
No. 21328

Note—With Standard Balances Nos. 1, 2 and 3 two 10 mg. riders are furnished with each Balance. With Becker Balances Nos. 4 and 7 three 0 mg. riders are furnished and with Troemner Balances Nos. 10 and 50 three 3 mg. riders, all of suitable shape for convenient use.



No. 21332

21328. **Balance, Analytical, Becker No. 1.** This is a high-grade analytical Balance, manufactured for us by the renowned firm of Becker's Sons, Rotterdam, and has long been in use in many leading laboratories. It is particularly adapted, because of robust construction, quick action and great sensibility, to the requirements of industrial laboratories and is highly recommended for such work.
Capacity—200 grams.
Sensibility—1-20 milligram.
Case—of highly polished, well-seasoned mahogany, with counterpoised front door and sliding door in rear.
Beam—of aluminum, 8 inches long, graduated to 1-10 milligram.
Knife Edges and Planes—of agate throughout.
Release and Arrest—beam is arrested by center milled head and pans are arrested separately by pressure on ivory button.
Pans—of polished German silver.
Finish—with the exception of polished aluminum beam, metal parts are protected by gold lacquer very resistant to laboratory fumes.
Duty Free **68.75** **Stock** **125.00**
21332. **Balance, Analytical, Becker No. 7.** This Balance is also made for us by Becker's Sons, Rotterdam, and is especially recommended for students' use and for industrial laboratories where a higher priced Balance is not required. It is substantially made and at the same time sufficiently sensitive to give close results.
Capacity—100 grams.
Sensibility—1-10 milligram.
Case—of highly polished well-seasoned mahogany with counterpoised front door and sliding door in rear.
Beam—of aluminum, 6 inches long, graduated to 1-10 milligram.
Knife Edges and Planes—of agate throughout.
Release and Arrest—provided with the improved pan arrest with arrangement for lifting plane from the knife edges at the ends of the beam when the balance is at rest, as in the higher priced Balances. This feature is not found in other balances of corresponding price.
Pans—of polished German silver.
Finish—with the exception of the polished aluminum beam all metal parts are lacquered.
Duty Free **36.00** **Stock** **65.00**
21324. **Balance, Analytical, Troemner No. 10.** This Balance is in extensive use in industrial laboratories throughout the country, also in many of our leading universities, and needs no introduction.
Capacity—200 grams.
Sensibility—1-20 milligram.
Case—of old, well-seasoned mahogany, French polish; the front sash is counterpoised, opening up the full width of the case. The rear sash also slides up, allowing the weighing of long objects to extend beyond the outside lines of the case. The top and ends are also fitted with glass sash, thus securing plenty of light from all directions.
Base—top is covered with a black plate glass.
Beam—of cold rolled aluminum, having more than three times the tensile strength of pure aluminum, oxidized black with a non-corrosive preparation, and divided into fifty parts each side of the center knife.
Knife Edges and Planes—of agate throughout.
Release and Arrest—releasing arms are of simplest construction with three principal parts, swinging up to hold the beam and down to release it and operated by a turn button in front of case, constructed so as to bring their axes coincident with the contact line at the center knife edge and hold the beam firm and secure when the Balance is being loaded or unloaded.
Pans—of aluminum, 3 inches diameter, of flat shape and adjustable on the arches. Arches are of cold drawn nickel silver, gold plated.
Finish—all brass parts are gold plated.
Stock **125.00**

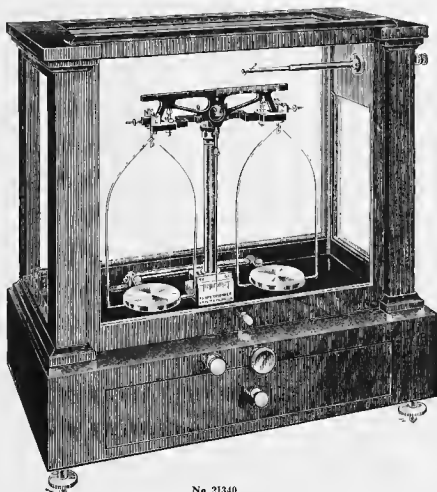


No. 21324

A NEW ANALYTICAL BALANCE

TROEMNER NO. 50 \$50.00 NET

MADE BY HENRY TROEMNER, PHILADELPHIA, FOR THE ARTHUR H. THOMAS COMPANY



No 21340

21340. Balance, Analytical, Troemner No. 50. After long cooperation with the firm of Henry Troemner, Philadelphia, we are enabled to offer a Balance at \$50.00, bearing his name and guarantee, but made specially for us, which will satisfactorily meet all the practical requirements of the analyst as well as any Balance now listed at \$125.00. We will send this Balance to any responsible chemist, subject to trial and approval and returnable at our expense if not satisfactory. This Balance is particularly recommended to industrial chemists because of its rigid and robust construction and is guaranteed to stand the daily wear and tear in a works laboratory.

Sensibility—The Balance has a definite sensibility of $\frac{1}{10}$ milligram under full load of 200 grams in each pan.

Capacity—200 grams in each pan.

Case—The case is of French polished mahogany with counterpoised front sash, with glass sash at the back, top and both ends. The base is fitted with a drawer and is provided with screw leveling feet.

Beam—The beam is of aluminum alloy, 7 inches long and is graduated on the right arm into fifty divisions. The special feature of this beam construction is that it is designed to support successfully without flexure a load of 200 grams in each pan, and that the knife edges are set rigid in the beam, thus doing away with any possible shifting which would make the Balance inaccurate and undependable.

Release and Arrest—The beam is supported by a three point rigid beam arrest that has a full-away action and releases the beam so that the contact at the center knife edge is coincident with the contact at the end knife edge, thereby avoiding all jarring and possible injury to the knife edge by a sudden shock.

Rider Carrier—The rider carrier is very simple in construction and is designed to be thoroughly effective and free from any possibility of derangement.

Bearings—Of agate throughout.

Pointer Scale—The ivory pointer scale is recessed (see illustration) so that the end of the pointer moves in the recess and in the same vertical plane as the divisions on the scale, thus avoiding all errors of parallax and making accurate readings convenient and rapid.

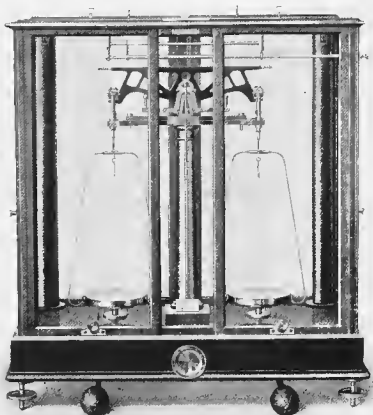
Pan Hangers—Of extra width and shape to conveniently accommodate a Vanier Potash Bulb.

Price 50.00

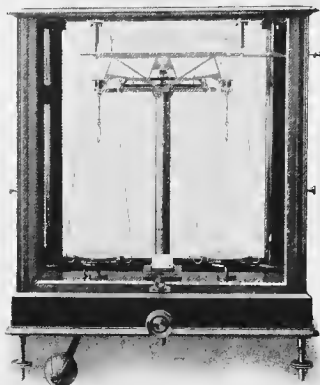
21341. Balance, Analytical, Troemner No. 65, exactly the same as No. 50 but with beam divided on both sides of the central knife edge instead of on the right-hand side only as in the No. 50, and with black polished plate glass base inside of the case. 65.00

RUEPRECHT PRECISION AND ANALYTICAL BALANCES

As supplied by us to laboratories in leading institutions throughout the United States for the highest grade of research work.



No. 21360



No. 21368

21360. **Balance, Precision, Rueprecht**, a balance of great precision and large carrying capacity, constructed upon the well-known Rueprecht system, with all moving parts heavily gold plated, in mahogany case.

Capacity grams	600	1000	2000	5000
Sensibility, milligrams	0.1	0.1	0.2	0.5
Duty Free	226.50	248.00	330.75	427.25
Duty Paid	305.25	343.50	458.00	591.50

21364. **Balance, Precision, Rueprecht**, as above, with automatic device for removing and placing weights on the right-hand beam and with arrangement for variable sensibility.

Capacity, grams	200	600	1000	2000
Sensibility, milligrams	0.05	0.1	0.1	0.2
Duty Free	215.00	344.50	385.85	496.10
Duty Paid	300.00	477.00	534.25	686.85

Note—The above Balances can be furnished in case constructed entirely of brass and mirror plate glass at an advance of approximately 20%.

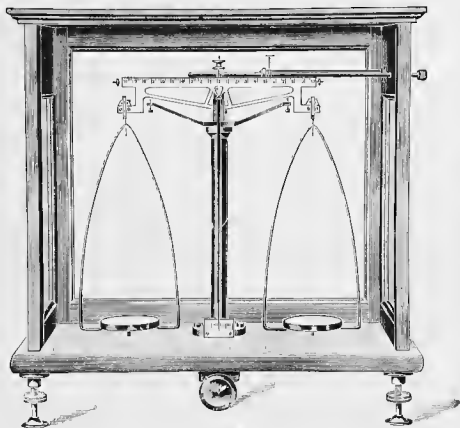
21368. **Balance, Analytical, Rueprecht**, in fine mahogany case, with beam 200 mm long; 200 grams capacity.

Sensibility, milligrams	0.1	0.05
Duty Free	124.05	132.30
Duty Paid	171.75	183.15

21372. **Balance, Analytical, Rueprecht**, as above, but with shorter beam, i.e., 150 mm long; 200 grams capacity.

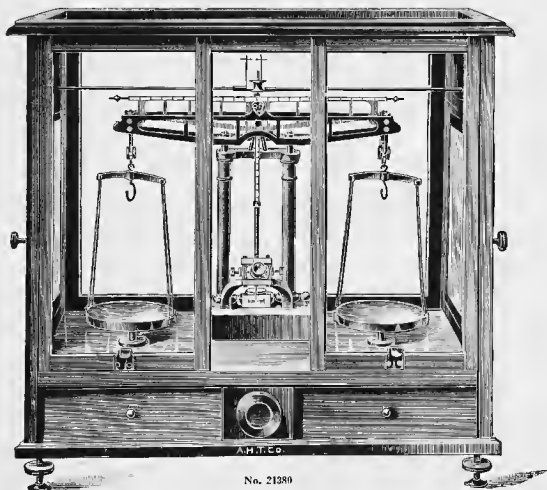
Sensibility, milligrams	0.1	0.05
Duty Free	124.05	132.30
Duty Paid	171.75	183.15

Note—Either of the above Balances can be furnished in case composed entirely of brass and mirror plate glass at an extra cost of \$35.85 duty free and \$49.60 duty paid.



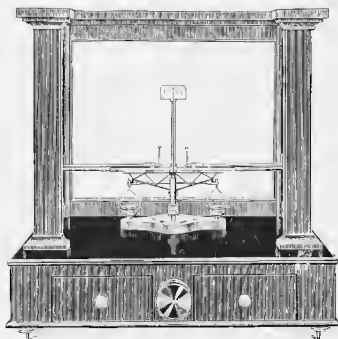
No. 21376

21376. Balance, Technical-Analytical, Staudinger, a convenient balance for quick and exact weighings on the lecture table and for students' work. With beam and hangers of magnalium and agate bearings and knife edges. Case is of mahogany with sliding front door and base is of black marble.
- | | | | | |
|------------------------------|-------|-------|-------|-------|
| Capacity, grams..... | 100 | 200 | 500 | 1000 |
| Sensibility, milligrams..... | 0.5 | 1 | 2 | 3 |
| Duty Free..... | 29.35 | 32.95 | 39.70 | 44.70 |
| Duty Paid..... | 35.20 | 39.50 | 47.65 | 53.65 |

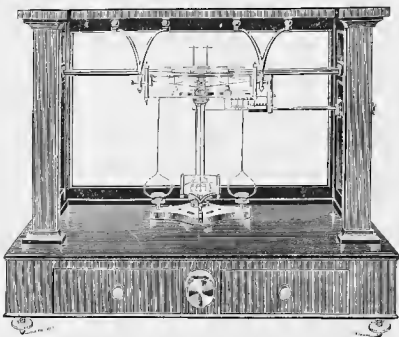


No. 21380

21380. Balance, Physical-Analytical, Standing. Recommended as a Balance of great precision with large carrying capacity. 1000 grams capacity, sensibility by means of reading microscope $\frac{1}{10}$ milligram; with adjustment for sensibility, agate bearings throughout, Argentinian beam 35 cm long, in fine mahogany case, with black mirror plate glass base.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 255.00 | Duty Paid..... | 357.00 |
|----------------|--------|----------------|--------|



No. 21384



No. 21388

21384. Balance, Assay, Ainsworth Inverted Type V, a reliable and widely used Assay Balance.

Sensibility—adjusted to a sensibility of 1-500 milligram and afterwards reduced to 1-200 milligram to increase the rapidity.
Case—of mahogany with counterpoised sliding door, 17 x 17 x 10 inches.

Beam—of hard rolled magnesium, 5 inches long.

Edges and Bearings—the end bearings are flat agate planes with suitable recesses for the engagement of agate contact points by means of which the bearings are raised from the edges when at rest.

Rider Carrier—of improved design with no metal surfaces in sliding contact and will operate smoothly and without lubrication under all conditions. The graduated scales divided in hundredths, each division representing 1-100 the weight of the rider used, are attached to the carrier. The rider carrier rod has a slight amount of end play in the sliding bushing which permits the withdrawal of the carrier from the eye of the rider without disturbing the reading, a greatly simplified construction.

Release—operates rapidly without causing the beam to kick, this being accomplished by first releasing the paw rests, then the end bearings and finally the beam, by means of a very simple mechanism not liable to derangement and which overcomes a serious defect in earlier balances of this type.

Finish—all metal parts are heavily gold plated and lacquered.

Price 300.00

21388. Balance, Assay, Ainsworth Type C, with Improved Multiple Rider Carrier. As used by leading assay-ers, smelters and mills where a large number of accurate weighings are to be made. The carrier can be attached to any of the other Ainsworth Balances. Each weight or rider has an individual arm, cannot be misplaced and can be operated with beam in motion. The numbers on the arms down indicate the weight of the riders on the beam and, when through weighing, all riders are reset simultaneously by a reverse movement of the thumbpiece.

Sensibility—adjusted to a sensibility of 1-500 milligram and afterwards reduced to 1-200 milligram to increase the rapidity.

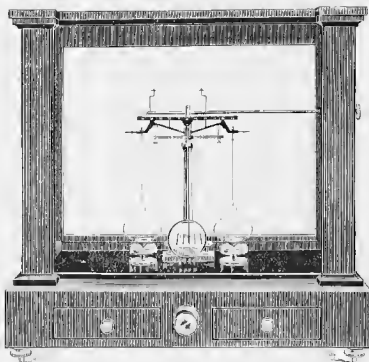
Case—of mahogany with counterpoised sliding door, 20 x 17 x 10 inches.

Beam—of brass form, with star adjustment, unobstructed on top, divided in 50 parts on either side of the center and read from 0 to the full weight of the rider used.

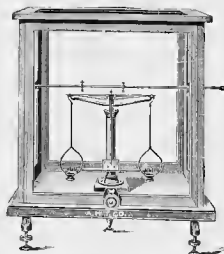
Rider Carrier—similar in construction to inverted type, No. 21384.

Finish—all metal parts are heavily gold plated.

Price 335.00



No. 21392



No. 21396

21392. **Balance, Assay, Troemner's New Form, No. 30.** This is an entirely new Balance designed to meet the demand for a low priced, short arm Balance with a sensibility of $\frac{1}{100}$ milligram and of quick action. It requires but 13 seconds for one complete oscillation.

Sensibility—1-100 milligram.

Case—of well seasoned mahogany, French polished, with glass sides and top and with black plate glass sub-base; fitted with counterpoised sliding door and provided with a reading glass for the ivory index. 18 x 9 $\frac{1}{2}$ x 18 inches.

Beam—of hard rolled aluminum alloy, graduated on both sides of the center knife edge into 50 divisions. The beam is undistorted on top, so that the rider can be placed at any division on the beam, from that the center to the last division on the beam, which is directly over the end knife-edge and represents the full weight of the rider used. With a $\frac{1}{2}$ mg. rider on the one-half divisions, or a $\frac{1}{10}$ mg. rider on the full divisions the Balance shows 1-100 mg. for each division on the ivory index.

Edges and Bearings—of Russian agate—accurately ground.

Rider Carrier—of single, double hook pattern, operated from right hand side of case with full, clear sweep across beam, and the rider, either single or double, can be placed at any division on the beam.

Finish—all the brass parts are covered with an impervious lacquer.

Price 125.00

21396. **Balance, Assay, Staudinger No. 22b.** This instrument is devised specially to meet the requirements of students' assay work in the U. S. at a low price. A large number of these instruments are now in use in this country, and no other balance of similar specifications is offered at a corresponding price.

Capacity—2 grams.

Sensibility—1-50 mg. but will easily show 1-100 mg.

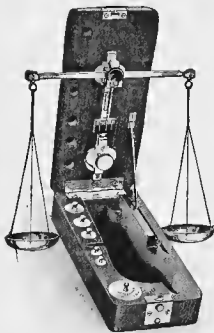
Case—of mahogany.

Beam—of magnesium, 200 mm long.

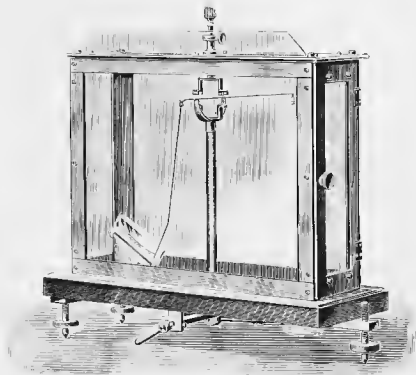
Knife Edges and Planes—of agate throughout.

Release and Arrest—the arrestment of beam hangers and pans is accomplished quickly and conveniently.

Duty Free 36.00 Stock 50.00



No. 21400



No. 21404

21400. **Balance, Assay, Pocket.** Improved form with eccentric lift for beam. Size when closed is 6 x 2 $\frac{1}{4}$ x 1 $\frac{1}{2}$ inches. Capacity 10 grams; sensibility $\frac{1}{4}$ mg. Complete with set of weights. A half assay ton weight is usually supplied in place of the 10 gram piece 16.50



No. 21408

21404. **Balance, Micro, Nernst.** This Balance is based upon the torsion of a very fine quartz fibre and is used for weighing small crystals and for carrying on micro-chemical reactions with accurate observation of change in weight. The Balance is mounted securely and by means of proper arresting device may be shipped with reasonable safety. Full instructions for operation accompany each Balance. Capacity 10 mg; sensibility $\frac{1}{1000}$ mg. See *Berichte der D. Chem. Gesellsch. Jahrg. XXXVI Heft 10 und Jahrg. XXXVIII Heft 1.*

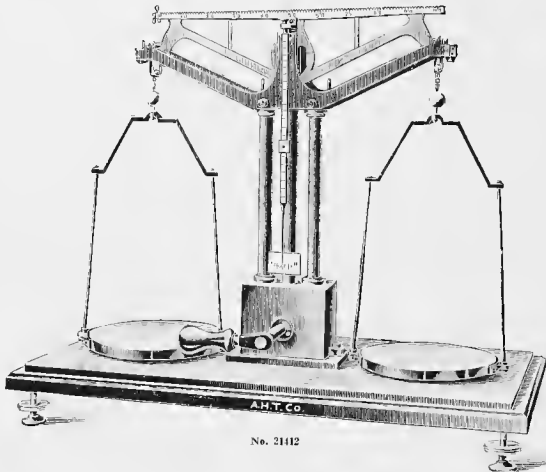
Duty Free 37.95

Duty Paid 43.70

21408. **Reading Microscope, Emich,** for use with above Nernst Balance, on adjustable stand, with counterpoise for the Microscope. See *Emich, Lehrbuch der Mikrochemie, Wiesbaden 1911.*

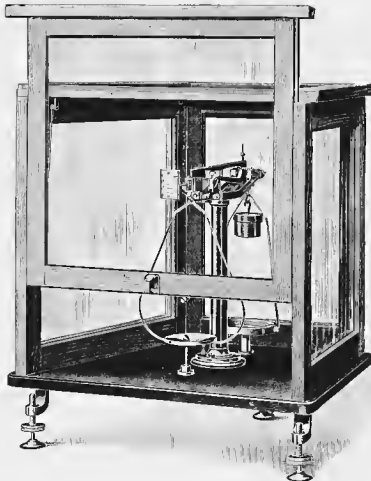
Duty Free 21.45

Duty Paid 28.60



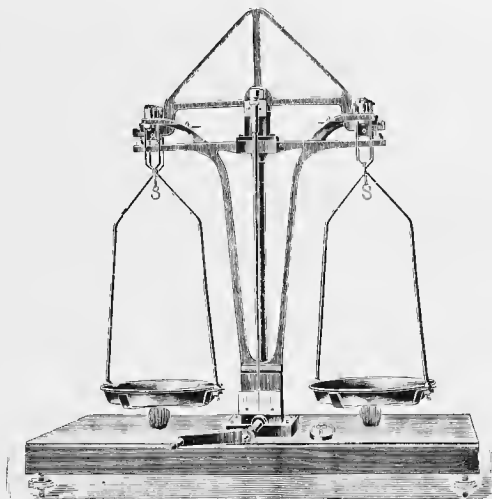
No. 21412

21412. Balance, Lecture Table, Standing. designed particularly for experiments where large carrying capacity is required; capacity 5000 grams, sensibility 1 centigram. Beam is divided into 100 equal divisions with zero at the left-hand side so that a 50 centigram platinum rider may be used with a value of 100 centigrams at the right-hand end of the beam. Beam is of bronze with agate bearings and planes, on heavy mahogany base; with levelling screws.
- | | | | |
|-----------|-------|-----------|--------|
| Duty Free | 75.00 | Duty Paid | 105.00 |
|-----------|-------|-----------|--------|
21416. Balance, Lecture Table, as above, but with covering case of glass and mahogany.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 105.00 | Duty Paid | 147.00 |
|-----------|--------|-----------|--------|



No. 21420

21420. Balance, Decimal, Mach, specially constructed for weighing precise quantities of substances for analysis, particularly in sugar, fertilizer and brewery laboratory practice or other work where large numbers of consecutive weighings of equal charges are to be made. The usual method is to use a scoop, counterpoised on the scale pan with lead shot placed in the circular box under the hangers at the short arm of the beam. If 20 grams of a substance is to be weighed, a 200 gram weight is placed in the rear of the short arm pan and the scoop on the front scale pan charged until the pointer comes to zero. Capacity 100 grams, sensibility 1° of scale = 1 milligram. Balance is furnished in mahogany case with metal parts heavily nickelled, suitable for use in the tropics and with base plate of polished mirror plate glass.
- | | |
|-----------|-------|
| Duty Free | 25.90 |
| Duty Paid | 34.50 |
21424. Balance, Decimal, Mach, as above but with pointer at the left-hand side instead of in front, and with side doors.
- | | |
|-----------|-------|
| Duty Free | 27.40 |
| Duty Paid | 36.50 |



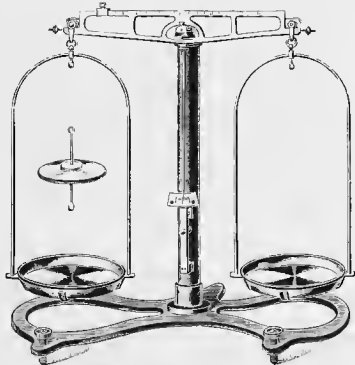
No. 21428

21428. **Balance, Lecture Table**, for weighing large flasks and other containers and also for lecture table use; with adjusting arrangement for end knife edges; beam is of aluminum and support black enamelled. It should be noticed that this balance is frequently offered with an iron beam, in which case the sensibility is greatly diminished.

Capacity, kilos.....	1	5	10
Sensibility, mg.....	10	30	50
Duty Free.....	18.00	28.50	36.90
Duty Paid.....	21.60	34.25	44.30

21432. **Balance, Lecture Table**, same as No. 21428 but in glass case with oak frame.

Capacity, kilos.....	1	5	10
Sensibility, mg.....	10	30	50
Duty Free.....	28.50	43.80	56.10
Duty Paid.....	34.25	52.60	67.35



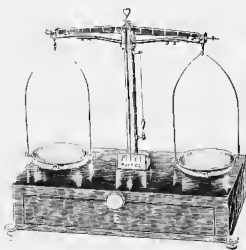
No. 21436

21436. **Balance, Laboratory**, for school and lecture table work, with black enamelled iron base and pillar, with damping device for quick arrestment. The beam is of brass heavily nickel plated and divided into 100 parts and carrying a rider weighing up to 10 grams without weights. The bearings and knife edges are of hard high grade steel and the balance is supplied with levelling screws. Capacity 2 kilos, height of bows 35 cm, diameter of pans 14 cm, length of beam 32 cm, sensibility 20 milligram.

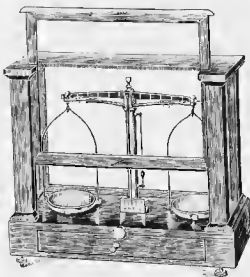
Duty Free.....	9.00
Stock.....	12.50

21440. **Balance**, as above, but with agate knife edges.

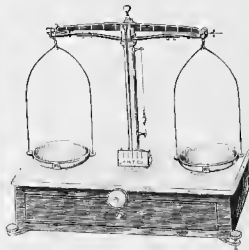
Duty Free.....	12.50
Stock.....	16.50



No. 21444

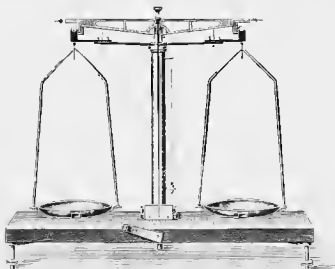


No. 21448

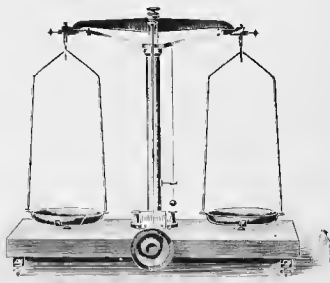


No. 21456

21444. **Balance, Pulp**, for sugar, ore, pulp, etc., smaller sizes widely used as prescription scales, arresting device extends to hangers, knife edges and planes are of steel, on polished mahogany base with drawer and levelling screws. A very satisfactory and widely used balance.
- | | | | | | |
|------------------------------|-------|-------|-------|-------|-------|
| Capacity, grams..... | 75 | 180 | 300 | 600 | 1500 |
| Sensibility, milligrams..... | 1 | 1 | 2 | 2 | 10 |
| Diameter of pans, mm..... | 65 | 80 | 100 | 125 | 150 |
| Each..... | 12.00 | 16.00 | 20.00 | 26.50 | 33.00 |
21448. **Balance, Pulp**, same as above in mahogany case, with sliding glass door.
- | | | | | | |
|----------------------|-------|-------|-------|-------|-------|
| Capacity, grams..... | 75 | 180 | 300 | 600 | 1500 |
| Each..... | 22.00 | 25.00 | 33.00 | 38.00 | 50.00 |
21452. **Balance, Pulp**, exactly the same as No. 21444, but with agate knife edges and planes and with circular spirit level instead of plumb bob.
- | | | | | | |
|------------------------------|--|--|--|-------|-------|
| Capacity, grams..... | | | | 100 | 250 |
| Sensibility, milligrams..... | | | | 1 | 2 |
| Each..... | | | | 22.50 | 26.50 |
21456. **Balance, Pulp**, exactly same as No. 21452, but with marble top on the mahogany base.
- | | | | | | |
|----------------------|--|--|--|-------|-------|
| Capacity, grams..... | | | | 250 | 500 |
| Each..... | | | | 20.00 | 22.00 |

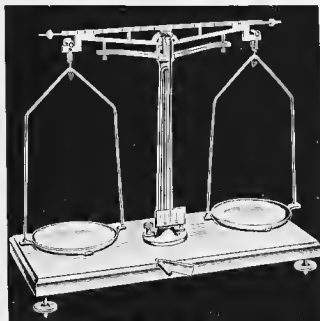


No. 21460

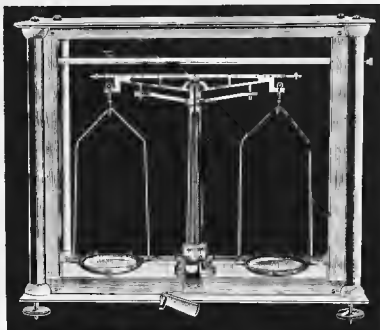


No. 21464

21460. **Balance, School Laboratory**, with open beam, agate knife edges and planes, arrest for both beam and hangers, levelling screws and plumb bob, with divisions on beam for use of rider.
- | | | |
|------------------------------|-------|-------|
| Capacity, grams..... | 100 | 250 |
| Sensibility, milligrams..... | 2 | 3 |
| Duty Free..... | 10.00 | 12.00 |
| Stock..... | 15.00 | 16.50 |
21464. **Balance, Staudinger School**, with agate knife edges and planes, improved beam and hanger arresting device, on heavy wooden base with levelling screws, with removable pans. Recommended as the most accurate and satisfactory school laboratory balance of its type.
- | | | |
|------------------------------|-------|-------|
| Capacity, grams..... | 100 | 250 |
| Sensibility, milligrams..... | 1 | 2 |
| Duty Free..... | 12.00 | 13.50 |
| Stock..... | 16.00 | 17.50 |



No. 21468



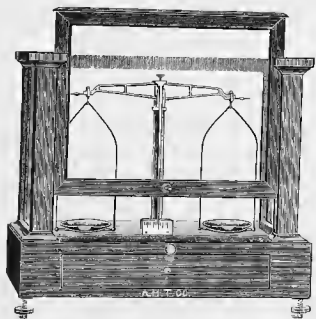
No. 21472

21468. **Balances, Magnalium.** Many so-called magnalium balances have only the beam, pillar and pans made of magnalium, the remaining parts being of brass. On this account they do not resist acid fumes much better than ordinary balances. **These balances are made entirely of magnalium insofar as the metal parts are concerned.** With agate knife edges and planes.

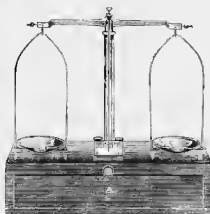
Capacity, grams	100	250
Sensibility, milligrams	3	5
Duty Free	10.00	12.50
Stock	13.25	14.50

21472. **Balance, Magnalium,** same as above but in glass and magnalium case, and with rider carrier.

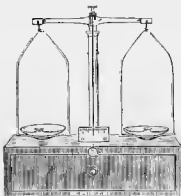
Capacity, grams	100	250
Duty Free	26.10	27.90
Stock	34.80	37.20



No. 21476



No. 21484

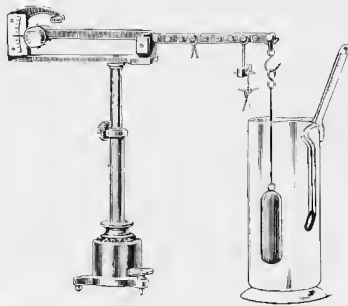


No. 21488

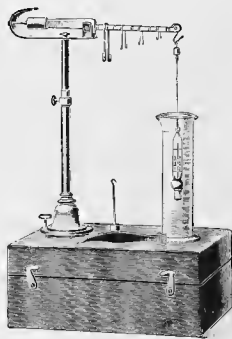
21476. **Balance, Laboratory,** for general laboratory work, open beam fitted with adjusting screws at both ends. The pans are 75 mm in diameter and nickel plated. Case is of polished mahogany with glass sides and top, sliding door, levelling screws and spirit level. Capacity 100 grams, sensitive to $\frac{1}{2}$ mg. 25.00
21480. **Balance, Laboratory,** same as No. 21476 but with agate bearings. 30.00
21484. **Balance, Prescription,** of brass with nickel plated pans 3 inches in diameter. Beam 9 inches long with adjusting screws. Sensibility 2 mg. 9.00
21488. **Balance, Prescription,** of brass, on wooden base, with drawer. Beam 6 inches long, pans 3 inches in diameter. Without adjusting screws at end of beam. A useful Balance at a low price. 6.00



No. 21492

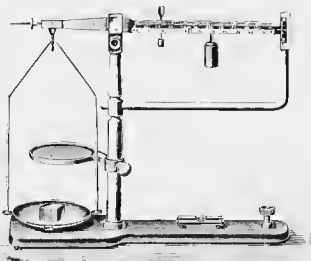


No. 21496



No. 21500

21492. Balance, Jolly Spiral Spring, with new patent reading scale. The inner tube can be adjusted up or down by means of the milled head and is graduated in millimeters with vernier reading to $\frac{1}{16}$ mm. This Balance has been found very convenient in many industrial laboratories, such as in rubber works, for taking specific gravities. 25.00
21496. Balance, Specific Gravity, Sartorius, for both liquids and solids. This Balance is much superior to balances of the same type made by other manufacturers. The outfit includes Reimann's Plummet for liquids, pan for solid bodies, jar, special thermometer and rider weights reading to the fourth decimal place.
- | | | | |
|-------------------------------------|-------|-------|-------|
| Duty Free | 22.50 | Stock | 30.00 |
| Special Thermometer, only | | " | 3.00 |
| Set of Riders, only | | " | 1.50 |
| Jar, only | | " | .30 |
| Reimann's Plummet, with thermometer | | " | .75 |
21500. Balance, Specific Gravity, Westphal. For the determination of the specific gravity of liquids up to the fourth decimal place. With jar, riders and Reimann's Plummet 12.00
- | | |
|-------------------------|------|
| Reimann's Plummet, only | 2.00 |
| Jar, only | .30 |
| Set of Riders, only | 1.50 |



No. 21504

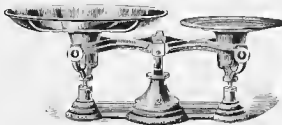


No. 21508

21504. Balance, Triple Beam, capacity 111 grams with a sensibility of $\frac{1}{3}$ centigram. One beam reads from 10 grams to 100 grams in divisions of 10 grams, the second from 1 gram to 10 grams in divisions of 1 gram and the third from 1 gram to 1 gram in divisions of 1 centigram.
- | | | | |
|-----------|-------|-------|-------|
| Duty Free | 11.50 | Stock | 15.00 |
|-----------|-------|-------|-------|
21508. Balance, Hand, with polished brass beam, steel knife edges, horn pans and silk cord.
- | | | | |
|----------------------|------|------|------|
| Length of beam, mm | 150 | 175 | 200 |
| Diameter of pans, mm | 60 | 75 | 90 |
| Each | 1.50 | 1.75 | 2.00 |



No. 21512



No. 21521



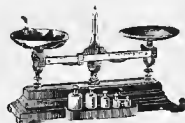
No. 21516



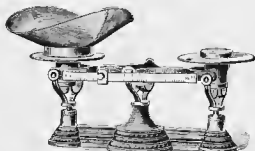
No. 21520



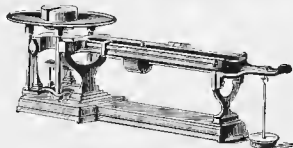
No. 21528



No. 21544

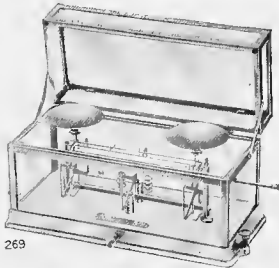


No. 21532



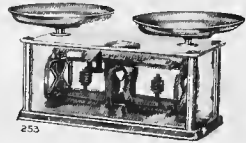
No. 21540

21512. Balance, Harvard Trip, with square or round porcelain plates 6 inches in diameter. Capacity 1 kilo, beam graduated up to 5 grams in $\frac{1}{10}$ grams 6.00
21516. Balance, Robervahl, for coarse weighing, with metal base and brass pans but without side beam.
Capacity, kilos 1 3 5 10
Diameter of pans, mm. 125 150 200 225
Each 2.80 3.60 4.50 6.00
21520. Balance, Counter, in ebony box with marble top and heavily nickel plated pans.
Diameter of pans, inches 7 8 9
Capacity, lbs 10 15 20
Each 14.00 16.00 18.00
21524. Balance, Troemner Trip. A very substantial and reliable scale, with one heavy, brass pan which is removable. Ornamented in black and gold.
Diameter of pans, inches 8 9 12
Capacity, lbs 2 4 10
Each 6.00 7.00 8.00
21528. Balance, Prescription. Very convenient in laboratory and pharmaceutical work. Pans 6 inches in diameter, heavily nickel plated. Capacity 500 grams in each pan, sensitive to 5 centigrams. Price includes full set of weights from 200 grams to 1 centigram, neatly fitted in base 10.00
21532. Balance, Moisture, for determining the percentage of moisture in ores, etc. Beam is divided on the top into ounces and on the bottom into percentage of 100 to 0. Including a set of iron weights from 2 lbs. to $\frac{1}{4}$ oz. Avoirdupois 10.00
21540. Balance, Solution. With two weighing beams and sliding poises, one divided into 100 parts, each representing 1 gram; the other into 10 parts, each representing 100 grams. A bar with a sliding poise is placed under the weighing beams to balance the empty bottle or container, which is quickly done by sliding the poise along the bar 25.00
21544. Balance, New Dispensing. Very convenient for rough prescription work or laboratory weighing. Pans $\frac{3}{4}$ inches in diameter, heavily nickel plated. Beam divided into decigrams. Capacity 100 grams. Including set of brass weights from 50 grams to 1 centigram, fitted into base 9.00



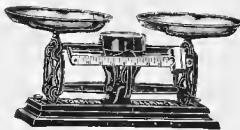
269

No. 21548

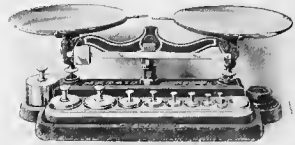


253

No. 21556



No. 21564

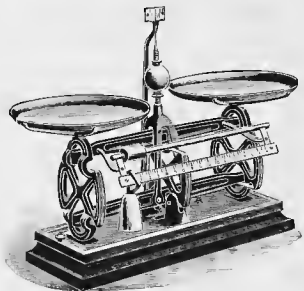


No. 21575



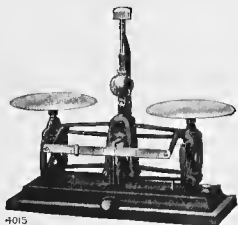
3015

No. 21572



No. 21576

21548. Balance, Torsion, with glass case and cover and slide beam with rider carrier operating from outside. Capacity 125 grams in each pan, with beam reading to 500 milligrams by 5 milligrams; pans 7.5 cm in diameter; sensibility 1 milligram. 40.00
21552. Hydrostatic Attachment, extra. 10.00
21556. Balance, Torsion, with mechanism entirely enclosed in glass case with German silver corner posts and nickel plated base; nickel plated brass pans 23 cm in diameter. Capacity 4.5 kilos in each pan, beam reads to 100 grams by 1 gram, sensibility $\frac{1}{4}$ gram. Rider on beam is manipulated from outside the case. With slide beam inside the case controlled by weight mover from the outside. 35.00
21564. Balance, Torsion, with 9 inch beam and 6 inch nickel plated pans. Capacity 5 kilos. Beam divided to 300 grams in $2\frac{1}{2}$ gram divisions. Sensitive to about 1 gram. 13.50
21568. Arresting Device, extra. 2.00
21572. Balance, Torsion, with tare weight. Bottles, dishes or other containers can be tared by sliding tare weight on upper beam, facilitating weighing and avoiding errors. Capacity 2.3 kilos in each pan, slide beam 100 grams by 1 gram, sensibility 7 centigrams, with nickel plated brass pans 15 cm diameter; with arresting device. 20.00
21576. Balance, Torsion, similar to No. 21572 but of larger capacity, i. e., 4.5 kilos in each pan with a sensibility of 15 centigrams; pans 23 cm in diameter; with slide beam divided into 450 grams by 5 grams; with arresting device. 22.00
21578. Balance, Solution, Metric. For rapidly making accurate reagents or other kind of composite solutions, with two movable brass pans. Price includes weights of solid brass. With side beam in front, undivided, for balancing the bottle or containers.
- | | | |
|-----------------------------------|----------------|-------|
| Capacity, kilos. | 1 | 5 |
| Diameter of pans, inches. | $5\frac{1}{2}$ | 9 |
| Each | 16.00 | 20.00 |



4015

No. 21580



4700

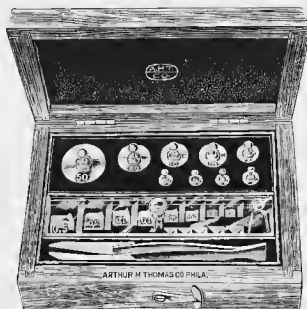
No. 21581

21580. **Balance, Torsion**, as recommended for soil analysis and as used in the U. S. Department of Agriculture. With slide beam divided in 10 grams by $\frac{1}{10}$ gram; capacity 1 kilo in each pan; sensibility 7 centigrams; with porcelain plates 15 cm in diameter, high poise, indicator and arrest 18.00
21584. **Balance, Torsion**, for moisture or subtraction tests. The scale is constructed with percentage beams so that 0.1% to 30% of moisture can be determined without calculation when 10 gram samples are used. By means of two tare beams one or more dishes can be balanced and recorded. As used in butter testing, paint and varnish testing laboratories, etc. With 10 gram weight. 15.00



View in Stock Room Showing Arrangement of Porcelain Evaporating Dishes

ANALYTICAL WEIGHTS



No. 21600

One piece Weights of Tobin bronze, made according to the designs of the Bureau of Standards, for use as Primary Standards, guaranteed to be within the tolerances established by the Bureau for Class A (new class M) are noted upon application. Certificates for Analytical Weights of German manufacture such as No. 21600 are furnished from the Kaiserlichen Normal-Eichungs-Kommission of Berlin, as a matter of convenience.



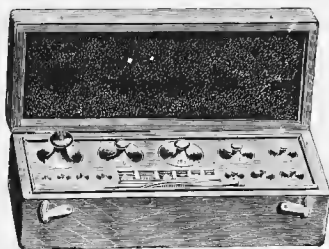
No. 21612

21600. Balance Weights, Analytical, with gram pieces heavily gold plated and with fractional pieces of platinum except the 1, 2 and 5 mg which are of aluminum and two 10 mg riders. In velvet lined, polished mahogany box, with ivory tipped forceps and fractional pieces covered by glass plate. These weights are adjusted with sufficient accuracy for the highest grade of analytical work.
- | | | | | | | |
|---------------------------------|-------|-------|-------|-------|-------|-------|
| Sets, 1 milligram to grams..... | 20 | 50 | 100 | 200 | 500 | 1000 |
| Duty Free, per set | 7.15 | 8.00 | 9.50 | 12.15 | 15.00 | 18.50 |
| Stock, per set | 10.75 | 12.00 | 14.25 | 18.25 | | |
21604. Balance Weights, Analytical With Certificate, exactly the same as No. 21600 but with certificate of the Kaiserlichen Normal-Eichungs-Kommission of Berlin.
- | | | | | | | |
|---------------------------------|-------|-------|-------|-------|-------|-------|
| Sets, 1 milligram to grams..... | 20 | 50 | 100 | 200 | 500 | 1000 |
| Duty Free, per set | 12.75 | 14.50 | 16.85 | 20.25 | 24.00 | 28.70 |
| Stock, per set | | 22.15 | 26.00 | | | |
21608. Balance Weights, Analytical, exactly similar to No. 21600 but with brass pieces carefully lacquered instead of gold plated. This set avoids the high duty on platinum and gold plated articles under the Tariff Act of 1913. By many experienced laboratory workers the lacquered finish is considered preferable to the gold plating.
- | | | | | | |
|---------------------------------|------|------|-------|-------|-------|
| Sets, 1 milligram to grams..... | 50 | 100 | 200 | 500 | 1000 |
| Duty Free, per set | 6.85 | 8.00 | 10.50 | 13.00 | 16.25 |
| Stock, per set | 8.25 | 9.75 | | | |
21612. Balance Weights, Analytical, Troemner, in mahogany block with removable cover, gram pieces carefully lacquered and fractionals of platinum and aluminum. With three 5 mg riders. Fractional pieces have one entire edge turned into vertical position for convenient handling with forceps.
- | | | | | | | |
|---------------------------------|--|--|--|--|-------|-------|
| Sets, 1 milligram to grams..... | | | | | 50 | 100 |
| Each | | | | | 19.00 | 21.00 |
21614. Balance Weights, exactly as above but with Bureau of Standards Certificate..... 27.00 29.50
21616. Balance Weights, Analytical, Becker's Sons, Rotterdam, exactly similar in accuracy and finish to No. 21612 and mounted in similar case. This set can also be furnished with Bureau of Standards Certificate. With three 6 mg riders.
- | | | | | | |
|---------------------------------|--|--|--|-------|-------|
| Sets, 1 milligram to grams..... | | | | 50 | 100 |
| Duty Free, per set | | | | 8.50 | 9.60 |
| Duty Paid, per set | | | | 14.00 | 16.00 |
21620. Balance Weights, Analytical, fractional sizes only. Same as those supplied in sets No. 21600 and adjusted to the same accuracy, 1, 2, and 5 milligram pieces of aluminum, larger pieces of platinum.
- | | | | | | | | | | | | |
|-----------|-----|-----|-----|------------|-----|-----|-----|-----|------|------|-------|
| Size..... | 1 | 2 | 5 | milligrams | .01 | .02 | .05 | 1 | 2 | 5 | grams |
| Each..... | .10 | .10 | .10 | | .25 | .30 | .45 | .60 | 1.25 | 1.75 | |
21624. Balance Weights, Analytical. Single pieces of brass, gold plated. Same accuracy as supplied in sets No. 21600.
- | | | | | | | | |
|------------------|-----|-----|-----|-----|-----|------|------|
| Size, grams..... | 1 | 2 | 5 | 10 | 20 | 50 | 100 |
| Each | .40 | .45 | .60 | .70 | .80 | 1.10 | 1.75 |

Note—Riders of convenient shape and size for all standard Analytical Balances will be sent with our Analytical Weights from stock if customer will please specify make and type of Balance in ordering the Weights.



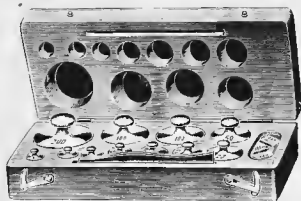
No. 21628



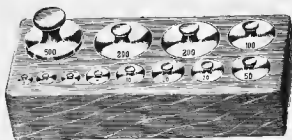
No. 21614



No. 21632



No. 21618



No. 21656

21628. **Balance Weights, Analytical**, with gram pieces nickel plated and fractionals of German silver. A good set for students' analytical work, the sets being accurately adjusted. In mahogany case with forceps. Sets, 1 milligram to grams..... 50 100
Per set..... 5.00 6.50
21632. **Balance Weights, Standard**, for sugar analysis.
Size, grams..... 13.024 26.048 52.096
Each..... .80 .90 1.00
21636. **Balance Weights, Standard**, for sugar analysis, set of three same as No. 21632, in mahogany box with lid..... 4.00
21640. **Balance Weights, Assay Ton**. Accurately adjusted to the standard of 29.166 grams to the ton. Set from 4 A. T. to $\frac{1}{10}$ A. T..... 6.00

WEIGHTS OF MEDIUM ACCURACY

21644. **Balance Weights**, of medium accuracy. Gram pieces are nickel plated, fractionals of aluminum, in polished box, with forceps. A very reliable set for ordinary laboratory routine.
Sets, 1 milligram to grams..... 20 50 100 200 500 1000
Per set..... 2.50 3.25 3.75 5.00 6.75 9.50
21648. **Balance Weights**, of medium accuracy, of lacquered brass. A very useful set for laboratory work. Fractionals are of German silver. In polished case with lid and forceps.
Sets, 100 milligrams to grams..... 20 50 100 200 500 1000
Per set..... 1.25 1.50 2.00 3.00 4.25 6.50
21652. **Balance Weights**, of medium accuracy, Troemner make. In cherry block, weights all solid brass with small pieces of nickel. A very reliable and popular set.
Sets, 1 centigram to grams..... 20 50 100 200 500 1000
Per set..... 1.10 1.25 1.75 2.50 4.00 6.50
21656. **Balance Weights**, of medium accuracy, in polished block, without lid, and without fractionals or forceps.
Sets, 1 gram to grams..... 50 100 200 500 1000
Per set..... .90 1.25 1.80 3.50 5.00



No. 21660



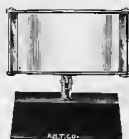
No. 21668



No. 21676



No. 21680



No. 21708



No. 21664



No. 21684



No. 21696

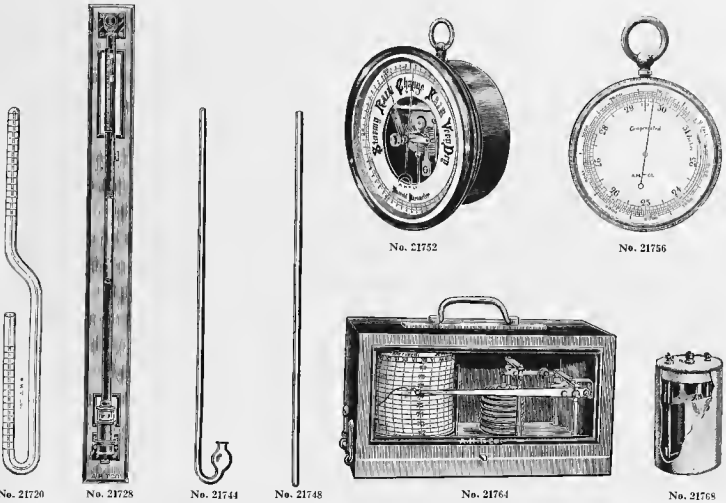


No. 21704



No. 21712

21660. **Balance Weights**, of brass in walnut box. These weights are roughly finished and are of ordinary accuracy but are very suitable for students' work.
 Sets, 10 milligrams to grams..... 50 100 200 500 1000
 Per set..... .90 1.25 1.80 3.00 4.75
21664. **Balance Weights**, single fractional sizes only of aluminum. Same quality as weights in sets No. 21644.
 Size, milligrams..... 1 2 5 10 20 50 100 200 500
 Each..... .10 .10 .10 .15 .18 .18 .18 .18 .18
21668. **Balance Weights**, of aluminum, fractionals only. Same quality as No. 21644 but in set of from 1 milligram to .5 gram. In mahogany box, with forceps..... 1.50
21672. **Balance Weights**, single fractional sizes only, of aluminum, same quality as No. 21648.
 Size, milligrams..... 1 2 5 10 20 50 100 200 500
 Each..... .05 .05 .05 .05 .05 .05 .05 .05 .05
21676. **Balance Weights**, of iron, for coarse weighing.
 Sets, 10 grams to kilos..... 1 2 5 10
 Per set..... 1.25 2.00 3.50 5.00
21680. **Balance Weights, Avoirdupois**, of sealed iron, for coarse weighing.
 Sets, 1/2 oz. to lbs..... 1 2 4 7
 Per set..... .50 .85 1.25 2.25
21684. **Balance Weights, Avoirdupois**, Troemner make, of nickel silver. Set from 1/4 oz. to 1 1/2 oz..... 1.00
21688. " " " " " " concave, of aluminum. Set from 1/2 grain to 10 grains..... 40
21692. **Balance Cover**, of rubber sheeting, to order to fit balances as per size which must be given with order. Affording a very convenient and satisfactory protection to the balances in the laboratory..... 3.00
21696. **Balance Riders**, of aluminum, carefully adjusted.
 Size, milligrams..... 1/2 1 2 5 6 10 12
 Each..... .15 .15 .15 .15 .15 .15 .15
21700. **Balance Riders**, same as No. 21696 but of platinum.
 Size, milligrams..... 6 10 12
 Each..... .50 .50 .50
- Note.** In ordering Riders kindly specify make and type of Balance on which they are to be used and they will be sent of proper shape to fit beam without bending.
21704. **Balance Pans**, of glass, with handle.
 Diameter, inches..... 2 1/2 2 1/2 3
 Per pair..... .75 .75 .75
21708. **Balance Reading Glass.** A lens with cylindrical curves instead of spherical permitting the reading of the entire scale of any ordinary analytical balance, with both eyes. On heavy base, with adjustable joint and extra handle so that same may be used as a hand glass when necessary. 4.50
21712. **Balance Rests**, of glass, for use under the levelling screws of balances. Each..... .10



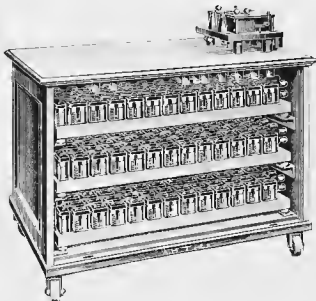
	No. 21720	No. 21728	No. 21744	No. 21748	No. 21752	No. 21756	No. 21764	No. 21768
21716.	Balloons, of collodion for collecting hydrogen and other gases							
	Length, inches.....		6	12	16			
	Each.....		.50	.85	1.10			
21720.	Barometer, Bunsen's, tube only, graduated in millimeters.....							
21724.	" Same as No. 21720 but filled with mercury.....							
21728.	" Observatory, U. S. Weather Bureau pattern. Furnished with scale divided either to $\frac{1}{16}$ inch and vernier reading to $\frac{1}{32}$ inch or graduated in millimeters and reading by vernier to $\frac{1}{16}$ mm. Mounted on polished mahogany board with white glass background to facilitate accurate reading. With thermometer.....							
21732.	Barometer, same as No. 21728 but without mahogany board.....							
21736.	" " " " with both millimeter and inch scales. On mahogany board.....							
21740.	" " " " " " " " " " " " Without mahogany board.....							
21744.	Barometer Tube, bent, with bulb, closed at one end.....							
21748.	" " straight, closed at one end.....							
21752.	Barometer, Aneroid, with open porcelain dial showing internal arrangement, 5 inches in diameter in brass case.....							
21756.	Barometer, Aneroid, watch form for the pocket, 2½ inches in diameter, in gilded metal mounting and morocco carrying case. Compensated for temperature and with revolving altitude scale reading to 8000 ft.....							
21760.	Barometer, same as No. 21756 but with revolving altitude scale reading to 16,000 ft.....							
21764.	Barometer, Richard, Recording. Divisions of chart equal 1 mm of mercury. Each chart equals seven days of time. In metal and glass case, 18 x 12 x 11 cm. Each chart equals seven days of time. In metal and glass case, 18 x 12 x 11 cm.....							
	Duty Free.....	22.00	Stock.....					
	Charts, for use with above.....							
	Duty Free, per 100.....	2.50	Stock.....					
21768.	Battery, Edison Primary. These batteries, formerly known as Edison-Laland, are unequalled for closed circuit work. They have a mean working E. M. F. of .667 volts per cell. When working continuously it is not advisable to take over 1½ amperes from the "BB" type, 2½ amperes from the "Q" type and 6 amperes from the "S" type.							
	Type.....	"BB"	"Q"	"S"				
	Size, inches.....	4½ x 7½	5½ x 8½	5½ x 13				
	Capacity, ampere hours.....	100	150	300				
	Complete in porcelain jar.....	1.50	2.20	3.00				
	Complete renewal.....	.72	.82	1.46				
	The following is the itemized cost of the parts necessary for one charge in renewing the batteries.							
	Copper Oxide Plates.....	.24	.31	.62				
	Zinc Plates.....	.28	.28	.50				
	Caustic Soda.....	.15	.17	.28				
	Paraffine Oil.....	.05	.06	.06				



No. 21772



No. 21776

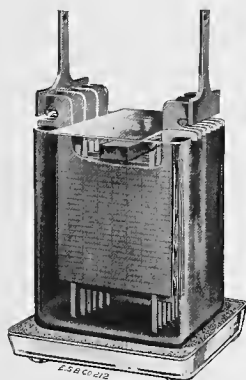


No. 21780

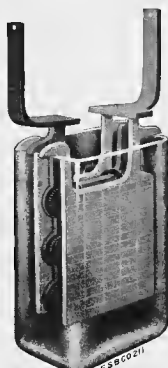


No. 21781, Type E5.

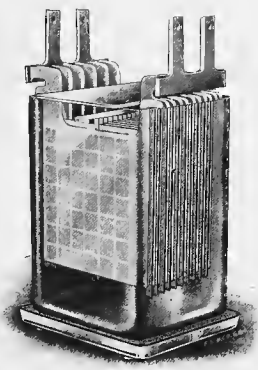
21772.	Battery, Grenet, original French make															
	Capacity, liters.....									2.00	2.75	4.00				
	Complete.....									.50	.80	.90				
	Carbon, for renewal.....									.20	.25	.30				
	Zinc.....															
21776.	Battery, Dry, an open circuit battery of high efficiency, 7 x 2 1/2 inches.														.25	
21780.	Battery, Storage, Model of the Physikalisch-Technische Reichsanstalt, Type U. These cells are 52 x 30 x 80 mm high, with sealed in porcelain lid and arrangement to permit the outlet of gases through fine glass wool. The cells have an E. M. F. of 2 volts each and have a capacity of .8 ampere hours at the normal discharge rate of 1/10 ampere, or 2 ampere hours at a discharge rate of 1/20 ampere. They are widely used for physical measurements, the testing of ammeters, voltmeters and other electrical measuring instruments, and have been found useful in many kinds of laboratory work where a great variation in E. M. F. is required. The cells are furnished singly for mounting in the laboratory or mounted up on base boards with connections, in batteries of from 10 to 100 cells; in portable cases, with switch board and lid, in batteries of 20 to 100 cells; and in portable cabinets in batteries of from 120 to 400 cells. Prices on application.															
21784.	Battery, "Chloride Accumulator," Portable Type. Portable batteries are shipped filled with electrolyte and charged ready for service. While the greatest care is used in packing, it is almost impossible to avoid damage to cells of this type shipped by freight. For short distances it is, therefore, recommended that shipment of the portable type be made by express. Where distance is great it is recommended that electrolyte be forwarded separately as in the case of regular batteries. Each cell when discharging gives approximately 2 volts and, as the cells in each case are connected in series, the number of cells multiplied by 2 will give the approximate voltage between the two outside connectors of each case. The normal charge rate is the highest rate in amperes at which the battery should be charged. At this rate a battery will be fully charged in nine hours and discharged in eight hours.															
	Number of cells in case....	1	2	3	4	5	1	2	3	4	5	1				
	Type and No. of plates.....	C3	C3	C3	C3	C3	D3	D3	D3	D3	D3	D5				
	Normal charge rate, amp.....	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	5				
	Weight, pounds.....	8	14	20	26	32	15	26	37	48	59	24				
	Price, complete charged.....	5.00	9.00	12.50	16.00	19.00	6.50	12.00	16.50	21.00	25.00	10.00				
	Number of cells in case.....	2	3	4	5	1	2	3	4	5	1					
	Type and No. of plates.....	D5	D5	D5	D5	D7	D7	D7	D7	D7	D7	E5				
	Normal charge rate, amp.....	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	10				
	Weight, pounds.....	43	62	81	100	33	58	83	108	133	163	33 1/2				
	Price, complete charged.....	18.00	26.00	32.00	38.00	12.00	22.00	30.00	40.00	50.00	14.50					
	Number of cells in case.....	2	3	4	5	1	2	3	4	1						
	Type and No. of plates.....	E5	E5	E5	E5	E7	E7	E7	E7	E9	E11					
	Normal charge rate, amp.....	10	10	10	10	15	15	15	15	20	25					
	Weight, pounds.....	60	86 1/2	113 1/2	140	42 1/2	82 1/2	122 1/2	163	44 1/2	53 1/2					
	Price, complete charged.....	28.00	40.00	50.00	60.00	18.00	35.00	50.00	60.00	21.00	25.00					



No. 2178b. Type D7



No. 2178c. Type C3



No. 2178f. Type F11

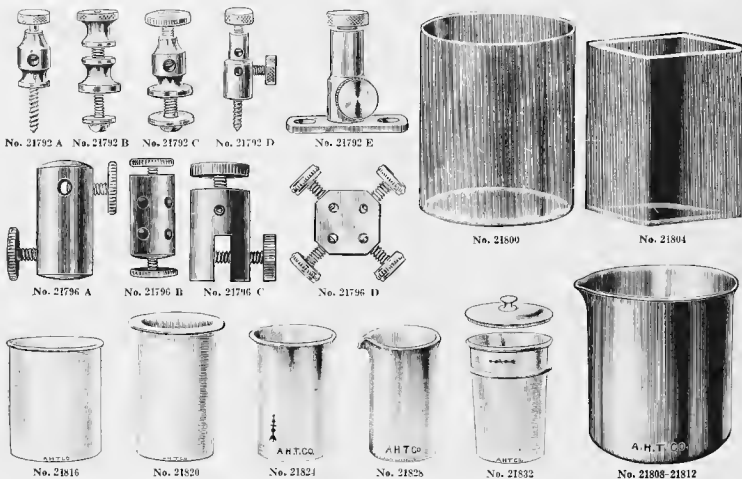
21788. Battery, "Chloride Accumulator," (the most widely used form of storage battery. The voltage of cells of all capacities is slightly over 2 volts on open circuit and, during discharge at the 8 hour rate, varies from that point at the beginning to 1.75 volts at the end. Electrolyte is shipped in carboys, for each of which a charge of \$2.00 net is made and an extra charge of 5c for caps when required. Credit will be allowed in full for these carboys when returned in good condition and charges prepaid. The following net charges are made for casing and packing.

"B," "LT" and "BT" elements, each.....	.02
"C" and "CT" elements, each.....	.04
"D," "PT" and "ET" elements, each.....	.10
"E" elements, each.....	.15
"F" elements, each.....	.25
Rubber Jars, each.....	.05
No charge for packing Glass Jars.	

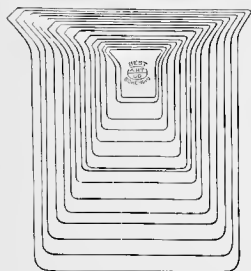
Type.....	LT	BT	CT	PT	ET	B	C		D		
Size of plate, inches.....	3 1/2 x 1	4 x 3	5 x 5	8 1/2 x 5	7 1/2 x 7 1/2	3 x 3	4 1/2 x 4	4 1/2 x 4	4 1/2 x 4	6 x 6	6 x 6
Number of plates.....	2	2	2	2	2	3	3	5	7	3	5
Discharge in { 8 hours.....	1	1 1/2	3	4 1/2	5 1/2	8	1 1/2	2 1/2	3 1/2	2 1/2	5
	3 ".....	1	2	4 1/2	6 1/2	8	1 1/2	3 1/2	5 1/2	3 1/2	7
	5 ".....	1 1/2	3	6	9	1 1/2	2 1/2	5	7 1/2	5	10
Normal charge rate.....	1 1/2	3	4 1/2			1 1/2	2 1/2	3 1/2	2 1/2	5	
Price, element only.....	.60	.90	1.75	2.60	3.50	1.50	2.25	3.50	5.00	3.25	5.00
Price, glass jar only.....	.20	.25	.50	.75	.95	.17	.30	.35	.45	.85	1.00
Price, rubber cover only.....		.12	.14	.14	.30						
Price, rubber jar and cover.....		.65	1.10	1.75	2.05	.65	.95	1.15	1.40	1.45	1.70

Type.....	D					E					
Size of plates, inches.....	6 x 6	6 x 6	6 x 6	6 x 6	7 1/2 x 7 1/2	7 1/2 x 7 1/2	7 1/2 x 7 1/2	7 1/2 x 7 1/2	7 1/2 x 7 1/2	7 1/2 x 7 1/2	7 1/2 x 7 1/2
Number of Plates.....	7	9	11	13	5	7	9	11	13	15	
Discharge in { 8 hours.....	7 1/2	10	12 1/2	15	10	15	20	25	30	35	
	10 1/2	14	17 1/2	21	14	21	28	35	42	49	
	15	20	25	30	20	30	40	50	60	70	
Normal charge rate.....	7 1/2	10	12 1/2	15	10	15	20	25	30	35	
Price of element only.....	6.75	8.50	10.25	12.00	8.25	11.75	15.25	18.75	22.25	25.75	
Price of glass jar, only.....	1.35	1.70	1.70	2.55	1.50	1.70	1.85	2.05	2.90	3.40	

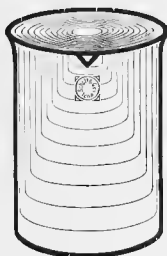
Type.....	F										
Size of plates, inches.....	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2	11 x 10 1/2
Number of plates.....	9	11	13	15	17	19	21	23	25	27	
Discharge in { 8 hours.....	40	50	60	70	80	90	100	110	120	130	
	56	70	84	98	112	126	140	154	168	182	
	80	100	120	140	160	180	200	220	240	260	
Normal charge rate.....	160	200	240	280	320	360	400	440	480	520	
Price of element only.....	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00	97.50	
Price of glass jar A only.....	4.40	5.05	5.05	6.25							



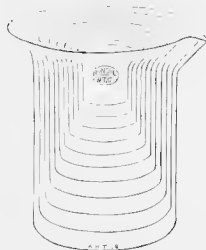
21792.	Battery Binding Posts, of brass. Style.....	A	B	C	D	E
	Each.....	.10	.07	.10	.20	.25
21796.	Battery Connectors. Style.....		A	B	C	D
	Each.....		.35	.25	.25	.20
21800.	Battery Jars, cylindrical, white glass, hand made.					
	Diameter, inches.....	4	4½	4	5	6
	Height, inches.....	4	4½	5	7	8
	Number in original package.....	60	48	48	30	24
	Each.....	.20	.25	.25	.50	.65
	Per dozen, in original package.....	1.45	1.65	1.80	2.75	3.30
21804.	Battery Jars, square form, with ground top. These are packed six dozen in a case.					
	Length, inches.....	3½	4	4	4	4
	Width, inches.....	3½	4	4	4½	4
	Height, inches.....	5	8	6	4	4
	Each.....	.20	.30	.25	.20	.20
	Per dozen, in original package.....	1.05	1.50	1.40	1.05	1.05
21808.	Beakers, Aluminum, with spout. Capacity, cc.....	60	120	250	500	1000
	Each.....	.30	.50	.70	1.00	1.10
21812.	Beakers, Copper, with spout. Capacity, cc.....	125	250	500	1000	2000
	Each.....	.55	.75	.90	1.20	3.00
21816.	Beakers, Enamel Ware, of seamless steel, white enamelled, both acid and fire proof. Very convenient for many purposes in the laboratory and especially for culture tubes during incubation.					
	Capacity, cc.....	300	450	650	900	900
	Height, mm.....	90	100	110	120	120
	Diameter, mm.....	75	85	95	100	100
	Each.....	.30	.35	.45	.55	.55
21820.	Beaker, Enamel Ware, of seamless steel, white enamelled, both acid and fire proof, with flat, well extended lip; 140 mm high by 70 mm inside diameter. Made especially for and widely used in the dyeing industry. Capacity 500 cc.....					.50
21824.	Beakers, Royal Berlin Porcelain, glazed inside and outside, without spout. Widely used in the testing of dye-stuffs, etc.					.50
	Capacity, cc.....	340	580	800	970	1500
	Each.....	.90	1.08	1.35	1.50	2.10
21828.	Beakers, "Sanitars" Porcelain, glazed inside and outside, with spout.					
	Capacity, cc.....			325	500	1000
	Each.....			.50	.75	1.25
21832.	Beaker, Royal Berlin Porcelain (Dye Pot), glazed on the inside entirely and on the outside down to the heavy ring for supporting same in water bath. Below the ring the beaker is unglazed; without lid; 165 mm high, 132 mm diameter at top, capacity 1460 cc.....					2.70
21836.	Lid, Royal Berlin Porcelain, for above beaker.....					.50



No. 21840



No. 21844



No. 21852

NOTE—Our "Best Bohemian" beakers Nos. 21840, 21844, 21860, 21864 and 21868 are offered as being the highest product of the Bohemian factories. They are selected after the most exhaustive chemical and physical tests made in Philadelphia under our own direction and are distinctly superior in shape, finish and resistance properties to German made beakers, with the exception of the products of Schott & Gen at Jena. We do not list or stock German beakers but can supply them on duty free orders at somewhat less price than our "Best Bohemian."

21840. Beakers, Best Bohemian Glass, Griffin's low form, with spout. This is our standard beaker and widely used in both educational and industrial laboratories. They are selected with special care as to shape and quality and are recommended as a most satisfactory beaker for routine work.

Number.....	000	00	0	1	2	3	4
Capacity, cc.....	20	40	100	150	250	350	500
Each.....	.07	.08	.10	.12	.15	.20	.25
Number.....	5	6	7	8	9	10	11
Capacity, cc.....	670	950	1250	1750	2400	3000	3750
Each.....	.35	.45	.55	.70	.80	.95	1.10

21844. Beakers, Best Bohemian Glass, Griffin's low form, without spout. Otherwise same as above.

Number.....	000	00	0	1	2	3	4
Capacity, cc.....	20	40	100	150	250	350	500
Each.....	.07	.08	.10	.12	.15	.20	.25
Number.....	5	6	7	8	9	10	11
Capacity, cc.....	670	950	1250	1750	2400	3000	3750
Each.....	.35	.45	.55	.70	.80	.95	1.10

21848. Beakers, New Jena Glass, Griffin's low form, with spout. The standard beaker for analytical work throughout the civilized world.

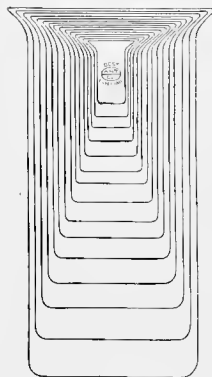
Capacity, cc.....	50	100	150	250	400	600
Each.....	.12	.13	.15	.17	.24	.29
Capacity, cc.....	800	1000	1300	1500	2000	3000
Each.....	.34	.39	.47	.53	.60	.78

21852. Beakers, Whitall Tatum Nonsol Glass, Griffin's low form, with spout. Extremely resistant to temperature change. Very insoluble in water, acids and alkalis and especially recommended for their uniformity of shape. By special arrangement we offer these Beakers for immediate shipment from our own stock at manufacturer's original net prices.

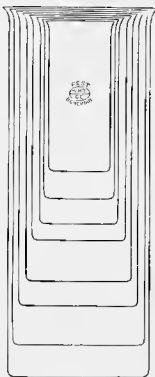
Capacity, cc.....	30	60	90	120	150	180
Each.....	.12	.12	.13	.14	.15	.15
Capacity, cc.....	250	300	350	500	600	700
Each.....	.17	.18	.20	.25	.28	.30

21856. Beakers, Whitall Tatum Regular Glass, Griffin's low form with spout; widely used in industrial laboratories because of their uniform shape and high quality of the glass. Exactly similar in shape to No. 21852. By special arrangement we offer these Beakers for immediate shipment from our stock at manufacturers original net factory prices.

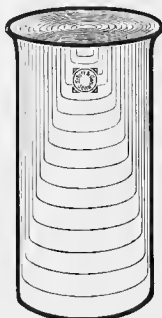
Capacity, cc.....	30	60	90	120	150	180	250	300
Each.....	.09	.09	.10	.11	.11	.12	.12	.14
Capacity, cc.....	350	500	600	700	1000	1400	2000	
Each.....	.16	.19	.20	.23	.35	.43	.55	



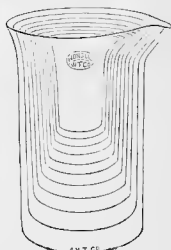
No. 21860



No. 21868

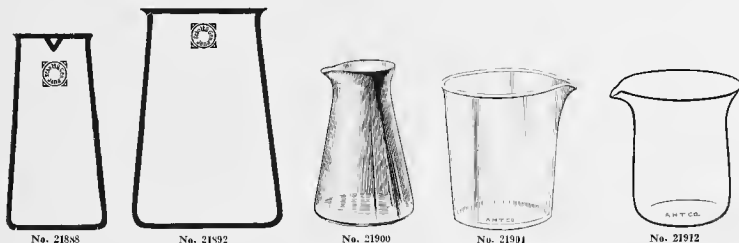


No. 21872

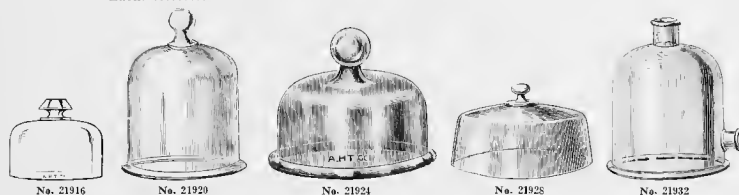


No. 21880

21860.	Beakers, Best Bohemian Glass, usual or Berzelius form, without spout	Same quality as No. 21840.									
	Number.....	000	00	0	1	2	3	4			
	Capacity, cc.....	15	30	45	75	110	170	250			
	Each.....	.06	.07	.08	.10	.12	.15	.18			
	Number.....	5	6	7	8	9	10	11	12		
	Capacity, cc.....	380	580	800	1150	1750	2250	2800	3700		
	Each.....	.22	.28	.35	.40	.55	.65	.75	.90		
21864.	Beakers, Best Bohemian Glass, usual or Berzelius form, with spout.	Same quality as No. 21840.									
	Number.....	000	00	0	1	2	3	4			
	Capacity, cc.....	15	30	45	75	110	170	250			
	Each.....	.06	.07	.08	.10	.12	.15	.18			
	Number.....	5	6	7	8	9	10	11	12		
	Capacity, cc.....	380	580	800	1150	1750	2250	2800	3700		
	Each.....	.22	.28	.35	.40	.55	.65	.75	.90		
21868.	Beakers, Best Bohemian Glass, extra tall form, without spout.	Convenient for lecture table.									
	Capacity, cc.....	150	250	350	500	750	1200	1800	2400		
	Each.....	.15	.20	.25	.30	.35	.45	.50	.60		
21872.	Beakers, New Jena Glass, usual or Berzelius form, without spout.										
	Capacity, cc.....	50	100	150	200	300	400	500	600		
	Each.....	.12	.13	.15	.17	.21	.24	.26	.29		
	Capacity, cc.....	800	1000	1300	1500	2000	2500	3000	4000		
	Each.....	.32	.37	.42	.45	.53	.63	.73	.85		
21876.	Beakers, New Jena Glass, usual or Berzelius form, with spout.										
	Capacity, cc.....	50	100	150	200	300	400	500	600		
	Each.....	.12	.13	.15	.17	.21	.24	.26	.29		
	Capacity, cc.....	800	1000	1300	1500	2000	2500	3000	4000		
	Each.....	.32	.37	.42	.45	.53	.63	.73	.85		
21880.	Beakers, Whittall Tatum Nonsol Glass, usual form, with spout. Extremely resistant to temperature change. Very insoluble in water, acids and alkalis and especially recommended for their uniformity of shape. By special arrangement we offer these Beakers for immediate shipment from our own stock at manufacturer's original net prices.										
	Capacity, cc.....	60	90	120	180	250	300	350	500	700	1000
	Each.....	.12	.13	.14	.15	.17	.18	.20	.25	.30	.45
21884.	Beakers, Whittall Tatum Regular Glass, tall form, with spout. Extremely resistant to temperature changes. Very insoluble in water, acids and alkalis and especially recommended for their uniformity of shape. By special arrangement we offer these beakers for immediate shipment from our own stock at manufacturer's original net prices.										
	Capacity, cc.....	30	60	90	120	180	250	300	350	500	700
	Each.....	.09	.09	.10	.11	.12	.13	.14	.15	.16	.17
	Capacity, cc.....	300	350	500	700	1000	1200				
	Each.....	.14	.16	.19	.23	.35	.38				



21888.	Beakers, New Jena Glass, slender conical form, with spout.							
	Capacity, cc.....	50	100	150	250	500	750	1000
	Each.....	.12	.13	.15	.17	.26	.34	.38
21892.	Beakers, New Jena Glass, wide conical form, without spout.							
	Capacity, cc.....	50	100	150	250	500	750	1000
	Each.....	.12	.13	.15	.17	.26	.34	.38
21896.	Beakers, Phillips, conical shape, without spout.							
	Capacity, cc.....	100	250	500	750	1000		
	Each.....	.10	.15	.25	.30	.40		
21900.	Beakers, Phillips, conical shape, with spout.							
	Capacity, cc.....	100	250	500	750	1000		
	Each.....	.18	.22	.30	.35	.45		
21904.	Beakers, tumbler form, of heavy molded glass. Not intended to stand heat; capacity 7 oz.....							.10
21908.	Beakers, Heavy Glass, low wide form with spout, convenient for many purposes for which the ordinary thin boiling beaker is not suitable.							
	Capacity, cc.....	100	250	400	750	1000	2000	
	Each.....	.20	.24	.35	.50	.60	.85	
21912.	Beaker, Heavy Glass, with wide flaring lip and spout, as used in sugar analysis.							
	Capacity, cc.....					175	900	
	Each.....					.20	.40	



21916.	Bell Glass, of light blown glass, without flange. Very convenient for covering small objects.								
	Diameter, inches.....					3			4
	Height, inches.....					1½			2
	Each.....					.35			.50
21920.	Bell Glass, of heavy glass, with extra wide flange carefully ground for use as air pump receivers.								
	Height, mm.....	80	105	130	180	200	230		260
	Diameter, mm.....	80	105	130	155	175	220		260
	Each.....	.60	.75	1.10	1.60	2.00	2.50		3.00
21924.	Bell Glass, low form, with ground flange.								
	Height, inches.....	1½	2½	3½	4	4½	5	6	8
	Diameter, inches.....	3	4	5	6	7	8	9	10
	Each.....	.50	.60	.75	1.00	1.25	1.50	1.75	2.00
									3.50
21928.	Bell Glass, low form, without flange. A very convenient shape for covering specimens, etc.								
	Height, mm.....				100	120	150		180
	Diameter, mm.....				200	240	300		400
	Each.....				.60	1.50	2.25		4.00
21932.	Bell Glass, with open top, with tubulature near bottom and with wide, well ground flange. Suitable for use as an air pump plate.								
	Height, mm.....						300		300
	Diameter, mm.....						150		200
	Each.....						3.00		4.00



No. 21936



No. 21940



No. 21944

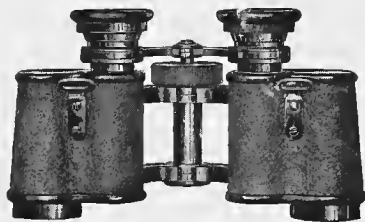


No. 21948



No. 21952

21936.	Bell Glass, high form, with ground flange																			
	Height, inches	8	9	11	14	15	15	15	17	18	18	18	18	18	18	18	18	18	18	18
	Diameter, inches	4	5	6	6½	7	8	8½	8½	9	9	9	9	9	9	9	9	9	9	9
	Each	.60	.80	1.00	1.00	1.25	1.50	1.75	1.75	2.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
21940.	Bell Glass, high form, with more or less square top; suitable for covering microscopes, etc.; flange not ground.																			
	Height, inches						13		15		17		20							
	Diameter, inches						8		9		10		11							
	Each						2.40		3.50		6.00		8.50							
21944.	Bell Glass, with open top, with ground flange and without stopper.																			
	Height, inches	6	8	9	11	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Diameter, inches	3	4	5	6½	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Each	.70	.90	1.00	1.20	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
21948.	Bell Glass, with open top, same as No. 21944 but with ground in glass stopper.																			
	Height, inches	6	8	9	11	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Diameter, inches	3	4	5	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Each	.75	1.10	1.20	1.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
21952.	Bell Glass, double walled, with ground-in glass stopper. The jar may be filled with colored fluid acting as a ray filter for determining the effect of various rays on plant functions, etc.																			
	Height, mm										300		400							
	Diameter, mm										120		150							
	Each										6.00		7.00							

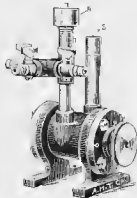


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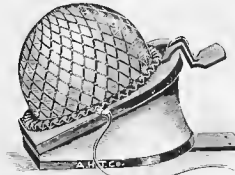


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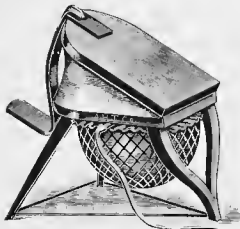
21956.	Binoculars, Bausch & Lomb-Zeiss Stereo, for nature study, ornithology, etc. The 6 X, 20 mm objective glass is recommended as a general purpose glass and for tourists' and sportsmen's use the 8 X, 21 mm glass, is recommended. Price includes heavy leather carrying case.																			
	Power	6 X	6 X	8 X	8 X	12 X	10 X													
	Diameter of objectives, mm.	21	30	21	25	30	45													
	Each	40.00	60.00	40.00	50.00	70.00	75.00													



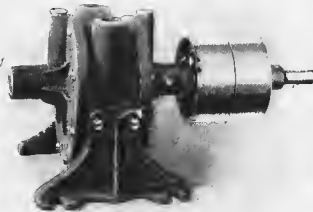
No. 21961



No. 21965



No. 21972



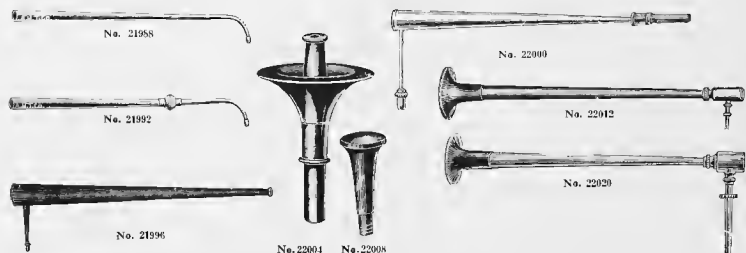
No. 21984 Blower



No. 21984 Air Receiver

21960. Bladders, Animal, dried assorted sizes. Per dozen. 1.00
21964. Blower, High Pressure, a new patent precision blower absolutely noiseless in operation and highly recommended for laboratory use. Very superior in steadiness of pressure and power required to the ordinary blower operating on the ventilating fan principle. Size A gives 4½ kilos, requires ½ h. p. motor and should be driven at 1400 r. p. m. Size B requires 1 h. p. and gives 8 kilos and should be driven at 700 r. p. m. Size A will operate simultaneously three laboratory blast lamps and Size B will operate six.
- | | | |
|--------------------|-------|-------|
| Duty Free. | A | B |
| Duty Paid. | 18.00 | 30.00 |
| | 21.60 | 36.00 |
21968. Blowers, Foot Power. These blowers produce a powerful and continuous blast, the pressure of which may be increased by adding one or more rubber discs to the air reservoir.
- | | | | |
|--|------|------|-------|
| Diameter of air reservoir, inches. | 7½ | 9 | 11 |
| Each. | 5.00 | 7.00 | 11.50 |
21972. Blowers, Foot Power, same as No. 21968 but mounted on legs.
- | | | | |
|--|------|------|-------|
| Diameter of air reservoir, inches. | 7½ | 9 | 11 |
| Each. | 6.00 | 8.00 | 12.50 |
21976. Rubber Discs for above Foot Blowers. These discs are cut from steam cured sheet rubber which is made of the best Up-River Para and contains no other ingredients than the necessary sulphur for curing. Will last much longer than discs cut from ordinary rubber sheeting.
- | | | | |
|---------------------------|-----|-----|------|
| Diameter, inches. | 7½ | 9 | 11 |
| Each. | .60 | .90 | 1.25 |
21980. Nets for above Foot Blowers. Each.35
21984. Blower, Crowell's Positive Pressure. Will give blast of from 1 to 10 lbs. pressure to the square inch or may be used as a vacuum pump for exhausting of vacuum not exceeding 24 inches of mercury. This apparatus is most satisfactory in securing suction for laboratory filtrations, etc. There are no springs, gears, valves or unbalanced parts and the pump does not have to be reversed when changing from blast to suction. In ordering please state whether or not air reservoir is desired.

Size Number	Outside Inches per Revolution	Cubic Feet per Minute at Maximum Speed	Revolutions per Minute at Maximum Speed	Approximate Horse Power at 100 lbs. Pressure	Pulleys Inches	Net Weight Pounds	Disc Size of Outlet	Floor Space Inches	Price of Blower only	Price of Air Receiver and Valve
1-A	20	6.9	600	1/4	4 x 1	24	10 in.	10 x 6½	\$20.00	8.00
2-A	45	13.	500	1/2	4 x 1½	34	12 in.	12½ x 6½	26.00	8.00
3-A	125	25.3	350	1	6 x 2	90	14 in.	22 x 14	40.00	10.00
4-A	280	40.5	250	1½	9 x 3	170	18 in.	28 x 17	50.00	10.00
5-A	460	53.2	200	2	10 x 3	225	22 in.	34 x 20	75.00	18.00
6-A	690	79.8	200	3	12 x 4	320	28 in.	38 x 20	100.00	18.00



21988.	Blowpipe, of brass.				
	Length, mm	200	225	250	300
	Each . . . . .	.08	.09	.10	.12
21992.	Blowpipe, of brass, with bulb.				
	Length, mm	200	225	250	300
	Each . . . . .	.17	.18	.20	.22
21996.	Blowpipe, Black, of japanned tin, with removable brass tip . . . . .				.15
22000.	" " of brass, with screwed on tip, and wooden mouth-piece . . . . .				.50
22004.	Mouth-piece for Blowpipes, of hard rubber, new form . . . . .				.40
22008.	" " wood . . . . .				.10
22012.	Blowpipe, Plattner, with hard rubber mouth-piece but without platinum tip				1.50
22016.	Platinum Tips, detachable, to fit Plattner Blowpipe No. 22012 at prices depending upon the platinum market				
22020.	Blowpipe, Berzelius form, of brass, extra fine finish, with hard rubber mouth-piece and platinum plate placed on end of jet. A very satisfactory form				2.00
22022.	Blowpipe, Charcoal, American, willow, of fine uniform grain, 4 x 1 x 1/2 inches. Per dozen . . . . .				.50
22023.	" " of coarser grain than above, 4 1/2 x 1 1/2 x 1/2 inches. Per dozen . . . . .				.25



No. 22024

22024. Blowpipe Set of Apparatus and Reagents, as designed by Prof. Butler of the Colorado School of Mines for use in the laboratory and in the field. Each piece is so arranged as to prevent any breakage; outside dimensions 11 1/4 x 6 1/2 x 2 1/4 inches. Complete including wet and dry fluxes and alcohol and oil in lamps. 17.50

The outfit consists of the following:—

- | | | | |
|-----------------------------|-------------------|-------------------|-------------------------|
| Blowpipe | Amal | Cobalt Nitrate | Bismuth Flux |
| Platinum Wires and Holder | 3 Arsenic Tubes | Hydrochloric Acid | Borax |
| Combination Charcoal Borer. | 2 sticks Charcoal | Sulphuric Acid | Potassium Bisulphate |
| Magnet and Chisel | 6 open Tubes | Nitric Acid | Oil, Lamp, brass |
| Streak Plate | Large Test Tube | Tin | Alcohol Lamp, brass |
| Blue Litmus | Small " " | Microcosmic Salt | Hammer |
| Red Litmus | Ammonium Hydrate | Sodium Carbonate | Platinum Tipped Forceps |

22028. Pocket Handbook of Blowpipe Analysis, by G. Montague Butler, E. M.75



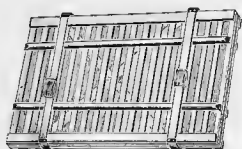
No. 22032



No. 22036



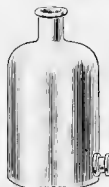
No. 22040



No. 22072



No. 22072



No. 22080



No. 22084

22032.	Boiler, or saucepan, of best imported enamel ware, white on inside and blue on outside. These goods are made of seamless steel and the enamel is both acid and fire proof and distinctly superior to the ware usually sold for household purposes. Very convenient for use in the preparation of culture media, etc. With cover.									
	Size, inches.....	6½ x 4	8 x 5½							
	Capacity, quarts.....	2	4½							
	Each.....	.90	1.30							
22036.	Boiler, or saucepan, same quality as No. 22032. Without cover.									
	Size, inches.....	5 x 3	6½ x 3½	8½ x 5						
	Capacity, quarts.....	1	2	4						
	Each.....	.35	.50	.95						
22040.	Boiler, or saucepan, double, same quality as No. 22032. Capacities given are for inside boilers.									
	Capacity, quarts.....	1	2	4						
	Each.....	1.50	2.25	3.25						
22044.	Bolting Cloth, as used in making sieves, of standard mesh, 40 inches in width.									
	Mesh per lineal ¼ inch.....	24	27	31	37½	44	50			
	Per yard.....	2.60	2.80	3.40	4.15	8.50	10.00			
22048.	Botanical Adhesive Tape, on spool, for fastening specimens to mounting paper, ½ inch wide, 36 inches long. Per spool.....							10		
22052.	Botanical Drying Paper, superior quality, as used in the U. S. Department of Agriculture and in other prominent herbaria. This paper, being made of pure cotton stock similar to blotting paper, absorbs the moisture much more readily than the driers usually supplied which contain a certain percentage of wood. 13½ x 18½ inches. Per 100 sheets.....							2.00		
22056.	Botanical, Drying Paper, extra heavy. Per 100 sheets.....							1.50		
22060.	“ Genus Covers, extra quality and weight, 17 x 24½ inches, with surface specially prepared for writing upon. Per 100.....							2.50		
22064.	Botanical Mounting Paper. This paper, as well as the Driers and Genus Covers, is made specially for us in very large quantities and we have used in it the purest, strongest stock producing a mount which has that desirable stiffness so seldom found in mounting papers. The color is very white and does not change with age as papers made of impure stock are sure to do. Size 11½ x 17 inches.									
	Per 100 sheets.....	1.25						5.50		
22068.	Botanical Pressing Paper, best white, folded and trimmed. Per ream.....							1.50		
22072.	“ Portable Plant Press. This press is light and strong and may be carried into the field with ease. Elastic bands prevent disarrangement of specimens and unused driers when the press is opened. Furnished with six driers.....							2.00		
22076.	Botanical Vasculum or Collecting Case, of metal, enameled with door opening along entire length. Size 16 x 8 x 5½ inches. With shoulder strap.....							2.00		
22080.	Bottles, Aspirator of heavy white glass, with outlet near bottom.									
	Capacity, liters.....	¼	½	1	2	4	6	8	12	20
	Each.....	.40	.50	.70	1.00	1.60	2.00	3.00	4.50	10.00
22084.	Bottles, Aspirator, of heavy white glass, with outlet tube near bottom formed into nipple for attaching rubber tubing.									
	Capacity, liters.....	¼	½	1	2	4	6	8	12	
	Each.....	.35	.40	.50	.75	1.00	1.75	2.25	3.25	4.75



No. 22085



No. 22092



No. 22096

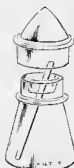
22088.	Bottles, Aspirator, same as No. 22084 but graduated.						
	Capacity, liters.....	1	2	4			
	Each.....	.90	1.20	2.10			
22092.	Bottles, Aspirator, with ground glass stopper and glass stopcock ground into outlet.						
	Capacity, liters.....	1	2	4	8	12	
	Each.....	1.60	1.80	2.00	2.50	4.00	6.00
22096.	Bottles, Aspirator, of heavy white glass, with ground in glass stopper and glass stopcock ground in at tubulation and held in place by a metal screw cap.						
	Capacity, gallons.....	1	2	3	5		
	Each.....	7.60	9.15	10.50	13.35		



No. 22100



No. 22104



No. 22108



No. 22112



No. 22120



No. 22128



No. 22132

22100.	Bottles, Balsam, with glass balsam dropper fitting loosely in the neck of the bottle and with glass cap ground on.	Capacity 45 cc.....	.25		
22104.	Bottle, Balsam, with constricted neck, dropper of wood and ground on cap, 30 cc capacity.....		.50		
22108.	Bottle, Balsam, conical form, with turned in lip for removing excess balsam from rod and conical cap to keep rod in vertical position, capacity 50 cc.....		.40		
22112.	Bottle, Dropping, with ground in pipette stopper with rubber cap to control delivery from pipette.	Capacity, oz.....	.25	1	
	Each.....		.25	.25	
22116	Extra Rubber Caps for No. 22112 Dropping Bottles, per dozen.....		.50		
22120.	Bottle, Dropping, with Barnes' pipette stopper. A very convenient and inexpensive bottle. Capacity 30 cc.....		.10		
22124.	Extra Rubber Bulb and pipette only for No. 22120 Bottles.....		.05		
22128.	Bottle, Dropping, with ground in pipette. Delivery may be controlled by finger or by the use of a rubber bulb.	Capacity, cc.....	15	30	50
	Each.....		.15	.18	.20
22132.	Bottle, Dropping, same as No. 22128 but with rubber bulb.	Capacity, cc.....	15	30	50
	Each.....		.19	.22	.25
22136.	Bottle, Dropping, same as No. 22128 but of amber glass.	Capacity, cc.....		30	50
	Each.....		.25	.30	
22140.	Bottle, Dropping, same as No. 22136 but with rubber bulb.	Capacity, cc.....		30	50
	Each.....		.30	.35	



No. 22114



No. 22148



No. 22156



No. 22160



No. 22168



No. 22170

22144. **Bottle Dropping, TK patent** with stopper arranged to deliver contents drop by drop or to hermetically seal the bottle.
- | | | | | |
|-------------------|-----|-----|-----|-----|
| Capacity, cc..... | 15 | 30 | 50 | 100 |
| Each..... | .15 | .18 | .20 | .30 |
22148. **Bottle Dropping, same as No. 22144** but with flat stopper protecting the lip of the bottle from dust.
- | | | | | | |
|-------------------|-----|-----|-----|-----|-----|
| Capacity, cc..... | 15 | 30 | 50 | 100 | 200 |
| Each..... | .25 | .25 | .30 | .35 | .40 |
22152. **Bottle Dropping, same as No. 22148** but of amber glass.
- | | | | | | |
|-------------------|-----|-----|-----|-----|-----|
| Capacity, cc..... | 15 | 30 | 50 | 100 | 200 |
| Each..... | .28 | .28 | .35 | .40 | .50 |
22156. **Bottle Dropping, with ground in pipette stopper and glass cap ground on.** Very suitable for highly volatile contents.
- | | | | | |
|-------------------|--|--|-----|-----|
| Capacity, cc..... | | | 30 | 60 |
| Each..... | | | .45 | .60 |
22160. **Bottle Dropping, Schuster, with ground glass stopper, capacity 30 cc.**..... .25
22164. " " same as No. 22160 but without glass stopper..... .15
22168. **Bottle, Cobalt or Acid, with solid glass stopper and glass cap ground on.**
- | | | | |
|-------------------|-----|-----|-----|
| Capacity, cc..... | 15 | 25 | 50 |
| Each..... | .30 | .35 | .40 |
22170. **Bottle, Immersion Oil, with loose fitting glass cap, with glass dropping rod fused to same**..... .50



No. 22172



No. 22174



No. 22176



No. 22180



No. 22184



No. 22188

22172. **Bottle, Immersion Oil, New Form, with loose fitting metal cap and dropper.** The immersion oil is used in the inside receptacle only in small quantities at a time so that it is impossible to withdraw a large drop. The outer compartment is to be filled with benzole, xylol, alcohol, etc., for cleaning objectives and slides, having no connection with the inside or oil compartment..... .75
22174. **Bottle, Immersion Oil, Bausch & Lomb, with metallic cap**..... .50
22176. **Bottle, Immersion Oil, Mach, with metallic cap**..... .75
22180. **Bottles, Specimen, wide mouth, of flint glass, for cork stoppers**
- | | | | |
|-----------------------|------|------|------|
| Capacity, ounces..... | 1½ | 2½ | 3½ |
| Per dozen..... | .50 | .55 | .65 |
| Per gross..... | 3.90 | 4.40 | 5.15 |
22184. **Bottles, Specimen, extra wide mouth and very narrow shoulder, of best American flint glass, for cork stoppers.**
- | | | | | |
|-------------------|-----|-----|-----|-----|
| Capacity, oz..... | 1½ | 3 | 4 | 6 |
| Per dozen..... | .60 | .65 | .85 | .85 |
22188. **Bottles, Specimen, with extra wide mouth for cork stoppers.** Of best white German glass. This series of bottles has been designed to meet the need of a more satisfactory bottle for specimens in pathological and histological laboratories etc., and is superior in both shape and finish to the American bottle listed under No. 22184.
- | | | | | | |
|--------------------|------|------|------|------|------|
| Capacity, etc..... | 15 | 30 | 50 | 75 | 100 |
| Per 10..... | .60 | .65 | .75 | .85 | 1.00 |
| Per 100..... | 5.00 | 5.50 | 6.00 | 7.00 | 8.00 |



22200. Bottles, Narrow Mouth, best American flint glass for cork stoppers.	Capacity, ounces.	1	2	3	4	6	8	10	12	16	32	64	
	Number in original case.	864	864	720	576	432	360	288	216	216	144	96	
	Per dozen	.35	.40	.50	.55	.65	.70	.85	.90	1.05	1.55	2.60	
	Per gross in original case	3.25	3.50	3.90	4.75	5.40	6.15	7.00	8.25	9.00	10.15	15.50	25.65
22204. Bottles, Narrow Mouth, best American amber glass, for cork stoppers. Shape same as No. 22200.	Capacity, ounces.	1	2	3	4	6	8	10	12	16	32	64	
	Number in original case.	864	720	576	432	360	288	216	216	144	96	96	
	Per dozen	.35	.40	.50	.55	.65	.70	.85	.90	1.05	1.55	1.55	
	Per gross in original case	3.50	3.90	4.75	5.40	6.15	7.00	8.25	9.00	10.15	15.50	15.50	
22208. Bottles, Narrow Mouth, best American green glass, for cork stoppers.	Capacity.	1 oz.	2 oz.	4 oz.	1 pt.	1 qt.	2 qt.	1 gal.	5 gal.				
	Number in original case.	864	720	432	288	144	96	48	36	6			
	Per dozen	.35	.40	.55	.70	1.05	1.55	2.40	4.00	17.00			
	Per gross in original case	3.50	3.90	5.40	7.00	10.15	15.50	24.00	40.00	170.00			
22210. Bottles, Wide Mouth, best American flint glass, for cork stoppers.	Capacity, ounces.	1	2	3	4	6							
	Number in original case.	864	864	720	576	432							
	Per dozen	.35	.40	.40	.50	.60							
	Per gross in original case	3.90	3.65	4.00	4.90	5.65							
	Capacity, ounces.	8	12	16	24	32							
	Number in original case	288	216	144	120	96							
	Per dozen	.75	.95	1.10	1.45	1.50							
	Per gross in original case	7.25	9.50	10.65	14.50	15.90							
22214. Bottles, Wide Mouth, best American amber glass, for cork stoppers. Shape same as No. 22210.	Capacity, ounces.	1	2	3	4	6							
	Number in original case.	864	720	432	288	144							
	Per dozen	.40	.40	.60	.75	1.10							
	Per gross in original case	3.65	4.00	5.65	6.15	7.25							
22218. Bottles, Wide Mouth, of green glass, for cork stoppers.	Capacity.	1 oz.	2 oz.	4 oz.	8 oz.	16 oz.	1 qt.	2 qt.	1 gal.	2 gal.	5 gal.		
	Number in original case.	864	720	432	288	144	96	48	12	6			
	Per dozen	.36	.40	.60	.75	1.10	1.60	2.50	4.10	12.80	18.35		
	Per gross in original case	3.65	4.00	5.65	7.25	10.65	15.85	24.50	40.15	102.50	175.00		
22222. Bottles, Narrow Mouth, flint glass, with high ground mushroom glass stopper. This bottle has a fine, fire polished finish approaching shop furniture ware in appearance and is much superior to iron mould finish. Recommended specially for laboratory or other uses where a bottle of better appearance is desired.	Capacity.	1 oz.	2 oz.	4 oz.	6 oz.	12 oz.	1 pt.						
	Number in original case.	144	72	72	72	72	36						
	Per dozen	1.00	1.25	1.50	1.65	1.90	1.75						
	Per dozen in original case	.80	1.00	1.20	1.35	1.55	1.40						
	Capacity.	1 pt.	1 qt.	1 gal.	2 gal.	3 gal.							
	Number in original case.	72	36	12	6	4							
	Per dozen	2.00	2.25	4.00	6.00	13.00	20.00						
	Per dozen in original case	1.60	1.80	3.20	4.80	10.40	16.00						
22226. Bottles, Wide Mouth, same quality, etc., as No. 22222.	Capacity.	1 oz.	2 oz.	4 oz.	1 pt.	1 qt.	1 gal.	2 gal.					
	Number in original case.	144	72	72	72	72	36	12	12				
	Per dozen	1.25	1.50	1.75	2.25	2.50	3.25	5.00	8.00	18.00			
	Per dozen in original case	1.00	1.20	1.40	1.80	2.00	2.60	4.00	6.40	14.40			



No. 22230

No. 22234

No. 22238

No. 22246

No. 22250

No. 22258

22230.	Bottles, Narrow Mouth, with vertical glass stopper, of green glass, for acids.							
Capacity.....	1/2 pt.	1 pt.	1 qt.	1/2 gal.	1 gal.	2 gal.		
Number in original case.....	144	144	96	48	36	12		
Per dozen.....	2.00	2.50	3.40	5.60	7.60	16.00		
Per gross in original case.....	20.00	25.00	34.00	56.00	76.00	160.00		
22234.	Bottles, Narrow Mouth, of white glass with flat glass stopper. These bottles are of German make and are distinctly superior in both shape and finish to American bottles of corresponding price. They are turned in a wet wooden mould which imparts a high lustre to the outside surface. Particularly recommended for use as laboratory reagent bottles.							
Capacity, cc.....	15	30	60	125	250	500	1000	2000
Number in original case.....	1800	1100	600	500	325	180	120	60
Each.....	.10	.10	.12	.15	.18	.25	.35	.45
Per 100 in original case.....	8.40	8.40	9.80	10.85	15.40	19.60	28.00	38.50
22238.	Bottles, Narrow Mouth, of white glass, with vertical stopper. Same quality as No. 22234.							
Capacity, cc.....	15	30	60	125	250	500	1000	2000
Number in original case.....	1800	1100	600	500	325	180	120	60
Each.....	.10	.10	.12	.15	.18	.25	.35	.45
Per 100 in original case.....	8.40	8.40	9.80	10.85	15.40	19.60	28.00	38.50
22242.	Bottles, Narrow Mouth, of amber glass, with vertical stopper. Same quality and shape as No. 22238.							
Capacity, cc.....	15	30	60	125	250	500	1000	2000
Number in original case.....	1100	600	500	325	180	120	60	60
Each.....	.11	.13	.14	.20	.25	.35	.50	.50
Per 100 in original case.....	9.45	10.85	11.90	17.15	21.70	30.80	42.00	
22246.	Bottles, Wide Mouth, of white glass, with flat glass stopper. Same quality as No. 22234.							
Capacity, cc.....	15	30	60	125	250	500	1000	2000
Number in original case.....	1800	1100	600	500	325	180	120	60
Each.....	.11	.11	.13	.14	.20	.25	.35	.50
Per 100 in original case.....	9.45	9.45	10.85	11.90	17.15	21.70	30.80	42.00
22250.	Bottles, Wide Mouth, of white glass, with vertical stopper. Same quality as No. 22234.							
Capacity, cc.....	15	30	60	125	250	500	1000	2000
Number in original case.....	1800	1100	600	500	325	180	120	60
Each.....	.11	.11	.12	.14	.20	.25	.35	.50
Per 100 in original case.....	9.45	9.45	10.15	11.90	17.15	21.70	30.80	42.00
22254.	Bottles, Wide Mouth, of amber glass, with vertical stopper. Same quality and shape as No. 22250.							
Capacity, cc.....	30	60	125	250	500	1000	2000	
Number in original case.....	1100	600	500	325	180	120	60	
Each.....	.12	.14	.15	.22	.28	.40	.50	
Per 100 in original case.....	10.15	11.90	13.15	18.60	23.80	33.60	46.25	
22258.	Bottles, New Jena Glass, narrow mouth, with flat glass stopper. These bottles are made of apparatus glass and are offered as the most resistant bottle obtainable for reagents.							
Capacity, cc.....				100	250	500	1000	
Each.....				.43	.45	.70	.95	



No. 22270



No. 22286



No. 22304



No. 22324

See text page 51

REAGENT BOTTLES, S. B. S. Type, of best German glass, with conical stopper with projecting flange to protect the bottle from dust in the narrow mouth shape and a flat hexagonal stopper projecting over the rim in the wide mouth shapes. The stopper can be placed on the table either on its side or inverted, without contact of the ground surface. Bottles for alkaline solutions, such as Potassium hydrate are made with a loosely fitting stoppers inside the neck but with the under side of the flange ground to fit the upper surface of the mouth of the bottle. Bottles are carried in stock in the labels designated below. Labels are deeply etched into the glass by means of sand blast and filled with white pigment. In ordering please use numbers. Special labels are engraved to order at an extra cost of 25¢ each. The Bottles may be imported duty free at an approximate reduction of 33 $\frac{1}{3}$ %, but orders must aggregate at least 100 bottles of a size.

22270. Reagent Bottle, Narrow Mouth, 125 cc capacity, as above, with labels as below.

Each	.25	Per dozen	2.50
B 1. Hydrogen Sulphide (Amber) H ₂ S		B21. Magnesium Sulphate Mg SO ₄	
B 2. Hydrochloric Acid HCl		B22. Mercuric Chloride Hg Cl ₂	
B 3. Acetic Acid HC ₂ H ₃ O ₂		B23. Silver Nitrate (Amber) Ag NO ₃	
B 4. Sulphuric Acid H ₂ SO ₄		B27. Lead Acetate Pb (C ₂ H ₃ O ₂) ₂	
B 5. Nitric Acid HNO ₃		B28. Ferrous Sulphate FeSO ₄	
B 6. Potassium Ferrocyanide K ₄ Fe(CN) ₆		B29. Ferric Chloride FeCl ₃	
B 7. Potassium Sulphocyanide KCNS		B30. Alcohol C ₂ H ₅ OH	
B 8. " Carbonate K ₂ CO ₃		B31. Ammonium Sulphocyanide NH ₄ CNS	
B 9. " Sulphate K ₂ SO ₄		B32. Barium Hydroxide Ba(OH) ₂	
B10. " Iodide KI		B35. Ether (C ₂ H ₅) ₂ O	
B11. " Ferricyanide K ₃ Fe(CN) ₆		B36. Cupric Sulphate CuSO ₄	
B12. " Hydroxide KOH		B37. Platonic Chloride PtCl ₄	
B13. " Dichromate K ₂ Cr ₂ O ₇		B38. Uranium Acetate UO ₂ (C ₂ H ₃ O ₂) ₂	
B14. Sodium Phosphate Na ₂ HPO ₄		B58. Fehling's Solution	
B15. Ammonium Hydroxide NH ₄ OH		B59. Sodium Carbonate Na ₂ CO ₃	
B16. " Sulphide (Amber) (NH ₄) ₂ S		B60. " Acetate NaC ₂ H ₃ O ₂	
B17. " Chloride NH ₄ Cl		B61. " Hydroxide NaOH	
B18. " Carbonate (NH ₄) ₂ CO ₃		B81. Stannous Chloride SnCl ₂	
B19. " Oxalate (NH ₄) ₂ C ₂ O ₄		B82. Ammonium Molybdate (NH ₄) ₂ MoO ₄	
B20. Barium Chloride BaCl ₂		B83. Carbon Disulphide CS ₂	
B21. Calcium Chloride CaCl ₂		B86. Mercurous Nitrate Hg ₂ (NO ₃) ₂	
B22. " Sulphate CaSO ₄		B96. Potassium Chromate K ₂ CrO ₄	
B23. " Hydroxide Ca (OH) ₂			

22274. Reagent Bottle, Narrow Mouth, 250 cc capacity, as above, with labels as below.

Each	.30	Per dozen	3.20
B101. Sulphuric Acid, Con. H ₂ SO ₄		B111. Barium Chloride BaCl ₂	
B102. " Dil. H ₂ SO ₄		B122. Ammonium Sulphide (Amber) (NH ₄) ₂ S	
B103. Nitric Acid, Con. HNO ₃		B126. Alcohol C ₂ H ₅ OH	
B104. " Dil. HNO ₃		B128. Sodium Phosphate NaH ₂ PO ₄	
B105. Hydrochloric Acid, Con. HCl		B130. Ammonium Oxalate (NH ₄) ₂ C ₂ O ₄	
B106. " Dil. HCl		B131. Acetic Acid HC ₂ H ₃ O ₂	
B107. Hydrogen Sulphide (Amber) H ₂ S		B135. Silver Nitrate (Amber) Ag NO ₃	
B108. Ammonium Hydroxide NH ₄ OH		B150. Potassium Hydroxide KOH	
B109. " Chloride NH ₄ Cl		B151. Calcium Hydroxide Ca (OH) ₂	
B110. " Carbonate (NH ₄) ₂ CO ₃		B152. Lead Acetate Pb (C ₂ H ₃ O ₂) ₂	
B111. Sodium Hydroxide NaOH		B154. Ferrous Sulphate FeSO ₄	
B112. " Carbonate Na ₂ CO ₃			

22278. Reagent Bottle, Narrow Mouth, 500 cc capacity, as above, with labels as below.

Each	.40	Per dozen	4.50
B204. Ammonium Hydroxide NH ₄ OH		B216. Nitric Acid HNO ₃	
B215. Sulphuric Acid H ₂ SO ₄		B217. Hydrochloric Acid HCl	

22282. Reagent Bottle, Narrow Mouth, 1000 cc capacity, as above, with labels as below.

Each	.50	Per dozen	5.50
B301. Sulphuric Acid, Con. H ₂ SO ₄		B305. Hydrochloric Acid, Con. HCl	
B302. " Dil. H ₂ SO ₄		B306. " Dil. HCl	
B303. Nitric Acid, Con. HNO ₃		B312. Ammonium Hydroxide NH ₄ OH	
B304. " Dil. HNO ₃			

22286.	Reagent Bottle, Wide Mouth, 125 cc capacity, as above described, with labels as below.			
	Each.....	.25	Per dozen.....	2.80
B301.	Sodium Carbonate Na ₂ CO ₃		B305.	Ferrous Sulphate FeSO ₄
B302.	Potassium Nitrate KNO ₃		B312.	Test Paper
B303.	" Cyanide KCN		B313.	Sodium Ammonium Hydrogen Phosphate Na(NH ₄)HPO ₄
B304.	Borax Na ₂ B ₄ O ₇			H ₂ O+4H ₂ O

22290. Reagent Bottles, Set of 40 as above described, with labels as per list below, consisting of 23 narrow mouth 125 cc Bottles; 5 narrow mouth 250 cc Bottles; 6 wide mouth 125 cc. Bottles and one 30 cc dropping bottle..... 8.00

22294. Reagent Bottles, Set of 40 as above described, filled with the following c. p. reagents, sealed and packed..... 17.00

250 cc Narrow Mouth Bottles.

- Acid Sulphuric (d₁₄) H₂SO₄
- " Hydrochloric HCl
- " Nitric HNO₃
- Ammonium Hydride (NH₄)₂HO
- Blank

125 cc Narrow Mouth Bottles

- Acid Sulphuric conc. H₂SO₄
- Ammonium Chloride (NH₄)Cl
- " Oxalate (NH₄)₂C₂O₄
- " Sulfoeyanide (NH₄)SCNS
- " Molybdate (NH₄)₂MoO₄
- " Carbonate (NH₄)₂CO₃
- Acid Acetic HC₂H₃O₂
- Alcohol (C₂H₅)OH
- Silver Nitrate AgNO₃(amber)
- Barium Chloride BaCl₂
- Calcium Hydroxide Ca(OH)₂
- Cupric Sulfate CuSO₄
- Ferric Chloride FeCl₃
- Hydric Sulphide HS (amber)
- Ammonium Sulfide (NH₄)₂S(amber)

- Lead Acetate Pb(C₂H₃O₂)₂
- Magnesium Sulphate MgSO₄
- Mercuric Chloride Hg₂Cl₂
- Mercurous Nitrate Hg₂(NO₃)₂
- Platinum Chloride PtCl₄ (1 oz dropping bottle)
- Potassium Acid Chromate K₂Cr₂O₇
- " Ferrocyanide K₄Fe(CN)₆
- Iodine KI
- Sodium Carbonate Na₂CO₃
- " Acetate NaC₂H₃O₂
- " Phosphate Na₂HPO₄
- Uranium Acetate (UO₂C₂H₃O₂)₂
- Ether (C₂H₅)₂O
- Blank

125 cc Wide Mouth Bottles

- Sodium Carbonate Na₂CO₃
- Borax
- Ferrous Sulphate FeSO₄
- Potassium Cyanide KCN
- Ammonium Sodium Phosphite Na(NH₄)HPO₃+4H₂O
- Test Paper

REAGENT BOTTLES, Whitall-Tatum Company, with ground glass labels, blown in the glass, the surface of each letter being ground so as to render it distinct. The lettering is thus indestructible and in no danger of being defaced when the bottle is washed or handled, and the inconvenience and unsightly appearance attending the use of paper labels is entirely avoided. The bottles are made of glass containing no lead, zinc or other metallic flux, and, in the points of convenient shape, thin, dropping lip and perfect stoppering, are unequalled. They are exclusively used in many of the leading laboratories in the U. S. See illustration on preceding page.

Reagent Bottles, Narrow Mouth, as above described. For names available in each capacity see list below. Names not in list may be engraved on bottles at an extra charge of 50¢ per dozen net. Please use numbers in ordering.

Capacity.....	1 oz.	½ pt.	1 pt.	1 qt.
Per dozen.....	1.25	1.75	2.50	3.25
Per gross.....	12.00	18.50	23.00	33.00

22300. Reagent Bottles, Narrow Mouth, One ounce height, 3 3/4 inches.

No. 326. Cobaltous Nitrate..... Co(NO ₂) ₂	No. 325. Silver Nitrate (Amber)..... AgNO ₃
" 336. Gold Chloride..... AuCl ₃	" 311. Blank
" 327. Platonic Chloride..... PtCl ₄	

22304. Reagent Bottles, Narrow Mouth, One-fourth pint, height 5 1/2 inches.

No. 3. Acetic Acid..... HC ₂ H ₃ O ₂	No. 97. Ammonium Sulphydiate..... NH ₄ HS
" 30. Alcohol..... C ₂ H ₅ OH	" 401. Barium Nitrate..... Ba(NO ₃) ₂
" 18. Ammonium Carbonate..... (NH ₄) ₂ CO ₃	" 126. Bromine for Hypo-Bromate
" 17. " Chloride..... NH ₄ Cl	" 406. " Wafer
" 15. " Hydroxide..... NH ₄ OH	" 418. Calcium Chloride Anhydrous CaCl ₂
" 19. " Oxalate..... (NH ₄) ₂ C ₂ O ₄	" 83. Carbon Disulphide..... CS ₂
" 16. " Sulphide (Amber) (NH ₄) ₂ S	" 407. Chloroform..... CHCl ₃
" 31. " Sulphocyanide..... NH ₄ SCNS	" 408. Coralene
" 32. Barium Carbonate..... BaCO ₃	" 409. Coraline
" 29. " Chloride..... BaCl ₂	" 421. Dimethyl Glioxime..... C(CH ₃) ₂ C(NOH) ₂
" 32. " Hydroxide..... Ba(OH) ₂	" 419. Hydrochloric Acid, Con..... HCl
" 21. Calcium Chloride..... CaCl ₂	" 128. Hydrogen Peroxide
" 23. " Hydroxide..... Ca(OH) ₂	" 87. Indigo Solution
" 22. " Sulphate..... CaSO ₄	" 414. Iodine Solution..... I+KI
" 26. Cupric Sulphate..... CuSO ₄	" 410. Litmus
" 35. Ether..... (C ₂ H ₅) ₂ O	" 90. Magnesia Mixture
" 29. Ferric Chloride..... FeCl ₃	" 100. Mercuric Potassium Iodide
" 28. Ferrous Sulphate..... FeSO ₄	" 86. Mercurous Nitrate..... Hg ₂ (NO ₃) ₂
" 2. Hydrochloric Acid..... HCl	" 115. Methyl Alcohol..... CH ₃ OH
" 1. Hydrogen Sulphide (Amber), HS	" 411. Methyl Orange
" 27. Lead Acetate..... Pb(C ₂ H ₃ O ₂) ₂	" 88. Nessler's Solution
" 24. Magnesium Sulphate..... MgSO ₄	" 122. Nitric Acid, Con..... HNO ₃
" 21. Mercuric Chloride..... Hg ₂ Cl ₂	" 125. Okenmayer's Reagent..... H ₂ C ₂ O ₄
" 5. Nitric Acid..... HNO ₃	" 92. Oxalic Acid..... H ₂ C ₂ O ₄
" 8. Potassium Carbonate..... K ₂ CO ₃	" 423. Phenol..... C ₆ H ₅ OH
" 13. " Dithionite..... K ₂ Cr ₂ S ₂ O	" 412. Phenolphthalein
" 11. " Ferriyanide..... K ₃ Fe(CN) ₆	" 91. Picric Acid..... C ₆ H ₃ (OH) ₃ (NO ₂) ₃
" 6. " Ferrocyanide..... K ₄ Fe(CN) ₆	" 37. Platonic Chloride..... PtCl ₄
" 12. " Hydrate..... KOH	" 95. Potassium Chromate..... K ₂ CrO ₄
" 10. " Iodide..... KI	" 404. Silver Sulphate..... Ag ₂ SO ₄
" 9. " Sulphate..... K ₂ SO ₄	" 60. Sodium Acetate..... NaC ₂ H ₃ O ₂
" 7. " Sulphocyanide..... KCN	" 59. " Carbonate..... Na ₂ CO ₃
" 26. Silver Nitrate (Amber)..... AgNO ₃	" 416. " Cobaltic Nitrite
" 39. Sodium Carbonate..... Na ₂ CO ₃	" 61. " Hydroxide..... NaOH
" 41. " Hydroxide..... NaOH	" 427. " for Hypo..... NaOH
" 14. " Phosphate..... Na ₂ HPO ₃	" 417. " Bromite..... NaOBr
" 4. Sulphuric Acid..... H ₂ SO ₄	" 418. " Thiosulphate..... Na ₂ S ₂ O ₃
" 38, 39 and 40. Blank	" 81. Stannous Chloride..... SnCl ₂

The above 40 bottles are furnished as a set for..... \$2.75

No. 77. Ammonia..... NH ₃	" 124. Fumic Gumme
" 82. Ammonium Molybdate..... (NH ₄) ₂ MoO ₄	" 113. Turmeric

22308. Reagent Bottles, Narrow Mouth, One-half pint, height 6½ inches.

No. 131. Acetic Acid	..... $HC_2H_3O_2$	No. 167. Hydrogen Sulphide (Amber)	..... H_2S
" 136. Alcohol	..... C_2H_5OH	" 152. Lead Acetate	..... $Pb_2(C_2H_3O_2)_2$
" 157. Ammonia	..... NH_3	" 153. Mercuric Chloride	..... $HgCl_2$
" 110. Ammonium Carbonate	..... $(NH_4)_2CO_3$	" 163. Nitric Acid, Con.	..... HNO_3
" 109. " Chloride	..... NH_4Cl	" 104. " Dil.	..... HNO_3
" 108. " Hydroxide	..... NH_4OH	" 150. Potassium Hydroxide	..... KOH
" 155. " Molybdate	..... $(NH_4)_2MoO_4$	" 145. Silver Nitrate (Amber)	..... $AgNO_3$
" 130. " Oxalate	..... $(NH_4)_2C_2O_4$	" 112. Sodium Carbonate	..... Na_2CO_3
" 122. " Sulphide (Amber)	..... NH_4S	" 111. " Hydroxide	..... $NaOH$
" 114. Barium Chloride	..... $BaCl_2$	" 129. " Phosphate	..... Na_2HPO_4
" 151. Calcium Hydroxide	..... $Ca(OH)_2$	" 156. Stannous Chloride	..... $SnCl_2$
" 154. Ferrous Sulphate	..... $FeSO_4$	" 101. Sulphuric Acid, Con.	..... H_2SO_4
" 165. Hydrochloric Acid, Con.	..... HCl	" 102. " Dil.	..... H_2SO_4
" 106. " Dil.	..... HCl	" 116. Blank	

22312. Reagent Bottles, Narrow Mouth, One pint, height 7½ inches.

No. 204. Ammonium Hydroxide	..... NH_4OH	No. 222. Hydrochloric Acid, Con.	..... HCl
" 227. " Dil.	..... NH_4OH+Aq	" 226. Hydrosodic Phosphate	..... Na_2HPO_4
" 229. " Sulphide, Dil.	..... $(NH_4)_2S+Aq$	" 216. Nitric Acid	..... HNO_3
" 218. Barium Chloride	..... $BaCl_2$	" 219. " Con.	..... HNO_3
" 223. Calcium Hydroxide	..... $Ca(OH)_2$	" 221. Potassium Hydroxide	..... KOH
" 225. " Sulphate	..... $CaSO_4$	" 228. Sodium Hydroxide, Dil.	..... $NaOH+Aq$
" 230. Ether	..... $(C_2H_5)_2O$	" 215. Sulphuric Acid	..... H_2SO_4
" 224. Ferrous Sulphate	..... $FeSO_4$	" 220. " Con.	..... H_2SO_4
" 217. Hydrochloric Acid	..... HCl	" 211. Blank	

22316. Reagent Bottles, Narrow Mouth, One quart, height 9½ inches.

No. 505. Hydrochloric Acid, Con.	..... HCl	No. 501. Sulphuric Acid, Con.	..... H_2SO_4
" 506. " Dil.	..... HCl	" 502. " Dil.	..... H_2SO_4
" 503. Nitric Acid, Con.	..... HNO_3	" 511. Blank	
" 504. " Dil.	..... HNO_3		

Reagent Bottles, Wide Mouth, as above described.

Capacity	.....	1 oz.	4 oz.
Per dozen	.....	1.35	1.95
Per gross	.....	13.00	20.50

22320. Reagent Bottles, Wide Mouth, One ounce, height 3½ inches.

No. 374. Ammonium Phosphate	..... $(NH_4)_2HPO_4$	No. 354. Potassium Nitrate	..... KNO_3
" 361. " Sodium Phosphate	..... $NaNH_4HPO_4$	" 372. Test Paper	
" 351. Borax	..... $Na_2B_4O_7$	" 353. Sodium Acetate	..... $NaC_2H_3O_2$
" 364. Copper	..... Cu	" 369. " Bitartrate	..... $NaHC_2H_3O_2$
" 365. Ferrous Sulphate	..... $FeSO_4$	" 359. " Carbonate	..... Na_2CO_3
" 366. " Sulphide	..... FeS	" 370. " Nitrate	..... NaN_3
" 377. Phenyl Hydrazine	..... $C_6H_5NH.NH_2$	" 367. Sodium Potassium Carbonate	..... Na_2CO_3, K_2CO_3
" 367. Potassium Chlorate	..... $KClO_3$	" 371. Starch	
" 358. " Cyanide	..... KCN	" 375. Zinc	
" 368. " Ferrocyanide	..... $K_4Fe(CN)_6$	" 375. Blank	

22324. Reagent Bottles, Wide Mouth, Four ounce, height 4½ inches.

No. 314. Ammonium Sulphate	..... $(NH_4)_2SO_4$	No. 313. Sodium Ammonium Hydrogen Phosphate	..... $Na(NH_4)HPO_4$
" 304. Borax	..... $Na_2B_4O_7$	" 301. Sodium Carbonate	..... Na_2CO_3
" 305. Ferrous Sulphate	..... $FeSO_4$	" 312. Test Paper	
" 303. Potassium Cyanide	..... KCN	" 307. Blank	
" 302. " Nitrate	..... KNO_3		



View of Shipping Room



No. 22328



No. 22332



No. 22336



No. 22360



No. 22356

32328. REAGENT BOTTLES, Narrow Mouth, with name and symbol, of hard white potash glass, with polished bottoms, and flat stoppers; with white enamelled labels with double border and brilliant black acid proof letters and figures for both name and symbol. Exactly like illustration. Because of the great variety of labels used and the alternatives offered these bottles are not carried in stock and are imported to order only in quantities aggregating not less than \$25.00 in value.

Capacity, cc.....	50	100	125	250	500	1000	2000	4000
Each, Duty Free.....	.30	.35	.40	.45	.50	.60	.85	1.25
Each, Duty Paid....	.45	.50	.50	.60	.70	.85	1.15	1.75

22332. Reagent Bottles, Wide Mouth, otherwise same as above.

Capacity, cc.....	50	100	125	250	500	1000	2000	4000
Each, Duty Free.....	.30	.35	.40	.45	.55	.70	.90	1.30
Each, Duty Paid....	.45	.50	.50	.60	.80	.95	1.25	1.85

Note—While we recommend Bottles as listed under No. 22328 and 22332 as standard, we offer the following alternatives in style, finish, etc.

22336. Alternative I. With upright stoppers at same price as regular No. 22328 and 22332 with flat stoppers.

22340. Alternative II. Of amber or blue glass instead of white, add the following to price of No. 22328 and 22332.

Capacity, cc.....	50 to 100	125 to 1000	2000	4000
Each, Duty Free.....	.02	.03	.05	.08
Each, Duty Paid.....	.03	.04	.08	.10

22344. Alternative III. For desk number on label and stopper, add the following to price of No. 22328 and 22332.

Capacity, cc.....	50 to 100	125 to 1000	2000	4000
Each, Duty Free.....	.03	.06	.06	.08
Each, Duty Paid.....	.05	.10	.10	.12

22348. Alternative IV. For loose fitting glass caps (Fig. 2) add the following to price of No. 22328 (narrow mouth).

Capacity, cc.....	50 to 100	125 to 1000	2000	4000
Each, Duty Free.....	.06	.10	.12	.15
Each, Duty Paid.....	.10	.15	.16	.25

22352. Alternative IV. For loose fitting glass cap, add the following to price of No. 22332 (wide mouth).

Capacity, cc.....	50 to 100	125 to 1000	2000	4000
Each, Duty Free.....	.08	.12	.15	.20
Each, Duty Paid.....	.12	.16	.25	.30

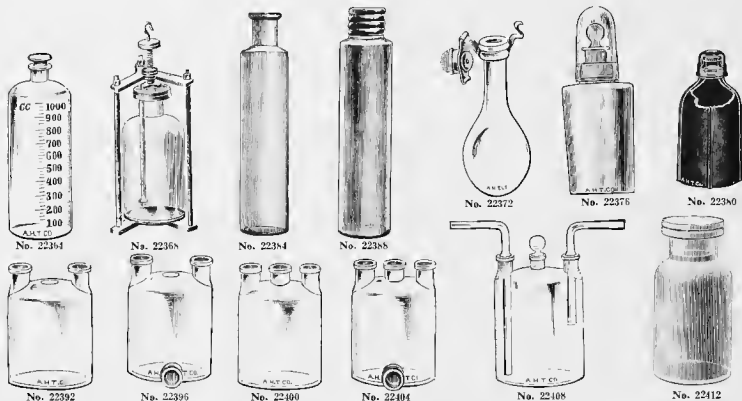
22356. Alternative V. For label like No. 22328 but without chemical symbol deduct the following from price of No. 22328.

Capacity, cc.....	50	100	125	250	500	1000	2000	4000
Each, Duty Free... .	.08	.08	.08	.10	.12	.12	.15	.20
Each, Duty Paid... .	.12	.12	.12	.15	.16	.16	.20	.25

Note—Prices for square or diagonal cut stoppers with and without flange, labels with etched lettering, labels without border, lettering without background, etc., will be sent upon application.

22360. Bottle Caps, of glass, to fit over the stoppers of Reagent Bottles.

Inside diameter of cap, mm	26	30	35	39	45	49	60
Capacity of bottle, cc...	30	60	125	250	500	1000	2000
Per ten.....	1.00	1.00	1.00	1.00	1.00	1.50	1.50



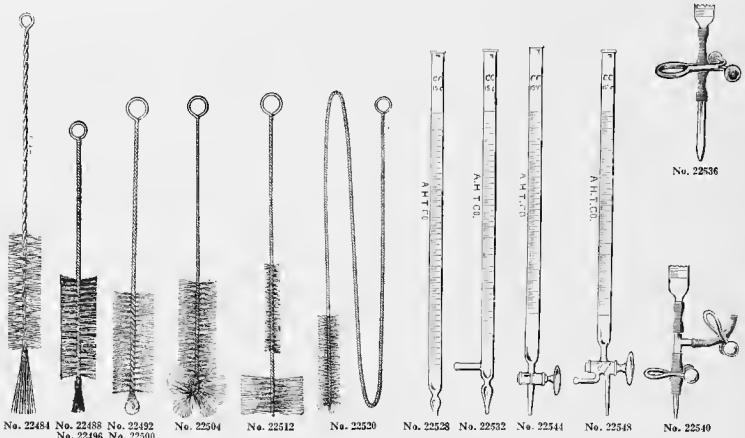
22364.	Bottle, Graduated, of flint glass, with glass stopper. So-called "mixing jar."							
	Capacity, cc.				250	500	1000	
	Each				1.25	2.00	3.00	
22368.	Bottle, Pressure, Lintner, complete with metallic clamp.							2.75
22372.	" of heavy glass, with patent stopper.							
	Capacity, cc.				100	150	200	
	Each				.30	.32	.35	
22376.	Bottles, Ether, of glass, with ground in stopper and ground on glass cap, widely used for all volatile liquids. This is a well made imported bottle.							
	Capacity, cc.			50	100	250	500	1000
	Each			.45	.50	.65	.90	1.40
22380.	Bottles, Hard Rubber, with paraffine seal and screw cap, for acids.							
	Capacity, cc.			100	250	500	1000	
	Each			.75	1.00	1.50	2.75	
22384.	Bottles, Oil Sample, of flint glass, tall, narrow shape.							
	Capacity, ounces			1	2	4	8	
	Number in original case			864	720	432	144	
	Per dozen			.40	.50	.65	.95	
	Per gross in original case			3.75	4.90	6.50	9.25	
22388.	Bottles, Oil Sample, same as No. 22384 but with metallic screw cap with cork lining. Capacity 4 oz., length 6 1/2 inches, diameter 1 1/8 inches. Packed 432 in original cases.							
	Each							.12
	Per dozen							1.05
	Per gross in original case							10.25
22392.	Bottles, Woulff, with two necks.							
	Capacity, cc.	125	250	500	1000	2000	4000	8000
	Each	.40	.45	.60	.85	1.20	2.50	4.00
22396.	Bottles Woulff, with two necks and bottom tubulation.							
	Capacity, cc.				500	1000	2000	4000
	Each				.80	1.00	1.50	3.00
22400.	Bottles, Woulff, with three necks.							
	Capacity, cc.	125	250	500	1000	2000	4000	8000
	Each	.45	.50	.65	.95	1.35	3.00	5.00
22404.	Bottles, Woulff, with three necks and bottom tubulation.							
	Capacity, cc.				500	1000	2000	4000
	Each				.90	1.20	2.00	3.50
22408.	Bottles, Woulff, with three necks, two of which are fitted with ground in glass delivery tubes and one with ground in glass stopper.							
	Capacity, cc.					125	250	500
	Each					1.00	1.25	1.60
22412.	Bottles, Water Sample, 2 oz. capacity, with flat ground in stopper. Both bottle and stopper can be numbered with serial number. As used in large quantities in the Filtration Laboratories of the Philadelphia Bureau of Water, etc.							
	Style					Plain	Numbered	
	Each					.25	.30	
	Per dozen					3.00	3.60	



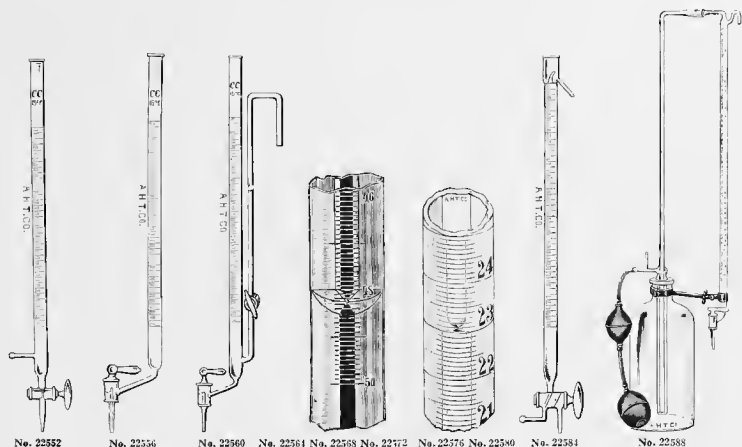
22416.	Boxes of paste board, so called "pill boxes." Covered with fine glazed paper, carmine color.			
	Diameter, inches.....	1	1½	1¾
	Depth, inches.....	¾	1½	2
	Per gross.....	.25	.35	.50
	In packages of 1 dozen of each size nested, per package.....			.12
22420.	Boxes of paste board, sliding form, covered with fine white glazed paper.			
	Length, inches.....	2½	3½	4½
	Width, inches.....	1½	1½	1½
	Depth, inches.....	¾	¾	¾
	Per dozen.....	.15	.15	.15
	Per gross.....	1.00	1.00	1.00
22424.	Boxes, of seamless tin, round form. Convenient for samples and specimens.			
	Capacity, ounces.....	½	1	2
	Per dozen.....	.10	.16	.20
22428.	Boxes, of turned wood. Convenient for samples and specimens.			
	Capacity, ounces.....	½	1	2
	Per dozen.....	.08	.10	.14
22432.	Brush, of bristle, for assay buttons.....			.50



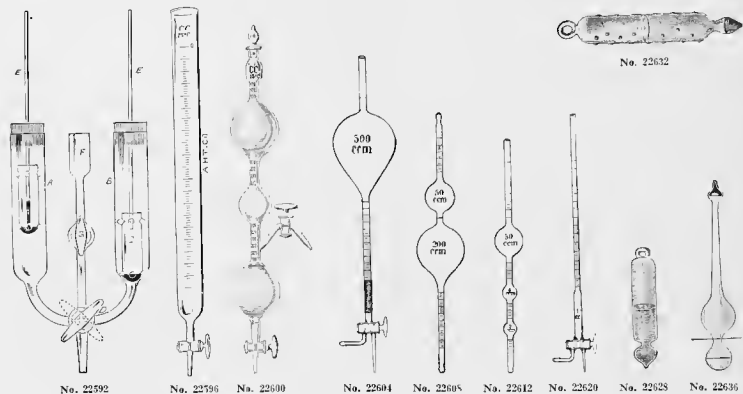
22436.	Brush, of black horse hair, 9 inches long, with wooden handle. For cleaning small cylinders, etc.	.20		
22440.	" of black bristle, conical shape, with tuft on end, 12 inches long. For cleaning cylinders, etc.	.30		
22444.	" of black and white bristle, conical shape with tufted end, with four rows of bristles. For cleaning large cylinders, jars, etc.	.35		
22448.	Brush, of black bristle, 12 inches long. For cleaning cylinders, beakers, etc.	.25		
22452.	" of black and white bristle, on wooden handle, with four rows of bristles. For cleaning large jars, cylinders, etc.	.30		
22456.	Brush, of black and white bristle, with two tufts on end for reaching corners of large cylinders, jars, etc. With four rows of bristles.	.35		
22460.	Brush, for beakers, with long handle of wood.....	.20		
22464.	Brush, of bristle in wooden handle, flat. Convenient for pasting labels, etc.			
	Width of bristles, inches.....	1	1½	2
	Each.....	.05	.08	.10
22468.	Brush, of camel's hair, flat, with wooden handle. For dusting scale pans.			
	Width of hair, inches.....	½	1	1½
	Each.....	.15	.25	.40
22472.	Brush, of camel's hair, round, with wooden handle, ½ inch diameter. For dusting scale pans.....	.40		
22476.	Brush, of camel's hair, bound in quill handle.			
	Length of hair, mm.....	14	18	22
	Each.....	.05	.07	.10
22480.	Brush, of camels hair, bound in quill, so-called "camel's hair pencils."			
	Number.....	3	5	7
	Size.....	Small	Medium	Large
	Per dozen.....	.20	.25	.35



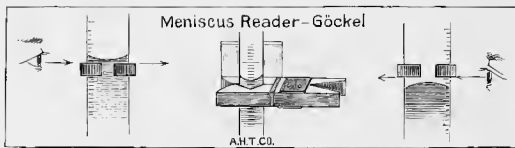
22484.	Brush, Test Tube, special, of stiff bristles, 1 inch in diameter, with tuft at end. As used in the laboratories of the Johns Hopkins Medical School. Black bristles, 2 inches long, on heavy tinned wire; total length 13½ inches.							
22488.	Brush, Test Tube, on brass wire, with bristle end. Total length 9 inches; length of bristle part 2 inches; diameter of bristles 1¼ inches.							.10
22492.	Brush, Test Tube, same as No. 22488 but with sponge end.							.08
22496.	“ “ “ on tinned wire, with bristle end.							.08
	Total length, inches.						9	.09
	Length of bristle part, inches.						2½	.24
	Diameter “ “ “						1¼	.14
	Each.					.06	.07	.08
22500.	Brush, Test Tube, on tinned wire, with sponge end. Total length 9 inches; length of bristle part 2½ inches; diameter of bristles 1¼ inches.							.06
22504.	Brush, Test Tube, with tufted ends. Total length 9 inches; length of bristle part 3 inches; diameter of bristles 1¼ inches.							.05
22508.	Brush, Test Tube, with sponge end and rattan handle.							.06
22512.	Brush, Flask, convenient for Babcock milk test bottles, etc. Total length 9½ inches; diameter of large bristles 2 inches; diameter of small bristles ½ inch.							.05
22516.	Brush, Tube, total length 13 inches; length of bristles 2½ inches; diameter of bristles ½ inch. Per dozen.							.15
22520.	Brush, Tube, total length 36½ inches, length of bristles 5 inches, diameter of bristles ½ inch.							.10
22524.	Brushes, of the general shape of Test Tube Brushes, No. 22488 to 22500, but larger, for cleaning cylinders, large tubes, bottles, etc. Mounted on brass wire.							
	Total length, inches.					11	14	16
	Length of bristle part, inches.					3	4	4
	Diameter of bristles, inches.					2	2½	2½
	Each.					.15	.20	.30
22528.	Burettes, for pinchcock.							
	Capacity, cc.	10	25	50	50	75	100	100
	Graduated in cc.	1/16	1/8	1/4	1/8	1/16	1/16	1/16
	Each.	.50	.65	1.00	1.20	1.75	1.75	2.00
22532.	Burettes, for pinchcock, with side tube for refilling.							
	Capacity, cc.					25	50	100
	Graduated in cc.					1/16	1/16	1/16
	Each.					.75	1.30	1.85
22536.	Burette Attachment, consisting of rubber tubing, pinchcock and tip. For use on burettes No. 22528 and No. 22532.							.25
22540.	Burette Attachment, consisting of T tube, tip, three rubber connections and two pinchcocks. For use in refilling burettes No. 22528.							.50
22544.	Burettes, with straight glass stopcock.							
	Capacity, cc.	10	25	50	50	75	100	100
	Graduated in cc.	1/16	1/8	1/4	1/8	1/16	1/16	1/16
	Each.	1.00	1.35	1.65	1.75	1.85	2.25	2.50
22548.	Burettes, with three-way glass stopcock.							
	Capacity, cc.					25	50	100
	Graduated in cc.					1/16	1/16	1/16
	Each.					2.25	2.75	3.50



22552.	Burettes, with straight glass stopcock, with side tube for refilling.							
	Capacity, cc.	25	50	100				
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$				
	Each	1.50	2.00	2.65				
22556.	Burettes, with glass stopcock set on at an angle.							
	Capacity, cc.	25	50	75	100	100		
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$		
	Each	1.35	1.85	2.25	2.35	2.50		
22560.	Burettes, with glass stopcock set on at an angle and side tube for refilling with glass stopcock in same							
	Capacity, cc.				50	100		
	Graduated in cc.				$\frac{1}{10}$	$\frac{1}{10}$		
	Each				3.25	4.25		
22564.	Burettes, for pinchcock, same shape as No. 22528 but with dark blue enamelled stripe on white back-							
	ground for accurate reading of meniscus. See sectional illustration.							
	Capacity, cc.				50	100		
	Graduated in cc.				$\frac{1}{10}$	$\frac{1}{10}$		
	Each				1.50	2.50		
22568.	Burettes, same as No. 22564 but with straight glass stopcock.							
	Capacity, cc.	25	50	100				
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$				
	Each	2.00	2.50	3.50				
22572.	Burettes, same as No. 22564, but with three way glass stopcock.							
	Capacity, cc.	25	50	100				
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$				
	Each	2.25	3.00	4.25				
22576.	Burettes, for pinchcock, same shape as No. 22528 but with two sides white enamelled with transparent							
	vertical stripe behind graduations for accurate reading of meniscus. See sectional illustration.							
	Capacity, cc.				50	100		
	Graduated in cc.				$\frac{1}{10}$	$\frac{1}{10}$		
	Each				1.50	2.50		
22580.	Burettes, same as No. 22576 but with straight glass stopcock.							
	Capacity, cc.	25	50	100				
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$				
	Each	2.50	3.50					
22584.	Burettes, Automatic, with three-way stopcock, zero point and overflow cup, with dark blue enamelled							
	stripe on white background for accurate reading as in 22564							
	Capacity, cc.	25	50	100				
	Graduated in cc.	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$				
	Each	3.50	4.50	5.25				
22588.	Burette Automatic Zero, Squibb's latest form filled by pressure from rubber bulb. All joints are ground							
	air-tight and price is for the complete apparatus with bulbs, reservoir, clamp and burette; with							
	dark blue enamelled stripe on white background for accurate reading.							
	Capacity, cc.				25	50		
	Graduated in cc.				$\frac{1}{10}$	$\frac{1}{10}$		
	Each				6.00	7.50		

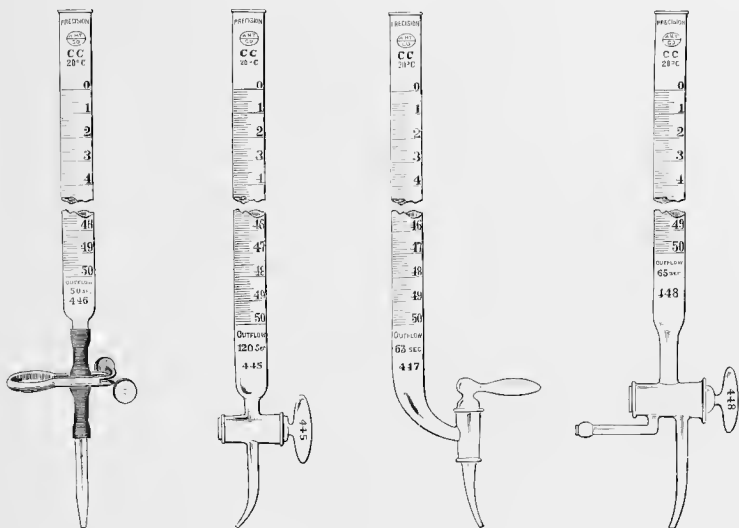


22592. **Burette Rose Automatic Adjustable** (Patent applied for). For repeated delivery of definite quantities. Automatically delivers the quantity at which it is set and cannot overflow. The quantity to be delivered can be quickly changed. Specially recommended for nitrogen determinations by Kjeldahl method, fiber determinations, fat determinations in milk analysis by Babcock method, for lead acetate solution in sugar determinations, for solvents in ore and soil laboratories and for the dispensing of nutrient solution and culture media in bacteriological laboratories. See *Journal of the American Chemical Society, May, 1910*. Measuring tubes 35 x 200 mm giving an approximate delivering capacity of 182 cc each 6.00
22596. **Burettes, Dispensing, wide form with glass stopcock.**
- | | | | |
|--------------------------|------|------|------|
| Capacity, cc. | 250 | 500 | 1000 |
| Graduated in cc. | 5 | 10 | 25 |
| Each | 3.00 | 3.50 | 4.00 |
22600. **Burette Saponification (Sapometer), Huggenberg.** See *Seifensiederzeitung 1903, S. 795* 7.00
22604. **Burette, Morse,** for calibrating flasks, pipettes, burettes, etc., 500 cc. 6.00
22608. " " " " " 50 cc and 200 cc. 6.00
22612. " " " " " 50 cc, 3 cc and 2 cc 6.00
- Two-way Stopcock for use with above as shown in illustration of No. 22604. 3.00
22620. **Burette, Morse, 1 cc,** for small quantities, with stopcock attached 6.00
22624. **Burette Caps, of glass.** Outside diameter of burette must be given in ordering.
- | | | | |
|------------------------------|-----|-----|-----|
| To fit burettes, cc. | 25 | 50 | 100 |
| Each | .05 | .08 | .10 |
22628. **Burette Float, Erdmann**25
22632. " " **Vollhard, with glass points to prevent sticking to walls of burette**40
22636. " " **Beutel**35
22640. **Burette Funnel.** A small glass funnel convenient for use in filling burettes.10



No. 22641 and 22645

22641. **Burette Meniscus Reader, Göckel.** With glass plate.75
22648. " " " " Without glass plate.60



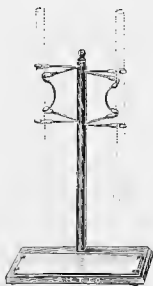
No. 22660 No. 22672 No. 22664 No. 22680 No. 22668 No. 22684 No. 22672 No. 22688

BURETTES, Precision, graduated by weighing at 20°C. in accordance with the specifications of the Physikalisch-Technische Reichsanstalt, i. e., with individual control number, time of outflow, all around graduations for the whole centimeters and semi-circular graduations for the fractions, etc. These burettes are offered with our unofficial factory certificate and also with the Physikalisch-Technische Reichsanstalt certificate and control stamp, i. e., the official certificate of the German government.

Precision Burettes with Unofficial Factory Certificate

These certificates are made out in the factory in exact accordance with the methods prescribed by the Physikalisch-Technische Reichsanstalt and no burette is certified unless the error falls within the limit permitted by the Physikalisch-Technische Reichsanstalt. The data on these certificates may be used as a check where burettes are calibrated in the laboratory or with entire reliance upon the accuracy of the figures given.

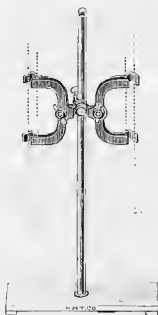
22660.	Burettes, Precision, with pinchcock, rubber tubing and glass tip, graduated in accordance with the requirements of the P. T. R. at 20° C and with unofficial factory certificate.			
	Size.....	25 cc in $\frac{1}{10}$ ths	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths
	Each.....	1.75	3.00	4.00
22664.	Burettes, Precision, with straight glass stopcock, graduated in accordance with the requirements of the P. T. R. at 20° C and with unofficial factory certificate.			
	Size.....	25 cc in $\frac{1}{10}$ ths	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths
	Each.....	2.70	4.00	6.00
22668.	Burettes, Precision, with glass stopcock set on at an angle, graduated in accordance with the requirements of the P. T. R. at 20° C and with unofficial factory certificate.			
	Size.....	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths	
	Each.....		4.00	6.20
22672.	Burettes, Precision, with three way glass stopcock, graduated in accordance with the requirements of the P. T. R. at 20° C and with unofficial factory certificate, size 50 cc in $\frac{1}{10}$ ths.....			4.60
	Precision Burettes with official Physikalisch-Technische Reichsanstalt Certificate			
	These Burettes are exactly the same as those described above in workmanship and accuracy but are furnished with the P. T. R. certificate and control stamp, for which a higher price must be charged because of the German government fee.			
22676.	Burettes, Precision, with pinchcock, rubber tubing and glass tip, with P. T. R. certificate.			
	Size.....	25 cc in $\frac{1}{10}$ ths	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths
	Each.....	5.25	6.15	7.85
22680.	Burettes, Precision, with straight glass stopcock, with P. T. R. certificate.			
	Size.....	25 cc in $\frac{1}{10}$ ths	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths
	Each.....	6.15	7.00	9.65
22684.	Burettes, Precision, with glass stopcock set on at an angle, with P. T. R. certificate.			
	Size.....	50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths	
	Each.....		7.00	9.65
22688.	Burettes, Precision, with three-way glass stopcock, 50 cc. in $\frac{1}{10}$ ths; with P. T. R. certificate.....			7.85



No. 22692



No. 22700



No. 22708



No. 22728



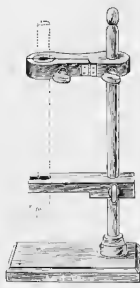
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No. 22740



No. 22744

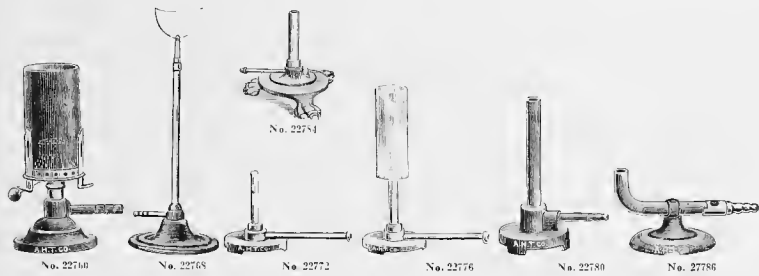


No. 22716

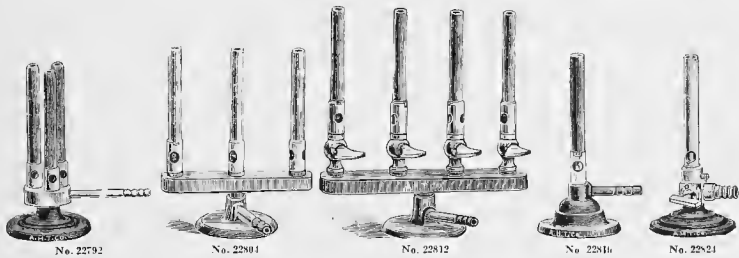


No. 22720

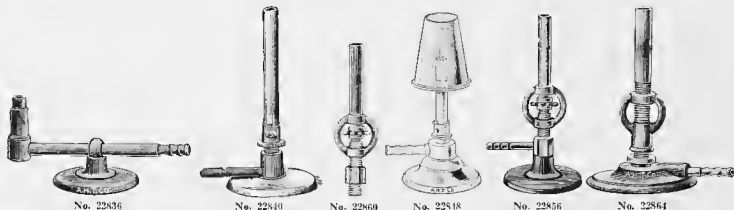
22692. Burette Support, Chaddock, with rubber lined wire clamps for holding the burette which is readily placed in position or removed by simply springing back the wire. The rod and base are of polished wood and a piece of milk white glass is fastened on the base. For two burettes... 1.50
22696. Burette Support, same as above, but for one burette... 2.50
22700. Burette Support, consisting of rectangular base No. 37668, medium size and adjustable clamp No. 24534... .80
22704. Burette Support, consisting of porcelain base No. 37680 and brass clamp for one burette, No. 24554... 5.25
22708. Burette Support, consisting of porcelain base No. 37684 with brass rod in center and brass clamp No. 24558 for two burettes... 7.00
22712. Burette Support, of wood, with cork lined clamp, for one burette... 1.00
22716. " " " " same as above but with an extra arm to keep the burette steady... 1.40
22720. " " " " with cork lined clamp, for two burettes... 1.25
22724. " " " " same as No. 22720 but with double arm to keep the burettes steady... 1.50
22728. " " " " with round porcelain base, brass rod adjustable as to height and revolving clamps, for four burettes... 7.50
22732. Titration Outfit, consisting of wooden support and two burettes, 2 aspirating bottles of 1 liter capacity and rubber connections, pinchcocks, etc., as shown in illustration. Complete... 8.25
22736. Support, only, without glassware... 6.00
22740. Burette Support, consisting of rectangular base No. 37672, with rod in center and No. 24542 clamp for two burettes... 1.25
22744. Burette Support, consisting of automatic burette clamp No. 24570 for two burettes and new form of support permitting the use of same in the vertical position and also in a horizontal position by hanging the base plate on the wall by means of aperture provided... 3.75
22748. Burette Support, as above but for one burette... 5.00



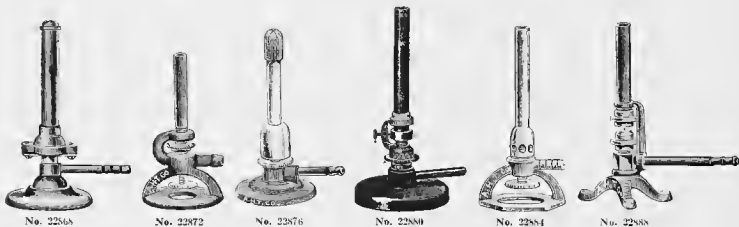
- 22760. Burner, Argand, with lava lip and sheet iron chimney. Flame is adjustable and can be turned very low. 1.00
 - 22764. Glass Chimney for use with No. 22760 Burners, with clamp to attach to burner.15
 - 22768. Burner, consisting of an ordinary gas jet with 12 inch stem on heavy iron base. Very convenient in laboratory. 1.00
 - 22772. Burner, Micro, for obtaining a small flame; $2\frac{1}{2}$ high, nickel plated, with long inlet tube. Very suitable for use with paraffine baths, etc. 50
 - 22776. Burner, Micro, same as No. 22772 but with glass chimney. 1.00
 - 22780. Burner, with circular draft; without air regulator; will not clog because of any substance falling in tube. Height 5 inches, diameter of tube $\frac{3}{8}$ inch.35
 - 22784. Burner, Micro, consisting of a brass tube on bronze base with air inlet underneath, height 3 inches, diameter of tube $\frac{3}{8}$ inch. A very convenient and economical burner for the laboratory table where great heat is not required.25
 - 22786. Burner, Bunsen, low form. Height 3 inches diameter of tube $\frac{1}{8}$ inch.50
 - 22787. " " low form, same as No. 22786 but larger and heavier. Height $4\frac{1}{2}$ inches.
- | | | | | |
|------------------|---------------|---------------|---------------|------|
| Diameter of tube | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | 1 |
| Each | 1.30 | 1.50 | 1.75 | 3.00 |



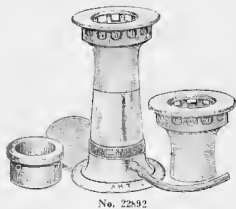
- 22788. Burner, Bunsen, multiple, with two tubes. 1.25
- 22792. " " " " three " " 1.50
- 22796. " " " " four " " 2.00
- 22800. " " " " six " " 2.75
- 22804. " " " " three tubes in straight line. 2.00
- 22808. " " " " four " " " " 2.40
- 22812. " " " " " " " " with individual stopcocks. 4.50
- 22816. Burner, Bunsen, with laquered brass air regulator. This is a superior burner to the ordinary Bunsen in both construction and finish. Height 6 inches, diameter of tube, $\frac{1}{8}$ inch.25
- 22820. Burner, Bunsen, same construction as No. 22816 but with tube $\frac{1}{4}$ inch in diameter giving a much larger flame.40
- 22824. Burner, Bunsen, with pilot flame and stopcock. 2.00



22836. Burner, Bunsen, improved low form. 1.15
 22840. Burner, Bunsen, improved form with gas regulator in addition to air regulator. Superior to the ordinary Bunsen in that perfect combustions may be had at all times. Height 6 inches, diameter of tube $\frac{1}{8}$ inch. 1.15
 22844. Burner, Bunsen, Royal Berlin Porcelain, with air regulator. 2.00
 22845. " " " " " as above, with porcelain chimney as shown in illustration. 3.50
 22852. Extra Porcelain Burner Tube.50
 22856. Burner, Adjustable, improved form, with regulators for both gas and air, for either coal or gasoline gas. Height 6 $\frac{1}{2}$ inches, diameter of tube $\frac{1}{8}$ inch. 1.25
 22860. " " " same as No. 22856 but without base. Fitted with thread. 1.15
 22864. Burner, Detroit, suitable for either gasoline gas or coal gas. Height 6 inches, diameter $\frac{1}{8}$ inch. 1.00



22868. Burner, Acetylene, designed especially for acetylene gas and not suitable for use with either coal or gasoline gas. Height 6 inches, diameter of tube, $\frac{1}{8}$ inches. 1.50
 22872. Burner, Boyce Adjustable, suitable for coal or gasoline gas; with separate regulators for gas and air supply. A popular, low priced adjustable burner giving great satisfaction75
 22876. Burner, Boyce Acme Safety, for either coal or gasoline gas, with regulator for both gas and air. Gives perfect combustions with high or low flame and can not strike back under any circumstances. A very satisfactory burner. 1.50
 22880. Burner, Adjustable, for burning any kind of gas. Works very well with gasoline gas. 1.25
 22884. Burner, Tirrill, made entirely of brass, for use with either coal or gasoline gas. Adjustable for both gas and air. A very satisfactory burner. 1.00
 22888. Burner, Universal, adjustable for gas and air. Works well with either acetylene, natural, coal or gasoline gas 1.00



22892. Burner, Chaddock. A clean, non-corrodible and durable burner. Specially recommended for use where metallic burners are unsuitable because of corrosion. Complete with air regulator, support for dishes, chimney for triangle and three asbestos pads 2.00



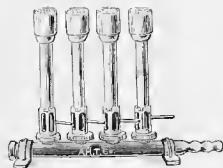
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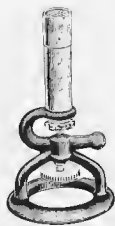
No. 22900



No. 22904



No. 22808



No. 22912

22896.	Burner, Teclu, with regulator for gas and air, gives a large and powerful flame.			
	Height, inches.....	6	7 $\frac{1}{2}$	
	Diameter of tube, inches.....	$\frac{1}{2}$	$\frac{1}{4}$	
	Each.....	1.25	2.00	
22900.	Burner, Fletcher Safety, of brass with gauze top to prevent striking back. Complete with brass base.			
	Height, inches.....	4 $\frac{1}{2}$	5 $\frac{1}{4}$	7
	Diameter at top, inches.....	$\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$
	Each.....	2.15	2.60	3.10
22904.	Burner, High Temperature, a new burner of the grid top type with gas and air regulation. Equal in performance to any burner of this type.			
	Diameter of top, inches....	$\frac{3}{4}$	1	1 $\frac{1}{8}$
	Each.....	1.00	1.50	2.00
22908.	Burner, Quadruple, High Temperature, consisting of four high temperature burners as above mounted on base with supply pipe.			15.00
22912.	Burner, Sargent's High Temperature, a burner of the grid type, with adjustment for gas and air, with large tube and grid top.			
	Diameter of grid top, inches	$\frac{3}{4}$	1	1 $\frac{1}{4}$
	Each.....	1.00	1.50	1.75



No. 22916



No. 22920

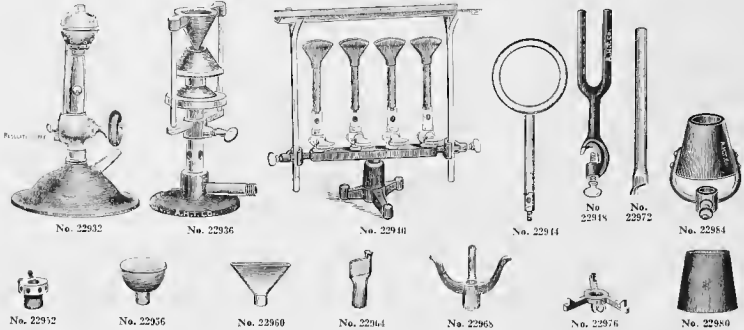


No. 22924



No. 22928

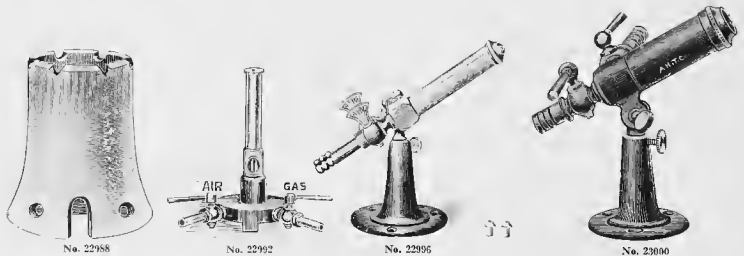
22916.	Burner, Scimitar Patent. Constructed upon the Meker principle with a metal grid $\frac{1}{8}$ inch deep at top. Adjustable for both gas and air and can be used with any kind of gas.				
	Diameter of flame, mm.....			25	30
	Each.....			2.10	2.50
BURNERS. BLUE FLAME, for high temperatures with great economy of gas. This is the latest development of the grid top type of burner, giving greatly increased heating power and an absolutely homogeneous flame, all of which is available for heating from the top of the burner to the extreme point. The gas regulating device permits its use with any quality of gas delivered at any pressure and permits regulation from the maximum to the smallest flame without back-firing. This burner is supplied in five sizes and also on adjustable support and with blast attachment. With blast attachment a temperature exceeding 1700°C is obtained.					
22920.	Burner, Blue Flame, as above described.				
	Diameter of grid top, mm.....	19	22	25	31
	Each.....	1.00	1.60	2.00	2.50
22924.	Burner, Blue Flame, as above, but with patent universal joint for maintaining the burner in vertical, horizontal or inclined position.				
	Diameter of grid top, mm.....				19
	Each.....				3.00
22928.	Burner, Blue Flame, as above, with blast attachment				
	Diameter of grid top, mm			22	31
	Each.....			2.50	3.80
					43
					5.00



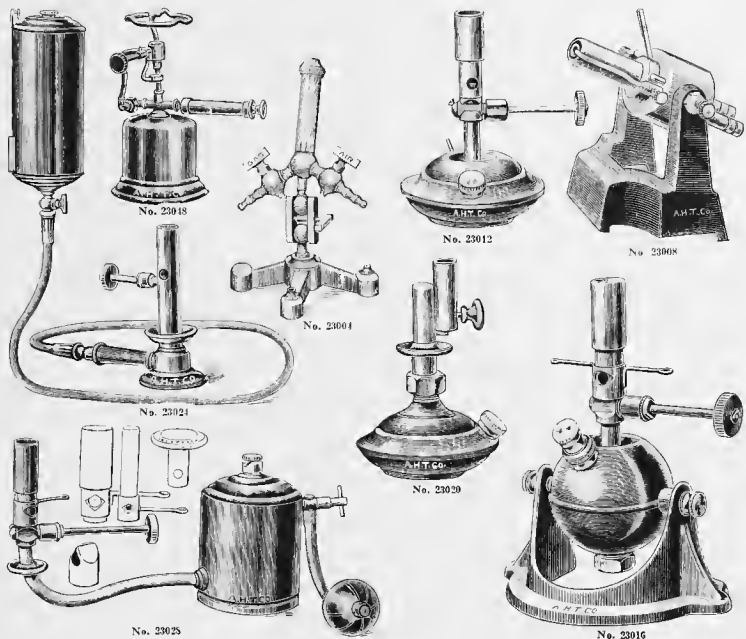
22932.	Burner, Eureka, self-lighting, height 6½ inches, diameter of flame tube ¾ inch	2.00
22936.	Burner, Greenman, for use with the Greenman Thermo-regulator	9.00
22940.	Burner, Quadruple, for combustion tubes, each burner with air regulator, stopcock and wing tip, with adjustable support for the combustion tube	7.50
22944.	Burner, Bunsen Ring Form. For use on apparatus support for heating funnels, flasks, etc. With air regulator.	
	Diameter of ring, inches.	3 4 5 6 8
	Each	1.25 1.50 1.75 2.00 2.50

Burner Attachments

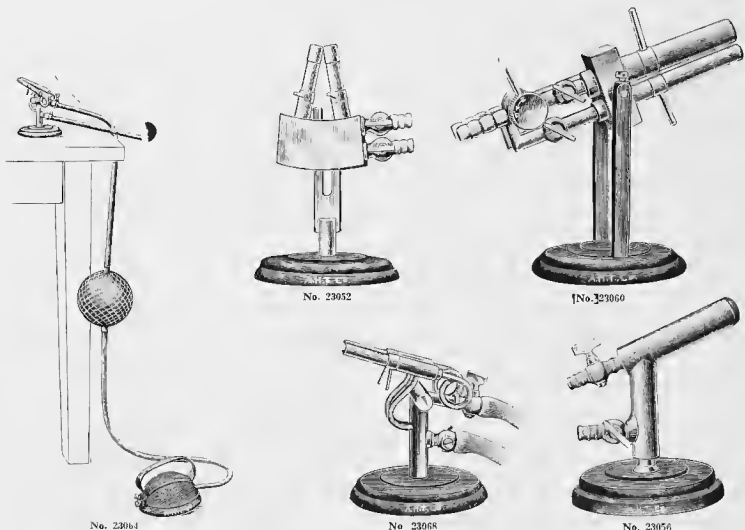
22948.	Support, fork shaped, for attaching to support. To hold Bunsen Burners .....	.25
22952.	Crown Top for Burners, giving round flame, suitable for heating small dishes. ....	.40
22956.	Gauze Top for Burners, giving large round flame .....	.25
22960.	Wing Top for Burners, giving a broad flat flame very suitable for bending glass tubing .....	.10
22964.	Blowpipe Tip for Burners, giving a flat flame, with rest for blowpipe .....	.15
22968.	Tripod for Burners, for supporting small dishes, etc., directly over flame.	
	Size	Small Large
	Each .....	.15 .20
22972.	Tube for Burners, to fit inside of the burner for giving yellow flame for blowpiping .....	.15
22976.	Star for Burners, to support chimney, etc. ....	.20
22980.	Chimney of metal, for use on burners in connection with star No. 22976 .....	.10
22984.	“ of iron, with support attached .....	.40



22988.	Guard for Burners, of vitrified earthenware, 9 inches high, 8 inches diameter at bottom and 5 inches diameter at top. Protects the flame from drafts and forms a rigid non-corrosive support .....	.35
22992.	Burner, Bunsen Blast, with separate cocks for blast and gas supply. The blast is directed at the mouth of the burner by a small tube which aids as a powerful blowpipe. Can be used as an ordinary Bunsen burner and blast turned on only when desired. Height 6½ inches	3.50
22996.	Burner, Bunsen Blast, for use with gas and air pressure, new pattern. On adjustable stand with separate cocks for blast and gas, and with three tips	3.50
23000.	Burner, Bunsen Blast, improved form, extra large size for use with gas and air blast. On adjustable stand with two tips	8.00



23004. Burner, Blast, French form. mounted on universal joint on tripod, with separate cocks for gas and pressur..... 5.00
23008. Burner, Compound Blast. An improved Burner of the Fletcher type, furnishing a flame from a finely pointed jet to a large powerful blast. One lever adjusts air and gas automatically. With pilot light..... 10.00
23012. Burner, Barthelemy, Automatic, for benzene. Burns 90 minutes with full flame on one charge. Will melt copper wire 3 mm in diameter in 45 seconds. Use benzene from sp. gr. 0.67 to 0.71..... 4.50
23016. Burner, Barthelemy, Automatic, for benzene, on tilting mount. Burns two hours with full flame on one charge. Melts copper wire 4 mm diam. in 1½ minutes. Flame may be placed at any angle. Very convenient for bending glass tubing, etc., in the laboratory. Use benzene of sp. gr. 0.67 to 0.71..... 8.00
23020. Burner, Barthelemy Automatic, for alcohol. Burns 90 minutes with blue, smokeless flame on one charge. Melts copper wire 3 mm diameter in 1½ minutes..... 4.40
23024. Burner, Barthelemy Automatic, for alcohol. Produces a perfectly blue flame without smoking somewhat hotter than the flames of ordinary gas burners. Considered the best alcohol burner made. Price includes burner. 5 ft. of metallic tubing and reservoir.
- | | | | |
|-----------|-------|--------|--------|
| Size..... | Small | Medium | Large. |
| Each..... | 6.00 | 8.50 | 10.00 |
23028. Burner, Barthelemy Automatic, for benzene. A blast burner with perfect combustion giving a temperature of about 1400° C. This burner is smokeless and odorless and absolutely safe. Used with flame tubes of three sizes producing a benzene blast or cooking flame. Regularly furnished with medium size flame tube—21 mm diameter..... 7.50
- | | | | |
|---|-----|-----|------|
| Extra Flame Tubes for No. 23028 Burner. Number..... | 1 | 2 | 4 |
| Each..... | .50 | .70 | 1.00 |
23036. Rose Top Burner for No. 4 Tube..... 1.00
23040. Wing Top Burner to fit any size tube..... .25
23044. Burner, Barthelemy Automatic, for Benzene, as above but with metallic force pump and pressure gauge. 9.50
23048. Burner, Blast, for gasoline. With flame adjustable from very small to five or six inches. Will burn about 1½ hours at full blast on one charge. With swivel burner and removable tripod. Reservoir 3¼ x 4 inches, capacity 1 pint. Nickel plated..... 4.75



23052. **Burner, Blast**, with two darting needle point flames, for sealing vials, ampoules, serum tubes, etc. On heavy base with adjustment for gas and air and for use with flame in vertical position. 6.00
23056. **Burner, Blast**, Thuringian glass-blower's model, with ball bearing socket, on heavy base, all parts hard soldered, with gas tube of 7 mm. 3.50
23060. **Burner, Blast, Janus Improved**, as used in the German glass blowing industry for making stopcocks, Roentgen tubes, etc. A very practical blast burner for chemical laboratories as by a simple turn either a thin needle pointed flame or a large roaring flame of varying sizes, is obtained. Each burner tube has independent regulation for gas and air and one may be operated independently of the other. Diameter of large tube 7 mm, of small tube 5 mm. 10.00
23064. **Burner, Blast**, double tube, with foot blower. A new form designed particularly for the sealing of vials, ampoules and tubes containing various biological products where instantaneous sealing is important. The ordinary blast burner is unsatisfactory for this purpose because of the improper shape and size of the flame and its unsteadiness, noise and great consumption of gas and air. This new burner has two darting needle point flames which meet and form one blade shaped flame which instantly seals small tubes. By regulation of the gas and air this blade shaped flame can be retained at any desired length. In sealing 1 cc ampoules only $\frac{1}{2}$ cu. ft. of gas per hour is required. The use of this burner permits the sealing of the ampoules so quickly that no heat reaches the contents, an important feature where the vial or ampoule contains camphor, ether or concentrated solutions easily carbonized or with chemicals of a low boiling point such as ether, ethyl chloride, etc. With small foot blower and bulb as shown in illustration. 10.00
23068. **Burner, Blast**, only as above, without blower or bulb. 5.00



No. 23072

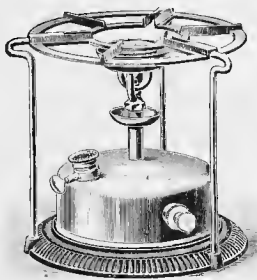


No. 23076

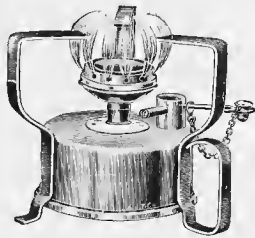
23072. **Burner, Evaporating**, of cast iron. Very convenient for heating glass and porcelain vessels as no cold air can reach the hot part of the dish. Flames are blue and smokeless
- | | | | |
|------------------|------|------|-----------------|
| Diameter, inches | 4 | 5 | 6 $\frac{1}{2}$ |
| Each | 1.00 | 1.25 | 2.00 |
23076. **Burner, Evaporating**, same as No. 23072 but made of solid copper with lap joints joined without solder.
- | | | | |
|------------------|------|------|-----------------|
| Diameter, inches | 4 | 5 | 6 $\frac{1}{2}$ |
| Each | 1.50 | 2.00 | 2.50 |



No. 23080



No. 23084



No. 23092

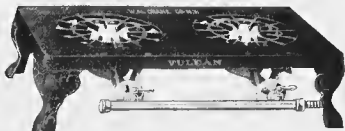
23080. Burner, Dangler, for gasoline. Under ordinary pressure a temperature of 1100° F. is obtained. Complete with copper reservoir. 8.60
23084. Burner, Hydro Carbon, burning vaporized kerosene which is automatically generated as fast as needed from ordinary kerosene; gives a hot blue flame without smoke or smell; height 8½ inches, diameter of base 9 inches. Without stand as shown in illustration. 4.00
23088. Stand, for above burner, with top 8½ inches in diameter.50
23092. Burner, Alcohol, of brass, nickel plated; guaranteed to be smokeless, odorless and safe; will boil 1 quart of water in 8 minutes; dimensions 4½ x 4½ x 8 inches. 1.00



No. 23096

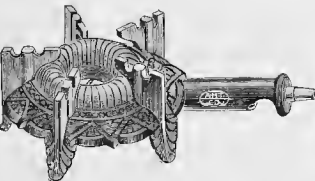


No. 23104



No. 23108

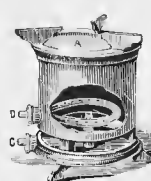
23096. Burner, Gas, 3½ inches high, 6 inches in diameter. For ordinary or gasoline gas. Please specify in ordering.60
23104. Burners, Gas, of cast iron, low form, 4½ inches high, fitted with double burner. Diameter, inches. 6½ 7½ 8½
- Each. 1.00 1.15 1.25
23108. Burner, Gas, with two radial burners and rings set flush with smooth top. Dimensions of top 11½ x 21 inches. For ordinary or gasoline gas. Please specify in ordering. 3.00



No. 23112

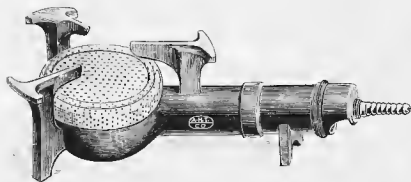


No. 23120



No. 23124

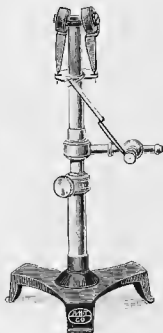
23112. Burner, Fletcher Radial. Made entirely of annealed cast iron, giving a solid flame when in use without tendency to run to a point in the center. Convenient for general laboratory work. Diameter, inches. 3½ 5
- Each. 1.50 2.00
23116. Burner, same as No. 23112 but with cap-nut regulator. For use with gasoline gas. Diameter, inches. 3½ 5
- Each. 1.80 2.30
23120. Burner, Low Form, extra large, with gauze top; height 5 inches, diameter of gauze 2½ inches, length 14 inches. A very powerful burner. 2.00
23124. Burner, for Low Temperatures, adjustable from a gentle current of warm air to a clear red heat, dispensing with the use of sand baths, water baths, etc., and well adapted for drying, evaporating, boiling, etc. For very low temperatures the ring must be lighted through opening "B." Style. Without Blast Pipe "C" With Blast Pipe "C"
- Each. 1.75 2.00



No. 23128



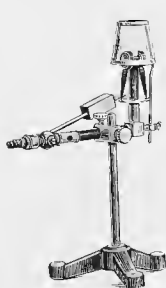
No. 23140



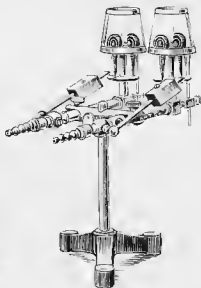
No. 23144



No. 23156



No. 23148

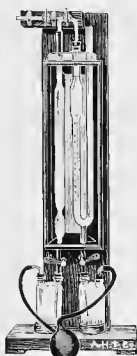


No. 23152

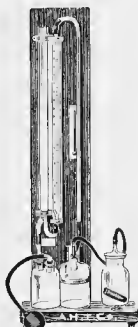


No. 23164

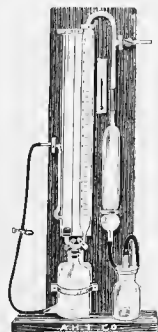
23128. **Burner, Fletcher's Solid Flame.** Will boil quickly four or five gallons of water or keep a small vessel boiling steadily by simply turning the gas low.
 Diameter of flame surface, inches..... 3½ 4½
 Each..... 1.00 2.00
23132. **Burner,** same as No. 23128 but with cap-nut regulator. For use with gasoline gas.
 Diameter of flame surface, inches..... 3½ 4½
 Each..... 1.30 2.30
23136. **Extra Perforated Copper Cap** for use with Burners No. 23128 and No. 23132.
 Diameter, inches..... 3½ 4½
 Each..... .30 .35
23140. **Burners, Koch Safety.** With automatic stopcock to close off the gas when flame is extinguished. Of improved construction with spring control and very superior to those in general use. With threaded inlet for attachment of flexible metallic tubing.
 Height, inches..... 5 6
 Diameter of tube, inches..... 7/8 1
 Each..... 5.00 6.50
23144. **Burners, Koch Safety.** Same as No. 23140 but adjustable for height.
 Height, inches..... 9 10
 Adjustable to, inches..... 13 14
 Each..... 7.50 8.50
23148. **Burner, Koch Safety,** with weight instead of spring release. On a stand providing both horizontal and vertical adjustment; with mica chimney to protect flame from drafts. Very superior in operation to the imported article of same description and made here because of dissatisfaction with those of foreign make..... 10.00
23152. **Burner, Koch Safety,** same as No. 23148 but with two burners. Complete on adjustable stand and with two mica chimneys..... 17.50
23156. **Flexible Copper Tubing,** specially arranged to connect above Koch Burners with our American Standard Incubators, Paraffine Ovens, etc. With ½ inch i. p. size coupling at each end which connects with thread regularly supplied on burners and on the connecting tubes of our American Standard Incubators..... 1.00
23160. **Burner, Barthel,** for denatured alcohol; enamelled finish, with brass reservoir; smokeless, economical and a satisfactory substitute for the gas stove in laboratory work where no gas supply is available. With one burner..... 4.50
23164. **Burner, Barthel,** same as above, with two burners and one brass reservoir..... 8.50



No. 23168



No. 23184



No. 23188

- 23168. Calcimeter, Scheibler, for the determination of carbonic acid in boneblack, etc. Complete..... 25.00
- 23172. Bottles with special glass stopper with tubulation..... .80
- 23176. Rubber Caps..... .50
- 23180. Balloons of thin rubber..... .65
- 23184. Calcimeter, Scheibler, for the determination of carbonic acid in saturated gases, complete..... 32.00
- 23188. Calcimeter, Scheibler-Finkener, as used for determination of carbonic acid in marble, limestone, etc.; complete with thermometer and barometer..... 28.00



No. 23192



No. 23196



No. 23200



No. 23204



No. 23212



No. 23216 No. 23220 No. 23224

23192.	Calcium Chloride Cylinder, narrow mouth, on foot, with tubulature near bottom.					
	Height, mm.....	210	260	315	350	420
	Diameter, mm.....	25	40	45	50	55
	Each.....	.50	.60	.75	.90	1.10
23196.	Calcium Chloride Cylinder, wide mouth, on foot, with tubulature near bottom.					
	Height, mm.....	210	260	315	350	420
	Diameter, mm.....	25	40	45	50	55
	Each.....	.50	.60	.75	.90	1.10
23200.	Calcium Chloride Cylinder, with perforated glass stopper and side tubulation at top.					
	Height, mm.....					225
	Diameter, mm.....					40
	Each.....					2.00
23204.	Calcium Chloride Glass Support, to prevent the calcium chloride from falling into the lower chamber					.30
23208.	Calcium Chloride Holder, for balance cases.....					.75
23212.	Calcium Chloride Drying Tube, La Motte.....					.50
23216.	Calcium Chloride Tubes, straight, with one bulb.					
	Length, mm.....	100	125	150	200	250
	Each.....	.10	.10	.12	.15	.20
23220.	Calcium Chloride Tubes, straight, with two bulbs. Length, mm.	100	125	150	200	
	Each.....	.10	.12	.15	.20	
23224.	Calcium Chloride Tubes, with two bulbs, and inner tube to collect moisture.					
	Length, mm.....	100	125	150	200	
	Each.....	.15	.18	.20	.25	



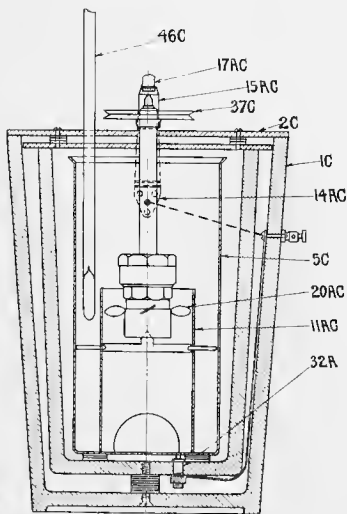
23228.	Calcium Chloride Tubes, U-shaped.							
	Length, mm.	75	100	125	150	175	200	250
	Each	.13	.15	.18	.20	.23	.28	.35
23232.	Calcium Chloride Tubes, U shaped, with two side tubes.							
	Length, mm.				100	120	150	180
	Each				.15	.20	.22	.30
23236.	Calcium Chloride Tubes, Vollhardt, with two side tubes and bulb						125	150
	Length, mm.							200
	Each						.30	.35
23240.	Calcium Chloride Tubes, Peligot, with three bulbs							
	Length, mm.				100	125	150	180
	Each				.30	.35	.45	.60
23244.	Calcium Chloride Tubes, with ground in outlet tubes.							
	Length, mm.						100	125
	Each						.50	.65
23248.	Calcium Chloride Tubes, Marchand.							
	Length, mm.						100	120
	Each						.25	.30
23252.	Calcium Chloride Tubes, Schwartz, with side tubes and perforated glass stoppers.							
	Length, mm.				100	120	150	180
	Each				.90	1.00	1.15	1.50



View in Salesroom showing special stands for Distilling Flasks, Retorts, Beakers, Museum Jars, etc.



No. 23300



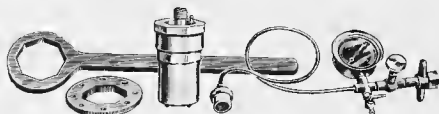
No. 23300—Sectional View

CALORIMETER, PARR STANDARD. The marked features of this method are accuracy, simplicity, ease and rapidity of manipulation. The results are absolute and not relative. The operations are such as can be carried on by one not specially skilled in laboratory processes. Oxygen under high pressure or any pressure is not used. The time consumed in conducting a test on a weighed and dried sample should not exceed fifteen or twenty minutes. Sodium Peroxide is used as the combustion medium. The CO_2 and H_2O formed in the reaction are at once absorbed by the chemical giving a solid residue instead of gaseous products. It will at once be seen that the apparatus required is simple in construction and easy of manipulation.

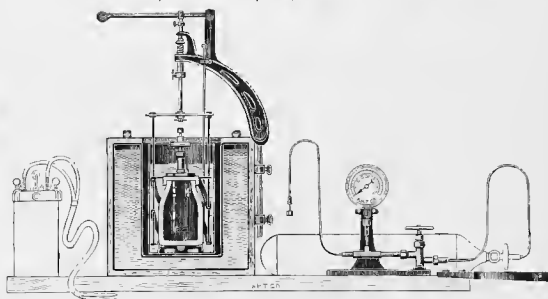
- | | | |
|--------|--|--|
| 23300. | Calorimeter, Parr Standard, as above described complete for Electric Ignition, complete for either lighting circuit or battery, with special thermometer $65-90^\circ \text{F}$. graduated to $\frac{1}{5}^\circ \text{F}$. with Bureau of Standards certificate, 2 liter measuring flask, chemical receptacle, measuring cup, 5 inch 100 mesh brass sieve with bottom, chemical sufficient for fifty determinations, pincers, ignition wires reading lens with support, camels hair brush, etc. | 75.00 |
| 23308. | Reading Lens, for reading the divisions on the thermometer. This lens uses the thermometer stem for its support, thereby maintaining the same angle of vision for all points on the scale, without support. | 2.00 |
| 23310. | Reading Lens, same as No 23308 but with support. | 3.00 |
| 23314 | Rank of Resistance, for use when igniting the charge of the Electric Ignition bomb. The 110 volt outfit includes five lamp sockets, wired up in parallel together with switch and fuse block and for 220 volt two lamp sockets in series and five in parallel, with same accessories. | |
| | Voltage..... | 110 volts 220 volts |
| | Each | 5.00 5.50 |
| 23318. | Water Motor and support | 5.00 |
| 23322. | Electric Motor, variable speed for either A.C. or D.C. voltage must be specified. | 12.00 |
| 23338. | Bomb, Electric Ignition, complete with wrench | 30.00 |
| 23346. | Thermometer, as supplied with the outfit, $65-90^\circ \text{F}$. in $\frac{1}{5}$ ths with B. of S. certificate. | 10.00 |
| 23350. | Special Thermometer, $65-105^\circ \text{F}$. same as above. | 15.00 |
| 23354. | Accelerator, 2 oz. bottle | .50 |
| 23358. | Barium Oxalate, 2 oz. bottle | .50 |
| 23362. | Gaskets for bomb, per dozen | .25 |
| 23366. | Hydrone, 2 lb. can | 1.75 |
| 23370. | Special Chemical, 2 oz. bottle | .75 |
| 23374. | Sodium Peroxide, a special grade. Size of can | $\frac{1}{4}$ lb. $\frac{1}{2}$ lb. 1 lb. |
| | Each | .65 1.25 2.00 |



No. 23378



No. 2337A—Bomb, assembled with Spanner, Socket, Gauge and Oxygen Connection

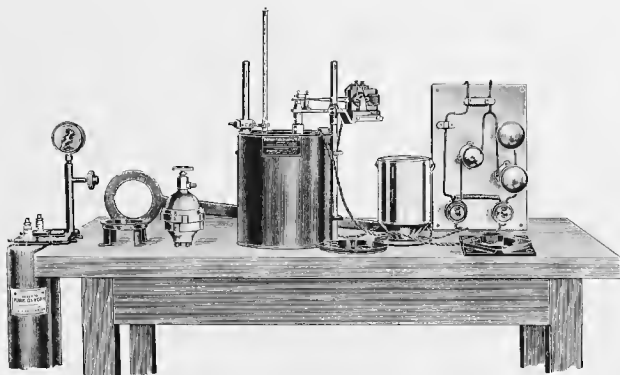


No. 23446

23378. **Calorimeter, Parr Oxygen Bomb.** The new features consist of a bomb of a new acid resisting alloy superior in strength to the best tool steel and which obviates the use of any platinum or enamel lining; the use of rubber gaskets in place of lead and a new automatic oxygen valve. Complete with bomb, water container, insulating vessel with cover, stirrer and pulley, oxygen connection with gauge, needle valve and couplings, octagon holder for bomb, ring support for holding calorimeter covers with thermometer spanner wrench electric motor with variable speed, direct or alternating, one-half dozen capsules of special alloy, thermometer graduated in $\frac{1}{2}^{\circ}$ F., with U. S. Bureau of Standards certificate, reading lens and support, special ignition wire and gaskets..... 300.00

Accessories for Parr Oxygen Bomb Calorimeter.

23382.	Bomb only. Of acid resisting alloy.....	175.00
23386.	Water Container.....	10.00
23390.	Insulating Vessel with cover, stirrer and pulley.....	45.00
23394.	Oxygen Connection with gauge, needle valve and couplings.....	26.00
23398.	Octagon Holder for Bomb, with spanner wrench.....	10.00
23402.	Electric Motor with variable speed, direct or alternating.....	12.00
23406.	Special Thermometer, as regularly supplied with the outfit, 65-90° F., graduated in $\frac{1}{2}^{\circ}$ F. with U. S. Bureau of Standards certificate.....	10.00
23410.	Reading Lens and support.....	3.00
23414.	Ring Support for holding calorimeter covers with thermometer.....	2.00
23418.	Special Ignition Wire, per card.....	.50
23422.	Large Gaskets for Bomb, per dozen.....	.75
23426.	Small Gaskets for Valve, per dozen.....	.75
23430.	Small Gaskets for Union, per dozen.....	.25
23434.	Beckman's Differential Thermometer, graduated to 100° C. with P. T. R. Certificate of Standardization.....	25.00
23438.	Capsules (special alloy) $\frac{1}{2}$ dozen.....	6.00
23442.	Bench with hinged top and locking device for oxygen cylinder. Blue print for constructing bench will be sent free on request.....	18.00
23446.	Calorimeter, Mahler Bomb, original French make, constructed under the supervision of the author. A standard instrument throughout the world. With enamelled steel bomb, stirring apparatus, platinum tray, etc., but without thermometer, oxygen cylinder and primary battery as shown in illustration. (Price subject to variation because of platinum market). Duty Free..... 248.75 Stock..... 300.00	300.00
23450.	Thermometer, original French make for use with above, + 8 to + 19° C. in $\frac{1}{3}$ ths.....	22.50
23454.	Thermometer as above, + 18 to + 29° C. in $\frac{1}{3}$ ths.....	22.50
23458.	Thermometer as above, + 14 to + 25° C.....	22.50



No. 23470

CALORIMETER, EMERSON FUEL. This is a calorimeter of the so-called "bomb" type, with its essential elements of operation the same as the original Berthelot type. It, however, embodies improvements in design over the older types of bomb calorimeters which tend to increase the durability of the instrument and greatly facilitate its operation.

The bomb is made of steel, consisting of two cups joined by means of a heavy steel nut. The two cups are machined at their contact faces with a tongue and groove, the joint being made tight by means of a lead gasket inserted in the groove. The lining is of sheet metal spun to fit the interior. The bomb is made up tight, with a milled wrench or spanner. The pan holding the combustible is of platinum or nickel. The fuse wire should be platinum in general fuel testing. In standardizing the calorimeter by means of cane sugar, benzoic acid, etc., it is necessary to use iron fuse wire.

The jacket is a double walled copper tank, between the walls of which water is inserted. The calorimeter bucket is made as light as possible, of sheet brass.

The stirring device consists of a paddle wheel shaft enclosed in a vertical tube to facilitate its action in circulating the water. The stirrer shaft is driven by a belt from a small motor at the other end of the stirrer bracket. The motor is mounted on a sliding plate which permits of a changing position of same to vary the tension on the belt. This varying tension serves to regulate the speed of the paddle shaft by thus varying the speed of the motor. The stirrer is mounted on a post on the calorimeter jacket, as is the thermometer holder. The motor is driven by a 110 volt circuit and should be placed in series with a 16 c.p. lamp. If so desired, a motor driven by a battery can be specified in ordering the apparatus. The battery motor is driven by a six volt storage battery. The Edison-Leland Type of battery is preferred. These motors designed for the 110 volt power circuit may be driven on the other voltage provided that a proper resistance be placed in series so that the current in the circuit is one-half ampere. The motor may be driven by either direct or alternating current.

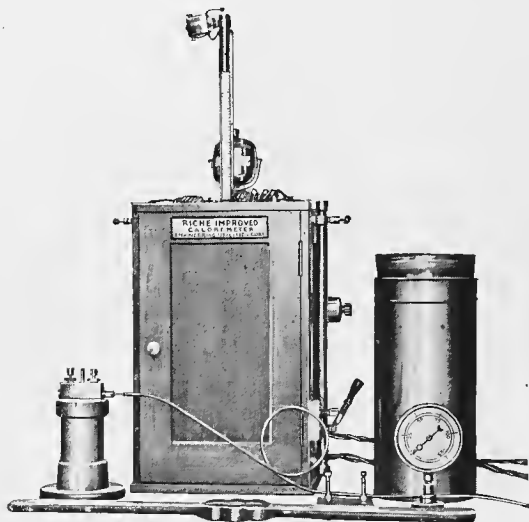
The piping for the insertion of oxygen under pressure is made especially strong and durable. The piping of small internal bore is made of heavy brass. The system is fitted with a hand nipple at one end to make the connection with the bomb, and the other end has a special fitting to grasp the oxygen supply tank. The oxygen piping of the regular Emerson Calorimeter outfit is designed to fit the oxygen cylinders sent out by the S. S. White Dental Mfg. Co. For prices see page 252. Oxygen piping to fit the oxygen cylinders of the Linde Air Products Co. can be specified in ordering the apparatus. The oxygen piping furnished to connect with S. S. White Company's cylinders is designed for two cylinders while that furnished to connect with the Linde Air Product Company's cylinders (which are considerably larger) is designed for only one cylinder. Commercially pure oxygen, free from all traces of combustible gases should be used.

The plate holder or vise is to be used when tightening the nut of the bomb with the spanner.

The table with the rotating top is to hold the bomb when the same is connected to the oxygen piping.

The spanner or wrench is a forging with 30 inch handle and is used to make bomb up with gas tight joint.

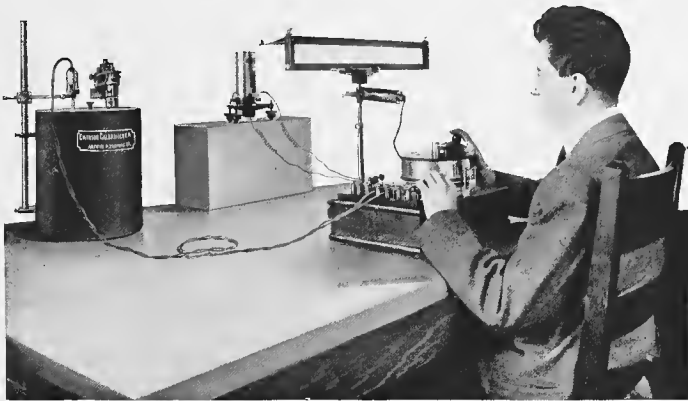
23470.	Calorimeter, Emerson Fuel, as described above, complete with steel bomb with spun nickel lining, calorimeter can, double walled calorimeter jacket, heavy piping leading to oxygen supply tank, high pressure gauge, special holder and spanner, stirrer with motor attached (battery drive can be supplied if desired) nickel pan, thermometer holder, gaskets, etc., but without thermometer.....	180.00
23474.	Calorimeter, Emerson Fuel, same outfit as No. 23470 but with gold lined copper cup instead of nickel.....	275.00
22478.	Calorimeter, Emerson Fuel, same outfit as No. 23470 but with platinum lining. (Price subject to market fluctuation of platinum).....	490.00
23482.	Nickel Lining only for Emerson Fuel Calorimeter.....	12.00
23486.	Motor only for Emerson Fuel Calorimeter.....	8.00
23490.	Thermometer, Beckmann, Goetze make, range 5° to 6° C. in 1/10°, without certificate.....	15.00
23494.	Thermometer, as above, with P. E. R. certificate.....	25.00



No. 23500

CALORIMETER, RICHE IMPROVED ADIABATIC, designed for use in all branches of calorimetric work, i.e., the presence of heat power in coal, food or other commercial products the values of which are materially altered by impurities. The bomb is of the Kröcker type, provided with two outlets so that carbon determinations can be made. The bomb is supported by a hinged ring which is raised and lowered without touching the fingers in the water. The water jacket for the bomb consists of a vacuum cup which insures both isolation and insulation. The stirrer is of the screw propeller type and the rods are insulated by passing through hard rubber with a hard rubber cap screwed on each end. The vacuum cup containing the water is surrounded by an oak box lined with one inch pressed cork glued to the wood. On the cover, in addition to the cork is glued a piece of hair felt one-half inch thick, effecting a tight joint with the top of the vacuum cup. Ignition of the substance in the bomb is accomplished by a current from three 2-volt storage cells. The current first passes through a 3-ampere fuse wire in series with a platinum wire within the bomb itself. The platinum wire is connected with the substance to be burned by means of a linen thread of sufficient size to secure ignition. In making combustions, the substance to be burned is prepared, weighed and placed in the bomb, which, after being charged with 30 to 40 atmospheres of oxygen, is then placed in the split ring and the wires connected. The water in the vacuum cup is brought to any temperature within + or - 5° of the room temperature. The thermometer is adjusted and the motor started. Readings are then taken until the temperature of the water becomes constant. The sample is then ignited by closing the switch and the readings are taken. The heat absorption is complete when the thermometer shows a constant temperature for three successive minutes. When the bomb is removed and opened and rinsed with water, the rinsings are titrated with $\frac{N}{10}$ alkali for nitric acid, using litmus as an indicator. This calorimeter may be used with any of the standard bombs now in use. See *Journal of the American Chemical Society*, November, 1913.

23500.	Calorimeter, Riche Improved Adiabatic, complete with thermometer	225.00
23504.	" " " " " without thermometer	215.00
23508.	" " " " " " or gauge	210.00
23512.	" " " " " " gauge or accessories	150.00



No. 23520

Leeds and Northrup Platinum Resistance Calorimeter Thermometer with Reading Bridge, High Sensibility Galvanometer and Scale in Connection with Emerson Fuel Calorimeter.

CALORIMETER THERMOMETER, LEEDS & NORTHRUP, Platinum Resistance, Bureau of Standards Type.

A platinum resistance thermometer designed to secure an accuracy greater than can be obtained with a mercury thermometer. It is sensitive to temperature changes of .0003°C. or .0008°C. and, therefore, the temperature interval can be read to an accuracy about ten times as great as is possible with mercury thermometers. The bulb of the resistance thermometer is more robust than is a mercury thermometer and is also much quicker in responding to changes in temperature. Its knife-like form, which gives it a maximum of surface with a minimum of volume, practically eliminates thermometer lag. Its range of measurement includes the melting point of ice and the boiling point of water. The electrical method of reading is also well adapted to obtaining radiation corrections through time temperature curves. See "Calorimetric Resistance Thermometers," Bureau of Standards Bulletin, Volume 3.

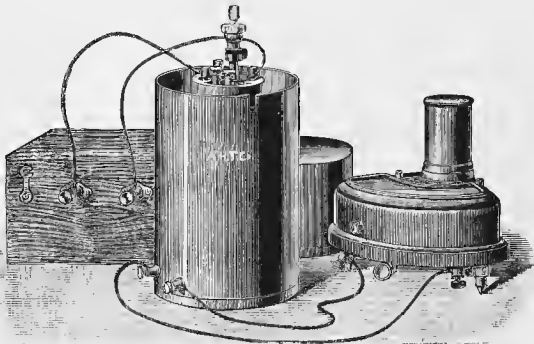
- 23520. Thermometer Outfit, as above, sensitive to .0003°C., consisting of Reading Bridge, uncertified Resistance Bulb, High Sensitivity Galvanometer, Lamp and Scale, but without Calorimeter... 355.00
- 23524. Reading Bridge..... 200.00
- 23528. Resistance Bulb, uncertified..... 40.00
- 23532. " " with certificate of the Bureau of Standards..... 50.00
- 23536. High Sensitivity Galvanometer..... 90.00
- 23540. Lamp and Scale..... 25.00
- 23544. Thermometer Outfit, as above, sensitive to .0008°C., consisting of Reading Bridge, uncertified Resistance Bulb, and Galvanometer with Telescope and Scale, but without Calorimeter..... 244.00
- 23548. Reading Bridge..... 150.00
- 23552. Galvanometer, with Telescope and Scale..... 54.00

Calorimeter Thermometers as above described are used by

- | | |
|---|------------------------------------|
| U. S. Bureau of Standards | Armour Institute |
| U. S. Bureau of Mines | Harvard University |
| U. S. Department of Agriculture, Nutrition Laboratory | Cornell University Medical College |
| U. S. Naval Experiment Station | Pennsylvania State College |
| City of St. Louis | Ohio State University |
| University of Illinois | University of Chili |
| Johns Hopkins University | Ottawa Department of Mines |
| Massachusetts Institute of Technology | Etc., Etc. |

CALORIMETER, ATWATER BOMB, widely used in determining the heating value of feeding stuffs, foods, the adulteration of fats and oils, in addition to coal work. See *Journal of the American Chemical Society, Vol. XXV, No. 7, July, 1903*. The Atwater Bomb Calorimeter can be furnished with complete platinum bomb, at an extra price which must be quoted on application. The regular outfit consists of the following:

- Bomb, with rolled gold plated copper lining for shell and with top nickel lined and nickel supports, complete with one dozen nickel capsules (three sizes), tools, ignition wire, gaskets, etc., for use with bomb..... 150.00
- Clamp, for holding bomb, with spanner..... 15.00
- Support, for holding bomb while changing, manometer, and connections..... 16.00
- Pellet Press and Mold, complete..... 25.00
- Calorimeter Cylinders, complete with water holder, stirrer, thermometer support and electrical connections..... 25.00
- Direct Current Motor, with speed reducing gear..... 20.00
- Alternating Current Motor, with speed reducing gear..... 22.50
- Thermometer Reading Glass..... 6.00
- Electric Tapper, for use with thermometer, complete with batteries, push button and wire..... 5.00
- 23560. Complete Outfit, consisting of the above, without thermometer, with alternating current motor..... 264.50
- 23564. " " " " " " " " direct current motor..... 262.00



No. 23565

CALORIMETER. FÉRY THERMO-ELECTRIC, a new application of the thermo-electric couple to calorimetry, providing the following distinct advantages in the determination of calorific power:—
Direct reading in calories on millivoltmeter scale.

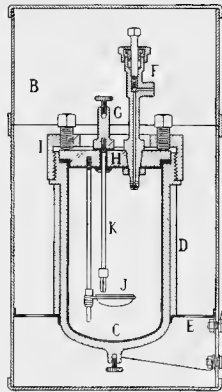
Omission of water jacket, the steel bomb itself constituting the calorimetric mass.

Omission of mercurial thermometer with its attendant difficulty in reading.

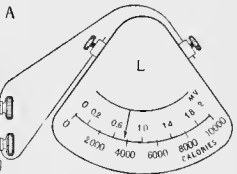
Rapidity of determinations, i. e., 15 minutes.

The bomb proper consists of a steel cylinder lined inside with nickel to prevent oxidation and surrounded on the outside with a close-fitting copper jacket "D." The bomb is supported in an outside copper cylinder "A" by means of constantan disc "E." When the millivoltmeter is connected as shown, the steel bomb, the constantan disc and the outside copper jacket constitute a copper-constantan thermo-electric couple with the hot junction at the point where the constantan disc "E" is joined to the steel bomb and the cold junction at the point where the constantan disc is attached to the outside copper jacket.

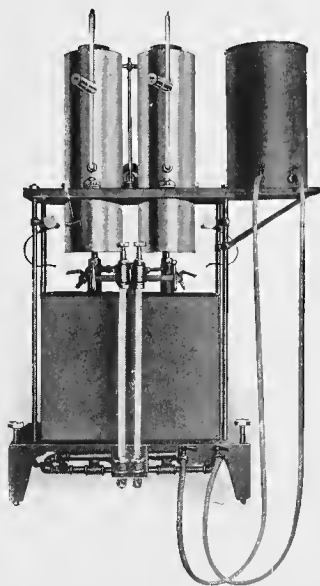
Experiments at the British National Physical Laboratory and at the Laboratoire National des Arts et Métiers, of France, have shown that with a comparatively constant weight of sample and a uniform oxygen pressure in the bomb the elevation of temperature is proportionate to the calories released in the bomb divided by the weight of the sample in grams and that in a long series of tests the error in readings on benzoic acid were found to be considerably less than 1%. As the needle of the millivoltmeter remains at the point of maximum deviation for about 15 seconds, the readings can be taken with great accuracy. The ignition is accomplished by a hot wire heated by an accumulator of 60 ampere-hour capacity at 4 volts or by a magneto. See *Génie Civil* du 25 Mai 1912.



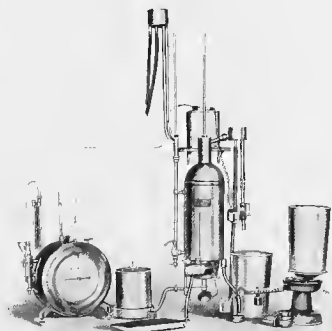
Vertical Section through bomb showing connection to millivoltmeter.



23568.	Calorimeter, Féry Thermo-electric, with bomb, copper jacket and millivoltmeter.		
	Duty Free	193.75	Duty Paid
23572.	Calorimeter, Féry Thermo-electric, as above with certificate of the Laboratoire National des Arts et Métiers.		232.50
	Duty Free	200.00	Duty Paid
23576.	Manometer, for automatically controlling constant pressure of the Oxygen.	18.75	Duty Paid
23580.	Pastille Press, with moulds.		18.00
	Duty Free	15.00	Duty Paid
23584.	Accumulator, 4 volt, 60 ampere-hours.		13.50
	Duty Free	11.25	Duty Paid
23588.	Ignition Magnets, to be used in place of the Accumulator		19.50
	Duty Free	16.25	Duty Paid



No. 23592

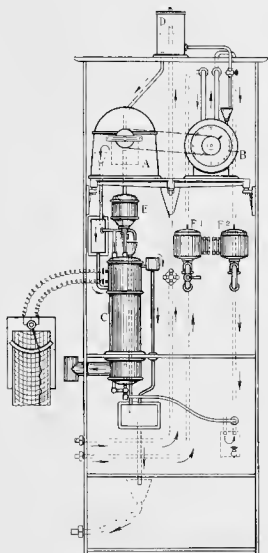


No. 23596

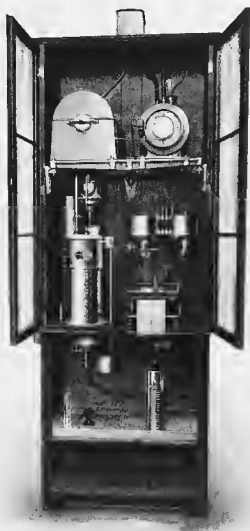
23592. **Calorimeter for Gas, Parr.** In this instrument have been eliminated the main sources of error, i.e., the metering of gas, the radiation of heat, the variations due to the differences in the humidity of the air, the uncertainty as to the quantity of air used, the incompleteness of combustion and the inaccuracy of the numerous thermometric readings which are necessary. Determination is based upon the burning of a standard gas of known composition and heat value on one side and the unknown gas on the other, in such a manner that equal volumes under equal pressures and equal temperatures may be made to impart their heat to equal volumes of water. The heat values are, therefore, in direct proportion to the temperature readings of the two thermometers and the metering of gas thus avoided. See *Journal of Industrial and Engineering Chemistry, August, 1910*. Complete, including generator for standard gas, electric motor for driving the apparatus, thermometers, reading lens, pilot lamps, gravity tank, one 2 lb. can of Hydron and instruction book..... 275.00

CALORIMETER, SARGENT AUTOMATIC GAS, for determining the calorific value and the dust, tar, moisture and solid matter in commercial and inflammable gases. The Calorimeter consists of a wet test meter in which the gas consumed is accurately measured. From this meter it flows to a governor which maintains a uniform pressure of the gas at the burner. In the calorimeter proper the accurately measured gas is burned and its calorific value is manifested in the rise of temperature of measured quantities of water flowing through. From the calorimeter proper the heated water for each unit of gas burned is automatically discharged into one of the pails in which it is weighed on the decimal scales. The pounds of water, times its rise in temperature in degrees Fahrenheit, times the quantity of gas in cubic feet consumed, gives the B. t. u. direct. The complete outfit consists of the following equipment, only one pair of thermometers, of course, being necessary.

- 23596. Calorimeter Body with automatic attachment, Bunsen burner, tubing, exhaust thermometer and beaker..... 100.00
- 23600. Two Thermometers, inlet and outlet. Graduated to $\frac{1}{100}^{\circ}$. For ordinary work 16.00
- 23604. Two Thermometers, Precision, inlet and outlet, with certification. Graduated to $\frac{1}{100}^{\circ}$ 30.00
- 23608. Wet Pressure Governor with weights..... 15.00
- 23612. Wet Test Gas Meter with all attachments..... 52.50
- 23616. Scales, special, 10 lbs. weighing to $\frac{1}{100}$ lb..... 12.00
- 23620. Two Weighing Pails, Balanced and nicked..... 5.00



No. 23652



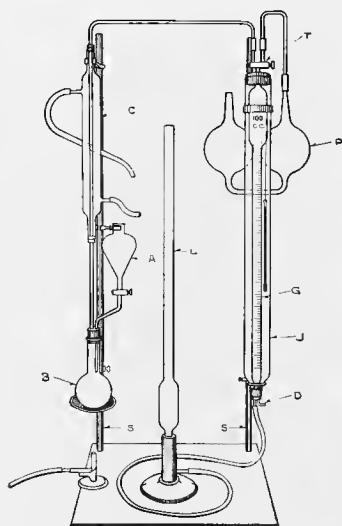
No. 23652

EXPLANATION OF DIAGRAM

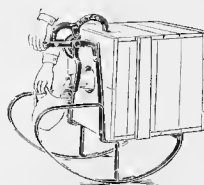
WATER METER A, GAS METER B, which by means of a light running coupling (usually cogwheels with chain) are compelled to keep the relation between the quantity of gas and the quantity of water constant.
 CALORIMETER BODY C, the arrangement for continuously recording the heating value which takes up the gas flame and gives off the heat developed therefrom to the stream of water continuously flowing through it.
 REGULATOR D, which allows the water to flow to the plummet box.
 " E, which provides for a regular flow of water to the water meter.
 TWO GAS PRESSURE REGULATORS F1 AND F2 which keep the pressure in front and behind the gas meter regular within certain limits.
 DIFFERENTIAL THERMOMETER, with connections, a thermo-element for the production of an electric current, the tension of which denotes the difference of temperature between the incoming and outflowing water.
 TWO CONTROL THERMOMETERS for the incoming and outflowing water.
 CASE with tightly fastened connection pipes, etc.

CALORIMETER, JUNKERS AUTOMATIC GAS, for the continuous measurement and recording of the heat value of gases. For gas plants, coke ovens, blast furnaces, foundries and all other establishments producing gas for light, power and heat as well as for laboratory investigations. The instrument requires no measurement of water or gas, no watching of thermometers and no calculations, the calorific value being continuously shown by a pointer. Readings can be made at points distant from the calorimeter or at several points simultaneously from one calorimeter.

23652.	Calorimeter, Junkers Automatic Gas, complete as above described, including calorimeter with thermo-electric pile, apparatus for measuring the proportions of gas and water with supply regulator, regulator for gas pressure, cupboard with glass doors and accessories and reservoir for supplying water constantly to the apparatus for measuring water, but without galvanometer.	Stock	350.00
	Duty Free	313.50	Duty Paid
23656.	Galvanometer, Indicating simple construction, for use with above.		60.00
	Duty Free	49.50	Duty Paid
23660.	Galvanometer, Indicating improved construction.		80.00
	Duty Free	66.00	Duty Paid
23664.	Galvanometer Registering, with 24-hour charts.		180.00
	Duty Free	148.50	Duty Paid
23668.	Galvanometer, Registering, for continuous operation.		260.00
	Duty Free	214.50	Duty Paid



No. 23700



No. 23704



No. 23708



No. 23712



No. 23716



No. 23724



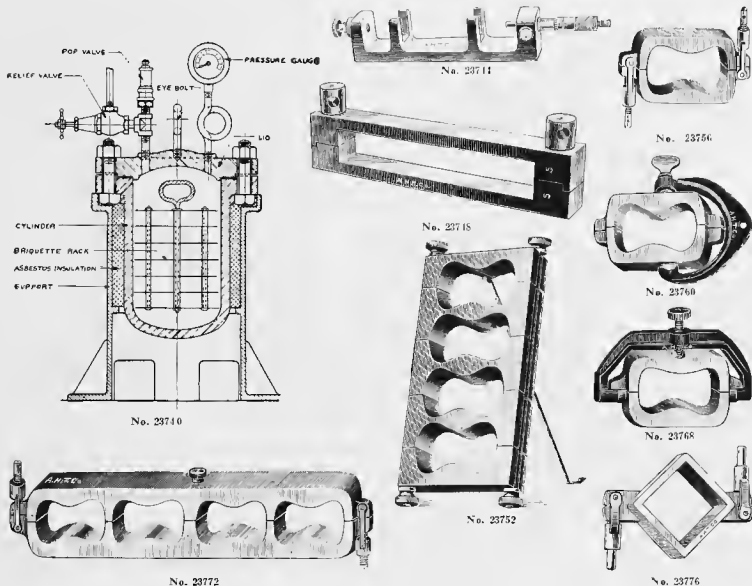
No. 23728



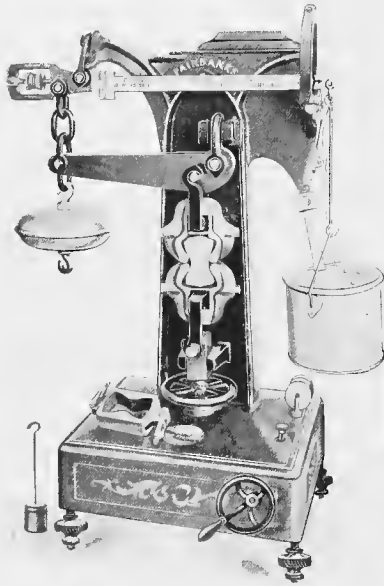
No. 23736

- 23700. Carbon Apparatus, Parr,** for the determination of total carbon in coal, coke, etc., in connection with the Parr Calorimeter. Complete with directions and tables 45.00
- 23704. Carboy Incliner, Universal,** strongly built, of iron throughout. Is shipped knocked down and may be assembled in a few minutes. Delivers the last drop from a carboy 5.00
- 23708. Carboy Stopper, Hard Rubber,** with air inlet and soft rubber cap to fit over the mouth of the carboy for the convenient handling of acids 4.00
- 23712. Casseroles, Sanitäts Porcelain,** trade mark "arrow," with porcelain handle, without lids
- | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|------|------|
| Capacity, cc. | 30 | 70 | 100 | 125 | 250 | 375 | 625 | 1000 | 2000 |
| Diameter, mm. | 50 | 65 | 75 | 85 | 100 | 110 | 130 | 160 | 230 |
| Each | .18 | .20 | .30 | .30 | .35 | .55 | .70 | 1.00 | 2.75 |
- 23716. Casseroles, Sanitäts Porcelain,** trade-mark "arrow," with wooden handles but without lids
- | | | | | | | |
|-----------------------|-----|-----|-----|-----|------|------|
| Capacity, cc. | 125 | 250 | 375 | 625 | 1000 | 2000 |
| Diameter, mm. | 90 | 110 | 130 | 140 | 160 | 200 |
| Each | .40 | .55 | .70 | .85 | 1.15 | 2.10 |
- 23720. Lids only for Casseroles No. 23716.**
- | | | | | | | |
|--------------------------|-----|-----|-----|-----|------|------|
| To fit size, cc. | 125 | 250 | 375 | 625 | 1000 | 2000 |
| Each | .10 | .15 | .20 | .25 | .30 | .50 |
- 23724. Casseroles, Royal Berlin Porcelain,** trade mark "scepter." With porcelain handle, without lids
- | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|------|------|------|
| Capacity, cc. | 30 | 75 | 150 | 210 | 375 | 750 | 1250 | 2000 |
| Diameter, mm. | 50 | 70 | 85 | 95 | 110 | 135 | 165 | 175 |
| Each | .40 | .50 | .60 | .75 | .90 | 1.65 | 2.10 | 3.60 |
- 23728. Casseroles, Royal Berlin Porcelain,** trade mark "scepter." Deep form, with wooden handle.
- | | | | |
|-----------------------|------|------|------|
| Capacity, cc. | 1050 | 1900 | 3230 |
| Diameter, mm. | 110 | 140 | 170 |
| Height, mm. | 155 | 180 | 205 |
| Each | 2.00 | 2.90 | 4.40 |
- 23732. Casseroles, Opaque Fused Silica,** shape of 23724; glazed inside and outside, with handle.
- | | | | | | |
|-----------------------|------|------|------|------|------|
| Capacity, cc. | 30 | 75 | 150 | 200 | 350 |
| Each | 1.75 | 2.15 | 2.65 | 3.40 | 4.40 |
- 23736. Cement, Refractory (Vulcan Paste) Northrup.** For use at the highest available temperatures. Applied as a paste for stopping up cracks, sealing holes, as a protective covering to heating wires wound on cylinders or, when thinned according to directions on jar, as a protecting paint. It is very plastic and cohesive as a paste or paint, which on heating to 200° C or more, becomes flinty hard. It is very useful in many ways for high temperature experiments in the laboratory. Per pint jar 3.25

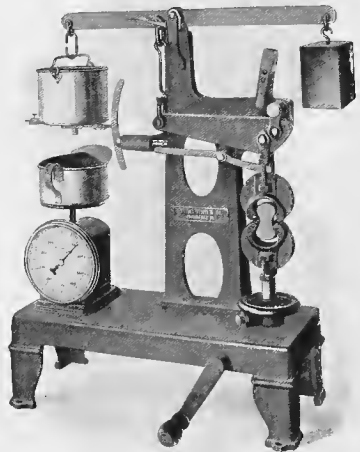
CEMENT TESTING APPARATUS



23740. Autoclave Force, for Cement Boiling Test, with metal rack for holding briquettes. Inside dimensions, 12 x 7 inches; cover and clamps of special alloy steel; the cover is provided with a steam gauge registering up to 400 lbs., and also a pop safety valve which may be set to blow off at 300 lbs.; an angle relief valve is provided to relieve the pressure at the expiration of the test. The cover is fastened to the cylinder of the autoclave by means of a hinged clamp, made in two halves; thus obviating the use of any bolts for fastening, and, as the clamp encircles the entire cylinder, uniform pressure is exerted at the cylinder cover and the cylinder, thus insuring an absolutely tight joint. A rack for supporting the briquettes is supplied with the apparatus which is made most substantially and mounted on suitable support. 100.00
23742. Burner, Special for Force Autoclave. 5.00
23744. Cement Micrometer, for measuring the expansion of test bars subjected to the autoclave test. The head is divided so that the micrometer will give positive readings, irrespective of whether the test bars expand or contract during the time they are subjected to the autoclave test. The micrometer head is divided so that the expansion or contraction can be measured to 1/1000th of an inch. 35.00
23748. Cement Mould, of brass, for making test bars, with brass test bar which is exactly 6 inches long at 70° F., for use in setting the micrometer before subjecting the cement specimen to test. 6.00
23752. Briquette Mould, new model, according to the specifications of the American Society of Civil Engineers; by having different length rods the mold can be changed to take from 1 mould up to any number desired with no possibility of individual moulds springing out of place. In gangs of 3 or more moulds, per mould. 3.50
23756. Briquette Moulds, brass, with end clamps, according to the specifications of the American Society for Testing Materials. 2.50
23760. Briquette Moulds, same as above but with iron, horseshoe shaped clamp 2.50
23764. Extra Clamp for Briquette Mould No. 23760.30
23768. Briquette Moulds, improved form, for shaping sections automatically without rapping According to the specifications of the American Society for Testing Materials. 3.00
23772. Briquette Gang Moulds
- | | | | | | |
|-------------------------------|------|------|-------|-------|-------|
| Number of briquettes. | 2 | 3 | 4 | 5 | 6 |
| Each. | 6.00 | 9.00 | 12.00 | 15.00 | 18.00 |
23776. Cube Mould, of brass, one inch per gang. 3.00
23780. " " " " two " " " 4.00



No. 2378A



No. 23792

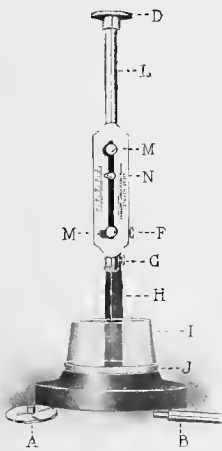


No. 23796

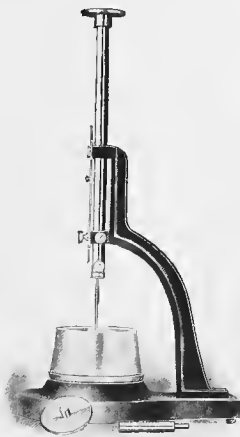


No. 23800

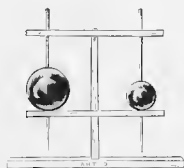
23781. **Cement Testing Machine, Fairbanks Automatic**, recognized as standard. Without springs or hydraulic apparatus, the action being automatic and entirely free from jars which tend to break the specimen before its greatest efficiency has been reached. The tensile strength is generally accepted as the standard, it being less difficult to obtain fair comparisons than by other methods. 1000 lbs. capacity. Size 12 x 24 inches. 110.00
23788. **Cement Testing Machine, Fairbank's Improved Automatic**. This machine is exactly like the above except that it is mounted on a sub-base containing a worm and worm gear connected to an axis which is threaded and passes up through the base, and hand wheel by which means a steady tension is applied to the briquette until broken. Recommended because of great increase in tensile strength of cement during recent years. Capacity 1000 lbs. 160.00
23792. **Cement Testing Machine, Olsen's New Automatic Shot form**. The principal advantages of this machine are as follows:
 The machine is automatic to its full capacity and is not touched from start to finish of test.
 The instant the briquette breaks, the breaking load is read on the dial of the scale.
 The load is applied with absolute smoothness, and impact from falling shot is eliminated.
 The cut-off on the shot kettle is practically instantaneous.
 All shot that has escaped from the kettle has already done its work and the column of falling shot in the air when the specimen breaks is, therefore, weighed as it should be.
 A new grip which brings the strain uniformly on the specimen is used.
 The briquette hangs clear of the frame of the machine, giving plenty of room for the hands when adjusting specimens.
 This is a widely used and thoroughly satisfactory outfit; 1000 lbs. capacity, length 24 inches height 26½ in-hes, weight 40 lbs. 125.00
23796. **Soundness Test Apparatus, Le Chatelier**. A very convenient method. 3.00
23800. **Cement Sampler**, for obtaining fine samples of cement from the center of a barrel 7.50



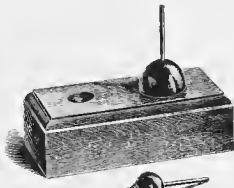
No. 23804



No. 23804—Side View

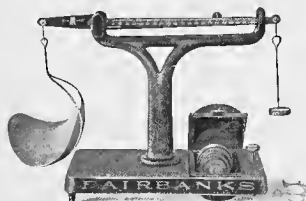


No. 23824

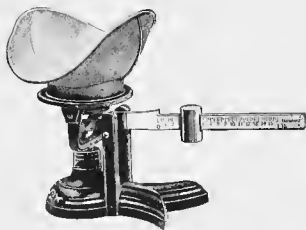


No. 23820

23804. **Vicat Needle Apparatus, Improved form.** This apparatus does not require an extra compensating weight to give a downward pressure of 300 grains when the 1 mm needle is used (both needles are made of equal weight), thus obviating error because of overlooking the use of the compensating weight with the small needle. Complete with one mould **16.00**
23808. **Extra Rubber Mould** ... 2.50
23812. **Extra Glass Mould** ... 1.00
23816. **Vicat Needle Apparatus, Bramwell Improved Form,** very convenient to determine the normal consistency and time of setting of cement. The plunger ends are of different diameters and the small needle when not in use can be reversed and screwed into the body of the main plunger. **20.00**
23820. **Gilmore Needle,** for determining both the initial and final set of cement. Consists of a steel needle $\frac{1}{2}$ inch in diameter with a $\frac{1}{4}$ lb. weight, and a needle $\frac{3}{8}$ inch in diameter with a 1 lb. weight **4.00**
23824. **Gilmore Needle,** same as No. 23820 but with vertical support to keep needle perpendicular to the surface of the pat. **5.00**

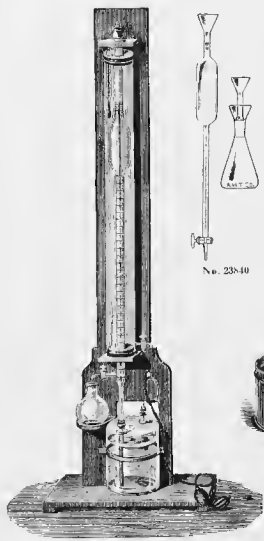


No. 23828



No. 23832

23828. **Cement Scale,** specially made to show the fineness of cement Will weigh 1 lb. to .0001 lb. avoirdupois. **13.00**
23832. **Percentage Scale** for fineness test, with beam divided to 16 oz. in $\frac{1}{2}$ oz.; also with a second row of figures reading from 0 to 100%. **6.00**



No. 23836



No. 23840



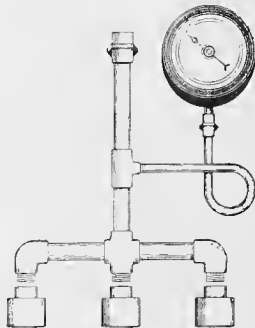
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No. 23845



No. 23846



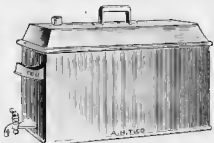
No. 23860



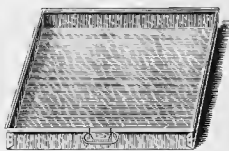
No. 23864



No. 23888



No. 23868

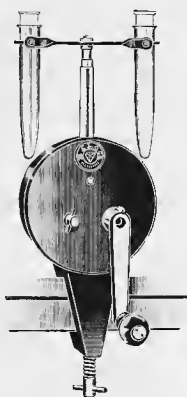


No. 23876

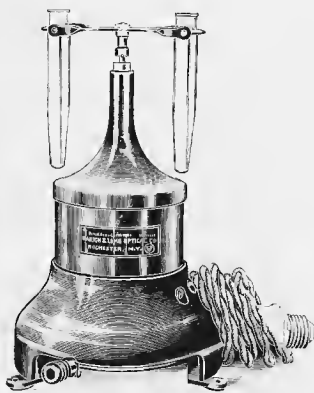
23836. **Volumenometer, Erdmenger-Mann**, for the determination of the specific gravity of cement. A very accurate method, consuming much less time than the Le Chatelier, and highly recommended by leading cement engineers, complete with ten flasks 35.00
23840. **Specific Gravity Apparatus, Jackson**, for the true determination of the specific gravity of cement. Consists of a special burette with bulb and stopcock and a special flask with ground in funnel stopper of exactly the same bore as the burette. As described in the *Journal of the Society of Chemical Industry*, 15 June, 1904, No. 11, Vol. XXIII. 6.00
23844. **Specific Gravity Bottle, Le Chatelier**, as used in cement testing 2.00
23845. **Specific Gravity Bottle, Le Chatelier, New Form**, in accordance with the U. S. Bureau of Standards requirements and as used in the U. S. Government test for Portland Cement. See Circular No. 53 of the U. S. Bureau of Standards, without certificate 3.00
23852. **Specific Gravity Bottle**, as above, but with certificate of the U. S. Bureau of Standards 5.00
23856. **Specific Gravity Bottle, Schuman**, with tube graduated to 50 cc in 10ths. 2.50
23860. **Permeability Testing Apparatus**, for determining experimentally the exact relations between the impermeability and strength of concrete, treated by the integral method. The briquettes are cylindrical in shape, 3 inches in diameter and 2 inches high. A pressure gauge is attached to the main vertical tube for indicating the pressure under which the water flows. As constructed in the Structural Material Testing Laboratory of the Brooklyn Polytechnic Institute. Complete with one mould. 14.00
23862. **Extra mould** 4.00
23864. **Cement Sample Cans**, per dozen 1.00
23868. **Steaming Apparatus**, for boiling and steaming test. Made of copper; 12 x 12 x 24 inches 30.00
23872. **Glass Plate**, for use with briquette moulds, 24 x 24 inches. 2.00
23876. **Pan of galvanized iron**, 24 x 24 x 3 inches deep. 2.00
23880. **Brush of brass wire with wooden handle**50
23884. **Trowels**, for making briquettes, etc.
- | | | | |
|------|------|-------|-------|
| | Size | Small | Large |
| Each | | .40 | .60 |



No. 23900



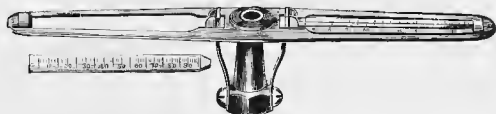
No. 23904



No. 23908



No. 23924

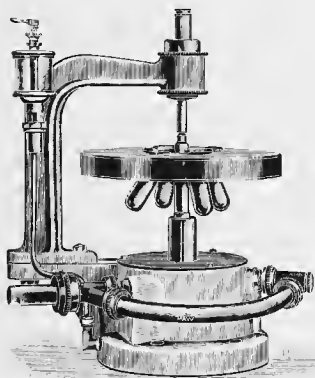


No. 23932

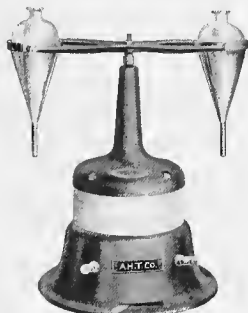
23900.	Centrifuge, Bausch & Lomb, Hand, single speed, giving 1,200 revolutions per minute with fifty turns of the handle, the latter being so constructed as to render sudden stopping impossible. Complete with two-arm sedimentation attachment and one graduated and one ungraduated glass tube 7.50
23904.	Centrifuge, Bausch & Lomb, Hand, two speed, providing for speeds from 1200 to 4000 revolutions per minute. Similar in construction to No. 23900. Complete with Daland's haematokrit, automatic blood pipette, two sputum tubes and two-arm sedimentation attachment with one graduated and one ungraduated glass tube. 10.00
23908.	Centrifuge, Bausch & Lomb, Electric, with rheostat providing five different speeds of from 750 to 2100 revolutions per minute with two 15 cc tubes. For operation upon ordinary incandescent lamp socket. Please specify voltage in ordering. Complete with two-arm sedimentation attachment and one graduated and one ungraduated glass tube.
	For Circuit, 110 volts, direct 220 volts, direct 110 volts, alternating, 60 cycles
	Each 25.00 27.50 30.00

Accessories for use with any of above Centrifuges.

23912.	High Speed Indicator, 1.50
23916.	Speed Indicator, automatic registering, 3.00
23920.	Two-arm Head, for 50 cc tubes, with aluminum shields and one graduated and one ungraduated tube, 50 cc 4.50
23924.	Four-arm Head, for 15 cc tubes, with aluminum shields and one graduated and three ungraduated tubes, 15 cc. 4.50
23928.	Blood Lancet, Moore automatic, 1.50
23932.	Haematokrit, Daland, with two percentage and two sputum tubes. 2.50
23936.	Milk Tube, for determining percentage of fats,50
23940.	Blood Tube, for use in Haematokrit for determining percentage of haemoglobin50
23944.	Pipette, 1 cc, for filling milk tubes,10
23948.	" " " " automatic, for filling blood tubes75
23952.	Glass Centrifuge Tube, graduated, 15 cc.35
23956.	" " " " " " 50 cc.75
23960.	" " " " ungraduated, 15 cc.15
23964.	" " " " " " 50 cc.30
23968.	Aluminum Shield, to hold 15 cc glass tube,25
23972.	" " " " " " 50 cc " "50
23976.	Sputum Tube, for haematokrit, ungraduated,25
23980.	Metallic Guard, for use with Electric Centrifuge No. 23908, 7.50



No. 24048



No. 24056

Table of Speeds with Arthur H. Thomas Company Special Water Motor Centrifuge, No. 23984.

Head	15 lbs. pressure	20 lbs. pressure	30 lbs. pressure	40 lbs. pressure	50 lbs. pressure	60 lbs. pressure
2-15 cc tubes.....	1100 r. p. m.	1200 r. p. m.	1500 r. p. m.	1700 r. p. m.	1900 r. p. m.	2100 r. p. m.
4-15 cc tubes.....	850 "	970 "	1200 "	1400 "	1550 "	1700 "
2-50 cc tubes.....	900 "	1050 "	1300 "	1500 "	1700 "	1900 "
4-50 cc tubes.....	850 "	1050 "	1050 "	1280 "	1400 "	1600 "

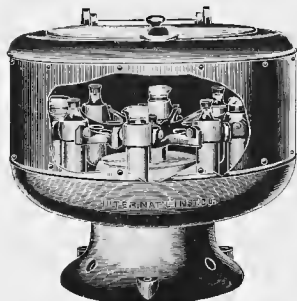
24048. Centrifuge, Water, Double Jet, Martin, for high speeds. This form of centrifuge consists of a plate with four radiating chambers each having a depth sufficient to take a tube and its necessary holder flush with the under surface of the plate, thus avoiding all atmospheric resistance. The plate is fitted to a spindle, pivoted between an upper and lower center, and the spindle carries at its lower end a small water wheel in a "well" to which are attached the nozzle or nozzles and fittings for connecting with the water main and for carrying off the waste water. The upper center is poised lightly to avoid friction, and is mounted in a flexible holder, thus giving the necessary freedom from strain when working at high speeds. Three sizes of plates are made, carrying tubes of 25 cc, 10 cc and 5 cc, respectively. The speed has been carefully measured and a rotation of from 1000 to 5000 revolutions per minute can be maintained with ordinary pressure and with absolute safety. Complete with four German silver tube holders and 1 dozen glass tubes.

For four tubes of.....	5 cc	10 cc	25 cc
Duty Free.....	34.50	34.80	44.10
Duty Paid.....	41.40	41.80	52.90
24052. Extra Glass Tubes for use with Martin Centrifuge. Capacity, cc.....	5	10	25
Per dozen, from stock.....	.90	1.10	1.35

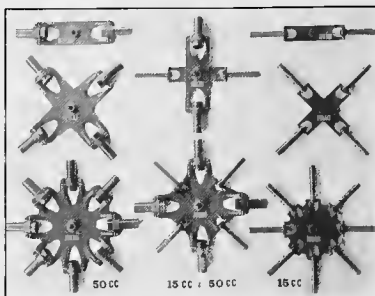
Table of Speeds with Martin Double Jet Centrifuge

Head	Pressure in lbs.	10	15	20	25	30	35	40	45	50	60	70
4- 5 cc tubes.....	1200	1600	2000	2500	3100	3400	3700	4000	4300	4550	4900	
4-10 cc ".....	1000	1400	2200	2700	3100	3400	3700	3900	4100	4500	4900	
4-25 cc ".....		900	1200	1550	1900	2100	2300	2500	2900	3200	3500	

24056. Centrifuge Electric, specially arranged for Goetz method of phosphorous determination in steel analysis. With aluminum arm with conical aluminum Goetz tube holders and graduated, glass stoppered Goetz tubes. Size..... 3-tube 4-tube
- With rheostat for 110 volts direct current..... 41.00 55.00
24060. Centrifuge, Electric, as above, but with rheostat for 220 volts direct current..... 54.00 65.00
24012. Goetz Phosphorous Tubes of glass, graduated and with glass stopper, each..... 1.00
24016. " " " ungraduated and without glass stopper, each..... .40



No. 24064



50 cc and 15 cc Heads and Tubes for Size 1 Centrifuge

CENTRIFUGES, INTERNATIONAL ELECTRIC SIZE 1, a compact, high-power centrifuge, with moderately large capacity, conveniently arranged for research and routine work in bacteriological, physiological and chemical laboratories of hospitals, medical schools, dairies and health departments. Made in two types according to speed, Type A and Type B. Height 18 inches, diameter 17 inches and weight about 75 lbs. With speed control rheostat and protecting case. Speeds with various heads are shown in table.

	Speeds with head	4-tube, 15 cc	8-tube, 50 cc	Board of Health
Size 1, Type A, direct current		3000 r.p.m.	2400 r.p.m.	3000 r.p.m.
" " alternating current		1900 "	1600 "	2800 "
" Type B, direct current		4000 "	3000 "	3000 "
" " alternating current		3600 "	3000 "	3000 "

24064. Centrifuge, International Size 1, with speed control rheostat and protecting case, but without heads or tubes.

For current	110 volts, d. c.	220 volts, d. c.	110 volts, a. c. 60 cycles	220 volts, a. c. 60 cycles
Size 1, Type A	40.00	44.00	46.00	48.00
" Type B	65.00	68.00	78.00	80.00

Accessories for Size 1 Centrifuge.

The price of any desired outfit may be had by adding the price of attachments desired to the price of the machine as listed above. No glassware is included in price for attachments. These must be added separately.

24072.	Head, 2-tube, to carry either 2-50 cc tubes, two Gooch crucibles or two Babcock bottles without cups or tubes.	3.00
24076.	Trunnion cups for Gooch crucibles, each.	.75
24080.	Hard Rubber Collars for Gooch crucibles. (Crucibles should be sent to us to be fitted.) Each.	.90
24084.	Trunnion Ring and 50 cc metal tube.	1.25
24092.	Head, 2-tube, to carry 2-15 cc tubes, with metal tubes	3.40
24096.	" 4-tube, " 4-15 cc " " " "	7.80
24100.	" 8-tube, " 8-15 cc " " " "	13.60
24104.	Combination Head, 4-tube, to carry 2-15 cc and 2-50 cc tubes, with metal tubes	8.70
24108.	Head, 4-tube, to carry 4-50 cc tubes, with metal tubes	9.60
24112.	" 8-tube, " 8-50 cc " " " "	17.20
24116.	Combination Head, 8-tube, to carry 4-15 cc and 4-50 cc tubes, with metal tubes	16.40
24120.	Trunnion Cups, for Babcock test bottles (used in 50 cc places), each.	.50
24124.	Board of Health Head, without tubes.	10.00
24128.	Head, perforated brass basket, 5 inches in diameter, with drip pan	20.00
24136.	Trunnion Carriers for Goetz tubes, each.	1.75
24140.	" " " " " " " " " " " "	3.00
24144.	" " " " " " " " " " " "	1.75
24148.	Prescription Bottles, of glass, 200 cc, per dozen.	1.50
24152.	Glass Centrifuge tubes, plain, 15 cc capacity, per dozen.	1.35
24156.	" " " " " " " " " " " "	1.50
24160.	" " " " " " " " " " " "	4.00
24164.	Board of Health Tubes, 2 cc capacity, per 100.	4.75
24168.	Head, 2-place, for two Goetz Phosphorous Tubes, 2-150 cc Squibb's funnels or 2-200 cc bottles, without trunnion carriers.	5.00
24012.	Goetz Phosphorous Tubes, of glass, graduated and with glass stopper, each	1.00
24016.	" " " " " " " " " " " "	.40

24172. Centrifuge, International, with Hospital Equipment, for urine analysis, bacteriology, serology, etc., consisting of the following:

1 No. 24184 Combination Head carrying 2-15 cc and 2-50 cc tubes, with steel tubes.	6 No. 24180 glass tubes, graduated, 15 cc capacity.			
1 doz. No. 24152 glass tubes plain, 15 cc. capacity.	1 doz. No. 24150 glass tubes, 50 cc. capacity.			
Current.....	110 volts, d. c. 220 volts, d. c. 110 volts, a. c. 220 volts, a. c.			
			60 cycles	60 cycles
Size 1, Type A.....	53.50	57.50	59.50	61.50
" Type B.....	78.50	81.50	91.50	93.50

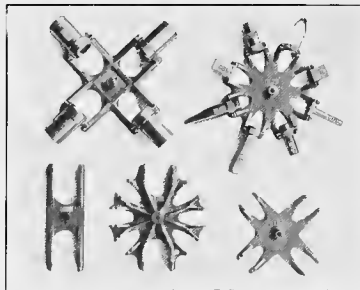
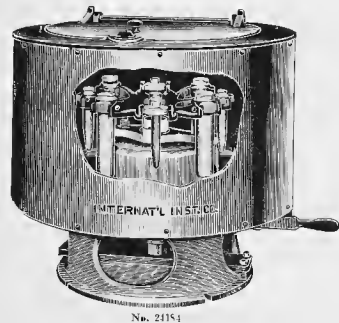
24176. Centrifuge, International, with Board of Health Equipment, for urine analysis, bacteriology, serology, and milk testing, consisting of the following:

No. 24116 Combination Head carrying 4-15 cc and 4-50 cc tubes, with metal tubes.	1 doz. No. 24160 glass tubes, 15 cc. graduated.			
No. 24124 Board of Health Head.	1 doz. No. 24156 " " " graduated			
4 No. 24120 Trunnion Cups for Babcock bottles.	2 doz. No. 24164 Board of Health Tubes with rubber stoppers.			
1 doz. No. 24152 glass tubes, 15 cc. plain.	1 doz. No. Babcock milk bottles.			
Current.....	110 volts, d. c. 220 volts, d. c. 110 volts, a. c. 220 volts, a. c.			
			60 cycles	60 cycles
Size 1, Type A.....	78.35	82.35	84.35	83.35
" Type B.....	103.35	106.35	116.5	115.35

24180. Centrifuge, International, with Board of Health and Food Laboratory Equipment, a very complete outfit for urine analysis, bacteriology, serology, milk testing, food analysis and most work encountered in hospital or public service laboratories, consisting of the following:

- | | |
|--|--|
| No. 24100 Head carrying 8-15 cc tubes, with metal tubes. | 1 doz. No. 24132 glass tubes, 15 cc. plain. |
| No. 24112 " " " " 8-50 cc " " " " " graduated | 1 doz. No. 24160 " " " " " graduated |
| 3 Trunnion cups for Babcock test Bottles. | 1 doz. No. 24156 " " " " " 50 cc capacity |
| No. 24124 Board of Health Head. | 2 doz. No. 24164 Board of Health Tubes with rubber stoppers. |
| No. 24106 Head carrying 2 Squibb's separatory funnels. | 2 doz. No. Babcock Milk Test Bottles |
| 2 No. 24114 Trunnion Carriers for Squibb's separatory funnels. | 2 No. Squibb's Separatory Funnels, 150 cc. |

Current.....	110 volts, d. c. 220 volts, d. c. 100 volts, a. c. 220 volts, a. c.			
			60 cycles	60 cycles
Size 1, Type A.....	108.50	112.50	114.50	116.50
" Type B.....	133.50	136.50	146.50	148.50



Four-tube, eight-tube heads, etc., for Size II Centrifuge

CENTRIFUGE INTERNATIONAL ELECTRIC, SIZE 2, designed for larger capacity but not for higher speeds than Size 1 machines. Made in two types according to speed, types A and B. Height 23 inches, diameter 24 inches, weight about 150 lbs. Size 2, Type A, is not made for alternating current. Speeds with various heads are shown in table.

Speeds with head	1b-tube, 50 cc or 8-tube, 100 cc	8-tube, 50 cc	Board of Health
Size 2, Type A, direct current	1500 r.p.m.	2000 r.p.m.	3000 r.p.m.
" Type B, " " " " " "	2200 " "	3000 " "	3000 " "
" Type B alternating current	2200 " "	3000 " "	3000 " "

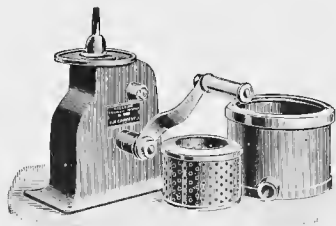
24184. Centrifuge, International Size 2, with speed control rheostat and protecting case, but without heads or tubes.

Current.....	110 volts, d. c. 220 volts, d. c. 110 volts, a. c. 220 volts, a. c.			
			60 cycles	60 cycles
Size 2, Type A.....	61.00	65.00		
" Type B.....	95.00	99.00	95.00	95.00

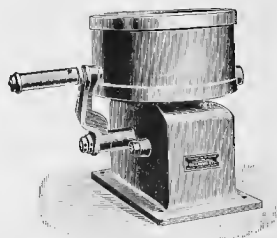
Accessories for Size 2 International Centrifuge.

Accessories listed under the Size 1 Centrifuge, p. 118, may also be used with the Size 2 machine when desired and, in addition, the attachments of larger capacity, and for special purposes as listed below. No glassware is included in price for attachments.

24188.	Head, 8-tube, carrying 100 cc, 50 cc or 15 cc tubes or Babcock bottles, without tubes.....	10.00			
24192.	Combination Head, 8-place, carrying 2-200 cc tubes, or 2-150 cc tubes, or 2 Squibb's funnels or 2 Goetz tubes, and 6-100 cc tubes, or 6-50 cc tubes or 6-15 cc tubes or 6 Babcock bottles, without cups or tubes.....	13.50			
24196.	Head, 4-place, carrying either 4-200 cc cups or 4-150 cc Squibbs funnels, without cups.....	8.00			
24200.	" 16-tube, carrying 16-50 cc tubes, or 16 Babcock bottles, without cups or tubes.....	16.00			
24204.	Metal Tubes, 100 cc, each.....	.75			
24208.	Trunnion Rings, 100 cc, each.....	.35			
24212.	Metal Tubes, 50 cc, each.....	.55			
24216.	Trunnion Rings, 50 cc, each.....	.35			
24220.	Metal Tubes, 15 cc, each.....	.45			
24224.	Trunnion Rings, 15 cc, each.....	.40			
24228.	Glass tubes, with lip, 100 cc capacity, per dozen.....	1.75			
24232.	Centrifuge, International, with Soil Analysis Equipment, consisting of Size 2, Type B Centrifuge, with a speed of 1200 revolutions per minute, and equipped with a speed control rheostat, 8-tube head, eight 100 cc metal tubes and rubber cushions, $\frac{1}{2}$ gross 100 cc glass tubes and an eight tube rack for the bench.				
	Current.....	110 volts, d. c.	220 volts, d. c.	110 volts, a. c. 60 cycles	220 volts, a. c. 60 cycles
	Each.....	80.00	84.00	101.00	104.00
24236.	Centrifuge, International, with General Laboratory Outfit with special reference to bacteriological and serological work where large quantities are to be handled, consisting of Size 2 Centrifuge with speed control rheostat, 8-tube head, eight each of 100, 50 and 15 cc metal tubes and two dozen each of 100 cc, 50 cc and 15 cc plain glass tubes.				
	Current.....	110 volts, d. c.	220 volts, d. c.	110 volts, a. c. 60 cycles	220 volts, a. c. 60 cycles
	Size 2, Type A.....	102.00	106.00		
	" Type B.....	136.00	140.00	136.00	136.00
	Note—For Size 2 Centrifuge fitted with 16- and 24-bottle Babcock heads, see Milk Analysis Apparatus, p. 347.				
24240.	Centrifuge, International with Food Analysis Equipment, consisting of No. 24192 Combination Head, 8-place, for 2 Squibb's funnels and 6-50 cc tubes, 2 Squibb's separatory funnels, 150 cc, 1 dozen glass tubes 50 cc, $\frac{1}{2}$ dozen metal tubes 50 cc, $\frac{1}{2}$ dozen Trunnion Rings for 50 cc tubes, and two carriers for Squibb's separatory funnels.				
	Current.....	110 volts, d. c.	220 volts, d. c.	110 volts, a. c. 60 cycles	220 volts, a. c. 60 cycles
	Size 2, Type A.....	88.90	92.90		
	" Type B.....	122.90	126.90	122.90	122.90

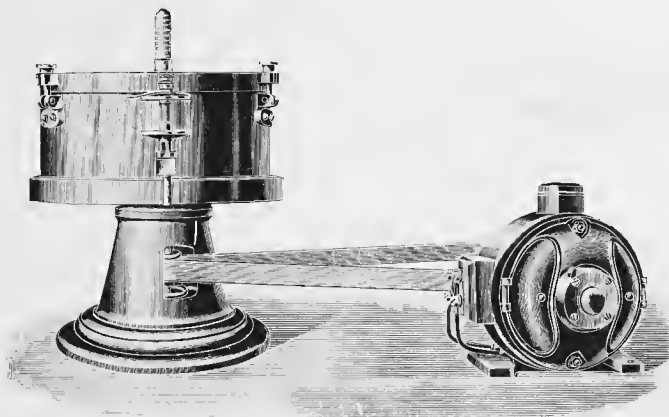


No. 24244



No. 24252

24244.	Centrifuge Cyclone, with perforated drum, for separating precipitates and crystals from their mother liquors. Widely used by sugar chemists for the determination of the yield as well as purity test. With bronze basket, $4\frac{1}{2}$ inches in diameter, with crank for hand power driving....	50.00
24248.	Centrifuge, Cyclone, same as above but with pulley for power driving.....	50.00
24250.	Hard Rubber Basket for handling of material which must not come in contact with the metal.....	8.00
24252.	Centrifuge, Cyclone, same as above but heavier and larger, with metal basket 8 inches in diameter with crank for hand power driving.....	100.00
24256.	Centrifuge, Cyclone, same as above but with pulley for power driving.....	100.00
24258.	Hard Rubber Basket for above.....	10.00



No. 24250

24260. **Centrifuge, Large Universal, with independent drive, for serological and bacteriological work where large quantities are to be handled as in separation of blood serum. Especially adapted for centrifuging a large number of small specimens at one time with head No. 24312. The variety of heads adapted for use with this machine permit its application to most lines of laboratory work requiring the use of a Centrifuge of high speed and large capacity, as in steel, rubber, sugar and oil analysis and the separation of crystals from their mother liquors. The prices given include regular head as illustrated on next page under 24260—Regular Head with metal cups of the capacities indicated and one dozen special heavy glass tubes and endless camels hair belt and speed indicator, but without motor.**

Capacity, tubes.....	6-50 cc	6-100 cc	6-200 cc	6-300 cc	6-400 cc	6-500 cc
Revolutions per minute.....	3000	4000	4000	3000	3000	3000
Horse power required	$\frac{1}{2}$	1	2	3	4	5

Centrifuge, without Motor	Duty Free	58.10	115.00	233.00	284.00	358.00	386.75
"	Duty Paid	67.20	132.00	267.00	325.00	410.15	443.50

24264. **Electric Motor, only for above Centrifuge, direct current, with starting rheostat.**

Horsepower.....	$\frac{1}{2}$	1	2	3	4	5
Duty Free.....	75.70	115.00	178.25	228.80	260.00	284.00
Duty Paid.....	86.00	130.00	202.50	260.00	295.00	322.50

Centrifuge, Large Universal, as in No. 24260 but for different purposes as indicated by the respective heads. The machine supplied with these heads is the smallest size of the above series, i. e., that for 6-50 cc tubes, with the exception of heads F and H with which the centrifuge for 6-100 cc tubes is supplied. For motor prices see 24264.

Head A, with revolving sieve of hard glazed porcelain enclosed in a porcelain jacket with spout. The bearings are entirely protected from the liquid. The maximum speed permitted by the strength of the porcelain is about 2000 r. p. m.; diameter 140 mm.

Head B, with revolving sieve of heavily tinned copper, for separating crystals from their mother liquors, etc. May be used at a speed up to 3000 r. p. m. On special order these sieves may be furnished with ebonite lining, silver plating, lead lining, etc.

Head C, for the examination of rubber according to the method of Frank-Marcwald, for the purpose of separating rubber and other organic compounds from the mineral filling materials without filtering. This outfit is supplied with two heads, one for 4 glass stoppered cylindrical glasses and the other for 4 Erlenmeyer Flasks.

Head D, for sugar analysis after the method of Zimmerman, as used in the Royal Institute for Sugar Testing, in Berlin; for the determination of the quantitative crystals in raw sugar, the calculation of the yield, the calculation of the adherence of the syrup and the qualitative examination of sugar crystals for size, color, etc. The metallic cups are furnished with two circular sieves and one felt plate.

Head E, for testing mineral oils for water, dirt, etc.; for 4-50 cc tubes, the cylindrical lower part of the tube being graduated in percentages; maximum speed 3000 r. p. m.

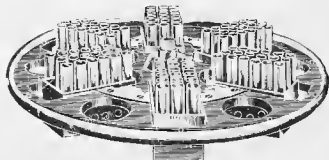
Head F, same as Head E but for 4-100 cc tubes.

Head G, for Goetz phosphorus determination; for 4-50 cc tubes.

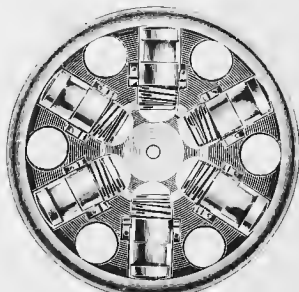
Head H, " " " " 4-100 cc " "

24268. **Centrifuge, without Motor, with Head**

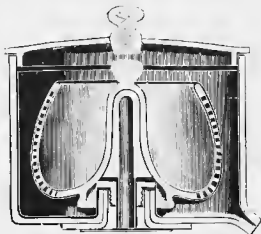
	A	B	C	D	E	F	G	H
Duty Free.....	106.50	106.50	124.10	124.10	115.30	175.00	98.10	160.00
Duty Paid.....	122.20	122.20	142.20	142.20	132.20	199.50	112.20	182.00



No. 24312 Special Head for Serum Work



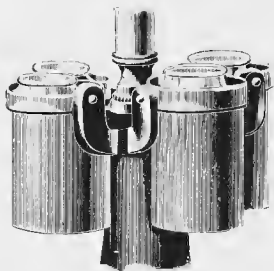
No. 24260 Regular Head



No. 24265 Head A



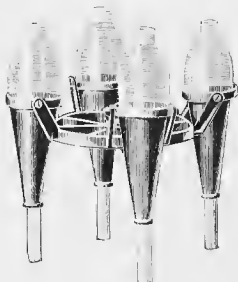
No. 24628 Head B



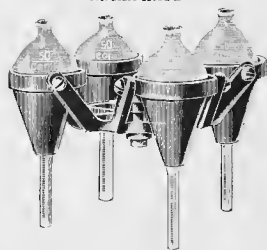
No. 24268 Head C



No. 24268 Head D



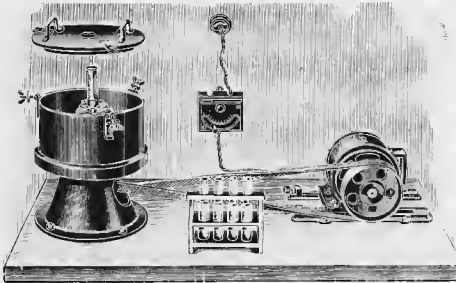
No. 24268 Head G and H



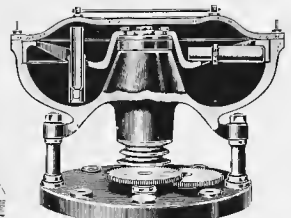
No. 24268 Head E and F

Accessories for the Large Universal Centrifuge as above.

24272.	Porcelain Perforated Drum for Head A, 175 x 140 mm	18.00
24276.	“ “ outside jacket for Head A, 240 x 210 mm	24.00
24280.	Glass Cylinders for Head C, 50 cc capacity.....	.60
24284.	Metal Cups, each with two circular sieves and one felt plate, for Head D, each ..	1.25
24288.	Felt Discs, per 100.....	2.50
24292.	Graduated Glass Tubes, for Head E, 50 cc capacity, each	1.15
24296.	“ “ “ “ “ F, 100 cc “ each	1.30
24300.	“ “ “ “ “ G, 50 cc “ each	1.15
24304.	“ “ “ “ “ H, 100 cc “ each.....	1.13
24308.	Gas Tubes, for above, each.....	.10
24312.	Special Head for Serum Work, consisting of swinging rectangular boxes each carrying 12 or 24-10 cc glass tubes, particularly recommended as an accessory to the two smaller sizes of Large Universal Centrifuge.	
	Number of Tubes	72-10 cc 141-10 cc
	Duty Free	80.00 100.00
	Duty Paid	93.50 112.50
24316.	Centrifuge Tubes, of heavy well-annealed glass, cylindrical, with round bottom, for use in head illustrated above and as regularly supplied with the Universal Centrifuge.	
	Capacity, cc.....	50 100 200 300 400 500
	Each .....	.60 .80 1.10 1.25 1.75 2.00



No. 24320



No. 24328

24320. Centrifuge, Electric, High Speed, König, designed especially for serological work. With heavy armour plate cover and separate motor, all mounted on the same base board. A regulating resistance permits the reduction of speed from the maximum of approximately 8000 revolutions per minute to about 2000. With speed indicator as shown in illustration. Prices quoted are for motors for 110 volts direct current. For motor for 220 volts direct current prices are increased \$5.15 duty free and \$6.85 duty paid. For alternating circuits, both voltage and number of cycles must be given and price will be quoted upon application.

Capacity.....	4-15 cc tubes	6-15 cc tubes	4-30 cc tubes	6-30 cc tubes
Duty Free	130.00	150.00	150.00	171.25
Duty Paid.....	157.50	182.50	182.50	207.50

24324. Special Glass Tubes for use with above centrifuge.

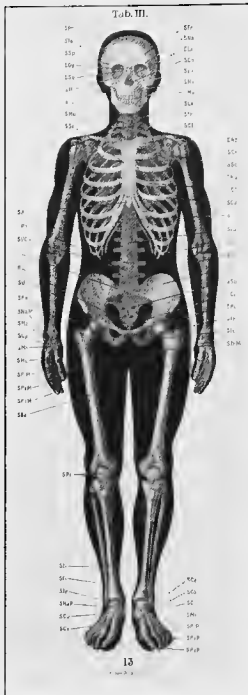
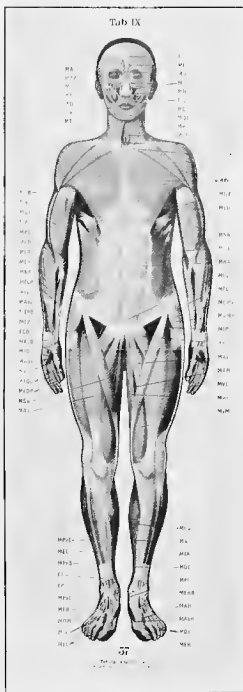
Capacity, cc.....	15	30
Each .....	.20	.40

24328. Centrifuge, Delepine 1913 Model, for independent drive, having a speed of 10000 r. p. m. with a light load and of 3000 to 4000 r. p. m. with a heavy load. In order to secure lightness, strength and absence of rusting, the rotor, buckets and tubes are made of Duralumin, an aluminum alloy having the strength of steel and only one-third its weight, which Prof. Delepine has selected after testing several metals and alloys and ascertained that it was capable of resisting the stress to which it had to be submitted. This metal is but slightly affected by organic fluids such as milk and has little action upon the bacteria. He has, therefore, designed tubes of Duralumin to take the place of the glass tubes generally used. These tubes are practically indestructible and, therefore, eliminate the loss of material due to breakage of the tubes, and also permit of certain adaptations which are not possible with glass. The centrifuge consists of a Duralumin rotor of special shape allowing the maximum number of tubes to be used and securing, when the disc or rotor is rotating rapidly, the most advantageous position of the tube in regard to equilibrium and safety. For 16 tubes of 100 cc each. These tubes have flat bottoms, for standing without support, and have consecutive numbers from 1 to 16 stamped upon them. Complete, without motor.

Duty Free	435.75	Duty Paid.....	522.90
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24332. Duralumin Tubes, 100 cc capacity.

Duty Free, each	4.65	Duty Paid, each	5.60
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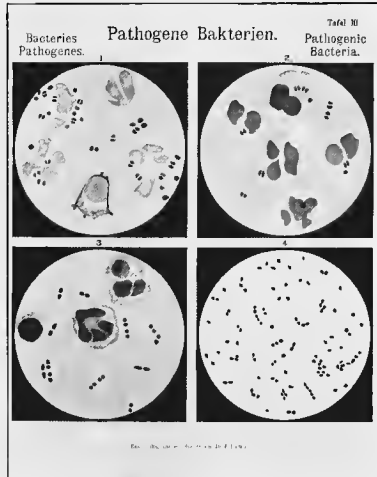
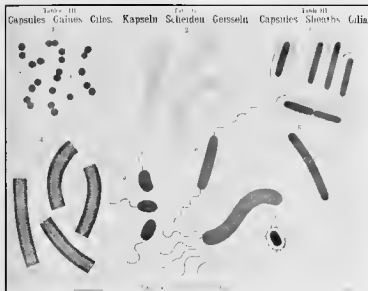
No. 24400. Chart IX

No. 24400. Chart III

24400. Charts, *Tabulae Anatomicae*, Lendenfeld, a comprehensive series of large charts covering the whole range of human anatomy, in finest color lithography after hand drawing, with explanatory text. The charts are 207 cm high by 74 cm wide.

- Chart
- I. Integument (Skin and hair follicles, various sections).
 - II. Structure of Bones, Cartilages and Teeth (various sections of cartilage and lower molar teeth, femur, etc)
 - III. Skeleton (Anterior view).
 - IV. " (Posterior view).
 - V. Skull (various views).
 - VI. Parts of Skeleton (Vertebrae, hand, foot and hyoid bone).
 - VII. Connective tissue, adipose tissue, ciliated epithelium.
 - VIII. Muscular Tissue (various muscles).
 - IX. Muscular System (anterior view of the superficial muscles).
 - X. " (" deep-seated ").
 - XI. " (" posterior view of the superficial muscles).
 - XII. " (" deep-seated ").
 - XIII. Muscles and Tendons of the Hand (superficial and deep-seated muscles of the palm and back).
 - XIV. Nervous System (anterior view).
 - XV. Brain (various views).
 - XVI. " Cerebrum.
 - XVII. Parts of the Nervous System (spinal cord, ganglia, cells, nerve fibres, motor endplates).
 - XVIII. Organs of Taste and Touch (tongue, taste buds, various corpuscles, free nerve endings, etc.).
 - XIX. Eye, Nose and Nasal Sinuses.
 - XX. Retina (transverse section).
 - XXI. Ear (left inner ear, cochlea and diagrammatic section).
 - XXII. Ear (transverse section).
 - XXIII. Organs of Circulation and Respiration (Femoral vein, blood capillaries, blood corpuscles, lymph spaces, artery, trachea terminal bronchus).
 - XXIV. Heart.
 - XXV. Arterial System (anterior view).
 - XXVI. Venous and Lymphatic System (anterior view of the venous system and lymphatic plexus).
 - XXVII. Lungs and Abdominal Viscera (anterior view) and Organs of Digestion (frontal view).
 - XXVIII. Organs of Digestion (wall of the intestines, epithelium of the stomach, salivary gland, pancreas, liver)
 - XXIX. Organs of Digestion, Urinary Organs and ductless glands.
 - XXX. Ductless Glands and Male Genitalia (spleen, adrenal, thymus, thyroid, testicle, spermatozoa).
 - XXXI. Male Genitalia.
 - XXXII. Female Genitalia (anterior view of the ovary, section through the ovum).
 - XXXIII. Situs Viscerum (median view of the head and female trunk).

Charts, as above, each duty free 3.60
 " " " complete set of Charts Nos. I to XXXIII, inclusive, duty free 118.80



No. 24404. Series I, Chart 3

No. 24404 Series II, Chart 3

24404. Charts, Bacteriology, Luksch, a series of 18 charts, with accompanying text in German, English and French, carefully executed in colors. Series I consists of 6 charts 81 x 110 cm devoted to General Bacteriology and Series II consists of 12 charts, 80 x 106 cm, devoted to Pathogenic Bacteria.

- Series I, Chart No. 1. Forms of Bacteria.
 " " " 2. Structure of Bacteria Cells.
 " " " 3. Capsules, Sheaths and Cilia.
 " " " 4. Division Gonidia.
 " " " 5. Reproduction by Spores.
 " " " 6. Ramification. Forms of Involution. Plasmoptysis.
 Series II, Chart No. 1. *Bacillus typhi* abd. Agglutination. Bacteriolysis. Phagocytosis.
 " " " 2. *Staphylococcus pyogenes*. *Streptococcus pyogenes*. *Micrococcus cut-r*
rhialis. *Micrococcus tetragenus*.
 " " " 3. *Micrococcus gonorrhoeae*. *Micrococcus meningitidis*. *Diplococcus pneu-*
moniae. *Micrococcus melitensis*.
 " " " 4. Capsule cocci. *Bacillus capsulatus* Friedländer. *Bacillus anthracis*.
 " " " 5. *Bacillus tetani*. *Bacillus Chauveau*. *Bacillus oedematis maligni*.
Bacillus botulinus.
 " " " 6. *Bacillus aerogenes* Welch. *Bacillus pyocyaneus*. *Bacillus typhi abdom-*
inalis.
 " " " 7. *Bacillus diptheriae*. *Bacillus tuberculosis*. *Bacillus leprae*.
 " " " 8. *Bacillus influenzae*. *Bacillus mallei*. *Bacillus pestis*. *Bacillus chol-*
erae gallinarum.
 " " " 9. *Bacillus suisepitonus*. *Bacillus suisepitifer*. *Bacillus chusio pathiae summ*.
 " " " 10. *Aktinomyces*. *Bacillus necrosos*. *Bacillus ulcers mollis*.
 " " " 11. *Bacillus fusiformis*. *Vibrio cholerae*. *Spirillum gallinarum*.
 " " " 12. *Spirillum febris recurrentis*. *Spirillum frambosiae tropicae*. *Spiro-*
chaete pallida.

Charts, as above, Series I (6 charts), unmounted.....	9.00
" " " " mounted on linen with rollers.....	13.50
" " " " Series II (12 charts), unmounted.....	18.00
" " " " " " mounted on linen with rollers.....	27.00

24408. Charts, Bacteriology, Roux. These charts are prepared in the laboratories of the Pasteur Institute, Paris, and are carefully reproduced in colors. They are lithographed on heavy paper 80 x 62 cm with edges bound and with eyelets for hanging and are accompanied by explanatory text in English, French and German.

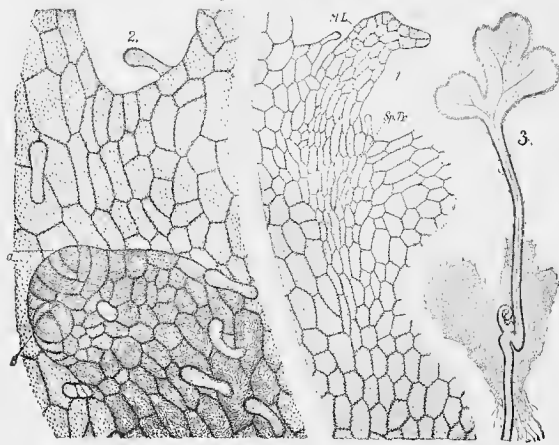
- | | |
|--------------------------------|---|
| 1. Bacteria. | 10. Anthrax—kidney. |
| 2. " " " | 11. Chicken Cholera—blood. |
| 3. Moulds. | 12. Erysipelas—blood of pigeon. |
| 4. Anthrax—colony on gelatine. | 13. " " —liver of pigeon. |
| 5. " " —formation of spores. | 14. " " —spleen of pig. |
| 6. " " —blood. | 15. <i>Staphylococcus</i> —culture in bouillon. |
| 7. " " —spleen pulp. | 16. <i>Streptococcus</i> —culture in bouillon. |
| 8. " " —omentum. | 17. " " —kidney. |
| 9. " " —liver. | 18. <i>Pneumococcus</i> —culture in gelatine. |

Continued on next page.

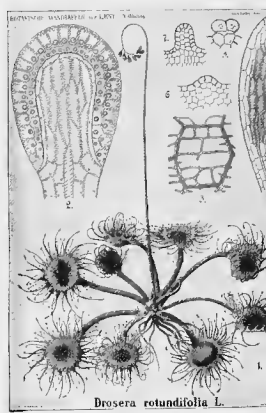
Charts, Bacteriology, Roux (continued).

19. <i>Pneumococcus</i> —blood.	43. <i>Diphtheria</i> —culture on coagulated serum.
20. " —capsules, positive and negative.	44. " —smear from fossil membrane.
21. <i>Plague</i> —	45. " —section of trachea.
22. " —culture.	46. <i>Septic Vibrios</i> —flagella.
23. " —blood from spleen.	47. " —peritoneal exudate.
24. " —smear from buds.	48. <i>Syphilitic Anthrax</i> —peritoneal exudate.
25. " —omentum of rabbit	49. <i>Tetanus</i> —bacilli with flagella.
26. " —liver.	50. " —culture with spores.
27. <i>Bacillus Typhosus</i> —flagella.	51. " —spores in phagocytes.
28. " —aggluta.	52. <i>Cancer</i> —development of archoplasm.
29. <i>Choera</i> —vibrions. Flagella	53. " —spermatogenesis of guinea pig.
30. <i>Recurrent Fever</i> —blood.	54. " —pseudococcidia.
31. <i>Coccidiosis</i> —pus.	55. <i>Small pox</i> —cornes of rabbit.
32. <i>Tuberculosis</i> —reaction in omentum.	56. " —pustule in skin of monkey.
33. " —spleen, spleen of rabbit, giant cells.	57. <i>Coccidia in rabbit</i> —life cycle (schematic.)
34. <i>Tuberculosis</i> —initial intravascular phagocytosis.	58. " —adenoma of liver.
35. " —intravascular tubercle, 12th day.	59. <i>Malaria</i> —haematozoos in fresh blood.
36. " —perivascular tubercle (kidney) 25th day	60. " —" " blood after staining.
37. " —ramified bacilli. Yellow degeneration.	61. " —development of <i>Haemamoeba relictis</i> in mosquito.
38. " —encysted bacilli. Spleen of rodent.	62. " —quito.
39. " —putum.	63. <i>Trypanosoma in rat</i> —division.
40. <i>Leprosy</i> —section of skin.	64. " —agglutination.
41. <i>Glanders</i> —pus and section of lung.	65. " —tse-tse fly—division.
42. <i>Actinomycosis</i> —phagocyte reaction.	

24408 Charts, complete set as above, duty free..... 75.00



No. 24412—Kny Botanical Chart



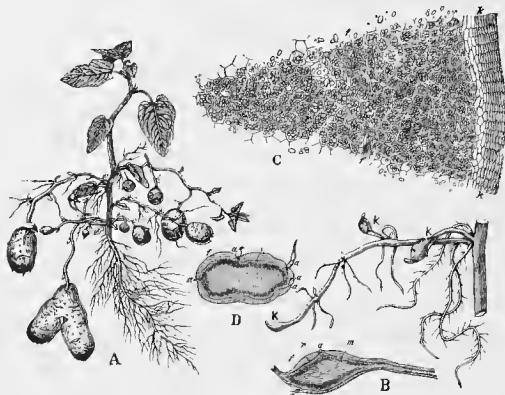
No. 24416

24412. Charts, Botanical, Kny, on heavy chart paper, printed in colors, 69 x 85 cm, with explanatory text. The old series consists of 100 charts in sections of 10 charts each (excepting sections VI and VII), each section being furnished in a portfolio and sold only by the section. For the new series see No. 24416.

Section I, Charts I to X, in portfolio, duty free.....	7.20
I. Structure of the living plant cell and arrangement of its most important elements; the two chief kinds of protoplasmic movement inside a closed membrane, rotation and circulation and transition between the two.	
II. Structure and development of the starch grain.	
III. The chief forms of Calcium Oxalate crystals.	
IV. Chief stages in the conjugation of a large species of <i>Spirogyra</i> .	
V. Milk cells of <i>Euphorbia splendens</i> and <i>Lactuca sativa</i> L.	
VI-VII. A few of the most important forms of one-celled hairs.	
VIII. Longitudinal section through a dicotyledonous vascular bundle.	
IX. Vascular bundle from the interior of the stem of <i>Saccharum officinarum</i> L.	
X. Development of the embryo of <i>Brassica Napus</i> L.	
Section II, Charts XI to XX, in portfolio, duty free.....	7.20
XI. Structure and development of the epidermis of <i>Ficus elastica</i> .	
XII. Portion of a transverse section of a leaf of <i>Pinus Laricio</i> .	
XIII. Stoma of <i>Thymus Serpyllum</i> , surface and transverse section.	
XIV. Transverse section through the vascular bundle of the petiole of <i>Polypodium vulgare</i> .	
XV. Part of a transverse section of a three year old twig of <i>Tilia parvifolia</i> .	
XVI. Transverse section through vascular bundle from the stem of <i>Cucurbita Pepo</i> .	
XVII. Medium longitudinal section of the rapidly growing root-tip of <i>Secale cereale</i> .	
XVIII. Transverse section of a well developed radicle of <i>Secale cereale</i> .	
XIX. Development of the ovule of <i>Oenothera biennis</i> .	
XX. Ovule of <i>Viola tricolor</i> immediately after fertilization, drawn in median longitudinal section.	

Charts, Botanical, Kny (continued).

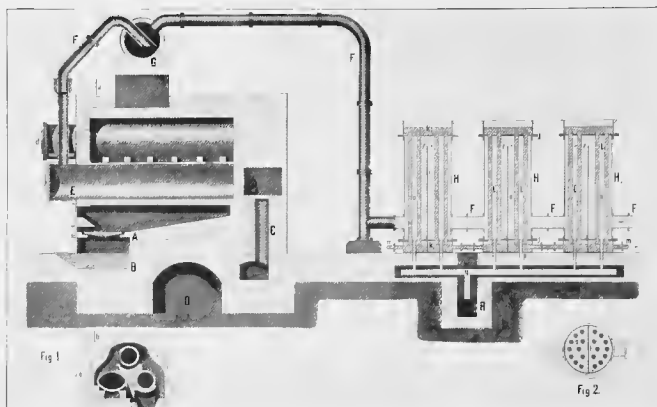
	Section III, Charts XXI to XXX, in portfolio, duty free.....	9.00
	XXI. Development of <i>Penicospora rabotheae</i> de Bary.	
	XXII-XXIII. Development of <i>Mucor Mucedo</i> L.	
	XXIV-XXV. Development of <i>Puccinia graminis</i> (Pers.).	
	XXVI. Reproduction in the Florilege.— <i>Nemalion multivium</i> (Wob. and Mohr.).	
	XXVII. " " " " — <i>Lophium medietranes</i> (Floriet).	
	XXVIII. " " " " — <i>Dutresnaya coccinea</i> (Parl.).	
	XXIX. Development of the tip of the stem of <i>Hippuris vulgaris</i> L.	
	XXX. " " " " " " — <i>Elodea canadensis</i> (L. G. Rich and Michaux).	
	Section IV, Charts XXXI to XL, in portfolio, duty free.....	9.00
	XXXI. Development of <i>Rivularia bullata</i> (Poir.).	
	XXXII-XXXIII. " " " " — <i>Eurotium</i> .	
	XXXIV-XXXV. " " " " — <i>Penicillium crustaceum</i> L. (Fries).	
	XXXVI. " " " " —the Fucaceae—Apical growth of <i>Pelvetia canaliculata</i> .	
	XXXVII-XXXVIII. " " " " —Fertilization in <i>Fucus vesiculosus</i> L.	
	XXXIX. Heterogenous dimorphism in the flowers of <i>Primula elatior</i> (Jacq.).	
	XL. trimorphism in the flowers of <i>Lythrum salicaria</i> L.	
	Section V, Charts XLI to L, in portfolio, duty free.....	9.00
	XLI-XLIV. Development of <i>Claviceps purpurea</i> (Fries).	
	XLV-XLVIII. " " " " — <i>Botryditium granatum</i> L.	
	XLIX. Transverse section through a vascular bundle showing soft bast divided into two portions from the middle part of the petiole of <i>Chamaeceros humilis</i> L.	
	L. Reduced vascular bundle from the stem of <i>Elodea canadensis</i> (Rich. & Michx.) in transverse section.	
	Section VI, Charts LI to LXV, in portfolio, duty free.....	15.00
	LI-LIIB. Anatomy of the wood of <i>Pinus sylvestris</i> L.	
	LIIV. Transverse section through the central cylinder of the root of <i>Asparagus officinalis</i> L.	
	LIV. " " " " " " " " — <i>Musa sapientum</i> L.	
	LVI. " " " " " " " " —the root of <i>Vicia Faba</i> L in the beginning of secondary growth.	
	LVII. Transverse section through the central cylinder of the root of <i>Vicia Faba</i> L showing advanced secondary growth.	
	LVIII. Development of the periderm in young shoots of <i>Sorbus Aucuparia</i> L.	
	LIX. " " " " —bark in one year twigs of <i>Vitis vitifera</i> L.	
	LX. " " " " —young stems of <i>Quercus sessiliflora</i> Sm.	
	LXI-LXII. " " " " —lenticels in twigs of <i>Syringia vulgaris</i> L.	
	LXIII-LXV. " " " " — <i>Sphaeroplea annulata</i> Ac. var. <i>carassisepta</i> Heinr.	
	Section VII, Charts LXVI to LXXX, in portfolio, duty free.....	15.00
	LXVI-LXVII. Development of the embryos of <i>Alisma Plantago</i> L.	
	LXVIII-LXIX. Structure and development of the lichens.	
	LXXIV-LXXVI. Structure of the wood of <i>Quercus sessiliflora</i> Sm.	
	LXXVII. Apical growth and branching of <i>Delosseria alata</i> Huds.	
	LXXVIII. Cell division in the young stamen-hairs of <i>Trifolium virginica</i> L.	
	LXXIX. Secondary growth in thickness of the stem of <i>Draecena Draco</i> L.	
	LXXX. Concentric vascular bundle from the zone of secondary thickening in the stem of <i>Draecena Draco</i> L.	
	Section VIII, Charts LXXXI to XC, in portfolio, duty free.....	12.00
	LXXXI-LXXXIII. Developmental processes in the embryo-sac of <i>Monotropia Hypopitys</i> L.	
	LXXXIV-XC. Structure and development of <i>Marchantia polymorpha</i> L.	
	Section IX, Charts XCI to C, in portfolio, duty free.....	12.60
	XCI. Structure and development of the glands of lupinus.	
	XCII. Pollination of the flower of <i>Aristolochia Clematis</i> L.	
	XCIII-C. Development of <i>Aspidium Filix-mas</i> Sw.	
24412.	Complete set of 100 Charts, as above listed, consisting of 9 sections, duty free.....	96.00
24416.	Charts, Botanical, Kny, New Series. These charts are larger than the old series, i.e. 106 x 150 cm and, while published in sections of varying numbers, are also sold separately. See illustration, page 136.	
	Section X, Charts Nos. 101 to 105.	
	101. <i>Drosera rotundifolia</i> .	
	102. <i>Mimosa pudica</i> .	
	103. <i>Sporogyna setiformis</i> .	
	104. <i>Cuscuta Trifolii</i> .	
	105. <i>Berberis vulgaris</i> .	
	Section XI, Charts Nos. 106 to 110.	
	106 and 107. <i>Dionaea muscipula</i> L.	
	108. <i>Centaurea Jacea</i> L.	
	109 and 110. <i>Mucor Sphyrates</i> de Bary.	
	Section XII, Charts Nos. 111 to 115.	
	111 and 112. The honey substitute of Orchard Flowers, <i>Macillaria rufescens</i> , <i>Stanhopea graveolens</i> and <i>Stanhopea oculata</i> .	
	Section XIII (continued).	
	113 and 114. Internal structure of the Sun- and Shade leaves of the Red Beech (<i>Fagus sylvatica</i> L.).	
	115. The Plasmodium of <i>Fuligo varians</i> (<i>Aethalium septatum</i>).	
	Section XIII, Charts 116 to 120.	
	116 and 117. Ectotrophic and Endotrophic Mycorrhiza.	
	118. Surface Modelling of Spores.	
	119 and 120. Apical Growth of Roots of <i>Phanero-gams</i> .	
24416.	Charts, Kny, New Series, as above, unmounted, per section, duty free.....	10.50
	" " " " " " " " each, duty free.....	2.40
24418.	Charts, Kny, New Series, mounted on linen with rollers, per section, duty free.....	15.00
	" " " " " " " " each, duty free.....	3.30



No. 24129—Frank and Tschirch, Botanical

24420. Charts, Plant Physiology, Frank and Tschirch, printed in colors upon heavy chart paper, 69 x 85 cm, each with explanatory text. These charts are furnished in six sections of 10 charts each, each section being furnished in a portfolio. They are sold only by the section.

Section I, Charts I to X, in portfolio, duty free.....	9.00
I. Zones of growth in dicotyledonous plants.	
II. Root hairs.	
III. Mechanical tissue in monocotyledons.	
IV. Germination of corn.	
V. Potato tubers.	
VI. Origin, growth and separation of starch grains.	
VII. Structure of the leaf of <i>Beta vulgaris</i> (common beet).	
VIII. Appearance and division of the stomata.	
IX. Forma of stomata.	
X. Mycorrhiza of trees.	
Section II, Charts XI to XX, in portfolio, duty free	9.00
XI. The cell.	
XII. Multiplication of cells by division.	
XIII. The growing point and growth of the stem.	
XIV. Cnolorphyll grains.	
XV. Spectra of chlorophyll, xanthophyll and of living leaves.	
XVI. " " alcoholic solutions of green and of etiolated leaves.	
XVII. Young stems of <i>Helianthus annuus</i> (Sunflower), first appearance of the ducts.	
XVIII. " " " " " " " " enlarged.	
XIX. Older stem of <i>Helianthus annuus</i> , enlarged.	
XX. " " " " " " " " enlarged.	
Section III, Charts XXI to XXX, in portfolio, duty free.....	9.00
XXI. Germination of the pea.	
XXII. Stem of <i>Lanum usitatissimum</i> (flax) in cross section, rigidity by means of wood and bast ring.	
XXIII. Growth of a stalk of rye.	
XXIV. Fillo-vascular bundle and starch sheath of corn.	
XXV. Stoma of beet leaf, 1.	
XXVI. " " " " " " " " 2.	
XXVII. Origin and appearance of root hairs.	
XXVIII-XXIX. Division of the nucleus.	
XXX. Chromoplasts.	
Section IV, Charts XXXI to XL, in portfolio, duty free.....	9.00
XXXI. Germination of flax.	
XXXII. Root-tubercles of the lupine.	
XXXIII. " " " " " " " " pea.	
XXXIV. Bacteria and symbiotic fungi of the Leguminosae.	
XXXV. The entrance of the symbiotic fungus into the lupine.	
XXXVI. " " " " " " " " pea.	
XXXVII. Root tubercles of <i>Phaseolus nanus</i> .	
XXXVIII. Daily period of growth.	
XXXIX. Ring ducts.	
XL. Spiral ducts.	
Section V, Charts XLI to L, in portfolio, duty free.....	9.00
XLI-XLIV. Forma of starch grains	
XLV. Transition from the primary structure of the root to the secondary and throwing off of the primary rind.	
XLVI. Periderm (cork and cork formation).	
XLVII. Cork of the tubers of <i>Solanum tuberosum</i> (Potato).	
XLVIII. Callus of wounds and leaf scars	
XLIX. Root systems of the Dicotyledons (lupine, mustard).	
L. " " " " " " " " Monocotyledons (rye).	



No. 24428

24428. Charts, *Chemical Technology*, von Schroder, size 106 x 78 cm. showing the more important manufacturing processes based upon chemistry. Mounted on linen with rollers.

	Series I.		Series V.
Chart 1.	Production of sulphur.	Chart 21.	Gas generator.
" 2.	Refining crude sulphur.	" 22.	Glass-potfurnace.
" 3.	Preparation of nitric acid.	" 23.	Glass-troughfurnace.
" 4.	Preparation of sulphurous acid by combustion of pyrites for use in the manufacture of sulphuric acid.	" 24.	Glass-stretchingfurnace (for making plate glass).
" 5.	A. Furnace for lump pyrites. B. Furnace for fine pyrites.	" 25.	Hoffman's ring furnace.
	Series II.		Series VI.
Chart 6.	Sulphuric acid factory, ground plan.	Chart 26.	Lime kiln.
" 7.	Sulphuric acid factory, vertical section.	" 27.	Manufacture of porcelain.
" 8.	Details in the process of manufacturing sulphuric acid.	" 28.	Manufacture of sodium.
" 9.	Concentration of acid.	" 29.	Manufacture of aluminum.
" 10.	Preparation of fuming sulphuric acid.		Series VII.
	Series III.	Chart 31.	Charring of wood.
Chart 11.	Salt Garden.	" 32.	Coke furnace.
" 12.	Graduation house.	" 33.	Furnace for roasting iron ores.
" 13.	Salt boiling.	" 34.	Iron-blast furnace (Hochofen).
" 14.	Soda manufacture.	" 35.	Blast super heater (Winderhitzer).
" 15.	Condensation of muriatic acid.		Series VIII.
	Series IV.	Chart 36.	Fresh fire (Frischfeuer).
Chart 16.	} Manufacture of illuminating gas.	" 37.	Puddling furnace.
" 17.		" 38.	Bessemer pear.
" 18.		" 39.	Martin furnace.
" 19.		" 40.	Rolling mill.
" 20.	System of generative heating, Siemens'.		Series IX.
		Chart 41.	Lead furnace.
		" 42.	Silver furnace.
		" 43.	Copper furnace.
		" 44.	Zinc furnace.
		" 45.	Mercury furnace.
			Series X.
		Chart 46, 47.	Semet-Solvay coke ovens.
		" 48.	Pure Aluminum, Calcium Carbide.
		" 49.	Carbon Bisulphide I.
		" 50.	" II.
	Charts, as above, in lots of not less than five, each duty free.....		1.35
	" " " " " any series of five, duty free.....		6.00
24432.	Chart, the Elements and their Atomic Weights, as adopted by the International Committee, 62 x 62 inches, mounted on linen.....		4.00
24436.	Chart, as above, mounted on linen with wooden rollers.....		5.00
24440.	Chart, Periodic Arrangement of the Elements, Mendelejeff, latest arrangement by Baskerville, mounted on linen.....		2.00
24444.	Chart, as above, mounted on linen with wooden rollers.....		2.50



No. 2448. Series 2, Chart I

No. 2448. Series 1, Chart IV

24448. Charts, Parasitic Protozoa and their Carriers, **Dönitz and Hartmann**. This publication is to eventually include 18 to 20 charts, of which 10 to 14 charts will be devoted to Protozoa, Series I, and 6 to 8 charts to their carriers, Series II. At the present time 9 charts of Series I, as per list below, have been issued and 2 charts only of Series II, the work having been interrupted because of Dr. Hartmann's absence in South America. Series I charts are 120 x 160 cm and Series II charts are 90 x 120 cm. They are carefully executed in colors.

- Series I, Chart I. *Chlamydophrys encihelys* (Ehrbg.).
- " " II. *Trichomastix lacertae* (Bütschli).
- " " III. *Leucozytozoon Ziemanni* (Lav.).
- " " IV. *Plasmodium vivax* (Grassi et Fel.).
- " " V. *Lambliia muris*, *Lambliia intestinalis*, *Trichomonas intestinalis*, *Nyctotherus faba*, *Balantidium minutum*, *Balantidium coli*.
- " " VI. *Haemoproteus columbae*.
- " " VII. *Trypanosoma lewisi*.
- " " VIII. *Entamoeba tetragena* (Viereck), *Entamoeba histolytica* (Schand).
- " " IX. *Leishmania donovani* (Lav. u. Mesn.)

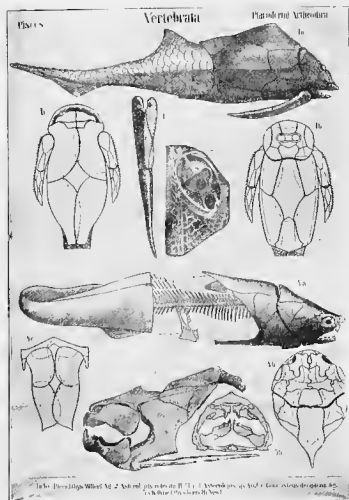
Series II, Chart I. *Glossina palpalis* (Robin Desv.) ♀, *Glossina morsitans* (Westw.) ♂, " *morsitans* Details.

24448. Charts, as above, unmounted, each duty free... 3.00
 " " mounted on linen with rollers, each duty free... 3.75

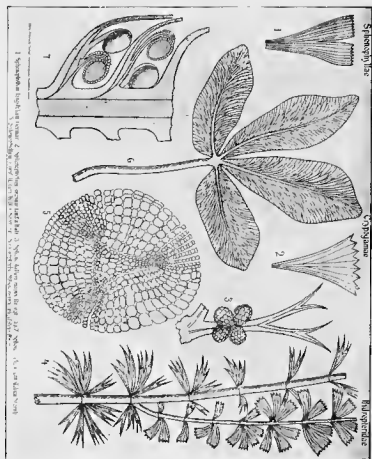
24452. Charts, Haematology and Cytology, **Landouzy and Labbe**. These charts are prepared under the direction of the Pasteur Institute, Paris, and are finely executed in colored lithographs on heavy paper with stout binding and eyelets for hanging. Size 80 x 62 cm.

- | Normal Blood | | Serum |
|------------------------------|--|---|
| I. Leucocytes. | | I. Blood Serum. |
| II. " " | | |
| III. " " | | |
| IV. Spectrum. | | |
| Pathological Blood | | Blood in Disease |
| I. Variole. | | I. Primary Tuberculosis of the Pleura. |
| II. Lymphatic Leuemia. | | II. Secondary Tuberculosis of the Pleura. |
| III. Myelogenic Leuemia. | | III. Hydrothorax. |
| IV. " " | | IV. Pleurisy due to Pneumococcus. |
| V. Disturbances of Hematies. | | V. Sarcomatous Pleurisy. |

24452. Charts, as above, complete set, duty free... 20.00



No. 24456



No. 24456

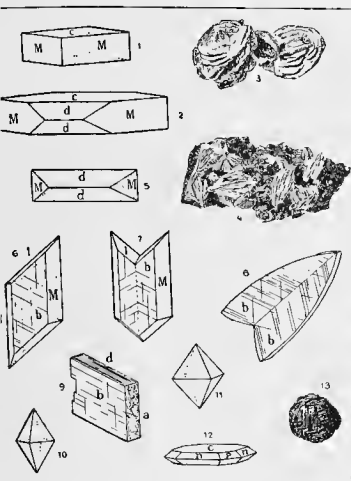
24456. Charts, Paleontology, Zittel and Haushofer, consisting of 83 charts, 100 x 140 cm, mounted on linen with rollers, illustrating fossil animals and including 8 ideal landscapes after Haushofer. The ideal landscapes consist of Charts Nos. 6, 7, 8, 9, 26 and 40, as follows:—

- Chart 6. Carbonic Era.—Alsinites, Ferns, Peceoptera, Neuroptera and other plants of this period.
- " 7. Obilgeocene Period.—Palms, Flabellaria, Phoenicites, Anthracoterialium, etc.
- " 8. Carbonic Era.—Ligiliana, Lepidod. etc.
- " 9. Jurassic Era.—Sponges, Corals, Lepidodus, Ammonites, Cyrenid and Pt-roductyl.
- " 25. Glacial Period.—Alps showing glaciation, motaines, reindeer, tanning and mammoth
- " 40. Cretaceous Era.—Cypress, Aranearia, Segouia, Cretneria, Iguanodon.

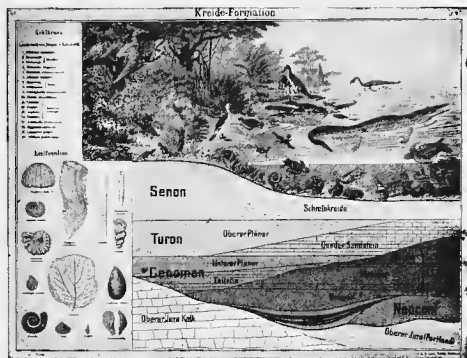
The contents of the entire series is given below, with the chart numbers:—

	Chart		Chart
Amphipoda	36.	Kndaria	75.
Amphibia	42, 43.	Lamellibranchiata	18, 32, 33.
Anthozoa	3, 4, 75.	Litopterna	69.
Artropoda	30, 31, 82, 83.	Mammalia	54, 55, 56, 57, 58, 61, 62, 63.
Aves	67, 68, 69, 70.		64, 65, 66, 67, 68, 69, 70, 71, 72.
Blastoiden	35.	Mammoth Hot Springs, Yellowstone Park	20.
Brachiopoda	12.	Marsupialia	54.
Bryozoa	5, 17, 77.	Mollusca	18, 19, 21, 22, 23, 24, 25, 27.
Carnivora	16.		28, 29, 32, 33, 78, 79, 80, 81.
Castle Geyser	41.	Molluscoides	5, 16, 17, 77.
Cephalopoda	19, 21, 22, 23, 24, 25, 27, 28, 78, 79, 80, 81.	Palechinoides	13.
Chelostomata	18.	Perissodactyla	58, 64, 65, 66.
Coelenterata	2, 3, 4, 75, 76.	Pylaeonophora	45.
Coprylaria	55.	Fishes	34, 35, 36, 37, 38.
Crinoida	10, 11.	Protocladia	57, 64.
Crocoidia	49.	Protozoa	1, 74.
Cynstraca	30, 31, 82, 83.	Radiolaria	52.
Cyctostomatia	15.	Reptilia	39, 44, 45, 46, 47, 48, 49.
Cystodes	12.		50, 51, 52, 59, 60, 73.
Dibranchiata	28.	Rhipidopteria	1.
Dinosauria	39, 50, 51, 59, 60.	Rhynchoccephalia	40.
Echinodermata	10, 11, 12, 15, 11, 15.	Rudidae	33.
Echinoumbra	13.	Sauropterygia	45.
Eolentata	61, 62, 63.	Scaphopoda	29.
Euechinoides	13, 14, 15.	Schalenbau	78.
Foraminifera	1, 74.	Selachii	34.
Gastropoda	37, 38.	Sponges	2.
Gastropoda	29.	Stegocéphali	42, 43.
Graptoloida	76.	Testudinata	47.
Hylotroca	74.	Tetrahbranchiata	10, 21, 22, 23, 24, 25, 27, 70, 80, 81.
Ichthyosaura	44.	Therapsidophora	46, 73.
Ideal Landscapes	6, 7, 8, 9, 26, 40.	Trochilota	55.
		Trilobitae	30, 82, 83.
		Versobrata	34 to 39, 42 to 73.

24456. Charts, as above, Nos. 1 to 83, with the exceptions noted below, each duty free 1.65
 " Nos. 6, 7, 8, 9, 26, 40 and 74 to 83, each duty free 1.80
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No. 24460



No. 24468

24460. Charts, Crystallography, Schwarzmann, consisting of 9 charts with 113 illustrations in all; size of each chart 70 x 96 cm.

- | | |
|------------------------------|---|
| Chart 1. Regular systems. | Chart 6. Oxides, halogens, aluminates and borates. |
| “ 2. Irregular systems. | “ 7. Carbonates. |
| “ 3. Hemihedron system. | “ 8. Sulphates, molybdates, wolframates & phosphates. |
| “ 4. Elements and sulphides. | “ 9. Silicates. |
| “ 5. Oxides. | |

Complete set, as above, duty free 7.20

24464. Charts, Paleontology, Zittel, Pompeckj and Salfeld, consisting of 10 charts, each 105 x 130 cm, illustrating fossil plants.

- | | |
|------------------------------|--|
| Chart 1. Thallopfiyta—Algae. | Chart 6. Filices—Sphenopteridae. |
| “ 2. Gymnospermae—Cycadeles. | “ 7. “ Cryptogamae—Neuropteridae. |
| “ 3. “ Ginkgoales. | “ 8. Filices—Cryptogamae—Dictyopteridae. |
| “ 4. “ Coniferales. | “ 9. “ Palaeopteridae. |
| “ 5. Filices—Pecopteridae. | “ 10. Cryptogamae—Sphenophyllae—Hydropteridae. |

Charts, complete set of 10, as above, mounted on linen with rollers, **duty free** 18.00

24468. Charts, Paleontology, Fraas. This series shows the development of the earth with its inhabitants, stratigraphic formation, type fossils and landscape reconstruction. Each chart is 95 x 125 cm, with explanatory text.

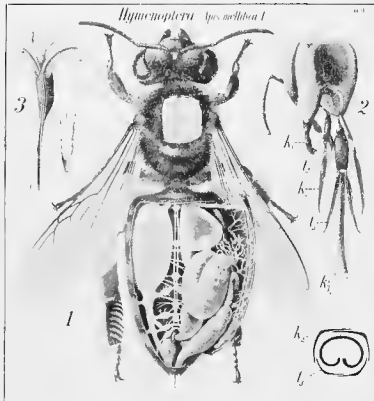
- | | |
|--------------------------|--------------------------------|
| Chart 1. Old paleozoic. | Chart 5. Cretaceous formation. |
| “ 2. Later “ | “ 6. Tertiary “ |
| “ 3. Triassic formation. | “ 7. Diluvian “ |
| “ 4. Jurassic “ | |

Complete set, as above, unmounted, duty free 10.00
 mounted on linen with rollers, **duty free** 15.15

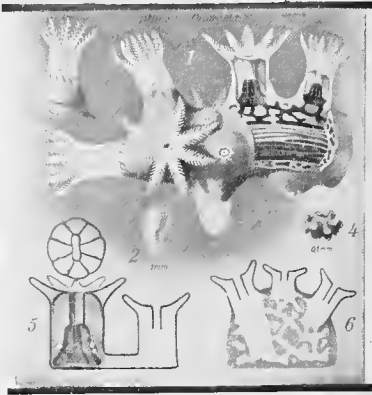
24472. Charts, Petrography, Sauer, consisting of 12 charts showing the microscopic structure of the most important rock types, size 75 x 100 cm, with explanatory text.

- | | |
|------------------------------------|---|
| Chart 1. Granite, from Lausitz. | Chart 8. Feldspar basalt, from Mt. Aetna. |
| “ 2. Gabbro from Völpersdorf. | “ 9. Basalt tuff, from Swabian Alp. |
| “ 3. Obsidian from Mexico. | “ 10. Bunter sandstone from Schwarzwald. |
| “ 4. Pitchstone from Arran. | “ 11. Gneiss from Erzgebirge. |
| “ 5. Vitrophyre from Lugano. | “ 12. Marble from Carrara. |
| “ 6. Pitchstone from Meissen. | |
| “ 7. Leucite porphyry, Lake Laach. | |

Complete set, as above, unmounted, duty free 6.00
 mounted on linen, with rollers, **duty free** 11.40



No. 24176



No. 24176

- 24476. Charts, Zoological, Pfuertscheller, Chromolithographic reproductions, 130 x 140 cm, with explanatory text in English, French or German. Twenty-five charts of the series are now finished by Prof. Pfuertscheller. He is continuing the work and there are now in preparation charts covering Protozoa, Coelenterata, Echinodermata, Worms, Crustacea, Myriopoda, Arachnoidea and Insects. The contents of the present series is as follows:—**
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Anthozoa (<i>Astroides calycularis</i>). 2. Lamellibranchiata (<i>Uni</i>). 3. Gastropoda (<i>Helix pomatia</i>). 4. Selachii (<i>Plagiostomi, Mustelus</i>). 5. Echinodermata (<i>sea-urchin</i>). 6. Hydrozoa (<i>Hydrmedusae (Hydra)</i>). 7. Cephalopoda (<i>Sepia</i>). 8. Mollusca (<i>formation of the mantle</i>). 9. Cestodes (<i>Taenia solium</i>). 10. Anthozoa (<i>Octactinia</i>). 11. Asteroidea (<i>Astroperten aurantiacus</i>). 12. Spongiae I. (<i>Sycon, Aplysina</i>). 13. Hymenoptera (<i>Apis mellifica I.</i>) | <ul style="list-style-type: none"> 14. Spongiae II. (<i>Euspongia officinalis</i>). 15. Thoroacetraca (<i>Astacus fluviatilis I.</i>). 16. Hirudineci (<i>Hirudo medicinalis</i>). 17. Infusoria (<i>Ciliata</i>). 18. Ophidia I. (<i>Tropidonotus natrix</i>). 19. Aves I (<i>Situs viscerum (Columba domestica)</i>). 20. Chelonia (<i>Emys</i>). 21. Myriopoda (<i>Lithobius</i>). 22. Teleostei (<i>Perca fluviatilis</i>). 23. Lepidoptera (<i>Pieris brassicae I.</i>). 24. Lepidoptera (<i>Pieris brassicae II.</i>). 25. Araneina (<i>Epeira</i>). |
|---|--|
- Charts, as above, Nos. 1 to 21, inclusive, mounted on linen with rollers, each, duty free. . . 2.50**
" " " Nos. 22 to 25 " " " " " " " " " " each, duty free. . . 3.00

- 24480. Charts, Zoology, Leuckart-Chun. These widely used and excellent charts are 104 x 140 cm for the regular charts and 135 x 192 cm for the special charts. Series I consists of 103 charts of Invertebrates and Series II, so far as finished, consists of 13 charts of Vertebrates, each chart accompanied by explanatory text in English, French and German. Special prices are quoted when more than 25 charts are ordered at one time. The contents of each chart is shown in the appended biological classification.**
- Charts, Leuckart-Chun, Series I, Nos. 1 to 101, inclusive, and Series II, Nos. 1 to 11, inclusive, unmounted, each, duty free. 1.80**
Charts, as above, mounted on linen with rollers, each, duty free 2.70
" " Series I, special charts Nos. 102 and 103, and Series II, special charts Nos. 12 and 13, unmounted each, duty free 3.60
Charts, as above, mounted on linen with rollers, each, duty free. 4.80

I. TYPE—PROTOZOA

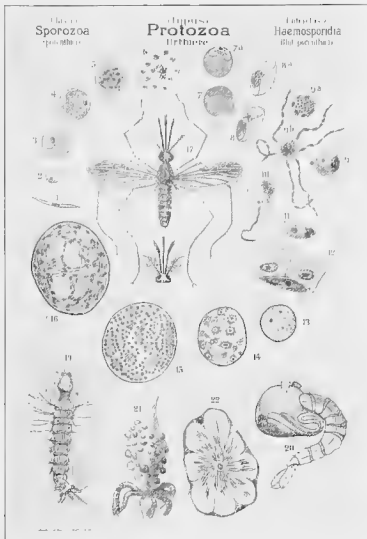
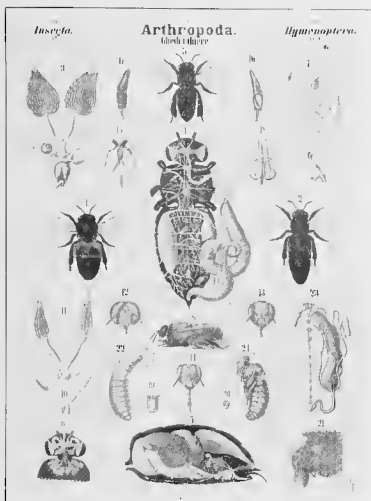
Class—Rhizopoda

Order—Thalamophora

- Series I, Chart 2. *Areolla vulgaris, Diffugia proteiformis, Eudlypha alveolata, Miliola (Triboculina) gibba, Quinaqueloculina, Polystomella strigilata, Cycloclupeus, Globigerina Diplophrys arcleri.*

Order—Radiolaria

- Chart 29. *Acanthometra elastica, Thalassicola pelagica, Collosoum inerme, Actinominia sateracanthion, Stilodietya quadrispina, Phaeodaria, Lithocireus productus, Encyridium galea.*



No. 24489. Series I, No. 27

No. 24480. Series I, No. 102

Charts, Zoology, Leuckart-Chun (continued).

Class—Sporozoa

Order—Graciloida

Series I, Chart 23. Polyrystalea, Monorystalea, Actinoccephalus oligocanthus, Gonopora terbellas, Clepsidrina polymorpha, Tropopora, Naeritis, Clepsidrina blattarum, Stydiomyces longicollis, Gamocystis tenax, Coelocidium among the Monocystidae.

Order—Haemosporidia

“ Chart 102. Life-cycle of Plasmodium praecox, showing sporozoite, schizont, schizogonia (merozoites), macrogamete, microgametoblast, ookinete, microgametes, oocyst, sporoblast, and various intervening stages and processes.—Anopheles claviger,—female, head of male, larva, nymph, stomach with oocysts, cross-section of salivary duct with sporozoites of Plasmodium.

Order—Coelocidia

“ Chart 103. Life-cycle of Coelocidium schubergeri, parasitic in Lithobius forficatus, showing sporozoites, schizont, merozoites, macrogamete, microgametoblast, microgametes, oocyst, sporocyst, and various intervening steps. Development stages of Adlesia ovata, showing microgametocytes, etc. Section of liver of rabbit with Coelocidium ovaliforme. Section of kidney of snail with Kloussia helicina.

Class—Infusoria

Orders—Flagellata, Choanoflagellata

Series I, Chart 75. Mastigamoeba aspera, Oikomonas tramo, Nonas gutturalis, Cercomonas longicauda, Anthophysa vegetans, Synura uvella, Tetramitus rostratus, Mesostoma intestinalis, Trichomonas vaginalis, Haematococcus, Euglena spirogyra, E. viridis, Ureocelis silicicula, Trachelomonas laqueata, Chlamydomonas parvumascuum, Dimorphan sertularia, Anisomonas grande, Cryptomonas ovata, Polytoma uvella, Colosiga borytrix.

Orders—Flagellata, Dinoflagellata, Cystoflagellata

“ Chart 76. Volvox globator, Goniodoma acuminata, Ceratium hirundinella, Glenodinium euctona, Ceratium furca; Dinophyses acuta, Gymnodinium spirale, Noctiluca miliaris.

Order—Ciliata

“ Chart 65. *Holotricha*, *Heterotricha*, *Hypotricha*.—Porodon teres, Cycladina glaucosa, Colpoda cucullus encysted, Paramecium caudatum, Frontonia leucas, Paramecium putrinum; Stentor polymorphus, S. coeruleus; Stylonychia mytilus.

“ Chart 67. *Oligotricha*, *Pavotricha*.—Tintinnopsis lexeides, Dictyocesta tiana; Carchemum polydatum, Vaginicola longicollis, Vorticella microstoma, Styrobona gemmipara.

Order—Suctoria (=Acinetaria)

“ Chart 68. Podophrya fixa, P. libera, P. quadrinerviata, Ephelata gemmipara, Dendrocometes paradoxus, Dendrosoma radiana, Acincta tuberosa, Stylonychia mytilus with parasite Sphaemphryae, Ophryodendron abietinum.

II. TYPE—COELENTERATA (ZOOPHYTES)

Sub-type—Porifera Sponges

Class—Spongiae

Order—Fibrospongiae

Series I, Chart 35. *Myros pongiae*, *Ceratopongia*, *Monactinellidae*.—Halysarcia dujardini, Euspongia officinalis, Hircinia setosa, Aplysilla tonella, Darwinella aurea, Spongilla lacustris, S. fluviatilis, S. lieberkühni, Rinalda arctica, siliceous spicules of Monactinellidae.

Charts, Zoology, Leuckart-Chun (continued)

- Order—Tetractinellidae**
- Series I, Chart 47. *Tethya maza*, *Tethya polyura*, *Tisiphonia fenestrata*, *Astartiella radiata*, *Corticium candelabrum*, *Plakina monocarpa*, *Cestria placenta*, *Cacumans vulvati*, *Plakina trilobata*, *Stelletta mammillaria*, *Corticium verticillate*, *Anorhina verrucosa*, *Tisiphonia agrifoliformis*, *Chondrilla phylloides*.
- Order—Lithisidae**
- " Chart 52. *Leiodermatium lynceus*, *Selicothoonchoneiloides*, *Discoodermia calyx*, *D. japonica*, *Corallistes pratii*, *Kaliapius cidaris*, spicules.
- Order—Hexactinellidae**
- " Chart 50. *Hyalonema mirabile*, *Holtenia carpenteri*, *Phoronema hemisphaerium*, *Rosella velata*, *Phoronema annae*, *Crateromorpha*, *Euplectella saliera*, *E. asperillum*, characteristic spicules.
- " Chart 50. *Lysoclema*.—*Autochone cylindrica*, *Rhabdodictyum delicatum*; *Dictyonina*.
- Order—Calcispongidae**
- " Chart 54. *Olyntbus primordialis*, *Ascaltis gegenbauri*, *Syconus primitivus*, various forms of spicules, *Syconia raphanus*.

Sub-type—Cnidaria (Corals, etc.)

Class—Hydrozoa

Order—Hydroidea

- Series I, Chart 16. *Hydra viridis*, *H. fusca*, *Cordylophora lacustris*, *Polocoryne carnea*, *Corymorpha mutans*; diagrammatic sections of typical Hydroids.
- " Chart 20. *Hydra viridis*, *Hydra vulgaris* var. *aurantiacea*, *Hydra grisea*.
- Order—Hydromedusae**
- " Chart 18. *Carmarina hastata*, *C. fungiformis*, *Hippocrene superciliaris*, *Bougainvillea superciliaris*.
- Order—Siphonophora**
- " Chart 56. *Agalina sarsi*, siphonophores of the family *Calycophoridae*, *Traya galea*, *Abyla pentagona*, *Eudoxia cuboides*, *Monophyes primordialis*, *Eudoxia eschscholtzi*, *Halstenia pirtum*, *Diphyes sieboldii*.
- Order—Acalephae (Jelly-fish)**
- " Chart 64. *Aurelia aurita*.—*Mastura* fixed with commencing stomodaeum, polyp with 4 tentacles, with 5 tentacles, *Scyphistoma* with 16 tentacles, *Strobila* with only one *Ephyra*, *Scyphistoma* with 5 segments; *Aurelia flavida*.

Class—Anthozoa (Corals)

Order—Octactinia (= *Acyonaria*)

- Series II, Chart 1. Single zooid of an Octactinian; *Corallium rubrum*.
- " I: Chart 94. Pennatulid siphonophore, *Renilla reniformis*, cross section of a polyp, cross-section of stalk of Pennatula.

Class—Ctenophora

- " Chart 74. *Hormiphora plumosa*, *Bolina hydalina*, *Cestus veneris*, *Vexillum parallelum*, *Beroe ovata*, *Beroe forskalii*.

III. TYPE—ECHINODERMATA

- Series I, Chart 79. *Development of the Larval Forms of Echinoderms*: Simplest larval form. Development of the Holothurian larva *Auricularia*, of the Asteroid larva *Bipinnaria*, and of the Pluteus larva.
- " Chart 80. Development of *Holothuria tubulosa*, *Cucumaria dolium*, *Synapta digitata*, *Echinus miliaris*, *Arbacia*, *Asterina gibbosa*.

Sub-type—Pelmatozoa

Class—Crinoidea

Order—Brachiata

- Series I, Chart 5. *Rhizocrinus lotensis*. Small individual, crown of a full-grown specimen, calyx from above, section of crown-section through an arm.
- " Chart 7. *Antedon rosaceus*.—Full-grown animal, calyx from dorsal side, arrangement of fibrous strings, larvae.

Class—Blastoidea

Order—Regulares

- Series I, Chart 46. *Pentamerites alentus*, *P. pyriformis*, *P. godoni*, *Codaster hindel*, *Orophocrinus stelliformis*, *Granatocrinus derbiensis*;
- " " *Astrocrinus leannei*.

and Order—Irregulares

Sub-type—Asterozoa

Class—Ophiuroidea

- Series I, Chart 39. *Ophiura*, *Ophiocoma*, *Ophiomyxa*, *Ophiothrix*, *Ophioglypha*, *Ophiarschna*.

Class—Asteroidea (Starfishes)

- Series I, Chart 86. *Asteropecten rubens*, *pedicellaria*, *Astropecten hemprichi*, *Echinaster sentus*.

Sub-type—Echinozoa

Class—Echinoidea (Sea-urchins)

- Series I, Chart 81. Sea-urchin with lower floor removed, *Aralic punctulata*, *Echinus acutus*, *Doroedaris papillata*, *Arbacia pustulosa*.

Class—Holothuroidea (Sea-cucumbers)

- Series I, Chart 61. Anatomy of a Holothurian of the family *Aspidochirotae*: gullet of a dendrochirote Holothurian and of *Synapta*; Holothuria impatiens, *Cucumaria*, *Chirodota*.

IV. TYPE—VERMES (WORMS)

Class—Platodes

Order—Trematoda

- Series I, Chart 62. *Tristomum coecium*, *T. papillosum*, *Gyrodactylus elegans*, *Polystomum integerrimum*, *Octobothrium lanceolatum*, *Diplozoon paradoxum*, *Dipora*.
- " Chart 33. *Diplostomum hepaticum*, *Diplostomum lanceolatum*.
- " Chart 73. *Diplostomum macrostomum*, *D. clavigerum*, *Cercaria macrocerca*, *D. echinatum*.
- Order—Cestoda**
- " Chart 15. *Taenia saginata*, *Taenia solium*.
- " Chart 44. *Botrioccephalus latus*, *Tetrarhynchidae*, *Caryophyllaeus mutabilis*.
- " Chart 99. Development of *Taenia echinococcus*, adult *Taenia*, genital organs of a young segment, *Cysticercus* condition *Cotylurus cerebri*; *Taenia serrata*; *Cysticercus psiliformis*, headbooks on the *Cysticercus*, head young *Taenia serrata*; development of the *Cystoid tapeworms*, *Taenia cucumerina*, young segment of same, *Cysticercoid* egg of same, *Cysticercus arionis*, etc.

Charts, Zoology, Leuckart-Chun (continued)

- " Chart 28. Planaria polychroa, Dendrocoelum laetum, Eurylepta orbicularis, Vortex viridis, Mesostomum ehrenbergi, Microstomum lineare.
- " Chart 39. Nemertes neesi, Amphityrus lactiflorus, Tetrastomina flavidum, development of Nemertes out of the Ptilidium Lineus obseurus.
- Class—Nemathelminthes**
- Order—Nematoda**
- Series I, Chart 31. Ascaris lumbricoides, Oxyurus vermiculatus, Dochmius duodenalis, D. trigonocephalus, Anguillula intestinalis
- " Chart 66. Trichocephalus dispar, T. affinis, Trichosomum crassicauda, Trichilaria spiralis, most containing Trichina.
- " Chart 49. Heterodera schachtii.
- " Chart 100. Male Echinorhynchus rigas, male Echinorhynchus angustatus, female genital apparatus of E. gigas nephridia of same, oviduct of E. angustatus and ligamentum suspensorium, section through ovary, egg of E. mouliniformis, embryos of E. gigas and of E. angustatus, larvae.

V. TYPE—ANNELIDA (ANNELIDS)

Class—Chaetopoda

Order—Polychaeta

- Series I, Chart 56. Elysia:—Nereis (Leontis) dumerilii, Heteronereis ceratidi, Nereis pubertaria, N. striolata, Alciopa cantrina, Tomopteris euhacta.
- " Chart 57. Scolodora:—Arenicola piscatorum, Physilochtaopterus major, Spinorbia leavis, Serpula vermicularis, Sabellaria alveolata, Pygospiobranchus protensus, Myxicola infundibulum.
- " Chart 19. Lumbricus riparius, L. agricola, Crochilus lacuum, Lumbricus communis, L. olidus, Lumbricus trapezoides, on Chart 24 following.

Class—Hirudinea = Discophora

- Series I, Chart 21. Hirudo medicinalis, Piscicola.

Class—Gephyrea

Orders—Sipunculoidea, Echiuroidea

- Series I, Chart 53. Sipunculus nudus, Echinurus melias, Bonella viridis, Stereopsis spinosus, Actinotrocha-larva of Phoronis.

Class—Rotifera, incl. Gasterotricha

- Series I, Chart 51. Hydatina senta, Stephanoceros cichhorni, Melicerta rugosa, Rotifer vulgaris, Notommatia sieboldi, Chaetomatys maximus.

VI. TYPE—MOLLUSCOIDEA

Class—Bryozoa

Orders—Endopoceta, Ectopoceta

- Series I, Chart 34. Pelecinella echinata, Plumatella repens, stages of statoblasts of Alcyonella fungosa in section, Alcyonidium nyctii, Bowerbankia densa, Acamarilus avicularia, Flustra membranacea.

Class—Brachiopoda

Order—Pesticardines

- Series I, Chart 98. Waldheimia australis, aut anatomy, Tytrabrata vitrea, Argiope neapolitana, larva, Terebratulina minor, Argiope kowalevskii;
- " Chart 101. Lingula anatina, and Order—Ecardines

- " Chart 101. Lingula anatina,—Anatomy in detail.

VII. TYPE—MOLLUSCA (SHELL-FISHES)

Class—Lamellibranchiata (Bivalves)

Order—Asphondia

- Series I, Chart 12. Margaritana margaritifera, development of Unio pictorum.
- " Chart 60. Ostrea edulis,—longitudinal sections, cross-section of larva ready to swarm, side view of same, heart, blood corpuscles, ball of sperm, spermatozoon, and mature eggs.
- " Chart 77. Pecten Jacobeanus, Arca noae, Mytilus edulis, Stenodylus gasteropus.
- " Chart 59. Cardium tuberculatum, pericardial chamber of Venus verrucosa, Plochaidea, Tereido and larva, hinge of Trigonina, Cladophore of Nya truncata.

Class—Scaphopoda (Tooth shells)

- Series I, Chart 92. Anatomy and development of Dentalium entalis.

Class—Gastropoda (Univalves)

Order—Pulmonata

- Series I, Chart 30. Anatomy of Helix pomatia, Helix pomorialis, Limnaea stagnalis, arion empiricorum.
- " Chart 8. Fontinalix capitatus, Eolis, Doris, Polyera quadrilineata, Pleurobranchus, Aplysia punctata.
- " Chart 43. Cressia scitula, Cymbulina peroni, larva, Clione borealis, Clionopsis krohni, larva of Clione and Pneumodermus, Firoda (Pneumatika) coronata, Eroliaides isseuri, Atlanta peroni.

Class—Cephalopoda

Orders—Tetrabranchiata and Dibranchiata

- Series I, Chart 14. Anatomy of Octopus vulgaris, head-cartilage of Sepia officinalis, brain of Sepia, section through eye of Sepia and of Nautilus pompilius.
- " Chart 36. Nautilus pompilius, Spirula prototypus, shell of Spirula peroni, male Argonauta argo, female of same, hectocotylus of Octopus carenae, spermatozoon of Sepia officinalis.

VIII. TYPE—ARTHROPODA

Sub-type—Branchiata

Class—Crustacea

Sub-class—Entomostraca

Order—Phyllopoda

- Series I, Chart 26. Apus caeciformis, Apus proctus, Branchiulus stagnalis, Daphnia pulex, Polyphemus oculus.

Order—Copepoda

- " Chart 25. Canthocamptus minutus, Cyclops canthocamptoides, Cyclops tenuicornis, Acetabularia perarum, Argulus foliaceus.

Order—Cirripedia

Charts, Zoology, Leuckart-Chun (continued)

- Series I, Chart 57. Anatomy and development of the *Lepadine*.—*Lepas anatifera*, entire section, embryo, Cypris stage, section of further developed *Lepas*, ripe young *Lepas*. Anatomy and development of the *Balanidae*.—*Balanus tintinnabulum*, Nuplius larva of *Balanus balanoides*, Cypris stage, young *Balanus*; *Ibla cumingii*.
 " Chart 58. *Rissocephala*.—*Carcinus maenas* with a mature *Sacculina carina* *in situ*, development of the *Sacculina*, Nuplius stage, first moult. Cypris stage, Cypris working its way into the body of the crab, young *Sacculina*, older *Sacculina interna*, cross section, longitudinal section, mature *Sacculina externa*.

Sub-class—Malacostraca

Order—Somatopoda

- Series I, Chart 95. *Squilla manna*.—Adult, side view, back view cut open, transverse section through abdomen, mouth parts, three stages in development, Eriethoid larva, older Squilloid larvae.

Order—Decapoda

- " Chart 91. *Macrura*.—Larval history of *Penaeus*, Nuplius, youngest *Zoea* stage, older *Zoea* larva, older *Penaeus* larva, same more developed *Zoea* form of other *Decapoda*, of *Callinectes*, of *Pagurus*, young *Homarus* and Larva, larva of *Astacus fluviatilis*. *Brachyura*.—Youngest *Zoea* of *Thia*, older *Zoea* of *Maia*.
 " Chart 92. *Astacus fluviatilis*.—Longitudinal section of male, section of cephalothorax, mouth parts, stomach, circulatory system, male genital apparatus, female genital apparatus, section through eye, inner antenna.

Order—Archostraca

Sub-order—Isopoda

- " Chart 3. *Asellus aquaticus*.—male, central nervous system, female, anatomy, embryo; *Porcellio scaber*.—animal groups of segments, incubatory pouch.
 " Chart 88. *Eutonnoisidae*.—Development of *Copon elegans*, second larval form, male and female, ventral views, female, dorsal view; *Postunio imenadis*, *P. kosmanni*, *Cancerion miser*.

Sub-order—Amphipoda

- " Chart 4. *Gammarus neglectus*, *Phronima solentaria*, *Caprella*

Class—Acerata

Sub-class—Merostomata

Order—Xiphosura

- Series I, Chart 90. *Limulus polyphemus*.—Longitudinal section of body, transverse section of cephalothorax, of female *Limulus*, circulatory and nervous systems, genital organs, young *Limulus*.

Sub-class—Arachnida

Orders—Scorpionida, Pseudo-scorpionida, Cyphophthalmida

- Series I, Chart 45. Inner structure of *Buthus jler*, *B. ornatus*, *Scorpio italicus*, *Chelifer caneroides*, *Gibhellium sudeticum*.

Order—Araneida

- " Chart 42. Inner structure of a female diplocephalic Araneid; *Epeira diadema*, *Sugestia sinuolata*, *Tegenaria*, *Zilla calophylla*, *Argioleuca arcuata*, *Phidosa fourcroyi*, *Argioleuca labyrinthica*.

Order—Acarina

- " Chart 48. Metamorphosis of *Trombidium fuliginosum*; *Tyroglyphus sitis*, *Trichodactylus aouyosum*.

- " Chart 58. *Sarcoptes scabiei* var. *hominis*, *S. muris*, *Chorioptes spatuliferus*, *Psoroptes longirostris*, *Analges passerinus*, *Dermodeus foliicolonus*.

Order—Lingatulida

- " Chart 63. *Linguatula* (*Pentastomum*) *tesquelles*, *Pentastomum denticulatum*, *P. torquatum*, *P. multinectum*, *P. constrictum*.

Sub-type—Tracheata

Class—Protracheata

Class—Myriopoda

Orders—Chilopoda, Symphyla, Parapoda

- Series I, Chart 32. *Lithobius forficatus*, *Scopiopeira horrida*, *S. complanata*, *Geophilus*, *Scopiopeidrella*, *Paraporus*.

- " Chart 35. *Polydesmus complanatus*, *Leptodesmus insculptus*, *Iulus londinensis*, *Glomeris marginata*, *Strongylosoma gervini* (also *Pezipatus capensis*).

Class—Insecta

Order—Orthoptera

- Series I, Chart 11. Migratory locust, *Orthopoda* stridulus, body of *Aceridium tartaricum*, mole-cricket, grass-hopper.

- " Chart 22. *Phegmina*, *Ephemeroptera*, *Libellulidae*, *Agria puella*.

- " Chart 83. *Termes lucigalis*, *Entomones* from Borneo, *Termes* from Java.

Order—Hymenoptera

- " Chart 17. *Phyllocera vastatrix*.—Vine leaf covered with galls of *Phyllocera*, development, apterous sexual generation, male and female generation, root-attacking generation and egg, winged generation, subterranean pupa. Map of France showing distribution of *Phyllocera*.

Order—Neuroptera

- " Chart 9. *Megaloptera*, *Chrysopa flaviventris*, *Trichoptera*, *Strepsiptera*.

Order—Coleoptera

- " Chart 6. Potato beetle (*Doryphora decemlineata*).

- " Chart 78. *Hylesinus piniperda*, *Bostriehus typographus*, galleries in trunk of a fir tree, *Bostriehus laevis*, *Eucopiosia solytus*, *Clerus formicarius*.

- " Chart 84. Organs and metamorphosis of European May-beetles (*Melolontha vulgaris* and *M. hippocastani*).

Order—Diptera

- " Chart 70. *Musca* (*Calliphora*) *vomitoria*. *Sarcophaga carnaria*, *Musca domestica*.

Order—Lepidoptera

- " Chart 21. *Calligae* Butterfly (*Pieris brassicae*), Goat Moth (*Cassia liquiperda*), caterpillar of *Bombyx pini*, silk glands, etc., head of larva of *Aporia crataegi*, head of imago of *Sphinx pinastri*, scales from butterflies' wings, alimentary canal of imago of *Sphinx atropis*, egg of *Smerinthus rapuli*—showing micropyle.

Order—Hymenoptera

- " Chart 41. Galls, adult insects etc., of certain Gall-Wasps of the oak.

- " Chart 27. Honey bee (*Apis mellifera*).

- " Chart 97. *Amantodon circumflexus*, *Gastropacha pini*, *Microgaster nemorum*, *Teleas phalae narum*, larva of *Platyaster*.

IX. TYPE—CHORDATA (VERTEBRATES)

Sub-type—Acrania

Class—Hemichordata

- Series I, Chart 93. *Balanoglossus kowalewskii*.—Development, organization of larva.

Class—Tunicata (Urochordata)

Sub-class—Copelata (Larvacea)

- Series I, Chart 71. Appendicularia and tadpoles of *Ascidia*, *Oikopleura cophocera*, *Stegosoma pellicoidum*, *Clavelina lepadiformis*.

Charts, Zoology, Leuckart-Chun (continued)

Sub-class Ascidiacea
 Series I. Chart 53. Anatomy of *Ciona intestinalis*, *Cordia*, *parviblagramma*, *Clavellinole padiformis*, development stages of the simple Ascidiacea.

Sub-class—Thaliacea
 Series I. Chart 49. *Doliolum mülleri*, *D. ehrenbergi*, *Salpa penata*, *Salpa demogeretia-mucronata*.

Class—Cephalochordata
 Series I. Chart 72. Development of *Amphioxus lanceolatus*.

Sub-type Craniata

Class—Pisces

Series II. Chart 1. Electric organs of *Torpedo marmorata*, *Gymnactus electricus* and *Malapterurus electricus*, pseudoelectric organs of *Mormyrus* and *Raja clavata*.

Order—Elasmobranchii

Series II. Chart 2. Embryonic development of *Plagiomimata*: Belfour's stages B to K.

“ Chart 3. Sections of early stages (to stage C.)

“ Chart 4. Sections of later stages (from stage D.)

“ Chart 12. Skeletons of *Acanthias*, dorsal and side view of skull of *Notidonus cinereus*, tooth of *Acanthias* and of *Notidonus*. (Double chart)

Order—Dignsi

Series II. Chart 10. Various specimens of *Carzodus*, *Prototertius annectens*

Class—Amphibia

Orders—Anura, Urodela

Series II. Chart 5. Embryonic development of *Rana temporaria* and *Triton*, in detail, earlier stages.

“ Chart 9. Embryonic development of *Rana temporaria*, *R. esculenta*, *Bombinator*, and *Triton*, later stages (in continuation of preceding chart).

“ Chart 69. Metamorphosis of the Common Frog (*Rana temporaria*)

“ Chart 6. Skeletons of *Batrachia*, *Rana temporaria*, *esculenta* and *tigrina*, details.

“ Chart 11. Intestinal tract of larval *Pelodytes fusca*, and *Rana esculenta*, jaw of last, dissection of pyloric tract, pharynx of newly hatched *Bufo vulgaris*, etc.

“ Chart 10. Vascular system of amphibia,—aorta with branchiae, heart and arteries, venous system, section of heart of frog.

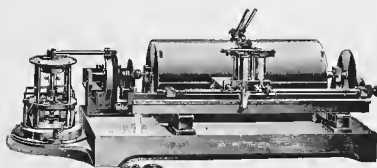
“ Chart 8. Nerve system,—brain and spinal cord of *Rana temporaria*, sections of brain, sympathetic system, brain of larva of *Bombinator igneus*, spinal cord of *Rana esculenta*, sense organs of lateral line of head of larval *Triton taeniatus*.

“ Chart 7. Urogenital system of Amphibia,—segment-canal from kidney of larval *Siphonops*, urogenitalia of male *Rana temporaria* and *R. esculenta*, and of female of sister species, diagrams of male and female urogenital systems of *Triton taeniatus*.

Class—Mammalia

Order—Primates

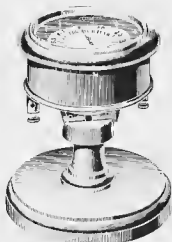
Series II. Chart 37. *Corilla eugenia*, skull of adult male *Corilla*, head of adult male *Chimpanzee*, skull of an adult male *Orang-outang*, head of *Semnopithecus asiacus*.



No. 24484



No. 24490



No. 24496

24484. Chronograph, registering, with electric motor and regulator after Thury, with three speeds, i.e., one rotation every minute, one every ten seconds, or one every second; electro marking magnets with two writing pens, all mounted on carriage with variable speed. A precision instrument for the graphic recording of any laboratory experiments requiring the measurement of small time.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 300.00 | Duty Paid | 375.00 |
|-----------|--------|-----------|--------|
24486. Chronoscope, Hipp, with two dials, reading to $\frac{1}{1000}$ of a second; clock-work operates for one minute.
- | | | | |
|-----------|-------|-----------|--------|
| Duty Free | 96.00 | Duty Paid | 120.00 |
|-----------|-------|-----------|--------|
24488. Chronoscope, Hipp, as above, but on wooden base with levelling screws.
- | | | | |
|-----------|-------|-----------|--------|
| Duty Free | 96.00 | Duty Paid | 112.50 |
|-----------|-------|-----------|--------|
24490. Chronoscope, Hipp, large model, operating 6 minutes from one winding; on column support.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 156.00 | Duty Paid | 195.00 |
|-----------|--------|-----------|--------|
24492. Chronoscope, Hipp, as above, but on wall bracket.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 144.00 | Duty Paid | 180.00 |
|-----------|--------|-----------|--------|
24496. Chronoscope, Ewald, for counting rapid interruptions in electric current, such as from an electrically driven tuning fork, etc.; dial divided from 1 to 100; pointer may be set instantly to zero after each reading.
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 50.40 | Duty Paid | 63.00 |
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No. 24500-Small



No. 24504-Small



No. 24500-Large



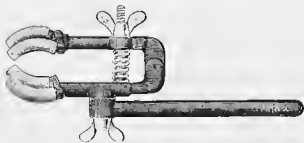
No. 24504-Medium



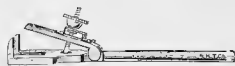
No. 24508-Small



No. 24504-Large



No. 24508-Large



No. 24514



No. 24510



No. 24518



No. 24522



No. 24526

- 24500 Clamps, Bunsen, extension, of japanned iron, with cylindrical rubber covered jaws. For use with clamp holders No. 24518 and No. 24526.
- | | | |
|---|-----|-----|
| Total length, inches..... | 8 | 9 |
| Will take tube, inches in diameter..... | 1½ | 2 |
| Each..... | .40 | .60 |
24504. Clamps, Bunsen, extension, of japanned iron, with one flat and one V shaped rubber covered jaw in the small and medium sizes and two in the large size. For use with clamp holders No. 24518 and No. 24526.
- | | | | |
|---|-----|-----|-----|
| Total length, inches..... | 7½ | 9 | 10 |
| Will take tube, inches in diameter..... | 1 | 2 | 2½ |
| Each..... | .40 | .60 | .75 |
24508. Clamps, Universal, extension, of japanned iron, with universal motion permitting its use for articles of irregular shape. Especially recommended for use with condensers and retorts. For use with clamp holder No. 24518.
- | | | |
|---|-----|------|
| Total length, inches..... | 8 | 11 |
| Will take tube, inches in diameter..... | 1½ | 3 |
| Each..... | .75 | 1.25 |
24510. Clamps, Hoffmann, extension, with one flat and one V shaped jaw, covered with rubber, the flat jaw with parallel motion. Total length 9½ inches. Will take tubes up to 1½ inches in diameter..... .40
24514. Clamps, Ostwald, extension, of polished brass. Jaws will take tubes from 1 to 50 mm in diameter. 2.00
24518. Clamp Holder, of japanned iron, with brass screws for attaching extension clamps, extension rings, etc., to apparatus supports.
- | | | |
|---|-----|-----|
| For supports up to, inches in diameter..... | ½ | ¾ |
| Each..... | .20 | .25 |
24522. Clamp Holder, of polished brass throughout, for supports up to 16 mm in diameter..... 1.10
24526. Clamp Holder, same as No. 24518 but adjustable, for rods up to ¼ inch in diameter..... .50



No. 24530



No. 24534



No. 24538



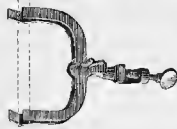
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No. 24558



No. 24570



No. 24574



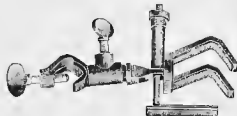
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No. 24582



No. 24598



No. 24586



No. 24590



No. 24594



No. 24602

24530.	Clamp, of nickel plated brass, with rubber covered jaws50
24534.	Clamp, of stamped steel, with rubber covered jaws; adjustable by check nut to any angle. A widely used and satisfactory clamp .....	.40
24538.	Clamp, of japanned iron. With rubber covered jaws held together by spring.....	.55
24542.	Clamp, same as No. 24538 but for two burettes.....	.75
24546.	“ Hoffmann , double, of japanned iron, with one V shaped and one parallel moving jaw, rubber covered	1.00
24550.	Clamp, improved double form, with V shaped and rubber covered convex jaw	1.00
24554.	Clamp, of brass, with widely separated jaws giving perfect support to burettes, etc.....	1.25
24558.	Clamp, same as No. 24554 but double	2.00
24570.	“ of brass, adjustable so that burette may be held in vertical position no matter in what position the upright support may be fixed. Single, for one burette.....	2.70
24574.	Clamp, same as No. 24570 but double, for two burettes	4.35
24578.	“ for immediate fixation of burette and permitting graduations to be freely read. Single.....	1.05
24582.	Clamp, same as No. 24578 but double	1.70
24586.	Clamp, of brass, with one parallel moving and one V shaped jaw for tubes up to 2½ inches in diameter such as condensers, etc.	2.10
24590.	Clamp, with screw for attaching to supports and brass hook for supporting apparatus.....	.75
24594.	Clamp, of japanned iron, with strong spring closed, movable jaw. A heavy serviceable clamp for large burettes, etc. ....	.50
24598.	Clamp, Lincoln , for two burettes. Will fit any rod up to ¼ inch diameter. Burettes are held perpendicular and are easily removed; very convenient and rigid.....	.75
24602.	“ of brass, nickel plated, for burettes. For screwing into wall or wood, so constructed that the graduated part of the burette is not covered.....	.40



No. 24606-10 and 11



No. 24618



No. 24622



No. 24626



No. 24634



No. 24638



No. 24642



No. 24646



No. 24650



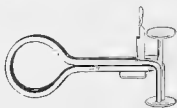
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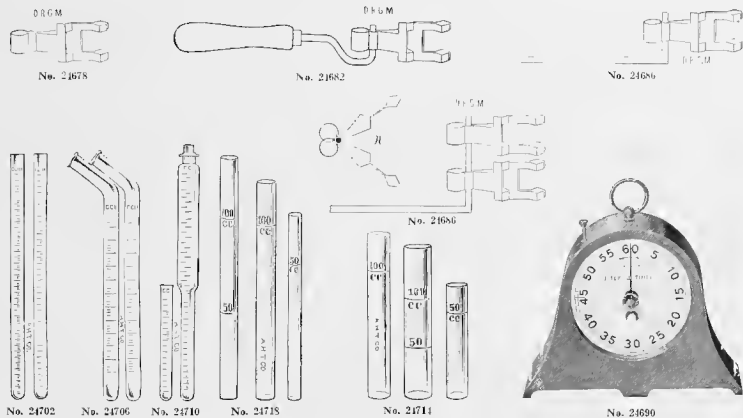


No. 24670



No. 24674

24606.	Clamp, Chaddock, for holding beakers.				
	Size.....		Small	Large	
	For beakers, mm in diameter.....		40-60	60-80	
	Each.....		.25	.25	
24610.	Clamp, Chaddock, for holding evaporating dishes.				
	Size.....		Small	Medium	Large
	For dishes, inches in diameter.....		3 to 4	4 to 6	6 to 7
	Each.....		.25	.25	.25
24614.	Clamp, Chaddock, for holding test tubes and necks of flasks			.25	
24618.	of wood, with rubber spring, for test tubes.....			.10	
24622.	“ same as No. 24618 but with wire spring.....			.10	
24626.	“ Stoddart, of spring brass wire, 4½ inches long, for test tubes.....			.15	
24630.	“ same as No. 24626 but of nickel plated steel wire.....			.10	
24634.	“ of nickel plated steel wire, for test tubes, improved form, 6 inches long.....			.15	
24638.	“ nickel plated, for holding crucibles and small dishes.....			.30	
24642.	“ “ German form, for test tubes.....			.40	
24646.	Clamp, Hoffman, nickel plated, for rubber tubing, so-called “screw compressor”		Dimensions given		
	are for maximum diameter of tubing for which clamp is available.				
	Size, inches.....		¾	1	
	Each.....		.20	.25	
24650.	Clamp, Hoffman, for rubber tubing, nickel plated, with one swinging jaw.				
	Maximum diameter of tubing, inches.....		¾	1	
	Each.....		.25	.30	
24654.	Clamp, Hoffman, for rubber tubing, nickel plated with open jaw.				
	Maximum diameter of tubing, inches.....		½	¾	
	Each.....		.25	.30	
24658.	Clamp, of brass, nickel plated, for rubber tubing, extra heavy, ¼ x 1½ inches.....			.50	
24662.	“ Muhr’s Pinchcock, of nickel plated spring wire (rectangular cross section) for rubber tubing.				
	Total length of clamp, inches.....	1½	2	3	
	Each.....	.10	.15	.20	
24666.	Clamp, Muhr’s Pinchcock, for rubber tubing, same as No. 24662, but with automatic catch to hold clamp open.				
	Total length of clamp, inches.....	2	2½	3	
	Each.....	.25	.30	.35	
24670.	Clamp, of brass, nickel plated, for watch glasses.				
	For watch glasses, mm in diameter.....		50	65	
	Each.....		.15	.20	
24674.	Clamp, of malleable iron with steel screw for fastening apparatus to table.				
	Length, inches.....	3	4	5	
	Each.....	.30	.40	.50	
			.60	.60	



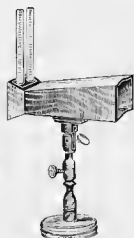
24678. **Clamp**, for thermometers, burettes, conductivity vessels, etc. The advantage of this clamp is that the same spring which clamps the article to be held in a vertical position, i. e., thermometers, etc., serves also to clamp the support on which the clamp is used, thus obviating the use of any screws. The clamps are of spring brass, heavily nickel plated and are kept in stock to fit vertical supports of 6 mm, 8 mm and 10 mm.
- To fit support, mm 6 8 10
- Each..... .90 .90 1.15
24682. **Clamp**, as above, with handle, for holding test tubes, small flasks, etc.
24686. **Extension Holder** with clamps as above to fit 6 mm support.
- Number of clamps..... 1 2
- Each..... 1.10 2.00
24690. **Clock** (Thayer Interval Timer), new model with bell entirely enclosed in brass case. Very convenient in timing continuous laboratory operations 4.75

COLOR TESTING APPARATUS.

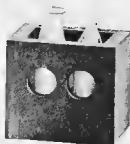
24702. **Color Comparison Tubes, Eggertz**, for the estimation of carbon and manganese in steel by the colorimetric method.
- Capacity, cc..... 30 50
- Graduated in, cc..... $\frac{1}{16}$ $\frac{1}{16}$
- Per set of two..... 2.50 2.75
- " " " four..... 5.00 5.50
24706. **Color Comparison Tubes, Julian**, same as No. 24702 but with bent ends. The bent end permits the mixing of the contents without the use of a stopper in the tube. The lower portion of the tube is ungraduated.
- Graduated from, cc..... 5 to 30 10 to 50
- Graduated in, cc..... $\frac{1}{16}$ $\frac{1}{16}$
- Per set of two..... 2.75 3.00
- " " " four..... 5.50 6.00
24710. **Color Comparison Tubes, Camp**, for manganese determinations.
- Per set of two..... 6.00
24714. **Color Comparison Tubes, Nessler**, of special colorless glass, usual form. Height of 50 cc mark in 50 cc tubes 120 mm, height of 100 cc mark in 100 cc tubes, 150 mm.
- Graduation, cc..... 50 100 50 and 100
- Each..... .50 .60 .70
24718. **Color Comparison Tubes, Nessler, American Public Health Association**. With polished bottoms and 50 cc mark 210 mm high on 50 cc tube, and 100 cc mark 325 mm high on 100 cc tubes. Tubes in selected sets of six or twelve guaranteed to have either 50 cc or 100 cc marks within 6 mm of same height. See American Public Health Association "Standard Methods of Water Analysis," 1912.
- Graduation, cc..... 50 100 50 and 100
- Each..... .50 .75 .90
- Per set of six..... 3.15 4.75 5.70
- " " " twelve..... 6.60 9.90 11.90



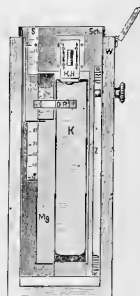
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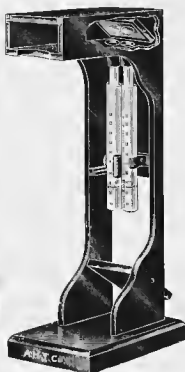
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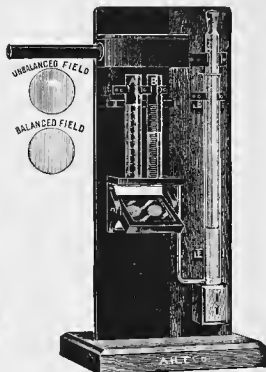
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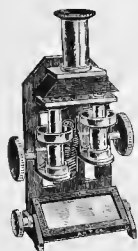


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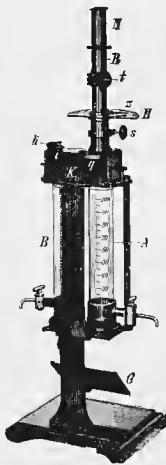
24722. Stand for Nessler Tubes No. 24718, of wood painted a dull black, with bottom lined with opal glass plate. For twelve 50 cc tubes..... 4.50
24726. Camera, for comparing color comparison tubes such as No. 24718, etc. Improved form with blue and ground glass..... 10.00
24730. Colorimeter, Rowntree and Geraghty, designed especially for accurately estimating the functional ability of the kidneys and for the determination of the relative efficiency of each kidney when the secretions are separately collected by the Phenolsulphonephthalein Test. In wooden case, with ampoules of Phenolsulphonephthalein..... 20.00
24732. Sterile Ampoules of Phenolsulphonephthalein, 10 in box..... 1.00
24734. Colorimeter, Dunning, for estimating the quantity of phenolsulphonephthalein excreted when applying the Rowntree and Geraghty Renal Functional test. Complete in polished wooden case. 5.00
24738. Colorimeter, Schreiner, as used in the U. S. Bureau of Soils. All working parts coming in contact with the saucple or standard are of glass. Broken parts are easily replaceable. See *Journal of the American Chemical Society, Sept. 9, 1905*, and *Bulletin No. 31 of the U. S. Department of Agriculture, Bureau of Soils*..... 15.00
24739. Graduated tubes for above, per pair..... 3.00
24740. Plain tubes for above, per pair..... .80
24742. Colorimeter, Kennicott—Campbell-Hurley. This instrument is used in the analysis of water, determination of carbon in steel, titanium metal, etc., and for the color variations of dye stuffs. See *Journal of the American Chemical Society, July, 1912*..... 20.00



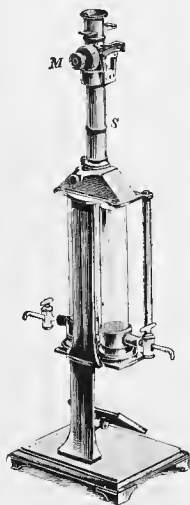
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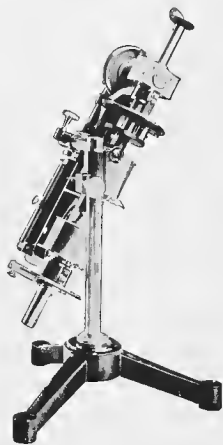
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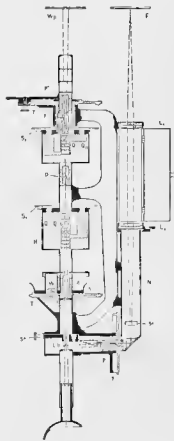
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24746. **Colorimeter, Duboscq, original French make.** A standard instrument for a great variety of work and as used in physiological chemistry in the determination of the total nitrogen in urine, non-protein nitrogen, urea and ammonia in blood, urea in urine, etc., by the methods of Dr. Otto Folin.
- | | | |
|-------------------------|-------|--------|
| Height of tube, cm..... | 5 | 10 |
| Duty Free..... | 56.25 | 77.50 |
| Stock..... | 81.00 | 111.60 |
24750. **Extra Glass Tubes, for Duboscq Colorimeter.**
- | | | |
|-------------------------|------|------|
| Height of tube, cm..... | 5 | 10 |
| Each, from stock..... | 3.00 | 4.25 |
24754. **Colorimeter, Duboscq, original French make, same as No. 24746 but with longer tubes and with horizontal reading telescope for convenience of operator.**
- | | | | |
|-------------------------|--------|--------|--------|
| Height of tube, cm..... | 20 | 30 | 35 |
| Duty Free..... | 100.00 | 125.00 | 137.50 |
| Duty Paid..... | 144.00 | 180.00 | 200.00 |
24758. **Colorimeter, Duboscq, original French make, small size, for biological investigation of blood, serums, etc., where only small quantities of solution are available.** Determinations may be made with less than 1 cc of solution, as furnished by us to Harvard Medical School, Cornell University, University of Pennsylvania, etc.
- | | | | |
|----------------|-------|------------|-------|
| Duty Free..... | 37.50 | Stock..... | 54.00 |
|----------------|-------|------------|-------|
24762. **Colorimeter with Polariscope (Polarisation-Colorimeter), with Grosse prism combination.** See *Zeitschrift f. physik. Chem.* 10, 165, 1892.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 57.00 | Duty Paid..... | 76.00 |
|----------------|-------|----------------|-------|
24766. **Colorimeter with Spectroscope (Spectro-Colorimeter), Krüss with ocular slit and device for accurately measuring location in spectrum.** See *Krüss Kolorimeter S. 121 u. Zeitschrift f. Physik. Chemie* 10, 165, 1892.
- | | | | |
|----------------|-------|----------------|--------|
| Duty Free..... | 75.00 | Duty Paid..... | 100.00 |
|----------------|-------|----------------|--------|

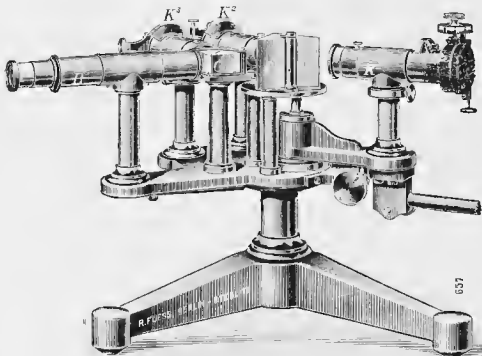


No. 24770



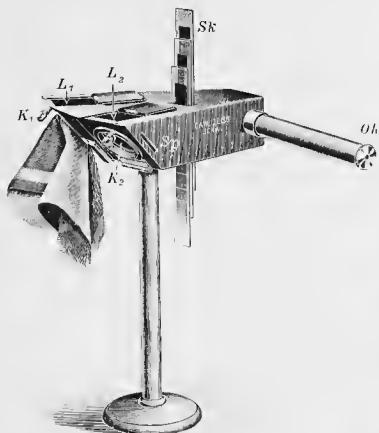
No. 24770—Sectional View

24770. Colorimeter-Chromoscope, Arons, for physiological and psychological work as well as the measurement of colors of paper, leather, yarn and other substances. See *Annalen der Physik*, Band 33, 1910 and Band 39, 1912. Reprint in German sent on application.
 Duty Free 420.00 Duty Paid 588.00



No. 24774

24774. Colorimeter, Precision, Nutting, as used in the U. S. Bureau of Standards. This Colorimeter is a monochromatic analyzer of wide range, high precision and great simplicity. The use of arbitrary reference standards, such as red, green and blue, is eliminated, the reading being given directly in wave length and per cent white. Light of a pure spectral hue may be mixed with white light to match the unknown, or, in the case of purple, mixed with the unknown to match white. The comparison is made by means of a Lummer-Brodhun prism. See *Bulletin of the Bureau of Standards*, Vol. 9, and *Zeitschrift für Instrumentenkunde* 1913, Januar.
 Duty Free..... 202.50 Duty Paid..... 270.00



No. 24778

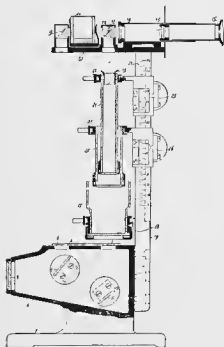


No. 24752



No. 24756

24778. **Color Tester, Zeiss**, with color scale, for accurate color comparisons of opaque materials, solutions, etc. See *Chemiker-Zeitung* 1912, S. 853, Bd. 38.
 Duty Free 50.00 Duty Paid 68.00
24782. **Colorimeter, Stammer**, designed especially for use in the sugar industry. Constructed entirely of metal, with tubes 260 mm high, and with four standard colored glasses.
 Duty Free 52.50 Stock 70.00
24786. **Colorimeter, Stammer**, constructed of metal throughout with tubes 350 mm high. Especially designed for use in testing petroleum and other mineral oils. Arranged for convenient determinations of market grades of oil such as Standard White, Prime White, Superfine White and Water White. With two Uranium Normal glass discs.
 Duty Free 78.00 Stock 104.00



No. 24802

24790. **Immersion Tube** of glass, with two jars, for use with No. 24786.
 Duty Free 12.60
 Stock 17.50
24794. **Uranium Glass Plates** for petroleum work for normal and half normal colors.
 Duty Free, each 4.35
 Stock, each 6.00
24798. **Normal Glass Plates**, for beer, sugar and other work.
 Duty Free, each 1.10
 Stock, each 1.50
24802. **Colorimeter (Chromophotometer) Pleseh**, Model I, as used in biological chemistry and described by Pleseh "Haemodynamische Studien," Berlin, 1909, and as used in the Laboratory of Physiological Chemistry, University of Pennsylvania. With two color tubes fitting one into the other, Lummer-Brodhun prism, trough, comparison prism, etc., with horizontal telescope and camera.
 Duty Free 127.50
 Duty Paid 170.00

LOVIBOND'S TINTOMETER

Note—Because of the great variety of combinations possible we do not carry these outfits in stock. Delivery can be made by importation usually in from three to five weeks. Manufacturer's original publication with full descriptive matter sent upon request.

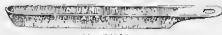
24806.	Colorimeter (Lovibond's Tintometer) improved optical instrument for both monocular and binocular vision.				
	Duty Free	12.60	Duty Paid	16.80	
24810.	Colorimeter (Lovibond's Tintometer) optical instrument, monocular only, arranged in case for factory use to prevent standards from being handled.				
	Duty Free	18.90	Duty Paid	25.20	
24814.	Colorimeter (Lovibond's Tintometer) improved optical instrument with hot water attachment for liquitating solids below 212° F.				
	Duty Free	22.50	Duty Paid	30.00	
24818.	Complete Set of Standard Glasses for Lovibond's Tintometer, 170 glasses in set for matching all colors.				
	Duty Free	282.00	Duty Paid	376.00	
Accessories for Lovibond Tintometer.					
24822.	Extra Shoe, to carry cells up to 6 inches.				
	Duty Free	2.25	Duty Paid	3.00	
24826.	Stand for either No. 24806, 24810 or 24814.				
	Duty Free	3.75	Duty Paid	5.00	
24830.	Stand, rigid, with support, to take cells up to two feet.				
	Duty Free	3.75	Duty Paid	5.00	
24834.	Extra Support, making the above suitable for cells of any length.				
	Duty Free	2.25	Duty Paid	3.00	
24838.	Mirror, white reflecting, for long troughs.				
	Duty Free	3.75	Duty Paid	5.00	
24842.	Mirror, white reflecting, mounted on jointed brass stand.				
	Duty Free	9.00	Duty Paid	12.00	
24846.	Metal Trough, with glass ends either silver plated or of brass.				
	Gauged, inches		$\frac{1}{8}$	1	12
	Duty Free	3.00	3.75	7.50	9.00
	Duty Paid	4.00	5.00	10.00	12.00
Combination Outfits for specific purposes.					
24850.	Lovibond Tintometer Set for brewers, maltsters, sugar and caramel manufacturers, wine and spirit merchants, etc., including the improved optical instrument No. 24806 box with stand and reflector, 1 inch, and $\frac{1}{2}$ inch silvered cells, filtering apparatus and 20 standard glasses, series 52 and 50; as recommended by the Council of the Institute of Brewing in their Malt Analysis Report "Colored Malts and Caramel."				
	Duty Free	37.50	Duty Paid	50.00	
24854.	Extra Apparatus for estimating the color of dry malt, consisting of 33 standard glasses, with trays, presser and standard white.				
	Duty Free	17.40	Duty Paid	23.20	
24858.	Lovibond Tintometer Set for estimating the color in water, including the monocular optical instrument No. 24810, box with supports and reflector, 2 ft. and 1 ft. brass cells and forty standard glasses.				
	Duty Free	63.60	Duty Paid	84.80	
24862.	Lovibond Tintometer Set for estimating percentage of Ammonia in Nessler's Ammonia Test, including the improved optical instrument, No. 24806, box with stand and reflector, $\frac{1}{2}$ inch glass cell, with 30 standard glasses.				
	Duty Free	36.00	Duty Paid	48.00	
24866.	Lovibond Tintometer Set for estimating Carbon in Steel, including the improved optical instrument No. 24806, box stand and reflector, $\frac{1}{2}$ inch cell and 34 standard glasses series 52, and 26 glasses series 50.				
	Duty Free	48.00	Duty Paid	64.00	
24870.	Lovibond Tintometer Set for estimating the color in oils, waxes, lards and other fats, varnishes, gelatine, scale, etc., including the improved optical instrument fitted with hot water attachment for melting solids, No. 24814, thermometer for taking their melting point, box, 1 inch, $\frac{1}{2}$ inch and $\frac{1}{4}$ inch silvered cells, without standard glasses.				
	Duty Free	40.50	Duty Paid	54.00	
24874.	Lovibond Tintometer Set, simple form, for estimating color in cotton seed oil, fitted with standard oil bottle and compound glass and set of 24 standard cotton seed oil glasses.				
	Duty Free	20.40	Duty Paid	27.20	
24878.	Lovibond Tintometer Set, for estimating the color in cotton seed oil, including the improved optical instrument No. 24814 fitted with lamp and hot water attachment for liquifying the oil and maintaining a given temperature, $5\frac{1}{2}$ inch cell and 36 standard glasses.				
	Duty Free	57.00	Duty Paid	76.00	
24882.	Lovibond Tintometer Set for standardizing merchantable petroleum, including the monocular optical instrument No. 24806, box with stand and reflector, 18 inch silvered cell, 4 special standard glasses for water white, standard white, superfine white and prime white.				
	Duty Free	33.00	Duty Paid	44.00	
24886.	Extra Apparatus for Intermediate, Russian and Lubricating oils, containing $\frac{1}{16}$ inch silvered cell and 5 additional standards.				
	Duty Free	9.60	Duty Paid	12.80	
24890.	Lovibond Tintometer Set for estimating the value of flour, including the improved optical instrument No. 25806, standard white, 6 trays, pressing apparatus and 90 standard glasses.				
	Duty Free	63.00	Duty Paid	84.00	
24894.	Lovibond Tintometer Set for estimating the coloring matter in tanning solutions, consisting of binocular instrument in polished box, with stand and reflector, 5 cm and 10 cm glass cells and 88 standard glasses.				
	Duty Free	64.50	Duty Paid	86.00	



No. 24930



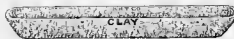
No. 24910



No. 24918



No. 24911



No. 24925



No. 24931

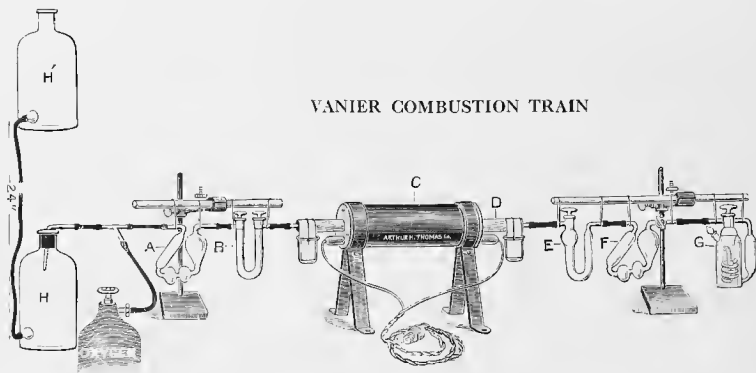


No. 24946



No. 24951

24910.	Combustion Boats, Royal Meissen Porcelain.					
	Length, mm.	60	75	75	100	115
	Width, mm.	10	11	15	15	13
	Each	.15	.15	.15	.25	.25
24914.	Combustion Boats, Opaque Silica, glazed, without handle.					
	Length, inches.		1½	3	3	4
	Width, inches.		½	½	½	½
	Each		.50	.75	.90	1.15
24918.	Combustion Boats, Alumund, adaptable to a great variety of work, but particularly designed for the determination of carbon in iron and steel. The boats may be used repeatedly because the alumund does not react with the iron oxide in the sample. Shapes have been carefully designed by practical chemists.					
	Length, inches.	3½	3½	4½	5	5½
	Width, inches.	½	½	½	½	½
	Depth, inches.	½	½	½	½	½
	Each	.30	.35	.50	.40	.40
24922.	Alumund Cover for Combustion Boat No. 24918, 4½ inches long x ½ inch wide.					.75
24926.	Combustion Boats, Johnson, of clay.					.10
24930.	R R Alumund, for use with combustion boats of either platinum or siliceous materials and particularly recommended for alumund boats, increasing their durability and preventing their destruction during combustions. Consists of pure crystalline Alumund and is supplied in granular form of No. 60, 90 and 120 mesh for use in the determination of carbon in steel. Please specify mesh in ordering. In glass stoppered bottles.					
	Size bottle.			½ lb.	1 lb.	2 lbs.
	Each			.40	.75	1.50
24934.	Combustion Capsules, Royal Meissen Porcelain, without lip, as used in coal analysis.					
	Diameter, mm.			40		50
	Depth, mm.					30
	Each				.20	.20
24938.	Combustion Tubes, Alumund, to withstand temperatures of approximately 2000° C. These tubes are made gas-tight by glazing without sacrificing their refractive quality; in 24 inch lengths.					
	Inside diameter, inches.		½	¾		1
	Each		4.95	4.95		4.95
24942.	Combustion Tubes, Sanitäts Porcelain. Glazed inside and outside. In 60 cm lengths.					
	Inside diameter, mm.	15	18	22		25
	Each	1.60	2.00	2.25		2.75
24946.	Combustion Tubes, Royal Berlin Porcelain, glazed inside and outside. Will stand a temperature of 1100° C. and are practically gas tight. In 60 cm lengths.					
	Inside diameter, mm.		15	20		28
	Each		4.50	5.40		7.20
24950.	Combustion Tubes, Marquardt Mass, for temperatures up to 1650° C. These are furnished either glazed or unglazed. In 60 cm lengths.					
	Inside diameter, mm.			15		20
	Each			4.00		4.75
24954.	Combustion Tubes Opaque Silica, for temperatures up to 1500° C. Tubes of the following diameters are carried in stock in 2 ft. lengths but tubing from ¾ in. to 2 in. inside diameter can be furnished in lengths up to 8 ft.: 24 in. long x ½ in. inside diameter is the standard tube for Hoskins Combustion Furnace No. 28988					
	Inside diameter, inches.		¾	1		1
	Each, unglazed		4.20	4.60		5.00
	Each, glazed on outside and at one end.		5.20	5.60		6.00
24956.	Combustion Tube, Vitrified Clay, Johnson. When used with tapered clay connector below rubber stoppers are unnecessary in carbon combustion work, etc. See <i>Journal of Industrial & Engineering Chemistry</i> , July, 1913.					3.00
24957.	Tapered Connector, Vitrified Clay, for use with above.					.90



No. 24958

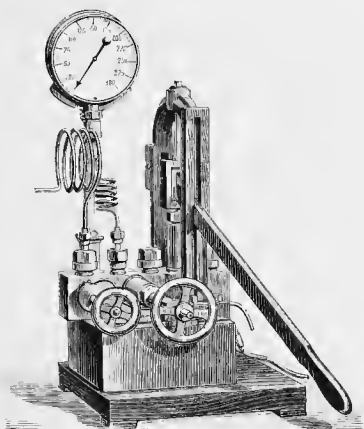
COMBUSTION TRAIN, VANIER, for the Determination of Carbon in Steel by the Direct Combustion Method with Electric Furnace, consisting of the following:

- H and H', 4 liter Aspirator Bottles for maintaining a constant pressure, H being filled with water.
- A, Potash Bulb with caustic potash for purifying oxygen before entering tube.
- B, Calcium Chloride Tube, for removing moisture from oxygen before entering tube.
- C, Hoskin Electric Combustion Tube Furnace.
- D, Glazed Quartz Combustion Tube, $\frac{3}{4}$ inch bore and 2 feet long.
- E, Vanier Zinc Tube for granulated zinc, to remove any trace of sulphur.
- F, Vanier Sulphuric Acid Bulb, for absorbing moisture.
- G, Vanier Combined Potash Bulb and Drying Tube.

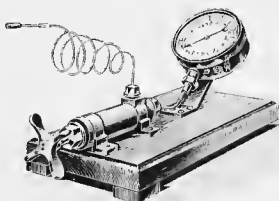
The determination of carbon in steel is one of the principal duties of the Steel Chemist and when this analysis is made by the direct combustion method with the proper furnace and absorption train, it becomes one of the most satisfactory analyses, both in point of time and in accuracy to be made in a steel laboratory. This combustion outfit is the design of Mr. Geo. P. Vanier, Chief Chemist of the Pennsylvania Steel Company, several of the important components of the train being specially designed by Mr. Vanier for this apparatus. With this outfit one man can, with five outfits, maintain a rate of ten combustions per hour. An important feature of the outfit is the Vanier Combined Potash Bulb and Drying Tube (Patented) Fig. G of the illustration. It offers many advantages over the bulbs formerly used, i.e.—

- Large capacity. Six grams, or more, of carbonic acid can be absorbed, thus enabling the chemist to make over 100 combustions without refilling.
- No rubber caps are necessary when weighing with the bulb filled with oxygen as the glass stopcock closes the inlet and outlet.
- Having a drying tube attached they are compact and more easily handled than the ordinary bulbs.
- They have a smooth outer surface which is easily cleaned.
- They are self-supporting and, having a firm base, can be conveniently placed on the balance pan when weighing.
- The drying tube being vertical, the moist gases pass in at the bottom and the drying tube never stops up. As the solid caustic potash deliquesces it forms a pool in the bottom of the drying tube thus making an extra seal.
- The gasses can be passed at a high rate without loss of CO₂ or moisture.
- When gases are passed through rapidly the action is perfectly quiet without any spraying or jumping of the solution.

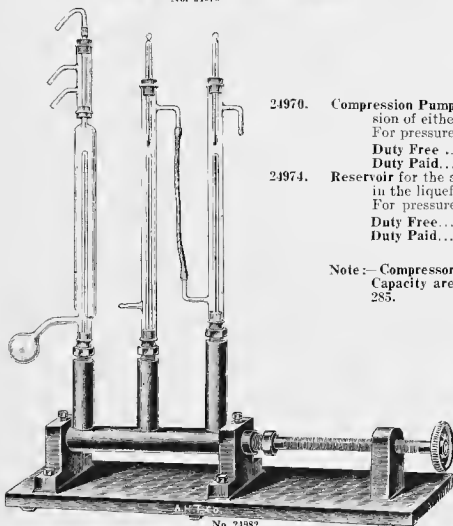
24958.	Vanier Combustion Train, complete outfit as illustrated, consisting of aspirator bottles H and H'; bulbs A, B, E, F and G, Hoskin's Electric Combustion Furnace C, glazed quartz combustion tube D rubber tubing, supports, clamps, glass rods, two Alundum combustion boats, $3\frac{1}{2} \times \frac{3}{4}$ inches, and $\frac{1}{2}$ lb. of R R Alundum but without oxygen tank.....	42.00
24962.	Vanier Combustion Train, complete as above, but with the addition of Hoskins Rheostat for regulating temperature of furnace.....	50.00
Single Parts.		
44732.	Potash Bulb. A of illustration.....	.50
23252.	Calcium Chloride Tube. B of illustration.....	.90
28988.	Hoskin Electric Combustion Tube Furnace. C of illustration.....	25.00
24954.	Glazed Quartz Combustion Tube, $\frac{3}{4}$ in. bore x 2 ft. long. D of illustration.....	5.20
26656.	Vanier Zinc Tube. E of illustration.....	.75
26660.	Vanier Sulphuric Acid Bulb. F of illustration.....	1.25
26664.	Vanier Combined Potash Bulb and Drying Tube. G of illustration.....	3.25
24918.	Alundum Combustion Boats. $3\frac{1}{2}$ in. x $\frac{3}{4}$ in., each.....	.35
24930.	RR Alundum. In 1 lb. glass stoppered bottle.....	.75
24964.	Factor Weight, 2.7275 grams, of lacquered brass. For weighing charge of boat.....	.75



No. 24970



No. 24978

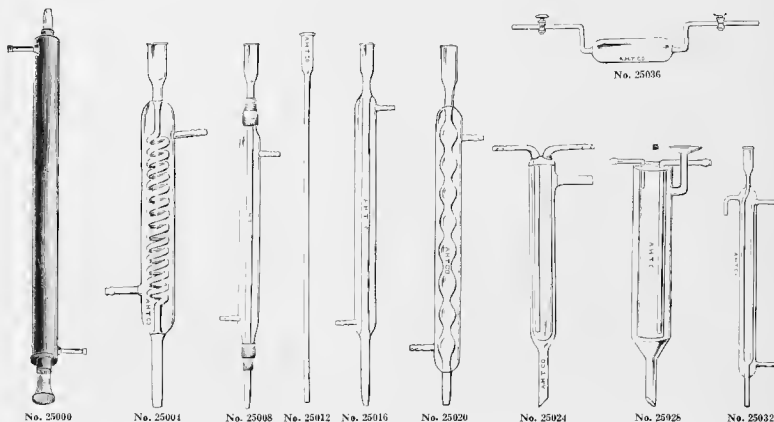


No. 24982

24970. **Compression Pump**, hand, for laboratory use in the compression of either liquids or gases.
 For pressures up to, atmospheres ... 300 1000
 Duty Free 136.40 156.20
 Duty Paid 173.60 200.00
24974. **Reservoir** for the above, on stand for the Cailletet experiment in the liquefaction of gases.
 For pressures up to, atmospheres..... 300 1000
 Duty Free 39.60 50.60
 Duty Paid 50.40 64.40

Note:—Compressors for liquefying Air and Hydrogen of large Capacity are listed under Liquid Air Apparatus, page 285.

24978. **Compression Pump for the Determination of Critical Pressure**, with high pressure manometer mounted on board, with six extra capillaries. See *Phys.-chem. Mess.* Seite 228.
 Duty Free 43.60 Duty Paid 59.40
24982. **Compression Pump, Ramsay-Young**, for gases, consisting of an iron compression cylinder with screw for pressure up to 200 atmospheres, with three tubulations for manometers, three calibrated and graduated manometer tubes of English lead glass, two cooling jackets with thermometers, etc. See *Travers, experimentelle Untersuchung von Gasen pag. 251 Braunschweig 1905.*
 Duty Free 90.75 Duty Paid 123.75

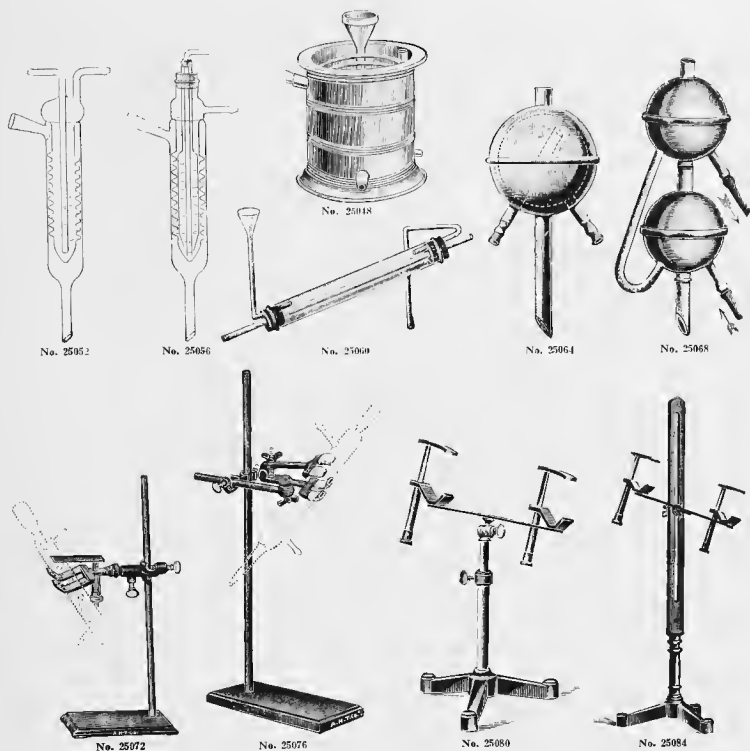


25000.	Condenser, of brass, with condensing tube of glass. With rubber stoppers.							
	Length, mm.....	300	375	500	600	675	750	1000
	Each.....	3.00	3.50	3.80	4.20	4.50	5.00	6.50
25004.	Condenser, Liebig, of glass, with condensing tube in form of coil sealed in water jacket.							
	Length, mm.....	150	200	250	300	400	600	
	Each.....	1.25	1.60	1.80	2.25	3.00	5.00	
25008.	Condenser, Liebig, with rubber connections.							
	Length, mm.....	250	300	400	500	600	800	1000
	Each.....	.85	1.00	1.10	1.25	1.60	2.00	3.00
25012.	Condenser Tubes for above condensers, of glass.							
	Length, mm.....	250	300	400	500	600	800	1000
	Each.....	.18	.20	.22	.25	.35	.45	.65
25016.	Condenser, Liebig, of glass, with inner tube sealed to body.							
	Length, mm.....	250	300	400	500	600	800	1000
	Each.....	.90	1.10	1.25	1.65	2.00		
25020.	Condenser, Allihn, of glass, with bulb condensing tube.							
	Length, mm.....	200	250	300	400	600		
	Each.....	1.10	1.25	1.40	1.60	2.40		
25024.	Condenser, Hopkins, outside jacket 35 cm long. As widely used in Extraction Apparatus. See <i>Journal of the American Chemical Society, December, 1908.</i>							1.75
25028.	Condenser, Hopkins, Picard-Law modification, which consists in the side tube being bent upright at right angles with a funnel top so that extraction fluid may be poured into the condenser without disconnecting the extraction tube when used in connection with extraction apparatus. Widely used in cotton seed oil work.							1.90
25032.	Condenser, Göckel, may be connected air-tight with receiver and used either as a reflux condenser or for the determination of inflammable substances where dangerous gases must be led off from inside.							
	Length of jacket, inches.....					18		24
	Each.....					3.00		3.60
25036.	Condenser, Sulphurous Acid, Liebig, of glass, with two stopcocks on horizontal tubes.							2.25



No. 25040

25040.	Condenser, of glass, with spiral.			
	Capacity, cc.....	500	1000	2000
	Each.....	3.00	3.50	4.25
25044.	Tripod, of metal, for use with condenser No. 25040.			
	For condenser, cc.....	500	1000	2000
	Each.....	1.00	1.50	2.00



25048. Condenser, of zinc, with heavy block tin worm. For use with distilling apparatus such as No. 20548. For still of capacity, gallons..... $\frac{1}{2}$ 1 2 3 5
 Each..... 5.00 6.00 8.00 10.00 12.00
25052. Condenser, Friedrichs, of glass, screw shape, with glass screw inside. See *Zeitschrift fur angew. Chemie, 1910*..... 3.00
25056. Condenser, Friedrichs, of glass, screw shape, with counter current device. Specially adaptable for use as reflux condenser. See *Zeitschrift fur angew. Chemie, 1912*..... 5.00
25060. Condenser, Mohr, of glass, with cork stoppers and tubing as shown in illustration.
 Length, mm..... 300 360 500
 Each..... 1.00 1.25 1.40
25064. Condenser, Soxhlet, spherical, of copper tinned inside, 4 inches in diameter..... 3.00
25068. " " same as No. 25064 but with two bulbs..... 6.00
25072. Condenser Support, consisting of Support No. 37663, with extra large rectangular base, large clamp holder No. 24516 and large universal clamp No. 24508..... 2.60
25076. Condenser Support, consisting of No. 37663 with extra large rectangular base and brass condenser clamp No. 24586..... 3.00
25080. Condenser Support, for condenser up to 60 mm in diameter, with double clamp of brass, on iron tripod..... 6.00
25084. Condenser Support, for condenser up to 60 mm in diameter, of iron, with double brass clamp..... 6.00



No. 25100



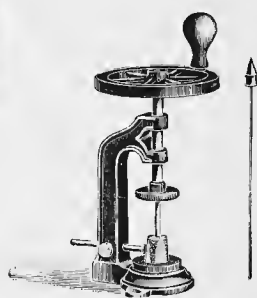
No. 25122



No. 25126

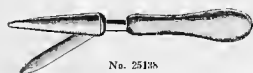


No. 25134

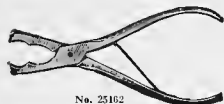


No. 25130

25100.	Corks, XXX Quality, regular length.																		
	Number.....	1	2	3	4	5	6	7	8	9	10								
	Diameter at small end, inches.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$
	Per 100.....	.15	.18	.20	.25	.30	.35	.50	.55	.65	.80								
	Number.....	11	12	13	14	15	16	17	18	19	20								
	Diameter at small end, inches.....	$\frac{11}{16}$	$\frac{1}{2}$	$\frac{13}{16}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
	Per 100.....	.85	.95	1.05	1.15	1.25	1.60	1.80	2.00	2.15	2.45								
25104.	Corks, Special Laboratory Quality, regular length. These corks are made for laboratory use and are not regularly listed or designated in the cork trade and because of the wide selection necessary to get homogeneous wood are much more expensive than any corks regularly on the market. They are particularly recommended for use with extraction apparatus, etc.																		
	Number.....	3	4	5	6	7	8	9	10	11									
	Diameter at large end, inches.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$
	Per 100.....	.38	.45	.55	.65	.80	1.00	1.20	1.40	1.60									
	Number.....	12	13	14	15	16	17	18	19	20									
	Diameter at large end, inches.....	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$
	Per 100.....	1.80	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75									
25108.	Corks, XXX Quality, short taper.																		
	Number.....	1	2	3	4	5	6	7	8	9	10								
	Diameter at small end, inches.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$
	Per 100.....	.15	.15	.15	.18	.25	.30	.35	.40	.45	.65								
	Number.....	11	12	13	14	15	16	17	18	19	20								
	Diameter at small end, inches.....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$
	Per 100.....	.75	.80	.85	.90	1.05	1.15	1.35	1.45	1.65	1.85								
25110.	Corks, XXX Quality, flat, $\frac{1}{8}$ inch high, so-called "specie" corks, very slight taper.																		
	Diameter, inches.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
	Per 100.....	.50	.50	.55	.55	.70	.85	1.00											
25111.	Corks, XXX Quality, same as No. 25110 but $\frac{1}{4}$ inch high.																		
	Diameter, inches.....	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$
	Per 100.....	1.35	1.55	1.80	2.05	2.30	2.30	2.30	2.30	2.30	2.30								
	Diameter, inches.....	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$
	Per 100.....	3.20	3.65	4.10	4.70	5.30	5.90												
25118.	Corks, XXX Quality, same as No. 25110 but $\frac{3}{4}$ inch high.																		
	Diameter, inches.....	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{3}{4}$	7	$7\frac{1}{4}$
	Each.....	.07	.09	.11	.13	.15	.18	.21	.24	.27	.30	.33	.36	.39	.42	.45	.48	.51	.54
	Diameter, inches.....	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{3}{4}$	7	$7\frac{1}{4}$	$7\frac{1}{2}$	$7\frac{3}{4}$	8	$8\frac{1}{4}$
	Each.....	.24	.27	.31	.35	.40	.45												
25122.	Cork Borers, of hard brass.																		
	Number in set.....			3	6	9	12	15											
	Per set.....			.60	1.00	1.75	2.40	3.20											
25126.	Cork Borers of hard drawn brass tubing. Each borer supplied with handle. A very convenient form.																		
	Number in set.....					6	9	12											
	Per set.....					1.00	1.75	2.40											
25130.	Cork Borer, for both wood and rubber corks, with device for conveniently holding the set of borers which vary from 4 to 15 mm in diameter.....																		
25134.	Cork Borer Sharpener, convenient for use in connection with No. 25130, for sharpening both inside and outside of borers.....																		



No. 25138

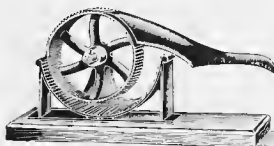


No. 25162



CP No. 1

No. 25116



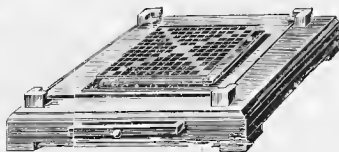
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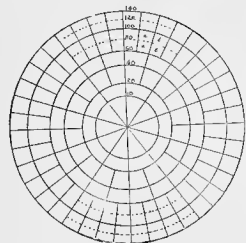
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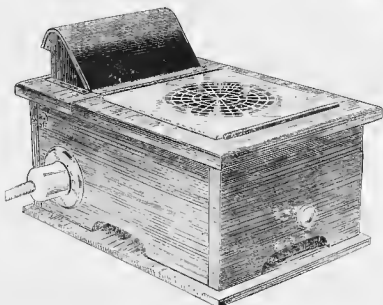
No. 25158



No. 25178



No. 25182



No. 25166



No. 25174

25138.	Cork Borer Sharpener, a steel cone with knife	1.00
25142.	“ Extractor, folding. Extractor is pushed down between neck of bottle and cork and then rotated and cork withdrawn. Very practical	.15
25146.	Cork Press, Lever, of cast iron. Size	Small Large
	Each	.25 .40
25150.	Cork Press, Rotary. For corks up to, mm.	18 32
	Each.	.50 .75
25154.	Cork Screw, quick acting, in heavy wooden handle.	.25
25158.	“ self pulling, with wire cutter. The most simple and practical cork screw made	.50
25162.	Cork Tongs, for compressing corks by hand.	.75
25166.	Counting Apparatus, Stewart, for colonies of bacteria, consisting of a hard wood box 12 x 6 x 8 inches, which contains a 16 candle-power incandescent lamp and adjustable platform carrying a Petri dish which is illuminated by oblique rays from the lamp which do not enter directly into the eye of the operator. A ruled glass plate is provided on the top of the box and the counting accomplished by viewing the colonies in the Petri dish through the glass plate. See <i>Journal of Medical Research</i> , January, 1906.	12.00
25170.	Reading Lens, for use with same.	1.50
25174.	Ruled Counting Plate, only.	6.00
25178.	Counting Apparatus, Wolfhuegel, for colonies of bacteria. Complete on wooden base with ruled glass plate and black and white back-grounds.	5.00
25180.	Ruled Glass Plate, only.	1.50
25182.	Counting Plate, Jeffer, for colonies of bacteria. See <i>Journal of Applied Microscopy and Laboratory Methods</i> , Vol. 1, No. 3. Can be used interchangeably with the Wolfhuegel's plate on the same base.	2.00



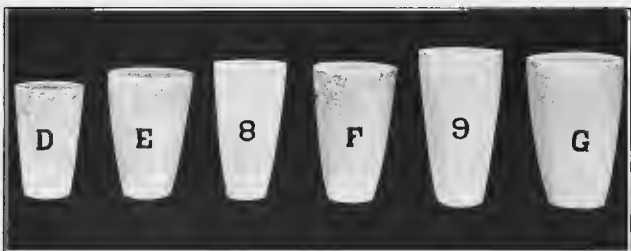
No. 25186

25186. Counting Apparatus, Böttcher, with moist chamber, consisting of an ordinary micro slide with glass ring 20 mm in diameter and 8 mm high cemented thereon. Cover glass for same ruled into 100 squares of 2 mm each, 19 of which squares are numbered. 1.50



No. 25202

25202. Crucibles, Denver Fire Clay made in both hard and soft burn, without covers.
- | | | | | | |
|--|------|------|------|------|------|
| Capacity, grams..... | 5 | 10 | 15 | 20 | 30 |
| Approx. number in original barrel..... | 900 | 550 | 400 | 350 | 300 |
| Per dozen..... | .40 | .50 | .55 | .60 | 1.00 |
| Per 100 in original barrel..... | 3.00 | 3.90 | 4.00 | 4.50 | 7.00 |
| Covers, per dozen..... | .40 | .40 | .40 | .40 | .40 |
- 25206.



No. 25210

25210. Crucibles, Denver Fire Clay without covers.
- | | | | | | | | |
|--|------|------|------|------|-------|-------|-------|
| Number..... | D | E | F | G | J | K | L |
| Height, inches..... | 4 | 4½ | 5 | 5½ | 6½ | 7½ | 8 |
| Diameter, inches..... | 2½ | 3 | 3½ | 3½ | 4½ | 4½ | 5½ |
| Approx. number in original barrel..... | 500 | 350 | 300 | 200 | 150 | 75 | 50 |
| Per dozen..... | .50 | .75 | 1.00 | 1.10 | 1.80 | 2.20 | 3.60 |
| Per 100 in original barrel..... | 3.50 | 5.50 | 7.00 | 8.00 | 12.00 | 15.50 | 27.00 |
| 25214. Covers, per dozen..... | .35 | .50 | .55 | .60 | .80 | 1.20 | 1.40 |



No. 2521b



No. 25222



No. 25230



No. 25238



No. 25212



No. 25216

25218. Crucibles, Hessian Sand, triangular form.

	Threes	Small 5s	Centimeters	Large 5s	Eights	Sizes
Number in nest.....	3	3	3	5	5	6
Height of largest, inches	3	4	4½	4½	7½	5½
Width at top, inches.	2½	3	3½	3½	5½	4½
Per nest.....	.10	.10	.10	.10	.30	.20

25222. Crucibles, Battersea, round form. Dimensions given are outside dimensions.

	Without covers.				With covers.				
Number.....	A	B	C	D	E	F	G	H	J
Height, inches.....	2½	3	3½	4	4½	5	5½	5½	6½
Diameter, inches.....	1½	1½	2½	2½	2½	3	3	3½	4½
Number in original barrel.....	1000	1000	750	500	500	500	400	300	250
Per dozen.....	.30	.35	.40	.45	.70	.80	1.10	1.20	1.65
Per 100 in original barrel.....	1.85	2.25	3.25	3.60	5.75	6.25	8.60	9.00	13.00
Covers, per dozen.....	.30	.30	.30	.35	.45	.55	.70	.80	.85

25226. Crucible, Battersea, Continued.

	K	L	M	N	O	P	Q	R
Number.....	7½	8	8½	9½	10	11	12	13
Height, inches.....	4½	5½	5½	6½	7	7½	8½	9
Diameter, inches.....	150	100	100	75	50	40	30	25
Number in original barrel.....	1.75	3.00	3.50	4.90	7.25	8.00	9.15	12.00
Per 100 in original barrel.....	13.50	24.00	28.00	39.00	58.00	64.00	73.00	100.00
Covers, per dozen.....	1.10	1.20	1.35	1.60	1.90	2.10	2.25	2.70

25230. Crucibles, Battersea, triangular form; without covers.

	S	T	U	V	W
Number.....	4½	4	3½	3½	2½
Height, inches.....	4½	3½	3½	2½	2½
Diameter, inches.....	1.15	.85	.60	.45	.40
Per dozen.....	8.75	6.50	4.75	3.60	3.00
Per 100 in original barrel.....	.85	.85	.70	.50	.50
Covers, per dozen.....					

25238. Crucibles, Alundum, highly refractory; well adapted to experimental electric furnace work and used successfully for melting platinum. They are not, however, adapted for uses where slags are encountered on account of their absorbent nature.

Number.....	5144	6608	6820	5922	5923
Diameter, inches.....	3	2½	2½	1½	1½
Height, inches.....	3½	4½	2½	2	3½
Each.....	1.25	2.00	1.00	.75	1.50

25242. Crucibles, Opaque Fused Silica, for melting.

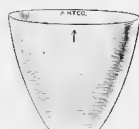
Number.....	1	3	4	6	7	14	16	30	60	70
Height, inches.....	3½	4½	4	6½	7½	7½	8½	10½	12½	20
Diameter at top, inches.....	2½	3½	4½	4½	4½	5½	6½	7½	10½	12
Each.....	2.00	2.15	2.15	3.15	3.75	4.00	5.00	8.00	12.50	18.00

25246. Crucibles, Dixon's Plumbago. Capacities given are actual total, not working capacities. The working capacity is variable, and may be from 70% to 90% of those given. The total capacity in pounds of metal depends on the specific gravity, and may be found approximately by multiplying the total liquid capacity in pints by the specific gravity of the metal.

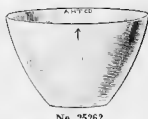
Number.....	0	00	000	0000	1	2	3
Capacity, pints.....	2	2½	2½	3	3½	4½	5½
Height, inches.....	1½	1½	2	2½	3½	3½	4½
Diameter at top, inches.....	.20	.20	.20	.25	.39	.35	.40
Each.....	4	5	6	7	8	9	10
Capacity, pints.....	1½	1½	2½	2½	3	3½	4
Height, inches.....	5½	6	6½	6½	7½	7½	7½
Diameter at top, inches.....	4½	4½	5½	5½	5½	6	6½
Each.....	.45	.55	.60	.65	.70	.75	.80

25250. Covers, Dixon's Plumbago, only, for crucibles No. 25246.

To fit No.....	0	00	000	0000	1	2	3
Each.....	.15	.15	.15	.15	.15	.15	.15
To fit No.....	4	5	6	7	8	9	10
Each.....	.15	.15	.20	.25	.20	.20	.20



No. 25254



No. 25262



No. 25270



No. 25258



No. 25274



No. 25278



No. 25286



No. 25294



No. 25290

25254.	Crucibles, Sanitäts Porcelain, trade mark blue arrow high form, glazed throughout, without covers.											
	Number.....	8	7	6	5	4	3	2	1			
	Capacity, cc.....	10	18	30	40	65	90	135	175			
	Diameter, mm.....	30	35	42	48	55	63	70	80			
	Each .....	.07	.07	.12	.12	.16	.20	.25	.35		
25258.	Covers, only, for crucibles No. 25254.											
	To fit Number.....	8	7	6	5	4	3	2	1			
	Each .....	.05	.05	.08	.08	.12	.15	.17	.25		
25262.	Crucibles, Sanitäts Porcelain, trade mark blue arrow, low form, glazed throughout. Without covers.											
	Number.....	000	00	0	1	2	3	4	5			
	Capacity, cc.....	8	13	15	25	45	90	150	250			
	Diameter, mm.....	25	34	40	46	57	68	80	87			
	Each .....	.07	.07	.07	.09	.09	.12	.14	.17		
25266.	Covers, only, for crucibles No. 25262.											
	To fit Number.....	000	00	0	1	2	3	4	5			
	Each .....	.05	.05	.05	.07	.07	.08	.10	.14		
25270.	Crucibles, Royal Berlin Porcelain, trade mark blue scepter, high form, glazed throughout, without covers.											
	Number.....	000	00	0	1	2	3	4	5			
	Diameter, mm.....	26	30	35	41	52	62	72	87			
	Capacity, cc.....	5	10	15	30	57	95	155	290			
	Each .....	.09	.12	.15	.21	.30	.35	.45	.55		
25274.	Covers, only, for crucibles No. 25270.											
	To fit Number.....	000	00	0	1	2	3	4	5			
	Each .....	.05	.05	.06	.06	.09	.12	.12	.15		
25278.	Crucibles, Royal Berlin Porcelain, trade mark blue scepter, low form, glazed throughout. Without covers.											
	Number.....	00000	0000	000	00	0	1	2	3	4	5	
	Diameter, mm.....	14	18	32	37	41	46	56	67	81	96	
	Capacity, cc.....		$\frac{1}{2}$	2	8	12	17	30	50	90	145	265
	Each06	.07	.12	.15	.18	.25	.35	.40	.50	.60	
25282.	Covers, only, for crucibles No. 25278.											
	To fit Number.....		0000	000	00	0	1	2	3	4	5	
	Each05	.06	.06	.06	.09	.09	.12	.15	.18	
25286.	Crucibles, Royal Meissen Porcelain, trade mark crossed swords. Glazed throughout. Without covers.											
	Number.....	1	2	3	4	5	6	7	8	9	10	11
	Diameter, mm.....	80	70	65	55	45	40	35	30	23	18	14
	Capacity, cc.....	200	140	160	60	40	25	15	7	3	1	$\frac{1}{2}$
	Each40	.35	.35	.25	.21	.18	.15	.15	.15	.15	.15
25290.	Covers, only, for crucibles No. 25286.											
	To fit Number.....	1	2	3	4	5	6	7	8	9	10	11
	Each21	.18	.12	.12	.09	.09	.06	.06	.06	.06	.06
25294.	Crucibles, Gooch, Royal Berlin Porcelain, trade mark blue scepter. Glazed inside and outside with the exception of the outside bottom surface. Holes in bottom are $\frac{1}{2}$ mm in diameter. Without covers.											
	Number.....							2	3	4		
	Capacity, cc.....							10	25	35		
	Diameter at top, mm.....							27	35	40		
	" " bottom, mm.....							18	22	25		
	Height, mm.....							30	40	43		
	Each30	.40	.45		
25298.	Crucible, Gooch, Royal Berlin Porcelain, trade mark blue scepter. Exactly similar to No. 4 of 25294 but with larger holes, i. e., 1 mm in diameter.											.45



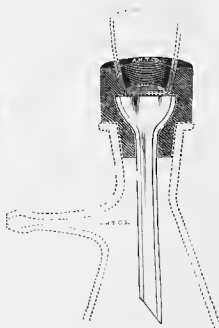
25300.	Crucible, Gooch, Sanit�s Porcelain, with perforated bottom, glazed throughout; 38 mm diameter of top by 40 mm high, diameter of bottom 25 mm. Without cover.	.40
25302.	Crucible, Caldwell, Royal Meissen Porcelain, with removable perforated bottom. Glazed throughout. Removable bottom glazed on upper surface only. Height 40 mm, diameter at top 40 mm, diameter at bottom 25 mm.	.50
25303.	Loose perforated bottom only, for above crucible.	.20
25304.	Crucible, Rose, Porcelain, with perforated cover and delivery tube. Unglazed.	
	Capacity, cc.	15 30 60
	Each.	.50 .80 .90
25306.	Crucible, Plattner, Royal Meissen Porcelain, glazed throughout, with wide flaring lip; height 25 mm, diameter 45 mm.	.25
20356.	Crucible, Royal Berlin Porcelain, of special shape, with large filtering surface, as used in the determination of soluble bitumens; height 24 mm, width at top 45 mm, width at bottom 35 mm.	.50
25310.	Crucible, Caldwell, Opaque Fused Silica, with open bottom with flange to take porcelain or platinum disc; 45 mm diameter at top, 25 mm diameter at bottom and 45 mm high, without disc.	1.80
25312.	Crucibles, Iron, spun from sheet, with covers.	
	Capacity, cc.	20 50 100 200 400
	Diameter, inches.	1 1/2 2 1/2 3 1/2 4 1/2
	Height, inches.	1 1/2 1 1/2 2 2 1/2 3
	Each.	.20 .25 .30 .40 .50
25314.	Crucibles, Copper, spun from sheet, with covers.	
	Capacity, cc.	20 30 50 75 100 150 200 250 500
	Diameter, inches.	1 1/2 1 3/4 1 1/2 2 2 1/4 2 1/2 3 3 1/4 4
	Height, inches.	1 1/2 1 1/2 2 2 1/4 2 1/2 3 1/2 3 1/2
	Each.	.50 .60 .70 .80 .90 1.10 1.30 1.50 2.00
25316.	Crucibles, Pure Silver, with covers.	
	Capacity, cc.	20 30 50 75 100 150
	Approximate weight, grams.	35 45 60 80 100 150
	Each.	3.25 3.75 5.25 7.00 8.50 12.00
25318.	Crucible, Nickel, Penstock-Martini, 40 cc capacity. For the rapid determination of sulphur in coal and coke. See <i>Journal of the American Chemical Society</i> , December, 1903.	3.00
25320.	Crucibles, Pure Nickel. These are very superior to the ordinary article in which the manganese content frequently causes trouble. The shape is also special, being that approved in steel laboratory practice. With covers.	
	Diameter, mm.	35 40 45 50 55 60 80 100
	Actual capacity, cc.	23 36 50 74 93 130 300 540
	Each.	.60 .70 .80 1.00 1.15 1.25 2.00 3.00
25322.	Crucible, Kawin, Pure Nickel, heavy wall, as used in muffle furnaces for burning off filter paper in silicon determinations in iron; 28 mm in diameter by 15 mm high.	.50
25324.	Crucible, Gooch, Pure Nickel, with perforated bottom and extra removable cup; 30 cc capacity, 1 1/2 inches in diameter by 1 1/2 inches high.	1.25



No. 25326



No. 25346



No. 25350



No. 25330



No. 25348

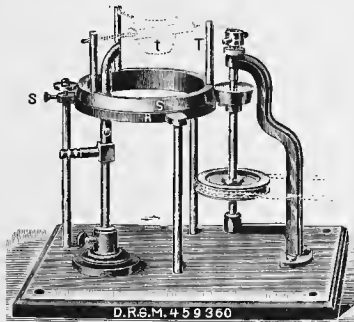


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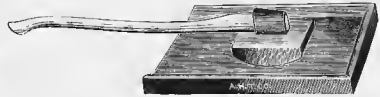
No. 25342

25326. **Crucibles, Alundum**, for general laboratory use. These crucibles are of a very light colored mixture of which the factory number is RA 84, which number is stamped on each crucible. Without covers.
- | | | | |
|------------------|-----|-----|-----|
| Diameter, inches | 1½ | 1¾ | 1¾ |
| Height, inches | 1½ | 1½ | 1½ |
| Capacity, cc. | 20 | 40 | 25 |
| Each | .30 | .35 | .35 |
25328. **Covers**, only, for crucibles No. 25326.
- | | | |
|---------------|------|------|
| To fit Number | 5202 | 5203 |
| Each | .30 | .35 |
25330. **Crucibles, Filtering, Alundum**. These crucibles are made in three degrees of porosity of which the factory designations are RA 98 very porous, RA 360 medium porous and RA 84 slightly porous. The varying degrees of porosity are easily discernible by their color and the mixture number is stamped on each crucible. Please state porosity in ordering. Without covers.
- | | | |
|------------------|-----|-----|
| Diameter, inches | 1½ | 1¾ |
| Height, inches | 1½ | 1½ |
| Capacity, cc. | 25 | 35 |
| Each | .30 | .35 |
25332. **Crucible, Alundum**, specially made for determining moisture in samples of coal. 2 inches in diameter, 1½ inches high.
25334. **Crucibles, Opaque, Fused Silica**, highly glazed; low, wide shape, without covers.
- | | | | | |
|------------------|-----|-----|-----|-----|
| Height, inches | 1 | 1½ | 1½ | 1½ |
| Diameter, inches | 1½ | 1½ | 2½ | 2½ |
| Each | .60 | .60 | .75 | .90 |
25336. **Crucibles, Opaque, Fused Silica**, highly glazed, high form, without covers
- | | | | |
|------------------|------|------|------|
| Height, inches | 2 | 1½ | 1½ |
| Diameter, inches | 2 | 1½ | 1½ |
| Each | 1.25 | 1.25 | 1.25 |
25338. **Covers**, only, for crucibles No. 25334 and 25336.
- | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|-----|
| Inside diameter, inches | 1½ | 1½ | 2 | 2½ | 2½ | 2½ |
| Each | .50 | .50 | .60 | .60 | .75 | .90 |
25340. **Crucible, Opaque Fused Silica**, highly glazed, special large size, 73 mm diameter and 8 mm high. 2.50
25342. **Crucible, Iron, Skidmore**. Designed for making oxygen from MnO₂, calcination of chalk with recovery of the expelled CO₂, manufacture of soda from cryolite, preparation of ammonia, destructive distillation of coal, wood or other organic substances, or for any use in which the materials employed or evolved do not act destructively on hot iron.
- | | | |
|------------------|------|------|
| Capacity, ounces | 3 | 6 |
| Each | 1.25 | 2.00 |
25346. **Crucible Holder, Bailey**, consisting of a rubber holder taking a 25 cc porcelain Gooch crucible. The rubber holder fits an ordinary 2 inch 60° glass funnel as shown in illustration. The lower part of the rubber holder rests against the side of the funnel supporting the crucible while the upper part makes a seal against the top of the funnel when suction is applied. Rubber holder only .30
25348. **Crucible Holder, Spencer**, consisting of a special glass funnel or filter tube, with projecting lug to support crucible, and rubber ring for use with Alundum crucible. The suction makes tight contact between the crucible and the inside of the glass funnel. See *Journal of Industrial and Engineering Chemistry*, Vol. 4, No. 8, Sept., 1912. 1.50
25350. **Crucible Holder, Walter**, for Gooch crucibles of 25 cc capacity, consisting of a combined rubber stopper and crucible holder with glass funnel shaped tube act in stopper. Will fit the neck of any regular suction flask up to 1 liter capacity. Price includes the funnel tube and rubber part only .40



No. 25350

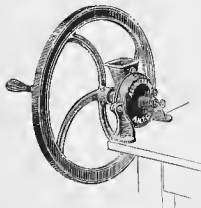
25352. **Crucible Holder, Rotary**, for the uniform heating of crucibles in the determination of ash, evaporations with concentrated sulphuric acid, incineration of sugar, glycerine, food products, etc. A uniform heating of the entire contents of the crucible is secured by the rotation of the triangle supporting it. Apparatus is arranged with pulley for convenient connection to water motor or other source of power. Complete with one burner as shown in illustration 20.00



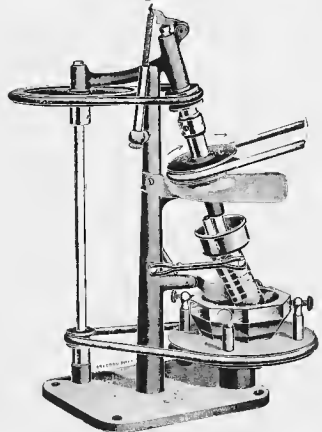
No. 25354



No. 25362



No. 25366

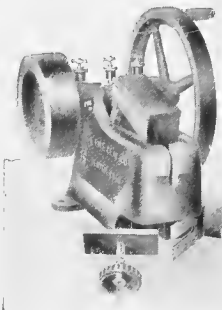


No. 25370

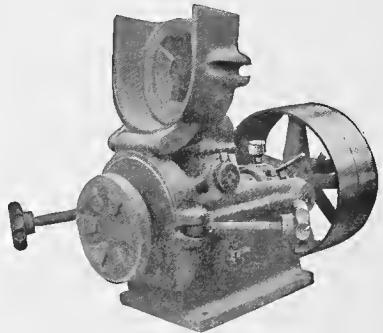
CRUSHING, GRINDING AND PULVERIZING APPARATUS

For Ores, Minerals, Drugs, Food Stuffs and Samples of various kinds, Bacteria, Animal Tissues, Lymph, etc. For convenience we have grouped under the above heading apparatus heretofore listed under Crushers, Grinders, Mills, etc., believing that such an arrangement will facilitate selection.

- | | | |
|--------|--|-------|
| 25354. | Crusher, or Bucking Board , of chilled iron. Board is 18 x 24 inches. | 10.00 |
| 25358. | “ “ “ similar to No. 25354 but of hardest Chrome Steel, weighs 115 lbs. Rubber is 7 x 8 inches and weighs 30 lbs. The metal does not grind off into the sample. As used in many large steel laboratories and as recommended by the Chemists' Committee of the U. S. Steel Corporation in their "Uniform Methods" | 45.00 |
| 25362. | Crusher, Weatherhead Patent , a pulverizing and amalgamating mortar which crushes and pulverizes coarse material at one operation. Will handle any material from clay to pig iron. The cover of the machine is so designed that it may be used as a small hand mortar using the end of the handle as a pestle. | 25.00 |
| 25366. | Mill, Assay , for pulverizing hard substances, such as ores, etc., for analysis. To bolt to bench or table. Will take material about 1/2 inch in diameter. | 10.00 |
| 25368. | Extra plates for above, per set | 2.00 |
| 25370. | Grinding Apparatus with Agate Mortar , for reducing ore to an impalpable powder. It is also used for grinding bacteria and other organic materials. Any desired pressure may be obtained and both mortar and pestle revolve giving a combined rolling and sliding motion. Agate mortar is 110 mm in diameter. Total height of apparatus 18 inches | 60.00 |



No. 25378

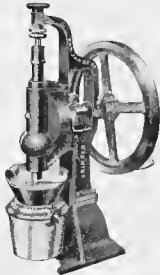


No. 25386

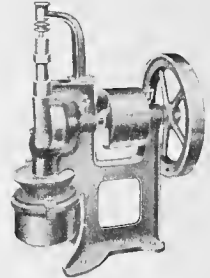
25374. **Crusher, Case Patent.** When driven by power has a capacity of from 100 to 200 lbs. per hour. Jaw opening is 2½ x 3 inches. The adjustment for fine or coarse work is made by use of patented shims which are inserted between the front jaw plate and the frame, affording a variation of from ¼ inch to 20 mesh. Weight 135 lbs. For hand power only..... 37.00
25378. **Crusher, Case Patent,** exactly same as No. 25374 but arranged for both hand and power driving 40.00
25382. " " large size, for power driving only. Similar to No. 25378 but with jaw opening 3 x 4½ inches, capacity 200 to 300 lbs. per hour, shipping weight 350 lbs. Furnished with both tight and loose pulleys..... 100.00
25386. **Pulverizer or Sample Grinder, Her's Patent Disc.** Will grind an ordinary 8 oz. sample to 100 mesh in less than one minute. Adjustment for degree of fineness can be made while machine is in operation, thus one part of a sample may be ground to 50 mesh, part to 100 mesh and part to 200 mesh while the machine is in motion. Made in two sizes, the small size with 6 inch discs, weighing 130 lbs. and is furnished with 10 inch pulleys and requires ½ h. p. to operate; the large size has 9 inch discs, weighs 300 lbs., and is furnished with 14 inch pulleys and requires 2 h. p. for operation. With one set of discs.
- | | | |
|------------------------------|-------|--------|
| | 6 | 9 |
| Each | 85.00 | 145.00 |
| Grinding discs, per set..... | 5.00 | 11.00 |
25388. Grinding discs, per set.....



No. 25390

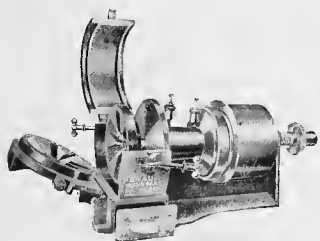


No. 25390

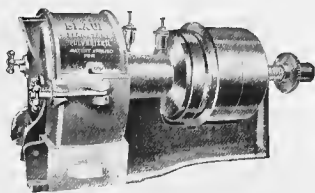


No. 25402

25390. **Sample Grinder, Braun, for Ordinary Ore,** pulverizes to 200 mesh at one grinding. Capacity 4 oz. of ordinary granite rock to 100 mesh in 3 minutes. For hand power only, with one set of discs. 50.00
25392. **Sample Grinder, Braun, for Coal and Coke,** otherwise exactly the same as above..... 50.00
25394. **Sample Grinder, Braun, for Coal and Coke,** with tight and loose pulley for power driving..... 60.00
25396. **Grinding Discs,** for any of above, per set..... 10.00
25398. **Sample Grinder, Braun, for Iron Ore,** with discs of special carbon steel containing a low percentage of phosphorus. With both tight and loose pulley for power driving..... 85.00
25400. **Grinding Discs,** of special carbon steel, per set..... 20.00
25402. **Grinder for Iron Ore, Braun, New No. 7,** similar in construction to the Sample Grinders but larger and built for higher speed. Grinding plates are 7 inches in diameter and are of carbon steel with low phosphorous content. Will grind ¼ inch material to 200 mesh. With balance wheel and tight and loose pulley for power only..... 125.00
24504. **Grinding Discs** of special carbon steel, 7 inches diam., per set..... 22.50
24505. **Grinding Discs** for coal and coke for above, per set..... 10.00

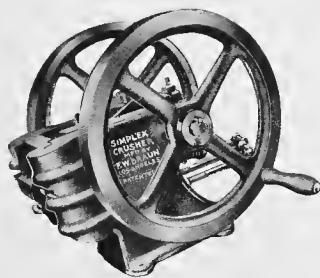


No. 25406

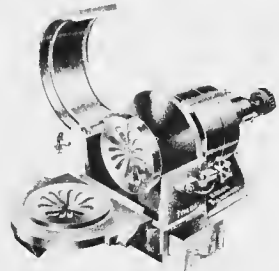


No. 25405

25406. **Pulverizer, Braun Planetary**, works equally well on hard, soft and talcy ores, such as lime rock, cement rock, etc. The planetary movement is obtained by a set of external and internal clover leaf gears. About 15 teeth are simultaneously in mesh, producing a slow, noiseless movement to the quill, which, being bored eccentrically, causes the rotating plate to impart a planetary movement. All the working strain is removed from the main bearings, thus insuring long life to the most expensive parts, and renewals at slight cost of those parts which take the most wear. This machine has a greater capacity than the regular Braun Pulverizer. Material which has been previously crushed to $\frac{1}{2}$ mesh can be ground to 80 mesh at the rate of 1 pound in 40 seconds, or 90 pounds per hour. The machine can be instantly adjusted to pulverize to any fineness while it is in operation, or at rest. The machine is as easily cleaned as the regular Braun Pulverizer No. 25426, and above illustration shows the simple manner of opening the cover and side door for this purpose. An important feature is that all the material is brushed into the pan beneath the machine so that the entire sample is saved. Length 36 inches, height 16 inches, speed 550 r. p. m., power 2 H. P. With one set of grinding plates 150.00
25410. Grinding Plates for above, extra, per set 15.00

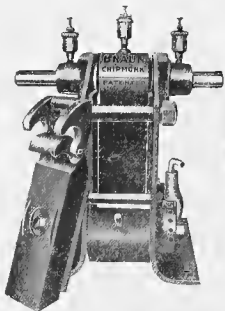


No. 25418

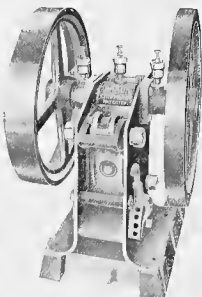


No. 25422

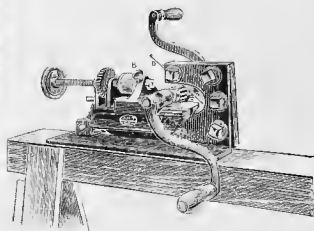
25414. **Crusher, Simplex Ore**, for hand power only. The important features of this machine are the ease with which the front jaw may be removed for cleaning the interior parts, and the simplicity of its adjustment. There are no bolts or screws to be removed and the machine can be opened and closed again in a moments time; very substantially built; size of jaws 6 x 3 inches. 30.00
25418. **Crusher, Simplex Ore**, as above for hand and power driving 33.00
25422. " " " " " power driving only, with both tight and loose pulleys 40.00
25426. **Pulverizer, Braun Improved UA Type**. The most important feature of this Pulverizer is the accessibility of all the interior parts for thorough cleaning. These parts are either enameled or machine finished allowing the material to be easily brushed into the pan. The manner in which the cover and door of the machine are opened insures all of the pulp being brushed into the pan. The capacity of the machine varies according to the fineness to which the material has been previously crushed. If $\frac{1}{2}$ and smaller mesh material is fed into the Pulverizer it will easily handle 60 lbs. per hour to 100 mesh. If the material has been crushed to about 10 mesh, it will easily handle 80 to 90 lbs. per hour to 100 mesh. The machine is fed through the spout in the door and will take material $\frac{1}{2}$ mesh and smaller and reduce it all with one grinding to any desired mesh. The best average speed at which the Braun Pulverizer should be operated is 850 r. p. m. Complete, with one set of grinding plates, length 23 inches, height 14 $\frac{1}{2}$ inches, power 1 H. P. 100.00
25430. Grinding plates for above, extra, per set 8.00



No. 25438

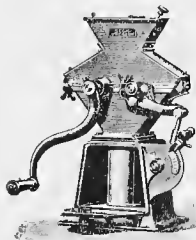


No. 25439

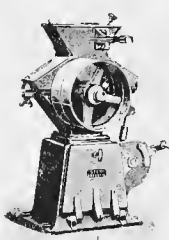


No. 25450

25434. **Crusher, Improved Chipmunk No. 1**, with improved adjusting device consisting of an eccentric bolt passing through the adjusting block. By moving the lever at the side of the machine backward it decreases the opening between the jaws; by moving it forward or towards the operator, it increases this opening. A safety pin is placed in one of the holes which prevents the stationary jaw being brought in contact with the movable jaw. The main feature of this machine is the fact that the frame is made of steel, each side being made in one piece, and both rigidly secured together with strong bolts. The second important feature is the ease with which all of the interior parts are reached for cleaning. The front or stationary jaw can be removed from the crushing chamber in a moment's time, while the rear jaw can be swung backward, thus exposing every part of the machine for cleaning. The vibratory jaw is mounted upon an eccentric shaft at its upper end, and rests against a toggle at its lower end. The eccentric imparts a circular or gyratory movement to the upper end, while the toggle compels the lower end to describe an arc of a small circle. This motion is both forward and downward, or a rubbing motion, and impels a discharge. With jaws 3 x 6 inches, opening $1\frac{1}{2}$ inches, capacity 300 to 400 lbs. per hour to $\frac{1}{4}$ mesh and smaller, for both hand and power driving..... 45.00
25438. **Crusher, No. 1a**, as above, but for power driving only, with tight and loose pulleys..... 55.00
25442. **Crusher, No. 3**, " " larger size with jaws 4 x 9 inches, opening 2 $\frac{1}{2}$ inches, capacity 1000 to 1500 lbs. per hour to $\frac{1}{4}$ mesh and smaller, for both hand and power driving..... 110.00
25446. **Crusher, No. 3a**, large size as above but for power driving only, with tight and loose pulleys... 125.00
25450. **Milling Machine, Laboratory, Johnson**, for taking samples of thin sheets, wire, resistance ribbon nails, steel blades and small samples of all kinds that are irregular in shape for use in carbon determinations in iron and steel analysis..... 28.00



No. 25454



No. 25458

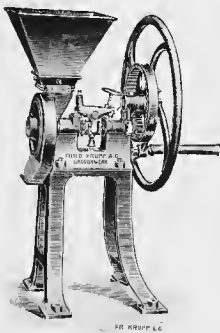


No. 25462

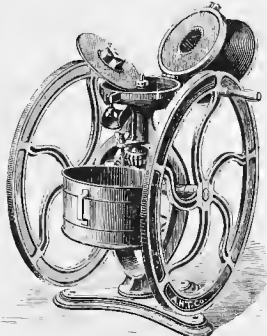


No. 25466

25454. **Mill, Seck**, for coarse grind, a widely used laboratory mill, particularly adaptable for grinding malt to a definite degree of fineness, which is adjustable by a special regulating device. This mill has been adopted by the International Congress of Chemists in Berlin and the Royal German Brewing Academy. For hand driving..... 100.00
25458. **Mill, Seck**, as above, for power driving..... 105.00
25462. **Mill, Grinding and Pulverizing**. Will granulate or grind to fine powder. Pulley 10 inches in diameter by 1 $\frac{1}{2}$ inches wide. Is used with great satisfaction in tanning laboratories for grinding leather samples and in cotton seed oil and other laboratories..... 25.00
25466. **Mill, Porcelain**, for grinding either wet or dry substances, for both bacteriological and chemical purposes, with grinding parts of acid-proof porcelain. With grinding surface of 170 mm in diameter, for hand power..... 25.00



No. 25470

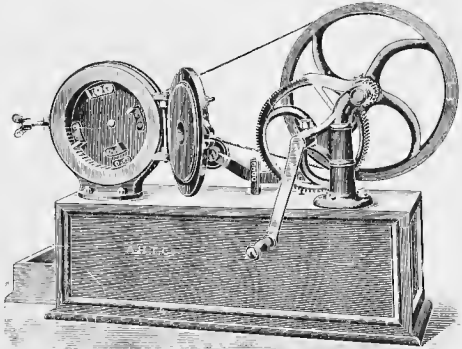


No. 25474



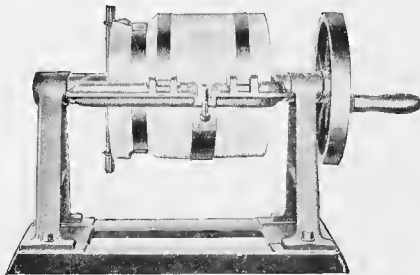
No. 25478

25470. Mill, **Excelsior**, for drugs, food stuffs, seeds and a great variety of other work in grinding laboratory samples. Widely used in Agricultural Experiment Stations. Diameter of grinding discs 6½ inches. Output per hour 25 to 50 lbs. **Duty Free** 77.95 **Duty Paid** 94.50
25474. Mill, **Swift B**. Easily adjusted to any degree of fine grinding. Can be opened, cleaned and closed quickly and without changing the degree of fineness as adjusted. Hopper capacity 3 lbs., total height 30 inches, diameter of fly-wheel 34 inches..... 25.00
25478. Mill, **Drug**, for grinding drugs, grains, seeds, etc. Can be regulated to grind to various degrees of fineness.
- | | | | |
|---------------------------------|------|------|------|
| Height, inches..... | 12½ | 15 | 20½ |
| Diameter of wheels, inches..... | 8 | 8 | 10 |
| Each | 4.25 | 6.00 | 9.00 |

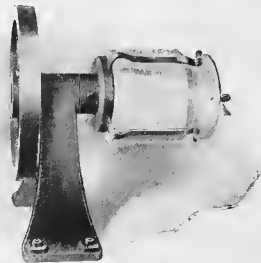


No. 25482

25482. Mill, **Laboratory Drug, Körner**, a new model particularly adapted for the grinding of vegetable substances and the preparation of drugs, feed stuffs, etc.: as supplied by us to the leading pharmaceutical manufacturers in the U. S., and as used in the U. S. Department of Agriculture, etc. See *Chemiker-Zeitung*, 1903 27, No. 42. For hand driving, with improved ball bearings. **Duty Free** 115.50 **Duty Paid** 140.00
25486. Mill as above, but for power driving, with improved ball bearings. **Duty Free** 82.50 **Duty Paid** 100.00

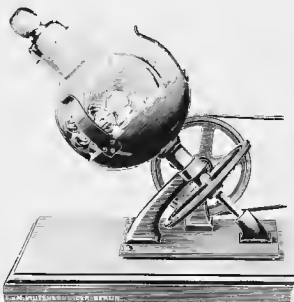


No. 25490

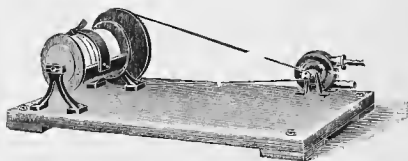


No. 25494

25490. Ball Mill, consisting of a porcelain jar with pebbles. Will handle specimens from $\frac{1}{2}$ oz. to $1\frac{1}{2}$ lbs. at one time. Pulley is 9 inches in diameter x 1 inch wide and requires 80 to 100 r. p. m. for fine grinding. Outside dimensions of jar 5.2 x 5.7 inches. Price complete with pebbles..... 15.00
25494. Ball Mill, consisting of a porcelain jar and pebbles. Jar is 8.7 x 9.6 inches. Will handle quantities from a few ounces up to 5 lbs. Wheel pulley 9 inches in diameter, with handle. Requires 60 r. p. m. Complete with pebbles..... 30.00
25498. Extra Jars, for No. 25494, each..... 12.00
25502. Porcelain Pebbles, per lb..... .30

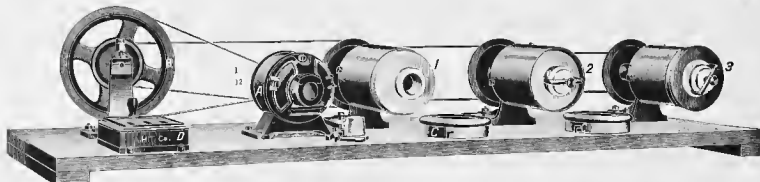


No. 25506



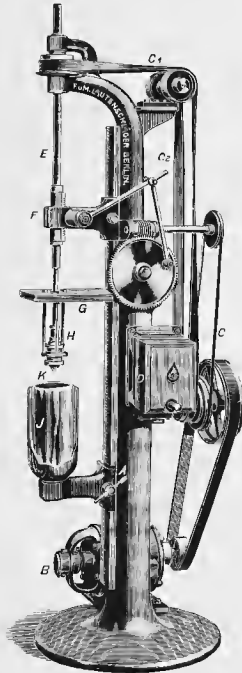
No. 25518

25506. Grinding Apparatus for Bacteria, etc., White, and as used in the laboratories of the Pennsylvania State Live Stock Sanitary Board. Glass globes may be sterilized with the agate marbles inside. Complete with two glass globes and set of agate marbles..... 35.00
25510. Extra Glass Globes, each..... 5.00
25514. " Marbles, per box of 25..... 5.00
25518. Ball Mill, Porcelain, small model on baseboard, with water turbine and including 2 kilos of hard porcelain balls. Duty Free..... 26.40 Duty Paid..... 32.00

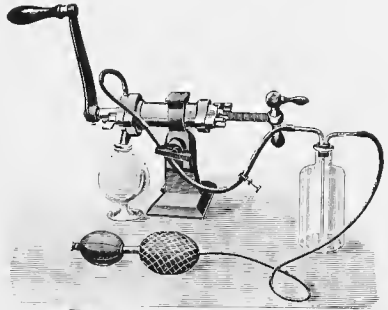


No. 25522 (See description on following page.)

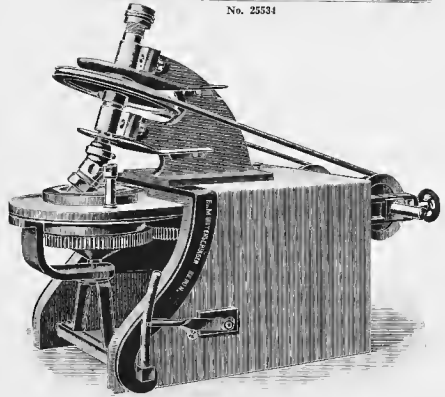
25522. **Grinding Machine for Bacteria etc.**, consisting of from three to five horizontally operated porcelain mills. As furnished by us to the laboratories of Henry Phipps Institute, Philadelphia, Pennsylvania State Live Stock Board, etc. Complete with motor for 110 or 220 volts direct current.
- | | | | | |
|----------------------|--------|--------|--------|--------|
| Number of Mills..... | 2 | 3 | 4 | 5 |
| Duty Free..... | 136.15 | 163.35 | 199.65 | 252.30 |
| Duty Paid..... | 165.00 | 198.00 | 242.00 | 305.80 |
25526. **Extra Porcelain Mills for above**, capacity 1200 cc. Can be sterilized.
- | | | | |
|----------------------|------|----------------------|-------|
| Duty Free, each..... | 8.75 | Duty Paid, each..... | 11.50 |
|----------------------|------|----------------------|-------|



No. 25530

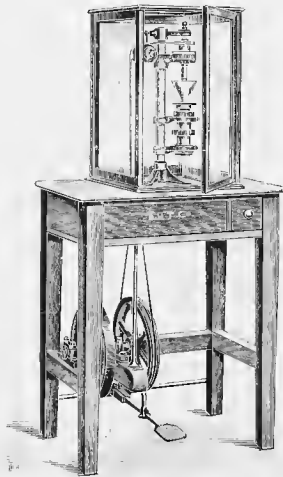


No. 25534

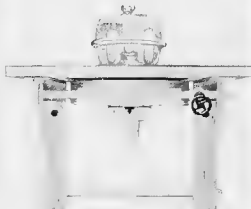


No. 25538

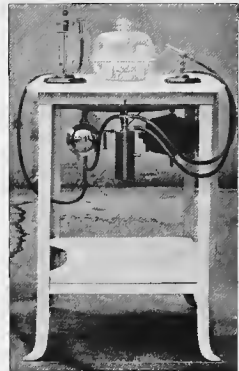
25530. **Grinding Apparatus, Macfaedyen, for Bacteria and Frozen Organisms.** The construction of this apparatus is based upon the fact that the organisms pulverize better when frozen by liquid air to the hardness of glass. The mortar is operated in a liquid air vessel. Complete with motor. Current and voltage must be specified in ordering.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 591.70 | Duty Paid..... | 717.20 |
|----------------|--------|----------------|--------|
25534. **Grinding Apparatus for Organs, Tumors, etc.**, by means of pressure applied during the cutting. Model of the Hygienic Institute, Berlin. The substances can be finely enough ground as to be injected directly.
- | | | |
|----------------------|-------|-------|
| Capacity, grams..... | 10 | 50 |
| Duty Free..... | 24.75 | 49.50 |
| Duty Paid..... | 30.00 | 60.00 |
25538. **Grinding Machine for Bacteria, etc., Koch**, as supplied by us to the laboratories of the Henry Phipps Institute, Philadelphia. With motor. Current and voltage must be specified in ordering.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 435.60 | Duty Paid..... | 528.00 |
|----------------|--------|----------------|--------|



No. 25542

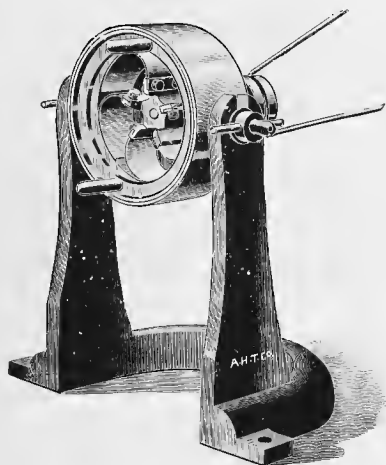


No. 25558



No. 25570

- 25542. Grinding Machine for the Preparation of Animal Lymph.** Devised for the thorough mixing of the animal lymph with the necessary glycerine. The lymph is poured into the conical shaped funnel and is carried by means of the revolving spindle through the cylinder. The spindle is of pure nickel sewed with a thread, gradually tapering from a rough thread at top to a very fine thread at bottom. The inside of the cylinder is also of pure nickel. The mixing spindle is run on a compound ballbearing and is so arranged that it can easily be removed for sterilizing and replaced without any difficulty. In order that the bore of the cylinder may be easily cleaned and examined the cylinder is cut into two halves and held together when in use by the clamps shown. The machine is mounted on a strong table with marble top and the working part is encased under a glass cover with hinged door. The cover need not be removed when the machine is at work. By means of this machine the lymph is thoroughly mixed in about 15 minutes without any loss of the lymph which is kept perfectly free from dust. As supplied by us to some of the leading manufacturers of biological products in the U. S. Complete as illustrated, for foot power, with treadle and driving wheel.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 142.00 | Duty Paid | 172.00 |
|-----------|--------|-----------|--------|
- 25546. Grinding Machine,** exactly same as No. 25542 but fitted with pulley for power driving.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 122.10 | Duty Paid | 148.00 |
|-----------|--------|-----------|--------|
- 25550. Grinding Machine,** exactly same as No. 25542 but with electric motor for direct current and adjustable resistance coils for starting. Voltage must be stated in ordering.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 204.60 | Duty Paid | 248.00 |
|-----------|--------|-----------|--------|
- 25554. Grinding Machine,** exactly same as No. 25542 but with electric motor for alternating current and with countershaft. Voltage must be stated in ordering.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 224.50 | Duty Paid | 272.00 |
|-----------|--------|-----------|--------|
- 25558. Grinding Mill for Lymph.** Model of the K. K. Impfstoff-Gewinnungs-Anstalt, Vienna; consisting entirely of glass, permitting the whole utensil to be repeatedly sterilized. The complete outfit is mounted on an enamelled iron bracket with marble top, and water motor for driving built in.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 115.20 | Duty Paid | 158.40 |
|-----------|--------|-----------|--------|
- 25562. Grinding Mill for Lymph** as above, but with electric motor drive. In ordering please state current.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 204.00 | Duty Paid | 280.50 |
|-----------|--------|-----------|--------|
- 25566. Filling Apparatus for Lymph.** Model of the K. K. Impfstoff-Gewinnungs-Anstalt, Vienna; improved construction, with complete equipment for the adjustment of pressure and blast lamp for melting the capillary tubing, on enamelled iron table, with electric motor.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 228.00 | Duty Paid | 313.50 |
|-----------|--------|-----------|--------|
- 25570. Combined Lymph Grinding and Filling Apparatus,** consisting of outfit No. 25562 for grinding, and outfit No. 25566 for filling. Complete, on enamelled iron table.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 468.00 | Duty Paid | 643.50 |
|-----------|--------|-----------|--------|



No. 25574



No. 25578



No. 25586

- 25574. Grinding Apparatus, Borrel, for Organic Tissues, Bacteria, Lymph, etc.** The grinding is accomplished by means of flexible steel leaves. The normal speed is about 2000 r. p. m. and the front (shown removed in illustration) is of glass so that the entire process may be observed. All the working parts may be readily sterilized and the machine is well suited for the grinding of moist as well as dry material.
- | | | | |
|----------------|-------|----------------|--------|
| Duty Free..... | 87.50 | Duty Paid..... | 105.00 |
|----------------|-------|----------------|--------|
-
- 25578. Cryoscope, Friedenthal, for Molecular Weight Determination** by depression of the freezing point in physiological and clinical work. See *Zentralblatt für Physiologie 1899-1900*. Outfit consists of the following:—
- Cooling Jar**, with wooden cover nickel stirrer, one freezing tube with rubber stopper and one freezing rod.
- Thermometer**, for the cooling mixture, from -20 to $+49^{\circ}$ C. in single degrees.
- Stirrer**, for the solution, consisting of glass rod with platinum ring. Approximately 1.2 grams of platinum.
- Thermometer, Heidenhain**, from $+0.5^{\circ}$ to -2.5° C. in $\frac{1}{10}$ ths. As in medical work only a few degrees under zero are required in the thermometer, this thermometer is furnished with fixed graduations so that the laborious adjustment of zero in the regular Beckmann thermometers is avoided. When small drops of mercury are found in the enlargement at the top of the tube they must be carefully run into the tube by inversion of the thermometer.
- Complete outfit as described.
- | | | | |
|----------------|-------|-------------|-------|
| Duty Free..... | 10.75 | Stock | 16.25 |
|----------------|-------|-------------|-------|
-
- 25582. Thermometer, Heidenhain, as described above.....** 9.00
-
- 25586. Cryoscope, Drucker-Burrian, for Molecular Weight Determination** by depression of the freezing point in physiological and clinical work, designed for small quantities, only 1.5 cc of solution being necessary. See *Zentralblatt für Physiologie*, Band XXIII, Nr. 22. Outfit consists of the following:
- Cooling Jar**, with nickel plated cover and stirrer.
- Freezing Tube**, with cork ring and air jacket with cork for both thermometer and stirrer.
- Stirrer**, of glass with platinum ring, approximately 1.2 grams of platinum.
- Thermometer**, with fixed degrees as in Heidenhain No. 25582, from $+0.5^{\circ}$ to -5° C. in $\frac{1}{10}$ ths, total length 24 cm, with specially small bulb designed especially for this apparatus.
- Complete outfit as described.
- | | | | |
|----------------|-------|-------------|-------|
| Duty Fr.e..... | 10.05 | Stock | 15.25 |
|----------------|-------|-------------|-------|
-
- 25590. Thermometer only, as described above.....** 9.00



No. 25602



No. 25606



No. 25610



No. 25614



No. 25618



No. 25622



No. 25626



No. 25630



No. 25630

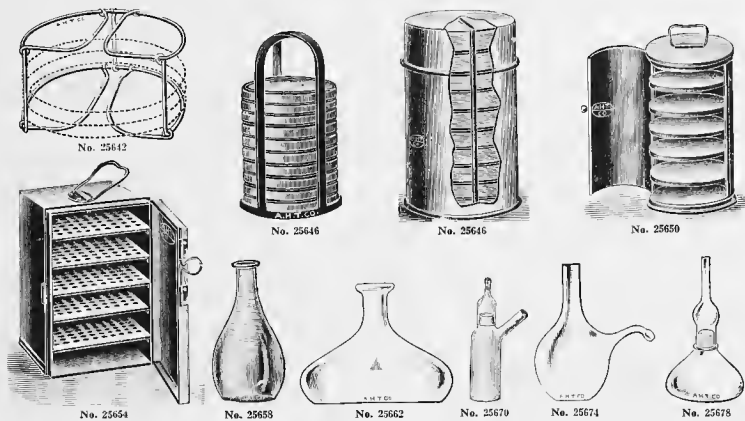


No. 25634

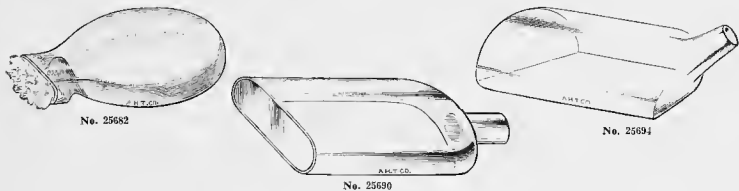


No. 25638

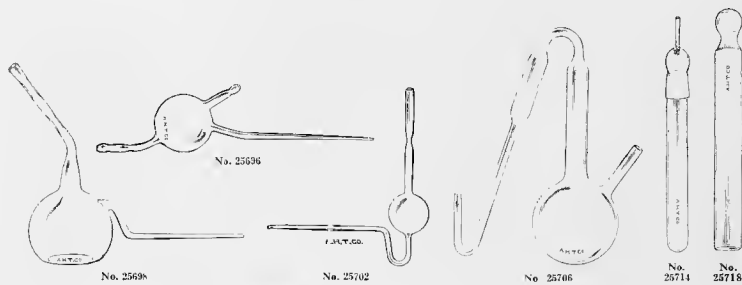
25602.	Culture Dishes, Petri, of glass, fitted in pairs. The 100 x 10 mm size is the standard Petri dish for bacteriological work throughout the U. S. The glass is very free from striae and will stand repeated sterilization with a minimum of breakage and corrosion.	100	120	150
	Diameter, mm.....	10	10	10
	Depth, mm.....			
	Per pair.....	.20	.40	.60
25606.	Covers, Porous Earthenware, for culture dishes 100 mm in diameter. Each.....			.15
25610.	Culture Dishes, of glass, fitted in pairs, with top and bottom surface as free from striae as possible, for cultures, mounting of specimens in gelatine, etc.	40	50	60
	Diameter, mm.....	10	10	10
	Depth, mm.....	.10	.15	.18
	Per pair.....	.15	.15	.18
		.21	.30	.40
		.40	.60	.80
		.90	1.20	1.50
25614.	Culture Dish, of glass, with top and bottom polished, permitting the examination of cultures with higher power objectives than the ordinary blown Petri dish. So-called Pasteur dish. Fitted in pairs.		100	100
	Diameter, mm.....		5	10
	Depth, mm.....		.50	.50
25618.	Culture Dish, of glass, fitted in pairs, with top and bottom of polished plate glass. Glass rings forming sides are cemented on at 600° C. in a special furnace. Especially valuable for photomicrographic work and use with microscope because of the freedom from distortion as compared with blown dishes. Will stand sterilization as well as the ordinary Petri dish. Per pair.....			1.25
25622.	Culture Dish, White Metal, Friedherger-Kanten, rectangular form, 250 mm wide by 10 mm deep. 3.00			
25626.	Culture Dishes, Gahrtschewsky, as originally used for Tetanus cultures but as now used for growing tissues in plasma. The culture is made on the under side of the lid. The circular concave portion of the dish serves to collect the products of metabolism falling from the culture, the circular trough around the bottom dish being used for water. By means of the apertures provided a slight turn of the lid permits or excludes the entrance of air into the culture compartment. Per pair.....			.75
25630.	Culture Dish, Porcelain, Neisser. Dishes are 100 mm in diameter x 10 mm deep and are furnished in both black and white glazed porcelain.		White	Black
	Color.....		.60	.75
	Each.....			
25634.	Culture Dishes or Moist Chambers, large double dishes of heavy glass, with loosely fitting covers with knob.		70	80
	Inside height, mm.....		200	240
	Diameter of cover, mm.....		1.25	2.00
	Each.....			
25638.	Culture Dishes or Moist Chambers, same as No. 25634 but without knob on cover.		70	80
	Inside height, mm.....		200	240
	Diameter of cover, mm.....		1.00	1.75
	Each.....			



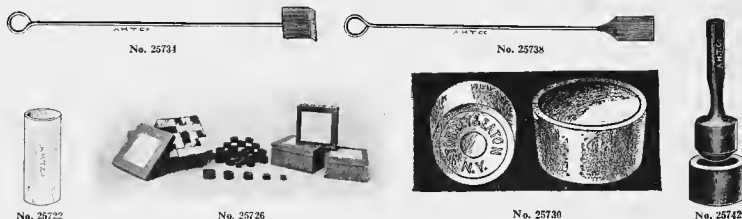
25642.	Culture Dish Holder, Ravenel, for dishes 100 mm diameter, of spring brass, nickel-plated. A very convenient device for handling dishes in the incubator and sterilizer. To hold, dishes.....	3	6
	Each.....	.50	.75
25646.	Culture Dish Holder, of polished copper, with removable inside tray. To take 100 mm dishes. Height 9 inches.....		3.00
25650.	Culture Dish Holder, of sheet copper, nickel plated, with door and handle. For dishes 100 mm in diameter. Height 8 inches.....		6.00
25654.	Culture Dish Holder, rectangular form, of nickel plated copper. For dishes 100 mm in diameter ..		6.00
25658.	Culture Flasks, Koch. Capacity, cc.....	50	100
	Each.....	.12	.15
25662.	Culture Flask, Fernbach, so-called Antitoxin flask. Shape as used in the Antitoxin Laboratories of the Philadelphia Board of Health, 8 inches high and 10 inches in diameter at base.....		2.00
25666.	Culture Flask, Freudreich, with cap ground on, 25 cc capacity.....		.35
25670.	" " " " with side neck, capacity 25 cc.....		.40
25674.	" " " " Lister, for serum, capacity 500 cc.....		.60
25678.	" " " " Miquel, with flat bottom and ground on cap. Capacity, cc....	50	75
	Each.....	.35	.40
			.45



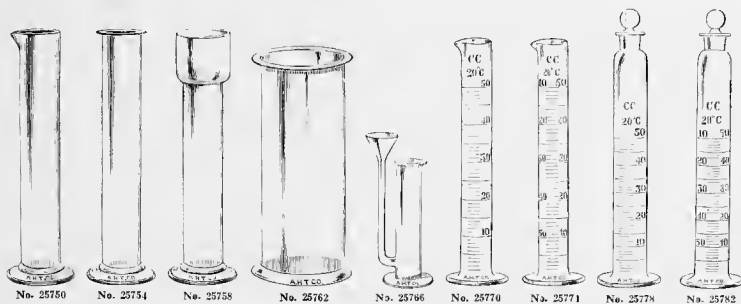
25682.	Culture Flask, Kolle, with indentation to prevent flowing out of medium. Flasks are about 3 cm deep. As used in the preparation of typhoid vaccine in the U. S. Army Medical Department. Diameter, cm.....	13	15
	Each.....	.50	.60
25694.	Culture Flask, Roux, 220 mm long, 120 mm wide and 53 mm deep.....		.80
25694.	" " Piorkowski, 140 mm long, 140 mm wide and 50 mm high.....		.80



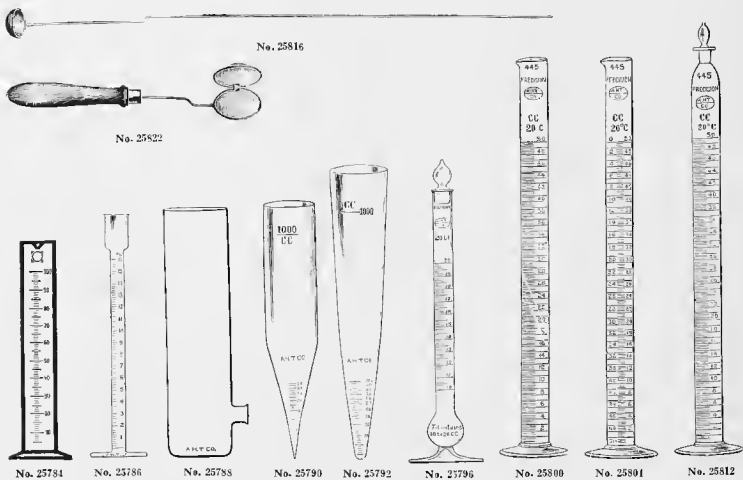
25696.	Culture Flask, Martin, for toxin,				
	Capacity, cc.....	125	250	500	1000
	Each .....	.35	.50	.75	1.00
25698.	Culture Flasks, Chamberland.				
	Capacity, cc.....	125	250	500	1000
	Each .....	.40	.50	.60	.80
25702.	Culture Flasks, Miquel, pipette form.....				.30
25706.	Culture Flask, Pasteur, with side tubulations and constricted neck.				
	Capacity, cc	100	250	500	1000
	Each .....	.40	.50	.60	.80
25710.	Culture Flask, Pasteur, Jena Glass. Same shape as above. Recommended because of insolubility of glass during sterilization. Capacity 500 cc.				1.30
25714.	Culture Tube, Gayon, 220 mm long by 20 mm diameter.....				.30
25718.	" " Roux, for potato cultures, 155 mm long by 20 mm diameter.....				.10



25722.	Cups or Cells, porous, of unglazed porcelain, for use in batteries, etc.								
	Height, mm.....	75	75	95	110	135	185	200	
	Diameter, mm.....	38	50	50	50	65	80	80	
	Each .....	.10	.15	.18	.20	.30	.40	.55	
25726.	Cupels, Brownite, for assaying, are absolutely uniform in composition and density, give a lower silver loss than bone ash, and are guaranteed against breakage in shipment. They should be bot before receiving the button.								
	Diameter, inches.....		1	1 1/8	1 1/2	1 3/4	2	2 1/8	
	Height, inches.....					1	1 1/8	1 1/2	
	Per 100		1.00	1.25	1.75	2.00	2.50		
25730.	Cupels, Torry & Eaton, of best washed bone ash.								
	Diameter, inches.....	1	1 1/8	1 1/2	1 3/4	2	2 1/8	2 1/2	
	Will absorb, grams.....	10	15	20	25	30	40	50	60
	Per 100	2.00	2.25	2.50	3.00	3.40	3.75	4.00	4.50
25734.	Cupel Rake, of iron, 24 inches long.....								.45
25738.	" " Shovel, of iron, 24 inches long.....								.45
25742.	Cupel Mould, of brass.								
	Size, inches.....					1 1/2	1 3/4	2	
	Each					2.50	2.75	3.00	



25750.	Cylinders, with spout.								
	Height, mm.....	100	125	125	150	150	175	200	210
	Diameter, mm.....	25	25	40	25	40	30	30	40
	Each.....	.15	.16	.18	.16	.22	.24	.25	.26
	Height, mm.....	250	260	300	300	315	350	365	375
	Diameter, mm.....	40	45	40	50	65	50	65	50
	Each.....	.30	.35	.35	.45	.55	.50	.60	.50
25754.	Cylinders, with rim around top, top not ground.								
	Height, mm.....	100	125	125	150	150	175	200	210
	Diameter, mm.....	25	25	40	25	40	30	30	40
	Each.....	.15	.16	.18	.16	.22	.24	.25	.26
	Height, mm.....	260	300	300	315	350	365	375	450
	Diameter, mm.....	45	40	50	65	50	65	50	50
	Each.....	.35	.35	.45	.55	.50	.60	.50	.65
25758.	Cylinders, with enlarged top. Especially adapted for use with hydrometers.								
	Height, mm.....					350	300	300	400
	Diameter at top, mm.....					50	75	75	75
	" " bottom inm.....					40	50	65	65
	Each.....					.50	.70	.90	
25762.	Cylinders, with ground rim at top for use with glass plates.								
	Height, mm.....				200	300	300	300	400
	Diameter, mm.....				100	80	100	80	80
	Each.....				.75	.80	1.25	1.25	
25766.	Cylinders, with side funnel for acid chambers, so-called "drop cups."								
	Height of cylinder, mm.....						125	150	
	Each.....						.50	.60	
25770.	Cylinders, Graduated, with single graduations, and spout, on foot.								
	Capacity, cc.....	5	10	15	25	50	100	100	
	Each.....	.25	.28	.30	.35	.40	.50	.50	
	Capacity, cc.....	200	250	500	1000	2000	3000	3000	
	Each.....	.75	.80	1.00	1.75	3.25	4.00	4.00	
25774.	Cylinders, Graduated, with double graduations, and spout, on foot.								
	Capacity, cc.....	5	10	25	50	100	200	250	500
	Each.....	.28	.30	.40	.50	.65	.80	1.00	1.20
25778.	Cylinders, Graduated, with single graduations and ground glass stopper. So called "mixing bottle."								
	Capacity, cc.....	10	25	50	100	150	200	250	500
	Each.....	.50	.55	.60	.80	.90	1.00	1.15	1.35
25782.	Cylinders, Graduated, same as No. 25778. but with double graduations.								
	Capacity, cc.....	10	25	50	100	250	500	1000	2000
	Each.....	.50	.60	.70	.80	1.20	1.65	2.45	4.50
25784.	Cylinders, Graduated, New Jena Glass, with single graduations.								
	Capacity, cc.....	50	100	200	250	500	1000	1000	
	Each.....	.90	1.10	1.35	1.50	2.00	3.00	3.00	
25786.	Cylinder, Graduated, for use with the official Brown-Duvel Moisture Tester. With enlarged top, reading in percentages up to 16%. See Bulletin 56 of the U. S. Bureau of Plant Industry.....								.40
25788.	Cylinder with Outlet but without spout, of well-annealed thin glass guaranteed to stand repeated sterilization; 4 inches in diameter and 15 inches high, with tubulation at the side; as used in the laboratory of Soil Bacteriology of the U. S. Department of Agriculture.....								1.25
25790.	Cylinder, as used in testing sewage, with conical end graduated from 0 to 50 cc, total capacity 1000 cc.....								2.50
25792.	Cylinder, as above, of conical shape throughout, with graduations at points from 0 to 100 cc, total capacity, 1000 cc.....								2.25



25796. Cylinders, Mixing, Precision, as used in the Hygienic Laboratory, of the U. S. Public Health Service for determining the immunity unit in the standardization of diphtheria antitoxin. See *Hygienic Laboratory Bulletin No. 21*. These cylinders are standardized at 20° C. in accordance with the requirements of the Bureau of Standards but are regularly furnished without certificate. With ground glass stopper without constriction in neck and with flask shaped enlargement below first graduation. Each cylinder of the series has a graduation of 10 cc in $\frac{1}{10}$ ths, i. e. the capacity to the beginning of the graduations is 10 cc and to the top of the graduations 20 cc and so on up to 100 cc.

Graduations, cc.	5-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Each.....	1.25	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90

CYLINDERS, Precision, graduated by weighing at 20° C. in accordance with the specifications of the Physikalisch-Technische Reichsanstalt, i. e., with individual control number, time of outflow, all around graduations for the whole centimeters and semi-circular graduations for the fractions, etc. These cylinders are offered with our unofficial factory certificate and with the Physikalisch-Technische Reichsanstalt certificate and control stamp i. e., the official certificate of the German government. Because of the limited demand we do not carry these cylinders in stock with the official P. T. R. certificate but import them on special order. We do, however, carry them in stock with our unofficial factory certificate. These certificates are made out in the factory in exact accordance with the methods prescribed by the P. T. R. and no Cylinder is certified unless the error falls within the limit permitted by the P. T. R. The data on these certificates may be used as a check where cylinders are calibrated in the laboratory or with entire reliance upon the accuracy of the figures given.

25800. Cylinders, Graduated, Precision, with single graduations and spout, adjusted for receiving, with unofficial factory certificate..

Capacity, cc.....	10	25	50	100	250	500	1000
Graduated in cc.....	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{2}$	1	5	5	10
Each.....	.85	1.30	1.55	1.35	1.90	2.35	3.05

25804. Cylinders, Graduated, Precision, same as No. 25800. but with double graduations; with unofficial factory certificate.

Capacity.....	10	25	50	100	250	500	1000
Graduated in cc.....	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{2}$	1	5	5	10
Each.....	1.25	1.60	1.90	1.50	2.25	2.70	3.50

25812. Cylinders, Graduated, Precision, with single graduations and ground glass stopper, adjusted for receiving. So-called "mixing bottle;" with unofficial factory certificate.

Capacity, cc.....	10	25	50	100	250	500	1000
Graduate in cc.....	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{2}$	1	5	5	10
Each.....	1.20	1.65	1.90	1.70	2.35	2.80	4.00

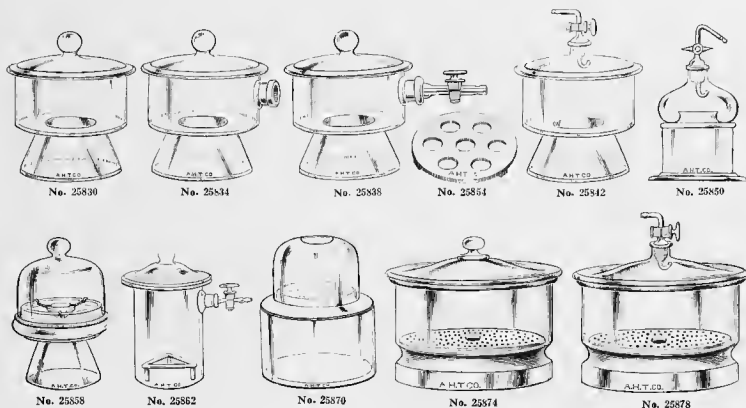
25816. Deflagration Spoons, of brass for burning phosphorus, sulphur, etc., in oxygen.
Diameter of bowl, inches..... $\frac{1}{2}$ 1

Each.....	.15	.20
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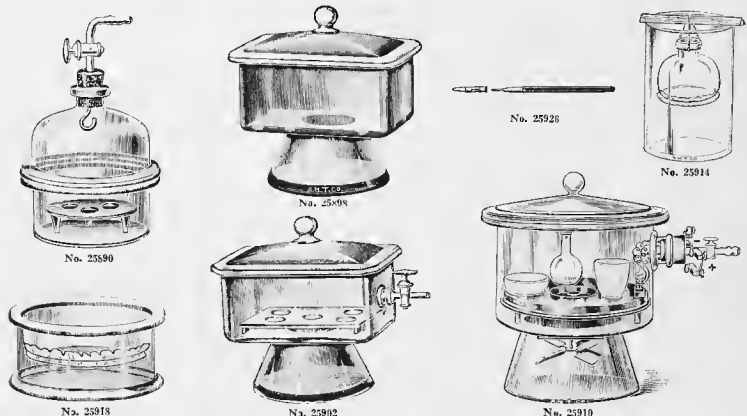
25820. Deflagration Spoons, same as above but of iron.

Diameter of bowl, inches.....	$\frac{1}{2}$	1
Each.....	.10	.15

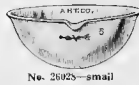
25822. Deflagration Spoon, for decomposition of water by sodium; with brass gauze bowl and wooden handle .50



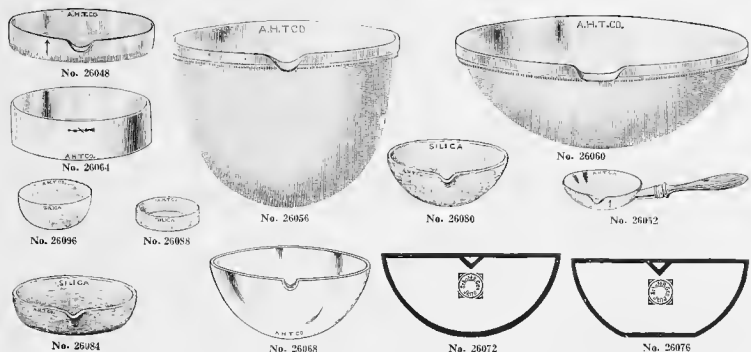
25826.	Demijohns, of glass, with rattan cover. Capacity, gallons.....	1	2	3	5
	Each .....	.50	.75	1.00	1.50
25830.	Desiccator, Scheibler, extra fine quality, with wide, finely ground flange to which covers are evenly and accurately fitted.				
	Diameter, mm.....	100	120	150	200
	Each	1.00	1.25	1.50	2.50
25834.	Desiccator, Scheibler, exactly like No. 25830, 150 mm diameter, but with side tubulation to take rubber stopper.....				2.25
25838.	Desiccator, Scheibler, exactly like No. 25834, but with a stout stopcock ground in side tubulation.				
	Diameter, mm.....	120	150	200	250
	Each	2.80	3.50	5.50	6.50
25842.	Desiccator, Scheibler, identical with No. 25830, but with ground in glass stopcock and hook in lid.				
	Diameter, 150 mm.....				3.50
25846.	“ Scheibler, ordinary quality. Recommended as a very satisfactory desiccator at an unusually low price. Shape same as No. 25830.				
	Diameter, inches.....		4	5	6
	Each .....		.60	.90	1.25
25850.	Desiccator, Hempel, with glass stopcock and hook for suspension. Diameter 150 mm.....				5.00
25854.	Porcelain Plates, glazed, especially intended for use in Scheibler desiccators. On three small feet and with from three to eight holes depending upon the diameter of the plate.				
	Diameter, mm.....	95	115	140	190
	Each .....	.75	.85	1.25	2.00
25858.	Desiccator, Atwater, with triangle inside, diameter about 4½ inches.....				2.00
25862.	Desiccator, Mitscherlich, with glass tripod for taking beakers and deep vessels, 150 mm deep, and 100 mm in diameter, with tubulation and ground in stopcock.....				3.00
25866.	Extra glass tripod for above.....				.25
25870.	Desiccator, Fresenius. Diameter, mm.....			80	100
	Each			1.00	1.20
25874.	Desiccator, Fruehling and Schultz, with glazed porcelain plate profusely perforated with small holes.				
	Diameter, mm.....			200	250
	Each			7.00	10.00
25878.	Desiccator, Fruehling and Schultz, same as above but with stopcock in lid.				
	Diameter, mm.....			200	250
	Each			9.15	13.00
25882.	Porcelain Plates, only, for Fruehling & Schultz Desiccators, glazed and profusely perforated with small holes.				
	Diameter, mm.....			190	230
	Each			1.75	2.10
25886.	Porcelain Plates, only, for Fruehling and Schultz Desiccators, with holes 26 mm in diameter for taking crucibles.				
	Diameter, mm.....			190	230
	Each			1.75	2.10



25890.	Desiccator, stoutly made to withstand considerable pressure. With glass stopcock, rubber stopper and hook in lid. Diameter, 140 mm.	5.25
25894.	Stopcock, only, for No. 25890 desiccator.	1.00
25898.	Desiccator, rectangular form, a new, very practical model.	
	Length, mm.	145 185
	Width, mm.	110 140
	Height, mm.	90 90
	Each.	5.50 7.50
25902.	Desiccator, exactly same as No. 25898 but with stopcock ground in side tubulation, but without porcelain plate as shown in illustration.	
	Length, mm.	145 185
	Each.	9.50 11.50
25906.	Porcelain Plates, rectangular, glazed for use in either of above desiccators and as shown in illustration of No. 25902.	
	Length, mm.	125 170
	Width, mm.	90 125
	Each.	1.80 3.35
	Note.—Desiccators No. 25898 and 25902 can be furnished in amber glass on special order.	
25910.	Desiccator, with Electric Hot Plate and Electric Fan. The electric motor and fan are mounted on a nickel desiccator plate and motor may be operated by a three-volt battery. The air circulation from the fan causes much more rapid drying. The tubulation is provided with glass stopcock in addition to electrical connections so that the desiccator may be used for drying in vacuum and with the electric hot plate in place on the nickel support becomes a small vacuum drying oven. The electric hot plate is regularly furnished for connection with 110 volts d. c.; 180 mm in diameter. Complete with nickel support, fan, motor, electric hot plate for 110 volts and support, but without battery.	
	Duty Free.	18.00
	Stock.	30.00
25914.	Dialyzers, consisting of an open top bell glass suspended in a glass jar. The large end of the bell glass is covered with parchment.	
	Capacity, liters.	2 4
	Each.	1.25 1.50
25918.	Dialyzers, Graham. The inner glass to which parchment paper is fastened is supported by its rim upon the edge of the outer vessel.	
	Diameter, mm.	100 150 200
	Each.	1.30 1.80 2.25
25922.	Dialyzer Tubing, of heavy parchment.	
	Diameter, mm.	45 55
	Per meter. . . . .	.08 .10
25926.	Diamond, for writing on glass. A fine diamond mounted in a metal handle with removable cap.	2.50
25930.	Diffusion Shells, Schleicher & Schüll No. 579. These shells offer a large dialyzing surface with the smallest possible volume and enable work to be carried on with a small outside vessel. Not suitable for Abderhalden technique.	
	Size, mm.	100 x 16 100 x 35-40
	Per box of 25.	3.15 7.35



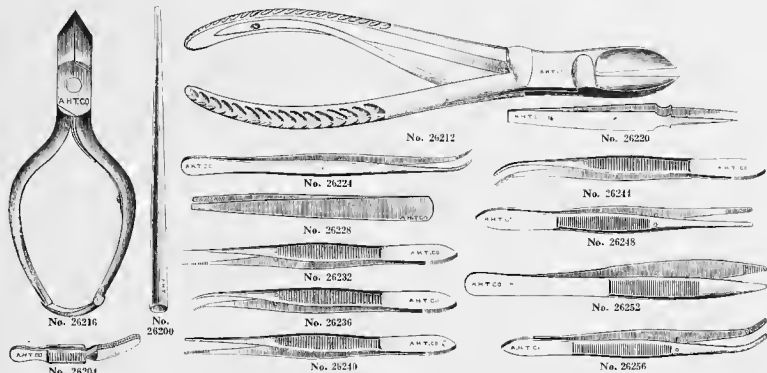
26016.	Dishes, Thüringian Porcelain, glazed inside only, shallow form. Recommended as an inexpensive dish for students' use.																			
	Capacity, cc.....	20	35	50	75	125	200	500	750	1100										
	Diameter, mm.....	58	70	82	92	108	135	165	200	235										
	Each.....	.07	.08	.10	.14	.18	.20	.25	.35	.60										
	Capacity, cc.....	1500	2000	2500	3400	4300	5200	7000	10000											
	Diameter, mm.....	265	285	305	315	345	375	415	450											
	Each.....	.80	1.10	1.40	1.60	2.00	2.95	3.90	5.85											
26020.	Dishes, Thüringian Porcelain, glazed inside only, deep form, with heavy welled rim. Same quality as No. 26016.																			
	Diameter, mm....	65	75	85	94	112	120	150	170	210	240	265	285							
	Capacity, cc.....	35	50	75	100	170	225	450	600	1150	1500	2250	2750							
	Each.....	.10	.10	.12	.14	.17	.30	.40	.55	.70	.95	1.40	1.70							
26024.	Dishes, Sanitäts Porcelain, trade mark "blue arrow," glazed both inside and outside up to and including 120 mm diameter size. Larger sizes glazed inside only as shown in large dish in illustration.																			
	Capacity, cc.....	20	50	75	90	115	160	225	240	350										
	Diameter, mm.....	50	70	80	85	95	105	110	120	150										
	Each.....	.08	.10	.12	.14	.17	.20	.30	.35	.55										
	Capacity, cc.....	700	1000	1250	1500	2000	3000	5000	8500	15000										
	Diameter, mm.....	190	210	235	255	275	300	355	400	470										
	Each.....	.90	.95	1.35	1.55	1.95	2.65	3.95	8.30	11.75										
26028.	Dishes, Royal Berlin Porcelain, trade mark "blue scepter," glazed inside and outside up to and including No. 5. Larger sizes glazed inside only and for a short distance below the rim on the outside, remainder of outside surface being unglazed. See larger dish of illustration.																			
	Number.....	000	00	0	1	2	3	4	5	6										
	Capacity, cc.....	35	60	80	100	140	175	210	300	385										
	Diameter, mm.....	60	70	80	85	90	100	110	120	145										
	Each.....	.15	.18	.21	.25	.35	.40	.45	.55	.70										
	Number.....	6a	6b	7	8	8a	9	10	11	12	13									
	Capacity, cc.....	535	690	765	1285	1430	2200	3250	5700	10000	16500									
	Diameter, mm.....	162	170	185	215	230	265	305	360	400	460									
	Each.....	.85	.90	.95	1.20	1.75	2.10	4.00	5.60	13.50	22.50									
26032.	Dishes, Royal Berlin Porcelain, same shape and execution as No. 26028 but with inside glazing of a dark green color.																			
	Capacity, cc.....						.80	175	300											
	Diameter, mm.....						.80	100	120											
	Each.....						.60	1.00	1.20											
26036.	Dishes, Royal Berlin Porcelain, shallow form, with comparatively flat bottom. Glazed inside and for a short distance below the rim on the outside, remainder of outside surface being unglazed.																			
	Number.....	1	2	3	4	5	6	7												
	Capacity, cc.....	45	60	95	160	200	350	550												
	Diameter, mm.....	70	80	95	105	120	140	160												
	Each.....	.20	.25	.40	.50	.60	.75	.90												
26040.	Dishes, Royal Meissen Porcelain, trade mark "crossed swords" in blue, glazed inside and for a short distance below the rim on outside, remainder of outside surface being unglazed.																			
	Number.....	11	10	9	8	7	6	5												
	Capacity, cc.....	20	50	120	190	280	525	870												
	Diameter, mm.....	65	83	110	123	135	165	190												
	Each.....	.18	.20	.35	.40	.60	.85	1.20												
	Number.....	4	3	2	1	0	0	0												
	Capacity, cc.....	1100	1700	2250	3750	4750	6200	8700												
	Diameter, mm.....	220	250	275	300	340	365	400												
	Each.....	1.45	1.70	2.10	2.75	4.00	6.00	6.50												
26044.	Dish, Alundum, for incinerations, 45 mm diameter at top, 30 mm diameter at bottom, 22 mm high, with wall 2 mm thick. These are furnished in either RA 84 or RA 320 mixture, which should be specified in ordering.																			



26048.	Dishes, Sanitäts Porcelain, trade mark "blue arrow," shallow form with flat bottom.									
	Number.....	1	2	3	4	5	6	7	8	9
	Diameter, mm.....	70	80	95	105	120	140	160	180	200
	Each.....	.14	.17	.20	.24	.27	.34	.41	.51	.63
26052.	Dishes, Sanitäts Porcelain, trade mark "blue arrow," glazed inside only with wooden handle.									
	Capacity, cc.....					40	120	200		525
	Diameter, mm.....					70	100	125		170
	Each.....					.30	.40	.65		1.35
26056.	Dish, Thüringian Porcelain, glazed inside only, with heavy double welted rim. Deep form. As supplied large chemical works. Dimensions 430 mm diameter by 305 mm deep.....									12.00
26060.	Dish, Thüringian Porcelain, glazed inside only, with heavy welted rim. As supplied to large manufactures. Capacity, cc.....							12,000		24,000
	Diameter, mm.....							420		600
	Each.....							4.75		12.00
26064.	Dish, Royal Berlin Porcelain, glazed, flat bottom; 72 mm diameter by 16 mm deep.....									.45
26068.	Dishes, Best Bohemian Glass, round bottom, with spout.									
	Diameter, mm.....	50	60	70	80	90	100	110	120	150
	Each.....	.15	.16	.18	.20	.25	.28	.32	.35	.50
26072.	Dishes, Jena Glass, round bottom, with stout walls. For many purposes may be used in place of porcelain and have the advantage of being transparent. With spout.									
	Diameter, mm.....	40	50	60	70	80	90	100	120	150
	Each.....	.15	.16	.17	.20	.25	.28	.32	.35	.50
	Diameter, mm.....	100	125	150	200	250	300			
	Each.....	.34	.55	.73	.95	1.15	1.70			
26076.	Dishes, Jena Glass, same as No. 26072 but with flat bottom.									
	Diameter, mm.....	40	50	60	70	80	90	100	120	150
	Each.....	.15	.16	.17	.20	.25	.28	.32	.35	.50
	Diameter, mm.....	100	125	150	200	250	300			
	Each.....	.34	.55	.73	.95	1.15	1.70			
26080.	Dishes, Opaque Fused Silica, highly glazed, with spout and round bottom.									
	Diameter, inches.....	2	2½	3½	4½	5½	6½	7½	8½	11
	Depth, inches.....	1½	1	1½	2	2½	3	3½	4	5
	Each.....	1.00	1.15	1.25	1.35	1.35	1.60	1.85		
26084.	Dishes, Opaque Fused Silica, highly glazed, flat bottom, with spout.									
	Diameter, inches.....	2½	3	3½	4½	5½	6½	7½	8½	11
	Depth, inches.....	1½	1	1½	2	2½	3	3½	4	5
	Each.....	1.15	1.25	1.35	1.35	1.60	1.85			
26088.	Dishes, Opaque Fused Silica, highly glazed, shallow flat form without lip. As used for ash determinations, ignitions, etc., instead of platinum dishes.									
	Diameter, mm.....	35	44	51	57	60	70			
	Each.....	.60	.60	.90	.90	1.00	1.25			
26092.	Dish, Opaque Fused Silica, highly glazed, for sugar analysis, of exactly the shape and dimensions of platinum dishes usually used for the purpose, i.e. 51 mm diameter and 25 mm deep, flattened on the bottom and without lip.....									1.25
26096.	Dish, Opaque Fused Silica, for tannin analysis, 82 mm diameter and 25 mm deep, flattened on the bottom and without lip.....									1.25

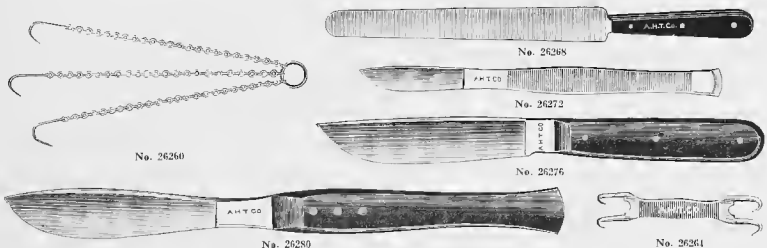


26100.	Dishes, Preparation, of glass, with flaring sides and ground on covers.								
	Diameter, mm.....		40	70	100				
	Each.....		.25	.30	.35				
26104.	Dishes, Preparation, of glass, low form. The lid is neatly fitted but is not ground on.								
	Height, mm.....		30	40	45	50			
	Diameter, mm.....		50	70	90	100			
	Each.....		.20	.25	.35	.40			
26108.	Dishes, Preparation, of glass, same as No. 26104 but high form, i.e., 75 mm high by 50 mm diameter. Very convenient for keeping clean micro slides on end. Each.....					.25			
26112.	Dishes, Preparation, of glass, with cover with knob, accurately ground air tight on broad flange. Particularly convenient for use as receptacle for clean cover glasses.								
	Height, mm.....		30	35	40	45			
	Diameter, mm.....		50	65	80	100			
	Each.....		.45	.50	.55	.65			
26116.	Dishes, Preparation, of glass, so-called American Stender Dishes. Covers ground on. The largest size, i.e., 90 mm high by 60 mm diameter is very convenient for clean micro slides.								
	Height, mm.....		24	30	35	90			
	Diameter, mm.....		36	50	60	60			
	Each.....		.08	.10	.15	.15			
26120.	Dishes, Stender, of glass, for biological preparations, staining, etc., with covers of polished plate glass accurately ground on. These are the original Stender dishes of German make.								
	Height, mm.....	25	30	35	40	50	60	70	90
	Diameter, mm.....	40	50	60	80	100	120	140	50
	Each.....	.25	.25	.30	.40	.50	.90	1.00	.50
26124.	Dishes, Aluminum, with straight sides and flat bottom, as used in milk analysis.								
	Diameter, mm.....					65		75	90
	Depth, mm.....					18		20	22
	Each.....					.30		.40	.50
26128.	Dish, Aseptic Enamel Ware, of seamless steel white enameled. Both acid and fire proof. Diameter $\frac{3}{4}$ inches, depth $\frac{2}{4}$ inches.....								.40
26132.	Dishes, Iron, lined with white porcelain inside and blue enamel outside. With handles and spout.								
	Diameter, mm.....	100	120	150	180	200	240	300	360
	Each.....	.40	.50	.80	1.00	1.20	1.50	2.25	3.00
26136.	Dishes, Lead, Diameter, inches.....	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6	
	Each.....	.10	.12	.16	.20	.25	.35	.50	
26140.	Dishes, Pure Wrought Nickel, with spout. Best imported quality with minimum trace of manganese.								
	Diameter, mm.....					60		80	100
	Each.....					.70		1.25	1.60
26148.	Dishes, Pure Silver, per gram.....								.10
	Diameter, mm.....	50	65	75	90	100	100	125	125
	Approximate weight in grams.....	45	65	100	125	175	320	320	
26152.	Dishes, Tin Foil for milk analysis; so-called "bottle caps." Size, inches.....	2 $\frac{1}{2}$ x $\frac{3}{4}$	2 $\frac{1}{2}$ x $\frac{3}{4}$	2 $\frac{1}{2}$ x $\frac{3}{4}$	3 $\frac{1}{2}$ x $\frac{1}{2}$				
	Per 100.....	1.25	1.15	1.80					
26156.	Dish, Weighing, with Counterpoise, of aluminum, shallow form. Capacity, cc.....							10	30
	Each.....							2.00	2.25
26160.	Dish, Weighing, with Counterpoise, of German silver. For Weighing Sugar Samples.....								3.25

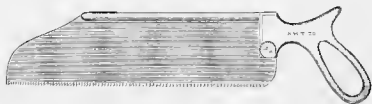


DISSECTING INSTRUMENTS

26200.	Blowpipe, for zoological work, of nickeled metal, 5 inches long.....	.15
26204.	Forceps, Artery, of nickeled steel, bent form, self-closing, with corrugated points, 55 mm long.....	.40
26208.	Forceps, Artery, same as No. 26204 but straight.....	.40
26212.	Forceps, Bone-Cutting, strong straight blades, with pinless lock joint permitting separation for cleaning. Length, mm.....	200 225
	Each.....	2.50 2.75
26216.	Forceps, Bone-Cutting, of nickeled steel, with strong curved blades, 125 mm long.....	.80
26220.	Dissecting fine, straight, smooth points, 95 mm long.....	.20
26224.	Dissecting fine, curved, with fine file-cut points and guide pin, 120 mm long.....	.35
26228.	Dissecting fine, of steel, heavy, with straight, blunt, corrugated points, 110 mm long.....	.15
26232.	Forceps, Dissecting, with fine straight corrugated points, 115 mm long.....	.40
26236.	Dissecting fine, curved, 110 mm.....	.40
26240.	Dissecting fine, medium fine, straight corrugated points, 115 mm long.....	.40
26244.	Dissecting fine, curved, 110 mm.....	.40
26248.	Dissecting fine, heavy, straight, corrugated points. Length, mm.....	105 115 130 145
	Each.....	.40 .40 .40 .40
26252.	Forceps, Dissecting, heavy, straight, corrugated points; without guide pin; 125 mm long.....	.40
26256.	Forceps, Dissecting, heavy, with curved corrugated points, 115 mm long.....	.60



26260.	Hooks and Chains, nickel plated, with sharp points.....	.20
26264.	Double Hooks, of steel, nickel plated.....	.25
26268.	Knife, Brain, with very thin blade of finest steel, in ebony handle. Length of blade 185 mm, width 26 mm.....	1.50
26272.	Knife, Cartilage, all steel, with nickel plated handle, with 45 mm cutting edge.....	.30
26276.	Knife, (Trossecting Knife), with ebony handle and heavy blade thick at the back. Length of cutting edge, mm.....	70 90
	Each.....	.75 1.00
26280.	Knife, Virchow, 3 1/2 inches length of cutting edge.....	1.50



No. 26284

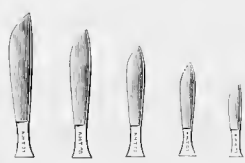


No. 26288 to No. 26312

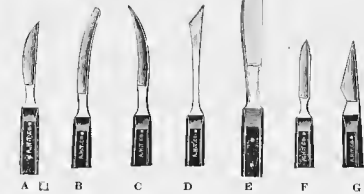
26284.	Bone Saw, of steel, nickel plated, with detachable blade for sterilization. Length of blade 200 mm.	3.00
26288.	Needle, Dissecting, with ebony handle, straight and sharp, 135 mm long.	.30
26292.	" " " " " " curved and sharp, 130 mm long.	.35
26296.	" " " " " " blunt, 130 mm long.	.35
26300.	" " " " " " half spear shaped, 130 mm long.	.35
26304.	" " " " " " spear shaped, with double cutting edge, 125 mm long.	.35
26308.	" " " " " " harpoon shaped, with two cutting edges and 145 mm long.	.60
26312.	" " " " " " hook shaped, 145 mm long.	.35
26316.	Dissecting Needle, cheap form, straight, in cedar wood handle. Per dozen.	.30
26320.	" " " " " " bent " " " " Per dozen.	.30
26324.	Needle Holders, of bone with clamp holding any needle. With one straight needle.	
	Length, mm.	85 110
	Each. . . . .	.07 .10
26328.	Needles, for Holder No. 26324, of steel, 50 mm long. Style.	A B C D
	Per ten. . . . .	.05 .07 .05 .05
26332.	Oil Stone, for sharpening scalpels, 4 inches long.	.60



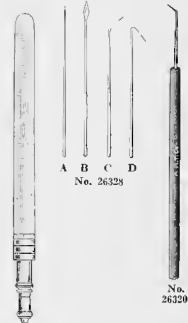
No. 26310 and No. 26352



No. 26340 and No. 26372



No. 26336 and 26348



No. 26328

No. 26324

No. 26320



No. 26332

SCALPELS, DISSECTING, are carried in the following grades:—

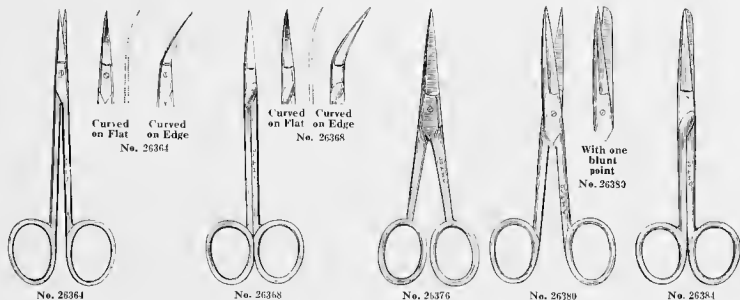
Quality A instruments are of the best attainable quality, being made by the same makers and of the same material as the highest grade minor operating knives.

Quality B instruments are of usual quality for general laboratory work.

Quality C instruments are entirely suitable for students work where instruments are used for one course in dissecting only but are not recommended for permanent use where they are to be repeatedly resharpened.

26336.	Scalpels, Dissecting, quality A, in ebony handle. Special shapes.						
	Style.	A	B	C	D	E	F
	Length of cutting edge, mm.	35	35	35	10	50	23
	Each.	1.25	1.25	1.25	1.25	1.25	1.25
26340.	Scalpels, Dissecting, quality A, in ebony handle. Regular shapes.						
	Length of cutting edge, mm.	18	25	32	38	45	50
	Each.	1.00	1.00	1.00	1.00	1.00	1.00

26344.	Scalpels, Dissecting, quality A, all steel. Easily cleaned and sterilized. Regular shapes.						
	Length of cutting edge, mm.....	25	32	38			
	Each.....	1.00	1.00	1.00	1.00		1.00
26348.	Scalpels, Dissecting, quality B, with ebony handle. Special shapes.						
	Style.....	A	B	C	D	E	F
	Length of cutting edge, mm....	35	35	35	10	50	23
	Each.....	.40	.40	.40	.40	.40	.40
26352.	Scalpels, Dissecting, quality B, with ebony handle. Regular shapes.						
	Length of cutting edge, mm.....	18	25	32	38	45	50
	Each.....	.40	.40	.40	.40	.40	.40
26356.	Scalpels, Dissecting, quality B, all steel. Regular shapes.						
	Length of cutting edge, mm.....	25	32	38	45		
	Each.....	.45	.45	.45	.45		
26360.	Scalpels, Dissecting, quality C, with ebony handles. Regular shapes.						
	Length of cutting edge, mm.....	25	32	38	45		
	Each.....	.25	.25	.25	.25		



26364.	Scissors, Dissecting, with fine points and screw joint, length 150 mm; regular quality.			
	Style.....	Straight	Curved on edge	Curved on flat
	Each.....	.50	.75	.75
26368.	Scissors, Dissecting, with fine points and aseptic lock joint, length 150 mm. Finest grade of surgical scissors.			
	Style.....	Straight	Curved on edge	Curved on flat
	Each.....	.90	1.00	1.00
26372.	Scissors, Dissecting, medium weight, with straight points, 150 mm long. A low priced scissors for student work.....			.25
26376.	Scissors, Dissecting, same size and style as above, but better quality.....			.40
26380.	Scissors, Dissecting, medium weight, with screw joint, 115 mm long.			
	Style.....	With sharp points	With one blunt point	
	Each.....	.60	.60	
26384.	Scissors, Dissecting, medium weight, with one sharp and one blunt point and aseptic lock joint. Finest grade of surgical scissors			
	Length, mm.....	105	115	125
	Each.....	.75	.90	1.00

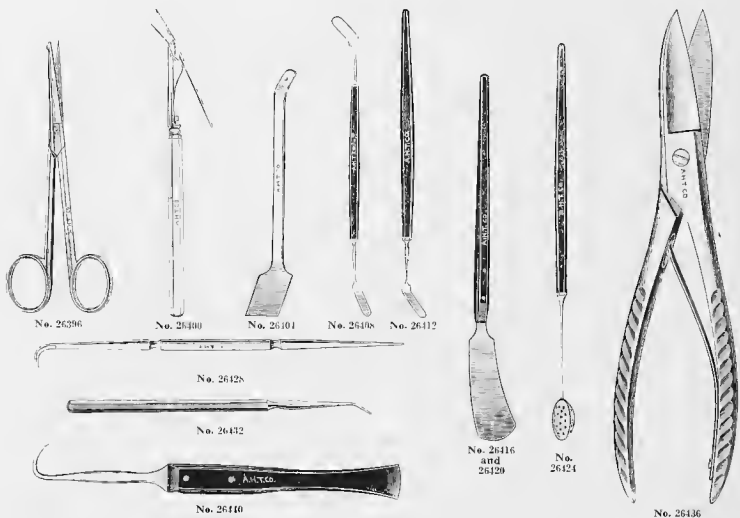


No. 26388



No. 26392

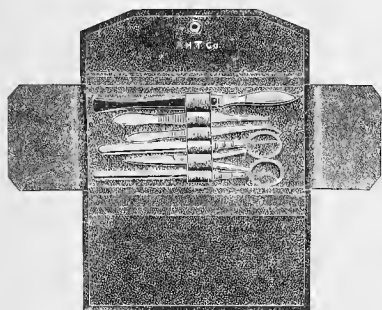
26388.	Scissors, Dissecting, heavy, with one sharp and one blunt point and screw joint.			
	Length, mm.....	125	150	175
	Each.....	.65	.80	.90
26392.	Scissors, Dissecting, heavy, 140 mm long, with both blades blunt and with aseptic lock joint. Finest grade of surgical scissors			
	.....			1.00



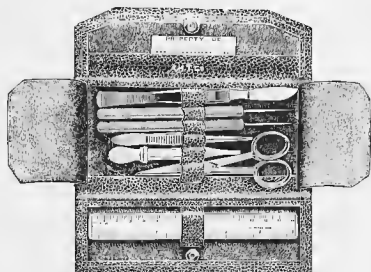
26396.	Scissors, Dissecting, Coronary Artery, with one probe point. As used in Johns Hopkins University.	1.25
26400.	" " with handle of genuine ivory, for the finest invertebrate dissecting. Length of blades 10 mm.	3.00
26404.	Section Lifter, nickel plated. Total length 100 mm, width 18 mm.	.10
26408.	" " with ebony handle. Width of small blade 6 mm, width of larger blade 10 mm.	.50
26412.	" " similar to No. 26408 but with only one blade. Width of blade 6 mm.	.35
26416.	" " with ebony handle and very flexible blades. Width of blade 20 mm.	.35
26420.	" " same as No. 26416 but width of blade 35 mm.	.40
26424.	" " perforated, for handling delicate specimens. Width of top 18 mm.	.50
26428.	Seeker, or Probe, with the curved end sharply pointed with an inner sharp edge.	.20
26432.	" " Mail form. As used in Johns Hopkins Medical School.	.40
26436.	Cartilage Shears, of nicked steel. Total length 230 mm, length of blades, 60 mm.	2.25
26440.	Tenaculum, of steel, with ebony handle and sharp hook. Length 160 mm.	.25
26444.	" " all steel, 160 mm long.	.40
26448.	Dissecting Instrument Cases, in the following styles:—	
	Type A—one fold leatherette case with cloth lining.	
	Type B—two fold leatherette case with cloth lining.	
	Type C—two fold genuine morocco leather case with velvet lining, and chamois protecting flaps.	
	Type D—three fold genuine morocco leather case with velvet lining and chamois protecting flaps.	
	Type.....	A B C D
	Each.....	.25 .50 .90 1.25

DISSECTING INSTRUMENTS IN SETS. The following sets have been prepared as being those mostly in demand. We also make up special sets, utilizing, if possible, the standard types of cases as listed above, and in accordance with the requirements of the practice in vogue in any laboratory.

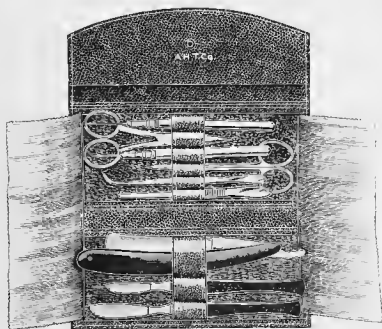
26452.	Dissecting Set, consisting of one-fold leatherette case with name card inserted and one forceps, one scalpel, two needles, one scissors, one rule and one pipette.	1.00
26456.	Dissecting Set, consisting of the following instruments in leatherette case No. 26448 Type A....	1.25
	1 No. 26360. Scalpel, with ebony handle and 35 mm edge.	1 No. 26221. Forceps, fine, curved points.
	1 No. 26372. Scissors, medium straight.	2 No. 26324. Needle Holders, fitted with needles.
	1 No. 26228. Forceps, blunt.	1 No. 31100. Celluloid Measure (not shown in illustration.)
26460.	Dissecting Set, consisting of the following instruments in leatherette case No. 26448 Type B....	2.25
	1 No. 26360. Scalpel, with ebony handle and 45 mm edge.	1 No. 26272. Cartilage Knife, all steel, with 45 mm edge.
	1 No. 26360. " " " " 25 mm edge.	1 No. 26268. Triple Chain and Hooks.
	1 No. 26372. Scissors, medium, straight.	1 No. 26269. Blowpipe.
	1 No. 26372. Forceps, heavy, straight, for vert-brate work.	1 No. 31100. Celluloid Measure (not shown in illustration.)
	1 No. 26410. Tenaculum.	



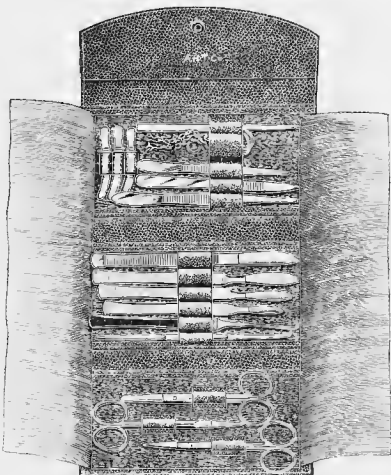
No. 26456



No. 26452



No. 26464



No. 26472

- 26164. Dissecting Set**, consisting of the following instruments in two-fold leatherette case No. 26448 Type B. 3.25
- | | | |
|-------------|--|--|
| 1 No. 26360 | Scalpel, with ebony handle and 41 mm edge. | |
| 1 No. 26369 | " " " " 23 mm " | |
| 1 No. 26364 | Scissors, fine, straight. | |
| 1 No. 26372 | " " " " medium, straight. | |
| 1 No. 26221 | Forceps, fine, curved points | |
- 26165. Dissecting Set**, consisting of the following instruments in two-fold morocco case, with velvet lining and chamois protecting flaps, No. 26448, Type C. 3.50
- | | | | |
|-------------|---|-------------|--|
| 1 No. 26352 | Scalpel, with ebony handle and 45 mm edge | 1 No. 26272 | Cartilage Knife, all steel, with 45 mm edge. |
| 1 No. 26352 | " " " " 32 mm " 25 " | 1 No. 26428 | Seeker |
| 1 No. 26374 | Scissors, medium, straight, nicked. | 1 No. 26299 | Triple Chain and Hook |
| 1 No. 26552 | Forceps, heavy straight, for vertebrate work. | 1 No. 26299 | Blowpipe |
| 1 No. 26440 | Tenaculum. | 1 No. 31160 | Celluloid Measure (not shown in illustration.) |
- 26472. Dissecting Set**, consisting of the following instruments in three-fold morocco case with velvet lining and chamois protecting flaps, No. 26448 Type D. 8.00
- | | | | |
|-------------|---|-------------|--|
| 1 No. 26356 | Scalpel, all steel, with 45 mm edge. | 1 No. 3254 | Forceps, for vertebrate work. |
| 1 No. 26356 | " " " " 32 mm " 25 " | 1 No. 26272 | Cartilage Knife, all steel, 45 mm edge. |
| 1 No. 26356 | " " " " 25 " 25 " | 1 No. 26441 | Tenaculum. |
| 1 No. 26364 | Scissors, fine, straight, nicked. | 1 No. 26428 | Seeker |
| 1 No. 26364 | " " " " curved. | 1 No. 32599 | Triple Chain and Hooks. |
| 1 No. 26380 | " " " " medium, straight, probe point. | 1 No. 26299 | Blowpipe. |
| 1 No. 26248 | " " " " medium, heavy, straight, 115 mm long. | 3 No. 26294 | Serrulae (Artery Forceps.) |
| 1 No. 26248 | Forceps, heavy, straight, 130 mm long. | 1 No. 31160 | Celluloid Measure (not shown in illustration.) |

STOKES AUTOMATIC WATER STILLS

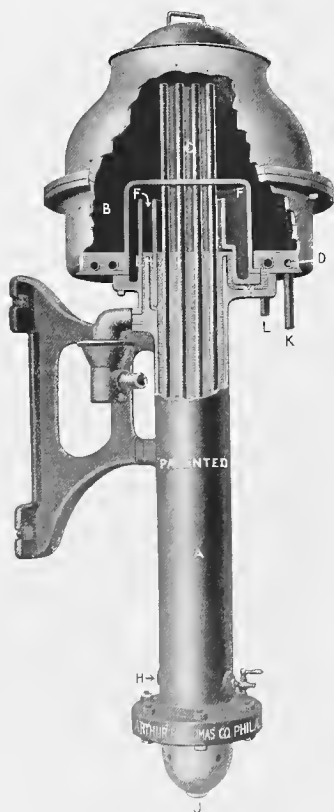


Diagram showing sectional view of the interior of the still and connections

These Stills are of the bracket type, as this arrangement offers the greatest economy of space and is more sanitary than mounting them on floor stands.

The cost of producing distilled water with the steam apparatus under ordinary conditions is one-fifth to one-quarter of a cent a gallon; this includes the cost of both the steam and water required. The quantity of raw water required to produce each gallon of distilled water depends on the temperature at which the distilled water is delivered by the Still. Under average conditions it requires about eleven gallons of raw water to produce one gallon of distilled.

As these Stills are self-contained and require only the two connections for water and steam, they can be installed at very small expense. They are shipped set up ready for connecting the steam and water.

The capacity of the steam Stills is based on having live steam of 20 to 40 pounds pressure at the Still.

By a patented construction the Stokes Automatic Still accomplishes two novel results. First—It utilizes the heat generated in the Still for preheating the incoming raw water to the boiling point. By this arrangement a very small quantity of live steam is required to operate the Still after it is once started. Secondly—By preheating the feed water before it enters the distilling chamber, ammonia and other gases, due to impurities in the raw water, are largely liberated and escape into the atmosphere through an opening in the condenser provided for this purpose. This is a very important feature, for by driving off these gases before the water enters the distilling chamber it prevents their reabsorption by the distilled water.

The Stokes Automatic Stills are made in five sizes; the smallest, No. 0 and No. 00 are heated by gas, gasoline burner or steam coil, and the other sizes; Nos. 1 to 4 are heated with live steam. The principle upon which they operate is as follows: The feed or raw water enters at (H) surrounds the condenser tubes (C) and serves first to condense the steam generated in the Still (B) as it descends the condenser tubes, converting it into distilled water; in so doing the raw water becomes heated to the boiling point by the time it reaches the top of the condenser where the ammonia and other gases escape into the air through the opening (F). A part of this feed water escapes over the goose-neck (E), either into a waste pipe or cistern, and the balance passes into the Still through the passage (M).

By referring to the illustration, it will be seen there is a zone of water at the top of the condenser, which being above the outlet or overflow (G), is not drawn off except to replenish the water in the Still as it evaporates. This zone of water at the top of the condenser is constantly kept boiling by the steam from the Still descending the condenser tubes, and it is here the ammonia and other gases are liberated. The Still is heated by live steam with a pressure of twenty pounds or over, which circulates in the copper coil (D), and serves to boil or evaporate the raw water. The distilled water comes out at (J) and can be piped to any receptacle. The condenser tubes extend to the extreme top of the steam chamber and high above the water level, so there is no danger of water being carried over by steam. The Still can be flushed for cleaning by opening a valve connecting with the drain, or by removing the copper lid on top, the interior can be easily scrubbed.

The heating coil is made of copper and will stand a steam pressure of 250 pounds. It is so arranged that it can be detached from the Still for cleaning. This is a very important feature, for scale will form rapidly on any heating surface where hard water is being distilled and unless the Still is constructed so this scale can be removed quickly the Still soon loses efficiency and ceases to operate properly.

The condenser cylinder and distilling chamber are cast iron, the latter galvanized to resist corrosion. The condenser tubes are brass, lined both inside and out with block tin. These are held with screw ferrules so the tubes can be removed if occasion should demand. The manhole cover on the top is copper, tin lined.

The manhole cover on the top is copper, tin lined.

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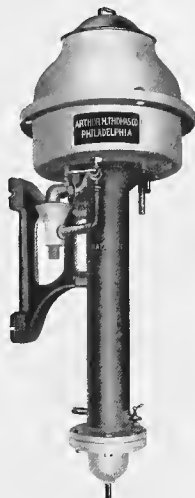
The manhole cover on the top is copper, tin lined.

The manhole cover on the top is copper, tin lined.

The manhole cover on the top is copper, tin lined.



No. 0 Still
Capacity $\frac{1}{2}$ gallon per hour



No. 2 Still
Capacity 10 gallons per hour

We guarantee these Stills to have the capacities stated above and to deliver pure water, free from any contamination. We will ship them on 30 days' approval to any one in the United States where satisfactory reference is furnished.

We supply copper tin-lined or glass-lined steel tanks for storing the distilled water in any capacity up to 1000 gallons.

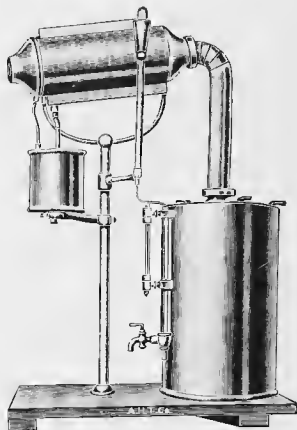
26500.	Distilling Apparatus, Stokes Automatic, Gas Heating; height 24 inches weight 35 lbs.					
	Size.....	0	00	000		
	Capacity per hour, gallons.....	$\frac{1}{2}$	1	3		
	Each.....	18.00	20.00	35.00		
26504.	Distilling Apparatus, Stokes Automatic, same as No. 00 of No. 26500 but with steam coil inside of boiling chamber, capacity 1 gallon per hour.....			25.00		
26508.	Distilling Apparatus, Stokes Automatic, same as No. 26500, equipped with 1 gallon gasoline storage tank, connecting iron piping and gasoline burner; with tank arranged to hang on the wall along side of the still. The burner for the $\frac{1}{2}$ gallon size consumes one gallon of gasoline in ten hours.					
	Capacity per hour, gallons.....		$\frac{1}{2}$	1		
	Each.....		25.00	27.00		
26512.	Distilling Apparatus, Stokes Automatic, Steam Heating.					
	Size.....	1	2	3	4	5
	Capacity per hour, gallons.....	5	10	25	60	100
	Weight, lbs.....	275	325	750	1200	1500
	Height, feet.....	3 $\frac{1}{2}$	4 $\frac{1}{2}$	7	7 $\frac{1}{2}$	7 $\frac{1}{2}$
	Each.....	100.00	150.00	250.00	450.00	600.00

Among those using STOKES AUTOMATIC WATER STILLs, are the following:

- | | |
|---|---|
| Kellogg Food Company | Texas State College of Agricultural & Mechanic Arts |
| International Crosscutting Company | University of Washington |
| Diamond Rubber Company | University of Missouri |
| Keystone Watch Case Company | Virginia Polytechnic Institute |
| Alan Wood Iron & Steel Company | Indiana State University |
| Republic Iron and Steel Company | University of Cincinnati |
| Pennsylvania Steel Company | Pennsylvania State College |
| American Can Company | Battle Creek Sanitarium |
| New Jersey Zinc Company | New York State Hospital for the Insane Matteawan |
| Pennsylvania Salt Manufacturing Company | German Hospital (Philadelphia) |
| E. I. du Pont de Nemours Powder Company | U. S. Department of Agriculture |
| Philadelphia & Reading Railway Company | U. S. War Department |

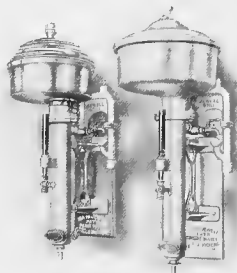


No. 26516



No. 26524

26516. Distilling Apparatus, Barnstead Automatic, Type G, for Gas Heating, yielding chemically pure distilled water without ammonia, gases, or organic impurities; substantially built of copper, nickel plated. Capacity per hour, gallons. 1 1½ 2 5 10
 Each 45.00 50.00 75.00 125.00 225.00
26520. Distilling Apparatus, Barnstead Automatic, Type E; for Electric Heating, capacity 1 gallon per hour. Current. 110 volts 220 volts
 Each 55.00 65.00
26524. Distilling Apparatus, Barnstead Automatic, Type S, for Steam Heating; of heavy copper and composition, thoroughly coated with pure block tin on all parts that come in contact with the water. Capacity per hour, gallons 2 5-7 10-15 15-20 20-25 25-30 50 75
 Each 75.00 115.00 170.00 285.00 300.00 430.00 540.00 775.00



No. 26528

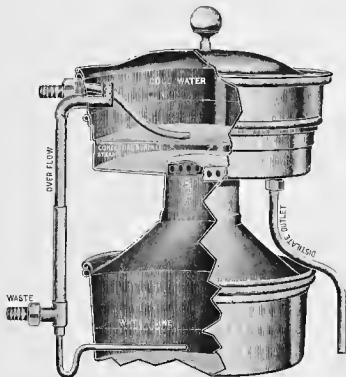


No. 26528

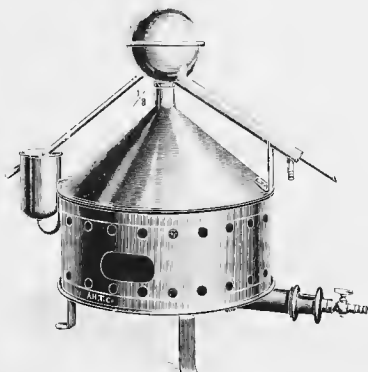


No. 26532

26528. Distilling Apparatus, Jewell, for use with gas; highly recommended for their simplicity and durability; substantially built and all parts easily accessible; boiling chamber is of iron, enamelled inside and finished outside with aluminum bronze paint; condenser of iron. Can be furnished on order with copper boiling chamber, nickel plated outside and tinned inside. Capacity per hour, gallons ½ 1 1½
 Each 25.00 15.00 65.00
26532. Distilling Apparatus, Automatic, for gas. Of cold rolled copper, lined throughout with block tin, with top of retort removable for cleaning. Capacity per hour, liters 2 4
 Each 15.00 25.00

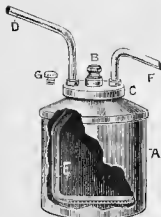


No. 26536



No. 26540

26536. Distilling Apparatus, Automatic, 11 inches in diameter by 13 inches high, made of heavy spun copper without soldered seams; capacity 2 liters per hour with a burner using 10 cu. ft. of gas per hour 15.00
 Iron Tripod, for use with above still 1.00
26540. Distilling Apparatus, Femel, Patented, capacity 5 liters per hour; delivers absolutely pure and sterile distilled water. Highly recommended and widely used in Germany.
 Duty Free 42.50 Stock 60.00



No. 26544

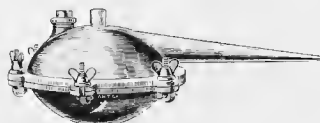


No. 26548



No. 26552

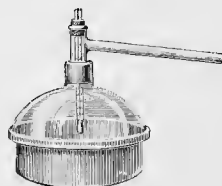
26544. Distilling Apparatus, for steam, designed for experimental distillation of heavy oils and other liquids or solids requiring agitation with high heat.
- | | | | | | |
|------------------------|-------|-------|-------|-------|-------|
| Capacity, gallons..... | 1/2 | 1 | 2 | 3 | 5 |
| Each..... | 13.75 | 24.00 | 36.00 | 42.00 | 54.00 |
26548. Distilling Apparatus, consisting of a tin-lined copper retort with zinc condenser with block tin worm, receiving funnel for cold water and outlet for hot water.
- | | | | | | |
|------------------------|-------|-------|-------|-------|-------|
| Capacity, gallons..... | 1/2 | 1 | 2 | 3 | 5 |
| Each..... | 12.00 | 14.00 | 18.00 | 23.50 | 32.00 |
- Note—For condenser only see No. 25048 and for retort only see No. 49012.
26552. Distilling Apparatus, Automatic, for making distilled water by steam heat; of heavy copper with steam coil near the bottom and provided with an automatic valve which controls the water supply; also water gauge and union for connecting with condenser No. 25048 or other form.
- | | | |
|------------------------|-------|-------|
| Capacity, gallons..... | 3 | 5 |
| Each..... | 29.25 | 32.25 |



No. 26556

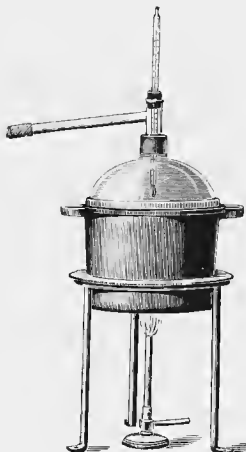


No. 26560

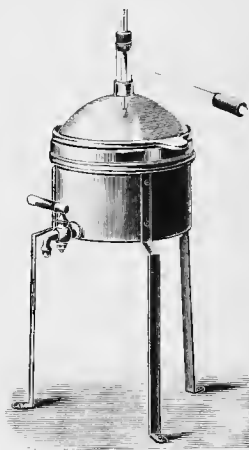


No. 26564

26556. **Distilling Apparatus**, of heavy copper, all seams brazed, intended for high temperatures; with flanges secured by six thumb screw clamps, easily taken apart for cleaning. Capacity, gallons..... 1 2 3
26560. **Distilling Apparatus, for Determination of Ammonia in Water.** The inlet tube permits the introduction of the permanganate solution into the flask after the distillation of the free ammonia; with mercury seal providing a perfect joint and easy disconnection..... 7.00
26564. **Distilling Apparatus, Vacuum**, for evaporations or distillations under diminished pressure. Consisting of a porcelain dish 160 x 80 mm, 2 liters capacity, glass dome with tabulation for thermometer and side tube, and rubber fitting between dome and porcelain dish. Without thermometer. . . 7.50

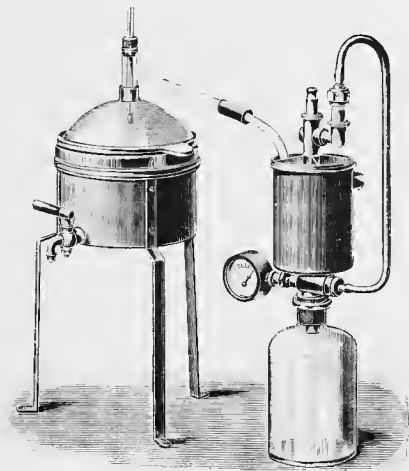


No. 26568

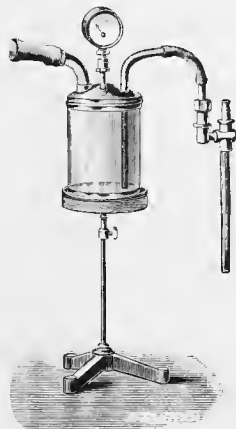


No. 26584

26568. **Distilling Apparatus, Vacuum**, with cast iron water bath, white enamelled inside, and tripod, but without burner or thermometer..... 10.00
26572. **Porcelain Dish only**, 160 x 80 mm, 2 liters capacity, for either No. 26564 or No. 26568..... 5.00
26576. **Glass Dome, only**..... 1.75
26580. **Rubber Ring, only**..... 1.00
26584. **Distilling Apparatus, Vacuum**, consisting of copper water bath with stopcock, on tripod, porcelain dish with glass dome fitted air-tight by means of gasket and glass side tube for side of dome, but without thermometer. Capacity of porcelain dish, liters 1 2
- Each 22.50 30.00

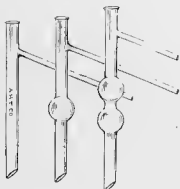


No. 26588

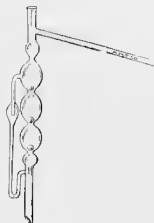


No. 26698

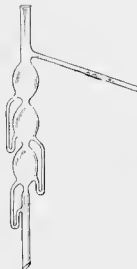
26588. Distilling Apparatus, Vacuum, same as No. 26584, arranged for distillations but with the addition of vacuum pump, condenser, gauge and glass bottle.
Capacity of porcelain dish, liters..... 1½ 2½
- | | | |
|----------------|-------|-------|
| Duty Free..... | 28.05 | 36.30 |
| Stock..... | 42.50 | 55.00 |
26592. Porcelain Dish only, with tin ring..... 7.50 10.05
- | | | |
|-----------------------------------|------|------|
| 26596. Glass Dome, only..... | 3.00 | 4.20 |
| 26600. Glass Side Tube, only..... | .45 | .60 |
| 26604. Rubber Rings, only..... | .85 | 1.40 |
26608. Glass Reservoir with metal top, with tubulations, gauge, filter pump and stand. For use with No. 26584 in place of gauge, condenser, etc., as listed under No. 26588.
- | | | |
|----------------|------|-------|
| Duty Free..... | 7.50 | 11.25 |
| Stock..... | | |



No. 26612-16-20

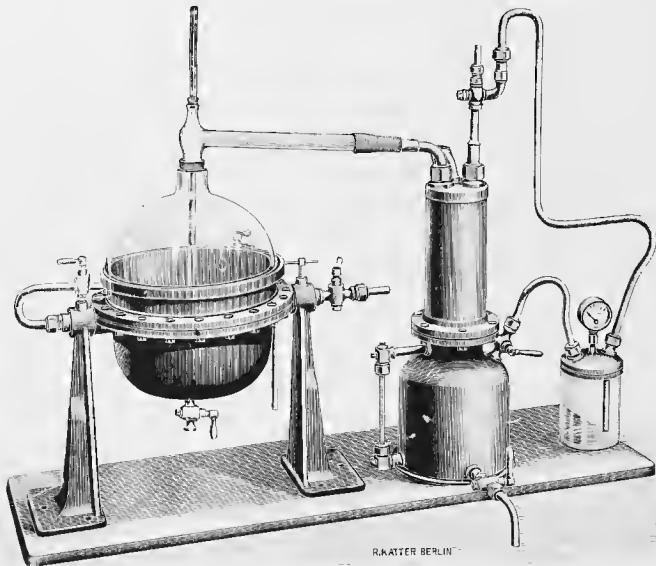


No. 26624



No. 26632

- | | | | |
|--|------|------|------|
| 26612. Distilling Tube, plain form, for fractional distillation..... | | | .15 |
| 26616. " " " with one bulb..... | | | .20 |
| 26620. " " " two bulbs..... | | | .25 |
| 36624. " " Glinisky, with glass valves..... | | | |
| Length, mm..... | 400 | 425 | 460 |
| Each..... | 1.50 | 2.00 | 2.50 |
| 26628. Distilling Tube, Le Bel-Henninger, with two bulbs..... | | | 1.00 |
| 26632. " " " " " three "..... | | | 1.25 |
| 26636. " " " " " four "..... | | | 1.80 |



No. 26640

26640. Distilling Apparatus. Vacuum, consisting of metal retort heavily tinned inside, with steam jacket and stopcock, with drip cup, stopcock for live steam connection, glass dome, copper condenser with block tin tube and filter pump, and glass overflow reservoir with metal top and pressure gauge. Very stoutly built for heavy work.

Capacity of metal pan, liters.....	7	12
Duty Free	95.70	108.90
Duty Paid	145.00	165.00

26644. Porcelain Dishes to fit inside of copper retort of No. 26640

Capacity of porcelain dish, liters.....	5	9
To fit retort, liters	7	12
Duty Free	9.10	12.90
Duty Paid	16.50	23.40

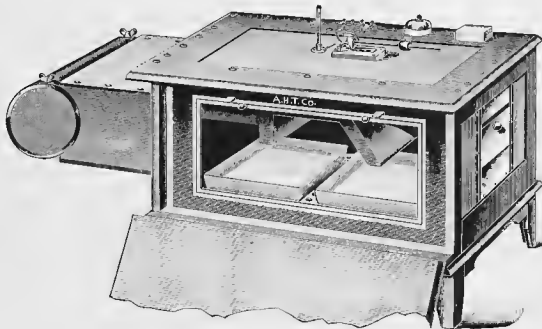
Note—Pure nickel dishes can also be fitted inside of the copper retort. Price on application.



View in Office



View in Office



No. 26648—For two trays

26648. **Drying Apparatus, Hearson**, for serums and other sensitive and easily decompose i liquids. This apparatus works without vacuum and renders possible the rapid, safe and antiseptic drying of the most delicate liquids at a low temperature. Two liters of serum can be dried in from six to eight hours which, with a large vacuum apparatus as formerly used, required at least 24 hours. The intake of air is filtered through a flannel filter and, after passing through the heating chamber, reaches the drying compartment in which are placed the trays containing the liquid to be dried. The warm air, after having become charged with moisture from the contents of the trays, passes out of the apparatus. Baffle plates insure the direct passage of the current of air over the trays. For most work a temperature of 25 to 30° C. is maintained in the warming chamber, temperature of which may be noted by reading the thermometer. The apparatus is provided for either gas or electric heating as may be specified but for most work we recommend that electric heating be used both for heating the chamber and operating the motor by means of a resistance on the same circuit which makes it impossible for the heating or the motor to operate alone. The following experiment shows the antiseptic conditions under which work may be done with this apparatus:—

Two liters of running water 1 cc were set. It grew 25 colonies of which the larger part was washed away. The running water was then divided into the four receptacles of the machine so that 500 cc was in each division. The air ventilator was operated for five hours and the ingoing air warmed with the following result:—

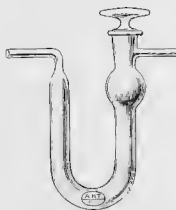
No. 1	Compartment—Water loss 180 grains—1 dead colony in 1 cc.
No. 2	“ —128 grains water evaporated—9 large dead colonies in 1 cc.
No. 3	“ —166 grains water evaporated—2 large dead and 7 living colonies in 1 cc.
No. 4	“ —123 grains water evaporated—7 large dead and 4 small colonies in 1 cc.

From this experiment it is evident that the germ number of the water by the drying process has not been increased but considerably decreased. In another test sterilized water was used and the air admitted was not warmed. In each compartment 250 cc of sterilized water dried for five hours, after which 1 cc of each tray was tested. All four tests remained free from germs.

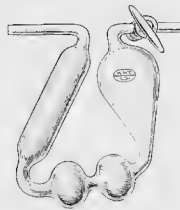
Number of trays	2	3	4
Duty Free	172.50	195.00	225.00
Duty Paid	258.75	292.50	337.50



No. 26652



No. 26656

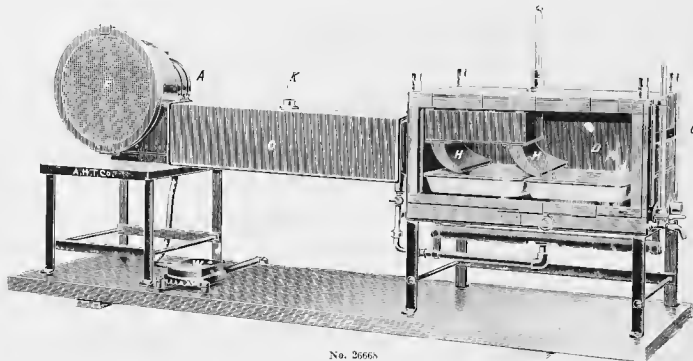


No. 26660



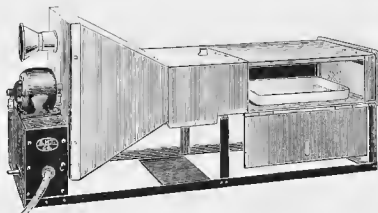
No. 26664

26652.	Drying Tubes, Liebig	.....	.30
26656.	“ “ Vanier, for zinc, being “E” of the Vanier Combustion Train p. 150.....	.....	.75
26660.	“ “ “ sulphuric acid, being “F” of the Vanier Combustion Train p. 150. ....	.....	1.25
26664.	“ “ “ Combined Potash Bulb and Drying Tube, being “G” of the Vanier Combustion Train p. 150.....	.....	3.25

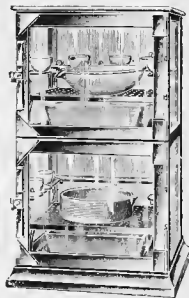


No. 2666

26668. **Drying Apparatus, Faust-Heim**, designed especially for serums and easily decomposed fluids. As furnished by us to leading manufacturers of biological products, Henry Phipps Institute of the University of Pennsylvania, etc. Illustration shows form as made for two dishes. The two larger sizes accommodate three and four dishes, respectively. For gas heating.
- | | | | |
|-----------------|--------|--------|--------|
| To take, dishes | 2 | 3 | 4 |
| Duty Free | 196.00 | 216.00 | 245.00 |
| Duty Paid | 237.60 | 261.80 | 297.00 |
26672. **Drying Apparatus Faust-Heim**, same as above but for electric heating. Price includes electric motor. Voltage must be stated in ordering.
- | | | | |
|-----------------|--------|--------|--------|
| To take, dishes | 2 | 3 | 4 |
| Duty Free | 208.75 | 236.00 | 272.25 |
| Duty Paid | 253.00 | 286.00 | 330.00 |



No. 26676

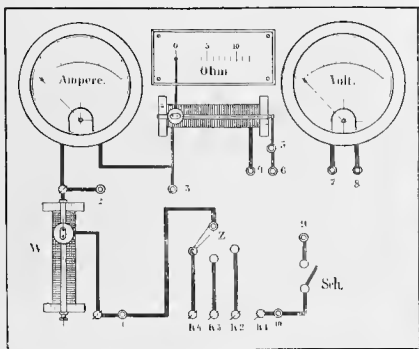


No. 26681

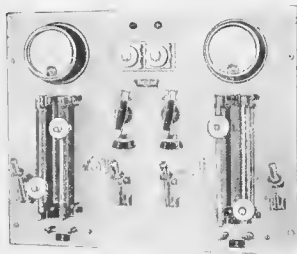


No. 26688

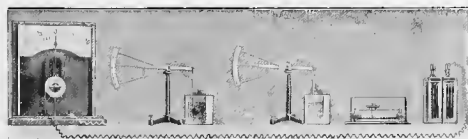
26676. **Drying Apparatus, Buxton and Beebe**, modified by Taylor, for the rapid drying, at low temperatures, of easily decomposed organic products. Of heavy polished copper with motor and burner for heating which is not shown in illustration. Price does not include dish. Voltage must be stated in ordering. \$5.00
26680. **Drying Closet**, of glass throughout, with nickel plated brass mountings. Inside dimensions 19 x 12 x 10 inches.
- | | | | |
|-----------|-------|-------|-------|
| Duty Free | 19.20 | Stock | 28.80 |
|-----------|-------|-------|-------|
26684. **Drying Closet**, same as No. 26680 but with two compartments and two handles.
- | | | | |
|-----------|-------|-------|-------|
| Duty Free | 32.00 | Stock | 48.00 |
|-----------|-------|-------|-------|
26688. **Ebulliometer, Dujardin-Salleron**, original French make, in exact accordance with the official standard of the Arts and Trades Conservatory in Paris, reading in degrees of legal alcoholometer scale and the degrees of Malligand Ebullioscope. Of polished copper with jacket around the burner, complete in case with accessories and thermometer. \$30.00
26689. **Special Thermometer**, for above \$10.00



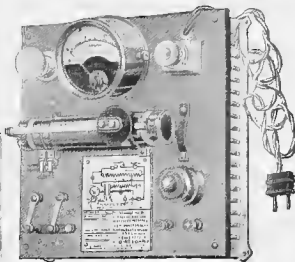
No. 26700



No. 26716



No. 26704



No. 26712

ELECTRO-CHEMISTRY APPARATUS

Storage Batteries Are Listed On Page 66

26700. **Switch Board for the Demonstration of Ohm's Law.** By means of ammeter, voltmeter and resistance connected with open connections, the operation of Ohm's law can be demonstrated to a comparatively large class, C, E and R being easily legible from the three scales, in amperes, volts and ohms. Size 75 x 60 cm.

Duty Free..... 49.50

Duty Paid..... 59.40

26704. **Apparatus for the Demonstration of Faraday's Law** and for the determination of equivalent weights, showing in a very instructive manner the separation of heavy metals from solutions of their salts, such as copper from copper sulphate, silver from silver nitrate, etc., and at the same time the equivalent deposits of the different metals with the same current. The apparatus consists of two (or more if necessary) balances of the specific gravity type with rider pointer and scale and, suspended from one arm, the platinum cathode in the electrolyte. As anode a plate of the metal to be deposited upon the cathode is usually used and electrolysis established with a current of from .1 to 2 amperes. The illustration shows two balances set up in connection with ammeter, rheostat and battery. Price includes only the balances, set of riders and Zeitschell. See *Zeitschrift für den physikalischen und chemischen Unterricht* XXV 4, page 270 and *Zeitschrift für Elektrochemie* XVII 1, page 45.

Duty Free..... 10.00

Duty Paid..... 12.00

26708. **Electrodes for above of**.....

	Silver	Copper	Nickel	Tin	Bismuth
Duty Free, when ordered with apparatus.....	1.25	.40	.50	.85	1.05
Duty Paid.....	1.45	.50	.65	1.00	1.25

26712. **Switch Board, Experimental, small universal, for currents up to 6 amperes and under 40 volts.** With precision volt-ammeter reading to 0 to 40 volts and from 0-4 amperes; regulating resistance, etc.

Duty Free..... 28.50

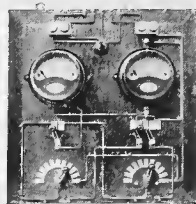
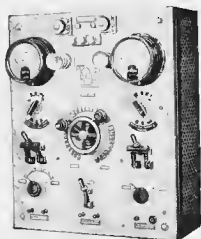
Duty Paid..... 34.20

26716. **Switch Board for Electrolytic Analysis.** This switch board permits the accurate organization and measurement of currents from 0 to 5 amperes and from 0 to 12 volts and provides connections to from 1 to 6 electrolyses. The prices given are for operation on accumulator or other low voltage circuit.

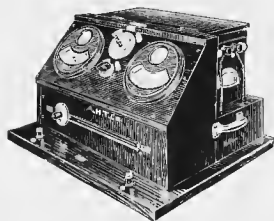
Number of electrolyses.....	1	2	4	6
Total current in amperes.....	5	10	20	30
Voltage.....	12	12	12	12
Duty Free.....	48.00	89.40	109.00	130.50
Duty Paid.....	57.60	107.00	130.75	156.60

For direct connection of above with 110 volts, extra per electrolysis ... 4.05

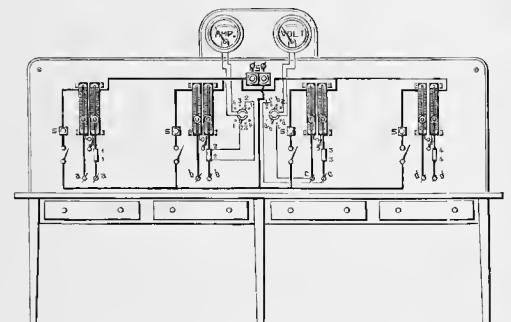
For direct connection of above with 220 volts, extra per electrolysis ... 6.00



	No. 26720 for D. C.	No. 26725 for A. C.	No. 26736
26720.	Switch Board, Experimental, Model C, for 110 volts direct current with precision milli-ammeter and voltmeter. Net weight 80 kilograms; size 85 x 70 x 30 cm.		
	Range of meters from 1 milli-ampere to, amperes.....	15	20 30
	Duty Free	110.75	112.50 118.15
	Duty Paid	132.75	135.00 141.75
26724.	Switch Board, Experimental, Model C, as above, but for 220 volts, direct current.		
	Range of meters from 1 milli-ampere to, amperes.....	15	20 30
	Duty Free	120.00	123.75 129.50
	Duty Paid	144.00	148.50 155.15
26728.	Switch Board, Experimental, Model C, as above, but for 110 volts alternating current.		
	Range of meters from 1 milli-ampere to, amperes.....	15	20 30
	Duty Free	108.75	110.75 116.25
	Duty Paid	130.50	132.75 139.50
26732.	Switch Board, Experimental, Model C, as above, but for 220 volts, alternating current.		
	Range of meters from 1 milli-ampere to, amperes.....	15	20 30
	Duty Free	118.15	121.90 127.50
	Duty Paid	141.75	146.25 153.00
26736.	Switch Board, Portable, for Quantitative Electrolysis, particularly recommended for teaching purposes because all connections are exposed, and not recommended for factory or continuous laboratory work because of the deterioration in connections due to this exposure. On heavy hardwood board arranged to either hang on the wall or stand on the work table. With precision voltmeter and ammeter reading from 0 to 10 volts and 0 to 10 amperes, respectively.		
	Duty Free	52.50	Duty Paid..... 63.00



	No. 26740	No. 26748
26740.	Switch Board, Portable, for Quantitative Electrolysis, similar to No. 26736 but with handles for convenient carrying and particularly recommended for factory and practical laboratory work because of the complete protection against dust and fumes and of the fact that the necessary accumulators may be conveniently placed inside the desk shaped cover. With precision voltmeter and ammeter reading from 0 to 10 volts and 0 to 10 amperes, respectively. With adjustable resistance, all necessary connections, etc., but without accumulators	
	Duty Free	70.00
	Duty Paid	82.80
26748.	Switch Board and Work Table, Classen, for Quantitative Electrolysis, with precision voltmeter reading from 0 to 15 volts in 0.2 volt steps and precision ammeter reading from 0 to 15 amperes in 0.2 amperes, and, in addition, both current and potential indicators with all necessary connections, resistances, etc., and connections for laboratory supply of gas, water and vacuum systems Without accumulators. Number of determinations.....	
		2 4 6
	Duty Free.....	211.25 330.00 440.00
	Duty Paid.....	256.00 400.00 532.00



No. 26752



No. 26756

26752. **Switch Board and Work Table for Quantitative Electrolytic Analysis**, for operation with direct current up to 5 amperes per electrolysis and at a voltage of 12 volts. Tables are stoutly made of well finished wood, with resistance, measuring instruments, switch, etc., on the upright switch board behind each table.

Number of electrolyses.....	2	3	4	6	8
Amperes, direct current.....	10	15	20	30	40
Duty Free	109.00	122.15	135.00	231.00	254.10
Duty Paid	130.75	146.50	162.00	277.25	305.00

26756. **Switch Board, Veit, for Quantitative Electrolytic Analysis**, with two gold plated rotating spindles, the polarity of which is reversible by means of switch; each spindle connected with six point switch, advancing the current from .05 amperes to .5 amperes, and additional switch from 1 ampere to 5 amperes. Ammeter reads from .05 to 5 amperes, with connections so that readings may be taken separately from either spindle. The container support will hold a platinum dish up to 3½ inches in diameter, with platinum contact points to insure good metallic contact when dish is used as either anode or cathode. Complete outfit is mounted on polished slate slab 31 x 18 inches supported by angle-iron braces. This switch board obviously can not be connected with an alternating current unless same is transformed by use of motor generator set..... 100.00

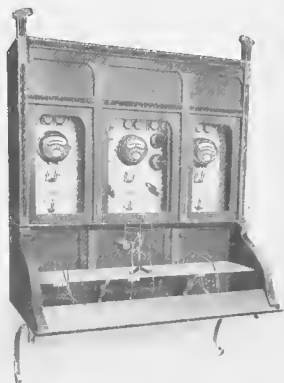
26760. **Switch Board**, same as above but with two revolving spindles..... 150.00



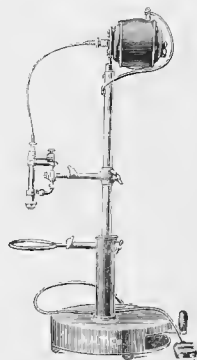
No. 26764

26764. **Electrolytic Outfit, Herman, for Quantitative Copper Analysis**, etc., with revolving anodes and cathode of platinum gauze. Assays are quickly made. Cabinets are made up of any number of units, each unit having an individual motor so that one or more units may be operated at one time. Can not be used on alternating current excepting with motor generator set. The outfit is neatly mounted in a hardwood case with a glass door, which protects the motors from the nitric acid fumes. Complete in cabinet with voltmeter and ammeter. Platinum electrodes are furnished at the market price of platinum. Approximate weight of anodes, 4.25 grams, cathodes, 9.00 grams.

Number of units.....	1	2
Each.....	100.00	120.00
Number of units....	4	6
Each.....	165.00	220.00



No. 2676b



No. 2677c

- 2676b. **Switch Board, Nissenson, for Quantitative Electrolysis, closet form.** Cabinet is made of polished oak with three counterpoised glass doors (in the outfit for 6 determinations) and two shelves covered with glass plates; each compartment is furnished with precision ammeter and voltmeter, necessary control switches, resistances, etc. Without accumulators.

Number of determinations.....	6	8	10
Duty Free	528.00	660.00	792.00
Duty Paid	640.00	800.00	960.00

- 2677c. **Electrolytic Support, Fischer, for use with any of the switch-boards or work table outfits previously listed.** With motor and electrode holder for all kinds of electrodes and stirring devices, with regulating rheostat in the base. Current, volts..... 110 d. c. a. c. and 220 d. c.

Duty Free	46.25	51.25
Duty Paid	56.00	62.00



No. 2677b



No. 2678d



No. 26784



No. 26785



No. 26792

- 2677b. **Electrolytic Support, Fischer, simplified 1912 model** Current, volts 110 d. c. a. c. and 220 d. c.

Duty Free	30.00	34.65
Duty Paid	36.00	42.00

- 2678d. **Electrolytic Support, Fischer-Fresenius, for electrolysis without rotation as in elementary electro-chemistry;** with double electrode holders and thermometer holder. 5.00

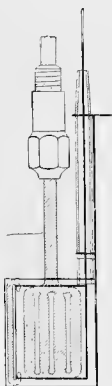
26784. **Electrolytic Support, with japanned iron base, glass upright with ring with three platinum lugs and one clamp, and binding post attached to both ring and clamp.**..... 5.00

26788. **Electrolytic Support, same as No. 26784 with two clamps with binding posts.**..... 4.75

26792. " " with glass upright carrying clamp and separate glass upright carrying ring. . . 5.00



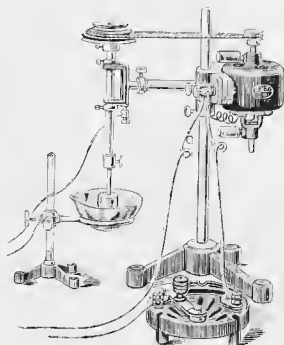
No. 26816



No. 26800 with 26816

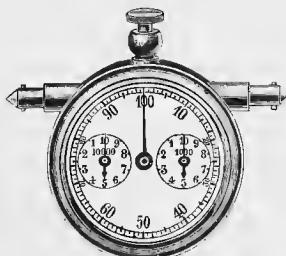


No. 26796

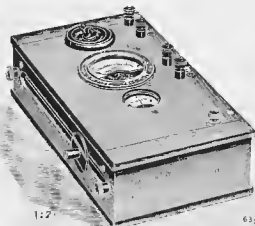


No. 26820

26796. Electrolytic Support, Peters, adjustable as to height and with extension clamp.
 Duty Free..... 6.00 Duty Paid..... 11.00
26800. Glass Stirrer, for Electrolysis, Fischer. Illustration of No 26772 shows the stirrer attached to the rotating head of the support and in connection with the double net electrode..... 1.50
26808. Connecting Cords for electrolytic support, covered with red and blue silk, respectively, to show polarity, 80 cm long, per pair..... 1.50
26816. Double Net Electrode, Pure Nickel, Fischer..... 10.00
 Note:—For Platinum Electrodes see Platinum Ware.
26820. Electric Stirrer and Rotating Anode Apparatus, consisting of motor which can be furnished for either alternating or direct current, 110 or 220 volts; adjustable arm for holding the anode or stirring rod with suitable attachment for electrolysis current and rheostat for regulating speed from 50 to 1000 revolutions per minute. Recommended for depositing metals in quantitative analysis. Price does not include crucible anode or dish shown in illustration, nor electrolytic stand with glass upright. Please specify voltage and current in ordering..... 25.00



No. 26824

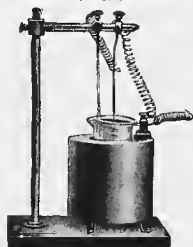


No. 26832

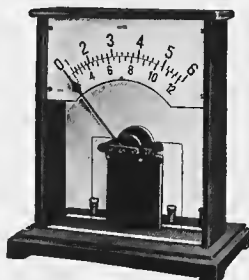
26824. Speed Counter, Fischer, for conveniently determining the speed of the stirring device..... 7.00
26832. Potentiometer (Compensation Apparatus), Fischer; a quick and convenient measurement and check of cathode potentials when determining and separating metals by means of electrolysis. The instrument consists of a rectangular walnut case with a convenient and handy arrangement of the following:—
 A moving coil voltmeter for 0-2.5 volts with divisions of 0.05 volts; a moving coil galvanometer with pointer and scale divided 10-0-10, sensitiveness $1^\circ = 0.000004$ amperes; a current switch for the auxiliary battery; a key; a sliding resistance and four terminals with suitable connections for battery and electrolysis. The sliding resistance is readily removable for cleaning. See A. Fischer, *Elektroanalytische Schnellmethoden* Enke, Stuttgart 1908 and A. Fischer, *Chemiker-Zeitung* (Cöthen 1909, No. 37, p. 337.
 Duty Free..... 55.50 Duty Paid..... 66.60



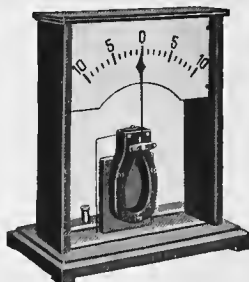
No. 26848



No. 26836



No. 26840



No. 26844

26836. **Apparatus for Rapid Electrolysis in a Magnetic Field**, consisting of a solenoid of insulated copper wire, inside of which is an iron cylinder to strengthen the magnetic field, the entire being covered by an iron mantle which serves to protect the winding and, at the same time, concentrate the lines of force. Connections are provided permitting the use of the same circuit for exciting the solenoid and conducting the electrolysis. The apparatus is intended for a 16 volt direct current circuit but may be conveniently used on regular lighting circuits of 110 or 220 volts direct current with additional resistances. Without electrodes..... 21.00

GALVANOMETERS, DEMONSTRATION, designed primarily for lecture table use, with transparent scale graduated on both front and rear so that same is visible to the audience as well as to operator. With case and base of polished mahogany, with glass both front and back. These instruments are convenient for use as Galvanoscopes, i. e., for the indication of the presence and polarity of electric currents, or as Galvanometers as the angle of deflection is proportional to the strength of the current. They are made in two systems, i. e., the electromagnetic or soft iron system with air damping device, and the moving coil or Deprez d'Arsonval system. With the set of resistances and shunts they can be used as volt and ammeters reading from 0 to 250 volts and from 0 to 50 amperes and, in addition, they are offered below in both systems with special scales graduated in both volts and amperes.

	Duty Free	Duty Paid
26840. Galvanometer, Demonstration, with soft iron (electromagnetic) system, as above described.....	13.50	16.25
26844. Galvanometer, Demonstration, with moving coil (Deprez d'Arsonval) system, as above described.....	15.00	18.00
26848. Set of Four Resistances and Three Shunts on Baseboard, for use with above Galvanometers. Can be connected singly with the instruments for measuring voltage from 0 to 1, 0 to 10, 0 to 100 and 0 to 250 volts and current from 0 to 1, 0 to 10 and 0 to 50 amperes.....	12.00	14.40

DEMONSTRATION VOLT AND AMPERE-METERS. These consist of the above Galvanometers with special scales reading directly in volts and amperes as indicated.

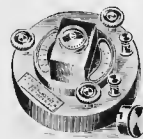
26852. Demonstration Ampere-Meter, with soft iron (electromagnetic) system, for either direct or alternating current, 1 to 60 amperes.....	15.00	18.00
26856. Demonstration Voltmeter, as above, 4 to 100 volts.....	15.00	18.00
26860. " " " " 100 to 250 volts.....	18.00	21.60
26864. " Combined Volt and Ampere-Meter, as above, with scale 0 to 12 volts and 0 to 6 amperes.....	19.50	23.40
Note:—Please state in ordering whether instrument is to be used on direct or alternating current.		
26868. Demonstration Ampere-Meter, with moving coil (Deprez d'Arsonval) system, for direct current only, 0 to 50 amperes.....	16.50	19.80
26872. Demonstration Voltmeter, as above, 0 to 500 volts.....	16.50	19.80
26876. Demonstration Universal Galvanometer, scale 2-0-2 milliamperes, 100-0-100 millivolts, with resistances by which the range is increased to 10 milliamperes, 100 ohms and 1 volt.....	21.00	25.20
26880. Separate Shunts, for above, from 100 millivolts to 50 amperes, each.....	3.60	4.35



No. 26896



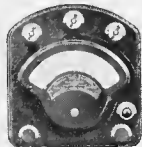
Nos. 26903 to 26910 Showing Various Scales



No. 26900



Nos. 26908 to 26910 Showing Various Scales

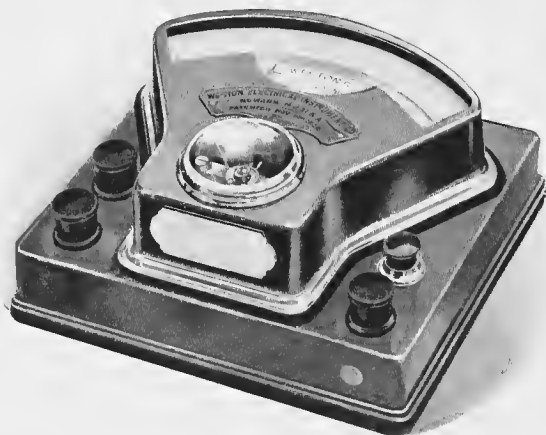


26896. Galvanoscope, for Wheatstone Bridge measurements, determination of E. M. F. by means of the compensation method, etc., internal resistance 6 ohms, sensibility .02 milliamperes = 1° of scale; diameter 100 mm, height 50 mm..... 8.25
26900. Galvanoscope, Paschen, with internal resistance of 10 ohms, sensibility of .002 milli-ampere = 1° of scale, and with an internal resistance of 6 ohms and a sensibility of .0002 milliampere = 1° of scale. In an iron case for magnetic protection. Sensibility must be specified in ordering.
 Duty Free..... 12.75 Duty Paid..... 15.30
26904. Galvanoscope, as above, in brass case.
 Duty Free..... 16.35 Duty Paid..... 19.65

WESTON MINIATURE PRECISION DIRECT CURRENT AMMETERS, VOLTMETERS AND VOLT-AMMETERS, Model 280. These instruments embody all the well known advantages of the Weston instruments being absolutely dead heat and extremely sensitive and so designed that they may be left continuously in circuit under full load without overheating or causing an appreciable change in the indications. The separate voltmeters have a resistance of about 100 ohms per volt while the volt-ammeters have a resistance of approximately 50 ohms per volt. The cases are made of sheet steel finished in dead black and the dimensions are 4.6 x 4.4 x 1.5 inches and any of the instruments may be carried in an ordinary coat pocket. A great variety of ranges is offered, i. e., the voltmeters from 50 milli-volts to 150 volts, and the ammeters from 50 milli-amperes to 30 amperes. They are admirably adapted to all kinds of commercial and experimental testing falling within their limits of e. m. f. and current and are very adaptable for individual students use in laboratory work. Particular attention is called to the double and triple scale instruments and the volt-ammeters. The triple range volt-ammeter is in reality six instruments in one case, since there are three current ranges and three e. m. f. ranges. Range must be specified in ordering.

26908.	Single Range Milli-Voltmeters.								
	Milli-volts.....	50	75	100	130	150	200		
	Each.....	12.50	12.50	12.50	12.50	12.50	12.50		
	Milli-volts.....	250	300	400	500	600	750		
	Each.....	12.50	12.50	12.50	12.50	12.50	12.50		
26912.	Single Range Voltmeters.								
	Volts.....	1	2	3	5	7.5	10	15	
	Each.....	12.50	12.50	12.50	12.50	12.50	12.50	12.50	
	Volts.....	25	40	50	75	100	120	150	
	Each.....	12.50	12.50	12.50	12.50	12.50	12.50	12.50	
26916.	Double Range Voltmeters.								
	Volts. 20-2	20-8	25-2.5	30-3	50-2.5	50-5	80-8	100-10	150-15
	Each.. 14.50	14.50	14.50	14.50	14.50	14.50	14.50	14.50	14.50
26920.	Triple Range Voltmeters.								
	Volts.....	25-10-2.5	30-3-1.5	30-6-3	30-15-3	40-20-4	50-5-2.5		
	Each.....	16.50	16.50	16.50	16.50	16.50	16.50		
	Volts.....	50-25-5	50-25-10	80-20-4	100-25-2.5	150-15-1.5	150-15-3		
	Each.....	16.50	16.50	16.50	16.50	16.50	16.50		

26924.	Single Range Mil-Ammeters.									
	Milli-amperes		50	75	100	120	150	200		
	Each		12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
	Milli-amperes		250	300	400	500	600	750		
	Each		12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
26928.	Single Range Ammeters.									
	Amperes	1	2	3	5	7.5	10	15	25	30
	Each	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
26932.	Double Range Ammeters.									
	Amperes	1-0 1	2.5-0 25	5-0 1 5-0 5	8-2	10-1 15-1 5	20-2 25-2 5	25-5	30-3	
	Each	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
26936.	Triple Range Ammeters.									
	Amperes	5-2 5-0.25	10-1-0 1	10-1 0 5	10-1-0.5	10-2 5-1	15-3-0.15	20-4-2	20-8-2	
	Each	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
	Amperes	25-2.5-0.5	25-5-2.5	25-10-2.5	25-10-5	30-3-1.5	30-6-3	30-15-3	15-3-1.5	
	Each	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
26940.	Single Range Volt-Ammeters.									
	Volts					1.5	3	3	3	3
	Amperes					3	1.5	3	3	15
	Each					19.00	19.00	19.00	19.00	19.00



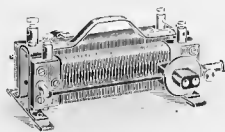
No. 26944

WESTON STANDARD PORTABLE DIRECT CURRENT VOLTMETERS AND AMMETERS. The illustration used shows the general type of the instruments and form of mounting, etc., for all of the Voltmeters, Ammeters, Mil-Ammeters and Milli-Voltmeters listed below.

26944.	Portable Voltmeters.									
	Range, volts	150	150	150-5	150-3	150-15	300-150	300	450	600
	Division volts	1	1	1- $\frac{1}{2}$	1- $\frac{1}{3}$	1- $\frac{1}{10}$	2-1	2	3	5
	Each	55.00	37.50	75.00	75.00	75.00	77.50	65.00	65.00	65.00
26948.	Portable Milli-Voltmeters.									
	Range, milli-volts	0 to 20		10 to 0 to 10		10 to 0 to 10 and		0 to 20 and		
	Divisions	100		100		100 to 0 to 100		0 to 200		
	Each	50.00		50.00		55.00		55.00		
26952.	Portable Mil-Ammeters.									
	Range, mil-amperes	150	300	600	1000	1500	500 and 50	500 and 10		
	Divisions, mil-amperes	1	2	4	10	10	5- $\frac{1}{2}$	5- $\frac{1}{10}$		
	Each	50.00	50.00	50.00	50.00	50.00	60.00	60.00		
26956.	Portable Ammeters.									
	Range, amperes					5	15	25	50	100
	Division, amperes					$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{4}$	$\frac{1}{2}$	1
	Each					65.00	65.00	65.00	65.00	70.00



Slate Rheostat, Type F



Universal Rheostat, Type U

Rheostats, Ruhstrat, Simple Form of Slate, Type F, on aluminum feet, with holes for screwing to table, and prismatic contact.

No.	Amperes	Ohms	Size, mm	Duty Free	Duty Paid	No.	Amperes	Ohms	Size, mm	Duty Free	Duty Paid
26960.	0 3	250	120 x 30 x 15	3.15	3.80	27040.	4 0	60	450 x 60 x 35	9.40	11.30
26964.	"	400	160 x 40 x 15	3.75	4.50	27044.	7 0	1.7	120 x 30 x 15	3.25	3.90
26968.	"	650	200 x 50 x 20	5.45	6.55	27048.	"	3	160 x 40 x 15	3.80	4.55
26972.	"	1200	300 x 50 x 25	6.10	7.25	27052.	"	5	200 x 50 x 20	5.70	6.85
26976.	"	1700	400 x 50 x 25	8.20	9.80	27056.	"	8	300 x 50 x 25	6.75	8.00
26980.	"	2400	450 x 60 x 35	9.40	11.30	27060.	"	16	450 x 60 x 35	9.75	11.70
26984.	0 6	140	160 x 40 x 15	3.75	4.50	27064.	10 0	.85	120 x 30 x 15	3.40	4.05
26988.	1 0	55	120 x 30 x 15	3.15	3.80	27068.	"	1 5	160 x 40 x 15	3.90	4.70
26992.	"	150	200 x 50 x 20	5.45	6.55	27072.	"	2 5	200 x 50 x 20	6.00	7.20
26996.	"	300	300 x 50 x 25	6.10	7.25	27076.	"	4	300 x 50 x 25	7.05	8.45
27000.	"	440	400 x 50 x 25	8.20	9.80	27080.	"	6	400 x 50 x 25	9.10	10.90
27004.	"	550	450 x 60 x 35	9.40	11.30	27084.	"	8.5	450 x 60 x 35	10.15	12.20
27008.	2 0	14	120 x 30 x 15	3.15	3.80	27088.	15 0	3	400 x 50 x 25	9.10	10.90
27012.	"	24	160 x 40 x 15	3.75	4.50	27092.	20 0	2.4	120 x 30 x 15	3.40	4.05
27016.	"	35	200 x 50 x 20	5.45	6.55	27096.	"	0.4	160 x 40 x 15	3.90	4.70
27020.	"	70	300 x 50 x 25	6.10	7.25	27100.	"	0 5	200 x 50 x 20	6.00	7.20
27024.	"	105	400 x 50 x 25	8.20	9.80	27104.	"	1	300 x 50 x 25	7.05	8.45
27028.	"	130	450 x 60 x 35	9.40	11.30	27108.	"	1 6	400 x 50 x 25	9.10	10.90
27032.	4 0	6	120 x 30 x 15	3.15	3.80	27112.	"	2.5	450 x 60 x 35	10.15	12.20
27036.	"	10	160 x 40 x 15	3.75	4.50						

To prices given above add the following for extras as indicated, if desired.

For Rheostats

Size, mm	Extra for slate with ohm divisions		Extra for winding with wire of increasing diameter		Extra for Ruhstrat cross winding	
	Duty Free	Duty Paid	Duty Free	Duty Paid	Duty Free	Duty Paid
120 x 30 x 15	.85	1.00	.55	.65	.75	.90
60 x 40 x 15	.85	1.00	.55	.65	.75	.90
200 x 50 x 20	.85	1.00	.55	.65	1.05	1.30
300 x 50 x 25	.85	1.00	.55	.65	1.05	1.30
400 x 50 x 25	.85	1.00	.85	1.00	1.50	1.80
450 x 60 x 35	.85	1.00	.85	1.00	1.50	1.80

Rheostats, Ruhstrat, Universal Form of Slate, Type U, consisting of two resistances mounted side by side on aluminum feet. The two resistances may be operated independently, in series, or in parallel, each being provided with separate contact slide. This form of Rheostat lends itself to a great variety of experimental purposes.

No.	Amperes	Ohms	Size, mm	Duty Free	Duty Paid	No.	Amperes	Ohms	Size, mm	Duty Free	Duty Paid
27116.	7 } 20 } 5	200 x 50 x 20	11.50	13.75	27148.	1 } 4 } 150	200 x 50 x 20	11.00	13.20		
27120.	" } 5 } 1					27152.				" } 28 } 300	300 x 50 x 25	12.00	14.40
27124.	" } 13 } 1.6	400 x 50 x 25	14.70	17.65	27156.	" } 40 } 440	400 x 50 x 25	14.35	17.25		
27128.	" } 16 } 2.5				450 x 60 x 35	16.75				20.00	27160.	" } 50 } 550	450 x 60 x 35	16.00	19.20
27132.	1.5 } 7 } 65	200 x 50 x 20	11.25	13.50			27164.	0.3 } 1.5 } 60	200 x 50 x 20		11.00	13.20
27136.	" } 120 } 5				300 x 50 x 25	12.60	15.00	27168.		" } 120 } 1200			300 x 50 x 25	12.00	14.40
27140.	" } 18 } 170	400 x 50 x 25	14.70	17.65				27172.	" } 170 } 1700	400 x 50 x 25	14.35	17.25
27144.	" } 250 } 16				450 x 60 x 35	16.75	20.00	27176.	" } 250 } 2400				450 x 60 x 35	16.00	19.20

To prices given above add the following for extras as indicated, if desired.

Size, mm	Extra for scale with ohm divisions		Extra for winding with wire of increasing diameter		Extra for Ruhstrat cross winding	
	Duty Free	Duty Paid	Duty Free	Duty Paid	Duty Free	Duty Paid
200 x 50 x 20	.45	.55	.45	.55	.75	.90
300 x 50 x 25	.45	.55	.45	.55	1.05	1.30
400 x 50 x 25	.75	.90	.75	.90	1.35	1.65
450 x 60 x 35	.75	.90	.75	.90	1.65	2.00



Metallic Tube Rheostat. Type F



Universal Tube Rheostat. Type U

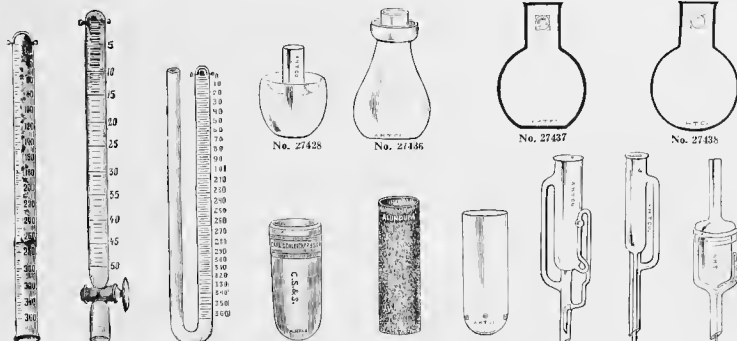
Rheostats, Ruhstrat, Metallic Tube Form, Type F, on foot, consisting of thin walled metal tubes thoroughly insulated with enamel and wound with resistance wire of a special alloy which is so well insulated by means of a microscopically designed oxide deposited on the surface as to permit the wire to lie in contact.

No.	Amp-eres	Ohms	Length, mm	Diam., mm	Duty Free	Duty Paid	No.	Amp-eres	Ohms	Length, mm	Diam., mm	Duty Free	Duty Paid
27180.	0.3	700	150	30	2.65	3.15	27280.	3 3	42	300	50	5.05	6.05
27184.	"	1000	200	30	3.00	3.60	27284.	"	60	400	50	5.70	6.85
27188.	"	1400	200	40	3.45	4.15	27288.	"	90	500	60	7.60	9.10
27192.	"	2300	300	40	4.20	5.05	27292.	5 0	5	150	30	3.00	3.50
27196.	"	2600	300	50	5.05	6.05	27296.	"	7.5	200	30	3.30	4.00
27200.	"	3600	400	50	5.70	6.85	27300.	"	11	200	40	3.75	4.50
27204.	"	5500	500	60	7.60	9.10	27304.	"	18	300	40	4.65	5.60
27208.	1.0	150	150	30	2.65	3.15	27308.	"	20	300	50	5.25	6.30
27212.	"	225	200	30	3.00	3.60	27312.	"	28	400	50	6.10	7.30
27216.	"	270	200	40	3.45	4.15	27316.	"	45	500	60	8.00	9.50
27220.	"	450	300	40	4.20	5.05	27320.	12 0	1	150	30	3.00	3.50
27224.	"	500	300	50	5.05	6.05	27324.	"	1.5	200	30	3.30	4.00
27228.	"	710	400	50	5.70	6.85	27328.	"	1.8	200	40	3.75	4.50
27232.	"	1130	500	60	7.60	9.10	27332.	"	3	300	40	4.65	5.60
27236.	2.0	25	150	30	2.65	3.15	27336.	"	3.2	300	50	5.25	6.30
27240.	"	38	200	30	3.00	3.60	27340.	"	4.4	400	50	6.10	7.30
27244.	"	50	200	40	3.45	4.15	27344.	"	7.8	500	60	8.00	9.50
27248.	"	85	300	40	4.20	5.05	27348.	20 0	0.25	150	30	3.00	3.50
27252.	"	100	300	50	5.05	6.05	27352.	"	0.4	200	30	3.30	4.00
27256.	"	140	400	50	5.70	6.85	27356.	"	0.45	200	40	3.75	4.50
27260.	"	220	500	60	7.60	9.10	27360.	"	0.75	300	40	4.65	5.60
27264.	3.3	10	150	30	2.65	3.15	27364.	"	0.8	300	50	5.25	6.30
27268.	"	15	200	30	3.00	3.60	27368.	"	1.1	400	50	6.10	7.30
27272.	"	20	200	40	3.45	4.15	27372.	"	1.9	500	60	8.00	9.50
27276.	"	35	300	40	4.20	5.05							

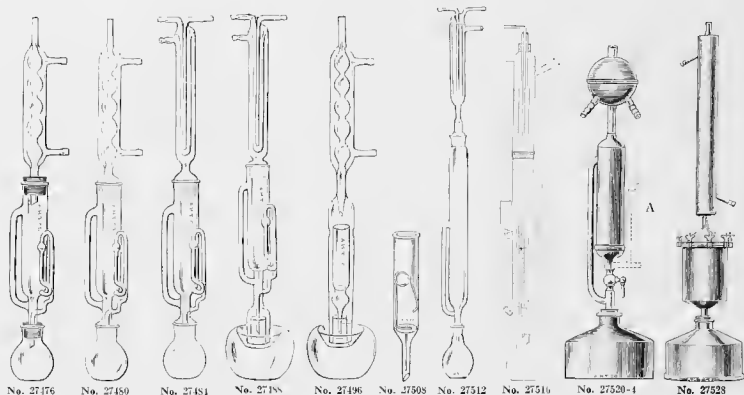
Size		Extra per tube for wire of increasing diameter		Extra for rotary drive with screw		Extra for perforated metal cover		Extra for scale graduated in 100 parts	
Length, mm	Diameter, mm	Duty Free	Duty Paid	Duty Free	Duty Paid	Duty Free	Duty Paid	Duty Free	Duty Paid
150	30	.55	.65	2.05	2.45	.85	1.00	.55	.65
200	30	.55	.65	2.10	2.50	.90	1.10	.55	.65
200	40	.55	.65	2.25	2.70	1.05	1.30	.55	.65
300	40	.60	.75	2.55	3.10	1.15	1.35	.55	.65
300	50	.60	.75	2.55	3.10	1.30	1.50	.55	.65
400	50	.70	.80	2.85	3.45	1.45	1.75	.55	.65
500	60	.85	1.00	3.15	3.80	1.65	2.00	.55	.65

Rheostats, Ruhstrat, Universal Metallic Tube Form, Type U, on feet, consisting of two metal tubes as in Tube Form Type F, but with two independent contacts permitting the use of the resistances either separately in series or in parallel. A new and useful form in laboratory work. Price twice those quoted above for Tube Form, Type F.

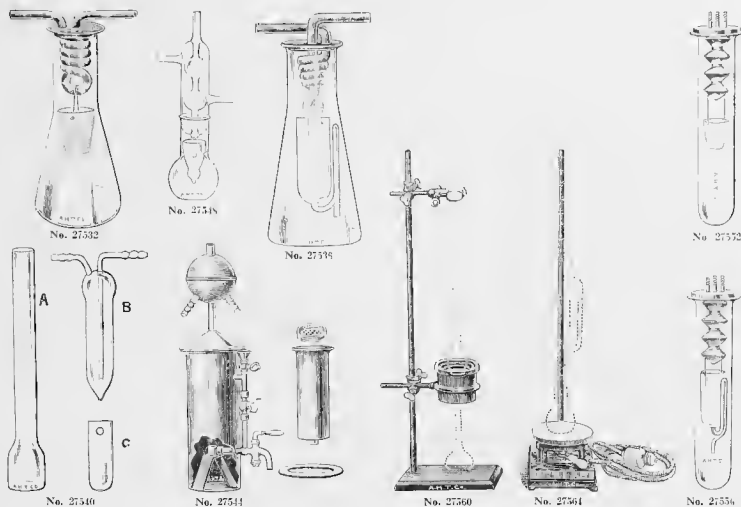
Note—In ordering Rheostats please specify carefully current capacity, resistance, and size desired.



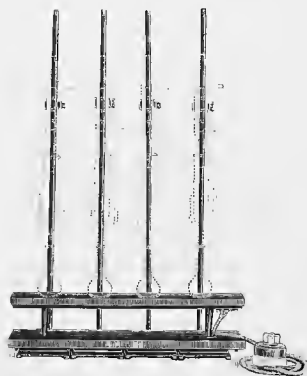
No.	Description	No. 27412	No. 27430	No. 27421	No. 27440	No. 27436	No. 27428	No. 27437	No. 27435	No. 27452	No. 27456	No. 27464	No. 27468
27400.	Emery Cloth, in sheets 9 x 11 inches, fine, medium or coarse. Per dozen sheets												.70
27408.	" Paper " 9 x 11 " " " Per dozen sheets												.30
27412.	Eudiometers, Bunsen, with platinum electrodes. Graduated, cc.									50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths		3.00
	Each									2.50			3.00
27416.	Eudiometers, Bunsen, graduated in millimeters. Graduated to mm.											300	500
	Each											2.00	2.50
27420.	Eudiometers, Mitscherlich, with glass stopcock and platinum electrodes. Graduated, cc.									50 cc in $\frac{1}{10}$ ths	100 cc in $\frac{1}{10}$ ths		
	Each									3.50	4.25		
27424.	Eudiometers, Ure, with platinum electrodes. Graduated, cc.									50 cc in $\frac{5}{16}$ ths	100 cc in $\frac{1}{2}$ cc		
	Each									2.00	2.50		
27428.	Extraction Flask, Knorr, for mercury seal; capacity 100 cc.												.40
27432.	" " with two holes in the neck to provide for the return flow of ether.												.50
27436.	" " Sy, with trough for mercury seal, with large neck to facilitate cleaning.									100	150	200	250
	Each									.50	.65	.75	.85
27437.	Flask, Extraction, New Jena Glass, flat bottom with wide neck and vial mouth. Capacity, cc.	50	100	150	250	500	750	1000					
	Each	.12	.13	.14	.19	.29	.37	.44					
27438.	Flask, Extraction, New Jena Glass, round bottom with wide neck and vial mouth. Capacity, cc.	50	100	150	250	500							
	Each	.12	.13	.14	.19	.29	.37	.44					
27440.	Extraction Thimbles Schleicher & Schüll's No. 603; seamless and made from the best material, it is absolutely impossible for any particles of the substances undergoing extraction to find their way into the ether. The ether itself flows readily from the shells.												
	Diameter, mm.	19	22	26	25	28	30	33	33	33	33	33	48
	Height, mm.	90	80	60	80	80	80	80	80	94	118	123	
	Per box of 25	1.65	1.65	1.65	1.85	1.60	1.85	1.85	2.30	3.30	3.70		
27444.	Extraction Thimbles, Schleicher & Schüll's New Double, exactly same as above but of double thickness.												
	Diameter, mm.									25	33	43	
	Height, mm.									80	80	123	
	Per box of 25									3.70	3.70	7.40	
27448.	Extraction Thimbles, Alundum. For the extraction of soaps, fats, foods, rubber, etc., by both organic and inorganic solvents, these thimbles offer the advantage of being rapid, practically indestructible and readily cleansed by ignition.												
	Diameter, mm.				32	35	26	25	30	19	34	32	45
	Height, mm.				51	55	60	70	80	90	100	127	127
	Each				.40	.50	.40	.40	.45	.50	.60	.75	1.00
27452.	Extraction Thimbles, Glass, round bottom, with perforations. Diameter, mm.	25	33	43									
	Height, mm.		80	80									
	Each		.35	.50									.75
27456.	Extraction Tubes, Soxhlet. The sizes of thimbles given are for convenience in ordering only as other thimbles may be used in each extraction tube. Inside diameter, mm.	30	38	50									
	Capacity to top of syphon, cc.	70	100	200									
	Height of syphon tube, mm.	90	112	120									
	Suitable for S. & S. thimbles, mm.	28 x 80	33 x 118	43 x 123									
	Each		1.20	1.60	2.30								
27460.	Extraction Tube, shape as above but of dimensions required by the Southern Cotton Oil Co.												1.20
27464.	Extraction Tube, Smalley, for cotton seed oil work.												1.30
27468.	Extraction Tube, Lehmann, with ground in top, for the extraction of bulky substances.												4.00



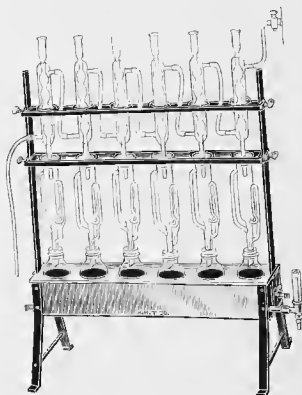
27476. **Extraction Apparatus, Soxhlet**, complete with flask and condenser. Consisting of bulb condenser, Soxhlet extraction tube No. 27456, and wide mouth Jena extraction flask fitted with specially selected fine grain cork stoppers.
 Inside diameter of Soxhlet Tube, mm. 30 3S 50
 Each 3.25 3.50 4.50
27480. **Extraction Apparatus, Soxhlet**, same as No. 27476 but with ground joints instead of cork stoppers. Each apparatus is furnished with three Jena glass flasks ground to fit extraction tube.
 Inside diameter of Soxhlet tube, mm. 30 3S 50
 Each 4.50 5.00 6.00
27484. **Extraction Apparatus, Soxhlet**, same as No. 27480, i. e., with ground joints throughout, but with Hopkins Condenser in place of bulb condenser. With three Jena extraction Flasks ground to fit.
 Inside diameter of Soxhlet tube, mm. 30 3S 50
 Each 5.00 5.50 6.50
27488. **Extraction Apparatus**, consisting of Soxhlet tube 3S mm inside diameter, Hopkins condenser and Knorr flask; 100 cc, for mercury seal. The joint between the condenser and extraction tube is ground air-tight. 6.00
27492. **Extraction Apparatus**, exactly same as No. 27488 but with Sy Flask for mercury seal. 6.00
27496. " " **Knorr**, complete with condenser, extraction tube with perforated platinum disc and Knorr flask. See *U. S. Department of Agriculture, Bureau of Chemistry, Circular No. 69, Walter & Goodrich "Improvements in the Knorr Fat Extraction Apparatus"* 6.50
27500. **Extra Condenser** with adapter sealed on. 3.60
27504. " **Extraction Tube**, with platinum disc. 3.00
27508. " **Tube**, improved form with nickel disc and wire spring. 1.20
- Note**—If Knorr flasks are desired with two $\frac{1}{4}$ inch holes in neck for return of flow of ether, an extra price of 10¢ per flask is charged.
27512. **Extraction Apparatus, Ringer**, with Hopkins condenser. An extraction apparatus well suited for continuous extractions from liquid media. The ether as it condenses in the condenser drips down into a central tube which permits of its escape through small openings at its bottom. The ether then, because of its gravity, rises to the surface of the medium to be extracted. This apparatus is well adapted for the extraction of β -oxybutyric acid from diabetic urine. As used in the Laboratory of Physiological Chemistry, Medical Department, University of Pennsylvania. All joints ground air-tight. Inside diameter of extraction tube 3S mm, length of extraction tube 37 cm. Complete with three flasks ground to fit. 8.00
27516. **Extraction Apparatus, Friedrichs**, for continuous liquid extractions. Complete with counter current condenser and three flasks, with all joints ground air-tight. The condensed ether from the condenser drops into the funnel tube of the extractor and reaches the bottom through the screw-cylinder. It then ascends and the new drops enter the liquid to be extracted. When the ether layer reaches the lower tube the excess runs back into the flask and the process goes on. By means of the stopcock funnel and the lower stop-cock, liquid may be introduced or drawn off without interrupting the operation. See *Zeitschrift für anal. Chemie, 1911* 15.00
27520. **Extraction Apparatus, Teas**, as used in tanning laboratories; extractor, flask and reflux condenser are of heavy copper, the flask being of 1 quart capacity. Original form without side tube A. 17.40
27524. **Extraction Apparatus, Teas**, as above with side tube A for flooding contents of extraction. 18.00
27528. **Extraction Apparatus, Yocum**, as used in tanning laboratories. The extractor and flask are of heavy polished copper, the latter of 1 liter capacity. The condenser is of brass ground in. 21.00



27532. **Extraction Apparatus, Cottle**, frequently referred to as the Underwriter's Laboratories form. See November *Journal of Industrial and Engineering Chemistry, 1912*; consisting of a metallic spiral reflux condenser supporting a porcelain Gooch crucible by means of platinum or aluminum wire. All contained in a specially designed, long neck Erlenmeyer flask, the whole apparatus being only 6 inches high and 3 inches wide. Specially recommended for use in testing rubber compounds as used on wires and cords. 2.50
27536. **Extraction Apparatus, for Rubber Analysis**, as recommended by the Joint Rubber Insulation Committee. See *Journal of Industrial and Engineering Chemistry, January, 1914*. This apparatus is in general like the preceding form but with a syphon cup for holding the paper extraction thimble instead of a Gooch crucible as used in the Cottle form. In addition, all of the dimensions are slightly different, being in exact accordance with the specifications of the Committee above referred to. 2.50
27540. **Extraction Apparatus**, as used in the Food Laboratories, Bureau of Chemistry, U. S. Department of Agriculture. Parts are supplied separately at the prices given or the complete outfit at the total of the three prices.
 A—Cylinder, 20 $\frac{1}{2}$ inches long, 2 inches in diameter, except at its lower or sealed end, which is enlarged to diameter of 3 inches for a length of 4 inches. 1.50
 B—Condenser, 1 $\frac{1}{2}$ inches in diameter, except at its upper end which is enlarged to a bulb 2 $\frac{1}{2}$ inches in diameter, to permit its suspension in "A". 1.50
 C—Thimbles, 6 inches long and $\frac{1}{2}$ inches in diameter, perforated $\frac{1}{2}$ inch from top with two $\frac{1}{2}$ inch holes placed opposite each other, capacity 100 cc, with straight upper rim.50
27544. **Extraction Apparatus, Reed**, as used for bark and wood extracts, etc.; in use in many tanning laboratories. Of polished copper, with polished condenser. Complete as shown in illustration. 18.00
27548. **Extraction Apparatus, Thora**, with ground joint condenser.
 Height, mm. 180 210
 Diameter, mm. 30 40
 Each 2.40 4.00
27552. **Extraction Apparatus, Wiley**, with metallic condenser and top and with porcelain Gooch crucible. No stoppers are required and the arrangement permits double weighing of both residue and extracted matter. 5.00
27556. **Extraction Apparatus, Wiley-Richardson**, a simple form, recommended where much work is done on fats, oils, gums and resins, combining the simplicity and efficiency of the original Wiley apparatus with the maceration and percolation method of washing as in the regular Soxhlet apparatus. Complete with glass syphon cup as shown in illustration but without extraction thimbles. 5.00
27560. **Support and Gas Heating Apparatus for Extraction Apparatus**, consisting of extra large support, ring 95 mm. clamp, cast iron water bath, 120 mm, without burner or glassware. 2.50
27564. **Support and Electric Heating Apparatus for Extraction Apparatus**, consisting of large support, clamp and electric heater for three heats, 115 mm, the latter being set into the base of the support. These supports may be arranged in banks of three, six, twelve, etc., and form a convenient and satisfactory method of conducting extractions as each extractor may be operated at a given heat independently of the others. For either 110 or 220 volts. Voltage must be stated in ordering. 7.00

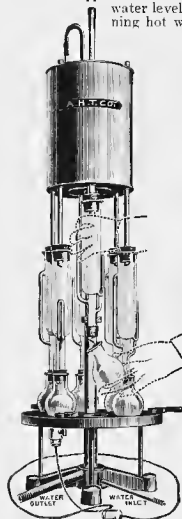


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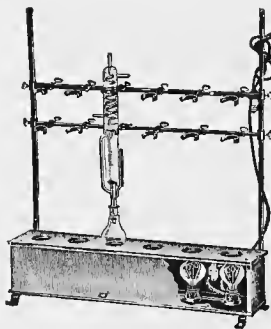


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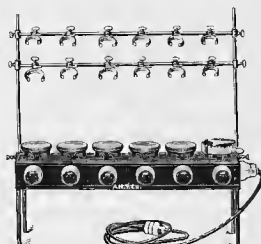
27568. Support and Electric Heating Apparatus for Four Extractions, consisting of 4 supports, 4 clamps and electric hot plate, without glassware. A convenient arrangement as the hot plate is not permanently attached to the bases of the supports and may be used for other work as well, as may also the supports. 15.40
27572. Support and Heating Apparatus for Six Extractions, consisting of rectangular copper water bath, with water level, and special upright supports for six extractors. Can be heated either by gas or running hot water. Without glassware or burner. 24.00



No. 27581

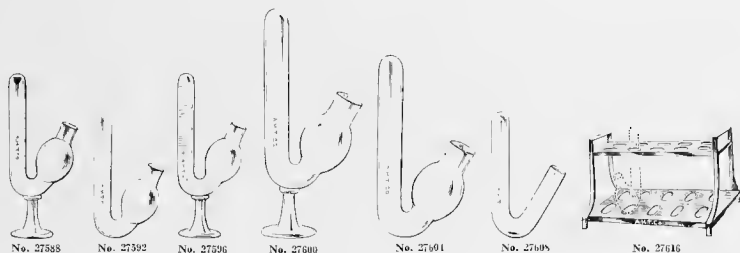


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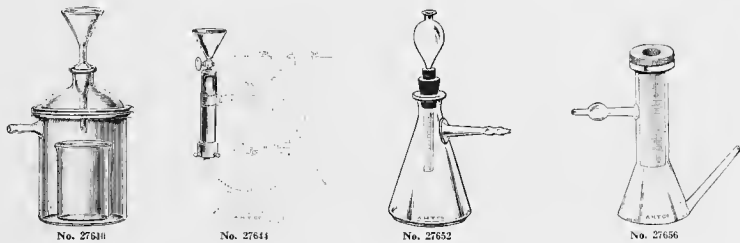


No. 27580

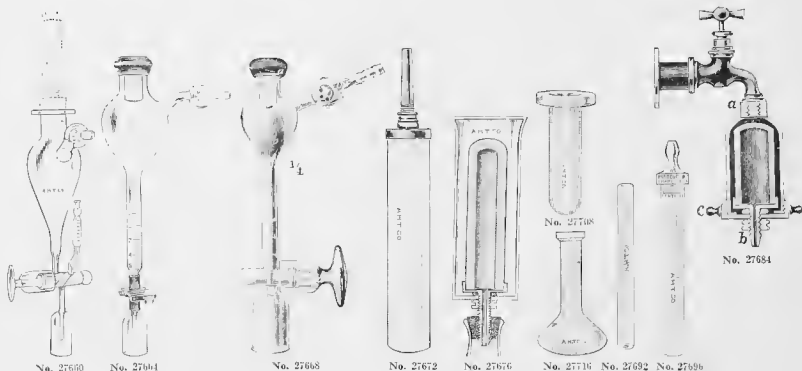
27576. Support and Electric Heater for Six Extractions, for heating by electric lamps. Box support is made of asbestos wood, with holes over the lamps used for heating. With iron uprights and adjustable metal rods with six clamps each. State voltage in ordering. Without glassware. 30.00
27580. Support with Electric Heaters for Six Extractions, similar to above but with electric hot plates with individual switches and support. The base is of sheet iron, 9 inches high, 5 1/2 inches wide and 24 inches long. State voltage in ordering. 55.00
27584. Revolving Support and Electric Heating Apparatus for Extraction Apparatus with copper condenser. The tank of the condenser is adjustable in height so that extractors of different sizes may be used. The temperature of the hot plate is high enough to volatilize solvents of the highest boiling point generally used in fat extractions. Where different temperatures are required small discs of asbestos may be inserted under the flasks. Very economical of space and of current. For either 110 or 220 volts. Voltage must be stated in ordering. 35.00



27588.	Fermentation Tubes, for bacteriological work, small size; height of vertical tube 100 mm, outside diameter of tube 12 to 13 mm; with long tubulation for plugging and bulb carefully made to hold entire contents of vertical tube; on glass foot, ungraduated.....	.25
27592.	Fermentation Tube, same size and shape as No. 27588 but without glass foot.....	.15
27596.	" " same size and shape as No. 27588 with glass foot and tube graduated in cubic centimeters.....	.50
27600.	Fermentation Tube, American Public Health Association standard. See "Standard Methods for the Examination of Water and Sewage." Inside diameter of upright tube 15 mm, length of vertical tube 140 mm, diameter of bulb 38 mm, on glass foot.....	.35
27604.	Fermentation Tube, same as No. 27600, but without glass foot.....	.20
27608.	" " without bulb, so-called "fish hook" form; height of vertical tube 100 mm, outside diameter of tube 12 to 13 mm.....	.10
27612.	Fermentation Tube, Smith, without foot, designed primarily for the cultivation of anaerobes, in exact accordance with the specifications given us by the author; carefully made as to all dimensions and as to the angle between the vertical tube and the bulb; in appearance similar to No. 27604.....	.30
27616.	Fermentation Tube Support, of copper; for 10 tubes without foot, of the usual size.....	2.50
27620.	Figures, of steel, for stamping steel, iron, billon, etc. In sets of 9. Face, inches.....	$\frac{1}{2}$
	Per set of nine.....	1.00
27624.	Files, flat, best quality. Length, inches.....	$\frac{1}{2}$
	Each.....	1.25
	..... 3 4 5 6 7 8	.10 .12 .15 .15 .18 .20
27628.	Files, round (Rat tail), best quality. Length, inches.....	4 5 6 8
	Each.....	.10 .12 .15 .20
27632.	Files, triangular, best quality. Length, inches.....	3 4 5 6 8
	Each.....	.08 .10 .12 .15 .20
27636.	File Handle, best quality.....	.05



27640.	Filtering Apparatus, Witt, with ground in funnel and ground on glass cover with side tubulation for filtering into beaker, or other receptacle, under diminished pressure. Price does not include beaker. The main body of the jar is 16 cm high by 12 cm in diameter and ground in funnel in 9 cm in diameter.....	4.50
27644.	Filter Apparatus, Martin, for filtering toxins or for filling bulbs with sterile liquid by means of a filter or other suction pump. Consisting of Pasteur-Chamberland cylinder in special metal mounting with funnel and stopcock. All parts are demountable, permitting sterilization in the autoclave. Without stand, clamps or glass bulb these being indicated in illustration to show arrangement only.....	12.60
27648.	Filter Apparatus, Martin, complete with suitable support and clamps.....	14.00
27652.	Filter Apparatus, Kitasato, consisting of 1000 cc flask, filter cylinder with bulb and rubber stopper.....	2.50
27656.	Filter Apparatus, Reichel, improved form, for separating the bacteria in fluid cultures from their various products. Complete with special flask of about 150 cc capacity, filter cylinder and rubber and asbestos rings.....	2.75

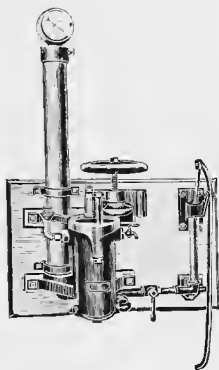


27660. **Filter Apparatus, Uhlenhuth and Weidanz**, for filtering serums, etc., for immediate delivery into ampoules without exposure. With measuring tube on the side for measuring doses up to 2 cc. May be used with Berkefeld filter and glass mantle as indicated in illustration, but filter cylinder and glass mantle with rubber stopper are not included in the price. It may also be used with Maassen cylinder No. 27708 by means of asbestos ring and rubber cap 6.00
27661. **Filter Apparatus**, similar to above but with Silberschmidt filter held in place by rubber band with Maassen cylinder No. 27708 by means of asbestos ring and rubber cap 4.50
27668. **Filter Apparatus**, same as 27664 with glass stopcock, but without filter cylinder 6.00
27672. **Filters, Berkefeld**, cylinders only with metallic head-pieces. As widely used in all laboratory work in the filtration of toxines and the preparation of sterile liquids of all sorts. These filters are furnished in three degrees of fineness:—

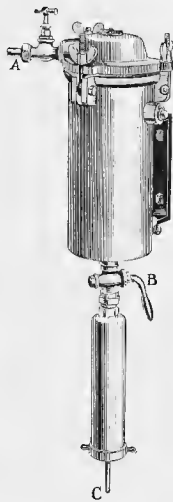
“W” = very fine or slow filtering.
 “N” = normal or medium filtering.
 “V” = coarse or rapid filtering.

Unless other specifications are given, the “N,” or normal, filters are supplied on all orders.

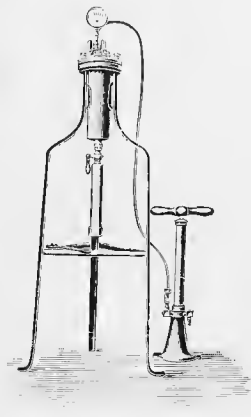
	Number.....	1	2	13	3	5	6
	Size, inches.....	10 x 2	8 x 1	5 x 1	2½ x 1	1½ x ¾	¾ x ½
	Each.....	3.50	3.00	2.50	1.25	1.15	1.00
27676.	Filters, Berkefeld , as above but with glass mantle with circular opening in bottom into which metal head-piece is clamped.						
	Number.....	1	2	13	3	5	6
	Each.....	5.25	4.25	3.75	2.00	1.65	1.50
27680.	Glass Mantles , only, for Berkefeld Filters, such as are included with the cylinder in No. 27676.						
	Number.....	1	2	3	5	7	
	Size, inches.....	14 x 4	11 x 2½	4 x 1	2½ x 1	1½ x 1¼	
	Each.....	1.75	1.25	.75	.50	.50	
27684.	Filters, Berkefeld, Household . Can be screwed to any ½ inch bibb faucet. In nickel plated mount with filter cylinder 6½ x 2½ inches.....						4.00
27688.	Extra Filter Cylinder , only.....						1.50
27692.	Filter Cylinder , of unglazed porcelain, 200 x 17 mm, outside dimensions. As used in Katasato and similar filters.....						.20
27696.	Filter Cylinder, Pasteur-Chamberland, Bougie “B.” i. e., fine and suitable only for use with pressure, original French make, with glazed flange and nipple, 200 mm long by 25 mm diameter.....						1.25
27700.	Filter Cylinder, Pasteur-Chamberland, Bougie “F.” i. e., of coarser texture and suitable for ordinary filtrations; same size and shape as above.....						1.25
27701.	Filter Cylinder, Berkefeld , of same shape as Pasteur Chamberland, i. e., with glazed flange and nipple; may be used interchangeably with these in the pressure apparatus.....						3.00
27708.	Filter Cylinder, Maassen , of unglazed German porcelain with glazed flange at top, for use by the Maassen, Reichel or Silberschmidt method, i. e., with asbestos ring between the flange and the top of the filter flask; 130 mm long by 35 mm diameter.....						1.25
27712.	Filter Cylinders, Berkefeld , of the same shape and for the same purpose as above.						
	Length, inches.....	5½			2½	1½	
	Diameter, inches.....	1½			¾	¾	
	Each.....	2.50			1.25	1.10	
27716.	Filter Balloon, Pukal , of unglazed Royal Berlin porcelain.						
	Capacity, cc.....	50	140	500	1000		
	Each.....	.65	1.60	1.75	3.00		



No. 2720



No. 27724



No. 27728

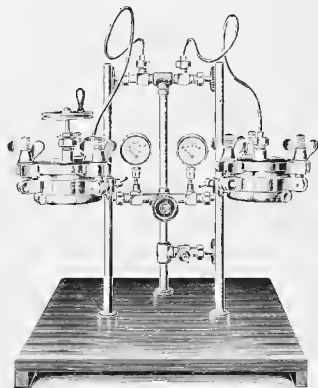
27720. **Filter Apparatus for Pressure, Hill**, for the use of hydraulic pressure. By this method the material to be filtered is separated from the pressure medium by a soft rubber membrane. This avoids foaming and also permits the use of water instead of air pressure. City water service will usually furnish 40 lbs. per square inch, which is about three times the pressure of a vacuum filter. The force pump supplied increases this to 300 lbs. per square inch. At the left top of the chamber is a block tin funnel and tube, through which the liquid is introduced to the filter. To this tube inside the chamber a flexible rubber tube connects the soft rubber filter bag. Within this bag is placed the Berkefeld, or similar, bougie, the nozzle of which fits through a bushing at the bottom of the filter chamber and delivers the filtered liquid below. The side funnel tube of tin is soldered into a brass nut, which, together with the tube, is readily removable for sterilization. There is a rubber washer at the base of this nut and a screw stopper in the funnel to prevent back flow under pressure. When filled the screw plug is inserted in the funnel and the contents of the bag may be subjected to the required pressure. The three-way cock enables one to admit water to the chamber, to close the chamber from the service pipe, leaving it under pressure, and to drain the chamber. The vertical pipe with pressure gauge at the top is an air pressure storage chamber and is for the purpose of keeping a fairly uniform pressure without continuous pumping. There is a vent cap at the top. This should be kept tightly closed. If it leaks, air will be gradually forced out and the chamber will be kept filled with water. In that case its usefulness would be temporarily impaired and, moreover, a single stroke of the pump would then raise the pressure beyond a safe point. Complete with one 8 x 1 inch Berkefeld cylinder and 1 liter rubber bag..... 92.00

27721. **Extra Rubber Bag**, 1 liter capacity..... 1.50
 27722. " " " 150 cc capacity..... 1.35

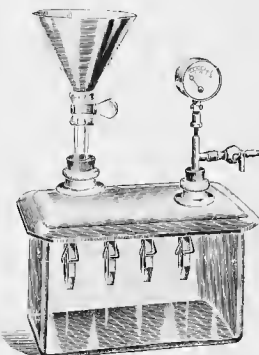
27724. **Filter Apparatus**, for filtering toxins by means of pressure. As supplied by us to the Antitoxin Laboratories of the Philadelphia Board of Health. Consisting of a cast iron bowl, enameled inside, 20 inches deep and 6 inches in diameter, with air-tight cover held down by four wing nuts, and with pressure cock attached and bracket for fastening on wall. Attached below is a detachable, nickel plated metal cylinder with a ground in stopper, carrying a Berkefeld cylinder 10 x 2 inches. Price includes the Berkefeld cylinder..... 50.00

27728. **Filter Apparatus for Pressure, Chamberland-Pasteur**. Original French make, with manometer, pressure pump and Pasteur-Chamberland cylinder.
 Duty Free..... 45.00 Stock..... 60.00

27732. **Filter Bags**, of felt.
 Capacity, quarts..... 1 2 4
 Size, inches..... 8½ x 8 9½ x 10 12 x 13½
 Each..... .50 .70 1.25



No. 27736



No. 27736

27736. **Ultrafiltration Apparatus, Bechhold**, as used in the Kgl. Institut für Experiment. Therapie, Frankfurt. a. M., consisting of a double filtration apparatus, one with stirrer and one with glass trough, with ground-on lid, separatory funnel, manometer and twelve clamps, but without the ultrafilter discs.

Duty Free..... \$0.00 Duty Paid..... 115.00

27740. **Ultrafilter Discs, Bechhold**, for use in the above apparatus, as used for filtering and separating colloids and crystalloids, albumenoids, albumoses, ferments, soaps, etc., as well as for testing beer, milk, etc. In Physiological Chemistry it is most useful in the examination of animal fluids such as urine, serous liquid, blood, etc., and in Bacteriology during the examination of the products of bacterial growth (toxins and antitoxins); while in Pharmacology, filtration of decoctions and extracts is facilitated by its use. The permeability of the ultrafilter to various colloids depends on its density, i.e., to the percentage content of nitrocellulose in the acid colloidium impregnating the filter, i.e., the higher the percentage the denser the filter. A $4\frac{1}{2}\%$ ultrafilter will, generally, prevent the passage of haemoglobin from a 1% solution. Small variations in either direction can not be completely avoided. Each filter is sent out between perforated parchment paper immersed in water to which a little chloroform has been added to prevent the growth of micro-organisms and the whole contained in an aluminum case sealed by a rubber ring, as after a filter becomes dry it is useless. The filters are impregnated in vacuo with acetic acid colloidium and are supplied under the designations of $\frac{1}{2}\%$, 3, $4\frac{1}{2}\%$, 6 and $7\frac{1}{2}\%$, according to the content of nitrocellulose in the colloidium. The filters are 90 mm in diameter.

Designation..... $\frac{1}{2}\%$ 3% $4\frac{1}{2}\%$ 6% $7\frac{1}{2}\%$
Duty Paid, per case of 1090 1.20 1.40 1.75 2.00

References.

Kolloidstudien mit der Filtrationsmethode (Ultrafiltration) von H. Bechhold, Zeitschrift für physikalische Chemie, LX, 3, 1907.
Die Gallertfiltration (Ultrafiltration) von H. Bechhold, Zeitschrift für Chemie und Industrie der Kolloide, Bd. II, Heft 1 und 2
Ultrafiltration von H. Bechhold, Biochemische Zeitschrift 6, Heft 5 und 6.
Ultrafiltration und Ultrafilter von Prof. Dr. E. Bertarelli, Zentralblatt für Bakteriologie 42, Nr. 22 und 23.
Ultrafiltration von T. I. I. Buijdenijk, Chemisch Weekblad 1910, Nr. 20.
Die Trennung von Emulsionen durch Filtration und Ultrafiltration von E. Hantschek, Zeitschrift für Chemie und Industrie der Kolloide, Bd. VI, Heft 5.
Versuche zur Aufklärung des zellfreien Gärungsprozesses mit Hilfe der Ultrafilter von A. v. Leden, Biochemische Zeitschrift 20, Heft 1 und 2
Conférence donnée au 1er Congrès intern. de Brasserie le 25.7. 1910 par M. H. Van Laer.
Pulsierende Ultrafiltration von H. Bechhold, Van Bemmelen Festschrift 430-433.
Funktion der Niereinglomeruli und Ultrafiltration von Burion, Pfleger's Archiv, d. Physiol. 136, 741-760.

27744. **Filter Discs, Alundum**. These discs can be advantageously used to replace perforated porcelain plates in many operations, obviating the necessity of preparing an asbestos mat. They are easily cleaned by reverse washing and ignition, permitting of their repeated use. They are supplied in two degrees of porosity RA 225 Medium and RA 98 Porous, which must be specified in ordering. Edges are moulded to a 60° bevel to fit funnels.

Diameter, inches.....	$\frac{1}{2}$	1	2	3	4	5	6	7	8
Thickness, inches.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Each .....	.25	.25	.35	.50	.75	1.00	1.25	1.50	1.75



No. 2774b



No. 27752



No. 27756

27748. **Filter Cones, Alundum.** These may be used in any 60° funnel by stretching a wide band of rubber tubing over the funnel. They have a large filtering area and can be thoroughly washed from all soluble salts and are recommended for the filtration of gelatinous and slow filtering solutions. They may be cleansed by reverse washing, reduced to a constant weight by ignition and used repeatedly. They are furnished in three degrees of porosity, RA 320 dense, RA 321 medium and RA 322 porous. Please specify porosity in ordering. Each cone is supplied with wire stand as shown in illustration.

Diameter, inches.....	1½	2½	4½
Capacity, cc.....	20	50	100
Each.....	.30	.35	.50

27749. **Rubber Gaskets** for use with any of the above..... .05

27752. **Filter Dish, Alundum.** Will fit into the top of any 60° funnel and affords a rapid means of filtering large amounts by suction. Well adapted to organic work. Supplied in three degrees of porosity, RA 84, RA 360 and RA 98. Diameter 5½ inches, capacity 400 cc..... 1.50

27753. **Rubber Gasket** for use with above Dish..... .50

27756. **Filter Paper, White, A. H. T. Co. Special.** This paper is offered for qualitative work and general manufacturing purposes, as being unequalled in strength, uniformity of texture and clear and rapid filtering. We have supplied this paper in large quantities to leading college and university laboratories throughout the U. S., for use in qualitative chemistry.

Diameter, mm.....	75	90	100	110	125	150	180
Price per 100.....	.10	.11	.12	.14	.15	.20	.26
Diameter, mm.....	200	250	330	380	450	500	600
Per 100.....	.33	.46	.70	.86	1.20	1.50	2.00

27760. **Filter Paper, White, A. H. T. Co. Special.** Same as above, in sheets 480 x 480 mm. Per 100..... 1.36

27764. **Filter Paper, Gray, A. H. T. Co.** Very tough and durable. Especially designed for pharmaceutical and manufacturing purposes.

Diameter, mm.....	100	125	150	180	200	250	330	380	450	500	600
Per 100.....	.11	.14	.18	.24	.28	.40	.60	.76	1.10	1.40	1.80

27768. **Filter Paper, Gray, A. H. T. Co.** Same as above, in sheets 500 x 500 mm. Per 100..... 1.25

27772. **Filter Paper, Baker & Adamson,** washed in hydrochloric acid, very rapid filtering, all soluble salts removed ("single washed.")

Diameter, mm.....	55	70	90	110	125	150
Per 100.....	.15	.30	.45	.55	.60	.85

27776. **Filter Paper, Baker & Adamson, "A" Quality,** thin paper, very rapid filtering, for general analytical works very low ash.

Diameter, mm.....	55	70	90	110	125	150
Ash in each paper.....	.00001	.00002	.00003	.00005	.000065	.000093
Per 100.....	.40	.50	.65	.80	1.00	1.20

27780. **Filter Paper, Baker & Adamson, "B" Quality,** dense paper for filtering Barium Sulphate, Calcium Oxalate, and other troublesome precipitates, also rapid filtering.

Diameter, mm.....	55	70	90	110	125	150
Ash in each paper.....	.00006	.00012	.00018	.0003	.0004	.0005
Per 100.....	.40	.50	.65	.80	1.00	1.20

27784. **Filter Paper, Munkitell, No. 00.** For special scientific work—washed in hydrofluoric and hydrochloric acids. Cut in round filters, 100 filters in a package, five packages in a box of birch bark.

Diameter, mm.....	55	70	90	110	125	150
Ashes, gram.....	0.000011	0.000018	0.000030	0.000045	0.000058	0.000083
Per 100.....	.50	.55	.80	1.00	1.10	1.25

27788. **Filter Paper, Munkitell, No. 0.** Washed with hydrochloric acid, removing traces of iron, alumina, lime, etc. The ash is reduced to a minimum, and a high standard of purity is secured. A uniform and quick filter, retaining fine precipitates, adapted to the most precise requirements of analytical work. Cut in round filters, 100 filters in a package, five packages in a box of birch bark.

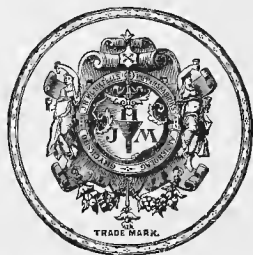
Diameter mm.....	55	70	90	110	125	150	185
Ashes, gram.....	0.000060	0.00010	0.00017	0.00025	0.00033	0.00046	0.00070
Per 100.....	.20	.27	.42	.55	.63	.85	1.25



No. 27788



No. 27812



No. 27796

27792. Filter Paper, Munktell, No. 0. Same as above in sheets 480 x 480 mm. Per quire 2.50
27796. Filter Paper, Munktell, No. 1F. The Original Swedish Paper. Of best linen material, by some claimed to be the most perfect filtering paper made; leaves one-third less ash than formerly, probably the smallest amount of any of unwashed paper. Cut in round filters, 100 filters in a package, five packages in a box of birch bark.
- | | | | | | | | |
|--------------|--------|--------|--------|--------|--------|--------|--------|
| Diameter mm. | 55 | 70 | 90 | 110 | 125 | 150 | 185 |
| Ashes, gram. | 0.0014 | 0.0023 | 0.0038 | 0.0056 | 0.0073 | 0.0105 | 0.0161 |
| Per 100 | .11 | .16 | .25 | .30 | .40 | .50 | .75 |
27800. Filter Paper, Munktell, No. 1F. Same as above in sheets 480 x 480 mm. Per quire 1.20
27804. Filter Paper, Munktell, No. 2. A pure white linen paper of medium thickness, not as closely made, therefore more rapid in filtration. A superior paper for all laboratory work.
- | | | | | | | | |
|--------------|--------|--------|--------|--------|--------|--------|--------|
| Diameter mm. | 55 | 70 | 90 | 110 | 125 | 150 | 185 |
| Ashes, gram | 0.0018 | 0.0030 | 0.0051 | 0.0074 | 0.0095 | 0.0138 | 0.0209 |
| Per 100 | .10 | .13 | .20 | .26 | .31 | .40 | .53 |
27808. Filter Paper, Munktell, No. 2. Same as above in sheets 480 x 480 mm Per quire 1.00



No. 27820



No. 27848

27812. Filter Paper, C. S. & S. No. 595. A good light paper, free of chlorine and tasteless, made of the best material. A filter of 15 cm diameter filters 100 cubic cm of water in 50 to 80 seconds.
- | | | | | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Diameter mm. | 55 | 70 | 90 | 110 | 125 | 150 | 185 | 240 | 270 | 320 | 385 |
| Per 100 | .10 | .11 | .16 | .18 | .20 | .28 | .34 | .65 | .85 | 1.05 | 1.25 |
27816. Filter Paper, C. S. & S. No. 595. Same as above in sheets 470 x 540 mm. Per 100 2.20
27820. Filter Paper, C. S. & S. No. 597. A stouter paper than the foregoing, perfectly white and clean, filters very quickly (100 cubic cm of water pass through a plain filter of 15 cm diam. in 80 to 100 seconds). A standard paper for analytical purposes.
- | | | | | | | |
|--------------|-----|-----|------|------|------|------|
| Diameter mm. | 55 | 70 | 90 | 110 | 125 | 150 |
| Per 100 | .15 | .16 | .22 | .28 | .30 | .38 |
| Diameter mm. | 185 | 240 | 270 | 320 | 385 | 500 |
| Per 100 | .48 | .75 | 1.00 | 1.20 | 1.55 | 2.60 |
27824. Filter Paper, C. S. & S. No. 597. Same as above in sheets 580 x 580 mm. Per 100 4.20
27828. Filter Paper, C. S. & S. No. 571, fat extracted for milk analysis. See *M. A. Adams' "Analyst"* 1885, p. 46. In strips 56 x 65 mm. Per 50 strips 1.75
27832. Filter Paper, C. S. & S. No. 604, soft. This paper is similar to No. 597 but has the additional advantage of possessing rapid filtering in the highest degree. In all cases where quick working is desired this paper is most suitable, excepting where the precipitate to be filtered, is very fine and requires a closer and harder paper.
- | | | | | | | | | | | | | |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| Diam., mm. | 55 | 70 | 90 | 110 | 125 | 150 | 185 | 240 | 270 | 320 | 385 | 500 |
| Per 100 | .15 | .16 | .22 | .28 | .30 | .38 | .48 | .75 | 1.00 | 1.20 | 1.55 | 2.60 |
27836. Filter Paper, C. S. & S. No. 604, in sheets 580 x 580 mm. Per 100 sheets 4.20

A R T H U R H. T H O M A S C O M P A N Y

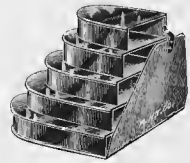
27840.	Filter Paper, C. S. & S. No. 575. Hardened filters, especially adapted for use with the filter pump as they cling closely to the sides of the funnel. These hardened filters will retain the finest precipitates and resist pressures of 2 or 3 atmospheres when moist. Another important feature is durability in continued use, one sheet of this paper being available for several operations, as the precipitate can be scraped off without removing the fluff from the filter. They are probably the only papers which are suitable for the filtration of caustic liquids, requiring a long time to deposit, such as solutions of bichloride of tin (SnCl ₂), chloride of antimony (SbCl ₃) also acids and strong alkalis.
	Diameter mm. 40 55 70 90 110 125 150
	Per 10042 .52 .56 .82 1.00 1.10 1.30
	Diameter mm. 185 240 270 320 385 500
	Per 100 1.70 2.60 3.40 4.15 5.50 9.00
27844.	Filter Paper, C. S. & S. No. 588. Folded Filters. For general use.
	Diameter mm. 125 185 240 320 385 500
	Per 10032 .48 .68 1.10 1.45 2.40
27848.	Filter Paper, C. S. & S. No. 589 "Black Ribbon." Washed in hydrochloric and hydrofluoric acid, of soft and very loose composition, filtering very quickly. Used for deposits which do not pass through easily, as is the case with many metals. Specially adapted for use in laboratories of metallurgy. For BaSO ₄ and similar deposits passing through easily, these filters should not be used.
	Diameter mm. 55 70 90 110 125 150
	Ashes, gram.00004 .00007 .00011 .00017 .00021 .00025
	Per 10052 .55 .82 1.00 1.10 1.30
27852.	Filter Paper, C. S. & S. No. 589 "Blue Ribbon." Washed in hydrochloric and hydrofluoric acid, and made from close, firm material. We recommend them to be used in connection with an air-pump or if possible as folded filters. They are suitable for the finest precipitations, which are not kept back by the black or white ribbon.
	Diameter mm. 55 70 90 110 125 150
	Ashes, gram.00004 .00007 .00011 .00017 .00021 .00025
	Per 10052 .55 .82 1.00 1.10 1.30
27856.	Filter Paper, C. S. & S., No. 589 "White Ribbon." Washed in hydrochloric and hydrofluoric acid. Suitable for most analytical purposes. These filters filter quickly and retain a properly treated deposit of BaSO ₄ .
	Diameter mm. 55 70 90 110 125 150
	Ashes, gram.00004 .00007 .00011 .00017 .00021 .00025
	Per 10052 .55 .82 1.00 1.10 1.30
27860.	Filter Paper, C. S. & S., No. 589 "Yellow Ribbon." Washed in hydrochloric and hydrofluoric acid. The filters of this brand are identical with the brand "white ribbon" but after being freed of mineral constituents, they are also treated with ether.
	Diameter mm. 55 70 90 110 125 150
	Ashes, gram.00004 .00007 .00011 .00017 .00021 .00025
	Per 10065 .70 1.05 1.25 1.40 1.65
27864.	Filter Paper, C. S. & S., No. 590. These filters, which are also treated with HCl and HFl are thinner than the brands specified under No. 589—white ribbon—but otherwise readily retain fine precipitates.
	Diameter mm. 55 70 90 110 125 150
	Ashes, gram.00002 .00003 .00005 .00007 .00009 .00013
	Per 10065 .70 1.05 1.25 1.40 1.65
27868.	Filter Paper, C. S. & S., No. 602, hard or extra hard, a paper of especial density and hardness. The finest particles or precipitates which no other paper can filter are retained. Consequently these papers must not be expected to work quickly and they are recommended for use with an air pump or as folded filters. The "hard" filters are supplied if grade is not specified in ordering. After filtration through these papers the superphosphates are rendered soluble for the purpose of determining the amount of the phosphoric acid soluble in water, and solutions which are to be polarized and impregnated with acetate of lead, become clear at once.
	Diam., mm. 55 70 90 110 125 150 185 240 270 320 385 500
	Per 10022 .26 .34 .42 .44 .55 .72 1.10 1.45 1.75 2.30 3.50
27872.	Filter Paper, C. S. & S. No. 602, hard or extra hard, in sheets 580 x 580 mm. Per 100 4.20
27876.	Filter Paper, C. S. & S. No. 591, an extra heavy and strong paper, specially adapted for the filtration of liquors, fruit juices, syrups and oils, and does not give off any hairs or fuzz to the filtrate. In sheets 580 x 580 mm. Per 100 5.80
27880.	Filter Paper, C. S. & S. No. 551, a deep black filtering paper, specially adapted for filtering light colored sediments and for drop reactions of the same nature. These papers are not acted upon by water, alcohol, ether diluted acids or alkalis.
	Diam., mm. 55 70 90 110 125 150 185
	Per 10022 .26 .34 .42 .44 .55 .72 1.10 1.45 1.75 2.30 3.50
27884.	Filter Paper, C. S. & S. No. 601, for drop reactions. In sheets 140 x 220 mm. Per 100 2.35
27888.	Filters, Folded C. S. & S. No. 580, with parchmentized points to prevent breaking under pressure. Specially recommended for the filtration of molasses, fruit juices, liquors and caustic solutions.
	Diam., mm. 320 385 500
	Per 100 1.40 1.75 2.70
27892.	Filter Cones, C. S. & S. No. 574, consisting of semi-circular discs of No. 575 hardened filter paper, for folding. An excellent substitute for platinum cones.
	Diam., mm. 55 70 90 110 125 150 185 240
	Per 10042 .46 .62 .76 .85 1.00 1.30 2.00



No. 27900



No. 27905



No. 27952

27896. **Filter Paper, Dreverhoff, No. 86, crimped fast filters, heavy, dense and pure white.** These papers filter more rapidly than any other, the filtering surface being increased 60% by the crimping. Specially adapted for sugar work and for filtration in silica determinations.

Diam., mm	55	70	90	110	125	150	185
Per 100	.14	.20	.26	.29	.33	.37	.50
Diam., mm	200	240	320	380	450	500	
Per 100	.64	.81	1.31	1.83	2.51	2.84	

27900. **Filter Paper, Dreverhoff, No. 207, rapid filtering, washed with hydrochloric acid.**

Diam., mm	55	70	90	110	125	150	
Ash per filter, grams	0.00016	0.0003	0.0005	0.0009	0.001	0.0016	0.0016
Per 100	.22	.27	.41	.54	.65	.82	

27904. **Filter Paper, Dreverhoff, No. 400, washed with hydrochloric and hydrofluoric acids; of very close texture, retaining the finest precipitates. Although very strong, it filters rapidly.**

Diam., mm	55	70	90	110	125	150	
Ash per filter, grams	0.00003	0.00006	0.00009	0.00014	0.00018	0.00028	0.00028
Per 100	.52	.78	1.09	1.50	1.68	1.98	

27908. **Filter Paper, Dreverhoff, No. 417, washed twice with hydrochloric and hydrofluoric acids; retains fine precipitates such as barium sulphate, etc.**

Diam., mm	55	70	90	110	125	150	
Ash per filter, grams	0.00002	0.0004	0.00006	0.00009	0.00012	0.00019	0.00019
Per 100	.67	.95	1.34	1.73	1.96	2.28	

27912. **Filter Paper, Dreverhoff, No. 206, a superior white paper for general qualitative and pharmaceutical work, retaining fine precipitates.**

Diam., mm	55	70	90	110	125	150	185	240	320	400	500
Per 100	.13	.15	.20	.23	.27	.30	.38	.58	1.02	1.91	2.18

27916. **Filter Paper, Dreverhoff, No. 206, in sheets 450 x 450 mm. Per quire**56

27920. **Filter Paper For Agar, A. H. T. Co. Special, sometimes designated as "Lautenschlaeger" filter paper. A heavy, white paper with rough surface. Specially recommended for filtering agar and other culture media. In sheets 400 x 400 mm. Per 100** 2.50

27924. **Filter Paper, white, so called "hibulous" paper.** Per ream 3.00 Per quire .20

27928. **Filter Paper, Chardin, as used and specially recommended for filtering agar agar in preparation of culture media. The filters are already folded and come in boxes containing 50 of the 32 cm size and 25 of the 50 cm size.**

Diameter, cm	32	50
Per box	1.00	.70

27932. **Filter Paper, Chardin, in sheets 58 cm square. Per 25 sheets.** 1.50

27936. **Filter Paper, Prat-Dumas, white, in sheets, 17 x 21 inches. Per quire**20
Per ream 3.50

27944. **Filter Paper, Dialyzing, Morochowetz, C. S. & S., a specially cut and folded membrane of parchment paper. They are folded ready for use in funnels from 12° to 15° angle and 250 mm high. No. 521 is thick and No. 522 thin.**

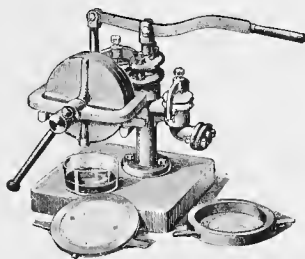
S. & S. number	521	522
Per package of 25	2.70	2.00

Note—For Funnel for use with above Dialyzing Filters, see No. 28582.

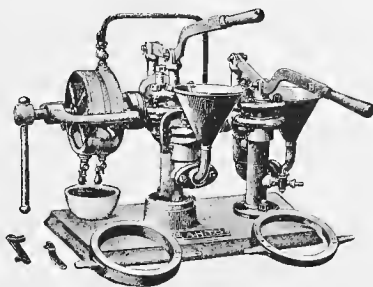
27948. **Filter Racks, for holding the filter paper away from the sides of the funnel; made of galvanized iron wire and rubber ring. May be folded to serve as squeezer.**

Diameter, inches	5	7½	9	12
Each	.30	.40	.50	.75

27952. **Filter Paper Box, of japanned tin, holding five sizes of circular filters from 3 to 7½ inches in diameter. Very convenient in the laboratory as it provides ready access to clean filters at all times** 2.50

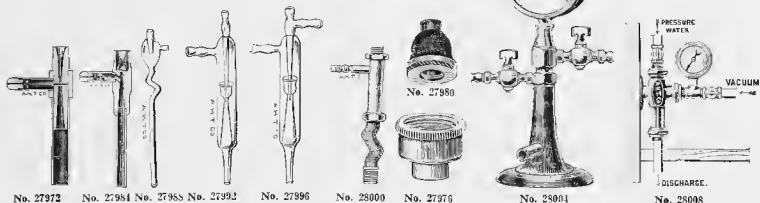


No. 27956

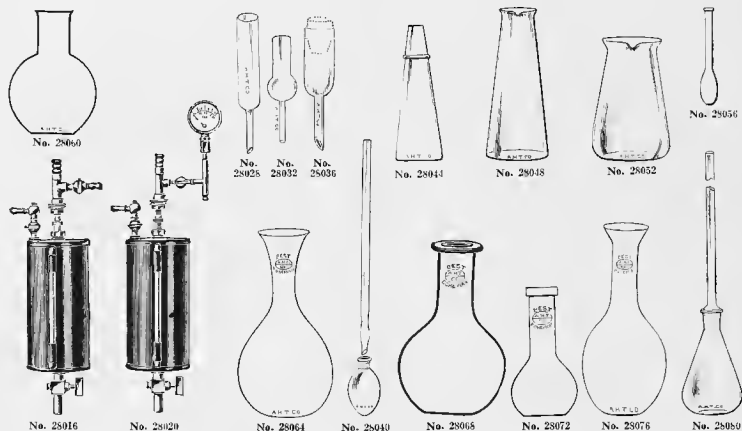


No. 27964

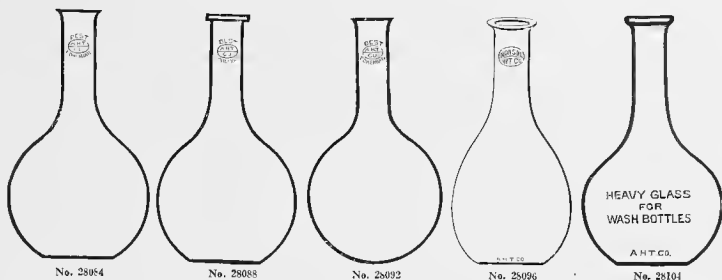
- | | | | | | |
|--------|---|-----------|-------|-----------|--------|
| 27956. | Filter Press, Laboratory, complete with pressure pump, three filter frames of different thickness and three sets of filter cloths. Exposed filtering surface is 400 sq. cm. Press is of iron on heavy iron base. | Duty Free | 45.00 | Duty Paid | 60.00 |
| 27960. | Filter Press, Laboratory, as above but of bronze | Duty Free | 60.00 | Duty Paid | 80.00 |
| 27964. | Filter Press, Laboratory, with two pumps, one for pumping the material for filtration into the press, the other to pump in the bleaching solution. Complete with three filter frames and three sets of filter cloths. With an exposed filtering area of 400 sq. cm. | Duty Free | 60.00 | Duty Paid | 80.00 |
| 27968. | Filter Press, Laboratory, with press and Pump A of bronze and Pump B of iron. | Duty Free | 90.00 | Duty Paid | 120.00 |



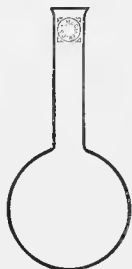
- | | | | | |
|--------|---|-----------------|-----------------|------------------|
| 27972. | Filter Pump, Chapman, of polished brass. For operation under ordinary water pressure either on faucet or directly connected to water supply pipe. Length, inches. | 3 $\frac{1}{2}$ | 4 $\frac{1}{2}$ | 5 $\frac{1}{2}$ |
| | Each | 1.35 | 1.75 | 2.00 |
| 27976. | Filter Pump Couplings, of brass, with faucet thread. Style and size of filter pump must be given when ordering. | | | .35 |
| 27980. | Filter Pump Couplings, of brass, for connecting with faucet without threads. Style and size of filter pump must be given in ordering. | | | .55 |
| 27984. | Filter Pump, of brass. New patent form. More efficient than the Chapman. | | | |
| | Length, inches | 3 $\frac{1}{2}$ | 4 $\frac{1}{2}$ | 5 $\frac{1}{2}$ |
| | Each | 1.35 | 1.75 | 2.00 |
| 27988. | Filter Pump, Geissler, of glass | | | .80 |
| 27992. | “ “ Muecnke, of glass, with one suction tube | | | 1.25 |
| 27996. | “ “ “ “ “ “ two | | | 1.50 |
| 28000. | Filter Pump, Richards, of brass. A very powerful pump. | | | |
| | Length, inches | 7 $\frac{1}{2}$ | 7 $\frac{3}{8}$ | 13 $\frac{1}{2}$ |
| | Size pipe fitting thread, inches | | | |
| | Each | 1.25 | 2.00 | 7.50 |
| 28004. | Filter Pump, On Base, with stopcocks for water and air connections | | | 10.00 |
| 28008. | Filter Pump, Water Jet Form, displacing $\frac{1}{4}$ cu. ft. of air per minute with 20 lbs. water pressure. Will exhaust a 1 gallon vessel to a vacuum of 29 $\frac{1}{2}$ inches of mercury in 10 min. with a 10 lbs. water pressure and in 5 min. with a 20 lbs. water pressure. Very useful for filtrations, percolations and distillations in laboratory work. Complete with vacuum gauge, connecting tee and two stopcocks. | | | 12.00 |
| 28012. | Filter Pump, as above but for operating by steam instead of water, with steam connections. | | | 12.00 |



28016.	Filter Pump, for both suction and pressure; with metal reservoir. Filter pump is removable. Filter cocks and fittings are nickel plated and reservoir is of zinc finished in bronze lacquer.	8.00
28020.	Filter Pump, as above, with manometer.	15.00
28024.	Metal Band for either of above, with holes to conveniently screw to wall.	.50
28028.	Filter Tubes, for filtering through asbestos, glass wool or glass powder.	
	Length, mm.	150 200
	Each.	.10 .15
28032.	Filter Tube, Fresenius, with bulb, 20 mm inside diameter at top.	.20
28036.	Filter Tubes, for use with Gooch, Alundum and similar crucibles. Tube of 32 mm inside diameter is suitable for Gooch crucible No. 25294, 25 cc or Alundum crucible No. 25266, 25 cc. Rubber tubing suitable for making air-tight connection with Gooch crucible is listed under No. 46236.	
	Inside diameter at top, mm.	18 20 25 28 32 37 40
	Each.	.18 .20 .25 .30 .35 .40
28040.	Flask, Acetylation, with ground in condensing tube, as used in determining menthol in oil of peppermint, etc.	1.25
28044.	Flasks, Assay, Best Bohemian Glass. Capacity, cc.	50 100 250
	Each.	.15 .18 .20
28048.	Flasks, Assay, Best Bohemian Glass, conical high form, with narrow mouth and spout.	
	Capacity, cc.	50 100 250 500
	Each.	.15 .20 .25 .30
28052.	Flasks, Assay, Best Bohemian Glass, conical wide form, with spout.	
	Capacity, cc.	50 100 250 500
	Each.	.15 .20 .25 .30
28056.	Flasks, Assay, Best Bohemian Glass, pear shape, with long neck.	
	Capacity, cc.	50 100 250
	Each.	.12 .15 .25
28060.	Flasks, Best Bohemian Glass; light weight, low form, with extra wide mouth and flat bottom, so-called Carbonic Acid flasks. Capacity, cc.	25 50 100 150 250
	Each.	.10 .12 .15 .20 .25
28064.	Flask, for Copper Determinations, with flaring neck. Capacity, cc.	150 250
	Each.	.20 .25
28068.	Flasks, Joliet, much heavier than boiling flasks but made to stand heat; as used in iron and steel analyses. Capacity, cc.	50 100 200
	Each.	.25 .35 .60
28072.	Flasks, Johnson, for Sulphur Determination, for use in iron and steel analysis. With heavy ring neck, taking a No. 6 rubber stopper, capacity 275 cc to base of neck; height 165 mm.	.25
28076.	Flasks, Low, for Copper Determination; cylindrical neck with flaring top.	
	Capacity, cc.	125 250
	Each.	.18 .30
28080.	Flasks, Soil Analysis, of Jena Glass, with long condenser tube ground in with air tight joint.	
	Capacity, cc.	200 500
	Each.	1.60 2.00



28084.	Flasks, Best Bohemian Glass, flat bottom, vial mouth, with uniform necks.																			
	Capacity, cc.....	25	50	100	150	200	250	300	400	500	750									
	To take stopper No.....	0	1	2	3	3	4	1	5	5	6									
	Each.....	.07	.08	.10	.12	.14	.16	.17	.18	.20	.25									
	Capacity, cc.....	1000	1500	2000	3000	4000	6000	8000	12000	20000										
	To take stopper No.....	6	7	9	10	10	10	10	10	11	13									
	Each.....	.30	.35	.45	.60	.80	1.00	1.50	2.00	3.50										
28088.	Flasks, Best Bohemian Glass, flat bottom with heavy ring neck.																			
	Capacity, cc.....	25	50	100	150	200	250	300	400	400										
	To take stopper No.....	0	1	2	3	3	4	1	5	5	6									
	Each.....	.07	.08	.10	.12	.14	.16	.17	.18	.17	.18									
	Capacity, cc.....	500	750	1000	1500	2000	3000	4000	6000	8000	10000									
	To take stopper No.....	5	6	6	7	7	9	10	10	10	10									
	Each.....	.20	.25	.30	.35	.45	.60	.80	1.00	1.50	2.00									
28092.	Flasks, Best Bohemian Glass, round bottom, with vial mouth.																			
	Capacity, cc.....	50	100	250	500	750	1000	1500	2000	4000										
	To take stopper No.....	1	2	4	5	6	6	7	9	10										
	Each.....	.08	.10	.16	.20	.25	.30	.35	.45	.80										
28096.	Flasks, Whitall Tatum "Nonsol" Glass, flat bottom, with vial mouth. Very insoluble in water, alkalis and acids and specially recommended for uniformity of shape. By special arrangement with the manufacturer we are enabled to offer these Flasks for immediate shipment from our own stock at original net factory prices.																			
	Capacity, cc.....	60	120	180	250	500	1000	1500	2000	4000	6000									
	To take stopper No.....	1	2	3	4	5	6	7	9	10										
	Each.....	.11	.13	.14	.15	.20	.28	.35	.45	.80										
28100.	Flasks, Whitall Tatum Regular Glass, flat bottom, vial mouth, widely used in industrial laboratories because of their uniform shape which is identical with the illustration of "Nonsol." By special arrangement with the manufacturers we are enabled to offer these Flasks for immediate shipment from our stock at original net factory prices.																			
	Capacity, cc.....	30	60	120	180	250	500	1000	1500	2000	4000	6000	8000	12000						
	Each.....	.08	.09	.10	.11	.12	.15	.23	.35	.75	1.25	2.00								
28104.	Flasks, Wash Bottle, with stout ring neck to withstand corking. The heavy wall of these flasks makes them much more durable under mechanical stress than the ordinary boiling flask.																			
	Capacity, cc.....	250	500	1000	2000															
	To take stopper No.....	3	5	6	7															
	Each.....	.15	.20	.35	.50															
28108.	Flasks, Opaque Fused Silica. These flasks are sufficiently transparent to enable the level of a liquid to be determined. They are furnished with either round or flat bottom and are admirably adapted for direct heating by electric resistance wires for boiling at high temperatures, etc.																			
	Capacity, cc.....	50	100	150	200	250	500	1000	1500	2000	4000									
	Each.....	2.75	4.00	4.25	5.00	6.25	7.50	16.00												
28112.	Flasks, New Jena Glass, round bottom, with vial mouth	See illustration on following page.																		
	Capacity, cc.....	50	100	150	200	300	400													
	To take stopper No.....	1	3	3	4	5	5													
	Each.....	.11	.12	.14	.16	.19	.23													
	Capacity, cc.....	500	700	1000	1500	2000	3000													
	To take stopper No.....	5	6	7	8	9	10													
	Each.....	.26	.32	.38	.45	.53	.68													



No. 28112



No. 28116



No. 28120



No. 28124

28116.	Flasks, New Jena Glass, flat bottom with vial mouth.								
	Capacity, cc.....	50	100	150	200	300	400	500	600
	To take stopper No.....	0	0	1	2	4	4	4	4
	Each.....	.11	.12	.14	.16	.19	.23	.23	.23
	Capacity, cc.....	500	700	1000	1500	2000	3000		
	To take stopper No.....	6	6	7	7	8	9		
	Each.....	.26	.32	.38	.45	.53	.68		
28120.	Flasks, New Jena Glass, flat bottom, with heavy ring neck.								
	Capacity, cc.....				500	1000	2000		
	To take stopper No.....				6	7	8		
	Each.....				.32	.46	.63		
28124.	Flasks, New Jena Glass, round bottom, with short ring neck.								
	Capacity, cc.....	50	100	150	200	300	400	500	700
	To take stopper No.....	0	2	3	3	4	5	6	7
	Each.....	.13	.14	.16	.19	.23	.28	.32	.38
	Capacity, cc.....	1500	2000	3000	4000	5000	6000	8000	10000
	To take stopper No.....	9	9	10	10	11	11	12	12
	Each.....	.55	.63	.80	.93	1.05	1.30	1.90	2.50
28128.	Flasks, New Jena Glass, round bottom with long ring neck. Prices and sizes same as for No. 28124.								



No. 28140



No. 28144



No. 28148

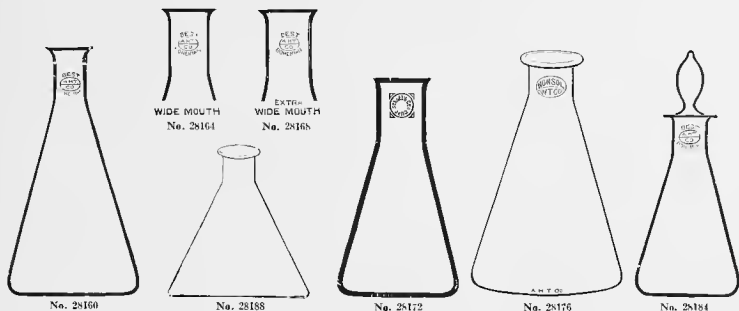


No. 28152

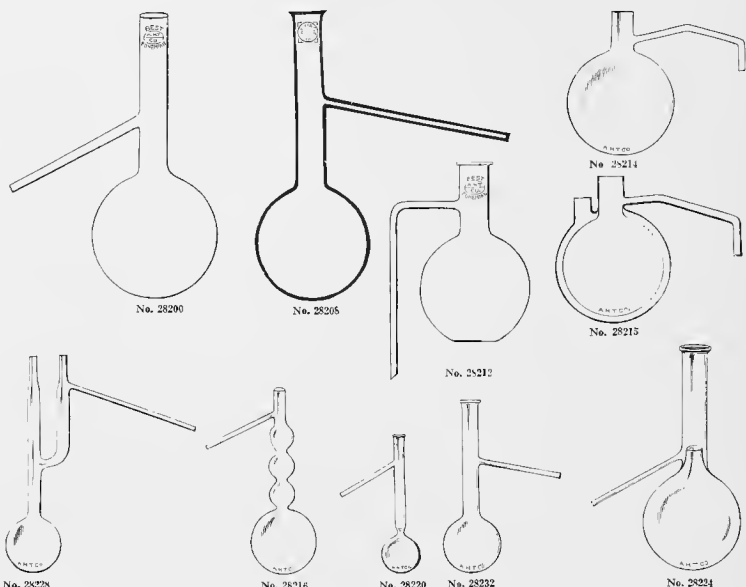


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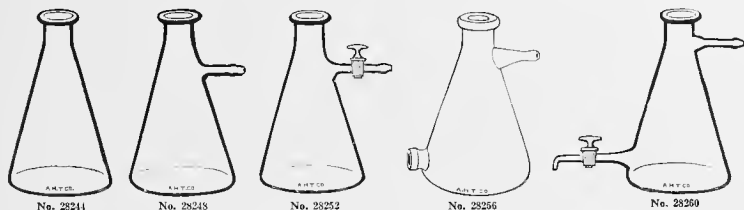
28140.	Flasks, for Iodine Determinations; with wide, flaring funnel shaped lip and hollow, ground in stopper fitted to neck.			
	Capacity, cc.....	125	250	500
	Each.....	.60	.75	1.00
28144.	Flasks, Copper Oxide, for storing CuO in organic analyses.			
	Capacity, cc.....	125	250	500
	Each.....	.55	.65	.85
28148.	Flasks, Copper, polished, with ring neck.			
	Capacity, cc.....	250	500	1000
	Each.....	1.75	2.00	2.50
28152.	Flasks, Copper, polished, as used for Kjeldahl determinations; 4 inches high, 8 1/2 inches diameter, capacity 1000 cc.....			3.30
28156.	Flask, Orlovius, for the sterile drawing and handling of blood for bacteriological purposes, fitted with a ground in glass stopper with two tubulations and a protecting cap.....			2.50



28160.	Flasks, Erlenmeyer, Best Bohemian Glass, with narrow mouth.	Capacity, cc.....	25	50	100	150	200	250	300	400	500	750	
		To take stopper No.....	0	1	2	3	3	4	4	5	5	6	
		Each.....	.07	.08	.10	.12	.14	.16	.17	.18	.20	.25	
		Capacity, cc.....	1000			1500			2000			3000	
		To take stopper No.....	6			7			7			9	
		Each.....	.30			.35			.45			.60	
28164.	Flasks, Erlenmeyer, Best Bohemian Glass, with wide mouth.	Capacity, cc.....	25	50	100	150	200	250	300	400			
		To take stopper No.....	1	2	3	4	4	5	5	6			
		Each.....	.07	.08	.10	.12	.14	.16	.17	.18	.20	.25	
		Capacity, cc.....	500			750			1000			1500	
		To take stopper No.....	6			7			8			9	
		Each.....	.20			.25			.30			.35	
28168.	Flasks, Erlenmeyer, Best Bohemian Glass, with extra wide mouth.	Capacity, cc.....	100			250			500			1000	
		Each.....	.10			.16			.20			.30	
28172.	Flasks, Erlenmeyer, New Jena Glass.	Capacity, cc.....	25	50	100	150	200	250	300	500			
		To take stopper No.....	0	1	3	4	5	5	6	6			
		Each.....	.09	.10	.11	.12	.13	.15	.17	.24			
		Capacity, cc.....	600			750			1000			1500	
		To take stopper No.....	6			7			8			9	
		Each.....	.26			.29			.37			.45	
28176.	Flasks, Erlenmeyer, Whitall Tatum Nonsol Glass. Very insoluble in water, alkalis and acids, and specially recommended for uniformity of shape. By special arrangement with the manufacturers we are enabled to offer these flasks for immediate shipment from our stock at original net factory prices.	Capacity, cc.....	60	120	180	250	500	1000	2000				
		To take stopper No.....	6	5	3	4	5	6	8				
		Each.....	.11	.13	.14	.15	.20	.30	.50				
28180.	Flasks, Erlenmeyer, Whitall Tatum Regular Glass, widely used in industrial laboratories because of their uniform shape, which is exactly similar to the Nonsol above listed. By special arrangement with the manufacturers we are enabled to offer these flasks for immediate shipment from our stock at original net factory prices.	Capacity, cc.....	60	120	180	250	350	500	700	1000	2000		
		Each.....	.09	.10	.11	.12	.14	.15	.20	.23	.38		
28184.	Flasks, Erlenmeyer, Best Bohemian Glass, with ground in glass stopper.	Capacity, cc.....	125			250			500			1000	
		Each.....	.50			.65			.85			1.25	
28188.	Flasks, Erlenmeyer, with very flat, extra wide base, specially constructed for boiling on electric hot plates and for culture flasks.	Capacity, cc.....	250			500			1000				
		Each.....	.18			.24			.45				



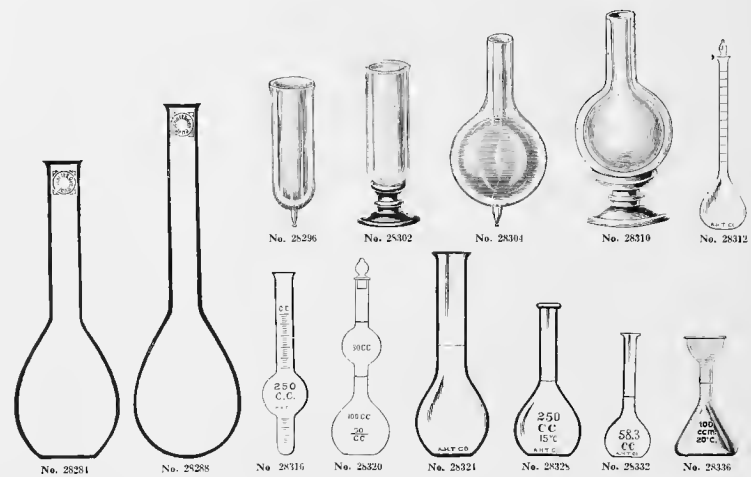
28192.	Flasks, Distillation, Best Bohemian Glass, with side tube high on neck.							
	Capacity, cc.....	30	60	100	250	500	1000	2000
	Each.....	.15	.20	.25	.30	.50	.65	1.00
28196.	Flasks, Distillation, Best Bohemian Glass, with side tube at center of neck.							
	Capacity, cc.....	30	60	100	250	500	1000	2000
	Each.....	.15	.20	.25	.30	.50	.65	1.00
28200.	Flasks, Distillation, Best Bohemian Glass, with side tube low on neck.							
	Capacity, cc.....	30	60	100	250	500	1000	2000
	Each.....	.15	.20	.25	.30	.50	.65	1.00
28204.	Flasks, Distillation, Best Bohemian Glass, with side tube 400 mm long at center of neck.							
	Capacity, cc.....	100	250	500	1000	1500	2000	3000
	Each.....	.30	.40	.60	.75			
28208.	Flasks, Distillation, New Jena Glass, with side tube at center of neck.							
	Capacity, cc.....	50	100	200	300	500	1000	1500
	Each.....	.22	.24	.29	.34	.45	.65	.78
							1.00	1.25
28212.	Flask, Distillation, Best Bohemian Glass, with side tube bent down at right angle. So-called "sulphur" flask. Capacity 500 cc.....							.60
28214.	Flask, Glass, for use with the official Brown-Duvet Moisture Tester. See Bulletin 56 of the U. S. Bureau of Plant Industry.....							.75
28215.	Flask, Copper, Double Wall, for use with the official Brown-Duvet Moisture Tester when same is used for moisture determinations in flour and ground grain substances in which the copper flask is used in place of the glass flask. See Bulletin 56 of the U. S. Bureau of Plant Industry.....							5.00
28216.	Flask, Distillation, Ladenburg, with three bulbs in neck. Capacity 500 cc.....							.80
28220.	Flask, Distillation, Hempel, as used in the U. S. Department of Agriculture, Forest Service, for the distillation of creosote. Capacity 500 cc.....							.80
28224.	Flasks, Distillation, Lunge, with trap in neck. Capacity, cc.....				125	250	500	
	Each.....				.60	.70	.90	
28228.	Flasks, Distillation, Claisen. Capacity, cc.....				50	100	250	500
	Each.....				.50	.60	.75	1.00
28232.	Flasks, Distillation, Engler, as used in the coal tar industry. Made to exact dimensions.							
	Capacity, cc.....					100	250	
	Each.....					.30	.40	
28236.	Flask, Distilling, Engler, Semi-transparent Silica, for use in distillation above 300° C.....							5.00
28240.	Flask, Opaque Fused Silica, with side arm for distillations.							
	Capacity, cc.....	50	100	150	200	250	500	1000
	Each.....	3.25	4.75	5.00	6.00	7.50	9.00	18.50



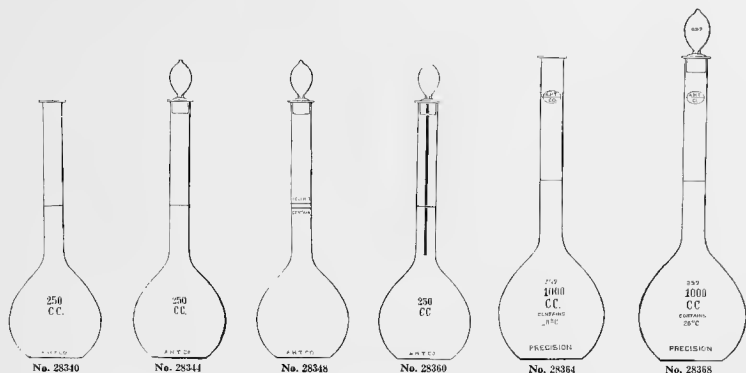
28244.	Flasks, Filtering, Erlenmeyer shape, of heavy glass to withstand pressure.							
	Capacity, cc.....	250	500	1000	2000			
	Each.....	.25	.40	.60	.75			
28248.	Flasks, Filtering, same as No. 28244 but with side neck.							
	Capacity, cc.....	250	500	750	1000	2000	4000	
	Each.....	.35	.45	.50	.60	1.00	1.50	
28252.	Flasks, Filtering, same as No. 28248 but with side neck and glass stopcock.							
	Capacity, cc.....				250	500	1000	
	Each.....				1.25	1.50	2.50	
28256.	Flasks, Filtering, Erlenmeyer shape, of heavy glass, with side neck and tubulation at bottom at opposite side to take ordinary stopper.							
	Capacity, cc.....		500	1000	2000			
	Each.....		.90	1.20	2.00			
28260.	Flasks, Filtering, Erlenmeyer shape, of heavy glass, with side tube at neck and in addition tubulation with stopcock on opposite side near bottom. Capacity 1000 cc.....							2.00



28264.	Flask, Filtering, as above, but with ground in stopcock in lower tubulation.						
	Capacity, cc.....	500	1000	2000			
	Each.....	1.50	2.00	2.50			
28268.	Flasks, Filtering, Erlenmeyer shape, of heavy glass, with side tube and with funnel ground into neck.						
	Capacity, cc.....		500	1000			
	Each.....		2.00	2.75			
28272.	Flask, filtering, with side tubulation and funnel shaped neck into which the filtering funnel may be tightly fitted by means of a heavy rubber ring. Price does not include glass funnel or rubber ring.						
	Capacity of flask, cc.....	500	1000	2000			
	Each.....	.60	1.00	1.50			
28273.	Rubber Rings, each.....						.15
28276.	Flasks, Kjeldahl, Whitall-Tatum, Nonsol Glass, very insoluble in water, alkalis and acids. Specially recommended for uniformity of shape. By special arrangement with the manufacturer we are enabled to offer these Flasks for immediate shipment from our stock at original net factory prices.						
	Capacity, cc.....		500	800			
	Height, mm.....		300	280			
	Diameter of body, mm.....		100	110			
	Each.....		.30	.35			



28280.	Flasks, Kjeldahl, New Jena Glass, round bottom, short neck.									
	Capacity, cc.	50	100	200	300	500	800	1000	1500	2000
	Each .....	.13	.14	.18	.22	.30	.35	.45	.55	.63
28284.	Flasks, Kjeldahl, New Jena Glass, flat bottom, short neck.									
	Capacity, cc.	50	100	200	300	500	800	1000	1500	2000
	Each .....	.13	.14	.18	.22	.30	.35	.45	.55	.63
28288.	Flasks, Kjeldahl, New Jena Glass, round bottom, long neck.									
	Capacity, cc.	50	100	200	300	500	800	1000	1500	2000
	Each .....	.14	.15	.20	.25	.33	.40	.50	.63	.70
28292.	Flasks, Kjeldahl, New Jena Glass, flat bottom, long neck.									
	Capacity, cc.	50	100	200	300	500	800	1000	1500	2000
	Each .....	.14	.15	.20	.25	.33	.40	.50	.63	.70
28296.	Flasks, Vacuum, Dewar, tube form, for liquid air, without base and unsilvered									
	Length outside, mm.							100		250
	Outside diameter, mm.							45		60
	Inside diameter, mm.							30		40
	Each							2.00		4.50
28300.	Flasks, Vacuum, as above, but silvered.							2.50		5.00
28302.	Support for either of above .....									.75
28304.	Flasks, Vacuum, Dewar, pear shaped, for liquid air, unsilvered.									
	Capacity, cc.		150		300		500		1000	
	Each		2.50		3.00		4.00		6.50	
28308.	Flasks, Vacuum, as above, silvered.		3.00		3.50		4.75		7.25	
28310.	Support, only, for above flasks		1.00		1.00		1.50		1.50	
28312.	Flask, Cassia, with graduated neck and glass stopper. Capacity 120 cc, neck graduated to 10 cc in $\frac{1}{10}$ ths.									1.50
28316.	Flask, Volumetric, with graduations above and below bulb, for saponification method of determining total fatty acid in cotton seed and similar products.									1.50
28320.	Flask, Volumetric, for the determination of unsaponifiable fats, capacity of lower bulb 100 cc, with mark indicating 50 cc; capacity of upper bulb 30 cc; with ground glass stopper and graduated to contain									1.10
28324.	Flask, Volumetric, for insoluble phosphoric acid determinations, with wide neck 25 mm inside diameter, capacity of flask 200 cc, of stout glass. ....									.40
28328.	Flask, Volumetric, for fertilizer work, 250 cc capacity, with short neck, of heavier glass than regular volumetric flask and with mark low on neck. ....									.50
28332.	Flask, Volumetric, as used in the analysis of feed water for boilers, particularly in determining the alkalinity, etc.; accurately graduated to deliver 58.3 cc. ....									.35
28336.	Flask, Volumetric, conical shape with enlarged mouth, 100 cc capacity. As used in oil analysis. ....									.75



28340.	Flasks, Volumetric, without stoppers, graduated to contain.								
	Capacity, cc.....	10	25	50	100	200	250	300	500 1000 2000
	Each.....	.15	.18	.20	.25	.30	.40	.45	.50 .65 1.00
28344.	Flasks, Volumetric, with ground glass stopper; graduated to contain.								
	Capacity, cc.....	10	25	50	100	200	250	300	500 1000 2000
	Each.....	.20	.25	.30	.35	.40	.45	.50	.60 .75 1.00
	Capacity, cc.....	300	500	1000	2000	3000	4000	5000	6000 7000 8000
	Each.....	.55	.60	.80	1.20	1.60	2.00	2.40	2.80 3.20 3.60
28348.	Flasks, Volumetric, with ground glass stopper; graduated to contain and to deliver. With two marks on neck.								
	Capacity, cc.....				100	250	500	1000	2000
	Each.....				.50	.70	.90	1.10	1.30
28352.	Flask, Volumetric, without graduation, for graduation by the user. Without stopper.								
	Capacity, cc.....				100	250	500	1000	2000
	Each.....				.18	.28	.40	.50	.60
28356.	Flask, Volumetric, same as above, with glass stopper.								
	Capacity, cc.....				100	250	500	1000	2000
	Each.....				.30	.40	.55	.70	.80
28360.	Flasks, Volumetric, with blue stripe on white enamel back, as in Schellbach burettes, making easy the reading of a sharp meniscus; with ground glass stopper. Graduated to contain.								
	Capacity, cc.....				100	250	500	1000	2000
	Each.....				.35	.50	.65	.85	1.00

FLASKS, VOLUMETRIC, PRECISION, graduated by weighing at 20°C. in accordance with the specifications of the Physikalisch-Technische Reichsanstalt, with individual control number. These flasks are offered with our unofficial factory certificate and, in addition, with the Physikalisch-Technische Reichsanstalt certificate and control stamp, i. e., the official certificate of the German government.

Precision Volumetric Flasks with Unofficial factory certificate

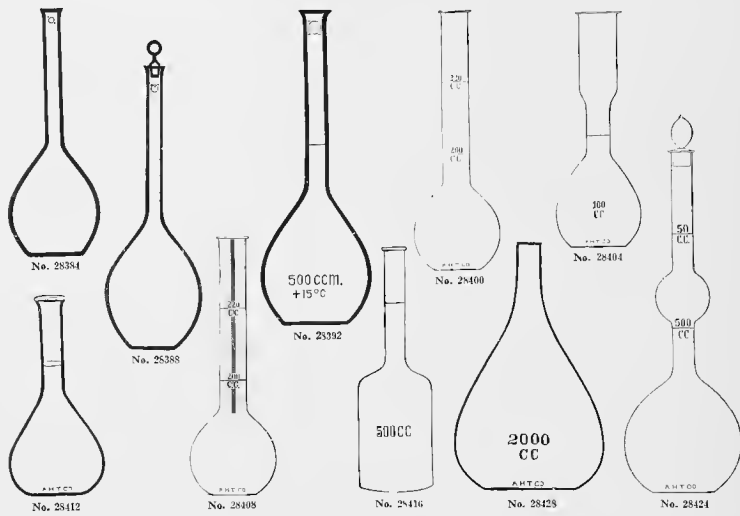
These certificates are made out in the factory in exact accordance with the methods used by the Physikalisch-Technische Reichsanstalt and no flask is certified unless the error falls within the limit permitted by the P. T. R. The data on these certificates may be used as a check where flasks are calibrated in the laboratory or with entire reliance upon the accuracy of the figures given.

28364.	Flasks, Volumetric, Precision, without stopper, adjusted to contain; with unofficial factory certificate.								
	Capacity, cc.....	50	100	250	500	1000	2000	3000	4000
	Each.....	.65	.70	1.00	1.25	1.50	2.30	2.80	3.20
28368.	Flasks, Volumetric, Precision, with stopper, adjusted to contain, with unofficial factory certificate.								
	Capacity, cc.....	50	100	200	250	500	1000	2000	3000
	Each.....	.80	.85	1.10	1.20	1.50	1.75	2.50	3.00
28372.	Flasks, Volumetric, Precision, with stopper, adjusted for delivery, with unofficial factory certificate.								
	Capacity, cc.....	100	250	500	1000	2000	3000	4000	5000
	Each.....	.85	1.20	1.50	1.75	2.50	3.00	3.50	4.00

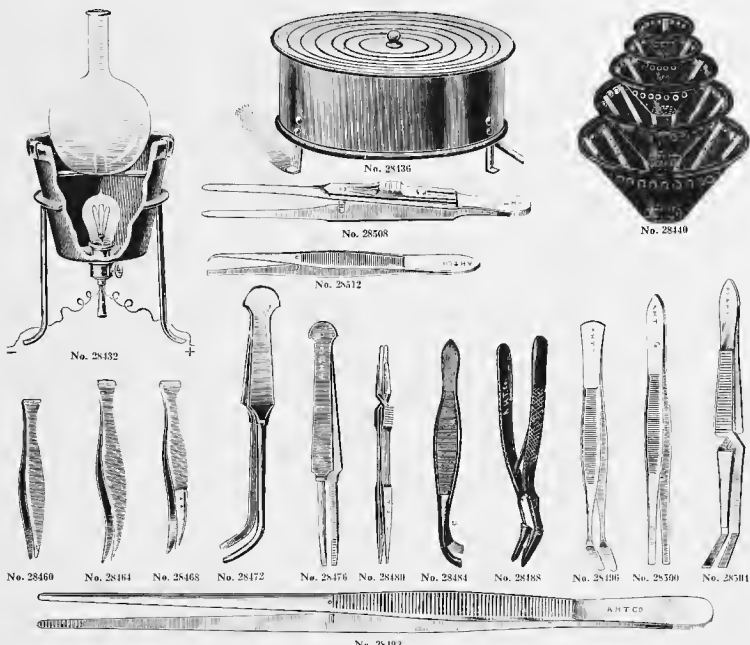
Precision Volumetric Flasks with Physikalisch-Technische Reichsanstalt Certificate

These flasks are exactly the same as those described above in workmanship and accuracy but are furnished with the official Physikalisch-Technische Reichsanstalt certificate and control stamp, for which a higher price must be charged because of the German government fee.

28376.	Flasks, Volumetric, Precision, with stopper, adjusted to contain, with P. T. R. certificate.								
	Capacity, cc.....	100	250	500	1000	2000	3000	4000	5000
	Each.....	2.00	2.65	3.15	3.75	5.25	6.00	7.00	8.00
28380.	Flasks, Volumetric, Precision, with stopper, adjusted for delivery, with P. T. R. certificate.								
	Capacity, cc.....	100	250	500	1000	2000	3000	4000	5000
	Each.....	2.00	2.65	3.15	3.75	5.25	6.00	7.00	8.00



28384.	Flasks, Volumetric, New Jena Glass, without stoppers and without graduation. The indicated capacity falls near the middle of the neck.										
	Capacity, cc.....	50	100	125	200	250	300	500	750	1000	2000
	Each.....	.17	.18	.19	.24	.29	.33	.42	.50	.55	.78
28388.	Flasks, Volumetric, New Jena Glass, same as No. 28384 but with glass stoppers.										
	Capacity, cc.....	50	100	125	200	250	300	500	750	1000	2000
	Each.....	.38	.39	.40	.48	.53	.58	.73	.83	.90	1.15
28392.	Flasks, Volumetric, New Jena Glass, without stoppers. Graduated to contain.										
	Capacity, cc.....	50	100	125	200	250	300	500	750	1000	2000
	Each.....	.50	.53	.55	.60	.70	.75	.85	1.00	1.15	1.40
28396.	Flasks, Volumetric, New Jena Glass, same as No. 28392 but with glass stoppers.										
	Capacity, cc.....					125	250		500	1000	
	Each.....					.77	.94		1.16	1.50	
28400.	Flasks, Sugar, with two graduations and without stoppers.										
	Capacity, cc.....		50 and 110	55	100 and 110				200 and 220		
	Each.....		.28		.35				.50		
28404.	Flasks, Sugar, Kohlrausch, with enlarged mouth.										
	Capacity, cc.....			100	200	200.6	201.2	201.4			
	Each.....			.40	.65	.65	.65	.65			
28408.	Flasks, Sugar, with dark blue enameled stripe on white enameled background.										
	Capacity, cc.....		50 and 55	100 and 110	200 and 220						
	Each.....		.40	.50	.70						
28412.	Flask, Sugar, Bates, 100 cc capacity, pear shape with flaring top.....										.60
28416.	Flasks, Volumetric, Stohmann, of heavy glass for shaking, graduated to contain, without stopper.										
	Capacity, cc.....					250	500	1000			
	Each.....					.60	.80	1.00			
28420.	Flasks, Volumetric, Stohmann, as above, with glass stopper.										
	Capacity, cc.....					250	500	1000			
	Each.....					.75	1.00	1.20			
28424.	Flasks, Volumetric, Giles, with glass stopper and two graduations. When used for making normal solutions the 10% extra volume in the neck of the flask is used for ascertaining exact titration, leaving a volume equal to the exact capacity of flask, for correction.										
	Capacity, cc.....					500/50	1000/100	2000/200			
	Each.....					1.75	2.40	3.50			
28428.	Flasks, Watering, as used in the determination of water requirement of plants. This flask is of special shape and of exactly 2000 cc capacity when filled even with the ground rim, there being no other mark on the flask. This feature enables them to be quickly filled by total immersion and insures delivery of the exact amount of water when placed in a vertical position over the pot, as illustrated in Bulletin 284 of the U. S. Department of Agriculture, Bureau of Plant Industry.....										1.50



28432. **Flask Heater**, heated by electric incandescent lamp, for conducting ether and similar distillations without danger. On support, with connecting cord but without flask. Will accommodate a 1000 cc flask. 4.00
28436. **Flask Heater**, Electric, of copper, with convenient ring top. Diameter $8\frac{1}{2}$ inches, height 4 inches. Furnished with three heats, regulating switch, 6 ft. of cord and switch for connecting. Requires 500 watts. Works equally well on direct or alternating current but voltage must be specified in ordering. 12.00
28440. **Flask Heaters**, of sheet iron, with ventilating openings and asbestos inset.
- | | | | | | |
|---------------|-----|-----|-----|------|------|
| Diameter, mm. | 110 | 130 | 180 | 220 | 270 |
| Each | .60 | .75 | .90 | 1.10 | 1.25 |
28460. **Forceps**, of brass, straight.15
28464. " " " bent.18
28468. " " " with ivory tips.70
28472. " " " nickel plated, so-called Goosenecks. Will not corrode; 150 mm long.50
28476. " " " steel, plain. Length, mm.150
- | | | | | |
|------|-----|-----|-----|-----|
| Each | 100 | 112 | 125 | 150 |
| | .10 | .12 | .15 | .20 |
28480. **Forceps, Blowing**. French form, $5\frac{1}{2}$ inches long, with heavy platinum tips.5.00
28484. **Forceps, Pinning** regular style.75
28488. " " **Blake**1.75
28492. **Forceps**, of steel nickel plated; For removing specimens from deep jars or bottles.
- | | | | | |
|-------------|------|------|------|------|
| Length, mm. | 250 | 300 | 375 | 450 |
| Each | 1.25 | 1.50 | 2.00 | 2.50 |
28496. **Forceps, Cover Glass**, with flat, bent blades, 105 mm long50
28500. " " " with thin, straight blades and guide pin, 115 mm long50
28504. " " " with thin, bent, flat blades; self-closing; 125 mm long75
28508. " " **Ehrlich**, with long, flat blades and locking device; 135 mm long.1.25
28512. **Forceps, Cover Glass**, Novy, with flat lower blade and curved, pointed upper blade. Nickel plated, 115 mm long50



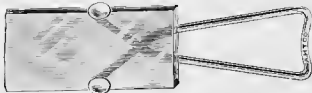
No. 28520



No. 28532



No. 28524



No. 28536



No. 28528



No. 28540



No. 28516



No. 28541



No. 28548



No. 28556



No. 28560



No. 28564



No. 28568

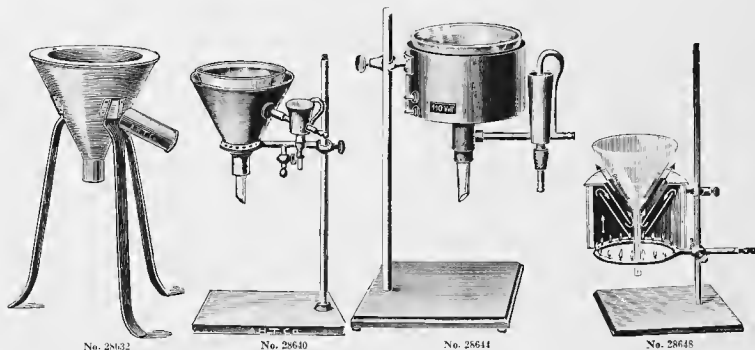


No. 28572

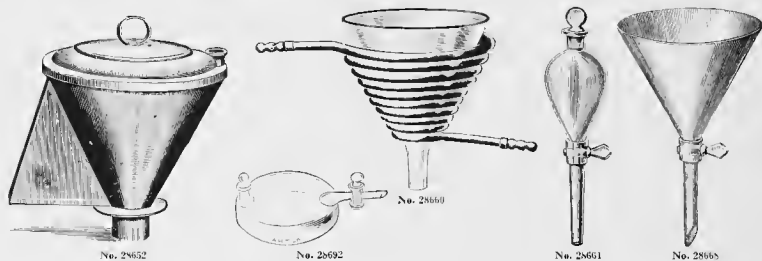
28516.	Forceps, Cover Glass,	Novy, same as No. 28512 but with locking device.....	1.00
28520.	" " "	Cornet, of spring brass, nickel plated, self-closing, 120 mm long	.45
28524.	" " "	and Slide, with weight to increase stability	1.00
28528.	" " "	Stewart, original form, of nickeled spring wire, self-closing.....	.10
28532.	" " "	" " same as No. 28528 but with ring to hold jaws together.....	.08
28536.	" " "	Slide, Kirkbride.....	.10
28540.	" " "	Boston.....	.25
28544.	Funnels, Glass, with angle of 60° and stem ground to point.		
	Diameter, mm.....	25 40 50 65 75 90 100	
	Each.....	.07 .09 .09 .10 .12 .15 .18	
	Diameter, mm.....	120 150 170 200 225 250 300	
	Each.....	.20 .30 .35 .50 .65 .90 1.35	
28548.	Funnels, Glass, Bunsen, with an exact angle of 60° and with long, thin stems (sizes up to 100 mm diameter have stems about 100 mm long) ground to point and with ground rim. This is an accurate funnel and is not to be confused with the ordinary funnel which we list under No. 28544.		
	Diameter, mm.....	25 40 50 65 75 90 100 110 120 150	
	Each.....	.10 .10 .12 .15 .16 .18 .22 .25 .30 .40	
28552.	Funnels, Glass, Special, exactly as above but with extra long, thin stems.		
	Diameter, mm.....	50 65 75 90 100	
	Each.....	.15 .18 .20 .25 .30	
28556.	Funnel, Glass, exactly as above but with capillary bore for perfect suction.		
	Diameter, mm.....	50 65 75 90 100	
	Each.....	.15 .18 .20 .25 .30	
28560.	Funnels, without stem, as used in sugar analysis. Diameter, mm.....	70 90 100	
	Each.....	.15 .20 .25	
28564.	Funnels, Glass, with short, wide stem; so-called powder funnels.		
	Diameter, mm.....	60 80 100	
	Diameter of stem, mm.....	14 16 18	
	Each.....	.20 .25 .30	
28568.	Funnels, Glass, with bulb, for filtering through glass wool. Diameter, mm.....	100 150	
	Each.....	.30 .45	
28572.	Funnels, Victor-Meyer, to suspend over evaporating dishes. Diameter, mm.....	160 200 260	
	Each.....	1.00 1.20 1.60	



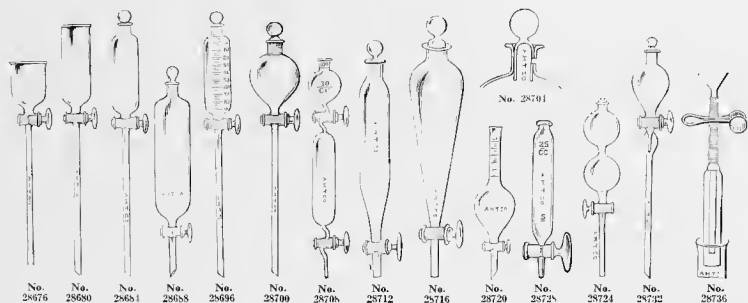
28576.	Funnels, Ribbed, for quick filtering. Of heavy pressed glass with finished rim.							
	Diameter, inches.	2 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$
	Each.....	.10	.12	.15	.18	.25	.40	.75
28580.	Funnels, Glass, with diagonal fluting, for very rapid filtering. Particularly recommended for use with our special filter paper No. 27920 in filtering agar agar for culture media.							
	Diameter, mm.....	70	100	160	200	240		
	Each.....	.25	.50	.70	1.45	2.25		
25582.	Funnel for use with Moroehowetz dialyzing filters, with very accurate angle 12°-15°, and 250 mm high.							.75
28584.	Funnels, Vogel, with side tubulation for suction. Diameter, mm.....				80	90		105
	Each.....				.75	.90		1.00
28588.	Funnels, Double Walled, for either hot or cold filtrations, with inlet and outlet tube, 100 mm in diameter.							3.00
28592.	Funnels, Double Walled, with exhaust and silvered lid, 100 mm in diameter.							6.50
28596.	Funnels, set of three for delivering minute quantities; $\frac{1}{2}$, 1 and 1$\frac{1}{2}$ inch in diameter. Per set.							.25
28600.	Funnels, Copper, with ribs, 4 inches in diameter. Without stem.							.75
28604.	Funnels, Aseptic Enamel Ware. Of seamless steel, white enameled, both acid and fire proof. With handle. Diameter, inches.		3	4 $\frac{1}{2}$	6	8		
	Each.....	.35	.50	.75	1.00			
28605.	Funnels, Porcelain, with perforated sides, 169 mm in diameter.							1.20
28612.	" " small size, for use as filter cones. Diameter, mm.		45	65				.35
	Each.....		.25					
28616.	Funnels, Porcelain, Buchner, with fixed perforated, porcelain plate.							
	Diameter, mm.....	50	65	80	100	125	150	200
	Each.....	.55	.70	.85	1.00	1.35	1.70	2.05
28620.	Funnels, Royal Berlin Porcelain, Buchner, with fixed, perforated plate. While more expensive, this funnel is distinctly superior to No. 28616 in that funnels of the same size have an equal number of perforations of 1 mm diameter in the plate.							
	Diameter of funnel, mm.....	50	85	112	160			
	Each.....	.90	1.50	2.10	4.20			
28624.	Funnels, Royal Berlin Porcelain, Hirsch, with fixed, perforated porcelain plate.							
	Diameter of funnel, mm.....	50	75	92	103	120	140	163
	Diameter of plate, mm.....	36	44	57	59	59	59	112
	Diameter of holes, mm.....	1	1	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
	Each.....	.60	.75	.90	1.20	1.50	2.10	2.70
28628.	Funnels, Hard Ruhher, with corrugated spout which allows the air to escape so that the liquid flows freely.							
	Capacity.....	$\frac{1}{2}$ pt.	$\frac{1}{2}$ pt.	1 pt.	1 qt.			
	Each.....	.35	.45	.60	.75			



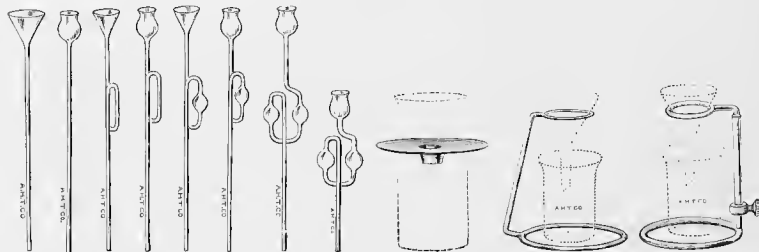
28632. **Funnel, Hot Water**, of heavy, polished copper, double wall, on three iron legs. Much superior to the ordinary article made without inside wall of copper. Including a glass funnel No. 28544, 150 mm diameter. 6.00
28636. **Funnel, Hot Water**, double walled, with constant water level, Bunsen ring burner, clamp, stopcock and glass funnel, 150 mm diameter, but without support 7.50
28640. **Funnel, Hot Water**, same as No. 28636, but with support 8.15
28644. **Funnel, Hot Water**, for electric heating, particularly recommended for filtration of culture media. Of copper, with constant water level and stand and connection cord and plug for electric light socket. Voltage must be stated in ordering. Including a glass funnel, 150 mm diameter. 16.00
28648. **Funnel, Hot Air**, Lothar Meyer, of copper, double walled. With ring burner, support and a funnel, 120 mm diameter 10.00



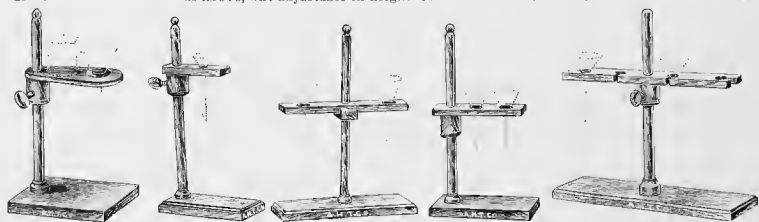
28652. **Funnel, Hot Water**, of tin, with double wall. 2.50
28656. **Funnel, Hot Water**, same as No. 28652 but of copper throughout. 4.50
28660. **Funnel, Hot Water or Steam**, consisting of a lead coil and one glass funnel, 170 mm diameter. 4.50
28664. **Funnels, Separatory**, of heavy glass, with glass stopper.
- | | | | | | |
|-----------------------|------|------|------|------|------|
| Capacity, cc. | 250 | 500 | 1000 | 2000 | 4000 |
| Each | 2.00 | 2.25 | 2.50 | 3.00 | 4.00 |
28668. **Funnels, Separatory**, of heavy glass, with angle 60° and stem ground to point.
- | | | | | | |
|-----------------------|------|------|------|------|------|
| Diameter, mm. | 100 | 150 | 180 | 200 | 240 |
| Each | 1.50 | 2.25 | 2.50 | 3.00 | 3.75 |
28672. **Funnel Separatory, (Terrapin Separator)**, as used in the U. S. Department of Agriculture, Bureau of Chemistry, for the handling of emiscible liquids which separate with difficulty because of their tendency to form emulsions; 200 cc capacity, with ground in stopper and stopcock. 3.00



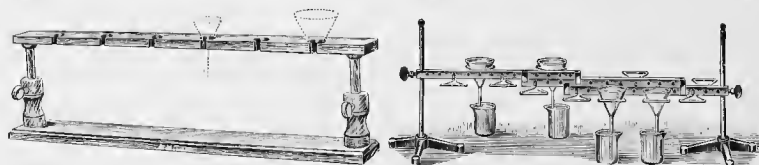
28676.	Funnels, Separatory, bell shape, with open top.						
	Capacity, cc.....	25	50	75	100		
	Each.....	.80	1.00	1.10	1.25		
28680.	Funnels, Separatory, cylindrical, with open top.						
	Capacity, cc.....	30	50	100	150	200	250
	Each.....	.90	1.00	1.10	1.35	1.50	1.75
28684.	Funnels, Separatory, cylindrical, with ground glass stopper.						
	Capacity, cc.....	30	50	100	150	200	250
	Each.....	1.15	1.25	1.35	1.50	1.75	2.00
28688.	Funnel, Separatory, cylindrical, with ground glass stopper and short stem, of stout glass.						
	Capacity, cc.....				500	1000	
	Each.....				2.50	3.25	
28692.	Funnel, Separatory, cylindrical, with ground glass stopper and short stem, exactly like No. 28688 but graduated.						
	Capacity, cc.....				500	1000	
	Each.....				4.00	5.00	
28696.	Funnel, Separatory, cylindrical, graduated, with glass stopper and air vent.						
	Capacity, cc.....				100	250	
	Each.....				2.00	3.00	
28700.	Funnels, Separatory, pear shape, with ground glass stopper.						
	Capacity, cc.....	30	60	125	250	500	1000
	Each.....	1.00	1.10	1.20	1.50	2.00	3.40
28704.	Funnels, Separatory, same as No. 28700 but with air vent in stopper.						
	Capacity, cc.....	125	250	500	1000	2000	
	Each.....	1.50	2.00	2.50	3.90	5.50	
28708.	Funnel, Separatory, for ether separation in nickel determinations. The outlet stem is moderately long and of small caliber so as to bold a column. Specially designed for use in iron and steel laboratories. Capacity, 160 cc.						1.75
28712.	Funnel, Separatory, for nickel determinations, as described in Blair's "Analysis of Iron and Steel," 7th Ed., p. 191.						3.00
28716.	Funnels, Separatory, Squibb, with ground glass stopper.						
	Capacity, cc.....		125	250	500		
	Each.....		1.50	1.80	2.40		
28720.	Funnel, Separatory, for sulphonation test of creosote, as used in the Forest Service of the U. S. Department of Agriculture. With graduated tube above the bulb. Capacity 125 cc.						3.00
28724.	Funnel, Separatory, LaWall, for preventing the formation of emulsions in shaking out with immiscible solvents. See Journal of American Pharmaceutical Association, April, 1914, p. 498. The liquid to be extracted is placed in one bulb, with sufficient water to completely fill the bulb and the immiscible solvent is placed in the second bulb. By inclining the apparatus, with the lighter of the two solvents in the lower bulb, extraction is easily accomplished by the passing of the liquids through the construction between the bulbs. Recommended for use in the assay process for alkaloidal fluid extracts.						
	Capacity of bulbs, cc.....		25	50	100		
	Each.....		1.50	1.60	1.75		
28728.	Funnel, Strans, for estimating lactic acid in gastric juice; with glass stopcock						1.25
28732.	Funnel, Dropping, Walter, for examining single drops. Capacity, 60 cc.						1.50
28736.	Funnel Attachment, for use in filling test tubes, flasks, etc. It prevents contact of fluid with the surface of vessel being filled so that the latter remains clean for the insertion of cotton plug. Including rubber tubing and pinchcock						.50



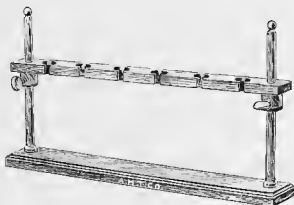
No. 28740	No. 28741	No. 28748	No. 28752	No. 28756	No. 28749	No. 28764	No. 28768	No. 28772	No. 28776	No. 28780
28740.	28741.	28748.	28752.	28756.	28749.	28764.	28768.	28772.	28776.	28780.
Funnel Tubes, straight, with conical top.	Funnel Tubes, straight, with thistle top.	Funnel Tubes, with loop and conical top.	Funnel Tubes, with loop and thistle top.	Funnel Tube, with loop, one bulb and conical top.	Funnel Tube, with loop, one bulb and conical top.	Funnel Tube, with double loop and one bulb on each side.	Funnel Tube, with double loop and one bulb on each side.	Funnel Support, for holding funnels on beaker.	Funnel Support, Ostwald, of brass wire, for one funnel.	Funnel Support, as above, but adjustable in height from 15 to 24 cm.
Length, mm.....	Length, mm.....	Length, mm.....	Length, mm.....	Length 300 mm.....	Length 300 mm.....	With thistle top; length 300 mm.....	With thistle top; length 300 mm.....	Diameter, mm... 65	Diameter, mm... 80	Diameter, mm... 100
200	200	200	200	300	300	300	300	.10	.10	.12
.10	.07	.08	.16	.20	.20	.20	.20	.25	.25	.35
.12	.12	.12	.20	.25	.25	.25	.25	.40	.40	.40
.14	.14	.14	.25	.25	.25	.25	.25	.30	.30	.30
.400	.400	.400	.400	.400	.400	.400	.400	1.00	1.00	1.00



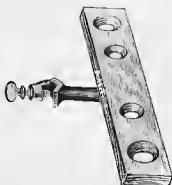
No. 28784	No. 28788	No. 28792	No. 28796	No. 28800
28784.	28788.	28792.	28796.	28800.
Funnel Support, of wood, for one funnel.....	Funnel Support, of wood, for two funnels, one on each side.....	Funnel Support, of wood, for two funnels, both on one side.....	Funnel Support, of wood, for four funnels, two on each side.....	Funnel Support, of wood, for four funnels, two on each side.....
.90	.50	.75	.70	.90



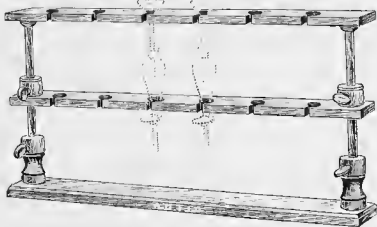
No. 28804	No. 28808
28804.	28808.
Funnel Support, of wood, improved pattern. For, funnels.....	Support, Schultz, of brass, nickel plated, adjustable in length from 40 cm to 120 cm and adaptable to from 1 to 20 simultaneous filtrations; with 12 triangular funnel supports.....
6	12
2.75	4.50
15.00	15.00



No. 28812



No. 28824



No. 28820

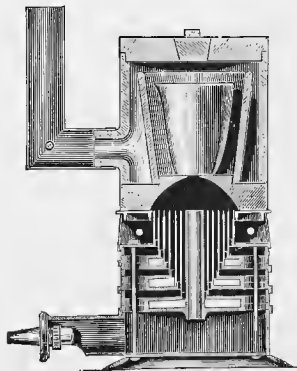


No. 28828

28812.	Funnel Support, of wood for six funnels in one row, with slotted holes.....	2.00
28816.	“ “ “ “ twelve funnels, six in each row, with slotted holes	4.50
28820.	Funnel Support, Leach, for separatory funnels.....	6.00
28824.	“ “ “ “ for four funnels, of wood with metal clamp, for attaching to support .....	.50
28828.	Funnel Support, revolving form, a very convenient new model.....	25.00



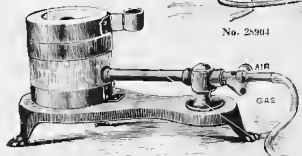
View in Salesroom Showing Arrangement of Samples



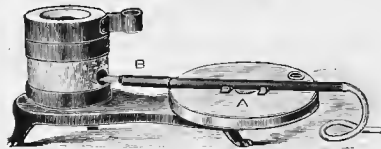
No. 28900



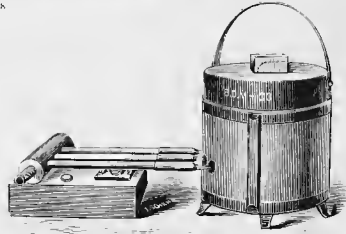
No. 28901



No. 28902



No. 28912



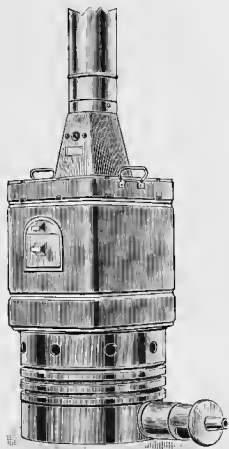
No. 28916

- 28900. Furnace, Fletcher Crucible No. 15, for operation without blast. Takes crucibles up to 4 x 3½ inches. For operation with either illuminating gas, natural gas or gasoline gas. Requires ½ inch diameter gas feed pipe. Price includes 6 ft. of pipe, a No. 3 clay crucible, clay cylinder and tongs 16.00
- 28904. Furnace, Fletcher Crucible No. 40, for illuminating gas only. Requires blast from foot blower such as No. 21968 and ¾ inch gas supply pipe. Takes No. 00 clay crucible. Complete with one No. 00 crucible, but without foot blower..... 3.50
- 28908. Furnace, Fletcher Crucible No. 40a, Injector. For use with illuminating gas, natural gas or gasoline gas. Requires ¾ inch supply pipe and takes a No. 00 clay crucible. May be used with foot blower No. 21968 and, where regular gas supply is not available, with gasoline gas generator. Complete with one No. 00 clay crucible, but without foot blower..... 4.00
- 28912. Furnace, Fletcher Crucible Kerosene Blast No. 40B, for use with refined petroleum or kerosene oil. Requires foot blower No. 21968 and takes No. 00 clay crucible. Complete with one No. 00 clay crucible but without foot blower..... 5.50
- 28916. Furnace, Fletcher Crucible Kerosene Blast No. 41E, similar to No. 28912 but larger. Complete with one No. 1 clay crucible and two burners, but without foot blower..... 10.50
- 28920. Furnace, Fletcher Crucible Kerosene Blast, similar to No. 28916 but larger. Complete with one No. 3 clay crucible and three burners, but without foot blower..... 13.00

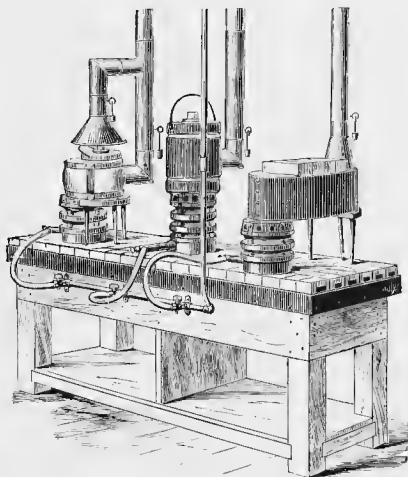
- 28924. Furnace, Fletcher Combined Muffle and Crucible No. 141, for use with illuminating gas, natural gas or gasoline gas. Requires foot blower No. 21968 and 1 inch bore supply pipe. Takes a No. 3 crucible or a muffle 3½ x 2½ x 6½ inches, or, when used as a crucible furnace only, takes a No. 6 crucible. Complete with muffle and one No. 3 clay crucible, but without foot blower..... 11.00



No. 28924

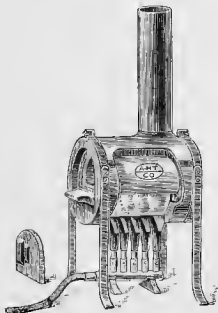


No. 28925



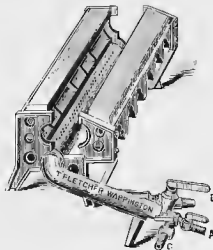
No. 28936-40

28928. **Furnace, Fletcher Muffle**, for exact temperatures not exceeding that of the fusing point of copper. For use with illuminating gas, natural gas or gasoline gas. Complete with muffle, dome, crucible tongs and 6 ft. of pipe.
- | | | | | |
|-------------------------------|--------------|--------------|--------------|---------------|
| Number..... | 3 | 4 | 5 | 6 |
| Muffle space, inches..... | 5½ x 5¼ x 5½ | 7½ x 6½ x 5½ | 8½ x 7½ x 6½ | 10½ x 9½ x 8½ |
| Bore of gas pipe, inches..... | 1 | 1 | 1 | 1 |
| Each..... | 17.00 | 22.00 | 35.00 | 45.00 |
28932. **Extra Domes or Muffles, each.....** 1.00 1.25 1.50 2.50
28936. **Furnace, Assayer's Combination, Brown**, fully described in "Manual of Assaying Gold, Silver, Copper and Lead Ores." For use with illuminating gas, natural gas or gasoline gas. Consists of three furnaces; the one on the left for roasting sulphurets, the center one for crucible fusions, taking a plumbago crucible 4 inches high by 3½ inches in diameter, and the one on the right for scorification and cupellation. Complete with plumbago fittings, chimney pipe, horizontal gas pipe and three ¾ inch taps, as illustrated, but without vertical gas pipe, fire-brick covered bench or rubber tubing. 57.00
28940. **Fire-Brick Covered Bench, extra.....** 32.00



No. 28944

28944. **Furnace, Wiesnegg Muffle, original French make**, for incineration. As supplied by us to the Food Laboratories of the U. S. Department of Agriculture, etc. Muffle dimensions 113 x 70 x 165 mm. Complete with muffle and 5 gas burners..... 16.00
28948. **Extra Muffles, each.....** .75
28952. **Combustion Furnace, Fletcher**, for ordinary gasoline or natural gas. For high temperatures it should be used with Foot Blower No. 21952 or other form of blast.
- | | | | |
|---------------------------|-------|-------|-------|
| Length of furnace, inches | 12 | 18 | 24 |
| Each | 12.00 | 16.00 | 20.00 |
28956. **Extra Fire-Clay Tiles**, 6 inches long, for use with Furnace No. 28952. Each..... .50



No. 21952



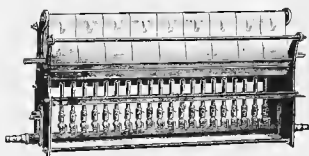
No. 28965



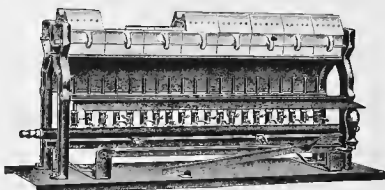
No. 28972



No. 28976

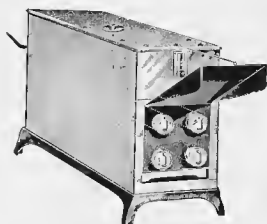


No. 28960

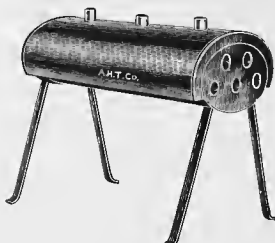


No. 28964

28960.	Combustion Furnace, von Babo-Erlenmeyer, a widely used and satisfactory model. With Bunsen burners with both stopcock and air regulator.				
	Number of burners.....	10	15	20	25
	Length of heating surface, cm.....	25	35	45	60
	Each.....	20.00	25.00	30.00	38.00
28964.	Combustion Furnace, Glaser, with burners of the Finkener type with stopcock and air regulator. Burner system is adjustable both vertically and horizontally and, by a special arrangement of the tiles and burners, a uniformly long surface is heated by each burner so that only 20 burners are required to heat an 80 cm surface.				
	Number of burners.....	10	15	20	
	Length of heating surface, cm.....	38	56	80	
	Each.....	35.00	40.00	50.00	
28968.	Extra Side Tiles for Furnace No. 28964. Each.....				.25
28972.	“ Top “ “ 28964. Each.....				.35
28976.	“ Clay Gutters for Furnace No. 28964. Each.....				.20

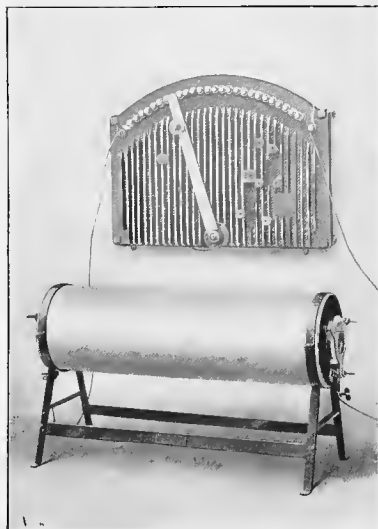


No. 28980

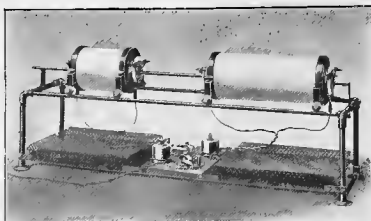


No. 28984

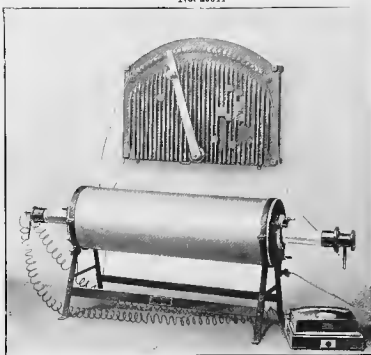
28980.	Furnace, Freas Tube, with electric heating and control. Recommended as a safeguard against untimely explosions so frequent with gas heated furnaces, due to fluctuating gas pressure, etc. The front of the furnace is fitted with a cast iron frame with four iron tubes 25 inches long and 1½ inches in diameter, set in and properly supported. The iron frame is also provided with a heavy metal hood to prevent contents of the tubes causing personal injury in case of an explosion. The indicator of the furnace is graduated for temperatures up to 200° C., but can be furnished for other temperatures when desired.....	85.00
28984.	Furnace, Explosion, Carius, for five 20-inch tubes. Tubes may be used up to 1½ inches outside diameter.....	15.00



No. 29033



No. 29041



No. 29044

Combustion Furnace, Heraeus, Type A. Wound with platinum ribbon for a maximum temperature of 1400° C. The inside diameter of the tube is 20 mm. Voltage must be specified in ordering. Prices include platinum. Length of heating tube, cm.....

29032.	Furnace only, without rheostat	47.50	63.00	72.50
29033.	" with rheostat for 110 volts.	61.50	85.00	98.10
29034.	" " " 220 "		85.00	98.10

Combustion Furnace, Heraeus, Type B, exactly same as No. 29032 but with tube 30 mm inside diameter and maximum temperature of 1350° C. Length of heating tube, cm.....

29036.	Furnace only, without rheostat	57.00	69.00	78.50	90.50
29037.	" with rheostat for 110 volts.			72.00	91.00
29038.	" " " 220 "			91.00	104.10

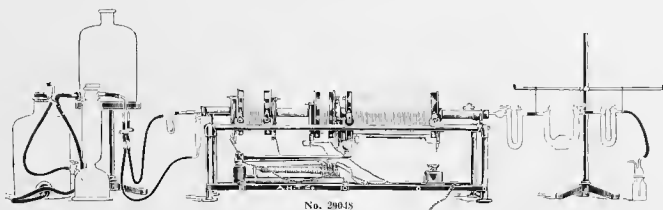
Combustion Furnace, Heraeus, for Reactions in Vacuum or in Gases other than Air. This is a platinum wound furnace of the same type as No. 29032 and No. 29036 but with larger internal chamber so that a special tube with closed end may be inserted. One end of the tube is provided with connections for the thermo-couple of a pyrometer and the other end with a mica observation window and inlet and outlet tubes for the gases. Tubes can be used of Royal Berlin porcelain, glazed inside and outside, opaque fused silica or Marquardt mass. For temperatures under 1000° C. the Royal Berlin glazed porcelain tubes are recommended as being more likely to be entirely gas tight. We guarantee none of the tubes to be absolutely gas tight under all conditions. With silica or Marquardt tubes a temperature of 1300° C. can be obtained. Prices include a suitable tube of Royal Berlin porcelain with the end fittings as shown in illustration but do not include pyrometer or thermo-couple. Inside diameter of the tube is 1 1/8 inches.

	Length of heating surface, cm.....		30	60
--	------------------------------------	--	----	----

29040.	Furnace, without rheostat		93.25	142.50
29041.	" with 110 volt rheostat.		127.25	185.00
29042.	" " " 220 "		127.25	185.00

Combustion Furnace, Heraeus, for Organic Analysis. Consists of two mutually independent furnaces mounted on wheels which operate on top of a supporting frame. A grooved metal trough extends through both furnaces and carries a combustion tube which should be about 90 cm in length. Each furnace is provided with a separate rheostat. The larger furnace is 35 cm in length and will cover a charge of copper oxide about 25 cm long. Prices include platinum. Voltage.....

			110	220
Each.....		135.00		124.50



No. 29048

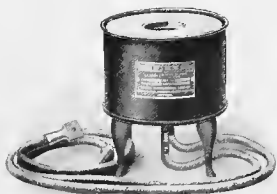
29048. Combustion Furnace, Heraeus-Dennstedt, for elementary organic analysis. See *Zeitschrift für angewandte Chemie* 1905, 18, 1134. For 110 volts the furnace takes about 16 grams of platinum and the 220 volt takes about 8 grams. This is not included in the price and is added to the cost of the furnace at market price. The glassware and supports constituting the train after Dennstedt are not included in the price nor is the combustion tube. Furnace only, for either 110 or 220 volts, **Duty Free** 82.50
29052. Complete Set of Glass Parts, rubber connections and supports for above, outfit to be arranged as shown in illustration. **Duty Free** 27.00



No. 29056

Furnace, Electric, Hoskins Crucible Type FA, for operation between a minimum of 316° C and a maximum of 1000° C, for either 110 or 220 volts alternating or direct current. Life of the heating element of nickel-chromium about 1000 hours if operating temperature is kept at maximum or below by means of rheostat which should always be used in connection with the furnace for safety as to burn outs and accurate control. Power consumption of No. 101 is 450 Watts and of No. 103 is 1000 Watts. Voltage must be specified in ordering.

No. 29060



Number	FA 101	FA 103	FA 104
Internal dimensions of chamber, inches	2 x 2½	4 x 4	5 x 5
29056. Furnace only	18.00	40.00	60.00
29057. Furnace with rheostat	23.00	48.00	70.00
Alundum Core only	1.00	2.00	4.00
Heating Unit	1.00	2.00	3.00
Core wound with wire	4.00	8.00	13.00

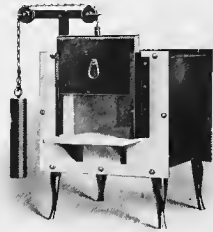
Number	FB 101	FB 102	FB 105
Inside dimensions of chamber, inches	1½ x 1½	2 x 2½	4 x 6
29060. Furnace only	18.00	20.00	60.00
29061. Furnace with Rheostat and Transformer, 60 cycles	41.00	45.00	109.00
29062. Furnace with Rheostat and Transformer, 25 cycles	51.00	55.00	122.50
Extra Heating Units	3.00	4.00	8.00

Note Regarding Use of Hoskins Type FA Furnaces

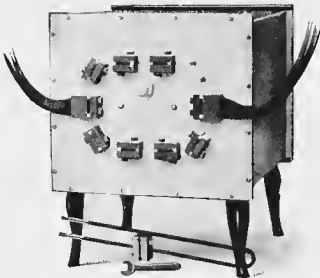
All Hoskins Type FA Furnaces are wound so that when connected to the proper voltage (110 or 220 volts alternating or direct) which is always stamped on the name plate, they will reach the maximum safe working temperature of 1832° F or 1000° C in approximately one hour. The Type FA Tube and Crucible Furnaces require approximately 40 minutes to reach this temperature. If these furnaces are left on the full line voltage after they have reached 1832° F the temperature will continue to increase and the resistance element will consequently burn out in a short time. To guard against this, a rheostat should always be connected in series with the furnace, and after the furnace has reached the desired working temperature the rheostat handle should be turned back part of the way toward the starting position. The proper point at which to set the rheostat handle in order to maintain any desired temperature may readily be determined by trial. Where the furnace is frequently operated at the same temperature it is convenient to make a mark on the rheostat at the proper point for maintaining this temperature, and after furnace has reached the proper temperature the rheostat handle can be set at the mark and left there, thus insuring that the proper temperature will not be exceeded.



No. 29064



No. 29065



No. 29068—Rear View of Type FB202



No. 29068—FB206

Furnace, Electric, Hoskins Muffle Type FA, general specifications the same as above with the exception of shape. FA 201 consumes 1100 Watts and FA 204 consumes 4150 Watts. Voltage must be specified in ordering.

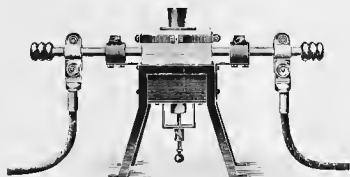
	FA 201	FA 202	FA 203	FA 204
Number.....	FA 201	FA 202	FA 203	FA 204
Inside dimensions of chamber, inches ..	3½ x 2½ x 5	4½ x 3 x 8	5½ x 3½ x 9	7½ x 5½ x 11
29064. Furnace only	35.00	50.00	65.00	80.00
29065. Furnace with rheostat.	43.00	60.00	85.00	110.00
Alundum Muffle only.....	2.50	4.00	5.00	7.00
Heating Unit.	2.50	4.00	6.00	10.50
Muffle wound with wire.	9.00	13.50	18.00	28.00

Furnace, Electric, Hoskins Muffle Type FB, operating within the same limits as Type FB Crucible Furnaces above. The control on the small size FB 202 is by means of rheostat with transformer but in all of the larger sizes is accomplished by means of regulating transformer only. Furnaces FB 206 and FB 207 are furnished on wire stand as shown in illustration.

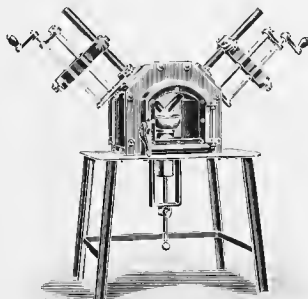
	FB 202	FB 204	FB 206	FB 207
Number	FB 202	FB 204	FB 206	FB 207
Inside dimensions of chamber, inches....	4½ x 3 x 9	7½ x 5 x 12½	12 x 8 x 19	12 x 8 x 26
Number of Heating Units.....	10	10	14	14
29068. Furnace only	60.00	95.00	250.00	300.00
29069. Furnace with Rheostat and Transformer, 60 cycles	116.00	190.00	422.00	486.00
29070. Furnace with Rheostat and Transformer, 25 cycles	132.50	210.00	481.00	534.00
Heating Units, each.....	1.00	2.00	3.00	4.00

Note Regarding Use of Hoskins Type FB Furnaces

Hoskins Type FB Furnaces which are operated in connection with rheostat control, i. e., Type FB 101, 102, 105, 202 and 301 are controlled in the same manner as Type FA Furnaces, the use of the transformer with the above mentioned Type FB Furnaces being simply for the purpose of stepping down the line voltage to the proper pressure for these furnaces.



No. 29072



Nos. 29076 and 29080

29072. Furnace, Electric Arc, Moissan Type, new model for experimental work. Current consumption 100 amperes at 50-60 volts. Accommodates a crucible 50 mm high by 45 mm diameter or a dish 35 mm high by 28 mm diameter. Without cables.

Duty Free.....	49.50	Duty Paid.....	65.00
Accessories			
1 pair Cables, 150 cm long, with connections.....	11.40	Duty Free	15.00
Extra per meter per pair when cables longer than above are required	2.85		3.75
Carbon Electrodes, 350 x 22 mm, per pair.....	.45		.60
Carbon Crucible with depression for electrodes.....	.27		.35
Magnesite Crucible.....	.30		.40
Magnesite Dish.....	.60		.80
Carbon Dish.....	.27		.35
Magnesite Dish.....	.27		.35
Magnesite Dish.....	.60		.75

Note—Duty Free prices are extended on Accessories only when they are ordered in connection with the Furnace and complete outfit.

29076. Furnace, Electric Arc, Moissan Type, new model with carbon adjustment. Current consumption 100 amperes at 50-60 volts. Will accommodate a dish 100 mm in diameter by 55 mm high. Without cables.

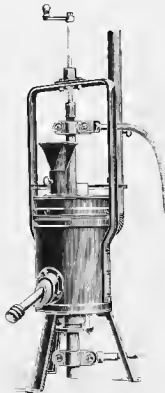
Duty Free.....	87.40	Duty Paid.....	115.00
Accessories			
1 pair of Cables, 150 cm long, with connections.....	11.40	Duty Free	15.00
Extra per meter per pair when cables longer than above are required	2.85		3.75
Screen of colored glass.....	4.50		6.00
Carbon Dish, 100 mm diameter.....	.35		.45
Magnesite Dish, " " " ".....	.45		.60
Magnesite Dish, " " " ".....	.95		1.25
Carbon Electrodes, 500 x 22 mm, per pair.....	.60		.75

29080. Furnace, Electric Arc, same as No. 29076 but with a current consumption of 200 amperes at 50-60 volts. Without cables.

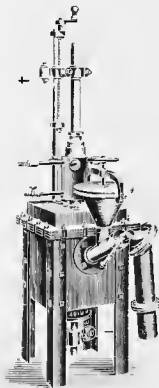
Duty Free.....	136.80	Duty Paid.....	180.00
Accessories			
1 pair of Cables, 150 cm long, with connections.....	19.75	Duty Free	26.00
Extra per meter per pair, when cables longer than above are required	9.50		12.50
Screen of colored glass.....	4.50		6.00
Carbon Dish, 100 mm diameter.....	.35		.45
Magnesite Dish " " " ".....	.45		.60
Magnesite " " " ".....	.95		1.25
Carbon Electrodes, 500 x 40 mm, per pair.....	1.60		2.00

29084. Furnace, Electric Arc, for Continuous Operation, for the handling of oxides difficult to reduce, such as chrome oxide, etc., as well as more or less infusible metals. The oven may be filled through the funnel at the top and emptied through the spout at the side. Dimensions of melting chamber 140 x 100 mm. For current consumption of 100 to 150 amperes at 50-60 volts.

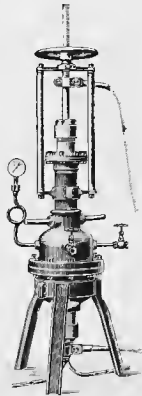
Duty Free.....	95.00	Duty Paid.....	125.00
Accessories			
1 pair of Cables, 150 cm long, with connections.....	16.00	Duty Free	21.00
Extra per meter per pair when cables longer than above are required	4.50		6.00
Colored Glasses with one pair of extra glass discs.....	1.35		1.75
Crucible of Carbon, with outlet tube.....	3.80		5.00
" " Magnesite, with outlet tube.....	4.50		6.00
Upper Carbon Electrodes, 500 x 30 mm.....	.45		.60
Lower " " 300 x 40 mm.....	.60		.75



No. 29084



No. 29088



No. 29092

29088. Furnace, Electric Arc, for distillations of phosphorus and various metals. The distillate is taken off through the side tube and the remaining material after the removal of the lid. For current consumption of 100 to 150 amperes at 50-60 volts. Dimensions of melting space 140 x 100 mm. Without cables.

Duty Free.....	171.00	Duty Paid.....	225.00
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Accessories

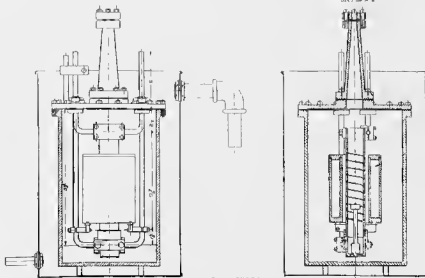
1 pair of cables, 150 cm long, with connections.....	Duty Free	Duty Paid
Extra per meter per pair, when cables longer than above are required.....	16.00	21.00
Crucible of Carbon.....	4.50	6.00
" " Magnesite.....	3.80	5.00
" " ".....	4.50	6.00
Upper Carbon Electrodes, 750 x 30 mm, per pair.....	.55	.75
Lower " " 300 x 40 mm, per pair.....	.60	.75

29092. Furnace, Electric Arc, Vacuum or Pressure, or for operation with gases other than air. Current consumption 100 to 150 amperes at 50-60 volts. Without cables.

Duty Free.....	285.00	Duty Paid.....	375.00
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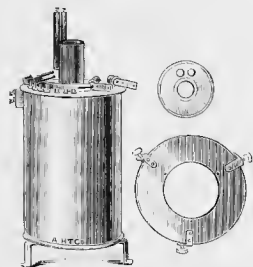
Accessories

1 pair of Cables, 150 cm long, with connections.....	Duty Free	Duty Paid
Extra per meter per pair, when cables longer than above are required.....	16.00	21.00
Carbon Crucible, 70 x 60 mm.....	4.50	6.00
Carbon Electrodes, 150 x 25 mm, each.....	.35	.45
	.40	.55



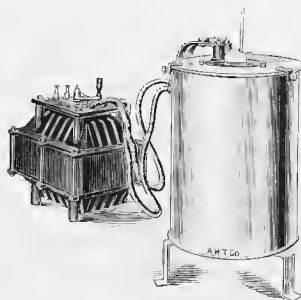
No. 29096

29096. Furnace, Arsem Electric Vacuum, as used in the Research Laboratories of the General Electric Company, U. S. Bureau of Standards, etc. Sizes and descriptions of various installations on request.



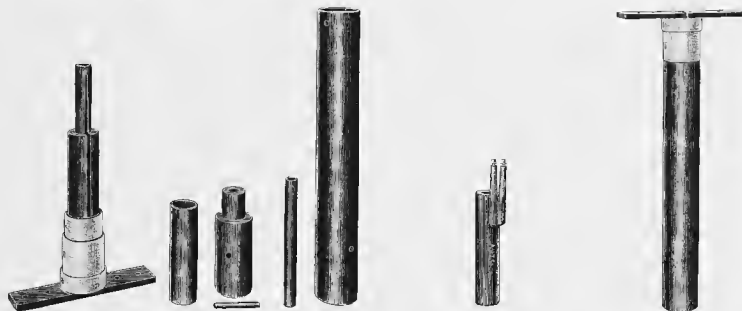
No. 29100

Large Furnace with Top and Cover removed and Heater Unit disconnected



No. 29100

Large Furnace, Assembled and Connected with Special Transformer



Cascade Attachment for Large Furnace taken apart

Heater Unit of Large Furnace Cascade Attachment Assembled

FURNACES, HIGH TEMPERATURE ELECTRIC, NORTHRUP, a new construction of electric furnace on a non-vacuum principle wherein the furnace itself develops in its heating chamber an atmosphere of carbon monoxide. The furnaces consist essentially of three main parts, a graphite heater unit, an inner compartment of moulded refractory material into which the heater unit fits, and an outer compartment filled with powdered refractory material, with outside jacket of polished monel metal. The furnaces are of the vertical type and heating chamber in the large model is a tube $1\frac{1}{2}$ inches internal diameter and 12 inches long, and in the small model 1 inch in diameter and $5\frac{1}{2}$ inches long. The Cascade Attachment for the large model is inserted in the chamber of the large furnace after same has been brought to a high temperature and the energy from the same transformer transferred by means of switch to the heating element of the attachment. The resistor-unit of the Cascade Attachment consists of a tube of re-graphitized Acheson graphite containing a crucible 11 mm internal diameter and 70 mm deep. These furnaces operate only on alternating current of low voltage.

Transformer for Large Model—This is specially made for a primary of 110, 220, 220 or 240 volts with five taps off on its winding and a switch whereby the secondary voltage may be regulated as many steps for a variety of temperatures. Capacity 4 K. W. for continuous operation and available for short intervals at a greater load.

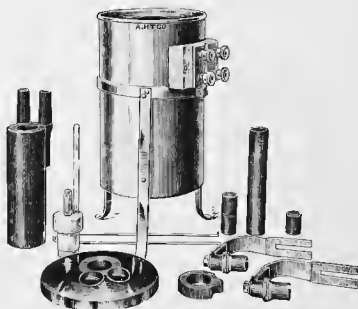
Transformer for Small Model—Capacity 1.5 K. W. continuously or 3 K. W. for 30 minutes.

Temperatures—For the large model a working temperature of over 1600°C . is not recommended although an occasional use at the temperature of melting platinum, 1755°C . is possible. With the Cascade Attachment in the large model a temperature of over 3000°C . is attained throughout a heating space of 15 cc. The small model may be safely operated at temperatures up to 1800°C .

Use—These furnaces have been developed by Dr. Northrup for use in his own researches upon the electrical conduction of matter at high temperatures but they have a great variety of application between 1100°C . and 1800°C ., avoiding the inconvenience and expense of the vacuum type furnace and where the temperature required makes the use of platinum wound furnaces impossible. No contaminating vapors are given off in these furnaces and their perfect black body temperature makes them admirable for the calibration of optical pyrometers. The small furnace is particularly adapted for melting cylinders or cones of coal ash without the gradual deterioration of the heater unit by vapors given off by the material. The furnaces are well adapted to the fusing of any of the precious metals and to the study of alloys because of the freedom from contamination during the process.



No. 29116
Small Furnace, Assembled



No. 29116
Small Furnace Showing All Principal Parts

- 29100. Furnace, Northrup, High Temperature Electric, Large Model, including graphite-crucible-tube with tongs for convenient handling and one cover piece for Furnace. Without transformer.. 360.00
- 29104. Special Transformer for Large Model, 4 K.W. capacity for continuous operation. To work on primary line of 110, 120, 220 or 240 volts, as ordered. The secondary voltage is regulated in five steps by tap offs from the primary winding..... 165.00
- 29108. Cascade Attachment for Large Model, with double-pole double throw switch with two pairs of flexible leads with connectors..... 125.00
- 29116. Heater Units for Large Model, of standard size and construction and ready for quick connection. . 35.00
- 29120. Graphite-Crucible-Tube for Large Model, 12 $\frac{1}{2}$ inches long with $\frac{1}{2}$ inch wall, closed at bottom. . 5.00
- 29124. Special Tongs, for handling graphite-crucible-tubes..... 1.50
- 29128. Cylindrical Graphite Weights for Large Model. These fit in the graphite-crucible-tube and are 2 inches high. They are convenient for use in building up load to bring the charge to any desired height from the bottom of the Furnace. Arranged for convenient handling by special tongs listed above..... 1.50
- 29132. Special Refractory Cylinders for Large Model. These are of the same shape and serve the same purpose as the Graphite Cylinders. They will not shrink or expand or contaminate the charge and have very high insulation..... 4.50
- 29136. Extra Covers for Large Model, of refractory material with window or sight hole and a stopper to close same when necessary..... 9.00
- 29140. Replaceable Resistor Units for Cascade Attachment..... 3.00
- 29144. Graphite-Crucible-Tubes for Cascade Attachment..... 1.50
- 29146. Furnace, Northrup, High Temperature Electric, Small Model, with one graphite-crucible-tube with tongs for handling, furnace cover piece and one compression carbon rheostat for insertion in the primary for close control of the voltage..... 90.00
- 29148. Special Transformer for Small Model, 1 $\frac{1}{2}$ K.W. capacity for continuous operation or 3 K.W. for 30 minutes. Primary winding to order for 110, 120, 220 or 240 volts. This transformer is not sold separately and is furnished only with the Small Model Furnace..... 65.00
- 29152. Heater Unit for Small Model, complete..... 30.00

References—

- "Resistivity of Copper in Temperature Range 29° C. to 1450° C." Journal of the Franklin Institute, January, 1914
- "A New High Temperature Furnace." Metallurgical and Chemical Engineering, January, 1914.
- "High Temperature Resistivity of Refractories; a New Method of Measuring, with Results for Aluminum." Metallurgical and Chemical Engineering, February, 1914.
- "Temperature and the Properties of Matter." Metallurgical and Chemical Engineering, June, 1912.
- "Molybdenum and Tungsten; Their Thermal E. M. F." Metallurgical and Chemical Engineering, January, 1913.
- "Resistivity of a few Metals Thru a Wide Range of Temperature. Journal of the Franklin Institute, February, 1913.
- "Some Effects of Temperature upon the Resistance of Graphite and Carbon." Metallurgical and Chemical Engineering, May, 1913.
- "Resistivity of Pure Gold in Temperature Range 29° C. to 1500° C." Journal of the Franklin Institute, March, 1914.
- "Resistivity of Brass: Solid and Molten." Metallurgical and Chemical Engineering, March, 1914.
- "Cascade Arrangement for Graphite Furnaces." Metallurgical and Chemical Engineering, May, 1914.

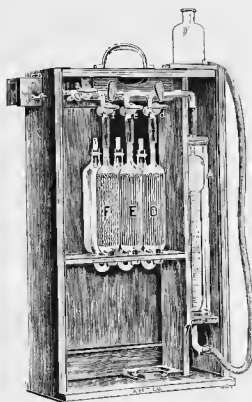
Complete eight page circular, showing heating curves, etc., will be sent upon request.



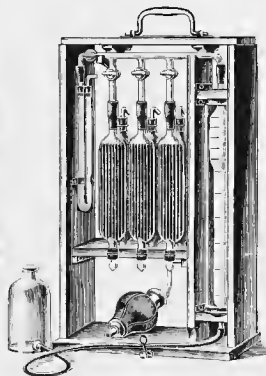
No. 29156

29156. Fusel Oil Apparatus, Bromwell, with stopcock and glass stopper in accordance with the requirements of the U. S. Department of Agriculture, Bureau of Chemistry, Bulletin 107, revised..... 3.50

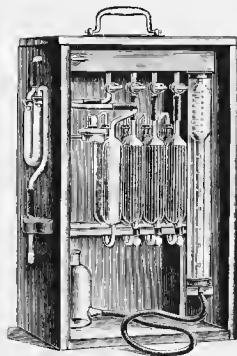
GAS ANALYSIS APPARATUS



No. 29160

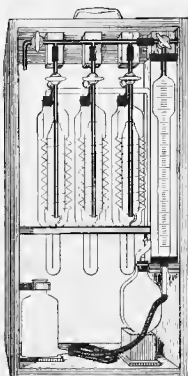


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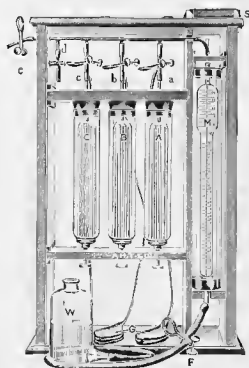


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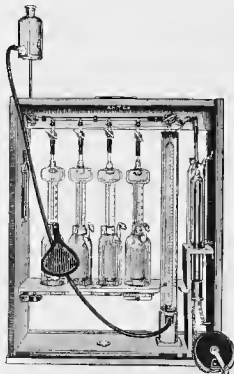
29160. Gas Analysis Apparatus, Orsat-Muencke, for the determination of CO₂, CO and O, particularly in flue and furnace gases. Consisting of graduated measuring burette with water jacket, aspirator bottle, three absorption pipettes and manifold tube which projects through the upper left-hand side of the case and which is provided with four glass stopcocks. Complete in portable oak case of durable construction..... 25.00
29164. Manifold for above with one horizontal and three vertical stopcocks, for three pipettes.... 8.00
29168. Gas Analysis Apparatus, Orsat-Fischer. This apparatus differs from the Orsat-Muencke only in the addition of a drying tube inside the case and attached to the manifold, the left-hand end of which turns down to make this connection instead of projecting through the wooden case as in the Orsat-Muencke. For three pipettes..... 25.00
29172. Manifold for above..... 8.00
29176. Gas Analysis Apparatus, Orsat-Lunge, similar in arrangement and principle to the Orsat-Muencke, but with four pipettes and bent palladium tube with lamp for heating same for separate estimation of hydrogen, and also drying tube on outside of case. Complete in portable oak case... 34.00
29180. Manifold for above, with one horizontal stopcock and four pipette stopcocks..... 10.00
- Note—The pipettes, measuring burettes, etc., for the three preceding gas analysis apparatus are standard and interchangeable and are carried in stock separately as follows:—
29184. Measuring Burette only, without water jacket..... 3.00
29188. Water Jacket only, for measuring burette..... .75
29192. Absorption Pipette, plain..... 2.00
29196. “ “ filled with glass tubes..... 2.50
29200. “ “ “ “ “ and copper spiral..... 2.50
29208. Soft Rubber Bag for attaching to pipette..... .50
29212. Rubber Bulb, of black acid-cured rubber with double valve set in bone fittings..... 2.50
29216. Gas Analysis Apparatus, Orsat-Dennis. See *Journal of Industrial and Engineering Chemistry, Vol. 4, No. 12*. Complete with measuring burette in water jacket, aspirator bottle, manifold tube with one horizontal stopcock and three pipette stopcocks and the new patent spiral absorption pipettes after Friedrichs. Complete in portable case..... 45.00
29220. Gas Analysis Apparatus, Orsat-Allen and Moyer. See *Transactions of the American Society of Mechanical Engineers, Vol. 18, p. 901*, and *Power Plant Testing, by J. A. Moyer, Chapter IX, 1911*. The distinctive improvement over the preceding forms of Orsat Apparatus is in the substitution of hard rubber capillaries for glass and the new absorption pipettes which are easily removable for the renewing of solutions..... 25.00



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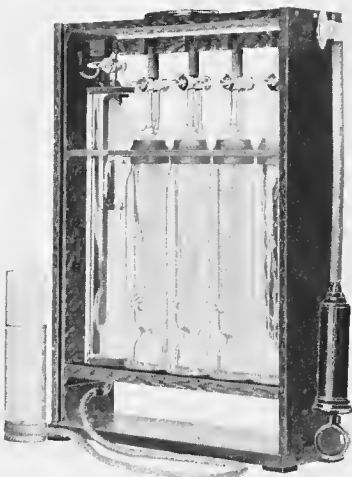


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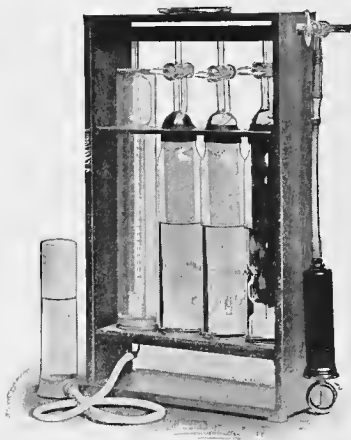


No. 29280

29280. Gas Analysis Apparatus, Lomschakow, for flue, generator and mine gases; a new system offering the advantage of great rapidity of operation, quick and complete absorption, economy of reagents and simple and convenient cleaning. See *Chemiker-Zeitung*, Nr. 133, 1913. With three absorption pipettes..... 50.00
29284. Extra Absorption Pipettes, each..... 10.00

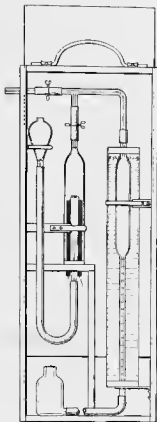


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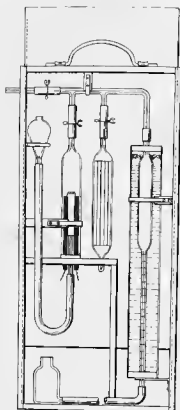


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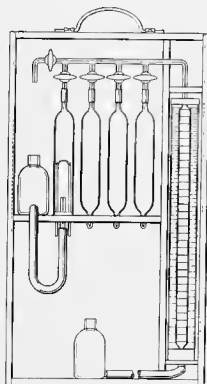
29288. Gas Analysis Apparatus, Williams Patent, Model A for complete analysis of combustible gases. For carbon dioxide, illuminants, oxygen, carbon monoxide, hydrogen, methane and nitrogen. Complete in portable oak case..... 50.00
29292. Portable Explosion Coil, with batteries, in quartered oak case..... 5.00
29296. Gas Analysis Apparatus, Williams Patent, Model B for flue gas analysis. With Williams' special bubbling pipettes. For carbon dioxide, oxygen and carbon monoxide..... 35.00



No. 29300



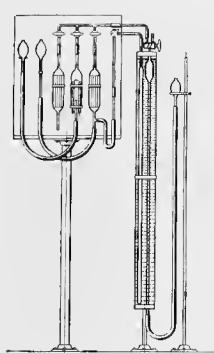
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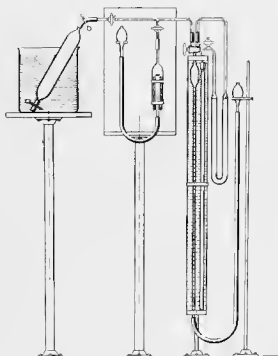
No. 29316

GAS ANALYSIS APPARATUS, BURRELL, U. S. BUREAU OF MINES TYPE. This series of Gas Analysis Apparatus is made in accordance with the original drawings furnished us by the Bureau of Mines and is in exact accordance with the specifications and descriptions in Bulletin 42 of the Bureau of Mines, *The Sampling and Examination of Mine Gases and Natural Gas*, Burrell and Seibert. The figure numbers given refer to illustrations in the above Bulletin. Prices on individual glass parts are quoted on application. All connections in explosion pipettes are of No. 27 platinum wire.

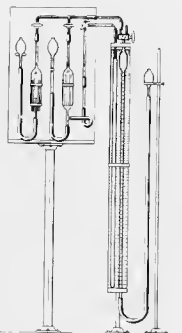
- 29300. Apparatus for the Determination of Methane in Mine Air, Portable Form, Fig. 13 of Bulletin 42. Complete in wooden case with sliding doors, rubber tubing, clamps, etc. 17.00
- 29304. Complete Set of Glass Parts only. 8.00
- 29308. Apparatus for the Determination of Carbon Dioxide and Methane in Mine Air, Portable Form, Fig. 14 of Bulletin 42. Complete with rubber tubing, clamps, etc., in wooden case with sliding doors. 18.50
- 29312. Complete Set of Glass Parts only. 9.00
- 29316. Apparatus for the Approximate Analysis of Mine Air, Portable Form, Fig. 16 of Bulletin 42. Pipettes are filled with glass tubes not shown in illustration. Complete in wooden case with sliding doors 29.50
- 29320. Complete Set of Glass Parts only. 17.00



No. 29324



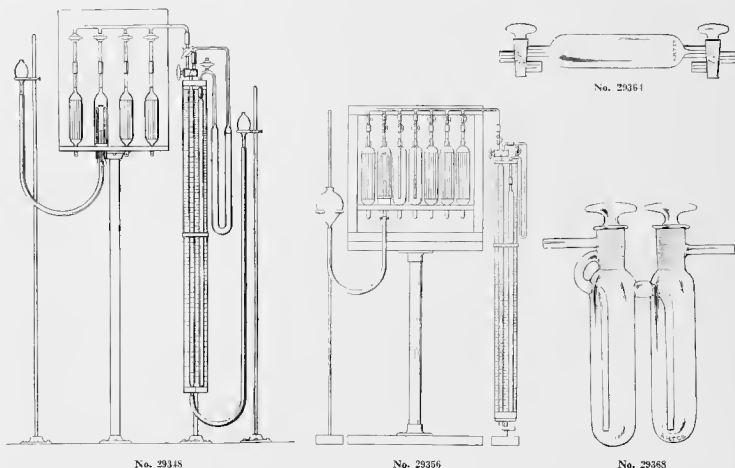
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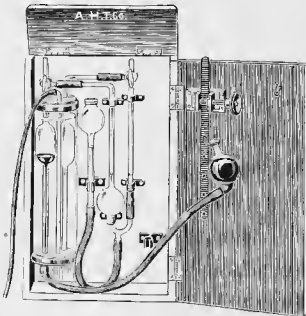
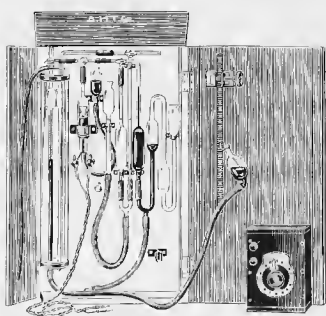
No. 29340

- 29324. Apparatus for the Exact Analysis of Mine Air and Flue Gas, Laboratory Form, Fig. 7 of Bulletin 42. Complete with three iron supports, rubber tubing, etc. 35.50
- 29328. Complete Set of Glass Parts only. 21.50
- 29332. Apparatus for the Exact Determination of Methane, Laboratory Form, Fig. 11 of Bulletin. Complete with supports, rubber tubing, clamps, etc. 34.50
- 29336. Complete Set of Glass Parts only. 20.00

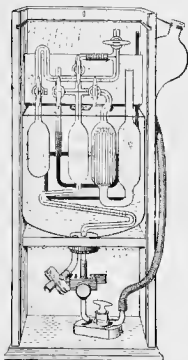
29340. Apparatus for the Exact Determination of Carbon Dioxide and Methane, Laboratory Form, Fig. 15 of Bulletin 42. Complete with iron supports, tubing, etc. 33.50
 29341. Complete Set of Glass Parts only 19.50



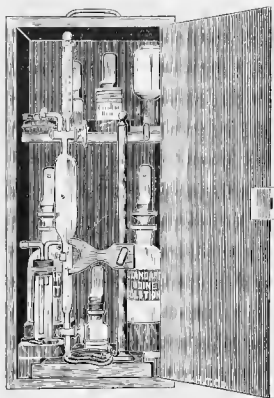
29348. Apparatus for Natural Gas Analysis, Laboratory Form, Fig. 23 of Bulletin. Complete with four iron supports, rubber tubing, clamps, etc. 45.00
 29352. Complete Set of Glass Parts only 25.50
 29356. Apparatus for Mixtures containing CO_2 , C_2H_2 , O_2 , CO , H_2 , CH_4 , C_2H_6 and N_2 , Laboratory Form, Fig. 17 of Bulletin 42. Complete with four iron supports, tubing, case, etc. 56.00
 29360. Complete Set of Glass Parts only 35.00
 29364. Gas Collecting Tube, Haldane, with three-way stopcock at each end, capacity 70 cc. 4.00
 29368. Gas Absorption Tube, Blount, for moisture and carbon dioxide. See Haldane "Methods of Air Analysis". 3.50



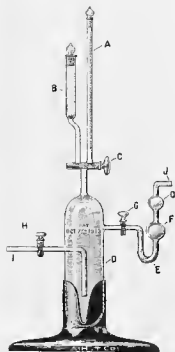
29372. Gas Analysis Apparatus, Haldane, Portable, for general air and gas analysis, especially designed for physiological investigations. See *Journal of Physiology*, Vol. 22, 1898 and Fig. 10, Haldane "Methods of Air Analysis," 1912. Complete in wooden case, with rheostat for controlling the current to the platinum spiral. 45.00
 29376. Gas Analysis Apparatus, Haldane, for the determination of very small percentages of carbon dioxide in the physiological investigation of air in ordinary rooms, schools, factories, etc. See *Journal of Hygiene*, 1901, p. 103, First Report of the Departmental Committee on Factory Ventilation, 1902 and Fig. 11, Haldane "Methods of Air Analysis," 1912. Complete in wooden case. 32.00
 Official English Certificate for above 10.00



No. 29388

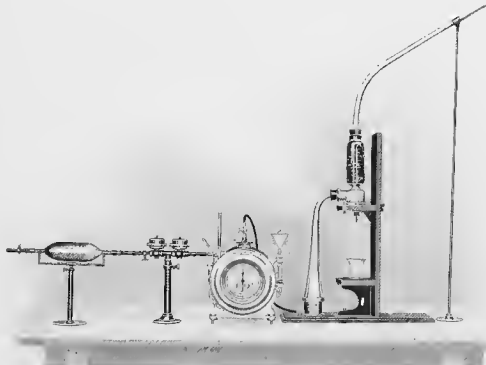


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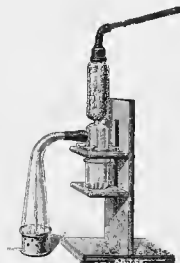


No. 29396

29388. Gas Analysis Apparatus, Petersen-Palmquist Anderson, for the convenient and exact determination of CO_2 in air. The standard apparatus for investigations of ventilating and other sanitary conditions of schools, factories, etc. Complete in case..... 50.00
29392. Sulphuretted Hydrogen and Ammonia Apparatus, Tutwiler, Standard U. G. I. Form. This apparatus gives direct readings in grains per 100 cu. ft. of gas of H_2S or NH_3 . It affords a simple and accurate method for determining the efficiency of the condensing, scrubbing and purifying apparatus in gas manufacture. A determination may be made in less than three minutes. In portable case, with chemicals necessary for operation..... 25.00
29396. Apparatus for Determining Hydrogen Sulphide in Gases, Johnson, Patented, a new system offering the advantage that accurate results may be obtained from small samples of gas as compared with the gravimetric method and that the time needed for a test is greatly shortened 18.00
29397. Apparatus as above but in case with necessary reagents 30.00

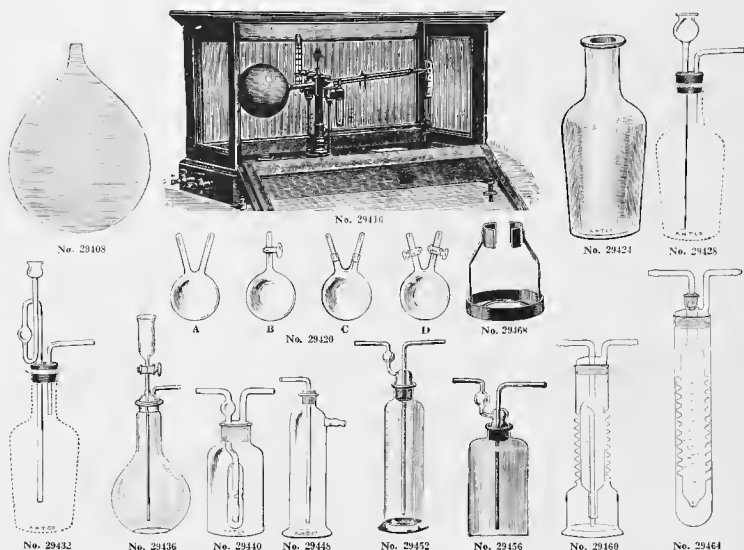


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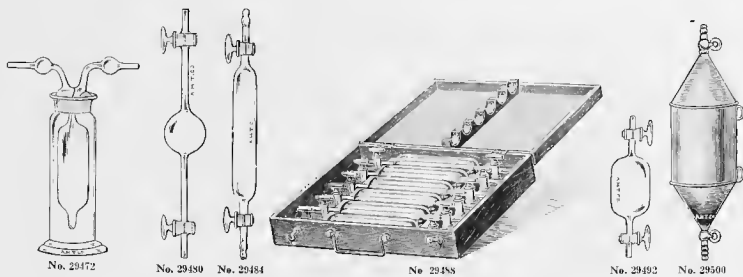


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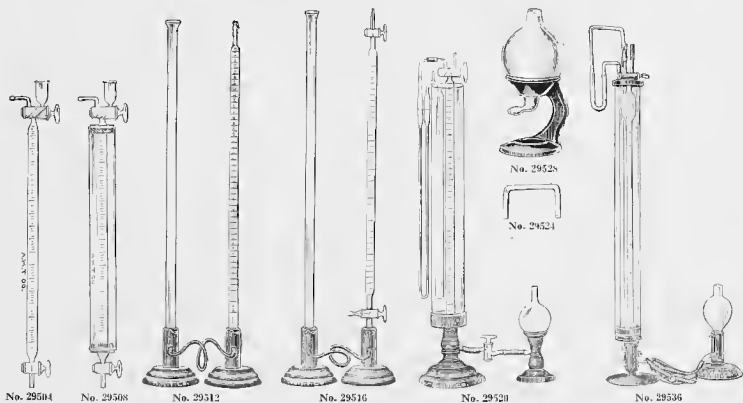
29400. Gas Apparatus for the Quantitative Determination of Sulphur and Ammonia, consisting of an ammonia saturator and automatic shut-off meter registering from $\frac{1}{1000}$ th of a cu. ft. to 100 cu. ft. a double dry governor mounted on stand and a London Gas Referee's sulphur determination apparatus, mounted as illustrated. The apparatus conforms to the latest modifications of the Board of London Gas Referees..... 115.00
29404. Sulphur Determination Apparatus, only, as used in above outfit, complete with burner and support 15.00



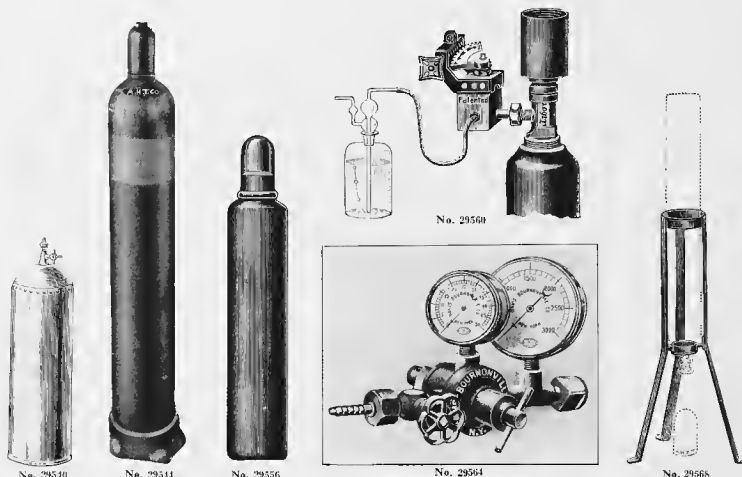
29408.	Gas Bags, oval, of pure gum, without stopcock.				
	Capacity, gallons.....	1	2	3	5
	Each	1.50	2.00	2.40	3.50
29412.	Brass Stopcock for above gas bags, to connect with tubing.....				1.00
29416.	Gas Balance, Lux, for the automatic determination of the specific gravity of gases. In glass case with levelling screws and spirit level.				
	Duty Free	116.00			
	Duty Paid				160.00
29420.	Gas Balloons, of blown glass, for weighing gases. Shape.....		A	B	C
	Each		1.00	1.50	1.50
	Each				2.50
29424.	Gas Generating Bottles, stout walled, for generating gases, etc.				
	Capacity, cc.....	125	250	500	750
	Each .....	.12	.18	.25	.35
	To fit, cc.....	125	250	500	750
	Each .....	.35	.35	.35	.40
29432.	Fittings only for above gas bottles consisting of thistle tube, rubber stopper and outlet tube.				
	To fit, cc.....	125	250	500	750
	Each .....	.40	.40	.45	.45
29436.	Gas Generating Bottles, with ground glass stopper, safety tube with glass stopcock and delivery tube.				
	Capacity, cc.....		250		500
	Each			2.00	2.50
29440.	Gas Washing Bottles, Allihn, with stopper. Capacity, cc.....		250	500	1000
	Each		1.50	2.00	2.50
29448.	Gas Washing Bottles, Bunsen, with rubber stopper. Capacity, cc.....		125	250	500
	Each .....		.40	.50	.60
29452.	Gas Washing Bottles, Drechsel, high form. Capacity, cc.....		100	150	250
	Each .....		.75	.85	1.10
29456.	Gas Washing Bottles, Drechsel, low form. Capacity, cc.....		100	150	250
	Each .....		.75	1.00	1.10
29460.	Gas Washing Bottle, Friedrichs, new spiral form, on glass foot				4.00
29464.	" " " " with spiral tube inside jar, without metal support.				
	Size, mm.....		200 x 40	300 x 50	
	Each		4.00	5.00	
29468.	Metal Support, for above.....		1.00	1.00	



29472.	Gas Washing Bottles, Muencke, with wide mouth. Capacity, cc.	100	250	500
	Each	1.25	1.50	2.00
29480.	Gas Collecting Tube, with bulb in center and two glass stopcocks			2.50
29484.	“ long form, 125 cc capacity, with two stopcocks.			2.50
29488.	Case for above, of polished mahogany, with fittings. To hold tubes		4	6
	Each		6.00	7.00
29492.	Gas Collecting Tube, short form, 125 cc capacity, with two stopcocks			2.50
29496.	Mailing Case, with screw cap, for convenient mailing of No. 29492 gas collecting tubes			.15
29500.	Gas Collecting Tube, Winkler, 12 inches long by 4 1/2 inches in diam.; of zinc with brass stopcocks			3.00

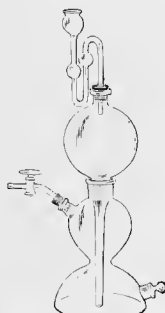


29504.	Gas Burette, Bunte, without water jacket. Graduated to 50 cc in 1/10ths, with two stopcocks	5.00
29508.	“ “ same as No. 29504 but with water jacket	5.75
29512.	“ “ Hempel, on weighted wooden bases without stopcocks. Per set	5.00
29516.	Gas Burette, Hempel-Winkler, with glass stopcocks, on weighted wooden bases. Per set	7.50
29520.	Gas Burette, Hempel, with correction for temperature and pressure, for measurement of gas volumes varying between .5 and 100 cc. With stopcock and levelling bulb, complete as illustrated	12.50
29524.	Connecting Tube for gas burettes	.15
29528.	Levelling Bulb, on iron stand, convenient for use in gas analysis and other purposes	1.50
29532.	Glass Bulb only, for above	.75
29536.	Gas Burette, Standard U. G. I. Form, being Tutwiler's modification of Hempel's burette. With manometer, correction tube, water jacket, levelling bulb and heavy metal bases. A special feature of this burette is the four-way stopcock which permits a permanent connection with the potash pipette, thus obviating the necessity of repeatedly connecting and disconnecting the pipette during the course of an analysis	25.00

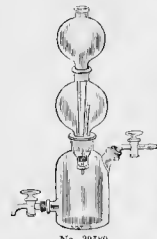


29510. Gas Cylinder, Low Pressure, Empty, of steel, riveted and brazed, tested to 600 lbs. pressure to the square inch; with stopcock and coupling. These cylinders are for sale and are returnable for re-filling but not for credit.
 Size, inches 10 x 32 13 x 44
 Capacity in cubic feet of oxygen at 225 lbs. pressure 25 50
 Each 16.50 22.50
29544. Gas Cylinder, High Pressure, Empty, of seamless steel 5½ inches in diameter by 31 inches high. Each cylinder is tested, numbered and stamped with the wording required by Paragraph 1822A of the Interstate Commerce Commission Regulations, which number is registered in New York with the Chief Inspector of the Bureau for the Safe Transportation of Explosives and other Dangerous Articles. These cylinders are sold outright only and are not returnable for credit. 15.00
29548. Gas Cylinder of Carbon Dioxide, consisting of high pressure cylinder No. 29544 filled with 20 lbs. of Carbon Dioxide as used in connection with freezing microtomes and other laboratory purposes. Cylinders are returnable for re-filling only and not for credit. 18.00
29552. Gas Cylinder of Oxygen, consisting of high pressure cylinder No. 29544 filled with 70 cubic feet of 99% pure electrolytic Oxygen (under 1800 lbs. at 68°F.). Oxygen is absolutely free from the oxides of carbon, hydrocarbons and other deleterious impurities. As used in calorimetry, carbon combustions in steel analysis, etc. Cylinders returned for refilling only not for credit. 17.80
29556. Gas Cylinders of Oxygen. These cylinders are filled with the indicated quantities of 97% pure Oxygen (S. S. White Dental Mfg. Co.) at 1000 lbs. pressure. These cylinders are only sold filled with Oxygen but are returnable when empty for either re-filling or credit at the prices indicated.
 Capacity, gallons. 40 100
 Each, filled with Oxygen 8.15 17.00
 Cylinders returnable for credit at (charges prepaid) 6.00 12.00
29557. Set of connections, for above cylinders 1.75
29560. Throttle Control Valve, for the safe and accurate delivery of small quantities of gas from cylinders as required in the use of carbon dioxide in connection with freezing microtomes and in the delivery of oxygen in calorimetry and carbon combustions in steel analysis 7.50
29564. Gas Pressure Regulator, for maintaining a constant pressure of oxygen when delivered from pressure cylinders. These regulators will deliver oxygen or other gas uniformly at any desired pressure up to 40 lbs. per square inch. One of the dials shows the pressure at which the oxygen is delivered while the other shows the pressure remaining in the tank. 30.00
29568. Iron Support, for high pressure Cylinder No. 29544. 4.00

Note.—We undertake the refilling of Oxygen Cylinders No. 29556 with S. S. White Dental Mfg. Co. Oxygen at their original prices, i.e. 40 gallon cylinders at 54¢ per gallon and 100 gallon cylinders at 56¢ per gallon. We fill high pressure cylinders with 99% electrolytic Oxygen at 54¢ per cubic foot with the addition of all transportation and hauling charges which may be necessary. We also fill high pressure cylinders No. 29544 with 20 lbs. of Carbon Dioxide at \$3.00 per cylinder, with transportation and hauling charges added. Low pressure cylinders are best filled with Oxygen and Ethylaluminum Gas for calcium lights at nearest supply establishment for gases of this character. The usual charge in large cities is \$3.00 for filling 25 gallon cylinders and \$5.00 for filling 50 gallon cylinders with Oxygen, and \$3.50 and \$4.00, respectively, for the same cylinders filled with illuminating gas. We undertake such filling as an accommodation for our customers when necessary, but without responsibility on our part.



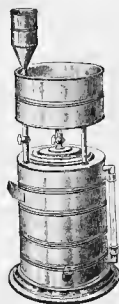
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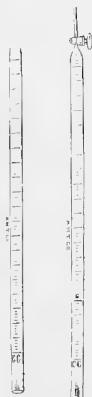
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No. 29592

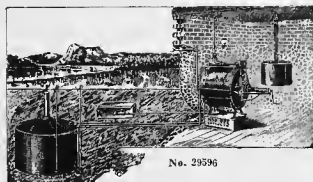


No. 29588



No. 29600

No. 29604



No. 29596

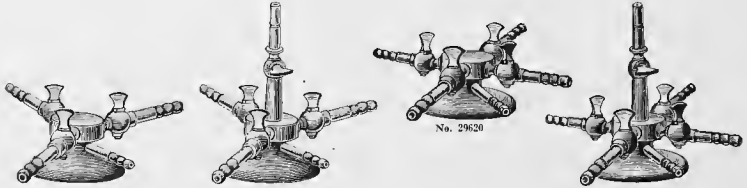


No. 29584

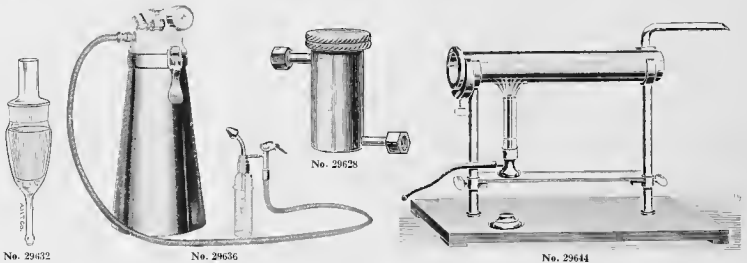


No. 29608

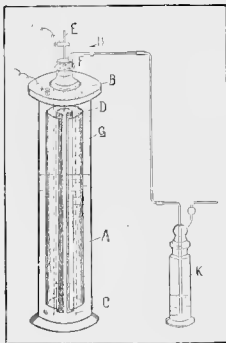
29572. Gas Generator, Kipp, improved form, for the continuous production of hydrogen sulphide; with large side opening for filling. Complete with Geissler stopcock, funnel tube, etc.
- | | | | | | | |
|-------------------|------|------|------|------|------|------|
| Capacity, cc..... | 250 | 500 | 1000 | 1500 | 2000 | 4000 |
| Each..... | 3.50 | 4.00 | 5.00 | 6.00 | 7.00 | 9.00 |
29576. Rubber Rings, for use in the above generator to prevent the iron sulphide from falling into the lower chamber.
- | | | | | |
|---------------------------|-----|-----|------|------|
| To fit generator, cc..... | 250 | 500 | 1000 | 2000 |
| Each..... | .30 | .35 | .45 | .60 |
29580. Gas Generator, McCoy. A steady gas pressure is maintained by delivering the acid in drops.
- | | | |
|-------------------|------|-------|
| Capacity, cc..... | 1000 | 2000 |
| Each..... | 8.00 | 10.00 |
29584. Gasoline Gas Generator, for operating one Bunsen burner or one blast burner in laboratories without gas supply. Must be used in connection with a foot blower or other form of blast apparatus. Dimensions $4\frac{1}{2}$ inches diameter by 7 inches high and contains 14 lineal feet of evaporating surface.
29588. Gas Holders, Berzelius-Pepys improved form, of heavy copper, with glass gauge.
- | | | |
|-----------------------|-------|-------|
| Capacity, liters..... | 20 | 40 |
| Each..... | 20.00 | 25.00 |
29592. Gas Holder, Berzelius, entirely of glass with ground fittings; capacity 8 liters..... 16.00
29596. Gas Generator, Titrill, for generating gasoline gas for use in laboratories. This machine accomplishes the mixing outside and is permitted by all fire underwriters without extra cost. The gas delivered gives a white, absolutely smokeless flame without odor. It is composed of a generator placed in the ground 30 ft. from the building and buried 6 ft. under ground, a mixer placed near the generator 3 ft. under ground and an air pump placed in the cellar of the building. The machine can be operated by either weight or water. The above illustration shows the machine operated by weight. Any plumber or gas fitter can set the same up with the directions supplied.
- | | | | | | |
|------------------------|--------|--------|--------|--------|--------|
| Number of burners..... | 15 | 25 | 50 | 75 | 100 |
| Each..... | 210.00 | 250.00 | 210.00 | 410.00 | 525.00 |
29600. Gas Measuring Tubes, of glass, graduated, closed at one end, without stopcock.
- | | | | |
|---------------|----------------------------|----------------------------|-----------------------------|
| Capacity..... | 25 cc in $\frac{1}{8}$ ths | 50 cc in $\frac{1}{8}$ ths | 100 cc in $\frac{1}{8}$ ths |
| Each..... | .65 | 1.00 | 1.50 |
29604. Gas Measuring Tubes, same as No. 29600 but with stopcock.
- | | | |
|---------------|----------------------------|----------------------------|
| Capacity..... | 25 cc in $\frac{1}{8}$ ths | 50 cc in $\frac{1}{8}$ ths |
| Each..... | 1.50 | 2.00 |
29608. Gas Palladium Tube, Hempel, for the absorption of hydrogen, with about 2 grams of palladium sponge.
- | | |
|-----------|------|
| Each..... | 5.00 |
|-----------|------|



29612. Gas Distributors, of brass, with one supply pipe and three burner connections with stopcocks... 4.00
 29616. Gas Distributors, of brass, same as No. 29612 but with burner in center..... 4.75
 29620. " " " " with gas supply pipe and four burner connections, with stopcocks... 4.75
 29624. " " " " same as No. 29620 but with burner in center 6.00



29628. Gas Filter, for use with either the Greenan or the Roux Binocell Thermo-regulators, to clean the gas of coal tar or other impurities, thereby securing more satisfactory working of the regulators 5.00
 29632. Gas Filter Tube, with projections to support paper thimble and ground in connecting tube. The upper connecting tube is 1 inch in diameter; without thimble 2.00
 29636. Gas Generator, "Autogenerator," for generating oxygen, automatically producing an absolutely pure oxygen from oxone at any desired pressure up to 50 lbs 45.00
 29640. Oxone Cartridges, in tins each containing six round tablets, sufficient for 4½ cu. ft. of oxygen, for use in above. Per cartridge..... 1.35
 29644. Gas Generator, on stand with three flame Bunsen burner, 50 cm long 12.00

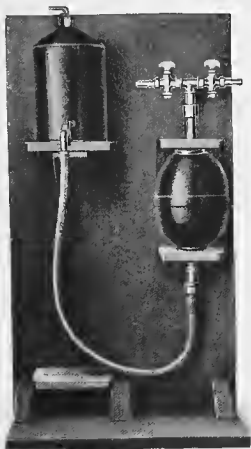


No. 29648

29648. Gas Generator, Electrolytic Oxygen and Hydrogen. By means of pure nickel electrodes and the use of 30% caustic soda solution as electrolyte, pure oxygen and hydrogen are generated in turn by reversing the poles of the battery. The oxygen is very pure, being particularly free from ozone. Height 7 cm by 15 cm in diameter. See *Zeitschrift für den physikalischen und chemischen Unterricht (Poske) XXV I. p. 69.*
 Duty Free 11.55
 Duty Paid 16.20



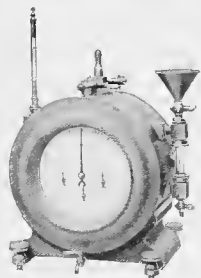
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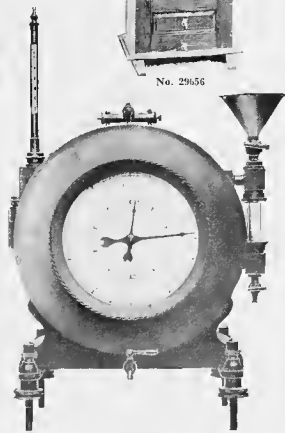
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No. 29656

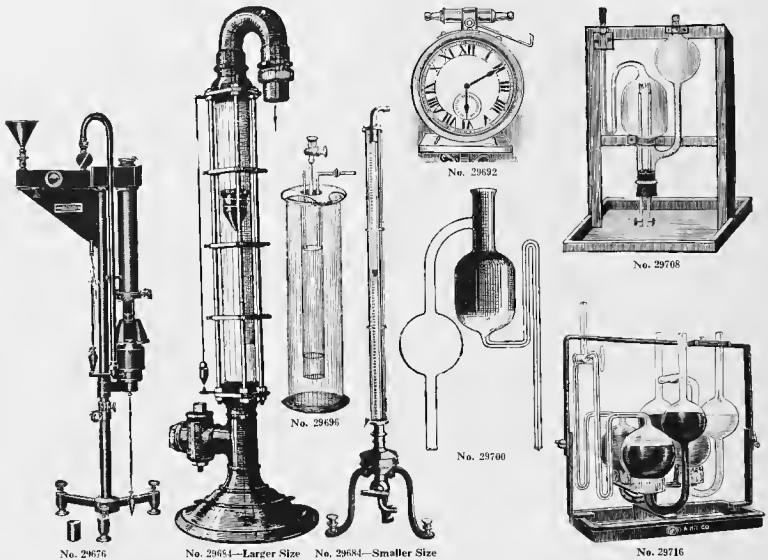


No. 29668

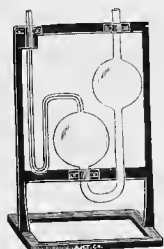


No. 29672

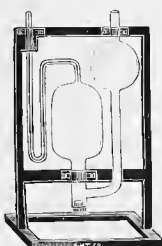
- 29652. **Cubic Foot Bottle**, immersion type, standardized by the U. S. Bureau of Standards. This instrument is the basis of all gas measurements; operating on the principle of displacing 1 cu. ft. of gas by a volume of 1 cu. ft. of water. 125.00
- 29656. **Cubic Foot Bottle**, as above, cabinet form. 275.00
- 29660. " " $\frac{1}{10}$, on wooden stand, for testing the correction of the registration of gas meters, particularly the wet test meters as used for experimental purposes. 55.00
- 29668. **Cubic Foot Bottle**, as above, $\frac{1}{2}$ cu. ft. 55.00
- 29664. **Gas Meter**, a wet test laboratory meter with a $\frac{1}{10}$ drum and a dial reading from $\frac{1}{1000}$ th of cu. ft. to 100 cu. ft. This meter is also furnished with a special dial having an hourly rate circle within the $\frac{1}{10}$ circle. This rate circle reads from 0 to 6 ft. per hour. Complete with water gauge, thermometer, spirit level and levelling screws 50.00
- 29672. **Gas Meter**, a photometer wet test meter, with a $\frac{1}{2}$ cu. ft. drum and an hourly rate dial reading from 0 to 5 cu. ft. per hour. This is the meter mostly used in photometrical work. The meter makes one revolution of the drum per minute in accordance with the legal rate at which gas should be burned in ascertaining its candle power, i.e., 5 cu ft. per hour. With water gauge, thermometer, two spirit levels and levelling screws. 50.00



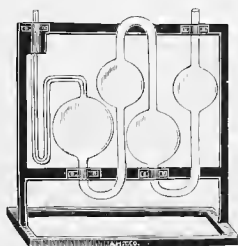
29676. **Harcourt Pentane Lamp**, model adopted as standard by the London Gas Referees with improvements as suggested by the U. S. Bureau of Standards 75.00
29680. **Harcourt Pentane Lamp**, as above, with certificate of the Bureau of Standards..... 87.50
29684. **Gas Meter, "Rotameter,"** an accurate instrument for showing instantaneously with direct reading the volume of gas or liquid passed through it per hour. In ordering it is important to state the kind of gas to be measured, the maximum and minimum capacity in liters per hour, the pressure at which measurement is to be made, the diameter of the inlet and outlet tubes to which the Rotameter is to be connected and the temperature of the gas or liquid to be measured.
- | | | | | |
|--------------------------------|--------|--------|--------|----------|
| Capacity, liters per hour..... | .05-10 | .1-20 | 1-50 | 2-100 |
| Duty Free | 75.00 | 66.00 | 45.00 | 37.50 |
| Duty Paid | 100.00 | 88.00 | 60.00 | 50.00 |
| Capacity, liters per hour..... | 10-200 | 30-300 | 50-500 | 100-1000 |
| Duty Free | 31.50 | 34.50 | 39.00 | 51.00 |
| Duty Paid | 42.00 | 46.00 | 52.00 | 68.00 |
29692. **Gas Regulator**, for shutting off the supply of gas at any desired time, consisting of a specially constructed clock with timing device and gas valve. The gas valve is connected by rubber tubing between the gas supply and the apparatus which it is to regulate..... 4.00
29696. **Specific Gravity Apparatus, Schilling**, for illuminating gas 18.00
29700. **Gas Pipette, Hempel-Friedrichs**, simple absorption, of reddish brown glass. See *Zeitschrift für angew. Chemie*, 1913. On metal stand..... 4.50
29704. Glass Parts only for No. 29700..... 3.00
29708. **Gas Pipette, Winkler**, for the determination of methane. On iron support, with platinum spiral.. 7.50
29712. Glass Parts, only, with platinum spiral..... 6.00
29716. **Gas Pipette, Double Absorption for Cuprous Chloride, Standard U. G. I. Form.** This pipette was designed to replace the two double absorption pipettes otherwise necessary in making a gas analysis. By simply turning the cock it is possible to bring the gas in contact with the absorbent contained in either side of the pipette without disconnecting..... 10.50
29720. Glass Parts, only, for above..... 7.50



No. 29724



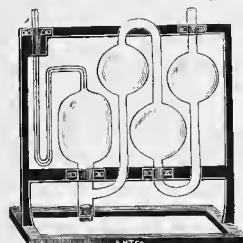
No. 29732



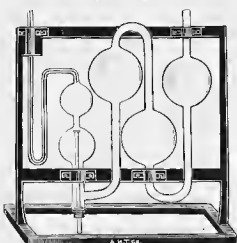
No. 29740

GAS PIPETTES, HEMPEL, mounted on improved iron supports with lacquered base. The glass parts are fastened to the supports by means of adjustable metallic clamps with cork inset. The adjustment permits of the use of glass parts of slightly varying dimensions. To avoid breakage iron supports and glass pipette are packed separately and must be set up in the laboratory.

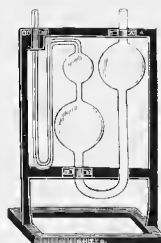
29724.	Gas Pipette, Hempel, simple absorption, for liquid reagents, on new form iron stand.....	3.00
29728.	Glass Parts only for No. 29724.....	1.25
29732.	Glass Pipette, Hempel, simple absorption, for liquid and solid reagents, on new form iron stand.....	3.00
29736.	Glass Parts only for No. 29732.....	1.50
29740.	Gas Pipette, Hempel, compound absorption, for liquid reagents, on new iron stand.....	4.00
29744.	Glass Parts only for No. 29740.....	2.00



No. 29748

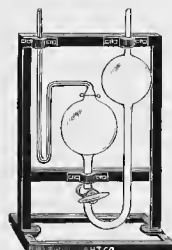


No. 29756

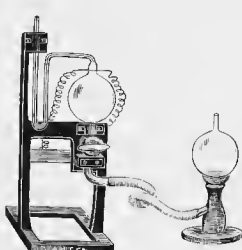


No. 29764

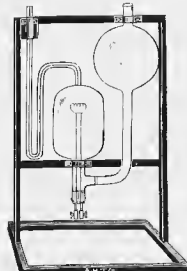
29748.	Gas Pipette, Hempel, compound absorption, for liquid and solid reagents, on new iron stand....	4.00
29752.	Glass Parts only for No. 29748.....	2.25
29756.	Gas Pipette, Hempel, for the preparation of hydrogen, on new iron stand.....	5.00
29760.	Glass Parts only for No. 29756.....	3.00
29764.	Gas Pipette, Hempel, with glass beads for ethylene absorption.....	3.50
29768.	Glass Parts only for No. 29764.....	2.00



No. 29772

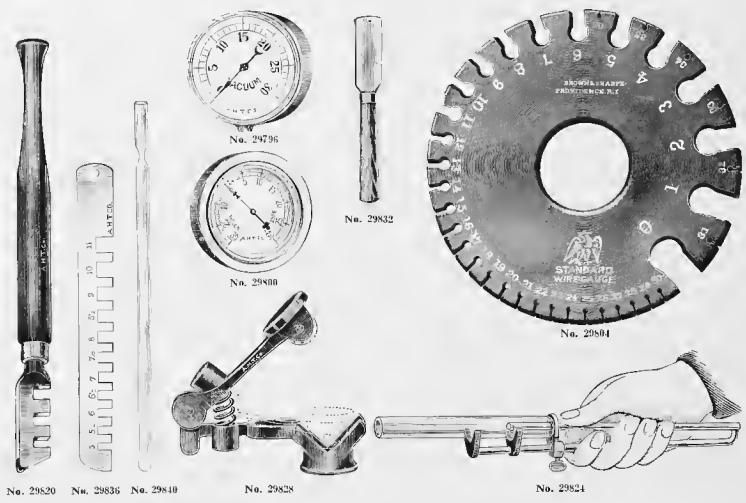


No. 29780

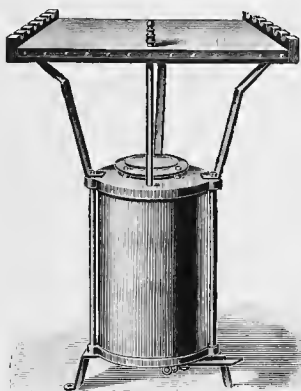


No. 29788

29772.	Gas Pipette, Hempel, simple explosion, with stopcock and platinum electrodes.....	6.00
29776.	Glass Parts only for No. 29772.....	3.50
29780.	Gas Pipette, Hempel, explosion, with platinum electrodes, stopcock and levelling bulb.....	7.00
29784.	Glass Parts only for No. 29780.....	4.25
29788.	Gas Pipette, Hempel, with platinum spiral, for methane, mounted on new iron stand.....	6.00



29792.	Gauge, Pressure, in brass case, reading in pounds. Suitable for steam, water or air pressure but when used with steam pressure must always be connected with syphon. May be graduated to any pressure not exceeding 300 lbs. Range must be specified in ordering. The 3 inch gauge connects on $\frac{1}{2}$ inch pipe thread and 5 inch gauge connects on $\frac{1}{4}$ inch pipe thread.	3	5	
	Diameter, inches.....	3	5	
	Each.....	5.00	7.50	
29796.	Gauge, Vacuum, reading in inches to 30 inches of mercury. Otherwise similar to No. 29792. Dial 3 inches in diameter.		5.00	
29800.	Gauge, Vacuum and Pressure, both on same dial, vacuum scale for 0 to 30 inches of mercury, pressure scale from 0 to 15, 30 or 60 lbs. Range must be specified in ordering. Exactly the same in construction as Nos. 29792 and 29796.		14.00	
29804.	Gauges, Wire, American Standard, B & S, of best tempered steel.			
	Size.....	0 to 36	5 to 36	
	Each.....	2.50	2.00	
29808.	Glass Beads, solid, 3 to 6 mm in diameter. Per lb.....		.90	
29812.	" " hollow, 5 to 6 mm long by $\frac{1}{4}$ to 3 mm in diameter. Per lb.....		.70	
29816.	Glass Cutter, Diamond. Price depends upon quality of splint and varies from \$5.00 to \$20.00.			
29820.	" " with small steel wheel.....		.20	
29824.	" Tubing Cutter. Large size will cut tubing of $\frac{3}{8}$ to 1 inch in diameter in lengths up to 8 inches; small size will cut tubing $\frac{1}{4}$ inch diameter in lengths up to 5 inches.			
	Size.....	Small	Large	
	Each.....	1.50	1.50	
29825.	Extra cutter wheels. Per dozen.....		2.00	
29828.	Glass Tubing Cutter, Griffin's form. For tubes, mm in diameter.....	17	30	
	Each.....	1.00	2.00	
29832.	Glass Cutter, consisting of a hardened, sharpened steel knife with wooden handle. A most convenient and satisfactory laboratory utensil.....		1.00	
29836.	Glass Tubing Gauge, of steel, very convenient for rapidly sorting glass or metal tubing by outside diameters. The slots vary in width by $\frac{1}{2}$ mm. These gauges come in three sizes, the size measuring from 5 to 11 mm being shown in the illustration.			
	Size, mm.....	1 to 5	5 to 11	11 to 16
	Each.....	1.00	1.25	1.50
29840.	Glass Tubing, heavy walled for sealing, so-called "Einschmelz" tubing			
	Length, mm.....	500	600	700
	Diameter, mm.....	18	20	22
	Each.....	.40	.45	.50



No. 29844

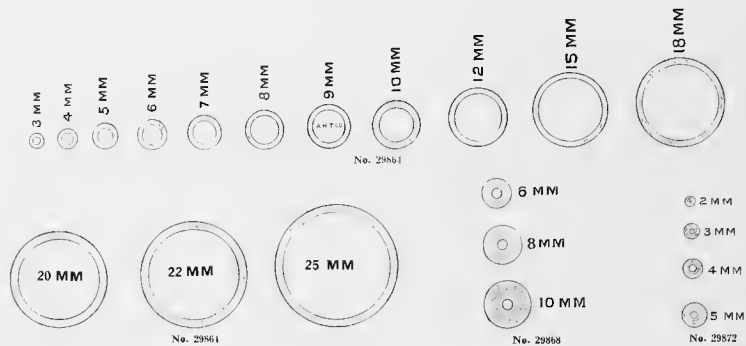


No. 29846

- | | | |
|--------|--|---------------------------|
| 29844. | Glass Blower's Table, consisting of an iron covered table top 75 x 75 cm, supported over a cylindrical foot bellows. Very convenient in the laboratory for glass-blowing as the blast lamp may be left permanently in place on the table without blast lamp or burner.
Duty Free 17.50 | Duty Paid 22.00 |
| 29848. | Glass-blower's Table, Thüringian model, with single and double blast burners, as shown in illustration, permitting the use of flame of all kinds as used in ordinary laboratory glass blowing. The use of this outfit makes laboratory glass blowing far easier of accomplishment than is possible with the use of ordinary blast lamp and foot blower.
Duty Free 23.25 | Duty Paid 27.85 |
| 29852. | Glass-blower's Table, as above without burners.
Duty Free 13.80 | Duty Paid 16.50 |



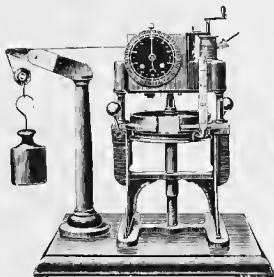
View in Stock Room Showing Adjustable Partitions on Right and Glass Tubing on Left



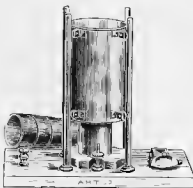
GLASS TUBING AND ROD is carried in stock in the original factory lengths of from 1½ to 2 meters. Customers are requested to state the length to which pieces may be cut for shipment. On small orders, particularly where factory length is not required, an extra charge is made for the special box required to insure safe transit. The following prices are based on tubing with usual factory variations as to bore, thickness of wall, etc. Where tubing must be selected to an exact measurement as to inside and outside diameter, an extra charge is made. Specifications as to diameter of glass tubing are always taken to be outside diameter unless otherwise stated, except in the case of combustion tubing where it is customary to specify inside diameter in order to make sure same will take proper size combustion boat.

29856.	Glass Rod, for easy manipulation before the lamp. From 1 to 25 mm diameter. Per lb. ....	.40
29860.	Glass Stirrers, with one end rounded and the other end pointed.	
	Length, inches.....	4 5 6 8 10 12 15
	Diameter, inches.....	$\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{2}$ $\frac{3}{4}$
	Per dozen.....	.20 .25 .30 .40 .60 1.00 1.15
29864.	Glass Bending Tubing, Best Imported. Particularly recommended for laboratory use because of the way with which it can be manipulated before the lamp. Not to be confused with low priced, thin walled "vial" tubing of either German or American make.	
	Outside diameter, mm.....	1 to 4 5 to 20 21 to 35 36 to 50
	Per lb.....	.45 .40 .50 .60
29868.	Glass Tubing, Barometer, in three outside diameters, i. e., 6, 8 and 10 mm. Per lb.....	.70
29872.	Glass Tubing, Capillary, with very small outside diameters, i. e., approximately 2, 3, 4 and 5 mm. The 2 mm tubing has a capillary fine enough to be designated as thermometer tubing. The tubing of 3, 4 and 5 mm outside diameter has a bore of about 1 mm and differs from barometer tubing only in the outside diameter. Per lb.....	1.00
29876.	Glass Tubing Combustion, Kavalier Hard Bohemian. Dimensions given are inside dimensions in order to determine size suitable for various combustion boats.	
	Inside diameter, mm.....	3 to 8 9-25
	Per lb.....	1.10 1.00
29880.	Glass Tubing, Jena Combustion, containing very little alkali. Very tractable in the blowpipe flame although as hard to fuse as the hardest Bohemian. Inside diameter, mm..	3 to 5 6 to 25
	Per lb.....	1.00 .75
29884.	Glass Tubing, Jena Apparatus Glass, adapted for work before the lamp in the manufacture of apparatus. Outside diameter 5 to 25 mm. Per lb.....	1.00
29888.	Glass Tubing, Jena Compound Robax Glass (registered trade-mark a light blue longitudinal line) for explosion furnaces, etc. Of great resistance to sudden temperature change, the action of water, acid or alkali solutions, etc. Outside diameter 12 to 25 mm. Per lb.....	.75
29892.	Glass Tubing, Jena Uviol Glass, of high transparency to ultra-violet rays and very thin wall. Imported to order only. Duty Free, per kilo.....	3.50
	Duty Paid, per kilo.....	7.00
29896.	Glass Tubing, Jena 397 ^{III} Glass, adapted for the enclosure of platinum wire, so-called fusing-in glass. Outside diameter 5 to 12 mm. Per kilo.....	1.00
29900.	Glass Tubing, Jena Fiolax Glass, made especially for the manufacture of ampoules and other containers for sterilized solutions. Very resistant to alkalis under sterilization and at the same time easy to manipulate before the lamp. Trade-mark for white tubing a red line and for amber a white line. A very valuable tubing for laboratory work because of its resistance to alkalis. Outside diameter 10 to 18 mm. Per kilo.....	2.50
29901.	Glass Tubing, Thermometer, Jena 16 ^{III} Glass, of great resistance power, almost entirely eliminating the periodical changes of the zero point. Registered trade-mark red longitudinal line with white background. About 5 to 6 mm outside diameter. Per lb.....	1.75
29908.	Glass Tubing, Thermometer, Jena Borosilicate 59 ^{III} Glass, with white background with lowest possible temperature coefficient, i. e., 1° C. = .0000177. For the manufacture of thermometers to measure high temperatures, i. e., up to 500° C. About 5 to 6 mm outside diameter. Per lb.....	2.75

29904. Glass Tubing, Thermometer, Thuringian make, with white background. About 5 to 6 mm outside diameter. Per lb. 1.00
29908. Glass Wool, of best Bohemian spun glass. In original cartons.
 Quality..... A (wavy, coarse spun) FF (wavy, fine spun) B (smooth, free from lead)
- | | | | |
|-------------------------|------|------|------|
| Per 25 gram carton..... | .40 | .40 | .40 |
| " 100 " | 1.25 | 1.25 | 1.25 |
| " 500 " | 5.00 | 6.00 | 4.25 |



No. 29912



No. 29916



No. 29918



No. 29932



No. 29936



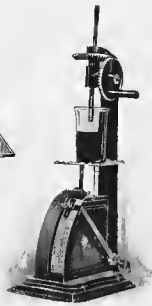
No. 29928



No. 29944



No. 29920

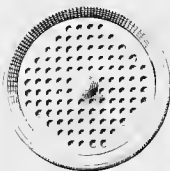


No. 29924

29912. Glue Testing Apparatus, Weiss (Consistency Meter) for measuring the consistency of rubber, sugar, sugar solutions, glue, gelatine, fats, oils, etc. The time of rotation of a horizontal disc under the impulse of a fixed weight is measured on the circular dial. 200.00
29916. Glue and Gelatine Tester, Alexander, of brass, with electric annunciator. See *Journal of the Society of Chemical Industry, Feb. 28, 1906* 26.00
29920. Glue Viscosity Pipette, Alexander, with tripod, metal jacket, etc. 5.00
29924. Glue Tester, Scott, for testing the tensile strength of glue, gelatine, etc., and for making comparative tests of the hardness of greases, wax, etc., reading in pounds and fractions of ounces automatically. 25.00
29928. Goggles, gas tight and indestructible, with rubber fittings and removable, clear glass lenses 1.50
29932. Graduates, Glass, of ordinary accuracy, graduated in ounces.
- | | | | | | | | |
|-----------------------|----------------|---------------|---------------|-----|-----|-----|------|
| Capacity, ounces..... | $\frac{1}{16}$ | $\frac{1}{8}$ | $\frac{1}{4}$ | 6 | 8 | 16 | 32 |
| Each..... | .18 | .22 | .28 | .35 | .40 | .70 | 1.20 |
29936. Graduates, Glass, of ordinary accuracy, graduated in cubic centimeters.
- | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|------|
| Capacity, cc..... | 30 | 60 | 120 | 250 | 500 | 1000 |
| Each..... | .25 | .28 | .35 | .50 | .80 | 1.40 |
29940. Graduates, Glass, of ordinary accuracy, graduated in ounces and cubic centimeters.
- | | | | | | | | |
|-----------------------|----------------|---------------|---------------|-----|-----|------|------|
| Capacity, ounces..... | $\frac{1}{16}$ | $\frac{1}{8}$ | $\frac{1}{4}$ | 6 | 8 | 16 | 32 |
| " " cc..... | 30 | 60 | 120 | 150 | 250 | 500 | 1000 |
| Each..... | .32 | .35 | .50 | .60 | .75 | 1.10 | 2.00 |
29944. Graduate, Glass, 1500 cc capacity, graduated in cc. 1.25
29948. Graduate, with graduated stem, as used in moisture testing in wood that has been creosoted, etc. Stem is graduated to 12 cc in $\frac{1}{16}$ ths. See *Bull-tin No. 134 of the U. S. Department of Agriculture, Forest Service* 1.20



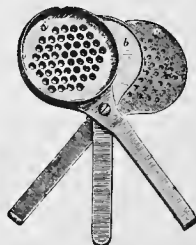
No. 29952



No. 29956



No. 29956

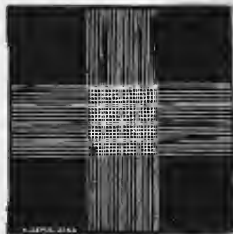


No. 29960

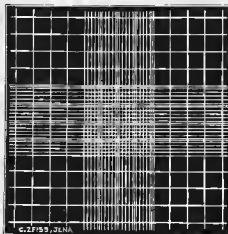
29952. Graduates, Aseptic Enamel Ware, of seamless steel, white enameled, both acid and fire proof; graduated in cubic centimeters on the inside.
- | | | | | |
|-------------------|------|------|------|------|
| Capacity, cc..... | 500 | 1000 | 2000 | 4000 |
| Each | 1.00 | 1.25 | 1.75 | 3.00 |
29956. Grain Germinator, Schönjahn, with thermometer; as used in determining the germinating power of barley, etc., in malting. For 100 grains..... 4.00
29960. Grain Tester, Grobecker, of brass, for sectioning 50 grains..... 6.00

APPARATUS FOR HAEMATOLOGY

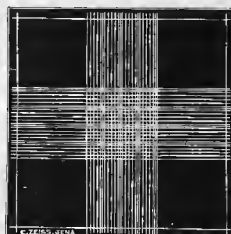
Diagrams Showing the most used Haemastometer Rulings



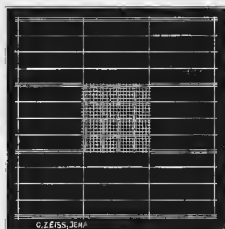
Thoma Ruling



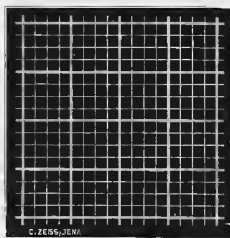
Neubauer Ruling



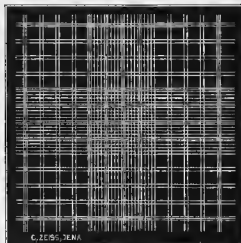
Zappert Ruling



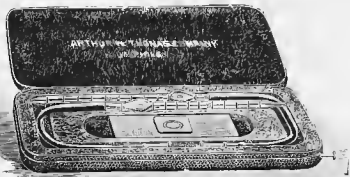
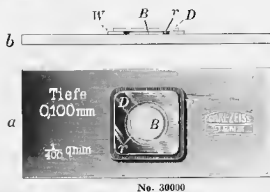
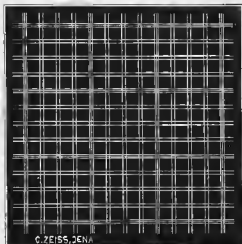
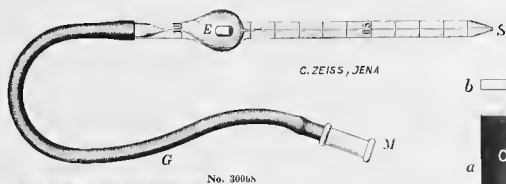
Breuer Ruling



Fuchs and Rosenthal Ruling



Turk Ruling

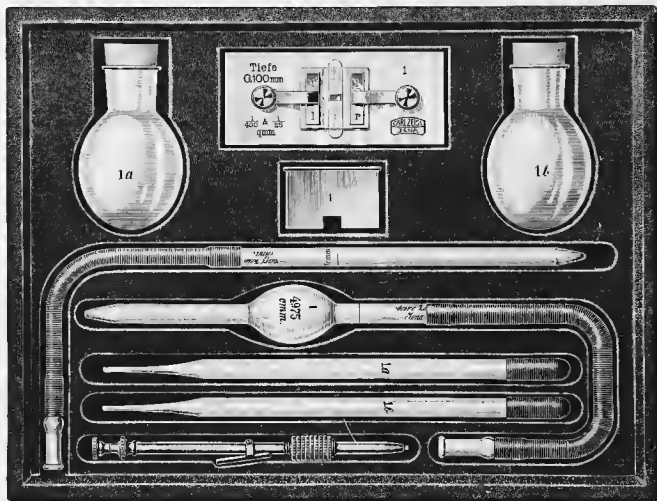


HAEMACYTOMETERS, ZEISS. We particularly emphasize the advantage of using the original Zeiss make of Thoma Haemacytometers and all modifications thereof; our experience having shown that the cheaper makes are inferior and never satisfactory as to accuracy. Our stock of Haemacytometers, with the exception of the Hayem-Sahli and the Thoma-Metz, is confined entirely to the Zeiss product. The counting chambers when sold separately are supplied without leather case but with one each thick and thin cover glasses. They are all of .1 mm depth, excepting the Helber and Fuchs-Rosenthal. The various rulings are shown in illustrations on preceding page.

30000.	Counting Chamber, Thoma ruling, with two cover glasses but without case.	4.50
30044.	“ “ Zappert “ “ “ “ “ “ “ “ “ “ “ “	4.70
30008.	“ “ Türk “ “ “ “ “ “ “ “ “ “ “ “	6.30
30012.	“ “ Breuer “ “ “ “ “ “ “ “ “ “ “ “	5.60
30016.	“ “ Bürker No. 1 ruling. The chamber is provided with two counting surfaces separated by a cross channel so that two countings can be done one shortly after the other. The rectangular cover glass is placed in position before introducing the blood mixture, the drops are placed upon the semicircular prominence of the middle plate and flow from thence by capillary attraction upon the counting surfaces. With cross lines divided on both counting surfaces.	7.40
30020.	Counting Chamber, Bürker No. 1 ruling, but with spring clamps to hold cover glass in position.	11.00
30024.	Counting Chamber, Bürker No. 2, the counting surfaces of which are not provided with cross line divisions. Counting is done by means of special ocular diaphragms; the value of the square aperture of these diaphragms can be estimated by the stage micrometer (1 mm divided into 100 parts) cemented alongside the counting chamber. With three ocular diaphragms.	8.85
30028.	Counting Chamber, Bürker No. 2 ruling but with spring clamps to hold cover glass in position.	11.70
30032.	Counting Chamber, Special, with two counting surfaces as in the Bürker No. 1 but with the surfaces ruled with the Neubauer ruling. As made specially for us by Zeiss and as used in the Clinical Laboratory at Johns Hopkins University Medical School.	11.70
30036.	Counting Chamber, Helber, for counting blood platelettes, yeast cells, bacteria, etc. With Thoma ruling but with counting cell 0.02 mm in depth instead of 0.1 mm.	4.85
30040.	Counting Chamber, Fuchs and Rosenthal, for cytological investigations of the cerebro-spinal fluids, with counting chamber 0.2 mm deep.	4.70
30044.	Leather Cases, of morocco, velvet lined, for any of the above counting chambers.	.55
30048.	Cover Glasses, for above counting chambers, square 0.4 mm thick.	.20
3006.	“ “ “ “ Bürker counting chambers, rectangular, 0.3 mm thick.	.25
30060.	“ “ “ “ “ “ “ “ “ “ “ “ 0.5 mm	.25
30064.	Mixing Pipette, Thoma, for red corpuscles, diluting 1 to 100; with rubber tube and mouth piece.	1.80
30068.	“ “ “ “ for white corpuscles, diluting 1 to 10; with rubber tube and mouth piece.	1.80
30072.	“ “ “ “ Rieder, for diluting 1 to 20; with rubber tube and mouth piece.	2.90
30076.	“ “ “ “ Miescher, for diluting 1 to 100, 1 to 150 and 1 to 200; with rubber tube and mouth piece.	4.30
30080.	“ “ “ “ “ “ “ “ “ “ “ “ for diluting 1 to 200, 1 to 300 and 1 to 400, with rubber tube and mouth piece.	4.30
30084.	Fluid Chamber, Bürker, for use on Bürker's counting chambers.	.75

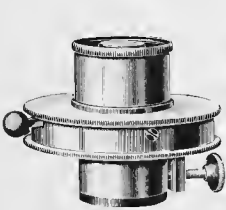
		With two pipettes red and white	With one pipette red or white
30088.	Haemocytometer, Thoma, complete with leather case and pipettes.....	9.75	7.75
30092.	" Zappert	9.90	7.90
30096.	" Türk	11.50	9.50
30100.	" Breuer	23.60	21.50
30104.	" Bürker 1	12.60	10.60
30108.	" Bürker 2	13.90	12.25
30112.	" Bürker 2	16.20	14.95
30116.	" Bürker 2	16.90	14.95
30120.	" Special Bürker-Neubauer	16.90	14.95

Note—For counting with Bürker No. 2 chamber without rulings, and in fact with all the counting chambers, it is sometimes convenient to use the seven square diaphragms after Ehrlich and the Ocular Net Micrometer Nos. 30132 and 30144, both of which are best used with the Adjustable Oculars with focussing eye lens No. 30110.

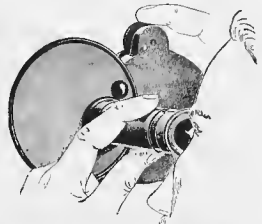
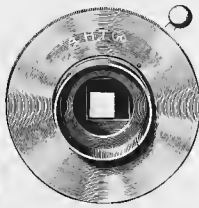


No. 30124

30124.	Haemocytometer Outfit, Bürker, for red corpuscles, consisting of Bürker No. 1 counting chamber with clamps, Bürker fluid chamber, 2 mixing flasks 125 cc capacity, 1 diluting pipette 4975 mm., 2 transfer pipettes and 1 blood lancet. Complete in case with directions for use and 100 diagrams for tabulating results. See <i>K. Bürker, Pflüger's Arch. f. d. ges. Physiol.</i> , 143 337 ff, 1911.	23.75
30128.	Haemocytometer, Hayem-Sahli, complete in case, consisting of the following, Eyepiece III with sliding eye lens and screw-in Hayem counter, including tables; object slide with chamber 0.2 mm deep, without ruling, but with reference square of 0.2 mm side ruled on the floor of the chamber and surrounded by concentric orientation circles; object slide with chamber 0.1 mm deep, with reference square of 0.2 mm side surrounded by concentric orientation circles and, in addition, a micrometer scale, i. e., 1 mm divided into 100 parts, 2 pipettes for the diluent of 250-500 cc capacity, one red and the other white, pipette of 1-5 cc capacity, for red corpuscles; pipette of 5-25 cc capacity for white corpuscles; two mixing retels with stoppers, one marked "red" and the other "white;" two thick and two thin plane, parallel cover glasses and one stirring spatulum	22.00
30132.	Ocular Net Micrometer, Zeiss, consisting of a square of 5 mm divided into small squares of 0.5 mm.	1.55
30136.	Ocular Diaphragm, Ehrlich Zeiss, with square openings of 1 mm, 2 mm, 3 mm, 4 mm, 6 mm, 8 mm and 9 mm. Convenient to place on the diaphragm of any regular Huyghenian Oculars	3.10
30140.	Oculars, Adjustable, Zeiss, particularly recommended for use with the various ocular micrometers in that the eye lens may be focussed sharply upon the micrometer when resting on the diaphragm Designation..... K. 6 H. 2 H. 3 H. 4 Duty Free..... 6.25 2.75 2.75 2.75 Duty Paid..... 7.75 3.40 3.40 3.40	



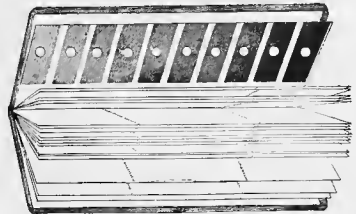
No. 30111



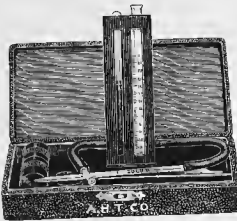
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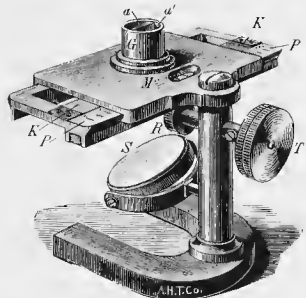
No. 3011b



No. 30156

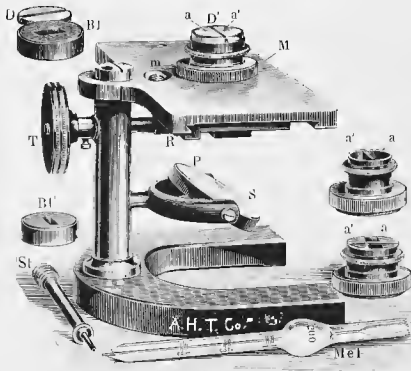


No. 30160

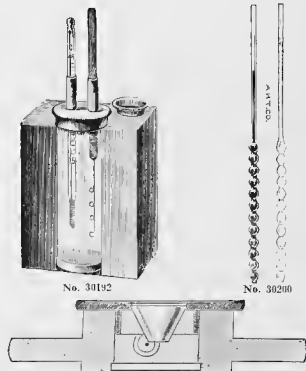


No. 30176

- 30144. Ocular, Ehrlich, with adjustable square diaphragm for use in blood counting, cytology, etc. 11.40
- 30148. Haemacytometer, Thoma-Metz, consisting of a counting ocular, counting slide, plano cover glass, pipette for red corpuscles and pipette for white corpuscles. The usual graduations on the counting chamber are omitted and are provided in the ocular which is adjusted for use with a 4 mm objective. Small variations in the focus of the objective may be compensated for by adjustment of tube length. This adjustment is controlled by the coincidence of the counting plate with a square engraved on the slide. In case 16.00
- 30152. Haemaglobinometer, Dare, complete in leather case. 22.50
- 30156. Haemaglobin Scale, Tallquist. A color scale of ten tints, ranging from 10% to 100%, bound in book form, pocket size, complete with 50 sheets of standard filter paper sufficient for 150 tests, and directions for use. 1.50
- 30160. Haemometer, Sahli, original Swiss make being constructed under Dr. Sahli's personal supervision and not to be confused with the many unsatisfactory imitations at a lower price. Complete with directions for use 7.50
- 30164. Standard Colored Tubes for above, each 1.25
- 30168. Graduated Tubes for above. 1.25
- 30172. Graduated Pipette for above. 1.25
- 30176. Haemometer, Fleischl, for measuring the percentage of haemoglobin in blood. The standard of comparison in this instrument is a tinted wedge of glass mounted movably beneath the stage. Only a small quantity of blood is required and the results are obtained easily and quickly. Complete in case with lock and handle. 24.00

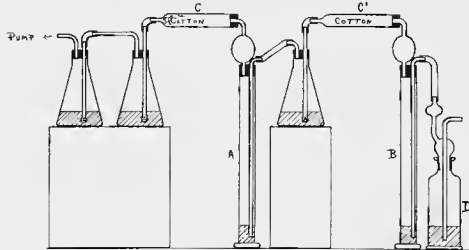


No. 30180

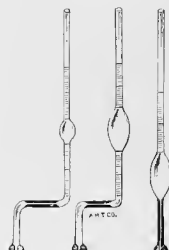


No. 30196

- 30180. **Haemometer, Fleischl-Miescher**, for estimating the absolute as well as the relative percentage of haemoglobin content of blood with great accuracy. Complete with cells, mixing pipette, etc. 45.00
- 30184. **Capillary Tubes for Fleischl Haemometers** of varying capacities to suit wedge of instrument. Capacity in cubic millimeters. Each..... .30
- 30188. **Yellow glass disc**, for use with Fleischl haemometers in day light. Each..... .175
- 30192. **Coagulometer, Biffi-Brooks**. Complete with thermometer..... .8.00
- 30196. **Coagulometer, Brodie-Russell-Boggs**, for use on the stage of the microscope. See *Johns Hopkins Hospital Bulletin*, June-July, 1907..... .9.00
- 30200. **Coagulometer, Schultz**, consisting of small glass tubes each with 14 bulbs, which may be broken off readily with the fingers for introduction into the normal salt solution. A simple and convenient method for determining coagulation time of blood. See *Berliner klin. Wochenschr.*, 1910, No. 13. Each..... .20



No. 30204

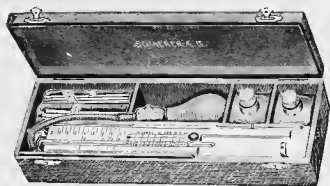


No. 30224

- 30204. **Apparatus for the Determination of Urea in the Blood, Marshall**. Complete outfit as shown in the illustration consists of two calcium chloride tubes, two Erlenmeyer flasks, two cylinders, one gas washing bottle, two rubber stoppers to fit cylinders, one Chapman filter pump, three special Folin tubes with perforations in bulb, three glass bulb connecting tubes, tubes for connecting flasks and tubes to reach to the bottom of the cylinders with necessary hose, etc. See *Journal of Biological Chemistry*, Vol. XI, No. 3, September, 1913. Complete outfit..... .7.00
- 30208. **Folin Tube with perforated bulb**, for above, each..... .15
- 30212. **Bulb Connecting Tube**, for above, each..... .30
- 30216. **Connecting Tubes, short**, for connecting flasks, for above, each..... .10
- 30220. **" "** long, to reach bottom of cylinders, for above, each..... .10
- 30224. **Stalagmometer, Traube**, for determining the surface tension of fluids by the number of drops formed by a given volume in a given time and as used for the small drop reaction in the diagnosis of typhoid vaccines and other studies in immunity. See *Biochem. z. März, 1910, Manch. med. W.* 5762, 1910 and *Journal of the American Medical Association*, May 23, 1910. Complete outfit consisting of three accurately calibrated glass tubes one each for small quantities of thin liquids, large quantities of thin liquids, and one specially for blood and other more viscous solutions.. 16.00
- 30228. **Stalagmometer Tubes**, as above, if ordered singly, each..... .7.50



No. 30256



No. 30232



No. 30236



No. 30240



No. 30244

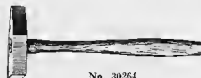


No. 30248

30232. Viscosimeter, Hess, for determining the viscosity of blood. Complete in case, with instructions for use. 22.25
30236. Blood Capsules, Wright, of soft glass, 2 1/2 inches long. Per 10 50
30240. Blood Collector, Vacuum, as devised by Dr. Keidel for collection of blood for Wasserman and other tests, consisting of an ampoule of 5 cc capacity from which the air has been exhausted, a piece of rubber tubing, a syringe needle and a glass tube to protect needle after sterilization. Per dozen. 2.40
30244. Blood Lancet, Swan, for drawing blood. .25
30248. Blood Lancet, English form, single end, with guard screw to regulate depth of stab. 1.00
30252. " " " double end, with both points protected for carrying in the pocket. 1.50
30256. Blood Pipettes, Wright, of soft glass with end rounded for convenient application of rubber tube and carefully drawn point; length 7 1/2 inches over all. Per 10 50



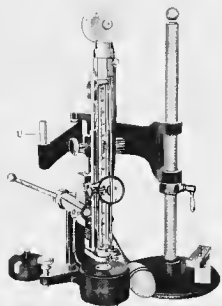
No. 30260



No. 30264



No. 30268



No. 30272

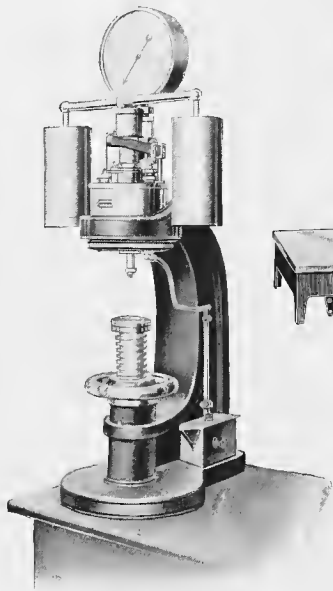


Gauge for No. 30276

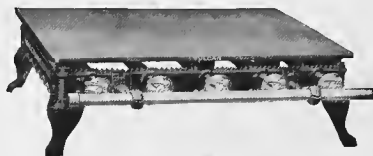


No. 30276

30260. Hammers, of solid cast steel, wedge shaped, for breaking ores.
- | | | | | |
|----------------|-----|-----|------|-----|
| Weight, ounces | 7 | 10 | 18 | 26 |
| Each | .50 | .60 | 0.80 | .90 |
30264. Hammers, for geologists, of solid cast steel, with edge parallel to handle.
- | | | | |
|----------------|-----|------|------|
| Weight, ounces | 14 | 20 | 28 |
| Each | .75 | 1.00 | 1.25 |
30268. Hammers, for geologists, of solid cast steel, with edge at right angle to handle.
- | | | | |
|----------------|-----|-----|-----|
| Weight, ounces | 11 | 16 | 20 |
| Each | .60 | .75 | .90 |
30272. Hardness Tester (Scleroscope), for measuring the hardness of metals. A miniature trip hammer is dropped from a fixed height upon the surface of the metal the hardness of which is to be tested. The height of the rebound of this hammer depends on the hardness or amount of resistance to penetration offered by the metal, and is measured by the Scleroscope scale. In addition to the Scleroscope proper the outfit consists of one plaster-mount vessel, one nicked and enameled swing arm and stand, one magnifier, hammer for soft metals only, one brass and one hard steel standard reference bars, 50 blank curve charts, all in polished hardwood carrying case. 150.00
30276. Hardness Tester, Keen, a simple portable instrument for testing the hardness of metals, the readings of which may be easily converted into approximately the Brinnell hardness numerals. A standard weight drops from a standard height, delivering a blow of constant magnitude on a socket in which is mounted a hardened steel ball. The indication on the piece to be tested is measured with a small celluloid gauge graduated to 1/16 mm or with a microscope. The instrument weighs only 6 1/2 lbs., is thoroughly portable and is finished with highly polished nickel plate. Complete with three extra hardened steel balls and measuring scale. 18.00



No. 30250



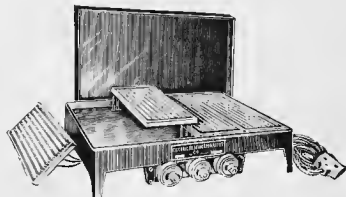
No. 30288



No. 30296—Three Heat



No. 30296—Single Heat



No. 30296—With top removed, showing replaceable heating units

30280. **Hardness Tester, Brinell**, for use in making Brinell's ball impression test or Ludwik's test by conical impressions. This method is standard throughout the world and gives numerical values of the hardness of materials without elaborate preparation, and insofar as iron and steel are concerned, the tensile strength as well. Some of the applications of this instrument are as follows:—
 Rapid control of chemical carbon determinations during iron and steel smelting.

Testing finished articles without damaging the same, say rails, tires, projectiles, armor plates, gun barrels of all kinds, structural steel, etc.

Examining the nature of the material in entire or broken parts of machinery, where the making of a tensile test bar is impossible.

Testing the degree of hardness and softness obtainable by thermal treatment of any steel.

Testing uniformity of temper.

Ascertaining the effect of the nature and temperature of various hardening fluids.

Studying the effect of cold working, etc., etc.

For a maximum pressure of 3000 kilograms. **Duty Free**..... 210.00 **Duty Paid**..... 250.00

30284. **Hardness Tester, Brinell**, as above, for a maximum pressure of 5000 kilograms. **Duty Free**..... 235.00 **Duty Paid**..... 280.00

30288. **Hot Plates**, for gas, with extra heavy polished steel top.
 Length, inches..... 18 24 30 36
 Width, inches..... 14 18 18 18

Each..... 12.00 16.80 21.60 26.50

30296. **Hot Plates, Electric, "Multiple Unit" Type**, wound for 110 and 220 volts interchangeable. Size 6½ x 18 inches reaches 400° F. on low heat, 600° F. on medium and 750° F. on high heat, and consumes 330, 660 and 990 Watts, respectively, for these temperatures.

Size, inches..... 12½ x 12½ 12½ x 18 18 x 24 6½ x 18

Each, one heat..... 17.50 24.50 34.00 15.00

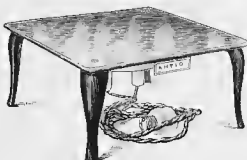
Each, three heats..... 20.00 27.50 37.50 17.50

Extra Units, each..... 3.25 4.00 4.00 2.50

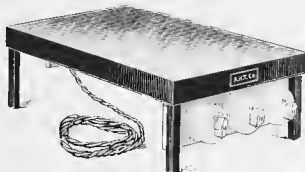
Rewiring Units, each..... 2.50 3.00 3.00 2.00



No. 30300



No. 30304

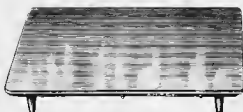


No. 30308

- 30300. Hot Plate, Hoskins Electric, with heating elements of nickel-chromium.** With 500 watts gives a maximum temperature of 483° C. With pressed steel top 6 inches in diameter. Works equally well on alternating or direct current but voltage must be specified in ordering. Furnished with six feet of flexible cord and plug. Requires use of 5 ampere snap or knife switch. 6.00
- 30304. Hot Plate, Hoskins Electric, with polished sheet steel top and cast iron legs.** Spiral resistance unit covers circular area 5 1/4 inches in diameter in center of top, 12 inches square. Gives maximum temperature with 500 watts of 260° C. at center and 121° C. at edge. Works equally well on direct or alternating current but voltage must be specified in ordering. Furnished with 6 ft. of flexible cord and plug. Requires 5 ampere snap or knife switch for operation. 8.00
- 30308. Hot Plate, Hoskins Electric, Three Heat, with polished sheet steel top 12 x 18 inches, with square steel legs.** Resistance unit composed of three parallel windings, each controlled by a snap switch on front of plate. Heat distribution is absolutely uniform. At "Low" heat with 600 watts gives 177° C., "Medium" with 1200 watts gives 232° C. and "High" with 1800 watts gives 288° C. Works equally well on direct or alternating current but voltage must be specified in ordering. Requires use of a double pole knife switch 20 amperes capacity on 110 volts, and 10 amperes on 220 volts 25.00



Nos. 30316 and 30320



Nos. 30324 and 30328



No. 30332

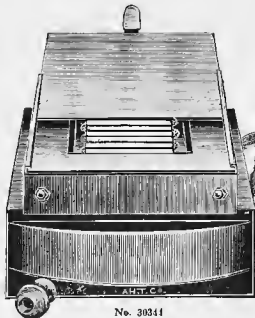
- 30312. Hot Plate, Electric, Three Heat.** Furnished with regulating switch, 5 ft. of flexible cord and snap switch. Gives maximum temperature of 315° C. when running idle. Of polished steel. Operates equally well on direct or alternating current but voltage must be specified in ordering.
- | | | |
|-------------------------|------|-------|
| Length, inches. | 6 | 6 |
| Width, inches. | 6 | 12 |
| Each | 9.00 | 11.00 |
- 30316. Hot Plates, Electric, Three Heat, circular form, of polished steel with slate base, with regulating switch.** All are furnished with 6 ft. of flexible cord and the 4 1/2 and 6 inch sizes with a lamp socket plug. No socket plug is furnished with the 8 inch size but a plug switch is furnished with the 10 inch. Operate equally well on direct or alternating current but voltage must be specified in ordering. Maximum surface temperature on "High" heat when running idle about 340° C. For arrangement to use these heaters in connection with Extraction Apparatus, No. 27564.
- | | | | | |
|---------------------------|-------|------|-------|-------|
| Diameter, inches. | 4 1/2 | 6 | 8 | 10 |
| Each | 6.00 | 7.50 | 10.00 | 13.00 |
- 30320. Hot Plate, Electric, circular form, for single heat, with 6 ft. of cord and lamp socket plug but without regulating switch.** Diameter, 4 1/2 inches. Of polished steel on slate base. Gives surface temperature when running idle on 250 watts of about 340° C. Operates equally well on direct or alternating current but voltage must be specified in ordering. 4.00
- 30324. Hot Plates, Electric, rectangular form, for one heat.** Of polished cast iron. Furnished with 4 ft. of cord but no plug. Will reach about 340° C. when running idle. Operate equally well on direct or alternating current but voltage must be specified in ordering.
- | | | |
|-------------------------|-------|-------|
| Length, inches. | 12 | 18 |
| Width, inches. | 9 | 12 |
| Each | 11.00 | 16.50 |
- 30328. Hot Plate, Electric, rectangular form, same as No. 30324 but with three heats and furnished with 4 ft. of cord and plug switch.** Operates equally well on direct or alternating current but voltage must be specified in ordering.
- | | | |
|-------------------------|-------|-------|
| Length, inches. | 12 | 18 |
| Width, inches. | 9 | 12 |
| Each | 13.00 | 18.50 |
- 30332. Hot Plate, Electric, long form, with three moderate heats, very suitable for extraction apparatus such as No. 27568.** With 5 ft. of cord and snap switch. Operate equally well on either direct or alternating current but voltage must be specified in ordering.
- | | | |
|-------------------------|-------|-------|
| Length, inches. | 24 | 24 |
| Width, inches | 24 | 4 1/2 |
| Each | 13.00 | 13.50 |



No. 30336

HOT PLATES, HERAEUS PATENT, WITH AUTOMATIC TEMPERATURE REGULATION. These plates are of aluminum with heating element of sheet Nichrome and reach a maximum temperature of 250°C. A micrometer screw is set to any temperature desired below the maximum, after which the plate will maintain the desired temperature to within 1° without attention, all of which is accomplished without the use of rheostats. The plates are listed below both without regulator and with regulator for both alternating and direct circuits. As the heating element is contained in an air box 2 inches deep the hot plate proper can be removed and replaced with a plate with aluminum rings at extra price.

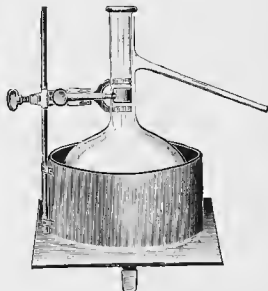
Size of plate, cm.....		12½ x 25	12½ x 50	20 x 40	25 x 50	10 x 85
Maximum current consumption, Watts		400	900	1200	1800	1300
30336.	Hot Plate, as above, without regulator	Duty Free 11.50	Duty Free 17.00	Duty Free 18.50	Duty Free 25.00	Duty Free 23.00
	Duty Paid	16.10	23.80	25.90	35.00	32.20
30337.	“ “ “ “ with regulator for D.C.,	Duty Free 22.00	Duty Free 27.50	Duty Free 28.50	Duty Free 35.50	Duty Free 33.50
	Duty Paid	30.80	38.50	39.90	49.70	46.90
30338.	“ “ “ “ with regulator for A.C.,	Duty Free 24.00	Duty Free 29.00	Duty Free 30.00	Duty Free 37.00	Duty Free 35.50
	Duty Paid	33.60	40.60	42.00	51.80	49.70
30340.	Aluminum Rings, for above Hot Plates.					
	Diameter of largest size, cm	9	12	15	18	
	Number of rings in set.....	4	5	6	7	
	Duty Free, per set .....	.80	1.00	1.20	1.40	
	Duty Paid, “	1.15	1.40	1.70	2.00	



No. 30341



No. 30344



30344. **Hot Plate with Flask Heater, Electric, Multiple Unit Type.** A practical combination of hot plate, flask heater and sand bath. The hot plate is removable and either the sand bath or flask heater may be inserted in its place immediately over the heating units. Attains a maximum temperature of 540° C which may be reduced sufficiently low for ether or alcohol extractions. The unit is replaceable by the operator. Complete with connecting cord and plug for either 110 or 220 volt lines. Voltage must be specified in ordering. 3.00
30346. **Extra Units, for either voltage.** 3.00
30348. **Rewinding Units at factory, each** 1.25

HYDROMETERS.

All our Baume scale Hydrometers are graduated in accordance with the American Standard scale, i. e.

$$B^{\circ} = \frac{60^{\circ} F.}{143 - \frac{135}{S.G.}}$$
 for liquids heavier than water and $S.G. = \frac{140}{150 + B^{\circ}}$ for liquids lighter than water.

30352. **Hydrometers, Specific Gravity,** for liquids lighter than water; ranges 0.700-0.800, 0.800-0.900, 0.900-1.000 and 0.700-1.000. **Each.** 1.00
30356. **Hydrometers, Specific Gravity,** for liquids heavier than water; ranges 1.000-1.200, 1.200-1.400, 1.400-1.600, 1.600-1.800, 1.800-2.000, 1.000-1.500, and 1.000-2.000. **Each.** 1.00
30360. **Hydrometer, Specific Gravity, Patent,** for both light and heavy liquids in either small or large quantities, as well as for solids. Provided with three scales on the one stem. Fig. 2 shows the paper scale laid out flat, before being placed in the stem of the hydrometer. One scale is graduated from 0.700 to 1.000 for light liquids in bulk, the second is graduated from 1.000 to 1.400 for heavy liquids in bulk, and the third is graduated in grams and $\frac{1}{16}$ grams, serving as a balance, for determining the specific gravity of light or heavy liquids and solids, which are placed in the small graduated stoppered bulb of the instrument. Complete in tin carrying case. 4.00
30364. **Hydrometers, Specific Gravity and Baume,** for liquids lighter than water; ranges 0.700-1.000 and 70-10; 0.700-0.850 and 70-34; 0.850-1.000 and 34-10; 0.700-0.800 and 70-14; 0.800-0.900 and 44-25; 0.900-1.000 and 25-10. **Each.** 1.25
30368. **Hydrometers, Specific Gravity and Baume,** for liquids lighter than water, with thermometer in stem; ranges 0.700 to 1.000 and 70-10. **Each.** 2.25
30372. **Hydrometers, Specific Gravity and Baume,** for liquids heavier than water; ranges 1.000-2.000 and 0-70; 1.000-1.400 and 0-41; 1.400-2.000 and 41-70; 1.000 to 1.200 and 0-24; 1.200-1.400 and 24-41; 1.400-1.600 and 41-54; 1.600-1.800 and 54-64; 1.800-2.000 and 64-70. **Each.** 1.25
30376. **Hydrometer, Specific Gravity and Baume** for liquids heavier than water, with thermometer combined; 1.000-2.000 and 0-70. **Each.** 2.25
30380. **Hydrometer, Universal, Baume and Specific Gravity,** for both heavy and light liquids. Baume ranges from 0 to 70 and 10 to 100° in single degrees, specific gravity from 0.700 to 1.900. **Each.** 1.75
30384. **Hydrometers, Baume,** for liquids lighter than water; ranges 20-10°, 30-20°, 40-30°, 50-40°, 60-50°, 70-60°, 80-70°, and 90-80°; divided in $\frac{1}{16}$ °. **Each.** 1.00
30388. **Hydrometers, Baume,** for liquids heavier than water; ranges 0-10°, 10-20°, 20-30°, 30-40°, 40-50°, 50-60° and 60-70°; divided in $\frac{1}{16}$ °. **Each.** 1.00
30392. **Hydrometers, Baume,** for liquids heavier than water; 0-50° and 0-70°; divided in single degrees. **Each.**50
30396. **Hydrometer, Twaddle,** for liquids heavier than water (Twaddle degrees multiplied by 5 and added to 1000=specific gravity); about 12 inches long. Ranges No. 0, 0-10; No. 1, 0-24; No. 2, 24-48; No. 3, 48-72; No. 4, 72-102; No. 5, 102-134 and No. 6, 134-160. **Each.**75
30400. **Hydrometer, Twaddle,** same construction and scales as No. 30396 but small size, i. e., about 6 inches long. **Each.** 1.00
30404. **Hydrometer, Brix,** ranges 0-30°, 30-60° and 60-90° graduated in $\frac{1}{2}$ °. **Each.** 1.00
30408. " " of Jena glass; ranges 0-15°, 15-30°, 30-45°, 45-60°, 60-75°, and 75-90°; graduated in $\frac{1}{16}$ °. **Each.** 1.25
30412. **Hydrometer, Brix,** of Jena glass, range 20-25°, graduated in $\frac{1}{16}$ °, with enclosed Centigrade thermometer of Jena glass. **Each.** 3.00
30416. **Hydrometer, Brix,** of German silver throughout, ranges 0-30°, 30-60°, and 60-90°; graduated in $\frac{1}{2}$ °. **Each.** 4.50
30420. **Hydrometers, Specific Gravity, Precision,** of Jena 16 III glass, reading to between the third and fourth decimal place from 0.700 to 1.950. Each hydrometer 350 mm long; ranges 0.700-0.760, 0.760-0.820, 0.820-0.880, 0.880-0.940, 0.940-1.000, 1.000-1.060, 1.060-1.120, 1.120-1.180, 1.180-1.240, 1.240-1.300, 1.300-1.360, 1.360-1.420, 1.420-1.480, 1.480-1.540, 1.540-1.600, 1.600-1.660, 1.660-1.720, 1.720-1.780, 1.780-1.840 and 1.840-1.950. **Each.** 2.50
30424. **Hydrometer, Specific Gravity,** complete set of above (No. 30420) consisting of 20 hydrometer spindles and one indicating thermometer spindle with which to determine the correct hydrometer to use in a given solution 50.00
30428. **Hydrometers, Specific Gravity,** complete set as in No. 30424 but certified to four points and with certificate of the Physikalisch-Technische Reichsanstalt. In wooden case 70.00
30432. **Hydrometers, Precision,** exactly same as No. 30424 and same ranges, but 15 cm long, for small quantities of fluids. **Each.** 1.75
30436. **Hydrometers, Precision,** complete set of No. 30432. In wooden case 35.00
30440. " " " " " " certified to four points and with certificate of the Physikalisch-Technische Reichsanstalt. In wooden case 55.00



No. 3076



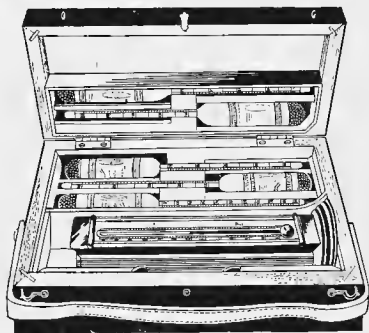
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No. 30360 Fig. 1



No. 30516



No. 30462



No. 30360 Fig. 2



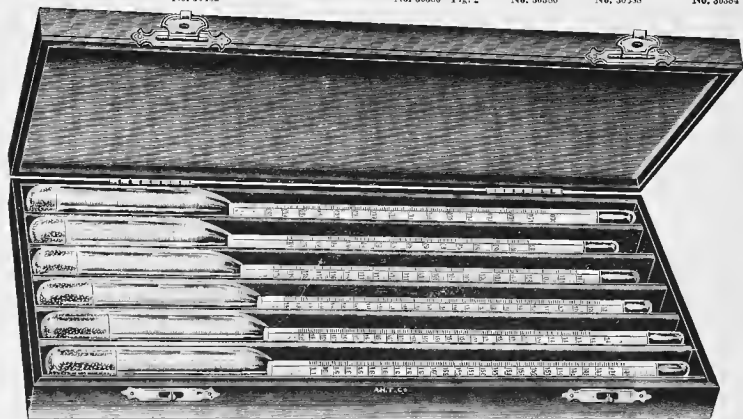
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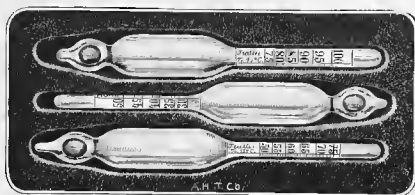
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No. 30384



No. 30111



No. 30476

30444.	Hydrometers, Precision, reading in specific gravity to the third decimal place. Set of six, 0.700-0.850, 0.850-1.000, 1.000-1.250, 1.250-1.500, 1.500-1.750 and 1.750-2.000. With separate thermometer in case. Spindles are not sold separately. In wooden case.	15.00
30448.	Hydrometers, Precision, complete set as in No. 30444 but with certificate of the Physikalisch-Technische Reichsanstalt. In wooden case.	21.00
30452.	Hydrometer, Baume, of German Silver, for liquids heavier than water, scale 0-50° in 1°	4.50
30456.	Hydrometer, Alcohol, Gay-Lussac, scale from 1°-100° in single degrees.	1.00
30460.	" Tralle and Proof Scales reading from 100° below to 100° above Proof and from 1° to 100° Tralle in single degrees.	1.00
30464.	Hydrometer, Alcohol, Tralle and Proof Scales as in No. 30460 and also with enclosed thermometer. U. S. Custom House standard pattern.	2.00
30468.	Hydrometers, Alcohol, U. S. Internal Revenue Bureau Pattern, covering the entire range of spirituous liquors. No. 1, 0-100°; No. 2, 80-120°; No. 3, 100-140°; No. 4, 130-170°; No. 5, 160-200°. Each.	2.50
30472.	Hydrometers, Alcohol, Complete Set, as above, in polished wooden case with leather lining, including one copper spirit can with standard thermometer.	24.00
30476.	Hydrometers, Alcohol, Plate. Set of three hydrometers 9 cm in length, for testing alcohol in museum jars and biological work without the inconvenience of pouring off a sufficient quantity to float the usual large hydrometer. Reading from 30 to 100% volume and tested in the Zeiss laboratories. In handsome case.	5.00
30480.	Hydrometer, Ammonia, 35-10° Baume scale in $\frac{1}{2}$ ° divisions. . . . .	.75
30484.	" Sommer's Patent, for determining the specific gravity of Asphalt, graduated from 0.85 to 1.3° at 25° C., as recommended by the Committee of the American Society of Civil Engineers. Complete with brass receptacle and fittings, with instructions for use.	10.00
30488.	Hydrometer, same as No. 30484, but graduated from 0.950 to 1.100°.	10.00
30492.	" (Barkometer) for tanning liquids reading from 0-60° Baume in single degrees.	1.00
30496.	Hydrometer, same as above but with thermometer and correction scale.	2.50
30500.	Hydrometer (Barkometer) reading from 0 to 60° Baume in single degrees with Fahrenheit thermometer to 90°, scale about 5 inches long.	2.00
30504.	Hydrometer, Benzene, also for coal oil, gasoline, naphtha, etc., scale 90-60° Baume reading in single degrees. Each.	2.75
30508.	Hydrometer Ether, reading from 0.75 to 0.700 Specific Gravity, with enclosed thermometer.	2.75
30512.	Hydrometer Glue, graduated from 0-12° in $\frac{1}{2}$ °.	1.25
30516.	Hydrometer, Lime-sulphur, for use in determining the degree of density of lime-sulphur solutions, as recommended by Parrott and Stewart; scale is from 0 to 38° Baume and from 1.000 to 1.350 specific gravity, without cylinder. . . . .	.75
30520.	Hydrometer, as above, with special cylinder.	1.00
30524.	Special Cylinder only. . . . .	.40
30528.	Hydrometer, (Salinometer) with direct reading in percentage of salt content, range from 1 to 100% in $\frac{1}{2}$ ° divisions. . . . .	.75
30532.	Hydrometer, Storage Battery, with specific gravity scale, with range 1.100 to 1.300 and 7 inches in length. Each. . . . .	.75
30536.	Hydrometer, Storage Battery, with syringe. The pointed tube of the syringe is inserted in the storage cell opening and the electrolyte withdrawn by means of the bulb. The specific gravity is then read by the hydrometer floating in the cylinder of the syringe without the use of another container. Reading from 1175 equals total exhaust of battery to 1300 equal full charge.	1.75
30540.	Hydrometer, Sugar and Syrup, "sweet water spindle," Brix scale, -5 to +5° in $\frac{1}{2}$ °ths.	1.25
30544.	" Morse's Readings, for tropical cane sugar factories. A special hydrometer with thermometer combined, for determining the possible yield of sugar from the cane by the density of the raw juice. The hydrometer shows how much sugar to expect and, by comparing this with the actual yield, the efficiency of the factory work can be estimated.	6.00
30548.	Hydrometer, Sugar and Syrup, Baume scale graduated in single degrees; 0-20° and 0-50°. Each. . . . .	.75
30552.	Hydrometer, Saxe's Aro-Pycnometer, for testing small quantities, only 3 cc of solution being necessary, range 1.000 to 1.060 specific gravity. . . . .	.75
30556.	Hydrometer, Vinegar, showing percentage of acetic acid.75
30560.	" (Solidimeter), for solids in vinegar, with thermometer.	3.00



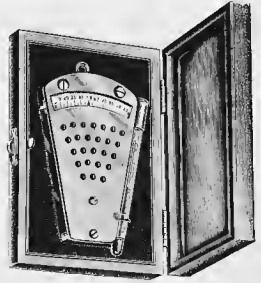
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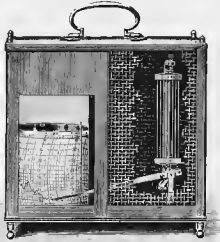
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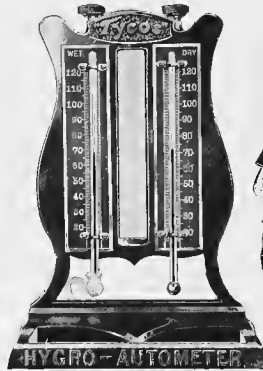
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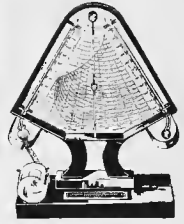
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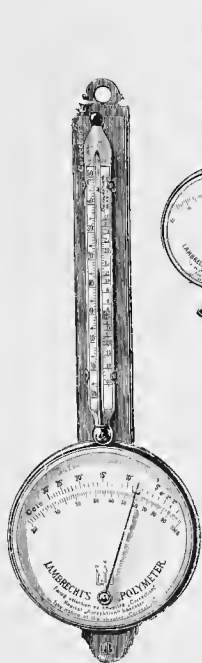


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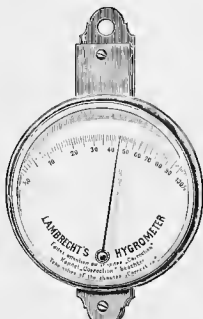
30564. Hygrometer, Mason, wet and dry bulb, for the determination of relative and absolute humidity and dew point in connection with the tables and directions. With black oxidized brass scale on oak board 5 x 11 inches. 2.25
30568. Hygrometer, simple form, in nickel plated case, with scale 80 mm in diameter. 2.75
30572. " " Wurster's model, for industrial use. For the testing of the moisture content of yarn, cloths, bales of tobacco, paper, etc. With thermometer. 10.00
30580. Hygrometer (Sling Psychrometer), for obtaining more rapid results than are possible with a stationary wet and dry bulb instrument. Scale 0° to 100° F. in 1°. With copper protecting case. . . . 9.00
30584. Hygrometer (Hygro-Autometer), an improved form of wet and dry bulb hygrometer, reading directly in percentage of relative humidity and dew point without the aid of tables. On black japanned iron frame. 10.50
30588. Hygrometer (Hygrodeik), an improved wet and dry bulb instrument showing relative and absolute humidity, with dew point without reference to tables. With black, japanned iron frame. . . . 12.00
30592. Hygrometer, Registering (Hydrograph), latest model, for registering the relative humidity, As used by manufacturers of food products, paper, explosives, etc., and in cold storage and tobacco warehouses. Including charts for one year's use. 55.00
- Duty Free 45.00 Stock 2.00
30593. Extra Charts, per box of 53 sheets. 2.00
30594. Extra Pens, each. 1.50
30595. Special Ink, per bottle.50



No. 30596



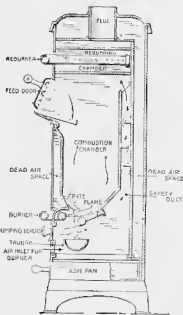
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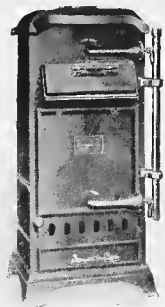
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No. 30612

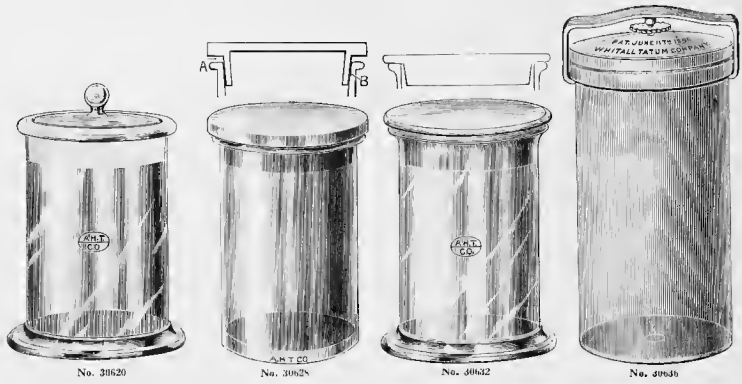


No. 30608—Sectional view



No. 30608

30596. **Hygrometer, Lambrecht's Polymeter**; an accurate hygrometer with thermometer and various correction scales, used both in meteorology and for industrial purposes; non-corrodible, with phosphor-bronze finish with enamel scale, total height 245 mm, diameter of scale 75 mm; not to be confused with cheaper forms of the same instrument **12.00**
30600. **Hygrometer, Miniature Form**, total height 140 mm with scale 75 mm in diameter, in non-corroding phosphor-bronze case, with thermometer; particularly recommended for laboratory use as in bacteriological incubators, etc. **14.00**
30604. **Hygrometer, Lambrecht**, for factory use, for hanging on wall, without thermometer, in nickel plated zinc case, total height 150 mm, with scale 75 mm in diameter. **5.00**
30608. **Incinerator, Laboratory**, for convenient disposition of laboratory and dissecting room refuse, particularly infected animal carcasses and similar material. The arrangement of the combustion chamber and burner insures the drying of wet compact refuse by allowing air passage through it until it is finally consumed. Any drip or liquid matter is caught in the trough below the burner. The apparatus is economical in its operation and because of asbestos lining causes very little heat radiation in the room and it is easy to take apart. Full directions for installation and operation are sent with each machine. A $\frac{3}{4}$ inch gas supply pipe is necessary and a proper flue for disposing of the products of combustion. Size I is supplied with a single grate and Size II has two grates.
- | | | |
|---|--------------|--------------|
| Designation | Size I | Size II |
| Outside dimensions, inches. | 15 x 11 x 37 | 18 x 18 x 49 |
| Capacity of combustion chamber, cu. inches. | 1412.5 | 2825 |
| Each | 60.00 | 90.00 |
30612. **Induction Coils, Ruhmkorff**, mounted on polished mahogany base, with condenser and adjustable vibrator.
- | | | | | | |
|---|---------------|---------------|---------------|---------------|--------------|
| Length of spark, approximately, inches. | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1 |
| Each | 4.50 | 6.75 | 9.00 | 13.50 | 18.00 |
30616. **Ink, Diamond**, for writing on glass, 25 grams in gutta percha bottle. Per bottle **.50**



30620. Jar, Museum, A. H. T. Co. Special, with foot and ground in, air tight stopper with knob. A widely used jar for all laboratory and museum purposes, of special finish affording a great brilliancy and lustre and not to be confused with jars of similar shape to be had at much less price. See list below of additional sizes to be had on import orders.

Height, cm.	10	10	13	15	15	15	18	18	20	25	60
Diam., cm.	7.5	10	7.5	10	15	20	30	12	15	30	25
Each	.50	.80	.60	1.00	1.80	3.00	6.80	1.30	2.00	7.55	6.00

30620. Jars, Museum, A. H. T. Co. Special Import List. For the convenience of those preparing lists of our Special Museum Jars as listed above for duty free importation we list the sizes available with prices, duty free, f. o. b. Philadelphia boxing extra. Orders are intended to be for at least 10 jars of a size (except in the case of very large sizes) and to aggregate at least \$50.00 in value.

Height, cm.	5	5	5	5	5	6	6	6	6	6	6
Diameter, cm.	1	2	3	4	5	1	2	3	5	6	8
Duty Free, per 10	.75	.75	.75	.95	.95	.75	.75	.75	1.05	1.15	1.80
Height, cm.	7	7	7	7	8	8	8	8	8	8	8
Diameter, cm.	2	3	4	10	2	3	4	5	6.5	8	10
Duty Free, per 10	.75	.95	1.15	2.40	1.05	1.15	1.35	1.35	1.50	1.90	2.70
Height, cm.	8	9	9	9	9	9	9	10	10	10	10
Diameter, cm.	16	2	3	4	5	6	9	2	3	4	5
Duty Free, per 10	6.00	1.15	1.15	1.35	1.35	1.50	2.70	1.15	1.35	1.50	1.50
Height, cm.	10	10	10	10	10	12	12	12	12	12	12
Diameter, cm.	6	7.5	10	12	15	2	3	4	5	6	8
Duty Free, per 10	1.70	1.90	3.00	4.50	5.55	1.15	1.35	1.50	1.70	1.90	2.40
Height, cm.	12	12	12	12	12	13	13	13	13	15	15
Diameter, mm.	10	12	15	18	20	5	7.5	10	16	2	3
Duty Free, per 10	3.75	4.65	6.00	7.50	9.75	1.70	2.25	3.75	7.50	1.50	1.70
Height, cm.	15	15	15	15	15	15	15	15	15	15	15
Diameter, cm.	4	5	8	10	12	15	20	25	30	2	3
Duty Free, per 10	1.70	1.90	2.65	3.75	4.95	6.60	11.25	15.00	26.35	1.70	1.70
Height, cm.	18	18	18	18	18	18	18	18	18	18	18
Diameter, cm.	4	5	6	7	9	10	11	12	15	18	24
Duty Free, per 10	1.90	2.05	2.25	2.25	3.75	4.50	4.50	4.80	7.50	9.30	15.00
Height, cm.	20	20	20	20	20	20	20	20	20	20	20
Diameter, cm.	4	5	6	7	8	10	12	14	16	20	25
Duty Free, per 10	1.90	2.25	2.45	2.65	2.85	4.80	5.55	6.75	9.00	12.00	18.75
Height, cm.	20	22	22	22	22	22	22	22	22	22	22
Diameter, cm.	30	2	4	5	7	8	9	10.5	12	14	16
Duty Free, per 10	37.60	2.25	2.25	2.45	2.85	3.30	4.05	4.95	5.55	6.90	9.00
Height, cm.	22	25	25	25	25	25	25	25	25	25	25
Diameter, cm.	22	3	5	8	10	12	16	18	20	25	30
Duty Free, per 10	15.00	2.85	3.20	4.50	5.70	6.60	9.60	11.25	15.00	22.50	34.10
Height, cm.	25	30	30	30	30	30	30	30	30	35	35
Diameter, cm.	33	5	8	10	12	15	20	25	30	5	8
Duty Free, per 10	56.00	3.90	5.90	6.85	7.75	11.65	19.40	29.15	45.75	5.80	7.20
Height, cm.	35	35	35	35	40	40	45	45	50	50	55
Diameter, cm.	12	15	20	25	10	15	12	20	10	25	10
Duty Free, per 10	11.05	15.10	26.25	38.50	10.85	18.10	15.40	30.65	13.15	66.50	14.90

30628.	Jars, Museum, Hopkins-Columbia Model, as furnished by us in large quantities to various laboratories in Johns Hopkins University and Columbia University. The stopper of the jar is ground inside but the lid remains some distance from the upper flange. Glass and workmanship identical with No. 30620. These jars are not regularly carried in stock.																					
	Height, cm.....	9	10	12	13	15	18	20														
	Diameter, cm.....	4	5	6	7.5	8	14	6														
	Duty Free, per 10.....	1.30	1.50	1.80	2.25	2.60	6.65	2.40														
	Height, cm.....	20	22	22	21	30	35	35														
	Diameter, cm.....	10	9	20	14.5	15	9.5	30														
	Duty Free, per 10.....	4.70	4.00	12.50	7.35	11.60	7.70	75.00														
30632.	Jar, Museum, of same quality and finish as No. 30620 but with flat lid with air tight grinding between the lid and top of jar and with the downward projection of the lid loosely fitting into the jar, thus preventing the sticking of the lid sometimes encountered when the ground surface is inside the jar. The flat lid permits stacking of the jar either when filled or empty.																					
	Height, cm.....	10	10	13	15	15	18	18	20	25	60											
	Diam., cm.....	7.5	10	7.5	10	15	20	30	12	15	30	25	15									
	Each.....	.50	.80	.60	1.00	1.80	3.00	6.80	1.30	2.00	7.55	6.00	8.90									
30636.	Jar, Standard Museum, Whitall-Tatum Co., with mouth same size as body; with rubber band and metal clamp and two glass suspension rings on under side of glass cover. By special arrangement with the manufacturers we offer these jars at original factory prices.																					
	Height, inches.....	4	6	8	12	18	6	8	12	18	8											
	Diameter, inches.....	2 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	5										
	Capacity, pints.....	2	3	1	1 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	4	6	5										
	Each.....	.38	.41	.43	.49	.54	.57	.62	.73	.86	1.08											
	Per dozen.....	3.65	4.05	4.32	4.73	5.40	5.67	6.08	7.16	8.51	10.94											
	Height, inches.....	12	15	18	8	12	6	8	12	15	18											
	Diameter, inches.....	5	5	5	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{3}{4}$	7 $\frac{3}{4}$	8	12	15	18										
	Capacity, pints.....	8	10	12	8	12	9	12	18	22	28											
	Each.....	1.30	1.38	1.49	1.40	1.57	2.03	2.16	2.46	2.70	2.89											
	Per dozen.....	12.96	13.77	14.85	14.04	15.66	20.25	21.60	24.57	27.00	28.89											
	Height, inches.....						24	36	12	18	24											
	Diameter, inches.....						7 $\frac{3}{4}$	7 $\frac{3}{4}$	11 $\frac{1}{2}$	11 $\frac{1}{2}$	11 $\frac{1}{2}$											
	Capacity, pints.....						36	56	38	58	80											
	Each.....						3.32	4.32	5.13	6.48	8.10											
	Per dozen.....						33.21	43.20	51.30	64.80	81.00											
	Fittings for No. 30636 Jars.																					
	Diameter, inches.....			2 $\frac{1}{4}$	3 $\frac{1}{2}$	5	6 $\frac{1}{4}$	7 $\frac{3}{4}$	11 $\frac{1}{2}$													
30640.	Lids, only, each.....			.06	.10	.20	.28	.50	1.30													
30644.	Clamps, only, each.....			.24	.30	.48	.54	.90	1.70													
30648.	Rubbers, only, each.....			.05	.15	.35	.40	.60	1.40													
30652.	Jars, Museum, A. H. T. Co. Special Flat Top, with ground on lids of plate glass and with feet. The great variety of sizes offered and low prices have resulted in a very wide use of these jars. The foreign method of manufacture produces a jar of much finer appearance and finish and less susceptible to sudden temperature changes than corresponding ware made in the U. S. See following import list for duty free prices and variety of sizes available on importation order.																					
	Height, cm.....	10	10	10	15	15	15	15	18													
	Diameter, cm.....	6	10	16	10	15	20	30	15													
	Each.....	.35	.60	1.10	.75	1.05	1.90	4.00	1.20													
	Height, cm.....	18	20	20	25	60	70	70	15													
	Diameter, cm.....	21	18	30	25	15	10	15														
	Each.....	2.30	1.75	6.00	3.70	4.35	3.00	4.95														
30652.	Jars, Museum, A. H. T. Co. Special Flat Top, Import List. For the convenience of those ordering Jars No. 30652 for duty free importation we give the following list of sizes available and duty free prices.																					
	Height, cm.....	5	5	5	6	6	6	7	8	8	8											
	Diameter, cm.....	1.5	2	3	2	3	4	1.5	5	2.5	3.5	5										
	Duty Free, per 10.....	.55	.55	.60	.60	.65	.75	.60	.90	.70	.80	.95										
	Height, cm.....	8	8	8	8	8	9	9	9	9	10	10										
	Diameter, cm.....	8	10	12	13	15	4	6	9	18	2	4										
	Duty Free per 10.....	1.45	1.95	2.40	2.80	3.35	.90	1.20	1.85	5.30	.75	.90										
	Height, cm.....	10	10	10	10	10	11	11	12	12	12	12										
	Diameter, cm.....	5	6	8	10	16	3	9	2	3	4	5										
	Duty Free per 10.....	1.15	1.15	1.65	2.15	4.00	.85	2.05	.75	.90	1.00	1.15										
	Height, cm.....	12	12	12	12	12	13	13	13	13	13	13										
	Diameter, cm.....	8	10	12	16	20	3	5	6	7.5	10	13										
	Duty Free per 10.....	1.85	2.55	2.80	4.45	6.55	.95	1.30	1.55	2.05	2.55	3.35										
	Height, cm.....	13	13	13	14	14	14	14	15	15	15	15										
	Diameter, cm.....	15	18	28	10	14	20	25	2	4	5	6										
	Duty Free per 10.....	3.90	5.70	14.00	2.70	3.65	6.80	10.30	1.00	1.05	1.30	1.55										
	Height, cm.....	15	15	15	15	15	15	16	16	16	16	18										
	Diameter, cm.....	8	10	12	15	20	30	10	15	16	20	3										
	Duty Free per 10.....	2.05	2.75	3.15	3.90	6.95	15.40	2.80	3.90	4.55	6.95	1.15										
	Height, cm.....	18	18	18	18	18	18	18	18	18	20	20										
	Diameter, cm.....	4	5	8	10	12	15	18	21	25	2.5	4										
	Duty Free per 10.....	1.25	1.55	2.25	3.10	3.75	4.45	6.40	8.35	11.80	1.20	1.25										



No. 30652-56

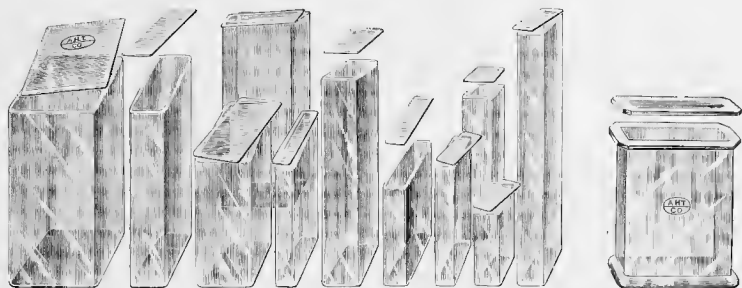
30652. (Cont.)

Height, cm.....	20	20	20	20	20	20	20	20	20	20	20
Diameter, cm.....	5	6	7	8	10	12	13	14	15	16	18
Duty Free per 10.....	1.55	1.75	2.00	2.25	3.10	3.75	4.05	4.50	4.95	5.75	6.40
Height, cm.....	20	20	20	22	22	22	23	23	23	25	25
Diameter, cm.....	20	30	35	5	7	9	6	12	18	3	4
Duty Free per 10.....	8.05	23.10	42.50	1.70	2.20	2.60	2.10	4.20	7.50	1.40	1.80
Height, cm.....	25	25	25	25	25	25	25	25	25	25	25
Diameter, cm.....	5	6	7	10	12	15	16.5	18	20	25	30
Duty Free per 10.....	2.05	2.10	2.40	3.80	4.65	5.90	7.30	7.85	9.90	13.65	24.65
Height, cm.....	28	28	28	28	28	28	28	28	28	30	30
Diameter, cm.....	4	5	6	7	8	10	12	16	20	3.5	5
Duty Free per 10.....	1.70	2.15	2.60	2.90	2.90	4.75	5.60	7.85	11.15	1.70	2.15
Height, cm.....	30	30	30	30	30	30	30	30	30	30	30
Diameter, cm.....	6	8	9	10	11	12	14	15	16	20	25
Duty Free per 10.....	2.60	3.25	4.35	5.10	5.60	6.10	6.95	7.50	8.65	11.90	18.20
Height, cm.....	30	35	35	35	35	35	35	35	35	35	35
Diameter, cm.....	30	3	4	5	6	7	8	10	12	15	18
Duty Free per 10.....	31.10	2.10	2.70	2.90	3.35	3.75	4.00	5.75	7.75	10.25	12.85
Height, cm.....	35	35	35	40	40	40	40	40	40	40	40
Diameter, cm.....	20	25	30	4	5	6.5	8	10	15	20	25
Duty Free per 10.....	15.50	29.75	42.00	2.80	3.10	3.95	5.05	6.45	12.50	18.40	38.60
Height, cm.....	40	45	45	45	45	45	45	50	50	50	50
Diameter, cm.....	30	5	8	10	15	20	25	5	6	8	10
Duty Free per 10.....	52.50	3.35	5.05	6.45	13.75	22.25	40.25	4.50	4.55	6.45	8.70
Height, cm.....	50	50	50	55	55	55	55	55	60	60	60
Diameter, cm.....	12	15	20	6	8	10	12	15	7.5	10	12
Duty Free per 10.....	10.90	15.50	24.00	5.75	7.65	10.65	14.25	17.25	8.35	11.85	13.20
Height, cm.....	60	60	70	70	70	70	70	80	80	80	80
Diameter, cm.....	15	20	7.5	10	12	15	20	8	10	12	15
Duty Free per 10.....	19.00	27.50	11.15	13.10	14.40	21.65	32.75	13.95	16.40	18.60	25.15
Height, cm.....	80	90	90	90	90	90	95	95	100	100	100
Diameter, cm.....	20	8	10	12	15	10	12	8	10	10	15
Duty Free per 10.....	38.00	18.15	20.60	23.00	32.30	22.90	27.35	22.55	27.25	45.25	

30660. Jars, Rectangular Museum, A. H. T. Co. Special, with flat ground on lids for permanent sealing. Of heavy clear white glass of extra fine finish and annealing. Much superior to jars of similar appearance which are sold at lower prices. Plain finish only in stock. See also following import list for duty free prices.

Height, cm.....	10	10	12	13	15	16	20	20	20
Width, cm.....	5	6	8	10.5	10.5	12	6	10.5	15
Depth, cm.....	2.5	5	5	4	5	9	4	5	7
Each.....	1.10	.55	.60	.70	.80	1.10	.75	1.20	1.75
Height, cm.....	21	26	26	26	29	30	37	42	45
Width, cm.....	21	65	15	21	15	20	25	10.5	12
Depth, cm.....	10	5	8	16	4	18	14	7.5	9
Each.....	2.85	1.15	2.30	4.00	2.00	4.35	5.00	3.20	3.30

30660. Jars, Rectangular Museum, A. H. T. Co. Special, Import List. For the convenience of those ordering Jars No. 30660 for duty free importation we give a list of the sizes available and duty free prices. These are furnished in two styles of finish, i. e., A plain, and B, with one wide face ground and polished.



No. 30660-64

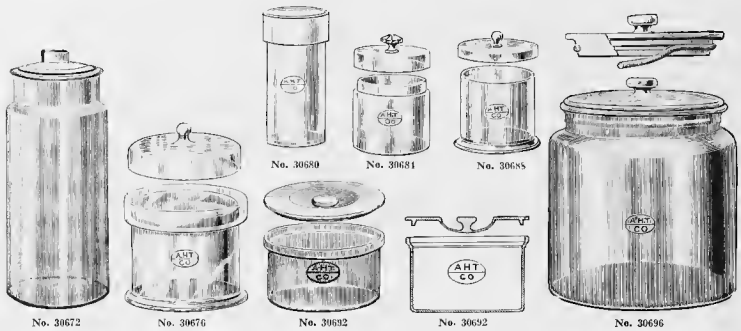
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30660. (Cont.)

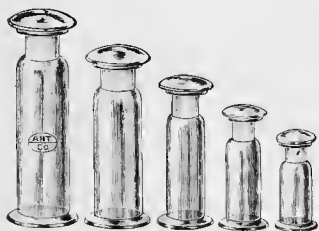
Height, cm.....	10	10	12	12	13	13	14	14	14	15	15
Width, cm.....	5	6	8	9	10.5	13	9	10	11	8	9
Depth, cm.....	2.5	5	5	3	4	5	2.5	2	3	4	7.5
A, Duty Free, per 10 B " " "	1.50	1.90	2.29	2.20	2.50	3.80	2.35	2.55	3.80	2.65	2.959
Height, cm.....	15	15	15	15	16	17	18	18	18	18	18
Width, cm.....	10.5	14	15	30	12	20	8	12	12	14	18
Depth, cm.....	5	6	6	10	9	7	4	2	6	12	7
A, Duty Free, per 10 B " " "	2.95	3.80	4.20	13.90	4.00	9.70	3.10	4.00	4.20	6.75	7.60
Height, cm.....	4.55	7.15	7.60	22.99	7.60	15.75	5.25	6.95	7.15	10.50	11.80
Width, cm.....	18	18	20	20	20	20	20	20	20	20	20
Depth, cm.....	22	40	6	10	10.5	12	12	13	13	15	15
Depth, cm.....	3	14	4	7	5	5.5	10	5	7	7	10
A, Duty Free, per 10 B " " "	10.30	30.00	2.80	4.45	4.45	4.45	5.05	4.45	4.45	6.30	6.95
Height, cm.....	16.80	52.50	4.45	6.75	6.65	7.15	8.40	7.35	7.35	10.50	10.95
Width, cm.....	20	20	20	20	20	21	21	22	22	24	24
Depth, cm.....	17	17	19	42	50	10	21	7	10	11	15
Depth, cm.....	9	14	7	7.5	1.5	7	10	3	3	5	7
A, Duty Free, per 10 B " " "	7.80	9.25	7.75	36.00	58.75	4.45	10.50	4.20	4.45	4.85	6.30
Height, cm.....	13.65	15.15	14.95	50.00	90.00	6.65	17.65	6.30	6.65	7.15	10.50
Width, cm.....	24	25	25	26	26	26	26	26	26	26	26
Depth, cm.....	24	10	20	6.5	1.5	15	18	21	21	21	26
Depth, cm.....	14	8	7	5	8	10	15	8	10	16	13
A, Duty Free per 10 B " " "	13.45	3.70	10.50	4.40	8.80	9.25	14.75	12.35	13.20	15.40	17.60
Height, cm.....	19.55	8.65	17.65	6.40	13.00	13.45	20.50	21.15	22.00	26.95	30.80
Width, cm.....	28	28	28	29	29	30	30	30	30	30	30
Depth, cm.....	10	19	20	9	15	10	10	17	19	20	23
Depth, cm.....	6	7	7.5	7	4	6	10	9	6.5	18	5
A, Duty Free per 10 B " " "	5.95	11.00	12.35	5.95	7.70	5.95	6.85	9.50	11.45	16.75	14.10
Height, cm.....	9.25	19.80	21.15	9.25	11.55	9.90	12.10	17.60	20.70	23.80	22.90
Width, cm.....	30	30	31	33	34	35	35	36	37	37	40
Depth, cm.....	24	25	20	16	28	15	20	12	12	25	30
Depth, cm.....	7.5	6	11	10	18	13	10	9	4	14	25
A, Duty Free per 10 B " " "	16.10	16.10	22.00	11.50	28.00	16.50	19.25	10.00	9.50	22.00	39.50
Height, cm.....	25.30	25.30	39.50	21.25	49.25	27.75	33.00	15.00	14.50	40.00	50
Width, cm.....	40	42	45	45	45	46	47	50	50	50	50
Depth, cm.....	40	10.5	10	12	25	25	12	12	20	25	30
Depth, cm.....	25	7.5	7	9	15	16	9	10	15	12	30
A, Duty Free per 10 B " " "	71.25	14.90	14.00	14.50	21.75	26.25	14.50	16.00	49.25	57.50	75.00
Height, cm.....	19.80	20.00	21.00	55.00	57.50	21.00	23.00	85.00	85.00	103.75	
Width, cm.....											
Depth, cm.....											
A, Duty Free per 10 B " " "						17.50	36.25	36.25	37.50	80.00	92.50
Height, cm.....						27.50	67.50	67.50	75.00		
Width, cm.....											
Depth, cm.....											

30668. Jars, Rectangular Museum, of same quality and shapes as No. 30660 excepting that they are furnished with glass foot and ground flange or lip at the top, providing a broader support at base and a widened space for air tight sealing. Not carried in stock.

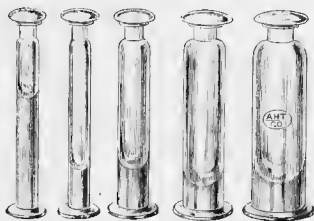
Height, cm.....	6.5	11	12	13	20	21	25	27	35	40	45
Width, cm.....	5.5	3.5	8	12	16	21	25	26	13	21	13
Depth, cm.....	5	1	2	4	4.5	10	12	13	12	17	12
Duty Free per 10...	4.50	3.60	3.60	6.00	18.45	21.75	27.30	39.00	27.00	40.50	31.50



30672.	Jars, Specimen, Whitall-Tatum Co., of clear white glass, with extra wide mouth and glass stoppers carefully ground in. By special arrangement with the manufacturers we offer these Jars at original factory prices.										
	Height, inches.....	2	3	2½	3½	5	3½	5	7	4	6
	Diameter, inches.....	1½	1½	2	2	2	2½	2½	2½	3	3
	Capacity, ounces.....	1½	2½	3	5	6	8	11	16	14	20
	Each.....	.16	.18	.19	.21	.23	.24	.27	.30	.32	.35
	Per dozen.....	1.62	1.76	1.89	2.03	2.30	2.43	2.70	2.97	3.11	3.51
	Height, inches.....	8	6	8	10	5	8	12	7	10	12
	Diameter, inches.....	3	3½	3½	3½	4½	4½	4½	6	6	6
	Capacity, ounces.....	28	20	40	52	38	62	92	98	140	168
	Each.....	.43	.46	.57	.68	.59	.73	.86	1.03	1.35	1.46
	Per dozen.....	4.19	4.59	5.67	6.75	5.81	7.29	8.64	10.26	13.50	14.58
30676.	Jars, Brain, of heavy, clear white glass, with trough or channel around rim into which cover fits loosely. Can be made air tight by the use of glycerine, paraffin oil, etc., and are particularly recommended for use as brain jars, or for other purposes where specimens must be readily accessible and yet air tight. Not carried in stock.										
	Height, cm.....	15	15	15	20	15	20	20	25	30	30
	Diameter, cm.....	15	20	25	25	30	30	30	30	30	30
	Duty Free per 10.....	15.00	19.50	22.50	24.00	29.45	34.90	38.75	46.50		
30680.	Jars, Dressing, of heavy white glass, with flat bottom, ground rim and loosely fitting cover.										
	Height, mm.....							130	180		
	Diameter, mm.....							65	80		
	Each.....							.40	.60		
30684.	Jars, Dressing, of heavy white glass, with lid closely fitting on shoulder but not ground air tight, with cut and polished knob.										
	Height, mm.....			100		120		150	210	260	
	Diameter, mm.....			100		120		150	210	260	
	Each.....			.95		1.15		1.60	2.60	3.40	
30688.	Jar, Dressing, of heavy white glass, with foot and lid fitting loosely, without indented shoulder.										
	Height, mm.....			100		120		150	210	260	
	Diameter, mm.....			100		120		150	210	260	
	Each.....			.75		.95		1.30	2.25	3.00	
30692.	Jars, Specimen, of glass, with lid smoothly fitting but not ground air-tight. Knob in the lid is countersunk so that jars may be readily stacked one on top of the other. Nearly air-tight when rubber band is used.										
	Height.....	3½	4½	5½	6	6½	7½	8½	10½	11½	
	Diameter.....	6¼	6¼	8½	9½	10½	11½				
	Capacity.....	1 qt.	3 pt.	6 pt.	9 pt.	13 pt.	2 gal.				
	Each, plain.....	.30	.35	.80	1.15	2.00	2.50				
	Each with rubber band.....	.35	.40	.85	1.25	2.15	2.75				
30696.	Jars, Specimen, with slight constriction at neck and lid provided with a rubber washer which renders the jar partially but not entirely air tight. These jars are of clear flint glass, but not of such fine finish as No. 30620 or 30652.										
	Height, inches.....			7½	10½	11½	12½	13½			
	Diameter, inches.....			6½	8½	10½	10½	11½			
	Capacity, gallons.....			1	2	3	4	5			
	Each.....			.80	1.40	2.40	3.40	4.00			

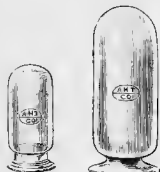


No. 30700



No. 30701

30700.	Jars, Specimen, with foot, slightly constricted neck and ground in stopper. Highly finished.						
	Height, mm.....	80	100	120	150	180	200
	Diameter, mm.....	30	30	40	50	60	80
	Each .....	.25	.35	.35	.50	.55	.75
30704.	Jars, Uniform Specimen, with foot, slightly constricted neck and ground in stopper. These jars are all of the same height i. e., 145 mm, but of varying capacities and are widely used in chemical museums.						
	Capacity, cc.....	5	10	20	50	100	125
	Each .....	.25	.25	.25	.30	.40	.50



No. 30708

No. 30712



No. 30716



No. 30720



No. 30724



No. 30728



No. 30732

30708.	Jars, Inverted Specimen, of clear white glass, with carefully ground in, air tight stopper.						
	Height, cm.....		13	19	22	32	
	Diameter, cm.....		5	8	10	12	
	Each .....		.40	.90	1.10	1.80	
30712.	Jars, Inverted Specimen, for cork stopper.						
	Height, cm.....	9.5	11	15	19.5	23	35.5
	Diameter, cm.....	4	5	6.5	7	9	11
	Each .....	.10	.13	.15	.20	.30	.50
30716.	Jars, "Lightning," of greenish glass. Lid is clamped air-tight by spring clip.						
	Capacity.....		$\frac{1}{2}$ pt.	1 pt.	$\frac{3}{4}$ pt.	1 qt.	$\frac{1}{2}$ gal.
	Each .....		.12	.14	.15	.16	.20
	Per gross.....		9.00	10.00	11.00	12.00	15.00
30720.	Jars, "Safety Valve," of white glass. Improved spring clamp with rubber washer makes the jars absolutely air-tight.						
	Capacity.....		$\frac{1}{2}$ pt.	1 pt.	1 $\frac{1}{2}$ pt.	1 qt.	2 gal.
	Each .....		.14	.16	.18	.20	.24
	Per gross.....		10.75	12.60	14.00	15.50	19.50
30724.	Jars, Specimen, of white glass. So-called "Jam Jars" with cover held air tight by rubber band and spring clamp.						
	Height, mm.....	40	70	80	100	150	120
	Diameter, mm.....	40	65	75	75	70	100
	Capacity, cc.....	30	125	200	250	400	600
	Each .....	.07	.09	.10	.11	.14	.23
30728.	Jars, Specimen, with metallic screw cap.						
	Height, mm.....		60	95	120	110	145
	Diameter, mm.....		30	35	45	60	80
	Capacity, cc.....		30	60	120	250	500
	Per dozen.....		.80	.90	1.25	1.83	3.00
30732.	Jars, Preparation, so-called "Ointment Pots." Of flint glass with metal screw caps lined with paraffine paper to protect the metal from corrosive action of contents.						
	Capacity, ounces.....	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8
	Each .....	.05	.06	.08	.10	.12	.14
	Per gross.....	4.50	5.45	6.95	8.85	10.50	12.40
							21.00
							36.00



No. 30736



No. 30740



No. 30711



No. 30748



No. 30752

30736.	Jars, Precipitating, straight cylindrical form, with spout.								
	Capacity, cc.....	125	250	500	1000	2000	4000	6000	10000
	Each .....	.20	.30	.40	.50	.80	1.50	2.00	3.00
30740.	Jars Precipitating, conical or tapering form, with spout.								
	Capacity.....	Noz.		16oz.	32oz.	1/2 gal.	1gal.	2gal.	3gal.
	Each .....	.20	.30	.55	.70	1.25	2.90	4.00	
30744.	Jars, Stoneware, with two handles and cover, resistant to chemicals and useful in laboratories as waste jars and similar purposes. Can be furnished on special order up to 50 gallons capacity. Because of their low value in comparison to their bulk, boxing is charged extra at cost.								
	Capacity, gallons.....	1	2	4	5	6	8	12	
	Height, inches.....	7 1/2	9	11 1/2	12 1/2	14 1/2	16 1/2	18 1/2	
	Diameter, inches.....	7 1/2	8 1/2	12	12 1/2	12 1/2	13 1/2	15 1/2	
	Each .....	.40	.60	1.00	1.25	1.50	1.75	2.50	
30748.	Jars, Stoneware, low form. The sizes listed are frequently used for temporary preservation of specimens in comparative anatomy. They can also be furnished on special order up to 50 gallons capacity. With covers. Boxing charged extra at cost.								
	Capacity, gallons.....				4	6	10	15	
	Height, inches.....				8 1/2	10	12 1/2	14 1/2	
	Diameter, inches.....				13	15	17 1/2	19 1/2	
	Each				1.00	1.25	2.25	4.00	
30752.	Knife, a convenient laboratory knife for preparing potato cultures, paring corks, etc.....								.20



No. 30736

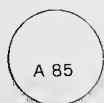


No. 30720

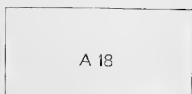


No. 30768

30756.	Labels, Dennison, gummed, on white paper with red border.								
	Number.....	225	223	217	213	209	205	201	
	Size, inches.....	3/4 x 5/8	3/4 x 3/4	1 1/8 x 1 1/8	1 1/8 x 1	1 1/8 x 1 1/4	1 1/8 x 1 1/2	2 1/4 x 1 1/2	
	Number in box.....	175	150	125	100	100	75	100	
	Per box .....	.06	.06	.06	.06	.06	.06	.06	
	Per carton of 1 doz. boxes.....	.50	.50	.50	.50	.50	.50	.50	
30760.	Labels, Dennison, gummed, in books, white with red border and rounded corners, in sheets, perforated, bound in book form. Size of book 9 x 5 inches, with 25 sheets in book.								
	Number.....	225	223	221	217	213	209	205	201
	Size, inches.....	3/4 x 5/8	3/4 x 3/4	3/4 x 3/4	1 1/8 x 1 1/8	1 1/8 x 1 1/8	1 1/8 x 1 1/4	1 1/8 x 1 1/2	2 1/4 x 1 1/2
	Number in book.....	1575	1400	1050	750	750	500	300	225
	Per book .....	.25	.25	.25	.25	.25	.25	.25	.25
	Carton of 6 books.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
30764.	Labels, Dennison, gummed, perforated, in rolls. Each roll is contained in a special box with slot opening so that labels can be drawn out as needed without opening the box. Each roll contains 1000 labels. Number.....								
	Size, inches.....				7/8 x 5/8	1 1/8 x 1 1/8	1 1/8 x 1 1/4	1 1/8 x 1 1/2	
	Per roll .....				.45	.50	.65	.70	
30768.	Labels, Dennison, gummed, white with red border, large rectangular shape. Packed 100 in a box.								
	Number.....	2001	2007	2002	2001	2006	2005	2003	
	Size, inches.....	2 1/4 x 1 1/2	2 1/4 x 1 1/4	3 1/4 x 1 1/2	3 1/4 x 1 1/2	4 x 1 1/4	4 1/2 x 1 1/4	4 1/2 x 2	
	Per box .....	.12	.15	.15	.18	.18	.20	.22	
	Per carton of 10 boxes.....	1.00	1.25	1.25	1.50	1.50	1.75	2.25	



No. 30772



No. 30776



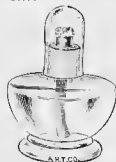
No. 30781



No. 30788



No. 30792



No. 30796



No. 30800



No. 30801



No. 30816



No. 30820



No. 30821

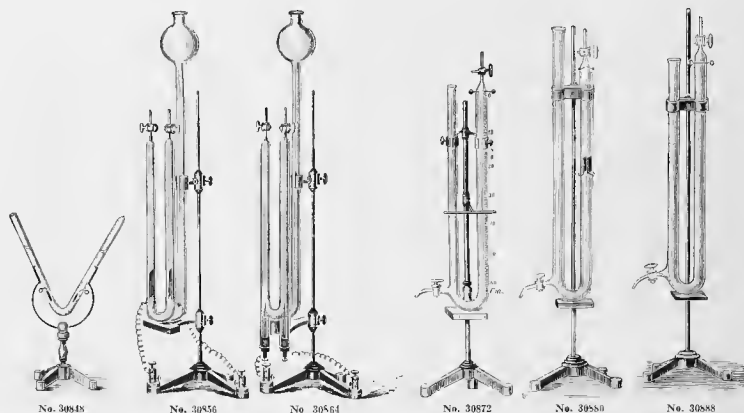


No. 30840

30772.	Labels, Dennison, gummed, on plain white paper without border.	Circular.				
	Number.....	A81	A83	A84	A85	A109
	Diameter, inches.....	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	Per box of 1000 .....	.10	.15	.15	.15	.20
30776.	Labels, Dennison, gummed, on plain white paper without border.	Rectangular.	No. A18, size $1\frac{1}{2} \times \frac{1}{2}$ inches.			
	Per box of 1000 .....					.25
30780.	Label Book, containing the names and formulae of the most used chemicals and reagents. Printed on good paper, gummed and perforated and bound in book form.	Per book .....				.40
30784.	Ladles, of wrought iron, with lip, 4 inches in diameter.....					.50
30788.	Lamps, Alcohol, of polished brass, with screw top and metal cap.					
	Capacity, ounces.....		2	4	8	
	Each .....		.50	.60	.75	
30792.	Lamp, Alcohol, of brass, with wick; capacity 8 ounces.....					.20
30796.	“ “ of glass, with base and ground on glass cap. With wick and metal fitting.					
	Capacity, cc.....		60	100	150	
	Each .....		.40	.45	.50	
30800.	Lamps, Alcohol, cylindrical shape, of glass with cap ground on. With wick and metal fitting.					
	Capacity, cc.....		30	60	100	150
	Each .....		.35	.40	.45	.50
30804.	Lamps, Alcohol, cylindrical shape, of glass with cap ground on, and with side tubulation and glass stopper. With wick and metal fitting.					
	Capacity, cc.....		60	100	150	
	Each .....		.55	.60	.65	
30808.	Lamp Wicking, a wick of any size is obtained by using the required number of strands.	Per bundle.				.45
30812.	Lead Shot, for cleaning bottles, No. 6.	Per lb.....				.10

LECTURE APPARATUS AS DESCRIBED BY HOFFMAN in his "Introduction to Modern Chemistry." The more frequently required pieces only are listed but the complete set is quoted for importation upon application.

30816.	Apparatus for the Decomposition of Water, with sliding, graduated glass tubes for the collection of gases. With platinum electrodes.....	2.25
30820.	Apparatus, same as No. 30816 but on glass foot.....	2.75
30824.	Apparatus for the Decomposition of Water, with graduated glass tubes with ground in stoppers. With platinum electrodes.....	3.50
30828.	Apparatus, same as No. 30824 but on glass foot.....	3.75
30832.	Apparatus for Decomposition of Water, with plain tubes with stopcocks, platinum electrodes, support and binding screws.....	10.00
30836.	Glass Parts only for No. 30832, with platinum electrodes.....	6.00
30840.	Apparatus for the Decomposition of Water, similar to No. 30832 but with graduated tubes, on support.....	11.00
30844.	Glass Parts only for No. 30840, with platinum electrodes.....	7.00



30848. Apparatus for the Decomposition of Hydrochloric Acid, Water and Ammonia, with platinum electrodes and support 6.00
 30852. Glass Parts only for No. 30848, with platinum electrodes 3.00
 30856. Apparatus for the Decomposition of Water, Hydrochloric Acid and Ammonia, with two platinum electrodes and glass stopcocks, on support with binding screws 10.00
 30860. Glass Parts only for No. 30856, with platinum electrodes 6.00
 30864. Apparatus, same as No. 30856 but with carbon electrodes 10.00
 30868. Glass Parts only for No. 30864, with carbon electrodes 6.00
 Note—The complete outfit for the decomposition of water, hydrochloric acid and ammonia consists of two Nos. 30864 connected with one No. 30856.
 30872. Lecture Eudiometer, with platinum electrodes, two stopcocks, one graduated arm and support 10.00
 30876. Glass Parts only for No. 30872, with platinum electrodes 7.00
 30880. Apparatus for the Decomposition and Reconstitution of Water, with platinum electrodes in middle of tube, two glass stopcocks and support. 10.00
 30884. Glass Parts only for No. 30880 with platinum electrodes 7.00
 30888. Apparatus for Demonstrating that Three Volumes of Hydrogen Combined with One Volume of Nitrogen to Form Two Volumes of Ammonia. With platinum electrodes, two glass stopcocks and support. 8.00
 30892. Glass Parts only for No. 30888, with platinum electrodes. 5.00



No. 30900

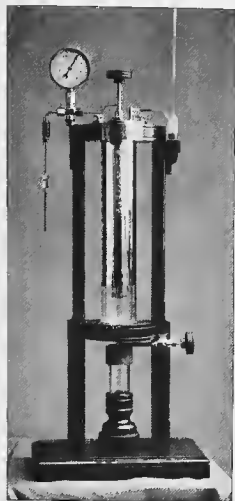


No. 30904



No. 30908

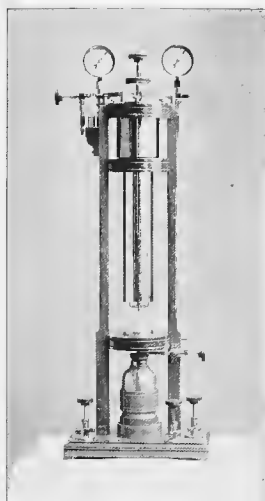
30896. Lens Paper, Japanese, for cleaning lenses, does not easily collect dust or become greasy and harsh. It is very soft and free from impurities.
 Size of sheet mm. 185 x 275 275 x 275
 Per package of 100 sheets35 .65
 30900. Level, of brass, 4 inches long50
 30904. " " round, in brass case; for balances, bacteriological work, etc.; 30 mm diameter. 2.00
 30908. " " " " " " nickel plated; 15 mm diameter.65
 30912. Liquid Air Apparatus, Olszewski, Demonstration Model. Arranged for the liquefaction of air only. Simple model for lecture table work with a capacity of 100 cc of liquid air in 5 or 10 minutes when operated with cylinders of 13 liter capacity under compression of 150 to 200 atmospheres pressure. With two 13 liter Steel Cylinders. See illustration on following page.
 Duty Free 175.00 Duty Paid 245.00
 30916. Liquid Air Apparatus, Olszewski, Technical Model. With apparatus entirely enclosed in nickel plated jacket. Capacity 1 liter of liquid air per hour when used in connection with a 7 h. p. Whitehead Compressor. Without Compressor. 287.50 Duty Paid 102.50



No. 30912



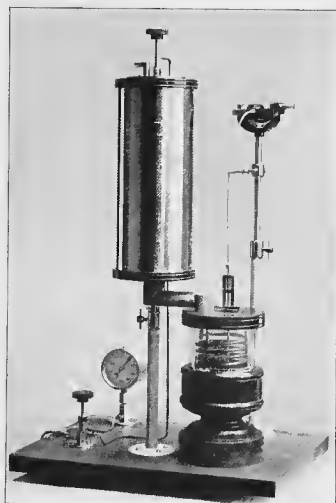
No. 30916



No. 30920

References:—K. Olszewski, "Verflüssigung des Wasserstoffs bei Vermeidung von Kälte-Verlusten," Zeitschrift für komprimierte und flüssige Gase sowie für die Pressluft-Industrie (XIV, Jahrgang).

K. Olszewski, "Die Verflüssigung der Gase," Bulletin des Sciences de Cracovie, Maiheft 1903, Sitzung vom 4. Mai.



No. 30921

30920. **Liquid Air Apparatus, Olszewski, Universal Type.**
For hydrogen and other gases, latest improved model, capacity 1.2 liters of liquid air per hour when operated with a Whitehead Compressor of 7 h. p. Capacity of hydrogen 1 liter per hour with the same sized Compressor. Without Compressor.
Duty Free . . . 575.00 Duty Paid . . . 805.00
30924. **Thermostat for Low Temperatures, Olszewski,**
range from 0 to -190° C. For use with liquid air or other liquefied gas as cooling media.
Duty Free . . . 325.00 Duty Paid . . . 455.00
30928. **Compressor, High Pressure, Whitehead,** suitable for both air and hydrogen but not for work with oxygen, requires 7 h. p. for attaining a final pressure of 200 kilograms per cubic centimeter; to be operated at 350 r. p. m. and with a loose pulley for power driving. Drawing with dimensions and other details upon application. As furnished by us to the Palmer Physical Laboratory, Princeton University. Price with direct connecting electric motor on request.
Duty Free . . . 885.00 Duty Paid . . . 1062.00

Note—Reprints in German descriptive of the above apparatus on application.



No. 30932



No. 30936



No. 30944



No. 30964



No. 30952



No. 30972



No. 30960



No. 30948



No. 30956



No. 30968

30932.	Magnets, Bar, of steel, best quality.	Length, mm.....	100	125	150	200	250	
	Each		.25	.30	.35	.50	.75	
30936.	Magnets, Horseshoe, with armature.	Length, mm.....	50	75	100	125	150	
	Each		.08	.10	.15	.25	.50	
30940.	Matrasses, of hard Bohemian glass, for blowpiping						.10	
30944.	Magnifiers, Pocket, Oval Shape, Single Lens.	Mounted in best quality vulcanized rubber, durable, light weight and of neat appearance.						
	Number		50	56	52	68	74	78
	Lens Diam. in Inches		$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
	Power		5 X	4 X	3.5 X	3 X	2.5 X	2 X
	Each		.35	.45	.55	.70	.85	1.00
30948.	Magnifiers, Pocket, Oval Shape, Double Lens.	Otherwise same as above.						
	Number		51	57	63	69	75	79
	Lens Diam. in Inches		$\frac{3}{4}$, $\frac{3}{4}$	$\frac{7}{8}$, 1	$1\frac{1}{4}$, $1\frac{1}{4}$	$1\frac{1}{2}$, $1\frac{1}{2}$	$1\frac{3}{4}$, $1\frac{3}{4}$	$1\frac{1}{2}$, 2
	Range of Powers		5 to 12 X	4 to 9 X	3.5 to 8 X	3 to 6 X	2.5 to 5 X	2 to 4 X
	Each		.50	.70	.85	1.00	1.35	1.70
30952.	Magnifiers, Pocket, Bellows Shape, Single Lens.	Otherwise same as above.						
	Number					101	110	119
	Lens Diam. in Inches					$\frac{3}{4}$	$\frac{7}{8}$	1
	Power					7 X	4 X	4 X
	Each					.35	.40	.45
30956.	Magnifiers, Pocket, Bellows Shape, Double Lens.	Otherwise same as above.						
	Number					102	111	120
	Lens Diam. in Inches					$\frac{3}{4}$, $\frac{3}{4}$	$\frac{3}{4}$, $\frac{7}{8}$	$\frac{7}{8}$, 1
	Range of Powers					7 to 15 X	4 to 9 X	4 to 9 X
	Each					.50	.60	.70
30960.	Magnifiers, Pocket, Bellows Shape, Triple Lens.	Otherwise same as above.						
	Number					103	112	121
	Lens Diam. in Inches					$\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{4}$	$\frac{3}{4}$, $\frac{7}{8}$, $\frac{7}{8}$	$\frac{7}{8}$, 1, $1\frac{1}{2}$
	Range of Powers					7 to 30 X	4 to 20 X	4 to 20 X
	Each					.70	.85	1.00
30964.	Magnifiers, Pocket, Nickel Mounted, Single Lens.	Differ from preceding in mounting which is of metal. Simply constructed and attractively nicked. Furnished only in bellows shape. Lenses of same quality and range as those in vulcanite mounting.						
	Number					101 NK	110 NK	119 NK
	Lens Diam. in Inches					$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{4}$
	Power					7 X	5 X	3.5 X
	Each					.50	.55	.65
30968.	Magnifiers, Pocket, Nickel Mounted, Double Lens.	Otherwise same as above.						
	Number					102 NK	111 NK	120 NK
	Lens Diam. in Inches					$\frac{1}{2}$, $\frac{3}{4}$	1, 1	$1\frac{1}{4}$, $1\frac{1}{2}$
	Range of Powers					5 to 12 X	4 to 9 X	3 to 6 X
	Each					.70	.80	.95
30972.	Magnifiers, Pocket, Nickel Mounted, Triple Lens.	Otherwise same as above.						
	Number					103 NK	112 NK	121 NK
	Lens Diam. in Inches					$\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{4}$	1, 1, 1	$1\frac{1}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$
	Range of Powers					4 to 20 X	3.5 to 17 X	2.5 to 9 X
	Each					1.00	1.20	1.35



Nos. 1, 2, 3
No. 30976



No. 6
No. 30976



No. 7, 7a
No. 30976



Nos. 168a, 167a,
169a, 165a
No. 30981



Nos. 168, 167, 166, 145
No. 30984



Nos. 173a, 172, 171a
No. 30985



Nos. 173, 172, 171, 170
No. 30985



No. 30980
Nos. 163, 162, 161, 160



No. 30950
Nos. 163a, 162a, 161a, 160

30976. Magnifiers, Doublet. Good lenses at a very moderate cost. Consist of two separated, plano convex lenses. Nos. 1, 2 and 3 are mounted for dissecting microscopes. No. 6 is a hand magnifier with hexagonal handle and No. 7 and 7a have folding pocket cases.

Number.....	1	2	3	6	7	7a
Focus in Inches.....	1 1/2	10	14	14	14	12
Power.....	7 X	10 X	14 X	14 X	14 X	12 X
Each.....	.75	.75	.75	.75	1.00	1.00

30980. Magnifiers, Coddington. Give a good definition and a wide field. Composed of a cylinder of glass with a deep groove cut in at equal distance from ends to serve as a diaphragm; ends of cylinder ground spherically and polished to form lens surfaces. Nos. 163a, 162a, 161a, 160a are mounted for use in dissecting microscopes, and Nos. 163, 162, 161, 160 in folding pocket cases.

Number.....	163a	162a	161a	160a	163	162	161	160
Focus in Inches.....	1 1/2	1	1	1	1 1/2	1	1	1
Power.....	7 X	10 X	14 X	20 X	7 X	10 X	14 X	20 X
Each.....	1.25	1.25	1.25	1.25	1.50	1.50	1.50	1.50

30984. Magnifiers, Triple Aplanats. High grade magnifier with large field and perfect correction for chromatic aberration as well as flatness, astigmatism and distortion; new construction designed for highest grade work. Composed of two meniscus lenses of flint glass separated by double convex lens of crown glass. Nos. 168a, 167a, 166a, 165a are mounted for use in dissecting microscopes and Nos. 168, 167, 166, 165 in folding pocket cases.

Number.....	168a	167a	166a	165a	168	167	166	165
Focus in Inches.....	1 1/2	1	1	1	1 1/2	1	1	1
Power.....	7.5 X	10 X	15 X	20 X	7.5 X	10 X	15 X	20 X
Each.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50

30988. Magnifiers, Hastings Aplanatic Triplet. With a very large angle of view and corrections of a high order. Nos. 173a, 172a and 171a are mounted for use in dissecting microscopes and Nos. 173, 172, 171 and 170 in folding pocket cases.

Number.....	173a	172a	171a	173	172	171	170
Focus in Inches.....	1 1/2	1	1	1 1/2	1	1	1
Power.....	7.5 X	10 X	14 X	7 X	10 X	14 X	20 X
Each.....	7.50	7.50	7.50	7.50	7.50	7.50	7.50



No. 30992



No. 30996 144A



No. 30996 144-2



No. 30996 144LP



No. 31000

30992. Magnifier, Tripod. Used for elementary biological work and dissections. Lens mounting screws up and down in brass frame for focusing. Diameter of lens one inch, power 7.5 X..... .35

30996. Magnifier, Watchmaker's. Easily held in orbit of the eye; No. 144LP has detachable spring to pass around the head. Lenses furnished in two different diameters (sizes 2 and 3), with same eye opening in each case. No. 144A fitted with two lenses, one removable to give two different magnifying powers as indicated below.

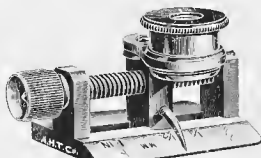
Number.....	144-2	144-3	144 1/2	144-2 LP	144-3 LP	144A
Lens Diam. in Inches.....	1	1 1/4	1 1/2	1	1 1/4	2 1
Range of Power.....	2 to 10 X	2 to 5 X	10 X	2 to 5 X	2 to 5 X	4 to 10 X
Each.....	.40	.40	.40	.55	.55	.60

31000. Magnifiers, Engravers' Glass. Designed for engravers, carvers and die cutters, also available for biological work, retouching and use as condensers because of their large clear field. Nos. 146-148 made with two plano-convex lenses giving flatter field and better image than one lens. All styles in vulcanized mountings.

Number.....	146	148	146A	148A
Lens Diam. in Inches.....	1 1/2	2 1/2	1 1/2	2 1/2
Power.....	3.5 X	2.5 X	3.5 X	2.5 X
Each.....	1.50	2.50	.75	1.25



No. 31001



No. 31005



No. 31012

31001. **Magnifiers, Linen Testers.** Intended primarily for counting threads in cloth, but used for beginners' classes and various other magnifying purposes. Mounting hinge to fold up compactly when not in use. Number. 141 141½ 142 143 143½
 Openings in Inches 1 x 1 ½ x ½ 1 x ½ 1 x ¼ ¼ dia.
 Power. 7 x 10 x 10 10 x 10 x
 Each 2.00 .45 .45 .45 .45
31008. **Magnifier, Cloth Counting Glass.** with base divided into spaces of ¼, ½ and 1 inch and the space between the ¼ and 1 inch marks divided into 10 mm. With focusing eyepiece with pointer attached which traverses the whole scale by means of quick acting screws. In leather covered case. 7.50
31012. **Magnifiers, Reading Glasses.** Regularly furnished with nickel rim of sufficient width to protect lens surfaces and with handle of ebonized wood.
 Lens Diam. Inches 2 2½ 3 3½ 4 4½ 5 5½ 6
 Focus in Inches 5 6 7 8 10 12 13 14 15
 Each60 .80 1.00 1.50 2.00 2.25 2.50 3.00 3.50



No. 31016



No. 31020



No. 31024



No. 31028 and 36

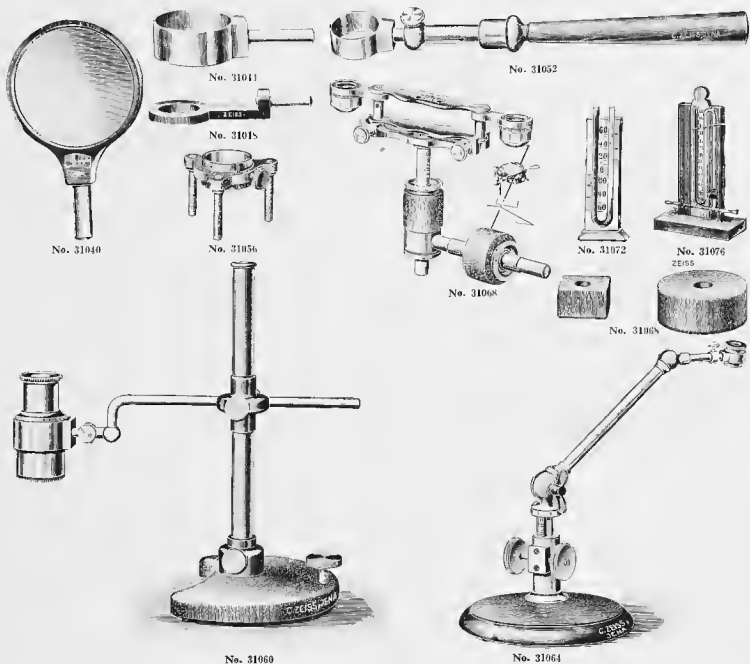


No. 31032

MAGNIFIERS, ZEISS ANASTIGMATIC COMBINATION LENSES

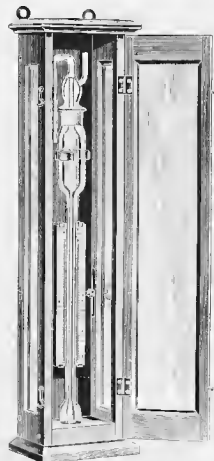
FOR DISSECTING, ETC. These excellent combinations are to be recommended particularly because of a comparatively large field of view, excellent definition and remarkably long working distance, and are furnished in simple mount for use in a dissecting microscope, handle and lens ring, or small tripods, as well as in single and double folding pocket cases. The Brücke system is designed especially for dissecting with the Mayer Dissecting Microscope and the systems may be used separately as simple magnifiers or with the ocular for greater magnification. To secure the best results with all simple magnifiers the observer should place the eye as near as possible to the magnifier.

31016. **Dissecting Combination Lens, Brücke**, giving powers of 11, 17, 30, 40, 60 and 100 diameters with the different combinations used singly or with the ocular lens. **Duty Free 10.00 Stock 12.40**
31020. **Dissecting Combination Lens, Brücke large**, with lens of a free aperture of 25 mm, power 5 to 10 diameters, with working distance from 60 to 70 mm and covering field from 7 to 13 mm in diameter. **8.75 10.85**
31024. **Magnifiers, Anastigmatic, in simple mount**, for use on dissecting stands or in lens ring with handle, small tripods, etc.
 Magnification. 16 x 20 x 27 x
 Diameter of field of view, mm. 10 8 6
 Free working distance, mm. 9 7 5.5
Duty Free 5.50 Stock 6.82
31028. **Magnifiers, Anastigmatic, same as above but in single folding mount.**
 Magnification. 16 x 20 x 27 x
Duty Free 6.25 Stock 7.75
31032. **Magnifiers, Anastigmatic, same as above but in double folding mount.**
 Magnification. 10 x and 20 x 16 x and 27 x 20 x and 27 x
Duty Free 10.50 Stock 14.88
31036. **Plankton Magnifier, Kolkwitz**, a special magnifier of 40 diameters, very useful in field work, giving a field of view 2 mm in diameter with a free working distance of 3 mm. This magnifier has a numerical aperture of 0.27. See R. Kolkwitz, "Entnahme- und Beobachtungsinstrumente für biologische Wasseruntersuchungen." Mitteilung aus der königlichen Prüfungsanstalt für Wasserreinigung zu Berlin, 1907, Heft 9, p. 126 and 127. pp.
Duty Free 12.00 Stock 14.88



Magnifiers, Zeiss Anastigmatic Combination (Continued).

31040.	Magnifier, Low Power, for use either in handle or on lens stand as listed below, with a power of 24 diameters, field of view 100 mm in diameter and free working distance of 100 mm.	2.80
31044.	Lens Ring, without handle, for use with either of the Brücke systems when same are to be used in combination with lens stand	.50
31043.	Lens Ring for Anastigmatic Magnifiers, in plain mount, for use in connection with handle or lens stand.	.50
31052.	Handle, only, for use with above Lens Rings; illustration shows ring in position in handle	.50
31056.	Tripod, with ring, to take any of the three Anastigmatic Magnifiers in plain mount.	1.00
31060.	Lens Stand, adjustable, for use with either the Brücke combination dissecting systems or the Anastigmatic Magnifiers in plain mount in combination with the necessary rings. Illustration shows large Brücke dissecting system with ring in position.	4.65
	Duty Free	3.75
	Stock	4.65
31064.	Lens Stand, adjustable, with hinged joints and rack and pinion adjustment, without lens or ring.	12.40
	Duty Free	10.00
	Stock	12.40
31063.	Object Holder, Wolf, designed especially for Entomology and for use with Anastigmatic Magnifiers in double folding case and with lens stand No. 31064. Price does not include the double magnifier shown in illustration but does include cork pinning blocks of three different shapes. In leather case with space to accommodate magnifier.	9.92
	Duty Free	8.00
	Stock	9.92
31072.	Manometer, consisting of glass U tube on wooden support, with scale. Without mercury	2.00
31076.	“ Bannert, with glass stopcock and movable scale engraved on wood. Without mercury,	5.00
31080.	“ “ with movable scale engraved on glass. Without mercury	6.00
Note—When desired the Manometers No. 31072, 31076 and 31080 will be shipped filled with mercury at customer's risk, with the cost of mercury added at market price.		



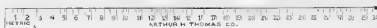
No. 31084



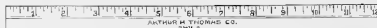
No. 31088



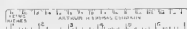
No. 31092



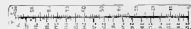
No. 31096



No. 31098



No. 31100



No. 31109



No. 31104



No. 31120



No. 31128



No. 31132

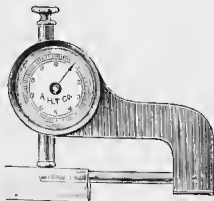


No. 31136

31084. **Manometer, Differential.** König. For measurements up to 20 mm of water pressure. With bottle of standard phenol solution. See *Lunge, Chemisch-technische Untersuchungs-methoden, 5. Aufl., p. 189 or Chemiker-Zeitung 1889, p. 71*. In polished case with glass door 18.00
31088. **Gauge, Seger Draft.** See *Lunges Sodaindustrie*. Very sensitive, for measuring the difference of drafts in fires, etc. With bottle of phenol solution 8.00
31092. **Manometer,** for measuring very slight differences in pressure, as in the determination of the specific rate of gases, etc. See *Zeitschr. für phys. und chem. Unterricht 1905, p. 199*. 6.00

MEASURING APPLIANCES

31096. **Rule, Boxwood,** graduated on one side in millimeters to 30 centimeters, on the other in $\frac{1}{4}$ th inches to 12 inches 20
31100. **Rule, Celluloid,** 6 inches long, in both metric and English, with comparative Centigrade and Fahrenheit thermometer scales on the back. A convenient vest pocket rule for the laboratory work 45
31104. **Rule, Steel,** with English and metric scales, graduated on one side to $\frac{1}{2}$ millimeter and $\frac{1}{16}$, $\frac{1}{32}$, and $\frac{1}{64}$ th inches; and on the other to $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$, $\frac{1}{256}$, and $\frac{1}{512}$ inches. Length 6 inches (150 mm) 75
31108. **Meter Stick,** with brass bound ends, graduated in metric system on one side and in inches on the other 50
31112. **Meter Stick,** as above, plain, i. e. without brass bound tips. 25
31116. **Half Meter Stick,** exactly the same as above but only $\frac{1}{2}$ meter long, with metal tips. 30
31120. **Rule,** folding caliper, of boxwood, graduated on one side in millimeters and on the other in $\frac{1}{4}$ th inches. Length (unfolded) inches 12
Each 30
31124. **Rule, Decimeter, Steel,** one decimeter long, one centimeter wide, one millimeter thick and graduated in centimeters and millimeters. Volume is 1 cc and weight in grams is the specific gravity. In metal bound leather pocket case 25
31128. **Caliper Rule,** pocket form, of polished brass, with both English and metric scale up to 6 centimeters and $\frac{1}{2}$ inches. Very convenient in laboratory work 50
31132. **Micrometer Caliper,** nickel plated, graduated to $\frac{1}{1000}$ th millimeter. Sizes given are the maximum opening between jaws. Scale, from 0 to, mm. 20
Each 1.75 2.00 2.25
31136. **Micrometer Caliper,** B. & S. American Standard, 1 inch reading to $\frac{1}{1000}$ th of an inch. 5.00
31140. same as No. 31136 but reading to $\frac{1}{100}$ th of a millimeter. 5.00



No. 31144



No. 31148



No. 31152



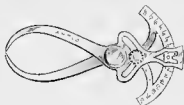
No. 31160



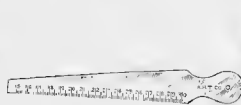
No. 31164



No. 31168



No. 31172



No. 31176



No. 31180



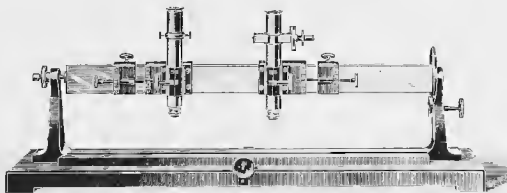
No. 31184

- 31144. **Micrometer Caliper**, for measuring the thickness of tubing walls to $\frac{1}{16}$ mm. Particularly convenient in measuring glass or metal tubing rapidly and with accuracy. Range from $\frac{1}{16}$ to 10 mm. 5.00
- 31148. **Micrometer Caliper**, roller form, for ascertaining the thickness of sheets of rubber, cloth, paper, etc. Reading in $\frac{1}{64}$ ths of an inch up to $\frac{1}{8}$ ths of an inch. 20.00
- 31152. **Micrometer Caliper**, dial form with steel box, reading on the dial to $\frac{1}{1000}$ th mm; very convenient for measurement of cover glasses in the laboratory, diameter of small wires, etc., in both laboratory and shop practice. 12.00
- 31156. **Micrometer Caliper**, as above, but reading to $\frac{1}{1000}$ th of an inch. 15.00
- 31160. **Vernier Caliper**, for both inside and outside measuring. Of steel, graduated in millimeters to 10 centimeters, with vernier reading to $\frac{1}{10}$ th millimeter. 1.50
- 31164. **Vernier Caliper**, of steel, graduated in millimeters and inches, 20 centimeters long, with vernier reading to $\frac{1}{10}$ th millimeters. 2.00
- 31168. **Caliper**, plain, of steel, for inside and outside measurements.60
- 31172. " with graduated measuring arc, reading in millimeters to 80 mm and in $\frac{1}{16}$ th inches to 3 inches. 1.75
- 31176. **Measuring Cones**, of steel, nickel plated, for measuring holes, graduated to $\frac{1}{16}$ th millimeter.

Scale, mm	1 to 15	15 to 30
Each	1.00	1.50
- 31180. **Tape Measure, Linen**, with English and metric graduations. In nickel plated case with spring.

Total length, meters.	1	2
Each . . . . .	.25	.40
- 31184. **Tape Measure, Steel**, with metric divisions on one side and English on the other. In German silver case with spring. Very convenient in laboratory work. Total length, meters. 1 2

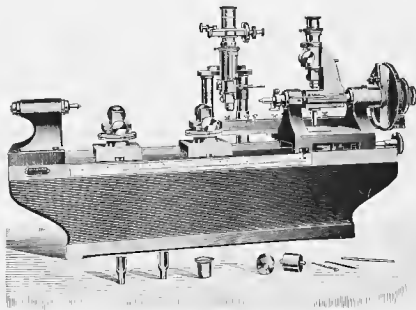
Each75	1.00
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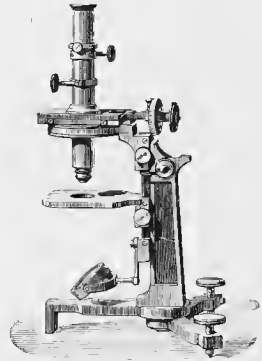
No. 31188

- 31188. **Micrometer Microscope**, a measuring device for use in calibrating or verifying thermometer scales etc., or as a comparator. With two microscopes mounted on horizontal carrier, each with micrometer fine adjustment and one with Fraunhofer ocular micrometer. Reading by means of Fraunhofer micrometer to $\frac{1}{1000}$ th millimeter.

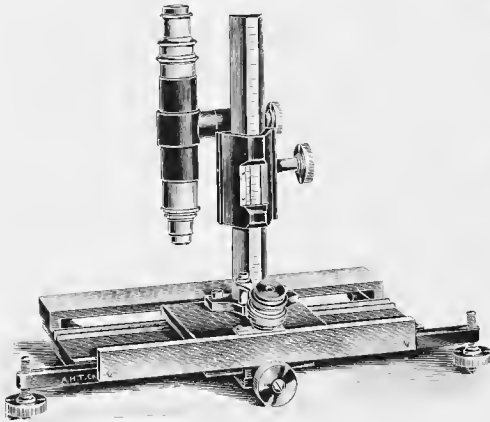
Duty Free.	\$4.00	Duty Paid	105.00
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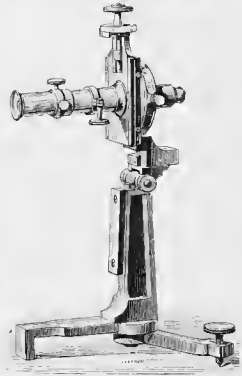
No. 31192



No. 31196a

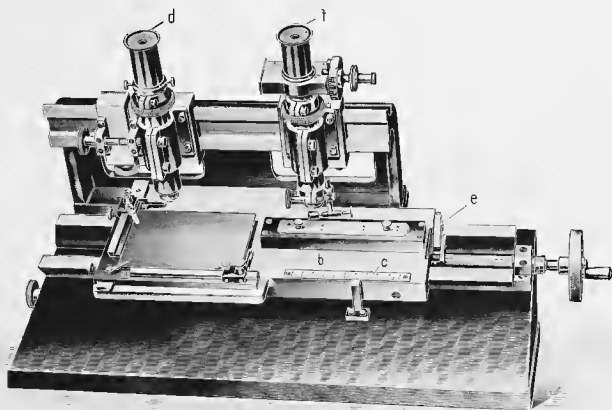


No. 31200



No. 31196b

31192. **Micrometer Measuring Machine, Model of 1910**, for actual as well as comparative measurements, reading by comparison to an accuracy of $\frac{1}{1000}$ th of a millimeter and giving absolute value measurements to $\frac{1}{1000}$ of a millimeter; total length which may be measured 300 mm, with centering device. This instrument is of great value in shop and laboratory practice where great accuracy is desired. Larger models measuring up to 2 meters quoted on application.
 Duty Free 480.00 Duty Paid 600.00
31196. **Micrometer Microscope, Fraunhofer**, measuring a total length of 20 mm and reading to $\frac{1}{100}$ of a millimeter. Mounted on tripod with axis so that same may be used vertically (Fig. a) or horizontally (Fig. b). The tripod is folding and the whole is mounted in a neat wooden case.
 Duty Free 84.00 Duty Paid 105.00
31200. **Microscope, Measuring**, with vertical and horizontal scale on silver reading to $\frac{1}{100}$ th millimeter. The vertical and horizontal scales are 16 cm long and are both actuated by rack and pinion. The microscope rotates in a vertical plane and may be clamped in any position. The horizontal and vertical positions of the microscope are definitely marked. A glass micrometer scale is placed in the common focus of the eyepiece and objective and serves to measure very short distances without moving either slide. By substituting a telescope objective the instrument may be used as a reading telescope or as a short range cathetometer. With one ocular, a 2 inch micro objective and extra telescope objective.
 Duty Free 54.00 Duty Paid 68.40
31204. **Extra Micrometer Eyepiece for above**, reading to $\frac{1}{1000}$ th of a millimeter.
 Duty Free 25.50 Duty Paid 32.30



No. 31208

31208. **Micrometer Microscope, or Comparator**, for the most accurate measurement of spectrographic negatives and other measurements of great accuracy. The separation of two spectral lines, for instance, is measured by direct comparison to a small scale on the specimen metal, the coefficient of expansion of which is equal to that of the plate itself; reading by means of Fraunhofer micrometer in the ocular to $\frac{1}{250}$ millimeter, which diminishes the error of the thread $\frac{1}{4}$ th. Particularly recommended for rapid measurements as the screw carrying the stage or table is immediately disengaged and its position changed.

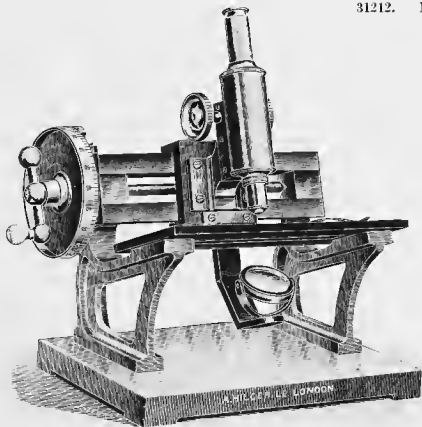
For measuring over, cm.....	9 x 12	13 x 18
Duty Free.....	321.60	480.00
Duty Paid.....	402.00	600.00

31212. **Micrometer Microscope, Hilger, 1913 Model** embodying the following modifications—

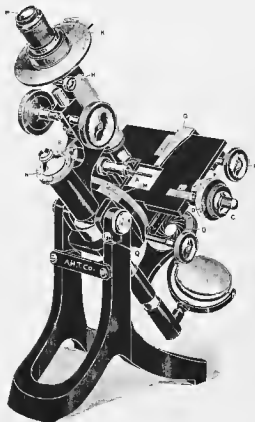
- The mirror moves with the travelling microscope.
- The milled head for turning the screw has been replaced by a handle.
- The standards which support the slide and substage are so designed that the axis of the microscope is sloped towards the observer.
- A vernier has been added, reading to 0.001 mm.

Though specially designed for rapid and accurate measurements of spectrum photographs, this instrument can be used with equal advantage for any of the accurate length measurements needed in a laboratory. With the aid of the handle now provided, one can pass rapidly over the whole range of motion, while at the same time the large drum-head enables measurements to be taken to 0.001 mm. The base is of cast iron and the microscope slide is mounted on two cast iron standards of such shape as to form convenient handles for moving the instrument.

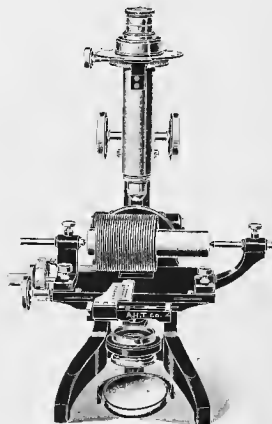
Length of horizontal motion, inches	3	6
Duty Free.....	164.70	197.10
Duty Paid.....	225.70	270.10



No. 31212



No. 31216



No. 31216

MICROSCOPE, MEASURING AND SCREW TESTING, LARGE MODEL. This instrument has been designed to give absolute measurements of small objects to a very fine degree with extreme accuracy. It is particularly useful for measuring and checking such articles as micrometer screws, divided scales, standard gauges, dies, etc., and is constructed for great ease of manipulation in such work. It is designed to give the length and pitch of a screw to .001 mm, the maximum, minimum and effective diameters and depth of thread to .01 mm, and the angle of the thread to 5' without the necessity of moving the screw after it has been once set up for examination.

The object, according to its shape, is either held in one of the chucks, A, of the rotating, divided holder, B, or fixed on the stage and its length measured by moving it across the field of the webbed ocular, P, by means of a micrometer screw with a divided head, C. The pitch of this screw is .5 mm and the head is divided into 100 parts; the fractions of these divisions are read from a vernier to $\frac{1}{1000}$ mm or $\frac{1}{25000}$ inch. Entire millimeters are shown by an index on the scale, D. The plate of the stage is held against the flint hard point of the screw by two long spiral springs set in the same plane as the dove-tailed fittings, one on each side equally displaced. The point of the screw is turned on a separate piece of steel to the thread; it is hardened, ground and polished, and let into the main piece before the thread is cut. This is done to prevent distortion of the thread which would occur if the hardening were done after cutting. The screw, which is of the most accurate description, is cut between dead centres with a single point.

The width of an object is measured by moving it across the field by means of the milled head, F; the amount of the traverse is read to .01 mm by the scale and vernier, G.

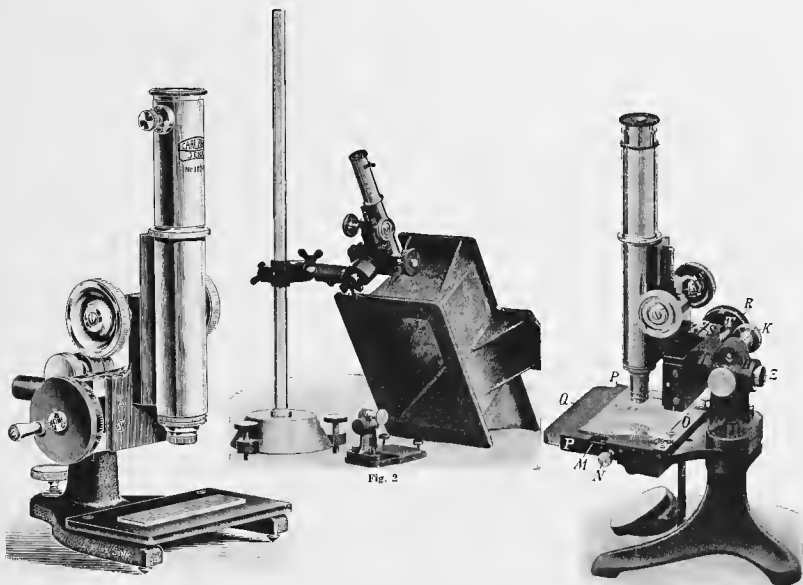
The angle between two lines, edges, sides, etc., as, for example, the angles of a screw thread, is ascertained by rotating the webbed ocular. One of the webs is brought coincident with a side and the milled head of the tangent screw, H, is turned until the web coincides with the other side. The angle is given on the scale and vernier, K, to 5'.

The milled head, L, actuates a tangent screw which inclines the object under examination to the optic axis; the degree of inclination is read to 5' by the scale and vernier, M. As the object lies in the same plane as the axis of rotation it does not go out of focus on being inclined. When the pitch of a screw is being measured the screw should be inclined the same number of degrees as the angle at which the thread crosses it; this angle can be approximated or else measured accurately by means of the circle attached to the ocular.

The object is focused by an ordinary rack and pinion coarse adjustment and a micrometer screw fine adjustment; the milled head, N, of this latter is divided to read direct to .01 mm. This divided head is of use in obtaining the correct position for viewing the profile of a screw thread. To effect this, the top of the thread is focused on the cross-wires of the ocular and the body is lowered by means of the fine adjustment an amount equal to the secant of the angle through which the screw is tilted on the stage multiplied by half the maximum diameter of the thread.

Extremely large objects, such as milling cutters, hobs up to 2 1/2" diameter, etc., can be accommodated on the instrument by means of special arms attachable to the stage which holds adjustable male and female centres.

31216.	Microscope, as above described, with 1 1/2 inch objective, cross-webbed ocular and complete set of chucks for carrying micrometer screws, small taps, etc., in strong wooden case.....	Duty Free 300.00	Duty Paid 380.00
31220.	Attachable arms, for carrying large objects.....	18.90	23.95
31224.	Extra Objectives 2 inch, 1 inch or 3/4 inch focus.....	6.30	8.00



Model A

Fig. 2

Model C

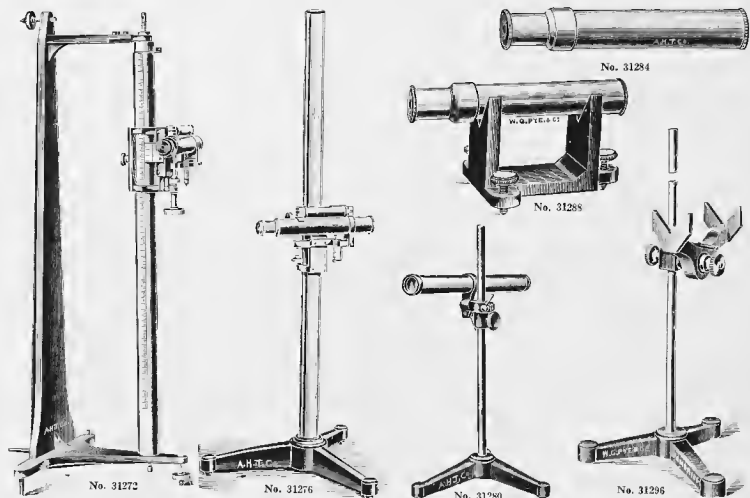
MICROSCOPE, MEASURING, ZEISS, MODELS A, B AND C, with horizontal movement of the microscope tube of either 20 or 50 mm and reading by means of micrometer head to $\frac{1}{100}$ mm. Model A is intended for use with objects which may be placed upon the stage, i.e. graduations, small castings, etc., and especially for the measurement of the concavities in metals produced by the Brinell Ball Test. In large pieces or castings the microscope body is removed from the base and clamped in a regular laboratory support as in Fig. 2. Model B differs from Model A only in the base and stage arrangement which consists in a heavier base with revolving circular stage permitting two measurements of diameter, for instance, at 90° each from the other. Model C consists in a base as in an ordinary microscope, with stage and mirror for the examination of photographic plates, spectrographs, or other objects by means of transmitted light. With model C higher power objectives may be used such as A₃ (26 diameters) and AA (54 diameters). The stage plate shown in illustration of Model A is removable so that the whole microscope with base may be conveniently placed upon large castings in the measurement of Brinell test depressions, etc.

31228.	Model A, with horizontal motion of 20 mm, without objectives or oculars, in case.....	Duty Free	Duty Paid
		50.00	62.00
31232.	Model A, with horizontal motion of 50 mm without objectives or oculars, in case.....	56.25	69.75
31236.	Model B, with horizontal motion of 20 mm, with heavy base and removable revolving circular stage, without objectives or oculars, in case.....	65.00	80.60
31240.	Model B, as above but with horizontal motion of 50 mm.....	71.25	88.35
31244.	Model C, with horizontal motion of 20 mm, with stage and mirror for transmitted light, without objectives or oculars, in case.....	68.75	85.25
31248.	Model C, as above but with horizontal motion of 50 mm.....	75.00	93.00
31252.	Ocular 2, with crosshairs and adjustable eyelens.....	4.25	5.27
31256.	Achromatic Objective A ₃ , giving a power with above ocular of 15 diameters..	3.00	3.72
31260.	“ “ “ A ₃ , 26 diameters.....	3.00	3.72
31264.	“ “ “ AA, 54 “ “ “	7.50	9.30

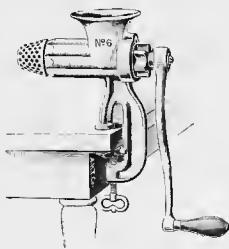
Note—Outfits may be made up with any of the above stands and optical equipment of oculars and objectives, but we offer the following as a typical outfit for Brinell test measurements, etc.

31268.	Microscope, Measuring, Model A, with ocular 2 and objective A ₂ , in case....	57.25	70.99
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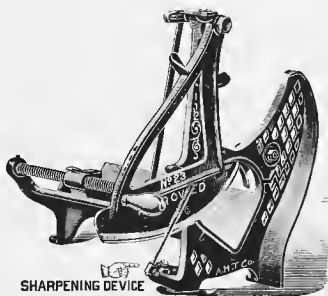
For more detailed information send for a copy of *Zeiss, Mess 153.*



31272. Cathetometer, for either horizontal or vertical use, consisting of a brass bar, hexagonal section, mounted between two hardened steel centers and which can be clamped in any position in azimuth. The scale is divided in millimeters and the carriage is provided with spring and clamp. The position of the telescope is read by means of verniers to $\frac{1}{10}$ th millimeter. The telescope has a focal length of about 7 inches and a clear aperture of $\frac{3}{4}$ and is provided with level and cross-wires and may be focussed from infinity to within three feet
- | | | |
|--------------------|-------|---------|
| Length of bar..... | 50 cm | 1 meter |
| Duty Free..... | 51.00 | 72.00 |
| Duty Paid..... | 64.60 | 91.20 |
31276. Cathetometer, or Reading Telescope, with objective with a focal length of 6 inches and aperture of $\frac{3}{4}$ inch, can be focussed from 3 ft. to infinity. Telescope is provided with crosshairs and level and fine adjustment screw for accurate setting in horizontal position. With vertical movement by rack and pinion to a distance of 24 inches. Very convenient in the laboratory for reading thermometers, barometer tubes, burettes, etc.
- | | | | |
|--|-------|----------------|-------|
| Duty Free..... | 33.00 | Duty Paid..... | 44.00 |
| Extra with scale on vertical rod to be read by vernier to 0.02 mm. | | | |
| Duty Free..... | 9.0 | Duty Paid..... | 12.00 |
31280. Reading Telescope, with objective 24 mm in diameter and crosshairs in ocular, with horizontal and vertical rotation and vertical adjustment, on support..... 17.50
31284. Reading Microscope, with Ramsden eyepiece, with 5 mm scale divided into $\frac{1}{10}$ mm. This is a most useful microscope for reading thermometers, electroscopes, etc; in general laboratory work. It is furnished with objectives of two foci and prisms do not include any support. The magnifying power of the 4 cm focus is 20 diameters and of the 30 cm focus 12 diameters.
- | | | |
|---|-------|-------|
| Focussing at approximately..... cm..... | 4 | 10 |
| Duty Free..... | 8.25 | 8.25 |
| Stock..... | 12.10 | 12.10 |
31288. Reading Microscope, as above, but with V-shaped support and levelling screws.
- | | | |
|---|-------|-------|
| Focussing at approximately..... cm..... | 4 | 10 |
| Duty Free..... | 10.05 | 10.05 |
| Duty Paid..... | 14.75 | 14.75 |
31292. Tele-Microscope, exactly similar in appearance to the above Reading Microscope but with special lenses to give high magnification and wide field and with a draw-tube enabling it to be used at various distances. A very useful laboratory microscope and particularly recommended for use in reading electroscopes leaves in the measurement of radio-activity and as used for this purpose by Thomson, Rutherford, etc. The eyepiece scale is 10 mm long divided in $\frac{1}{10}$ mm and with the draw-tube closed the instrument focusses at approximately 15 cm distance with a magnification of 20 diameters and with draw-tube open focusses at 30 cm with a magnification of 50 diameters. Without support.
- | | | | |
|----------------|-------|------------|-------|
| Duty Free..... | 12.00 | Stock..... | 17.60 |
|----------------|-------|------------|-------|
31296. Tripod Support, convenient for use with either of above Reading Microscopes, with V-shaped rest, two adjusting screws and spring clamp (not shown in illustration) to hold microscope tube in position
- | | | | |
|----------------|------|----------------|-------|
| Duty Free..... | 7.50 | Duty Paid..... | 11.00 |
|----------------|------|----------------|-------|



No. 32284



No. 31288



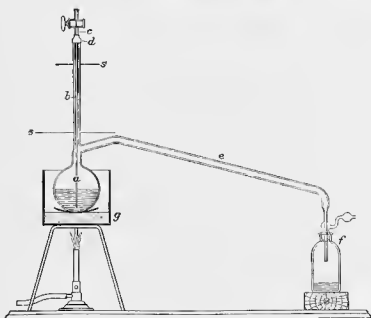
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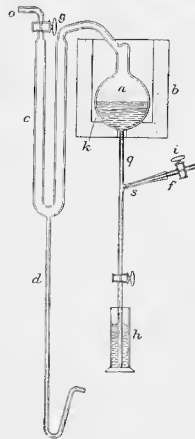
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No. 31309

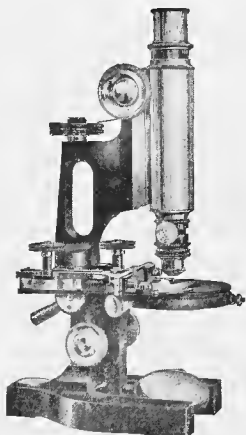


No. 31304



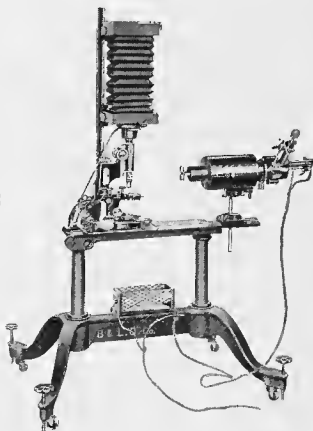
No. 31308

31284. Meat Chopper, useful for the preparation of meat for culture media. Leaves no meat in the machine and is easily cleaned.
- | | | | | | |
|-------------------|---------------|------|------|------|------|
| Number..... | 1 | 2 | 4 | 6 | 8 |
| Capacity lbs..... | $\frac{1}{2}$ | 1 | 2 | 3 | 4 |
| Each..... | 1.25 | 1.50 | 2.00 | 3.00 | 4.50 |
31288. Meat Cutter for Bagasse, etc., for cutting in preparation for laboratory analyses. With automatic feed giving shavings from $\frac{1}{4}$ th inch thick down to the thickness of thin paper..... 8.00
31292. Melting Point Tube, Thiel, of hard glass..... 1.00
31296. Mercury Trough, of porcelain, cross form, holding 3 kilos of mercury..... .75
31300. " of porcelain.
- | | | |
|----------------------|------|------|
| Capacity, kilos..... | 4 | 8 |
| Each..... | 1.00 | 2.00 |
31304. Mercury Still, Hulett, as used in the U. S. Bureau of Mines Experiment Station, Pittsburgh, Pa. See *Bulletin No. 42 of the U. S. Bureau of Mines and Physical Review, Vol. 34, 1911, p. 307*, consisting of flask of 500 cc capacity, with long neck and side tube, as illustrated, which is sealed to the outlet tube of a Drechsel wash bottle. The asbestos air bath, asbestos disc "S" tripod and burner, are not included in the price. 3.00
31308. Mercury Still, Hulett, for electric heating. Glass parts only, without electric heater "B." See *Bulletin No. 42 of the U. S. Bureau of Mines*..... 5.60



No. 31316

METALLOGRAPHIC APPARATUS



No. 31320

MICROSCOPE, METALLURGICAL, SAUVEUR-BAUSCH AND LOMB, latest model Handle Arm Type with lever fine adjustment, with rack and pinion for the raising and lowering of the stage so that focusing may be done without moving the vertical illuminator out of the optical axis of the illuminating system and also providing a much greater working distance for thick specimens. With circular revolving stage with large size opening (1½ inches) in the center, for convenience in manipulating the Sauveur magnetic specimen holder. This is the most widely used microscope in metallurgical laboratories in the U. S. and the outfit as regularly supplied consists of Sauveur Metallurgical Stand; two oculars, 10X and 5X; three special metallographic objectives, i.e. short mounted and corrected for use without cover glass, of 32, 16 and 4 mm e.f.; vertical illuminator; two stage specimen holders, one magnetic and the other non-magnetic, and auxiliary tube, in polished case.

31312. Microscope, as above, without Sauveur Mechanical Stage 128.00

31316. Microscope, as above, with Sauveur Mechanical Stage as shown in illustration 150.00

MICRO-PHOTOGRAPHIC APPARATUS FOR METALLOGRAPHY, SAUVEUR-BAUSCH & LOMB. This outfit offers the advantage of a photo-micrographic outfit with microscope which may be removed for regular work on the table and instantly replaced in proper position on the outfit or mounted with the illuminator on one solid support with all adjustments.

Supporting Stand—Of cast iron, neatly finished and very stable; has four supports with 25-inch lateral spread, provided with both castors and leveling screws; carries plate, 21 x 7½ in., at height of 32 in. from floor, to which plate are attached the optical beds.

Optical Beds—Two in number, of lathe type, carefully placed, one accommodating supports for the microscope, arc lamp with condensing system, table for microscopic photography (of rail sections, etc.), and parts for lantern slide and transparent microscopic projection when these are desired. The other, graduated to 60 mm., carries camera and is attached to base plate by strong hinge joint, permitting the camera to be used in any position from vertical to horizontal.

Illuminator—90 deg. hand feed arc lamp for use with direct or alternating current, enclosed in a small cylindrical hood with observation windows, attached to rear of condenser mount; carbon adjustments so arranged as to be conveniently reached from the observer's position either at the microscope or at the camera. Carbons may be adjusted either separately or together.

Condensing System—Triple condensing system with lenses 4½ in. diam. in patent ventilated mount, which is in turn mounted in a cylindrical metal hood, 9 in. long and 5 in. diam., in which the condensers may be easily adjusted to and fro with reference to the lamp; a cylindrical extension slips over the end of the hood and helps to render the apparatus more nearly light-tight; a spring clip is provided for holding filter screens. A green monochromate screen is provided with the outfit as this has been found to be almost indispensable for the best photomicrographic work; entire illuminating apparatus is carried by a special fork and standard, adjustable for height and also to and fro on the optical bed, and provided with conveniently located adjustment screws for shifting its direction, vertically or laterally. The lamp may also be tilted at an angle for transparent and for oblique illumination.

Camera—Regularly supplied with camera for 5 x 7 in. plates and smaller, having a maximum bellows draw of 24 in., equipped with double plate holder with reducing kits for 4 x 5 in. and 3½ x 4½ in. plates and a ground glass screen with clear center; an adjustable mounting on two supports clamped to optical bed; front standard fitted with sliding light-tight tube to connect with microscope. A similar camera to take 4 x 5 and 3½ x 4½ in. plates can be supplied at a reduction of \$40.00 in the price. We strongly recommend the regular 5 x 7 camera, however.

Shutter—Automatic with steel leaves, having a maximum opening of 60 mm. may be set with instantaneous, bulb or time exposure.

31320. Micro-photographic Outfit, as above described, including Sauveur-Bausch & Lomb Metallographic Microscope No. 31316 with Mechanical Stage and 5 ampere rheostat for 110 volt circuit, .. 310.00

31324. Micro-photographic Outfit, as above, for 220 volts 311.50

31328. " " " " without Mechanical Stage 288.00

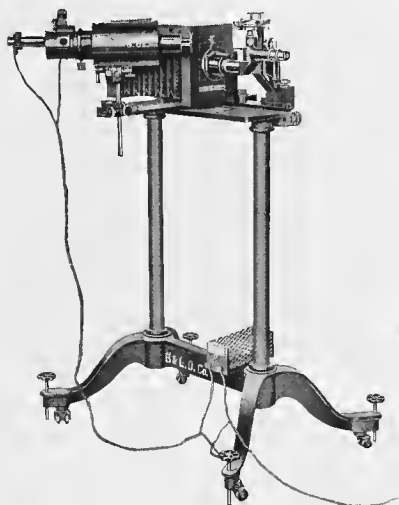
31332. " " " " Microscope 160.00

Note—If a 4 x 5 camera is desired \$10.00 may be deducted from each of the above prices.

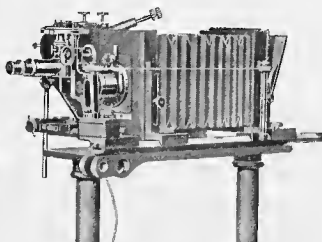
31336. Set of Lantern Slide Accessories consisting of supports, bellows, slide carrier, mounted condenser and 1½ inch diameter projection lens of either 6, 8 or 10 inch focus, as desired, 17.50

31340. Extra Carbons for lamp. Please state whether current is alternating or direct. Per 100 2.50

31344. Focussing Glass 4.00



No. 31348



No. 31348

MICRO-PHOTOGRAPHIC OUTFIT FOR METALLOGRAPHY WITH INVERTED SAUVEUR-BAUSCH & LOMB METALSCOPE. The microscope included with this outfit is of the inverted or Le Chatelier type, with fine adjustment controlled from the rear of the camera by a small milled head pulley. The illuminant is set at a convenient angle to the bed of the camera and arc may be conveniently set without movement from the position necessary at time of focusing. A separate microscope tube is provided for visual examination and with the vertical illuminator permanently fixed the only adjustment necessary is the arc lamp.

Supporting Stand—Of cast iron, neatly finished and very stable; with four supports with 25-inch lateral spread, provided with both castors and leveling screws; carries plate, 21 x 7½ in., at height of 40 in. from floor, to which plate are attached the optical beds.

Optical Beds—Two in number, of lathe type, carefully planed, one accommodating supports for the arc lamp with condensing system. The other, graduated to 610 mm., carries the camera.

Microscope—As described above.

Illuminant—90 deg. hand feed arc lamp consuming about 4½ amps. for use with direct or alternating current, enclosed in a small cylindrical hood with observation windows, attached to rear of condensing mount; carbon adjustments so arranged as to be conveniently reached from the observer's position either at the microscope or at the camera.

Carbons may be adjusted either separately or together.

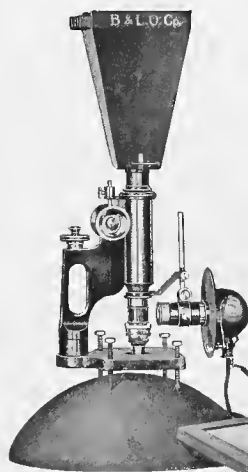
Condensing System—Triple condensing system with lenses ¼ in. diam. in patent ventilated mount, which is in turn mounted in a cylindrical metal hood, 9 in. long and 5 in. diam., in which the condensers may be easily adjusted to and fro with reference to the lamp; a cylindrical extension slips over the end of the hood and helps to render the apparatus more nearly light-tight; a spring clip is provided for holding filter screens. A green monochromatic screen is provided with the outfit, as this has been found to be almost indispensable for the best photomicrographic work; entire illuminating apparatus is carried by a special fork and standard, adjustable for height and also to and fro on the optical bed, and provided with conveniently located adjustment screws for shifting its direction vertically or laterally.

Camera—Regularly supplied with horizontal camera for 5 x 7 in. plates and smaller, having a maximum bellows draw of 2½ in., equipped with double plate holder with reducing kits for 4 x 5 in. and 3½ x 4½ in. plates and a ground glass screen with clear center; in adjustable mounting on two supports clamped to optical bed; front standard fitted with sliding light-tight tube to connect with metaloscope. A similar camera to take 4 x 5 and 3½ x 4½ in. plates can be supplied at a reduction of \$10.00 in the price. We recommend the regular 5 x 7 camera, however.

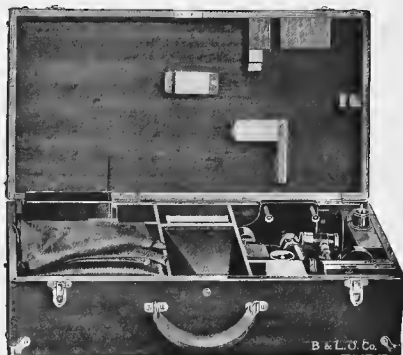
Shutter—Automatic with steel leaves, having a maximum opening of 49 mm may be set with instantaneous, bulb or time exposure.

31348.	Micro-photographic Outfit, as described above, including three special metallographic objectives, 16 mm and 4 mm in long mounts and 32 mm in short mount, all corrected for use without covers; four oculars, two each of 6.4X and 10X; vertical illuminator, two Sauveur specimen holders, one magnetic and one non-magnetic; inverted Metaloscope stand; camera with automatic shutter and pulley for controlling fine adjustment of microscope as above described, with 5 ampere rheostat for 110 volts and with Sauveur Mechanical Stage.....	345.00
31352.	Micro-photographic Outfit, as above, with rheostat for 220 volts.....	346.50
31356.	“ “ “ “ without Mechanical Stage.....	323.00
31360.	Focussing Glass.....	4.00
31364.	Extra Carbons for lamp. Please state whether current is direct or alternating. Per 100.....	4.00

Note—If 4 x 5 camera is preferred, \$10.00 may be deducted from each of the above prices.



No. 31368—In position for use on a casting and with electric illumination



No. 31368—Showing entire outfit conveniently packed in portable case



METALLOGRAPHIC MICROSCOPE AND CAMERA, TASSIN-BAUSCH & LOMB, a portable outfit for the microscopic investigation of structural metals and other surfaces; particularly designed for the practical study of the forging, casting or bar as it is turned out rather than from specimens cut from the piece which must be taken to the laboratory for examination. The Tassin Apparatus consists essentially of three parts, the Microscope, the Illuminating Apparatus and the Camera.

Microscope—The microscope is of Bausch & Lomb handle arm type. It has a large stage which is provided with leveling screws and forms the base of the instrument. The stage measures 110 x 92 mm., with a distance of 41 mm. from its center to the base of the arm. The effective length of the leveling screws is 39 mm. The object under examination is viewed through a circular aperture in the stage, 31 mm. in diameter. The stage, of course, may also be used in the regular way when the size of the specimen permits.

The body tube, carrying the objective, illuminating apparatus and ocular, is moved up and down by a rack and pinion adjustment; for approximate focusing, the exact focus being obtained by means of a fine adjustment of lever type with a milled micrometer head. A post with clamp is attached to the body tube so that the tube, after the focus has been obtained, cannot be forced down while attaching the camera, thus eliminating all risk of disturbing the focus or injuring the objective by forcing it down against the object.

Illuminating Apparatus—At the lower end of the body tube is attached the illuminating apparatus, to which is fastened a quick clamping nosepiece, permitting a ready interchange of objectives. The illuminating apparatus shown in position in illustration, consists of a vertical illuminator and an arm, to the outer end of which is clamped an upright metal arm, carrying a condensing system in an adjustable tube, a metal shield and an illuminant attached at the rear of the shield.

The illuminant may be either a 6-volt, 16 c. p. Mazda lamp or a small Acetylene burner, both of which are supplied with the complete outfit. The former illuminant is shown in illustration, the Mazda lamp being mounted in a metal hood attached to the shield by claps fitting over translated legs.

A resistance bank is supplied for use with the Mazda lamp to permit one to take current from either the regular 110- or 220-volt, direct or alternating circuit. This resistance bank is provided with six lamp sockets but is furnished without lamps. If it is desired to use the Mazda lamp regularly supplied with a 110-volt circuit, either direct or alternating, the bank should be equipped with two 32 c. p. and 16 c. p. carbon lamps; if a 220-volt circuit is to be used, the lamp should be fitted with five 32 c. p. carbon lamps.

When acetylene is to be used, the burner is attached to the back of the shield by means of a rod and clamp. The gas may be supplied by a charged acetylene tank, as used on automobiles, or by the generator listed.

Within the vertical illuminator is an adjustable reflector of clear glass. Openings in the mounting permit the light from the illuminant to reach this reflector, which directs it upon the object. Adjustments are provided for centering the light properly. After the correct position has once been established, no further attention need be paid to the position of the light source since it travels with the body tube in focusing.

Camera—The camera is of metal, 19 inches in length. It is provided with a focusing ground glass, two double plate holders for 3½ x 3½-inch plates and a small trap shutter. The front board is fitted with a draw tube which is inserted in the body tube of the microscope in place of the regular draw tube when making a negative. Two oculars are therefore desirable, one for each draw tube.

The three objectives regularly supplied, i. e., the 32, 16 and 8 mm. when used with a 7.5X ocular, will give magnifications of 30, 60 and 150 diameters, respectively.

Since one may often wish to know, before leaving the job, what sort of negatives he has obtained and there may not be a dark room at hand, we provide a changing box and a tank for daylight developing to meet this contingency. Any good orthochromatic plate may be used with any standard developer and fixing solution.

Price list on following page.

31368.	Tassin Metallographic Equipment complete, as above, consisting of the following parts: special microscope stand; quick changing nosepiece with three rings; two eyepieces, 7.5X; three objectives, 32, 16 and 8 mm; vertical illuminator; Tassin illuminating apparatus complete for acetylene; electric light attachment with Mazda lamp; resistance bank with cord, fuse block and connecting plug; Never Out Acetylene Generator No. 3 with six feet of rubber tubing; camera; 2 doz. Steel plates; hand magnifier; package of developing powders; focusing cloth; changing bag; carrying case with fittings	122.00
31372.	Special Microscope with stage 119 x 92 mm, with four leveling screws, rack and pinion and lever fine adjustments	26.75
31376.	Quickchanging Nosepiece with three rings	7.00
31380.	Eyepiece 7.5X	1.50
31384.	Objective 32 mm	4.00
31388.	Objective 16 mm	5.00
31392.	Objective 8 mm	8.00
31396.	Vertical Illuminator	6.50
31400.	Tassin Illuminating Apparatus for acetylene	15.00
31404.	Tassin Illuminating Apparatus for electricity including illuminator, hood, 6-volt Mazda lamp and socket	17.50
31408.	Electric Light Attachment consisting of hood, lamp and socket	3.50
31412.	Resistance Bank with snap switch and sockets for six lamps, fuse block, cord and plug; necessary for use with electricity; furnished without lamps	7.50
31416.	Never Out Acetylene Generator No. 3	9.00
31420.	Camera with ground glass, two plate holders, shutter and draw tube	13.50
31424.	Changing bag	1.25
31432.	Developing tank	4.00
31434.	Carrying Case	8.00

METALLOGRAPHIC MICROSCOPE, REICHERT. The advantage of this instrument is the manner in which the light is brought to bear upon the preparation and the more perfect quality of the illumination obtained thereby. The specimen requires one prepared surface only, which does away with the necessity of providing it with two approximately parallel planes, the instrument being so arranged that the polished surface rests upon a stage set accurately at right angles to the optic axis. The apparatus is fitted with convenient appliances for taking rapidly a series of photographs; a new and convenient form of slow adjustment with slide motion and micrometer screw at the side, the whole acting on the principle of the screw and inclined plane and thereby furnishing an exceedingly sensitive and exact adjustment.

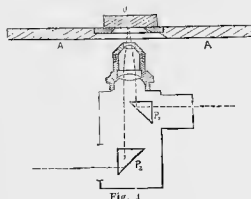


Fig. 4 shows diagrammatically the path of the rays. The rays emitted by the source of light are brought to bear upon the object by means of a prism and the objective, the function of the latter being both that of a magnifying lens and that of a condenser. The light reflected at the object passed into the prism P_1 , by which means it is deflected into the horizontal tube I and so reaches the observer's eye. To pass from observation with the eye to photographic records the prism marked P_2 in Fig. 4 can be given a quarter turn about an axis at right angles to the plane of the stage. The photographic plate, as shown in Fig. 7, is placed at right angles to the optical bench which carries the illuminating appliances. To facilitate the observation of the image the instrument may have appended to it an eyepiece elbow fitting which is inserted into the sleeve of the horizontal tube of the microscope. The rays are deflected upwards by a prism and thence pass through the eyepiece to the eye. The advantage of this arrangement is that it enables the worker to assume his accustomed posture. Fig. 5 shows the arrangement of the illuminating appliances and their order of sequence. A suitable illumination is furnished by any of the usual sources, such as Welsbach burners, Nernst lamps, Lilliput arc lamps, and arc lamps taking large currents, whilst in photomicrographic work preference should be given to one of the three last named sources. The whole of the illuminating appliances, the wheel diaphragm I (Fig. 5) and the condensing lens B are accommodated in a tube fitting which attaches to the microscope stand. In the same tube there is a slit for the glass screens and the light filter trough furnished with the microscope.

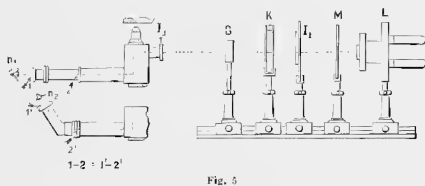


Fig. 5

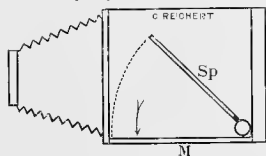


Fig. 8

Externally the complete Metallograph presents the form shown in Fig. 6. It will be seen that a heavy sole-plate is surmounted by a pillar, which, like other Reichert microscope stands, is provided with a loop serving as a convenient handle for lifting the microscope. This pillar carries the rack and pinion mechanism for the coarse motion of the stage, as well as a mirror capable of being moved in all directions.

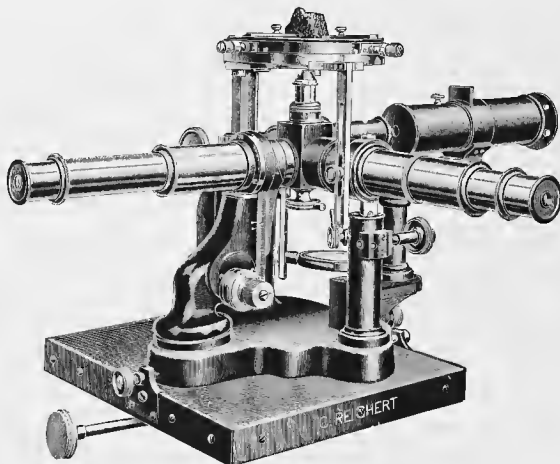


Fig. 6. No. 31436. Microscope with Circular Mechanical Stages

METALLOGRAPHIC MICROSCOPE, REICHERT. (cont)

The stage of the microscope is of the revolving and centering type, two screws being fitted to the side of the stage frame by means of which the specimen may be displaced by a few millimeters in any direction. Larger displacements may either be made by hand or with the aid of the compound mechanical stage. Fig. 7 represents this microscope as set up in combination with a photographic apparatus. The latter rests with its heavy metal feet upon an optical bench set at right angles to the centre line of the illuminating appliances. The tube facing the camera is optically connected with the latter by means of a sleeve and socket arrangement. The picture on the camera screen can be readily focused with great nicety by means of the movable eye lens of the projection eyepiece without in any way interfering with the adjustment of the eyepiece in the drawtube. To make the transition from ocular observation to photomicrography all that is necessary is to turn the small lever under the prism mount horizontally up to its stop. An image which has been sharply focused with respect to the ordinary eyepiece will then appear sharply upon the camera screen. Nevertheless, especially when light filters are being used, it is advisable to complete the fine adjustment by focusing on the screen. In this case the slow motion is transmitted to the microscope by means of a Hooke's key fitted with a socket by which it may be attached to the micrometer head facing the camera.

The Camera of the metallographic apparatus may be fitted with a focusing mirror, which adds materially to the ease and rapidity with which the apparatus can be used. It enables the observer, after completing the adjustment of the microscope, to obtain a sharp focus on the ground glass focusing screen without having to leave his seat. The ground glass focusing screen M is in this case at the side and parallel to the track of the camera, whilst the dark slide K remains in its usual position. It will be seen that the vertical mirror Sp, as shown in Fig. 8 is hinged between the ground glass focusing screen M and the dark slide K and may be turned about its axis by means of the lever fitted to the outside of the case. To view the image on the screen the mirror should be placed at an angle of 45° to the axis of the camera (Fig. 8) and during exposure it should be turned back in the direction of the arrow so as to lie close to the ground glass screen. This arrangement is particularly convenient in all cases where the use of feeble sources of light coupled with high magnifications necessitate long exposures. In such cases the arrangement may be readily controlled during the exposure.

31436.	Metallographic Microscope, Reichert, as shown in Fig. 6, with rack and pinion coarse adjustment, micrometer screw fine adjustment with milled heads at the side reading displacements of 0.001 mm, with centering revolving stage, also with wheel diaphragm, condensing lens, two glass screens, and one light-filter trough in a tube fitting. Without objectives or eyepieces	Duty Free 126.00	Duty Paid 168.00
31440.	Objective, No. 2	5.10	6.80
31444.	Apochromatic Objective, 16 mm.	18.00	24.00
31448.	“ “ 8 mm.	25.50	34.00
31452.	“ “ 4 mm.	31.50	42.00
31456.	“ “ 3 mm.	34.50	46.00
31460.	Apochromatic Immersion Lens 2 mm.	75.00	100.00
31464.	Compensating Eyepiece, No. 4	4.80	6.40
31468.	“ “ “ 6	4.80	6.40
31472.	“ “ “ 8	4.80	6.40
31476.	Micrometer Eyepiece “ III.	3.60	4.80

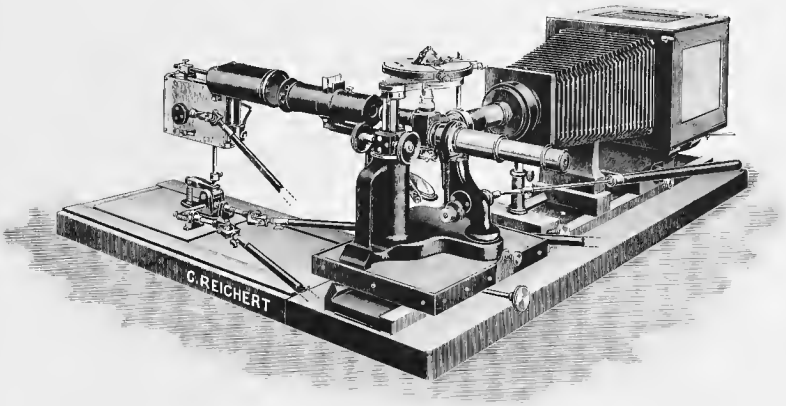
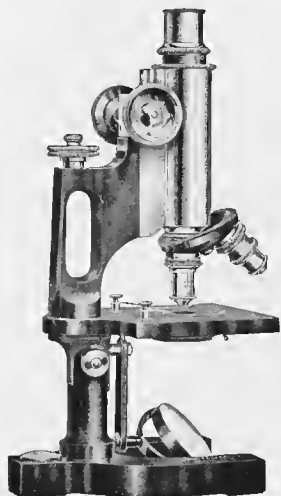


Fig. 7. No. 31436. Microscope with No. 31484 Circular Mechanical Stage, No. 31504 Photographic Camera and Base Plate, No. 31536 Hand Regulating Arc Lamp, No. 31508 Hooke's Key for focussing at a distance and No. 31552 Universal Motion for Adjusting the Lamp

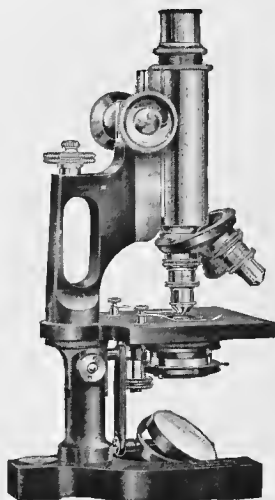
31480.	Attachable and Recording Mechanical Stage giving two motions at right angles to one another, the ranges of the respective motions being 30 mm. The magnitudes of the motions can be read with the aid of scales and verniers, and hence the position of any given element may be recorded and found without searching.			
	Duty Free	25.50	Duty Paid	34.00
31484.	Large Circular Mechanical Stage for attachment in the place of the centring and revolving stage usually employed. It has a diameter of 120 mm, it may be rotated and gives two motions at right angles to one another through a range of 20 mm. The magnitude of the motions can be read to 0.01 mm with the aid of verniers and divided drums. The stage is interchangeable with respect to the fixed stage, which is better adapted for the examination of large pieces of metal. Additional price of both stages.			
	Duty Free	30.00	Duty Paid	40.00
31488.	Eye-piece Elbow Mount with prism for observation from above, to slip into the drawtube of the microscope (Fig. 5)		Duty Free	Duty Paid
			6.30	8.40
31492.	Stage Micrometer ruled upon metal, being one millimeter divided into 100 parts		2.55	3.40
31496.	Ground Glass Screen with etched scale of millimeters for use in conjunction with a stage micrometer for ascertaining the magnification furnished by a photograph		3.75	5.00
31500.	Ground Glass Screen for ocular observation, to secure greater uniformity in the illumination when arc lamps are used, on stand		3.75	5.00
Photographic Equipment for use with Reichert Metallographic Microscope.				
31504.	Large Base Plate with two Optical Benches, Microscope Base, and Photomicrographic Camera , the latter being provided with a ground glass and plain plate glass focusing screen and a dark-slide to take 13 x 18 cm (7½ x 5 in.) plates and carriers to take 9 x 12 cm (4½ x 3½ in.) plates. The bellows give an extension of 75 cm (30 inches)		Duty Free	Duty Paid
			50.10	66.50
31508.	Hooke's Key for focussing from a distance		3.00	4.00
31512.	Projection Eye-piece No. 2		12.00	16.00
31516.	" " " " No. 4		12.00	16.00
31520.	One Extra Double Dark-slide		6.30	8.40
31524.	One Focusing Lens		4.20	5.60
	New Nernst Lamp on stand to raise and lower		9.75	13.00
31528.	a) for a supply pressure of 80 - 200 Volts		9.75	13.00
31532.	b) " " " " " 200-300 "		9.75	13.00
31536.	Small Hand Regulating Arc Lamp with carbons placed at right angles to one another, taking 4 amperes		12.75	17.00
31540.	Ditto with Hooke's Key for operating from a distance		18.75	25.00
31544.	Resistances for lamp No. 31536 for 110 volts		4.50	6.00
31548.	Large Hand Arc Lamp with carbons placed at right angles to one another, in metal casing, wound for a current of 10-30 amperes		56.25	75.00
31552.	Universal Motion fitting for adjusting lamp No. 31548 in every direction, with two Hooke's keys		16.50	22.40

MICROSCOPES AND ACCESSORIES



No. 31604—BH2
with stage iris diaphragm

The BH Microscopes are probably more widely used throughout the U. S. for students' laboratory work than any other make or type of Microscope.



No. 31616—BH8
with regular quick acting screw substage

MICROSCOPE, BAUSCH & LOMB TYPE BH. This microscope is probably more widely used for students' laboratory work in the U. S. than any other make or type of instrument. It was the first Handle Arm Microscope with the modern adaptation of the lever fine adjustment and was such a pronounced success that the modification of the other instruments, BBH, CAH and DDH, rapidly followed. With the addition of a substage of the quick acting screw type, Abbe condenser, and iris diaphragm, the BH type is available for bacteriological and other work requiring the use of the oil immersion objective of 1.9 mm focus. This is designated as the BH8.

Body Tube—Provided with society screw thread; draw tube graduated in single millimeters with every tenth line numbered, adjustable in cloth lined sleeve, or in metal fitting if so specified, and provided with society screw thread for the use of low power objectives.

Focusing Adjustment—Coarse adjustment by standard rack and pinion; fine adjustment of the Bausch & Lomb lever type with two-sized knurled head for slow and rapid movement, ceasing to operate when objective touches the slide.

Stage of BH1 to 4—Of metal completely covered with vulcanized rubber, measuring 103 x 101 mm, with a distance of 59 mm from center to base of arm, provided with spring clips, an iris diaphragm so mounted as to be readily detached if desired and screw threads for attaching a substage ring to hold an Abbe condenser; iris diaphragm controlled by knurled ring, operated from any point of its circumference.

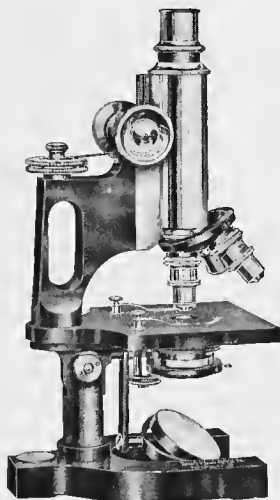
Substage of BH8—Adjustable for focus by a quick-acting screw; consists of a mounting for the Abbe condenser and an iris diaphragm, which comes into the plane of the stage when the screw is turned up as far as possible, allowing the condenser to be used in immediate contact with the slide; substance is swung to the left of the optical axis when screw reaches the limit of motion downward; iris diaphragm is automatically locked against closing when condenser is in position.

Finish—Main parts including body tube in alcohol proof black, adjustment heads in yellow.

Case—of hard wood with polished finish, fitted with brass lock and key.

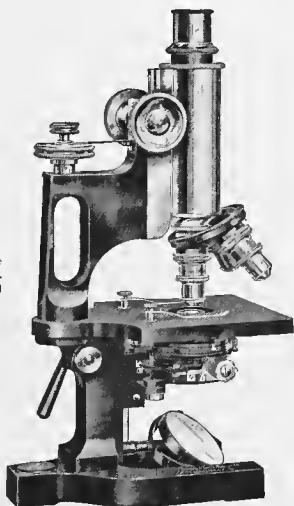
	Outfit	Objectives		Eyepieces	Nosepieces	Abbe Condenser	Price
		Dry	Oil Immersion				
31600.	BH1	16 mm	4 mm	7.5 X			27.50
31604.	BH2	16 mm	4 mm	7.5 X	Circular Double		31.50
31608.	BH3	16 mm	4 mm	5 X 10 X			29.00
31612.	BH4	16 mm	4 mm	5 X 10 X	Circular Double		33.00
31616.	BH8	16 mm	4 mm	1.9 mm 5 X 10 X	Circular Triple	1.20 N. A.	70.00

Note—Microscopes BH1, BH2, BH3 and BH4 are furnished with a substage ring and Abbe condenser 1.20 N. A., in an iris diaphragm mounting at an additional cost of \$7.50. The Abbe Condenser in the BH8 outfit is supplied in the regular quick acting Screw Substage. The above are the outfits regularly supplied. Prices on special outfits quoted on application.



No. 31640—BBH
with regular quick-acting screw substage

The BBH Microscope is the standard throughout the U. S. for medical and other advanced laboratory work.



No. 31660—CAH
with complete substage

MICROSCOPE. BAUSCH AND LOMB TYPES BBH AND CAH. The BBH Microscope is the handle arm successor of the BB Microscope which was for many years the standard microscope throughout the United States for physicians' use and for laboratory work in all advanced work. The CAH Microscope differs from the BBH only in size and having the complete substage and is recommended for the individual use of scientists doing more advanced work. Unless otherwise stated the following specifications apply to both types.

Body Tube—Outside diameter, 39 mm; provided with society screw thread; standard size eyepieces are used; draw-tube graduated in single millimeters with every tenth line numbered, adjustable in cloth-lined sleeve, or in metal fitting, if so specified, and provided with society screw thread for the use of low power objectives.

Focusing Adjustment—Coarse adjustment by standard rack and pinion; fine adjustment of Bausch & Lomb lever type with double knurled micrometer screw head for slow and rapid movement, the larger part graduated into 100 divisions, each equal to .0025 mm in vertical movement, and provided with a hinged indicator, which may be turned back from the head, fine adjustment ceases to operate when objective touches the slide.

Stage of BBH—of metal, covered with vulcanized rubber; measures 120 x 167 mm., with a distance of 70 mm. from its center to base of arm; provided with spring clips.

Stage of CAH—as above, measures 125 x 115 mm.; with a distance of 75 mm. from its center to base of arm.

Substage of BBH—adjustable for focus by a quick acting screw; consists of a mounting for the Abbe condenser and an iris diaphragm, which enters into the plane of the stage when the screw is turned up as far as possible, allowing the condenser to be used in immersion contact with the objective, if desired; substage is swung to the left of the optical axis when screw reaches the limit of motion downward.

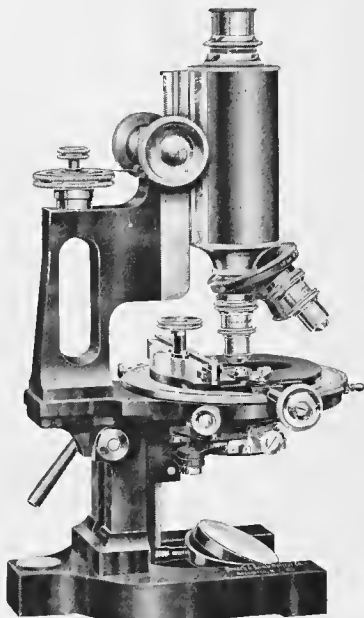
Substage of CAH—complete with swing-out condenser of Bausch & Lomb new construction, and arranged to take all the substage accessories; adjustable by standard rack and pinion; upper iris diaphragm of dome shape, self-locking, combined with Abbe condenser, the whole easily removable from substage, Abbe condenser removable from optical axis by a double swing movement to one side, releasing upper iris diaphragm for use; lower iris diaphragm adjustable laterally by rack and pinion for oblique illumination, revolvable about its own axis and mounted on a swiveling arm allowing it to be swung entirely out of the optical axis.

Finish—Main parts including body tube in alcohol proof black, adjustment heads in yellow.

Cases—Of hard wood with polished finish; fitted with brass lock and key.

	Outlet	Objectives				Nosepieces	Abbe Condenser	Price
		Dry	Oil Immersion	Eyeieces				
31620.	BBH1	16 mm 4 mm		7.5 X			41.50	
31624.	BBH2	16 mm 4 mm		7.5 X		Circular Double	45.50	
31628.	BBH3	16 mm 4 mm		5 X 10 X		Circular Double	43.00	
31632.	BBH4	16 mm 4 mm		5 X 10 X		Circular Double	47.00	
31636.	BBH6	16 mm 4 mm		5 X 10 X		Circular Double	54.50	
31640.	BBH8	16 mm 4 mm	1.9 mm	5 X 10 X		Circular Triple	1.20 N. A. 80.00	
31644.	CAH1	16 mm 4 mm		7.5 X			1.20 N. A. 76.00	
31648.	CAH2	16 mm 4 mm		7.5 X		Circular Double	1.20 N. A. 80.00	
31652.	CAH3	16 mm 4 mm		5 X 10 X			1.20 N. A. 77.50	
31656.	CAH4	16 mm 4 mm		5 X 10 X		Circular Double	1.20 N. A. 81.50	
31660.	CAH8	16 mm 4 mm	1.9 mm	5 X 10 X		Circular Triple	1.20 N. A. 110.00	

Note:—The new swing-out mounting for the Abbe Condenser with upper and lower iris diaphragms, is substituted for the regular one in the BBHs and BBH8 outfits at an additional cost of \$5.00. When ordering this mounting, please specify "screw substage with swing-out condenser."



No. 31680—DDH2 with Revolving Mechanical Stage and Complete Substage

MICROSCOPE, BAUSCH AND LOMB TYPE DDH. This is the largest and most elaborate of the Bausch and Lomb Handle Arm series and is particularly designed for advance research work, photo-micrography, etc.

Pillar—Double rectangular in section, provided with inclination joint and clamping lever to secure the instrument in any position and with stops in the vertical and horizontal positions.

Body Tube—Of aluminum, 50 mm outside diameter; provided with society screw thread; standard size eyepieces are used, draw tube graduated in single millimeters with every tenth line numbered, adjustable in cloth-lined sleeve, or in metal fitting, if so specified, and provided with a society screw thread; lower collar may be removed for attaching the Micro-Tessar, 72 mm objective.

Focusing Adjustment—Course adjustment by standard rack and pinion; fine adjustment of Bausch & Lomb lever type with micrometer screw head in two parts (for slow and rapid movement, the larger graduated into 100 divisions, each equal to .0025 mm, in vertical movement, and provided with a hinged indicator, which may be turned back from the head).

Stage—Revolving mechanical, with circumference graduated into single degrees and read by a convenient vernier; measures 126 mm outside and 112 mm inside the graduations; provided with two rack and pinion movements, covering a range of 75 mm and 35 mm, respectively; provided with centering screws and removable for substitution of plain stage, if desired, or upper part may be removed, leaving a large, flat surface with one rack adjustment.

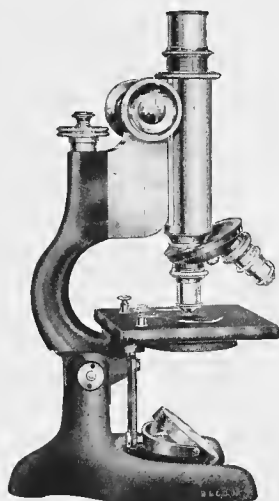
Substage—Complete with swing-out condenser and so arranged that all substage accessories, inserted into the upper sleeve, may be easily employed; adjustable by standard rack and pinion; upper iris diaphragm of dome shape, self locking, combined with Abbe condenser, the whole easily removable from substage; Abbe condenser removable from optical axis by a double swing movement to one side releasing upper iris diaphragm for use; lower iris diaphragm adjustable laterally by rack and pinion for oblique illumination, revolvable about its own axis and mounted on a swinging arm, allowing it to be swung entirely out of the optical axis.

Finish—Main parts, including body tube, in alcohol proof black; adjustment heads and buttons in yellow.

Case—Of hardwood with polished finish; lined with brass lock and key.

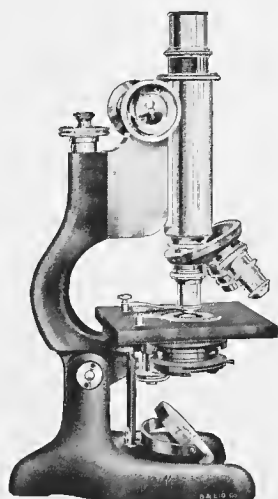
Objectives

	Outfit	Objectives		Eyepieces	Nosepieces	Abbe Condenser	Price	
		Dry	Oil Immersion					
31664.	DDH1	16 mm 4 mm		7.5 ×		1.20 N. A.	131.00	
31668.	DDH2	16 mm 4 mm		7.5 ×	Circular Double	1.20 N. A.	135.00	
31672.	DDH3	16 mm 4 mm		5 × 10 ×		1.20 N. A.	132.50	
31676.	DDH4	16 mm 4 mm		5 × 10 ×	Circular Double	1.20 N. A.	136.50	
31680.	DDH8	16 mm 4 mm	1.9 mm	5 × 10 ×	Circular Triple	1.20 N. A.	165.00	
31681.	Plain Vulcanite Stage for DDH, interchangeable with the Revolving Mechanical Stage.							15.00



No. 31696-F1
with stage iris diaphragm

The F and FF Microscopes embody all the advantages of the Lever Fine Adjustment combined with the Curved Arm.



No. 31700-FF8
with regular quick-acting screw substage

MICROSCOPE. BAUSCH & LOMB CURVED ARM TYPE F & FF. This Microscope is the latest development of the handle arm type with lever fine adjustment and is preferred by many to the BH type because of the facility and safety with which the arm of the microscope may be grasped by the whole hand and because of the large amount of space available for manipulation of the object on the stage.

Body Tube—Provided with society screw thread; standard sized eyepieces are used (23 mm diam.); draw tube graduated in single millimeters with every tenth line numbered, adjustable in cloth lined sleeve or in metal fitting, as so specified, and provided with society screw thread for the use of low power objectives.

Focusing Adjustment—Coarse adjustment by standard rack and pinion, provided with stop to prevent pinion from overriding rack, fine adjustment of Bausch & Lomb original lever type with two-sized knurled head for slow and rapid movement, respring to operate when objective touches the slide; adjustment head locked to prevent removal; all parts of fine adjustment thoroughly dust-proof.

Stage—of metal, completely covered with vulcanized rubber except at point of attachment; measures 102 x 102 mm, with a distance of 76 mm from center to arm at stage surface (distance from optical center to extreme inner curve of arm, 85 mm); provided with spring clips. In the F1 to F4 outfits the stage is provided with an iris diaphragm with mount having screw threads for attaching a substage ring to hold an Abbe condenser; iris diaphragm controlled by knurled ring, operated from any point of its circumference; stage attached to arm on broad bearing surface to insure maximum rigidity.

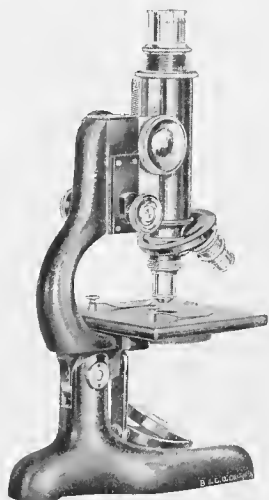
Finish—Main parts, including body tube in alcohol proof black, adjustment heads in yellow.

Case—Of hard wood with polished finish; fitted with brass lock and key.

Substage—of FF6 and FF8—adjustable for focus by a quick-acting screw; consists of a mounting for the Abbe condenser and an iris diaphragm, which comes into the plane of the stage when the screw is turned up as far as possible, allowing the condenser to be used in immersion contact with the slide; condenser is provided with iris diaphragm, beneath this being two iris diaphragms with equipment; sub-stage is swung to the left of the optical axis when screw reaches the limit of motion down ward; iris diaphragm is automatically locked against closing when condenser is in position.

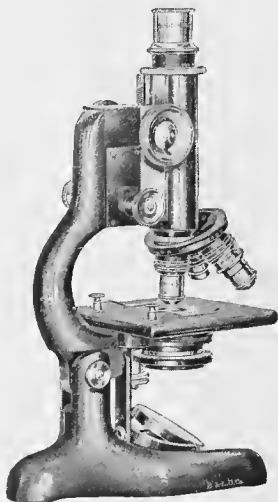
Outfit	Objectives		Eyepieces	Nosepieces	Abbe Condenser	Price
	Dry	Oil Immersion				
31684.	F1	16 mm 4 mm	7.5 X			27.50
31688.	F2	16 mm 4 mm	7.5 X	Circular Double		31.50
31692.	F3	16 mm 4 mm	5 X 10 X			29.00
31696.	F4	16 mm 4 mm	5 X 10 X	Circular Double		33.00
31698.	FF6	16 mm 4 mm	5 X 10 X	Circular Double	1.20 N. A.	41.00
31700.	FF8	16 mm 4 mm 1.9 mm	5 X 10 X	Circular Triple	1.20 N. A.	65.00

Note—Microscopes F1 to F4 can be furnished with a substage ring and Abbe condenser, 1.20 N. A. in an iris diaphragm mounting at an additional cost of \$7.50. In the FF6 and FF8 outfits the sub-stage furnished is the regular quick-acting screw type. The above are the outfits regularly supplied. Prices on special outfits quoted on application.



No. 31708 FS2
with stage iris diaphragm

These Microscopes offer the combined advantages of the Lever Fine Adjustment with the Side Wheel and Curved Arm



No. 31724 FFS8
with regular quick acting screw substage

MICROSCOPE, BAUSCH & LOMB CURVED ARM TYPE FS AND FFS with Lever Side Wheel Fine Adjustment.

This is a new microscope with side fine adjustment of the lever type, which is here used in conjunction with the curved arm made by Bausch & Lomb for many years. The principle is that of their original lever type of fine adjustment which has met the test of time and has been very generally adopted. The construction is simple and durable, giving a delicate movement for work with the highest powers, yet rapid enough for the lower powers. There is absolutely no tendency to wedge, and the adjustment has been tested in a manner equivalent to many years of use without showing wear or lost motion. This adjustment produces a vertical movement of the body tube of 0.25 mm for every complete rotation of the heads. It can be operated from either the right or left side of the arm, a turn of the fine adjustment heads always moving the body tube in the same direction, up or down, as a corresponding turn of the coarse adjustment heads. Positive stops denote the upper and lower limits of motion, and the adjustment ceases to operate when the objective comes in contact with the slide. An automatic take-up for wear is provided.

Body Tube—Provided with society screw thread; standard size eyepieces are used (23 mm diam.); draw tube graduated in single millimeters with every tenth line numbered, adjustable in lined sleeve or in metal fitting, if so specified, and provided with society screw thread.

Focusing Adjustments—Coarse adjustment by standard rack and pinion; fine adjustment of the lever type, with micrometer head on each side of arm, one complete revolution of the micrometer heads produces a vertical movement of the body tube of 0.25 mm.

Stage—Of metal, completely covered with vulcanized rubber except at point of contact with arm; measures 102 x 102 mm, with a distance of 76 mm from center to arm at stage surface (distance from optical center to extreme inner curve of arm, 33 mm); provided with spring clips. In the FS1 to FS4 Outfits the stage is provided with an iris diaphragm with mount having screw threads for attaching a substage ring to take an Abbe Condenser; the iris diaphragm being controlled by a knurled ring operated from any point of its circumference. With mechanical stage No. 32508 the entire surface of a slide, 50 x 75 mm, may be examined.

Substage of FFS6 and 8—Adjustable for focus by a quick-acting screw; consists of a mounting for the Abbe condenser and an iris diaphragm, which comes into the plane of the stage when the screw is turned up as far as possible, allowing the condenser to be used in immersion contact with the slide; substage is swung to the left of the optical axis when screw reaches the limit of motion, downward; iris diaphragm is automatically locked against closing when condenser is in position, or against inserting condenser when upper iris is closed.

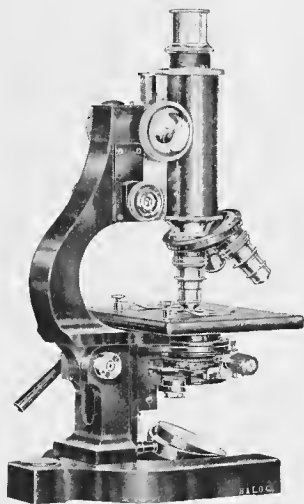
Mirror—Plane and concave, 50 mm in diameter; adjustable in two planes in a fork, mounted on a swinging arm provided with a stop for central illumination.

Finish—Lower parts, arm and body tube in alcohol-proof black; other parts in yellow.

Case—Of hard wood with polished finish, fitted with brass lock and key.

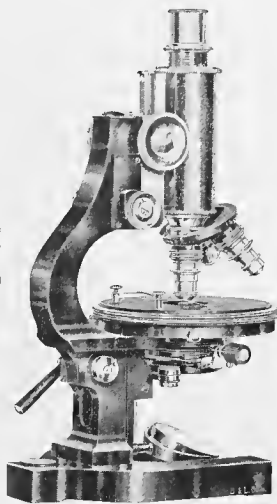
	Outfit	Objectives		Eyepieces	Nosepiece	Abbe Condenser	Price
		Dry	Immersion				
31704.	FS1	16 mm, 4 mm		7.5 x	Circular Double		30.00
31708.	FS2	16 mm, 4 mm		7.5 x			34.00
31712.	FS3	16 mm, 4 mm		5 x 10 x	Circular Double		31.50
31716.	FS4	16 mm, 4 mm		5 x 10 x			35.00
31720.	FFS6	16 mm, 4 mm		5 x 10 x	Circular Double	1.20 NA	43.50
31724.	FFS8	16 mm, 4 mm	1.9	5 x 10 x	Circular Triple	1.20 NA	67.50

Note.—Microscope FS1 to FS4 can be furnished with a substage ring with Abbe Condenser of 1.20 NA at an extra cost of \$7.50. Outfit FFS6 and FFS8 are provided with regular quick acting screw substage.



No. 31744 CAS8
With Complete Substage

These Microscopes offer the combined advantages of the Lever Fine Adjustment with the Side Wheel and Curved Arm.



No. 31764 CCS8
With Complete Substage

MICROSCOPES, BAUSCH & LOMB CURVED ARM TYPES CAS AND CCS with Lever Side Wheel Fine Adjustment. These models are of the size and general construction of CAH and CCH and combine with these features the curved arm with lever side wheel fine adjustment as introduced in types FS and FFS.

Base and Pillar—Same as in CAH.

Arm—Long curved form of rectangular cross section with rounded edges.

Body Tube—Same as in CAH.

Focusing Adjustment—Coarse adjustment by rack and pinion; fine adjustment of new side wheel lever type with micrometer head on each side of arm, with drums graduated to read single microns of vertical movement. Index lines are provided on side of arm to show upper and lower limits of fine adjustment range.

Stage of CAS—Of metal covered with vulcanized rubber, 125 x 115 mm with a distance of 87 mm from center to base of arm. With spring clips.

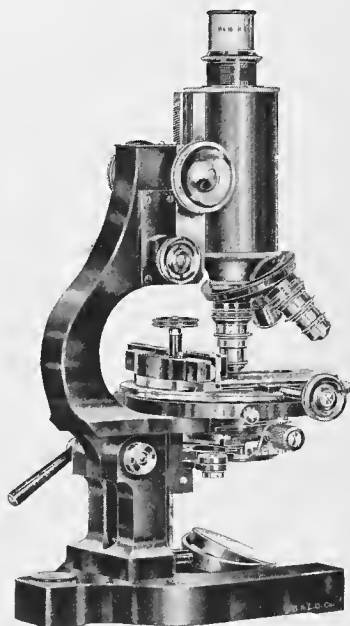
Stage of CCS—Circular revolving, 125 mm diameter, with vulcanite top, centering screws and spring clips. Distance from center of stage to base of arm 87 mm. Interchangeable with large revolving mechanical stage.

Substage—Complete substage equipment with Abbe Condenser, as supplied with CAH, DDH, DHS, etc.

Finish—Main parts, including body tube, in alcohol proof black. Adjustment heads in yellow lacquer.

Case—Of hardwood with polished finish. With brass lock and key.

	Outfit	Objectives		Eyepieces	Nosepieces	Abbe Condenser	Price
		Dry	Oil Immersion				
31728.	CAS1	16 mm 4 mm		7.5×		1.20 N. A.	72.00
31732.	CAS2	16 mm 4 mm		7.5×	Circular Double	1.20 N. A.	76.00
31736.	CAS3	16 mm 4 mm		5× 10×		1.20 N. A.	73.50
31740.	CAS4	16 mm 4 mm		5× 10×	Circular Double	1.20 N. A.	77.50
31744.	CAS8	16 mm 4 mm	1.9 mm	5× 10×	Circular Triple	1.20 N. A.	106.00
31748.	CCS1	16 mm 4 mm		10×		1.20 N. A.	82.00
31752.	CCS2	16 mm 4 mm		10×	Circular Double	1.20 N. A.	86.00
31756.	CCS3	16 mm 4 mm		5× 10×		1.20 N. A.	83.50
31760.	CCS4	16 mm 4 mm		5× 10×	Circular Double	1.20 N. A.	87.50
31764.	CCS8	16 mm 4 mm	1.9 mm	5× 10×	Circular Triple	1.20 N. A.	116.00



No. 31784—DDS8 With Revolving Mechanical Stage and Complete Substage

MICROSCOPE, BAUSCH & LOMB CURVED ARM TYPE DDS WITH LEVER SIDE WHEEL FINE ADJUSTMENT. This microscope is in size and finish identical with DDIH but is here combined with the curved handle arm and lever side wheel fine adjustment previously introduced in FS and FFS. This microscope, like the DDIH, is provided with large body tube for photo-micrography and large revolving mechanical stage and is particularly designed for advanced work in research.

Base—Horse-shoe form; even large.

Pillar—Double rectangular in section; provided with inclination joint and clamping lever to secure instrument in any position, and with stops in the vertical and horizontal positions.

Arm—Long, curved form, providing maximum space for manipulation of object.

Body Tube—Of brass, 30 mm outside diameter; provided with society screw thread; standard size eyepieces are used, draw tube graduated in single millimeters with every tenth line numbered, adjustable in cloth-lined sleeve, or in metal fitting, if so specified, and provided with a society screw thread; lower collar may be removed for attaching the Micro-Tessar, 72 mm objective.

Focusing Adjustment—Coarse adjustment by rack and pinion; fine adjustment of lever type, with micrometer head on each side of arm, one with drum graduated to read 25 microns at vertical movement of body—index lines are provided on side of arm to show upper and lower limits of fine adjustment range.

Stage—Large mechanical, with resting heads, revolvable with clamping device to prevent rotation when desired, diameter 125 mm with a distance of 87 mm from its center to the base of arm, provided with two rack and pinion movements, covering a range of 75 mm and 50 mm respectively to make possible the examination of 3 in. x 2 in. slide from corner to corner, upper part of stage may be removed, leaving a large flat surface with one rack movement; entire mechanical stage removable for substitution of a plain revolvable stage.

Substage—Complete with selenopent condenser and so arranged that all substage accessories, inserted into the upper sleeve, may be easily employed; adjustable by standard rack and pinion, upper iris diaphragm of dome shape, self-locking, combined with Abbe condenser, the whole easily removable from substage; Abbe condenser removable from optical axis by a double swing movement to non-sale, releasing upper iris diaphragm for use; lower iris diaphragm adjustable laterally by rack and pinion for oblique illumination, revolvable about its own axis and mounted on a swinging arm, allowing it to be swung entirely out of the optical axis.

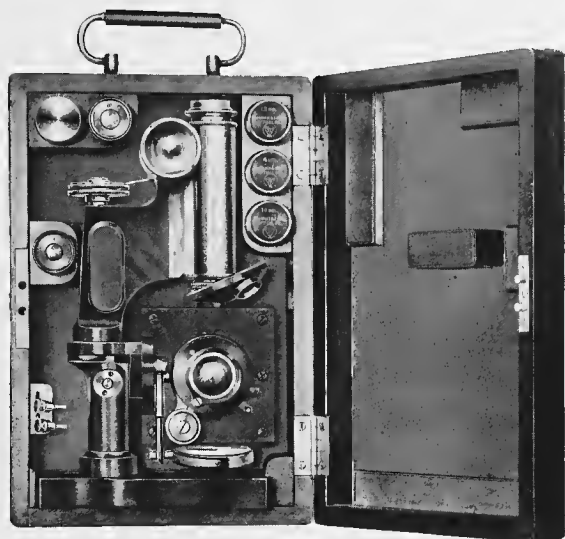
Mirror—Plane and concave, 50 mm in diameter, adjustable in two planes in a fork, attached in fixed position to substage support.

Finish—Main parts, including body tube, in alodized proof chrome; adjustment heads in yellow.

Case—Of hard wood with polished finish; fitted with brass lock and key.

Objectives

	Outfit	Dry	Oil Immersion	Eyepieces	Nosepieces	Abbe Condenser	Price
31768.	DDS1	16 mm 4 mm		7.5X		1 20 N. A.	120.00
31772.	DDS2	16 mm 4 mm		7.5X	Circular Double	1 20 N. A.	124.00
31776.	DDS3	16 mm 4 mm		5X 10X		1 20 N. A.	121.50
31780.	DDS4	16 mm 4 mm		5X 10X	Circular Double	1 20 N. A.	125.50
31784.	DDS8	16 mm 4 mm	1 9 mm	5X 10X	Circular Triple	1 20 N. A.	154.00



No. 31804—BHPs in Case



No. 31808

MICROSCOPE, BAUSCH AND LOMB PORTABLE TYPE BHP. This microscope is of the same general construction as the BBH but with folding stage and base to permit of convenient insertion in a small carrying case. It has been widely used for field work notably by the Rockefeller Sanitary Commission for the Eradication of the Hookworm to which we have supplied many instruments.

Base—V shaped, with hinge to permit parts to be folded together, stable with microscope at full inclination.

Focusing Adjustment—Course adjustment by standard rack and pinion; fine adjustment of Bausch & Lomb lever type with double knurled micrometer screw head for slow and rapid movement, the larger part graduated into 100 divisions, each equal to .005 mm in vertical movement, and provided with a hinged indicator, which may be turned back from the head; fine adjustment ceases to operate when objective touches the slide.

Stage—Of blackened metal, with vulcanized rubber top, measures 28 x 88 mm with a distance of 58 mm from its center to base of arm; provided with spring clips, mounted on a joint with clamp, permitting it to be turned in a vertical position for placing it in case and yet to be rigid when in a horizontal position for use.

Substage—Adjustable for focus by a quick acting screw, consists of a mounting for the Abbe condenser and an iris diaphragm, which comes into the plane of the stage when the screw is turned up as far as possible, allowing the condenser to be used in immersion contact with the objective, if desired; substage is hinged to the left of optical axis when screw reaches the limit of motion downward.

Finish—Main parts including body tube in alcohol proof black, adjustment screws in yellow.

Case—Of hard wood with polished finish; hinged with brass lock and key; outside dimensions, 254 x 192 x 83 mm (10 1/8 x 7 1/2 x 3 1/4 in.).

Weight—In carrying case, 19 lbs., 15 ozs.

	Outlet	Objectives			Eyepieces	Nosepieces	Abbe Condenser	Price
		Dry	Oil Immersion					
31800.	BHP4	16 mm 4 mm			5 x 10 x	Circular Double		56.50
31804.	BHPS	16 mm 4 mm	1.9 mm		5 x 10 x	Circular Triple	1.20 N. A.	92.50

MICROSCOPE, BAUSCH AND LOMB DEMONSTRATION TYPE O. This instrument enables an instructor to supplement his lecture work by showing a single object to an entire class. He has only to adjust the slide, focus the instrument and pass it around the class, the students pointing it to the light to make the observations. We have supplied this instrument also to a number of industrial establishments, such as manufacturers of safety razor blades for the convenient examination by workman of delicate parts during manufacture.

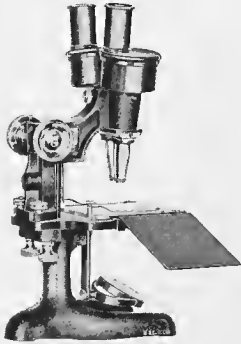
Arm—Handle type, of ample size.

Stage—Of blackened metal, 100 x 83 mm, giving a distance of 42 mm from its center to arm, provided with spring clips and with small posts underneath to hold the instrument in a vertical position when not in use.

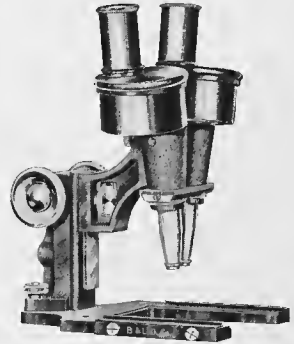
Focusing Adjustment—Body tube slides in a cloth-lined spring tube; when properly focused, it may be secured by a small set screw above the handle.

Body Tube—Fixed length, 160 mm; provided with society screw for regular microscope objectives; standard sized eyepieces are used.

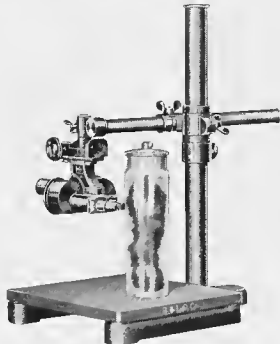
	Outlet	Objectives Dry	Eyepieces	Price
31812.	O ₁	16 mm	7 5 x	11.00



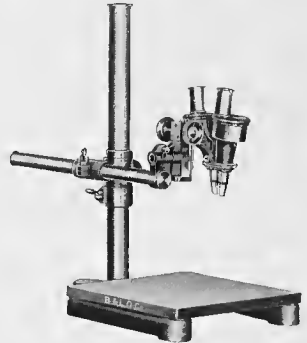
No. 31816—With paired objective in position



No. 31816—With base and stage, glass removed



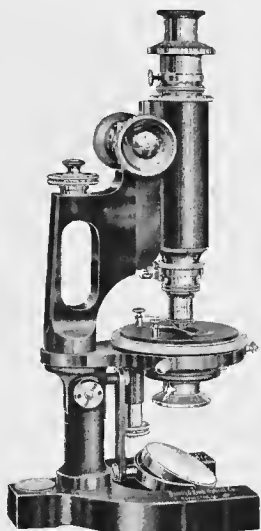
No. 31824—With body tube arranged horizontally



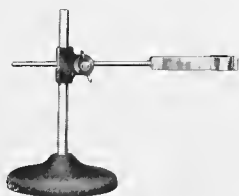
No. 31824—With body tube arranged vertically

MICROSCOPE, BAUSCH & LOMB BINOCULAR, with image erecting prisms, paired oculars and objectives. The body tube with prisms is similar to that used in the Zeiss Binocular and the eye-pieces are adjustable for inter-pupillary distance. The base is readily removable as is the glass part of the stage in which arrangement the instrument may be used for a variety of purposes. The distinct improvement in this model is in the construction of the arm which permits the detaching of the curved portion from the sliding piece which carries the rack and also from the body tube proper. These features permit the quick increasing or decreasing of the working distance and also the almost universal application of the binocular body when used in connection with the large preparation stand and support. The stand for large preparations consists of a heavy base of horse-shoe form with a removable wooden stage.

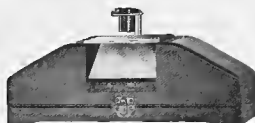
31816.	Microscope, Binocular, as above, stand only with hand rests but without oculars or objectives, in case.	45.00			
31820.	Support for Large Preparations, without binocular body tube.	18.00			
31824.	“ “ “ “ with binocular body tube, without objectives or oculars but with case for binocular body tube.	53.00			
31828.	Paired Objectives, for Bausch & Lomb Binocular Microscope.				
	Equivalent focus, mm.	55	48	40	32
	Each	11.00	11.00	12.00	12.00
31832.	Paired Oculars, for Bausch & Lomb Binocular Microscope.				
	Power.	5X	6 4 X	7.5 X	10 X
	Equivalent focus, mm.	50	40	33	25
	Each	3.00	3.00	3.00	3.00
					12.5 X
					20
					3.00
					3.00



No. 31844



No. 31852



No. 31845



No. 31845—Showing base opened

MICROSCOPE, BAUSCH AND LOMB CHEMICAL TYPE M. Constructed after the specifications of Dr. E. M. Chanot of Cornell University, and is designed for work in all branches of Micro-Chemistry and in commercial laboratories, being admirably adapted for the examination of foods and drugs as well as chemicals. High power objectives may be used with it, but a small cover glass should be cemented with pure glycerine to the front of even low powers to prevent damaging from contact with reagents. Bausch & Lomb quick changing nosepiece is regularly listed with this instrument, as it is desirable under ordinary conditions to have but one objective on the stand at once. The instrument is of the Handle Arm Type with lever fine adjustment similar in appearance to the BBH except for the revolving stage.

Stage—Circular revolving with knurled edge, graduated on circumference in single degrees, with every tenth line numbered, and read by a conveniently placed pointer; measures 88 mm outside and 78 mm inside graduations, with a distance of 88 mm from center to base of arm; has vulcanite top and is provided with spring clips and centering screws.

Analyzer—Consists of a Thomson prism mounted in a revolving collar graduated in two-degree divisions with every tenth line numbered; collar revolves smoothly in cylindrical mounting fitting over draw tube and is slotted to engage stud for zero point; can be easily removed for insertion of microscope eyepiece.

Polarizer—Consists of a high grade Nicol prism mounted with a revolving ring graduated in two-degree divisions, with every tenth line numbered, and having an indicating pointer; entire mounting securely supported in substance and fixed for zero point by stud which engages corresponding slot.

Finish—Entire instrument neatly finished in durable black.

Case—Of hard wood with polished finish; fitted with brass lock and key.

	Outfit	Objectives	Dry	Cross Hair	Eyeieces	Quick Changing Nosepieces	Price
31836.	M 1	16 mm	8 mm	10 ×	15 ×		84.00
31840.	M 2	16 mm	8 mm	10 ×	15 ×	With Two Rings	90.65
31844.	M 1	32 mm	16 mm	8 mm	$\left. \begin{matrix} 5 \times \\ 7.5 \times \\ 10 \times \end{matrix} \right\}$	With Three Rings	100.00

31848. **Microscope, Dissecting, Barnes**, consisting of a block of wood neatly finished and made in a shape forming hand rests; with lined base providing a case for accessories. Stage is of glass 80 x 70 mm, removable, and with black and white plate supplied for use as opaque background; distance from center of post to center of lens 50 mm. While Doublet lenses are supplied with the regular outfits listed below any of the regular magnifiers such as Coddington, Triple Aplanat and Hastings will fit the lens holder.

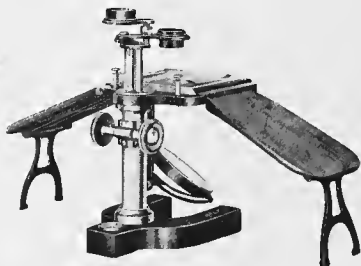
Number of Doublets	1	2
Each	2.50	3.25

31852. **Lens Holder, Type TU**, consisting of a one piece lens arm with spring clamp taking any magnifier not more than 38 mm in diameter, all mounted on heavy metal base; distance from center of post to center of lens 205 mm, adjustable in all directions

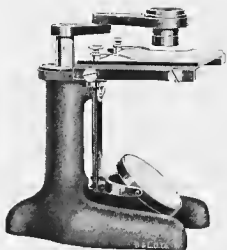
31856. **Lens Holder, Type TUS**, consisting of jointed lens arm on triangular post, with rack and pinion, distance from center of pillar to center of lens 340 mm. Spring clamp will take any lens not over 38 mm in diameter, range of rack work 48 mm. See illustration on following page.



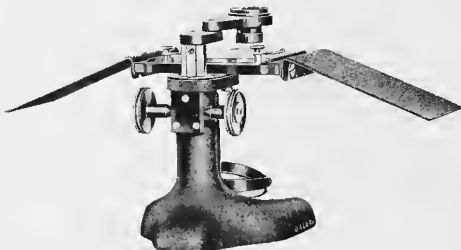
No. 31856 Type U



No. 31916 Type Y2



No. 31860 Type U1



No. 31888 Type W1

MICROSCOPES, BAUSCH AND LOMB DISSECTING, TYPES U, W AND Y. These three types of dissecting

Microscopes are supplied in varying outfits as given in the price list below or in special outfits as may be required. The specifications of the stands are as follows with a list of regular equipment and prices:—

Lens Arm—Jointed so that the entire field of stage may be covered; maximum distance from center of pillar to center of lens, 50 mm.

Type U. **Focusing Adjustment**—By means of sliding post in pillar, with knob; range, 47 mm.
Stage—Glass, 80 x 60 mm, removable; second set of grooves beneath stage for black and white metal plate, supplied for use as opaque background; spring clips attached to stage support; hand rests may be attached to edges of support.

Type W. **Focusing Adjustment**—By standard rack and pinion, with a knurled head on either side, giving a range of 60 mm.
Hand Rests—Of metal, neatly covered with leatherette, 95 mm in length and detachable.

Lens Arm—Jointed so that entire field of stage can be covered; maximum distance from center of pillar to center of lens, 80 mm; arm may be removed for substitution of erecting body; extra removable support provided for attachment of Abbe Camera Lucida, which may be raised or lowered to get full field of view.

Type Y. **Focusing Adjustment**—By standard rack and pinion, with knurled head on either side; range, 60 mm.
Stage—Plate glass, 90 x 80 mm, removable; second set of grooves beneath stage for black and white metal plate, supplied for use as opaque background; extra long spring clips attached to stage support, holes for hand rests in edges of stage support.

Hand Rests—Mahogany, 109 mm long, attached to edges of support and steadied by metal frames; detachable but included in outfits.

	Outfit	Lenses				Price
		Facal Lengths	Formulae	Camera Lucida		
31860.	U 1	25 mm			Doublet	6.75
31864.	U 2	38 mm	19 mm		Doublet	7.50
31868.	U 3	25 mm			Coddington	7.25
31872.	U 4	38 mm	19 mm		Coddington	8.50
31876.	U 5	25 mm			Triple Aplanat	9.50
31880.	U 6	25 mm	13 mm		Triple Aplanat	13.00
31884.	H R	Metal Hand Rests for Type U per pair—				.75
31888.	W 1	25 mm			Doublet	9.00
31892.	W 2	38 mm	19 mm		Doublet	9.75
31896.	W 3	25 mm			Coddington	9.50
31900.	W 4	38 mm	19 mm		Coddington	10.75
31904.	W 5	25 mm			Triple Aplanat	11.75
31908.	W 6	25 mm	13 mm		Triple Aplanat	15.25
31912.	Y 1	25 mm			Doublet	17.00
31916.	Y 2	38 mm	19 mm		Doublet	17.75
31920.	Y 3	25 mm			Coddington	17.50
31924.	Y 4	38 mm	19 mm		Coddington	19.00
31928.	Y 5	25 mm			Triple Aplanat	19.75
31932.	Y 6	34 mm	17 mm		Triple Aplanat	23.25
31936.	Y 7	38 mm	19 mm		Hastings Triplet	31.25
31940.	Y 8	38 mm	19 mm		Hastings Triplet	41.25
					Abbe No. 32044	



No. 31986



No. 32016



No. 32028

MICROSCOPE ACCESSORIES, BAUSCH AND LOMB.

Objectives—The 4 mm ($\frac{1}{4}$ in.) objective is supplied in two types of different N. A. The 0.65 N. A. is distinguished by an extraordinarily long working distance, which enables the objective to focus easily through the thickest cover-glass of the Thoma-Zeiss Haemacytometer.

The 4 mm objective of 0.85 N. A., with less working distance and less depth of focus than the 0.65 N. A. type has the advantage of greater resolving power.

B and L Catalog Number	Equivalent Focus	Equivalent Focus		Numerical Aperture	Working Distance	Micrometer Values with 6.4 X Ocular	Price
		Millimeters	Inches				
		31944. 1005	48					2	0.08	53	0.087 = 87 $\mu$	4.00
31948. 1009	32	1 $\frac{1}{4}$	0.10	38	0.044 = 44 μ	4.00	
31952. 1021	16		0.25	7.0	0.018 = 18 μ	5.00	
31956. 1027	8		0.50	1.6	0.0085 = 8.5 μ	8.00	
31960. 1029	4L		0.65	0.6	0.0040 = 4.0 μ	8.00	
31964. 1031	4S		0.85	0.3	0.0040 = 4.0 μ	8.00	
31968. 1035	3		0.85	0.2	0.0029 = 2.9 μ	8.00	
31972. 1041	1.9		1.30	0.15	0.0018 = 1.8 μ	27.00	

Oculars—The Huyghenian Oculars are of 23 mm outside diameter and are interchangeable with all modern European oculars such as Zeiss, Leitz, etc. If oculars are ordered for the old American size, i. e., 25 mm outside diameter, this fact must be stated in ordering.

B and L Catalog Number	Magnifying Power	Approximate Equivalent Focus		Price
		Millimeters	Inches	
31976. 1100	5 X	50	2	1.50
31980. 1101	6.4 X	40	1 $\frac{1}{2}$	1.50
31984. 1102	7.5 X	33	1 $\frac{1}{4}$	1.50
31988. 1104	10 X	25	1	1.50
31992. 1106	12.5 X	20	1	1.50

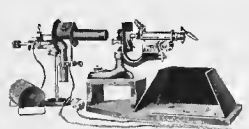
Substage Condensers—The usual Abbe Condensers are neither chromatically nor spherically corrected, but for all ordinary work serve their purpose very well. Their function is to send light through the object under an angle sufficiently large to fill the aperture of the objective with light. They are furnished in two numerical apertures: 1.20 N. A., containing two lenses, and 1.40 N. A., containing three lenses. The Aplanatic Condenser 1.40 N. A., consists of three lenses—an over hemispherical, a meniscus and a double convex, which has a spheroidal surface for correcting the spherical aberration. The spherical correction obtained in this way is of the highest degree and perfect for all zones of the condenser, a result that has not been reached by any other construction. The lenses are separable, and the condenser, with the upper lens removed, gives a numerical aperture of 0.60; with both lenses removed, one of 0.40. The quality of correction in each case is of the same high order as that of the complete combination.

The Achromatic Condensers are corrected for two colors and spherically corrected for two zones. They are recommended for work where it is essential that a sharp image of the light source, free from color fringes, be projected into the plane of the object. The iris diaphragm is located between the lenses.

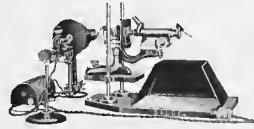
B and L Catalog Number	Designation	Numerical Aperture	Equivalent Focus		Slide Thickness	Price
			Millimeters	Inches		
31996. 1740	Abbe Condenser	1.20	12.0	1	1.80	7.50
32000. 1742	Abbe Condenser	1.40	8.7	1	0.90	9.00
32004. 1743	Aplanatic Condenser	1.40	12.0	1	2.00	22.50
32008. 4535	Achromatic Condenser	1.00	12.0	1	1.90	22.00
32012. 4537	Achromatic Condenser	1.40	13.0	1	0.90	30.00

Dark-Field Condensers—This Condenser is interchangeable with the Abbe Condenser, and can be applied to any Bausch & Lomb Microscopes fitted with either the screw or the complete substage. It consists of a reflector so constructed that the rays are made to strike the object at oblique angles, corresponding to numerical apertures between 1.00 and 1.40, allowing only those rays to reach the eye which are diffracted by the object. The result is that a dark field is produced in which objects appear brilliantly illuminated. Objectives having numerical apertures between 1.00 and 1.40, such as the oil immersion 1.30 N.A., must be provided with a funnel stop, when used with this condenser, in order to reduce the numerical aperture to less than 1.00. For successful operation a powerful light source is required. See discussion under Micro Lamps. Printed directions are enclosed with each illuminator. In centering mount with iris diaphragm. 11.00

32020. Funnel Stop for oil immersion objective, when used for dark field.	40
32024. Nosepiece, Double, new dust proof form accurately centered and par-focal for 16 mm and 4 mm objectives.	4.00
32028. Nosepiece, Triple, accurately centered and par-focal for 16 mm, 4 mm and 1.9 mm objectives.	5.50



No. 32092



No. 32104



No. 32112-16



No. 32124



No. 32128



No. 32128



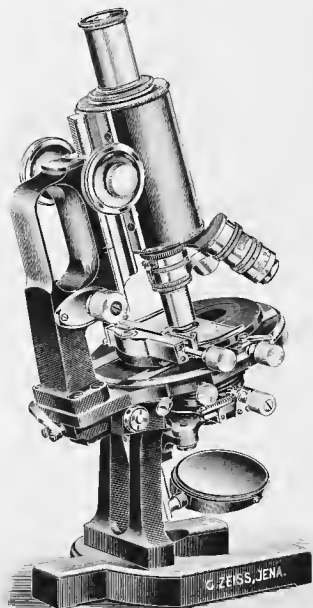
No. 32108



No. 32136

32092. **Micro Drawing Apparatus**, a new and convenient arrangement for the use of an ordinary Microscope in drawing; suitable for use with powers from 50 to 430 diameters. The standard image distance of 10 inches being fixed, the pencil is operated with the eye at its normal reading distance, an important feature where much work is to be done. Outfit includes drawing board, mirror, hand feed are lamp and rheostat for 110 volts, 4 amperes, with plug and cord but without microscope. 25.00
32096. **Drawing Board**, only, with support for the microscope, clamp and light shield 3.50
32100. **Mirror**, only, with clamp for draw tube 2.50
32104. **Micro Drawing Apparatus**, similar to above in operation but with adjustable support for the microscope, permitting alterations of the projection distance between mirror and paper. With drawing board, mirror, hand feed are lamp and rheostat for 110 volts, 4 amperes, but without microscope. 27.50
32108. **Adjustable Drawing Board**, only, with support for the microscope, clamp and light shield. 6.00
32112. **Polarizer**, for use interchangeably with an Abbe condenser in the substage; with one selenite. 12.00
32116. **Polarizer**, same as No. 32112, but with three interchangeable selenites mounted in metal rings. 15.00
32120. **Analyzer**, for use with either of the above Polarizers for attaching to the microscope immediately above the objective 10.00
32124. **Analyzer**, for attaching to draw tube above the ocular; with graduated disc to measure angle. 15.00
32128. **Turn-Table**, for ringing mounts and making cells. 4.00
32132. **Bulls-Eye Condenser**, for the illumination of opaque objects and to secure parallel beam from artificial sources of light. On adjustable stand.
- | | | | |
|----------------|------|------|------|
| | 38 | 56 | 75 |
| Each | 3.00 | 5.00 | 7.00 |
32136. **Vertical Illuminator**, for illuminating opaque objects, particularly metal surfaces; for attaching immediately above the objective. 6.50
32138. **Vertical Attachment**, new form, with bulls-eye condensing lens and iris diaphragm attachment. 15.00

We have found it difficult to comprehensively and clearly present the two makes of Microscopes and Accessories (Bausch & Lomb and Zeiss) in the space at our disposal in this catalogue. We believe those familiar with Microscope equipments will find no difficulty in securing the information necessary to the selection of outfits from the material listed on these pages but we emphasize our desire to send upon application the original catalogues of both Carl Zeiss and Bausch & Lomb Optical Co. with such additional and more specific information as we have gathered in an experience of over twenty years in the sale of Microscopes.



No. 3214—Stand IB with Triple Nosepiece, Objectives, and Ocular

MICROSCOPE, ZEISS STAND I. This is the standard Microscope throughout the civilized world for the most refined investigations by ocular observation, photo-micrography and micro projection; the large body tube permits the use of projection objectives and micro planars with full use of the emergent beam. These Stands are all of the handle arm type as shown in illustration. The finish and mechanical adjustments of these Microscopes represent the highest development of instrument making as applied to optical instruments.

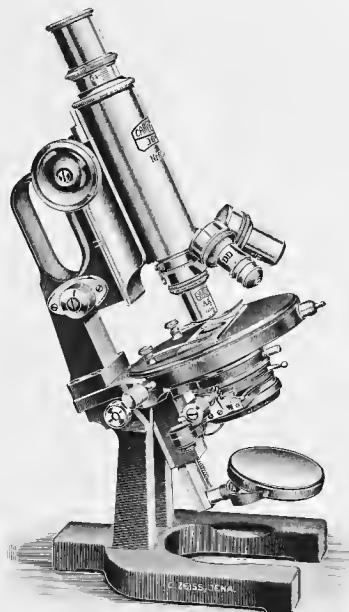
Fine Adjustment—By Berger slow motion with side wheel, first introduced by Zeiss in 1898.

Stages—The plain revolving vulcanite stage regularly furnished on Stand IA is interchangeable with the large revolving mechanical stage as shown in illustration and which is regular equipment for Stand IB. Either may be ordered as an extra accessory for interchangeable use. The special photo-micrographic stage furnished as regular equipment for Stand IC is not interchangeable with the others and must be furnished with the stand when ordered. It is of similar appearance to the large revolving mechanical stage but is particularly recommended for photo-micrographic work because of its extremely slow motion. This stage has a rectilinear range of only 10 mm in each direction actuated by two coaxial milled heads and on this account is not specially recommended for ocular observation, the large mechanical stage with a range of motion of 50 mm in one direction and 25 mm in the other with a third scale and vernier showing the position of the movable stop for the object slide and centering device, being preferable for this work.

Illuminating Apparatus. These Stands are all furnished with complete Abbe Illuminating Apparatus with Abbe condenser system of 1.40 N. A. as regular equipment for the Stands IA and IB. For photo-micrographic work particularly with objectives of wide aperture, the aplanatic condensing system of 1.40 N. A. is distinctly superior to the regular Abbe system and is therefore, furnished as regular equipment with Stand IC. Where photo-micrography is to be accomplished with objectives of less than 1.00 N. A. the centering achromatic condenser of 1.00 N. A. is recommended and in a complete photo-micrographic outfit both of these condensers should be ordered for the most refined work.

The Stands are all furnished in fine polished mahogany cases and prices do not include oculars, nosepieces or objectives. For prices on Complete outfits see page 323.

32140.	Stand IA, with plain revolving and centering vulcanite stage and Abbe condenser of 1.40 N. A.	
	Duty Free.....	81.25
		Stock.....
32144.	Stand IB, with large revolving mechanical stage and Abbe condenser of 1.40 N. A.	100.75
	Duty Free.....	100.00
		Stock.....
32148.	Stand IC, with special photo-micrographic stage, aplanatic condenser of 1.40 N. A. and set of accessory fittings for photo-micrography, consisting of a light-proof connecting funnel, light-proof connecting sleeve, adapters for the attachment of Microplanars, centering diaphragm, moderating glass and revolution counter.	124.00
	Duty Free.....	112.50
		Stock.....
		139.50



No. 32156—Stand III CA with Triple Nosepiece, Ocular and Objective

MICROSCOPE, ZEISS STAND III. This is the most widely used of the new series of Zeiss Microscopes with handle arm and Berger fine adjustment. It is identical with Stand I with the exception of large body tube and the finish of the base which in Stand III is of crystallized lacquer instead of smooth black. For all ocular observations, therefore, this stand meets the requirements of the most refined investigations but is not recommended for a wide range of use in photo-micrography and micro-projection because of the narrow or standard tube. Special attention is called to the four types of stages furnished as regular equipment with this outfit. With the exceptions above noted this stand is identical in finish and mechanical adjustments to Stand I.

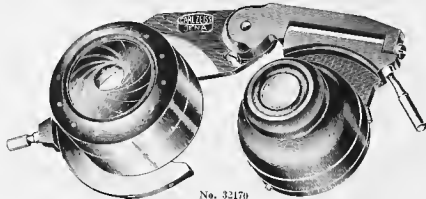
Fine Adjustment—By Berger slow motion with side wheel, first introduced by Zeiss in 1908.

Stages—The fixed round stage furnished as regular equipment with Stand IIC is 11 cm in diameter. The simplified mechanical stage furnished as regular equipment with Stand III CA is a non-revolving stage fitted with a movable plate giving a backward and forward movement by operating two screws jointly and a transverse motion by operating the same screws in opposite directions, with a range of displacement of 10 mm. This has been found a great convenience and for many purposes as satisfactory as the large mechanical stage. This simplified mechanical stage is also arranged as a revolving stage furnished as regular equipment for Stand IIICB. The plain revolving and centering vulcanite stage furnished as regular equipment with Stand IIID is the same as supplied with Stand IA and the large revolving mechanical stage supplied as regular equipment to Stand IIIE is the same as supplied with Stand IB. All of these stages are interchangeable and can be supplied as accessory equipment after the purchase of the regular microscope.

Illuminating Apparatus—These Stands are all furnished with the complete Abbe Illuminating Apparatus with Abbe condenser system of 1.40 N.A. as regular equipment. For very refined work we particularly recommend the addition of aplanatic condensing system of 1.40 N.A. or the achromatic centering condenser of 1.00 N.A.

The Stands are all furnished in fine polished mahogany cases and prices do not include oculars, nosepieces or objectives. For price on Complete outfits see page 323.

32152.	Stand IIIC with fixed round stage and Abbe Condenser of 1.40 N. A.		
	Duty Free.....	63.75	Stock..... 79.05
32156.	Stand III CA with simplified non-revolving mechanical stage and Abbe Condenser of 1.40 N. A.		
	Duty Free.....	66.25	Stock..... 82.15
32160.	Stand IIID with plain revolving and centering vulcanite stage and Abbe Condenser of 1.40 N. A.		
	Duty Free.....	72.50	Stock..... 89.90
32164.	Stand IIIE with large revolving mechanical Stage and Abbe Condenser of 1.40 N. A.		
	Duty Free.....	91.25	Stock..... 113.15



No. 32170

32170. **Swingout Condenser Mounting**, for Abbe Condenser of 1.40 N. A. If ordered with Stands IA, IB, IIC, IIIC, IID, or IIID, extra
 Duty Free 6.25 Duty Paid 7.75
 Note.—The Aplanatic Condenser of 1.40 N. A. as furnished on Stand IC is not adaptable to the swingout mounting.

REVOLVING STAGES, ZEISS. The Plain Revolving Vulcanite Stage as well as the Large Revolving Mechanical Stage may be ordered separately at any time for use with both Stands I and III or may be ordered as additional accessories at the prices given below.

32172. **Plain Revolving Vulcanite Centering Stage, only**
 Duty Free 6.25 Stock 7.75
 32176. **Large Mechanical Revolving Stage, with center housing.**
 Duty Free 25.00 Stock 31.00
 32180. **Center Housing, for use with plain revolving vulcanite stage or large mechanical stage.**
 Duty Free 4.25 Duty Paid 5.27

SUBSTAGE CONDENSERS, ZEISS. The following Condensers all fit interchangeably into the upper sleeve of the complete Abbe Illuminating Apparatus. In the series of Stands I and III previously listed we have included Condensers in the price but here list them separately with additional systems for special work for ready reference in making up the prices of special outfits.

32184. **Abbe Condenser, three lens system, 1.40 N. A., equivalent focus 8 mm.**
 Duty Free 6.25 Stock 7.75
 32188. **Aplanatic Condenser, 1.40 N. A., equivalent focus 10 mm, particularly recommended for photomicrography with high power objectives of wide aperture.**
 Duty Free 15.00 Stock 18.60

Note.—The front lens of both the preceding Condensers may be removed and the remaining lenses used as a long focus Condenser of small aperture for low power work. When the complete set is used with objectives of large aperture the Condenser should be used in immersion contact with the slide.

32192. **Centering Achromatic Condenser of 1.0 N. A., equivalent focus 14 mm.** This condensing system has an iris diaphragm mounted between the lenses and the iris diaphragm of the Abbe Illuminating Apparatus should, therefore, remain opened when this condenser is used. This Condenser is recommended for the most refined investigations in both ocular and microphotographic observations with objectives up to 1.0 N. A. and for best results should be used in immersion contact with the slide.
 Duty Free 18.75 Stock 23.25
 32196. **Condenser, Quartz, of 1.30 N. A. with interchangeable upper part reducing the aperture to 0.8.** For use in work with the Ultra-Violet as in the Luminescence Microscope.
 Duty Free 17.50 Stock 21.70
 32200. **Condenser, Paraboloid, for dark field illumination.**
 Duty Free 10.00 Stock 12.40
 32204. **Paraboloid Stops, for Zeiss Achromatic Objectives DD, E, F, J and $\frac{1}{2}$ inch and Apochromatic Objectives of 4 mm focus and less.**
 Duty Free25 Stock31

Note.—For best results in dark field illumination with the Zeiss Paraboloid Condenser, Arc Lamp No. 32848, page 331 or Nernst Lamp are recommended. The Condenser should be used in immersion contact with the slide, care being taken to avoid air bubbles. With all dry objectives of moderate power dark field illumination is obtained by total reflection at the cover glass. With dry objectives of high power and all oil immersion objectives a stop must be introduced into the objective mount in order to reduce the aperture of the objective to about 0.8. This stop is indispensable with immersion objectives of over 1.0 N. A. since dark ground illumination is produced in them not by total reflection at the surface of the cover glass but exclusively from the illumination of apertures above 1.0 N. A. The very considerable reduction of aperture of immersion objectives which is thus necessary to secure proper dark field illumination reduces their resolving power to such an extent as to make it advisable to use the higher power dry objectives wherever possible. The Paraboloid stops for the objectives are furnished without charge when both condenser and objective are ordered at the same time.

OCULARS, ZEISS. Huyghenian or Orthoscopic Oculars should never be used with Apochromatic Objectives as they are computed only for use in connection with the achromatic systems. The Compensating Oculars, on the other hand, may be satisfactorily used with Achromatic Objectives of considerable aperture, i.e., 0.85 N. A. and upwards or, in other words, with Achromatic Objectives DD, E, F and $\frac{1}{2}$ inch Oil Immersion. The two new Orthoscopic Oculars are recommended for use with Achromatic Objectives where high magnification with large field of view is required. As in the case of Compensating Oculars they permit the use of the eye at a very comfortable distance above the eye lens with the entire field in view.

32208. **Zeiss Huyghenian and Orthoscopic Oculars.**

	Huyghenian				Orthoscopic		
Designation No.,	1	2	3	4	5	6	7
Equivalent focus, mm	50	40	30	25	20	15	9
Magnification	3	4	5.5	7	9	12	20
Duty Free	1.50	1.50	1.50	1.50	1.50	6.25	6.25
Stock	1.86	1.86	1.86	1.86	1.86	7.75	7.75

ZEISS ACHROMATIC AND APOCHROMATIC OBJECTIVES, HUYGHENIAN, ORTHOSCOPIC AND COMPENSATING OCULARS. The tables on bottom of preceding page and those on this page give the principal optical data and prices. Please always specify focal length in addition to catalogue number in ordering. The information on this page with the tables of magnification on the following page will be found of great assistance in selecting the optical equipment for Zeiss Microscopes.

32212. Compensating Oculars, Zeiss.

Designation.....	Secker			Compensating Oculars		
	2	4	6	8	12	18
Equivalent focus, mm.....	70	30	33	21	15	10
Duty Free.....	5.00	5.00	5.00	7.50	7.50	6.25
Stock.....	6.20	6.20	6.20	9.30	9.30	7.75

Achromatic Objectives, Zeiss.

Class	Designation	Equivalent focus, mm.	Numerical Aperture	In combination with Huyghenian Ocular 2 with 160 mm tube length		Duty Free	Stock	
				Free working distance mm.	Diameter of field of view, mm.			
32216.	A ₀	4	—	32	14	3.00	3.72	
32220.	A ₁	45	—	61	10	3.00	3.72	
32224.	A ₂	37	—	43	7.5	3.00	3.72	
32228.	A ₃	28	—	27	5.2	3.00	3.72	
32232.	A*	43-29	—	10-42	9-20	10.00	12.40	
32236.	aa	26	0 17	14	4	6.75	8.37	
32240.	A	15	0 20	9	2	5.00	6.20	
32244.	AA	17	0 36	7.5	2.5	7.50	9.30	
32248.	B	12	0 35	3	1.5	7.50	9.30	
32252.	C	7	0 40	1.8	0.9	7.50	9.30	
32256.	D	4.2	0 65	0 6	0 5	8.75	10.85	
32260.	†DD	4 3	0 85	0 4	0 5	12.50	15.50	
32264.	†DD with correction collar					17.50	21.70	
32268.	†E	2 8	0 90	0 25	0 35	15.00	18.60	
32272.	†E with correction collar					20.00	24.80	
32276.	†F	1 8	0 90	0 17	0 23	18.75	23.25	
32280.	†F with correction collar					23.75	29.45	
32284.	P1	25	0 11	36	4	5.00	6.20	
32288.	D*	4 4	0 75	1 5	0 55	18.75	23.25	
32292.	J	1 8	1 18	0 2	0 23	27.50	34.10	
32296.	J with correction collar					32.50	40.30	
32300.	Homogeneous Immersion	1-12 Inch	1 8	1 25	0 15	0 25	25.00	31.00
32304.	Immersion	1-12 Inch Fl†	1 8	1 30	0 13	0 22	35.00	43.40

† Fluorite system.

Apochromatic Objectives, Zeiss.

Class	Equivalent focus, mm.	Numerical Aperture	Initial Magnification	With Compensating Ocular 4 at 160 mm. tube length		Duty Free	Stock	
				Free working distance mm.	Diameter of field of view, mm.			
32308.	16	0 30	15.5	5	2	20.00	24.80	
32312.	8	0 65	31	1 0	1	25.00	31.00	
32316.	4	0 95	63	0 2	0 45	35.00	3 40	
32320.	3	0 95	83	0 15	0 35	40.00	49.60	
32324.	Water Immersion	2 5	1 25	100	0 18	0 25	62.50	77.50
32328.		3	1 30	83	0 20	0 35	75.00	93.00
32332.	Homogeneous Immersion	3	1 40	83	0 16	0 35	100.00	124.00
32336.		2	1 30	125	0 16	0 25	75.00	93.00
32340.		2	1 40	125	0 12	0 25	100.00	124.00
32344.		1 5	1 30	167	0 09	0 20	87.50	108.50

MAGNIFICATION TABLES FOR BAUSCH & LOMB AND ZEISS OBJECTIVES AND OCULARS

Table of Magnifications with Bausch & Lomb Achromatic Objectives and Huygenian Oculars computed upon the basis of tube length = 160 mm and projection distance = 160 mm.

Equivalent focal length in mm.	Objectives		Eyepieces							
	Initial magnification of Objective	5x	6.4x		7.5x		10x		12.5x	
			Magnification	Size of field	Magnification	Size of field	Magnification	Size of field	Magnification	Size of field
4x	2	10 × 10.5 mm	13 × 9.6 mm	15 × 8.5 mm	20 × 6.5 mm	25 × 5.5 mm	35 × 4.5 mm	45 × 3.8 mm	60 × 3.0 mm	75 × 2.5 mm
32	4	20 × 5.5 mm	26 × 4.8 mm	30 × 4.3 mm	40 × 3.5 mm	50 × 3.0 mm	60 × 2.5 mm	75 × 2.0 mm	100 × 1.5 mm	125 × 1.2 mm
16	10	50 × 2.10 mm	64 × 1.85 mm	75 × 1.70 mm	100 × 1.30 mm	125 × 1.10 mm	150 × 0.90 mm	200 × 0.70 mm	250 × 0.60 mm	300 × 0.50 mm
8	20	100 × 1.02 mm	130 × 0.90 mm	150 × 0.83 mm	200 × 0.65 mm	250 × 0.55 mm	300 × 0.45 mm	400 × 0.35 mm	500 × 0.30 mm	600 × 0.25 mm
4	43	215 × 0.48 mm	275 × 0.43 mm	320 × 0.39 mm	430 × 0.30 mm	550 × 0.25 mm	700 × 0.20 mm	900 × 0.15 mm	1150 × 0.12 mm	1450 × 0.10 mm
3	57	285 × 0.36 mm	365 × 0.32 mm	420 × 0.29 mm	570 × 0.22 mm	720 × 0.17 mm	950 × 0.13 mm	1250 × 0.10 mm	1600 × 0.08 mm	2000 × 0.06 mm
1.9	95	475 × 0.22 mm	610 × 0.19 mm	720 × 0.17 mm	950 × 0.13 mm	1250 × 0.10 mm	1600 × 0.08 mm	2000 × 0.06 mm	2500 × 0.05 mm	3000 × 0.04 mm

Table of Magnifications with Zeiss Achromatic Objectives and Compensating Oculars at 160 mm tube length and calculated for an image distance of 250 mm.

Focus of the Objective, mm	Seeker	Compensating Oculars					
	2	4	6	8	12	18	
15	31	62	94	125	187	281	
8	62	125	187	250	375	562	
4	125	250	375	500	750	1125	
3	167	333	500	667	1000	1500	
2.5	200	400	600	800	1200	1800	
2	250	500	750	1000	1500	2250	
1.5	333	667	1000	1334	2000	3000	

Table of Magnifications with Zeiss Achromatic Objectives and Huygenian and Orthoscopic Oculars at 160 mm tube length and calculated for an image distance of 250 mm.

Objectives	Huygenian Oculars					Orthoscopic Oculars	
	1	2	3	4	5	6	7
A ₀	4.6	7	11	14	18	23	38
A ₁	7	10	16	20	28	35	57
A ₂	11	15	22	28	37	47	73
A ₃	20	26	38	47	55	68	110
A [*]	3-8	5-12	8-18	10-22	15-31	20-40	32-63
aa	24	31	46	57	75	95	150
A	42	54	79	97	130	165	250
AA	39	50	73	90	120	150	240
B	58	74	110	139	180	225	360
C	100	125	180	225	300	370	590
D	175	220	330	385	550	680	1100
DD	170	210	315	365	520	650	1050
E	275	345	505	620	830	1030	1650
F	410	510	735	900	1200	1440	2300
P ₁	26	33	48	60	80	100	160
D [*]	170	210	315	365	520	650	1050
J	410	515	730	920	1250	1570	2540
L-12	410	515	730	920	1250	1570	2540

Table of Magnifications, working distance and diameter of field of view with Paired Oculars and Objectives when used on the Binocular Microscope

Paired Oculars	Zeiss Paired Objectives									
	55		A ₂		A ₂		A ₂		P ₁	
	Magnification	Diameter of field mm	54		Magnification	Diameter of field mm	Magnification	Diameter of field mm	Magnification	Diameter of field mm
			Without diaphragm	With diaphragm						
Free Working distance mm	70				40			30		35
No. 1	8	13	14	7.5	20	5	31	3.3	37	3
No. 2	9	13	15	7.5	23	5	35	3.3	42	3
No. 3	13	10.5	22	6.5	32	4.2	50	2.7	60	2.5
No. 4	16	8.5	27	4.8	40	3.3	61	2.2	73	2
No. 5	23	6.2	39	3.6	67	2.5	88	1.6	105	1.4
No. 6	26	7.1	46	4.1	67	2.7	103	1.8	121	1.9
No. 7	44	4.1	77	2.4	112	1.6	172	1.1	200	1

COMPLETE ZEISS MICROSCOPE OUTFITS

With the preceding information as to Zeiss stands, stages and condensers and the optical data and prices of oculars and objectives, complete Zeiss outfits can be made up to meet all requirements. For the convenience of customers we list below commendable outfits on the basis of Stands I and III with both achromatic and apochromatic equipment.

32348. **Apochromatic Outfit on the basis of Stand IA, i. e., with plain revolving vulcanite stage.**

	Duty	Free Stock
Stand IA, with Abbe condenser of 1.10 N. A. and plain revolving vulcanite stage	81.25	100.75
Triple Revolving Nosepiece	5.00	6.20
Compensating Ocular 6	5.00	6.20
" " 12	7.50	9.30
Apochromatic Objective, 16 mm	20.00	21.80
" " 4 mm	35.00	43.10
" " 2 mm		
1.30 N. A.	75.00	93.00
	228.75	283.65

32352. **Apochromatic Outfit on the basis of Stand IC**

	Duty	Free Stock
Stand IC with aplanatic condenser of 1.10 N. A. and special stage and accessories for micro-photography	112.50	139.50
Tube Slide for interchanging objectives	2.50	2.48
3 Objective slides	6.00	7.44
Compensating Ocular 6	5.00	6.20
" " 12	7.50	9.30
Apochromatic Objective, 16 mm	20.00	21.80
" " 4 mm	35.00	43.10
" " 2 mm		
1.30 N. A.	75.00	93.00
	263.00	326.12

32356. **Achromatic Outfit on the basis of Stand III-CA.**

	Duty	Free Stock
Stand III-CA, with simplified mechanical stage and Abbe condenser of 1.10 N. A.	66.25	82.15
Triple Revolving Nosepiece	5.00	6.20
Huyghenian Ocular 2	1.50	1.86
" " 4	1.50	1.86
Achromatic Objective A	5.00	6.20
" " D	8.75	10.85
" " 1-12" Oil		
Immersion 1.25 N. A.	25.00	31.00
	113.00	140.12

32360. **Apochromatic Outfit on the basis of Stand IB, i. e., with large revolving mechanical stage.**

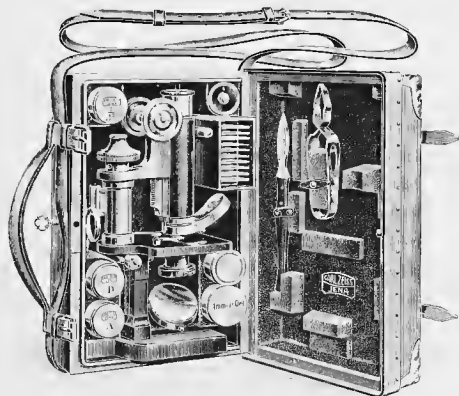
	Duty	Free Stock
Stand IB, with Abbe condenser of 1.10 N. A. and large revolving mechanical stage	100.00	124.00
Triple Revolving Nosepiece	5.00	6.20
Compensating Ocular 6	5.00	6.20
" " 12	7.50	9.30
Apochromatic Objective 16 mm	20.00	21.80
" " 4 mm	35.00	43.10
" " 2 mm		
1.30 N. A.	75.00	93.00
	247.50	306.90

32364. **Apochromatic Outfit on the basis of Stand III-CA**

	Duty	Free Stock
Stand III-CA with simplified mechanical stage and Abbe condenser of 1.10 N. A.	66.25	82.15
Triple Revolving Nosepiece	5.00	6.20
Compensating Ocular 6	5.00	6.20
" " 12	7.50	9.30
Apochromatic Objective, 16 mm	20.00	21.80
" " 4 mm	35.00	43.10
" " 2 mm		
1.30 N. A.	75.00	93.00
	213.75	265.05

32368. **Apochromatic Outfit on the basis of Stand III-E with large revolving mechanical stage.**

	Duty	Free Stock
Stand III-E with large revolving mechanical stage and Abbe condenser of 1.10 N. A.	91.25	113.15
Triple Revolving Nosepiece	5.00	6.20
Compensating Ocular 6	5.00	6.20
" " 12	7.50	9.30
Apochromatic Objective, 16 mm	20.00	21.80
" " 4 mm	35.00	43.10
" " 2 mm		
1.30 N. A.	75.00	93.00
	238.75	296.05



32372. **Portable Outfit, on the basis of Stand IV.**

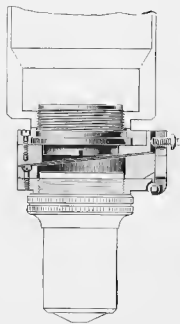
	Duty	Duty Paid
Zeiss Traveling Stand IV, as above	42.50	52.70
Double Nosepiece	3.75	4.65
Huyghenian Ocular 4	1.50	1.86
Achromatic Objective A	5.00	6.20
" " D	8.75	10.85
	61.50	76.26

32376. **Portable Outfit, on the basis of Stand IV, complete for bacteriological work.**

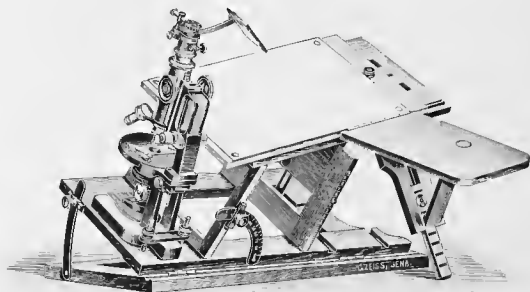
	Duty	Duty Paid
Zeiss Traveling Stand IV, as above	42.50	52.70
Triple Revolving Nosepiece	5.00	6.20
Huyghenian Ocular 2	1.50	1.86
" " 4	1.50	1.86
Achromatic Objective A	5.00	6.20
" " D	8.75	10.85
" " 1-12 inch.		
1.25 N. A.	25.00	31.00
	89.25	110.67

No. 32120

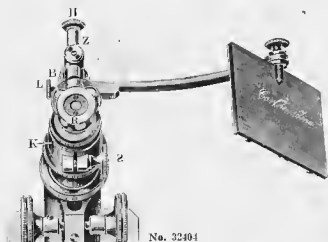
32380. **Microscope, Zeiss Traveling Stand IV, a new and compact Microscope with 80 mm rectangular stage, substage condenser of 1.0 N. A. in a strong, well protected canvas carrying case designed especially for use in the tropics, but without oculars, nosepiece, objectives or accessories shown in illustration.**
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 42.50 | Duty Paid | 52.70 |
|-----------|-------|-----------|-------|
32384. **Accessories, as shown in illustration, consisting of forceps, scalpel, scissors, dissecting needles, etc.**
- | | | | |
|-----------|------|-----------|------|
| Duty Free | 2.25 | Duty Paid | 2.79 |
|-----------|------|-----------|------|



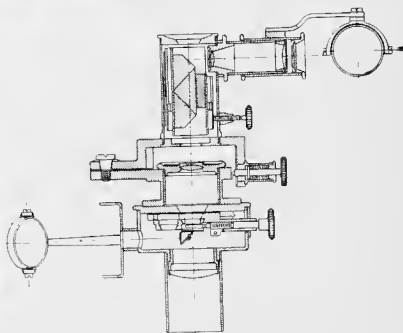
No. 32396 with No. 32400



No. 32416



No. 32404



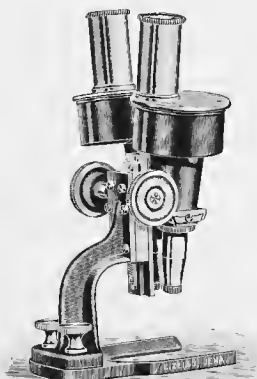
No. 32452

Zeiss Microscope Accessories

	Duty Free	Stock
32388. Triple Revolving Nosepiece.....	5.00	6.20
32392. Double Revolving Nosepiece.....	3.75	4.65
32396. Sliding Objective Changer, Tube Slide recommended for microphotographic work on account of accurate centering.....	2.00	2.48
32400. Sliding Objective Changer, Objective Slide. One for each Objective.....	2.00	2.48
32404. Large Abbe Drawing Camera, in case.....	15.00	18.60
32408. Vertical Illuminator, prism form.....	4.50	5.58
32412. " " with iris diaphragm.....	9.50	11.78
32416. Drawing Table, Bernhardt.....	13.00	16.12
32420. Ocular Micrometer, 10 to 100.....	1.88	2.33
32424. " Contrast Micrometer, 5 mm, consisting of 50 squares in 0.1 and .05 mm	2.50	3.10
32428. " " " 10 mm " " 25 " in .4 and .2 mm	2.50	3.10
32432. " Screw Micrometer with Ramsden ocular for use with achromatic objectives.....	22.50	27.90
32436. Ocular Screw Micrometer with compensating ocular No. 6, for use with apochromatic objectives.....	26.25	32.55
32440. Stage Micrometer, consisting of 3 mm divided into $\frac{1}{10}$ mm and $\frac{1}{100}$ mm divided into $\frac{1}{100}$ mm.....	2.13	2.64
32444. Abbe Apertometer for measuring the numerical aperture of micro objectives.....	17.50	21.70
32448. Microspectral Objective, Engelmann. See <i>Bot. Zeit.</i> 40, 419-436, 1882 and <i>Pflüger's Arch. f. d. ges. Physiol.</i> 27, 485-490, 1882.....	42.50	52.70
32452. Spectral Ocular, Abbe (Microspectroscope).....	50.00	62.00
32456. Maltwood Finder.....	5.00	6.20
32460. Ocular, Abbe Stereoscopic, by the use of which any of the Zeiss Stands may be converted into a binocular microscope for use with any powers. The attachment is adjustable for the inter-pupillary distance of the observer and should be used with achromatic objectives only. Its use with a revolving nosepiece or with apochromatic objectives is not recommended.		
Duty Free.....	45.00	
Duty Paid.....		55.80



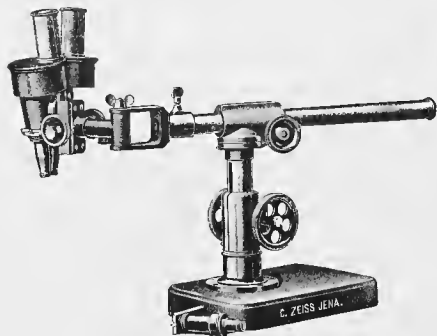
No. 32464



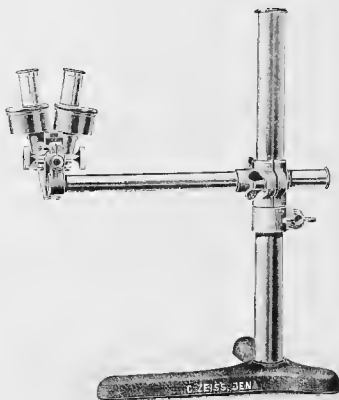
No. 32468

MICROSCOPE, ZEISS BINOCULAR STAND X, with image erecting prisms, paired oculars and objectives. This is the original Binocular Microscope giving true stereoscopic vision and which has not only come into wide use of recent years but has been widely copied by other makers. The regular outfit includes the stage and base and the vulcanite fork for attaching when the Microscope is used with the stage and base as a Dermatoscope, as shown in upper right hand corner of illustration. It is also furnished as Stand XB, with rack and pinion elevating motion with extension arm with joint, which arrangement has found much favor with geologists, mineralogists, botanists and zoologists. A lower priced form of this stand is now offered for the first time as Stand XB, Simplified Model. Where one pair of binocular tubes is to be used on both Stand XA and XB, the tubes should be ordered as a part of the Stand XB outfit after which they can be used on the stage and base of Stand XA by means of the Straight Support No. 32476. This Support is also necessary when the Drüner Stereoscopic Camera is used in connection with Stand XA.

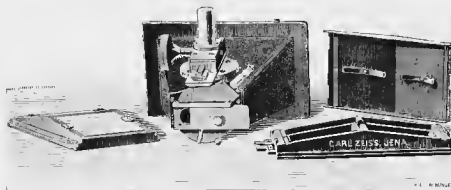
32464.	Zeiss Binocular Stand XA, with base, stage, hand rests for dissecting and vulcanite fork for use with the body tube as Dermatoscope, without objectives or oculars, in mahogany case.....	Duty Free 48.75	Stock 60.45
32468.	Dermatoscope, consisting of the upper part of Stand XA with the vulcanite fork but without stage and base and also without objectives and oculars, in case.....	33.25	41.23
32472.	Vulcanite Fork, only, for Dermatoscope.....	1.50	1.86
32476.	Straight Support, for use when the Drüner Stereoscopic Camera is to be used with Stand XA and also when the binocular body of Stand XB is to be used interchangeably on stage and base of Stand XA.....	2.50	3.10
32480.	Zeiss Binocular Stand XB, on heavy base, with rack and pinion vertical motion and extension jointed arm, without objectives or oculars, in mahogany case.....	65.00	80.60
32484.	Zeiss Binocular Stand XB, simplified model, as shown in illustration, without objectives or oculars, in mahogany case.....	40.00	49.60
32486.	Adapter, necessary for occasional use because it is impossible in either form of Stand XB to lower the tube sufficiently to focus on the plane of the table top or desk on which the base of the stand rests. If this feature is unnecessary this adapter need not be ordered.....	3.75	4.65



No. 32180



No. 32454



No. 32496



No. 32500

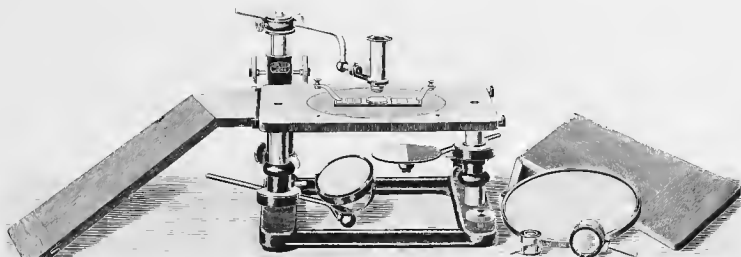
Note—Outfits involving the use of Stands XA and XB may be made up by ordering the paired oculars and objectives listed below. For the convenience of those wishing either a simple or a complete outfit we list two outfits on the basis of Stand XA as follows:—

32488. **Binocular Outfit**, on the basis of **Stand XA** giving a range of magnification from 9 to 40 diameters, with fields from 13 to 3.3 mm in diameter.
32492. **Outfit**, on the basis of **Stand XA** giving a range of magnifications from 9 to 103 diameters, with fields from 13 to 1.8 mm in diameter.

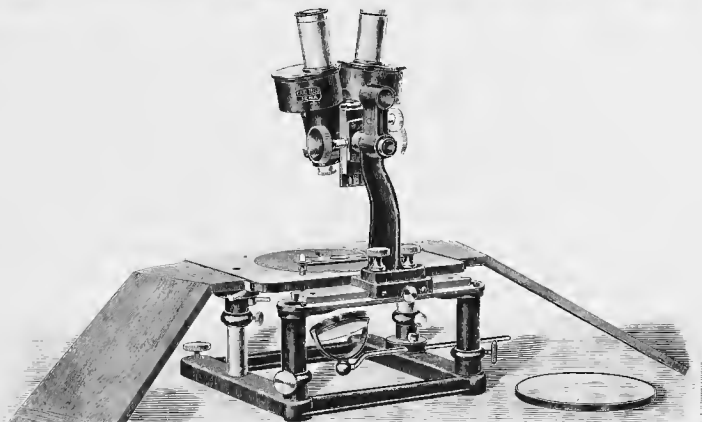
	Duty Free	Stock		Duty Free	Stock
Zeiss Binocular Stand XA	28.75	60.45	Zeiss Binocular Stand XA	18.75	60.45
Paired Oculars 2	3.00	3.72	Paired Oculars 2	3.00	3.72
" " 1	3.00	3.72	" " 4	3.00	3.72
Paired Objectives 55	11.25	13.95	" " 6	12.50	15.50
" " A	11.25	13.95	Paired Objectives 55	11.25	13.95
	17.25	95.79	" " A ₅	11.25	13.95
			" " A ₇	11.25	13.95
			" " A ₂	11.25	13.95
				112.25	139.19

32496. **Stereoscopic Camera, Drüner**, for use with Binocular Microscope, with instantaneous shutter, focusing frame with ground glass and clear glass screens and plate holder for a pair of plates 6 x 6 cm. For use on Stand XB without additional accessory or on Stand XA by the use of Straight Support No. 32476.
32500. **Reflecting Stereoscope** for obtaining orthomorph views of the negatives made with above camera, with a magnification of two diameters. See *s. Ruh*, "Die binokulare Instrumente," Berlin, 1907, published by Julius Springer and H. Brauns, Zeitschr. f. wiss. Mikr., XXV, 1908, pp. 282-287.

	Duty Free	Duty Paid		Duty Free	Duty Paid
Extra Plate Holder for pair of 6 x 6 cm plates	35.00	43.40		4.50	5.58
32504. Paired Objectives, for Zeiss Binocular Microscope. For magnification, etc., see page 322.				12.00	14.88
Designation..... 55					
Duty Free.....	11.25	11.25		11.25	11.25
Stock.....	13.5	13.95		13.95	13.95
32508. Paired Oculars for Zeiss Binocular Microscope. For magnification, etc., see page 322.					
Designation..... 1					
Duty Free.....	3.00	3.00		3.00	3.00
Stock.....	3.72	3.72		3.72	3.72
				6	7
				12.50	12.50
				15.30	15.50



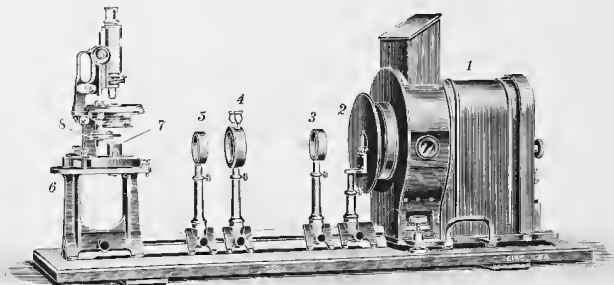
No. 32512—with 32516 and Brucke Combination 31016



No. 32512 with 32536

MICROSCOPE, DISSECTING, MEYER-ZEISS, a large dissecting microscope of almost universal application with the great variety of accessories offered; particularly recommended for use with the Binocular body, but may be fitted with simpler magnifiers such as the Anastigmatic No. 31024, the Brucke dissecting combination or with either the monocular or binocular compound microscopes, as on Zeiss stands XA, XB, XC or XI.

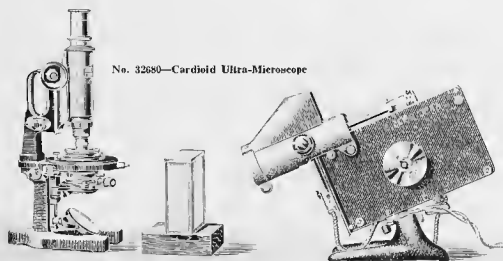
		Duty Free	Duty Paid
32512	Dissecting Stand with adjustable mirror and light modifying device, stage measuring 9 x 6 inches, round stage opening 4 1/4 inches in diameter, brass disc and plate glass disc to fit the stage opening, two arm rests, and holder fitted with rack and pinion for magnifiers and composite dissecting lenses	21.50	30.38
32516	Ditto , with simple sliding lens holder	17.50	21.79
32529	Cabinet for the stand, of alderwood	3.00	3.72
32521	Bound Foot rendering the sets holders available for use as lens stands independently of the dissecting microscope	1.75	2.17
Note —The stand of the new dissecting microscope may be used in conjunction with the body of the binocular microscope X b, the Drüner camera, the body of the erecting microscope X l, as well as a single tube similar to that of stand IX. For this purpose we supply a yoke attachment of two patterns:			
32528	Yoke with Slide Carriage for giving a traversing motion of the microscope body, with two fixing screws	6.75	8.37
32532	Yoke without Traversing Slide Carriage , with two fixing screws	2.75	3.41
Note —The various Bodies which may be attached to the yoke are subject to the following prices:—			
32536	Body of the Binocular Microscope Xb	27.50	34.10
32540	Drüner Stereoscopic Camera	35.00	44.40
32544	Pillar Bracket for the attachment to the yokes of the camera or the body of Stand Xb	2.50	3.10
32548	Pillar Bracket for the attachment of the body of Stand Xb in an inclined position	2.90	2.48
32532	Body of the Single-tube Erecting Microscope XI with exceptionally large radial extension	18.75	23.25
32556	Body similar to that of the single-tube Stand XI	7.50	9.30
Note —The following parts are required to render the stand available for use as a ball stage microscope:			
32560	Ball Stage to drop into the stage opening	2.75	4.65
32564	Raising Block for attachment between the yoke and the pillar bracket, with two long fixing screws	1.88	2.33
32568	Drawing Apparatus for use with the Mayer Dissecting Microscope	31.25	38.75



No. 32674—Luminescence Microscope

MICROSCOPE, LUMINESCENCE, ZEISS. This apparatus consists of an ordinary Microscope Stand as used for other work, with Achromatic or Apochromatic Objectives and either Huyghenian or Compensating Oculars, and differs only in the illuminating apparatus and source of light. In order that the illuminating apparatus permit the radiation of the object with ultra-violet light, which causes the luminescence, it is essential that the object slide as well as the condenser system be of quartz, which is permeable for the ultra-violet ray, exactly as is required in the micro-photographic outfit for ultra-violet light. The source of light may be either an arc lamp with specially prepared carbons or a Quartz Mercury Vapor Lamp, both of which are rich in ultra-violet rays. A collector condensing system of quartz lenses is also necessary. Light, particularly of wavelength visible to the eye, must be cut out by means of ultra-violet filters in order that the object may be examined solely in the fluorescent light originating from it under the action of the ultra-violet ray. The Lehmann filter with the additional filters of blue Uviol glass provides this feature. The illustration shows the outfit complete with Zeiss Microscope Stand III in position and the hand regulating arc lamp, but with the diaphragm removed to better display the remaining parts. For more detailed description send for a copy of Zeiss *Micco 326*. The component parts of the equipment with individual prices are as follows:

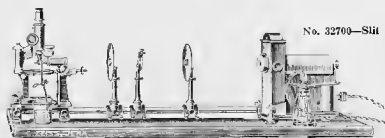
	Duty Free	Duty Paid
32572. Base Board, with optical bench 70 cm long.....	8.75	10.85
32576. Diaphragm Arrangement.....	5.09	6.20
32580. Blue Uviol Glass Disc, 6 cm diameter, on support.....	7.00	8.68
32584. UV Filter, 6 cm diameter, on support.....	17.00	21.08
32588. Wash Bottle, for filling and emptying the UV Filter.....	.69	.85
32592. Quartz Condensing Lens, plano-convex, 6 cm in diameter, on support.....	13.25	16.43
32596. Support for microscope with quartz prism.....	12.50	15.50
32600. Quartz Substage Condenser with iris diaphragm.....	17.50	21.70
32604. Centering Device for above.....	3.00	3.72
32608. Uranium Glass Plate, with circular ring for centering.....	2.00	2.48
32612. Plane mirror in mounting, for the convenient observation of the uranium glass centering plate.....	.38	.47
32616. Micro Slide of Quartz, 0.5 mm thick, 25 x 30 mm.....	1.13	1.40
32620. Cover Glass, of Euphos glass, 0.17 to 0.20 mm thick, 12 mm in diameter.....	.25	.31
32624. Object Carrier, Heidenhain, for the convenient manipulation of the quartz slides.....	.50	.62
32628. Hand Regulating Arc Lamp, for 10 amperes.....	13.50	16.74
32632. Carbons, special, impregnated with nickel, per 50 pairs.....	1.75	2.17
32636. Quartz Condensing Lens, consisting of two plano-convex lenses of quartz, 4 cm in diameter, on support.....	10.75	13.33
32640. Rheostat, for 110 volts, alternating or direct current, for either 5 or 10 amperes.....	8.00	9.92
32644. Rheostat, for 220 volts, alternating or direct current, for either 5 or 10 amperes.....	10.63	13.18
Note—As an alternative to the Arc Lamp above listed the Quartz Mercury Vapor Lamp may be used as a source of light as follows:—		
32648. Quartz Mercury Vapor Lamp.....	32.50	40.30
32652. Light Box for above.....	27.50	34.10
32656. Quartz Condensing Lens, similar to above, but consisting of a meniscus and plano-convex lens of 4 cm diameter, on support.....	12.00	14.88
32660. Rheostat for 110 volts direct current.....	10.00	12.40
32664. Additional Rheostat making above available for 220 volts direct current.....	6.25	7.75
32668. Extra Quartz Lamp, only, for replacement.....	11.25	13.95
32672. Microscope, Zeiss Stand IIIHQ as shown in illustration and specially designed for this outfit.....	60.00	74.40
32674. Complete Luminescence Outfit with Arc Lamp as above with rheostat for 110 volts.....	282.45	350.23
32675. Complete Luminescence Outfit with Arc Lamp as above with rheostat for 220 volts.....	285.08	353.49



No. 32680—Cardioid Ultra-Microscope

ULTRA-MICROSCOPE, ZEISS CARDIOID CONDENSER TYPE. The Cardioid Microscope as devised by Siedentopf is designed for bringing into view ultra-microscopic particles by means of a simplified attachment (the cardioid condenser) providing a remarkable light concentrating power. By this arrangement the rays of high aperture are employed to illuminate the object, while those of low aperture reach the eye. The difficulty occasioned by the presence of surface impurities, the maintenance of a stratum of the correct thickness and the absorbing properties of the ultra-microscopic particles have been avoided by the use of a suitably designed chamber. The Cardioid Ultra-Microscope is primarily adapted for the examination of colloid solutions, diluted precipitates and for the observation of micro-chemical and photo-chemical reactions. Where a suitable microscope and source of light are already available it is only necessary to provide the Special Equipment. In the illustration the Cardioid Condenser is shown in position on Zeiss Stand III equipped with the special apochromatic 3 mm objective with centering appliance, Cardioid Condenser in position on substage and quartz chamber in position in its holder on the stage, with the water cooling cell and arc lamp in position. For more detailed description send for Zeiss Mikro 306.

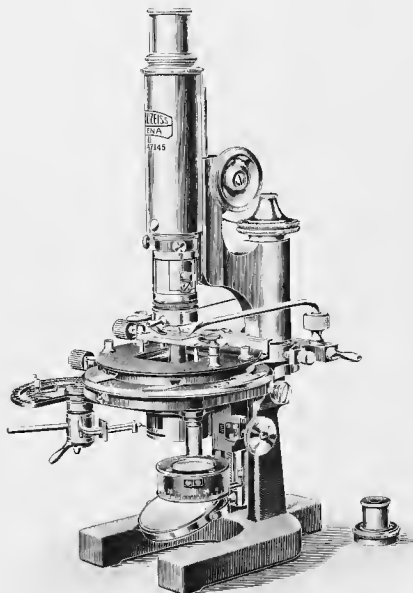
32676.	Special Cardioid Condenser Equipment, consisting of trough for water cooling without wooden support; Cardioid Condenser; quartz chamber; chamber holder; special apochromatic objectives 3 mm, N.A. 0.9; centering appliance for special apochromatic objective; compensating ocular 18 with sliding lens system; Huyghenian ocular I as searcher ocular, and platinum collar with two accessory supports, in case, but without Microscope stand or arc lamp as shown in illustration.	Duty Free	66.50	Duty Paid	82.46
32680.	Complete Cardioid Ultra-Microscope Outfit, consisting of above Special Equipment and Zeiss Stand IIIA, Arc Lamp No. 32848 as shown in illustration, with rheostat for 110 volts and 50 carbons.	Duty Free	134.76	Duty Paid	168.51
32684.	Complete Cardioid Ultra-Microscope Outfit, as above, with rheostat for 220 volts.	Duty Free	136.26	Duty Paid	170.37
32688.	Cardioid Condenser, only.	Duty Free	10.00	Duty Paid	12.40



No. 32700—Slit Ultra-Microscope

ULTRA-MICROSCOPE, ZEISS SLIT TYPE, an improved arrangement of the Siedentopf and Zsigmondy apparatus originally announced in 1904 and which by the orthogonal arrangement of the direction of illumination and observation and the micrometrically alterable thickness of the illuminating beam in relation to the depth of definition of the objective, entirely removes the powerful absorptive effect of the upper surface of the slide and the lower surface of the cover glass. This arrangement is specially recommended for the investigation of all colloid substances, serum solutions, drinking water, etc. With some additions as listed in separate outfit this arrangement is the only practical one for the investigation of ultra-microsomes inside solid bodies, glasses and crystals. For more detailed description send for Zeiss Mikro 339. Suitable outfits for both liquid colloids and solid colloids are offered as follows:—

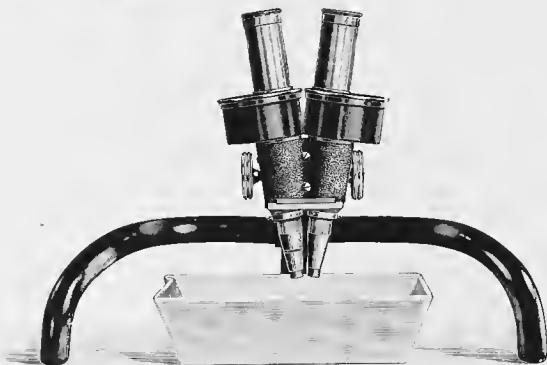
32700.	Complete Slit Type Ultra-Microscope Outfit for Liquid Colloids, consisting of table top with optical bench; objective $f = 120$ mm in disc-stop on saddle stand; precision slit on saddle stand capable of being rotated by 90° ; objective $f = 55$ mm in disc-stop on saddle stand; sole-plate with cross slide for the optical bench with intermediate-plate; achromatic objective AA for the cross slide; immersion objective D* with trough holder and screw-ring in case, trough with fixed sleeve with conical adapter and hose-clamp; Stand V without mirror, stage or case; Huyghenian ocular 4, cross ruled, with sliding eyepiece; Weule's automatically regulating arc lamp for direct current, 5 amperes, with diaphragm for the casing and rheostat for 110 volts.	Duty Free	172.65	Duty Paid	214.09
32704.	Complete Slit Type Ultra-Microscope Outfit, as above, with rheostat for 220 volts.	Duty Free	177.38	Duty Paid	219.95
32708.	Additional Equipment to above for Solid Colloids, consisting of achromatic objective C, polarizer on saddle stand, Analyzer I and Zeiss Microscope Stand IV with stage to raise and lower, without Abbe illuminating apparatus, and with case.	Duty Free	120.75	Duty Paid	149.73



No. 32732

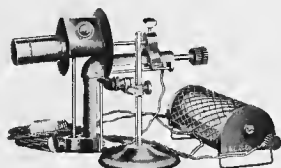
32732. **Microscope, Zeiss, for the Observation of Liquid Crystals**, consisting of Stand IV, with large mechanical stage divided in degrees with index, but without condenser system, diaphragm holder and iris diaphragm; with gas heating condenser with air cooling apparatus; preparation stage for the large mechanical stage; rotatory and adjustable analyser with selenite film for red of the first order; objectives A and D, each with water cooling arrangement; cross line oculars 2 and 4; micrometer ocular H3 and compressed air cylinder.
Duty Free. 221.25
Duty Paid. 274.35

32736. **Microscope, Zeiss, same as above, but with analyzer, to be put on the ocular instead of the rotatory and adjustable analyser.**
Duty Free. 207.50
Duty Paid. 257.30

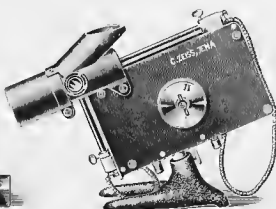


No. 32740

32740. **Microscope, Binocular, Chun, with image erecting prisms**, as used for dissecting and observing small animals in trays or on plates of large dimensions. The legs of the stand are jointed and may be extended or brought together to suit the size of the vessel. With paired oculars Nos. 2 and 4 and paired objectives of 77 mm and 40 mm focus, giving a range of magnifications from about 10 diameters to 50 diameters.
Duty Free. 80.50 **Duty Paid.** 115.95



No. 32844—with Rheostat No. 32852



No. 32848



No. 32868



No. 32872

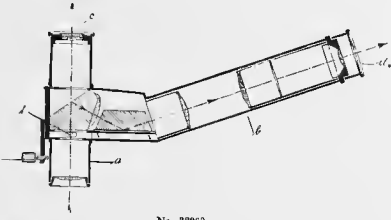


No. 32884

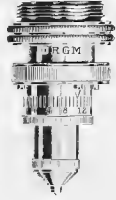


MICROSCOPE LAMPS. For all purposes involving the use of a Microscope, i. e., general microscopy, dark-field illumination, micro-photography, projection for drawing, illumination of opaque objects such as metallic surfaces (metallography), etc., the small arc lamp gives the best results, although in the ordinary use of the Microscope the light from the arc must be tempered by the use of ground or blue glass discs as provided. The Nernst lamps are a very convenient and satisfactory source of light for all of the work above mentioned with the exception of dark-field illumination with high powers, such as $\frac{1}{4}$ inch immersion objective for which use the arc is much superior. The Welsbach gas lamps give very good results, particularly in micro-photography, and are very satisfactory for general work with the Microscope. The kerosene lamp, while quite suited for ordinary use with the Microscope is not recommended for dark-field illumination, particularly with the higher powers. All of the arc lamps listed below may be used on ordinary house lightning circuits of either 110 or 220 volts, alternating current or direct current, the direct current being the most satisfactory. A suitable resistance is always necessary in using these lamps. The Flask Condenser is recommended for use with both the Nernst and Welsbach lamps, particularly for dark-field illumination.

32844.	Micro Lamp, Hand Feed Arc, Bausch & Lomb, on adjustable support, with cord and plug but without rheostat	14.00
32848.	Micro Lamp, Hand Feed Arc, Zeiss, specially recommended for dark-field illumination with the Zeiss Paraboloid Condenser and with the Cardioid Condenser for the examination of colloidal solutions, etc. To prevent undue heating of the object the use of a cell with weak copper sulphate solution or cool distilled water is recommended. Without glass cell.	14.00
	Duty Free	11.75
	Stock	15.98
32852.	Rheostat, fixed form, for 110 volts, 4 amperes, necessary in using either of the above Hand Feed Arc Lamp on house circuit.	5.00
32856.	Rheostat, as above, for 220 volts, 4 amperes	6.50
32860.	Carbons, for either of above Lamps, 6 inches long, $\frac{1}{8}$ in. diameter.	Per 10 .40
32864.	" " " " " " " "	Per 10 .38
32868.	Micro Lamp, Nernst Electric, Bausch & Lomb, on adjustable support with frosted globe; with cord and plug. Voltage must be specified in ordering. No rheostat necessary.	9.00
	Extra Glowers. Voltage must be specified in ordering.	.35
32872.	Micro Lamp, Nernst Electric, Zeiss, in metal mounting, conveniently inclined for easy direction of the beam upon the microscope mirror. The Nernst glower must be warmed when the current is first turned on with an alcohol lamp or similar source of heat. Voltage must be specified in ordering. No rheostat necessary.	10.00
	Stock	13.60
32876.	Extra Glowers.	1.50
32880.	Glass Cell for use with above lamps, with plane glass sides, 100 x 80 x 8 mm	3.00
32884.	Micro Lamp, Welsbach Gas, with adjustable support, on base, and with a blackened metal chimney and condensing lens.	8.00
32888.	Micro Lamp, Welsbach Gas, similar to above but with the addition of an iris diaphragm for controlling the size of the emergent pencil of light	12.00
32892.	Micro Lamp, Welsbach Gas, similar to above but without either condensing lens or iris diaphragm; intended for use with Flask Condenser No. 32900 in which case neither the diaphragm nor the condensing lens is necessary.	6.50
32896.	Mantles for above Welsbach Lamps, each	.25



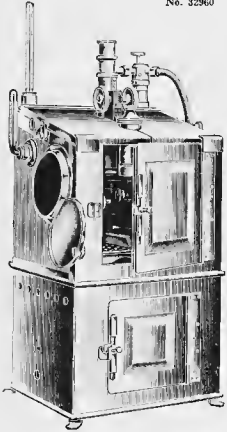
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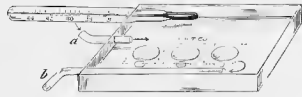
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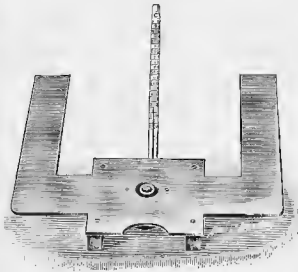
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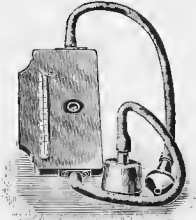
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No. 32948



No. 32952



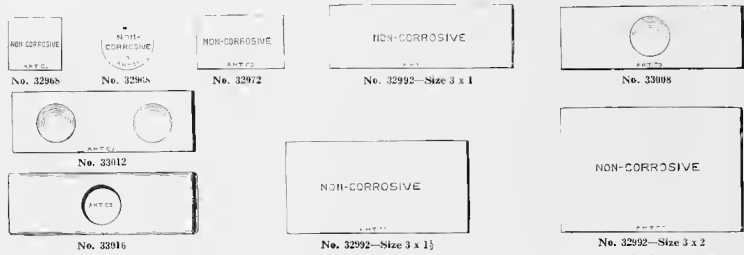
No. 32956

- 32936. **Micro Object Marking Apparatus.** This device is mounted in a society screw and can be inserted in place of the objective or carried on the nosepiece for use when occasion demands. After the field to be marked is found the diamond point is set to engrave a circle around same, the smallest circle possible being $\frac{1}{2}$ mm. After the circle is made, the field can always be easily located by the use of a low power objective at first. This apparatus is intended for use only on preparations mounted under a cover glass.

Duty Free.....	10.50
	Stock..... 14.00
- 32940. **Micro Object Marking Apparatus,** in objective mounting for screwing into nosepiece. This arrangement marks by means of a colored ring on the cover glass. The apparatus is filled with coloring matter and when brought gently in contact with the slide leaves a small ring..... 4.50
- 32944. **Microscope Oven, Plehn-Nuttal,** for constant temperatures, improved construction, with metal parts of Nickelin, a non-corrodible alloy. With micro burner and metallic thermoregulator, but without thermometer or microscope

Duty Free.....	61.05
	Duty Paid..... 81.40
- 32948. **Micro Warm Stage, Pfeiffer,** with three concavities for hanging drop, tubulations for inflow and outflow of water and thermometer graduated from 33° to 44° C. in $\frac{1}{10}$ ths..... 7.50
- 32952. **Micro Warm Stage, Schultze,** consisting of a "U" shaped metal stage to which heat is applied by means of an alcohol lamp or small burner. The stage is fitted with a condenser which renders it available for observations under a high power, and has a thermometer reading to 100° C..... 12.00
- 32956. **Micro Warm Stage, Stricker,** consisting of a flat metal chamber through which a constant stream of warm water may be passed; with a lens at the center making it available for use with high powers. A thermometer is provided with bulb within the chamber and scale on the outside of stage 14.00
- 32960. **Ocular, Double Demonstrating,** for use with two observers, with pointer in the common field of view, with power of 6 X.

Duty Free.....	17.60
	Duty Paid..... 22.00



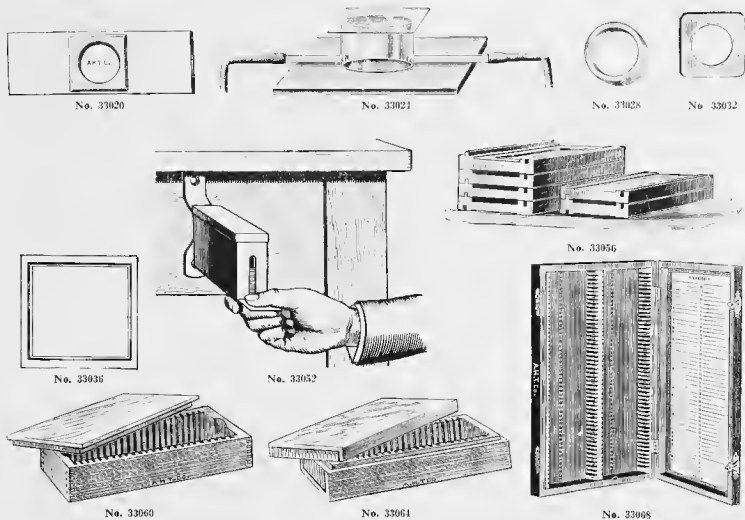
Thickness of Cover Glasses.

No. 1—varying from 0.13 to 0.17 mm (1/200 to 1/150 inch)
 No. 2— " " 0.17 to 0.25 mm (1/150 to 1/100 inch)
 No. 3— " " 0.25 to 0.50 mm (1/100 to 1/50 inch)

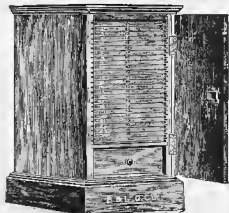
Number of Cover Glass in 1/2 Oz. Boxes.

1/2 oz. box of No. 1, 18 mm square contains 136 covers.
 1/2 oz. box of No. 2, 22 mm circles contains 90 covers.
 1/2 oz. box of No. 1, 22 x 40 rectangles contains 156 covers.

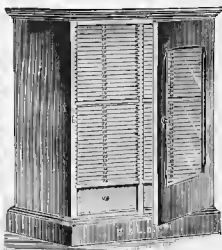
32964.	Micro Cover Glasses, Standard White, Blue Label, uniform in color and smoothly cut. Carefully packed in 1/2 oz. round cardboard boxes. Please specify size, shape and thickness in ordering.								
	Size, mm, squares or circles	12	15	18	22	25			
	Per 1/2 oz. box No. 1 . . . . .	.38	.38	.38	.38	.38			
	" " " No. 2 . . . . .	.30	.30	.30	.30	.30			
	" " " No. 3 . . . . .	.25	.25	.25	.25	.25			
32968.	Micro Cover Glasses, "Non-Corrosive," Red Label, guaranteed against corrosion in any climate. Glass is of slightly greenish tint. Neatly packed in 1/2 oz. round wooden boxes. A specialty of our own introduction in very wide use. Please specify size, shape and thickness in ordering.								
	Size, mm, squares or circles	12	15	18	22	25			
	Per 1/2 oz. box No. 1 . . . . .	.45	.45	.45	.45	.45			
	" " " No. 2 . . . . .	.35	.35	.35	.35	.35			
32972.	Micro Cover Glasses, "Non-Corrosive," Red Label, rectangular shape. Most used sizes.								
	Size, mm	22 x 30	22 x 32	22 x 36	22 x 40	22 x 50	24 x 30	24 x 36	
	Approx. contents of 1/2 oz. box of No. 1	60	58	50	48	38	66	45	
	" " " " " No. 2	53	50	41	38	26	51	36	
	Per 1/2 oz. box of No. 1 . . . . .	.75	.75	.75	.75	.75	.75	.75	
	" " " " " No. 2 . . . . .	.50	.50	.50	.50	.50	.50	.50	
	Size, mm	24 x 40	24 x 50	35 x 50	35 x 62	43 x 50	43 x 70		
	Approx. contents of 1/2 oz. box of No. 1	44	37	26	22	16	14		
	" " " " " No. 2	34	26	20	16	15	12		
	Per 1/2 oz. box of No. 1 . . . . .	.75	.75	.75	.75	.75	.75		
	" " " " " No. 2 . . . . .	.50	.50	.50	.50	.50	.50		
32976.	Micro Slides, Standard White, Blue Label, with carefully ground edges, average thickness 1 1/4 to 1 1/2 mm; carefully packed with paper between each slide, in 1/2 gross cardboard boxes.								
	Size, inches	2 x 1	3 x 1	3 x 1 1/2	3 x 2				
	Per 1/2 gross box . . . . .	.45	.45	.75	1.10				
32980.	Micro Slides, same as above, 3 x 1 inches, but 1/4 to 1 1/4 mm thick.								
32984.	Micro Slides, same as above, 3 x 1 inches, but 1/4 to 1 1/4 mm thick. Per 1/2 gross box . . . . .								.40
32988.	Micro Slides, same as above, i.e., 1/4 to 1 1/2 mm thick, 1 1/4 x 1 inch, for petrographers. Per 1/2 gross box								1.10
32992.	Micro Slides, "Non-Corrosive," Red Label, with well ground edges. The limits of thickness are usually from 1/4 to 1 1/2 mm, but the slides in any one box are usually of the same thickness. A specialty of our own in wide use. This slide is of a slightly greenish tint and is guaranteed not to corrode or become cloudy in any climate. Size, inches								
	Per 1/2 gross box . . . . .	.45	1.00	1.25					
32996.	Micro Slides, same as above but carefully selected to be between 1 1/2 and 2 mm thick, and as free from striae and scratches as possible as required in the U. S. Bureau of Plant Industry. In 3 x 1 inch size only. Per 1/2 gross box . . . . .								.50
33000.	Micro Slides, for Brain Sections, with carefully ground edges and about 2 mm thick.								
	Size, mm	80 x 110	100 x 150	115 x 150	160 x 190				
	Per 100	6.00	8.00	9.00	15.00				
33002.	Micro Covers for Brain Sections, of glass varying from .5 to .7 mm thick.								
	Size, mm	40x55	40x90	45x70	65x100	65x110	75x125	90x140	90x175
	Per 100	1.10	1.80	1.60	3.25	3.60	4.70	6.30	7.85
33004.	Micro Covers of Mica, for Brain Sections, carefully selected to be as free as possible from striae, etc.								
	Size, mm	40 x 55	40 x 90	45 x 70	65 x 100	65 x 110	75 x 125	90 x 140	90 x 175
	Per 100	1.80	4.80	3.60	12.00	13.20	21.00	27.00	36.00
33008.	Culture Slide, 3 x 1 inches, with polished spherical concavity 12 mm in diameter; as used for hanging drop and similar reactions. Each . . . . .								.05
33012.	Culture Slide, same as No. 33008 but with two concavities. Each . . . . .								.08
33016.	" " 3 x 1 inches, of heavy polished plate glass with flat bottom, depression 3 mm deep and 16 mm in diameter. Inside of bottom is smooth, but not polished. For drop cultures, etc. Each								20



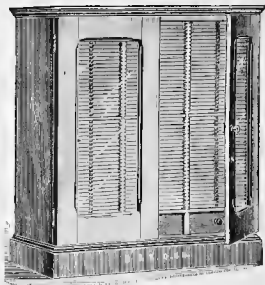
33020. Culture Slide, consisting of heavy polished plate glass slide with cell, 15 mm in diameter 3 mm deep, fused on in electric furnace. The advantage of this slide is that the bottom of the cell consists of the plate glass slide free from inequalities..... .35
33024. Culture Slides, for cultures, electrolysis, etc., with side tubes and cover glass 1.00
33028. Glass Rings for Micro Slides, with edges finely ground, for cementing on ordinary slides to make cells
 Diameter, mm 15 18 18 22 24
 Height, mm 3 5 10 9 10
 Each08 .10 .10 .15 .20
33032. Glass Cells for Micro Slides, consisting of a square plate of glass, with circular hole.
 Diameter of hole, mm 10 10 15 15 18 18
 Thickness of glass, mm 1 2 1 2 1 2
 Each15 .15 .15 .15 .15 .15
33036. Micro Labels, for slides, with border, 22 mm square Per box of 10010
 Per carton of 10 boxes75
33040. " " " " " rectangular, 22 x 15 mm. Per box of 10010
 Per carton of 10 boxes75
33044. " " " " " in books of 500 labels each. These labels are printed on best white gummed paper and are scored as to be readily torn from the book, leaving clean edges, interleaved with paraffine paper. Size 22 mm square. Per book25
33048. Micro Labels, for slides, same as No. 33044, but rectangular. Size 22 x 15 mm. Per book25
33052. Micro Slide Box, for conveniently keeping clean slides to be withdrawn one by one as needed. For attaching on wall. For 3 x 1 inch slides 1.00
33056. Micro Slide Mailing Cases, for slides 3 x 1 inches. Per dozen10
33060. " Boxes, of white wood, popularly known as Pillsbury boxes, for twenty-five 3 x 1 slides.
 Each08 Per 100 6.00
33064. " Slide Boxes, improved form, of selected wood, with lid fitting down over the outside of projection instead of inside as in No. 33060. Box is joined by superior method of gluing and is distinctly worth the difference in price.
 Number 1924 1930 1932 1934
 Size of slides 3 x 1 1 1/4 x 1 3 x 2 3 x 1
 Capacity 12 25 25 25
 Per 1075 1.25 2.00 1.00
33068. Micro Slide Box, for one hundred 3 x 1 slides, of wood covered with green book-binder's cloth, with hinged lid40



No. 33072-2016

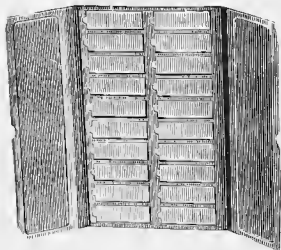


No. 33072-2020

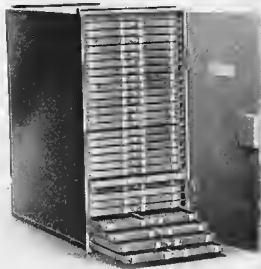


No. 33072-2025

33072. Micro Slide Cabinet, Bausch & Lomb, substantially made of mahogany, with drawer in bottom for card index. For 3 x 1 slides.
- | | | | |
|-----------------------|-------|-------|-------|
| Number..... | 2016 | 2020 | 2025 |
| Capacity, slides..... | 500 | 1500 | 3000 |
| Each..... | 12.00 | 25.00 | 50.00 |



No. 33076



No. 33080

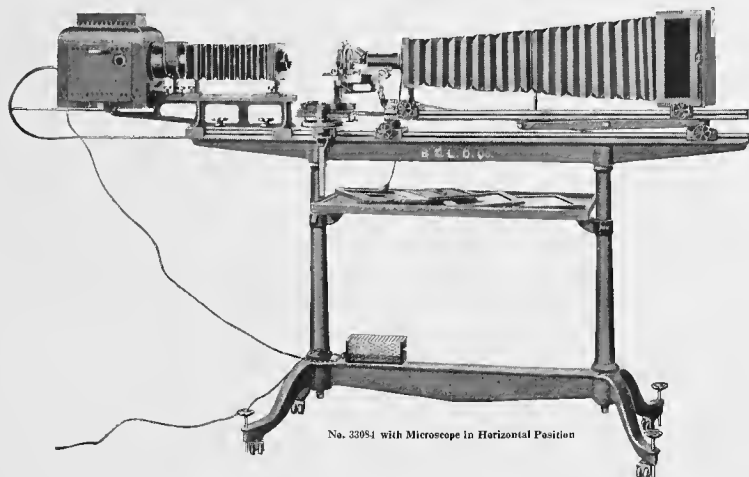
33076. Micro Slide Trays of cardboard, in map form, holding twenty 3 x 1 slides..... .25
33080. Micro Slide Cabinet, Minot, of metal. The 30 trays each hold twenty-four 3 x 1 slides giving a total capacity of 720 slides..... 20.00



View in Stock Room



Office View Showing Section for Distribution of Catalogues

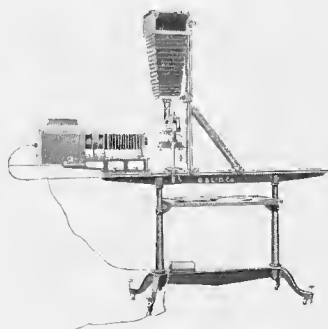


No. 33084 with Microscope in Horizontal Position

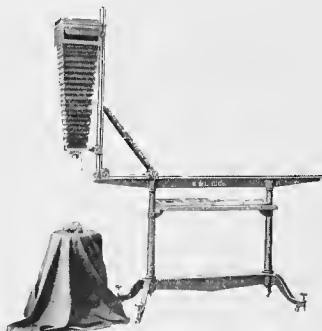
MICRO-PHOTOGRAPHIC APPARATUS, BAUSCH AND LOMB, MODEL G, for Horizontal and Vertical Work, with and without Microscope. Designed especially for general laboratory and research work in college, commercial institution or wherever photomicrographic work of the highest grade is desired. The new models presented here are the outgrowth of many years experience in developing and constructing apparatus of this general type with a view of obtaining the greatest possible stability and efficiency. Not only will this apparatus accommodate a wide range of magnifications, producing photomicrographs up to 8 x 10 inches in size, but it can also be used to advantage in photographing gross objects, in enlarging and reducing work and is thus an excellent laboratory camera. Its distinctive features are:

- Extreme rigidity**—Constantly accurate alignment of parts, due to construction on single supporting stand with accurately planed optical beds, free from spring and vibration.
- Superior illuminating system.**
- Convenient and effective adjustments.**
- Swing-out of microscope plate,** permitting direct observation of object to be photographed through eyepiece.
- Long range vertical adjustment of microscope plate,** permitting use of any standard microscope.
- Special camera box, providing for focusing an opaque screen in place of ground glass if desired.**
- Removable plate holder adapter,** permitting long side of plate to be placed in either vertical or horizontal position.
- Wide scope of adjustability and usefulness.**
- Supporting Stand**—Of cast iron, massive construction, having base of four feet cast in one piece with heavy connecting rib, base has spread of 54 x 24 in., and is fitted with both castors and leveling screws; two upright supports carry main optical bed at height of 42 in., wooden shelf for accessories measuring 37 x 18 in., is mounted between upright supports.
- Optical Beds**—Three in number, of lathe type, carefully planed and accommodating supports for the different parts, which may be adjusted as desired and rigidly clamped; main bed, 78 in. (198.5 cm) long and 4 1/2 in. (11.3 cm) wide, carries two supplementary beds—one adjustable carrying camera, and one stationary, bearing illuminating apparatus; adjustable bed 49 in. (124 cm) long and 4 1/2 in. (11.3 cm) wide, can be set at any position from the horizontal to the vertical and rendered absolutely rigid by its supporting braces; both main and adjustable beds graduated in centimeters and millimeters, with every fifth centimeter numbered; stationary bed is mounted on heavy casting which may be clamped to main bed at any desired point or removed without difficulty.
- Illuminant**—Two different electric illuminants are regularly listed with outfit—90 arc lamp, provided with long extension feeding device for adjusting from rear of camera box, or single-glower Nernst lamp for 110 or 220 volts; both lamps mounted either in large light-tight lamp house with observation windows and spring door or in smaller lamp house without door; both lamp houses, when furnished with arc lamp, provided with small mirror mounted near one of observation windows to serve as guide in feeding lamp from rear of camera box; 5-ampere, 110 volt rheostat mounted on base of stand, when arc lamp is furnished.
- Condensing System**—Apparatus is listed with two different condensing systems—complete and simple; complete consists of regular triple system, 4 1/2 inch diameter, in Bausch & Lomb patent ventilated mount with water cell, bellows and standards mounted on stationary optical bed, front standard of bellows has special mounting carrying a 2 1/2 inch diameter, 12 inch focus plano convex condensing lens for use with front lens of triple system removed, an iris diaphragm with 2 1/2 inch opening and a trough for carrying yellow glass ray filter or cell for liquid filter, both of which are furnished with outfit; simple system consists only of this front standard with plano-convex lens, iris diaphragm and ray filters as described.
- Camera**—Consists of supports carrying tapering bellows with draw of approximately 40 in., having wire support in center; rear support carries box of neatly finished hard wood with door in side for use in focusing image on opaque white screen if desired; supplied with reversible adapter carrying laboratory plate holder for 8 x 10 plates and kits for smaller sizes, also with two focusing screens—one ground glass with clear center and one clear glass with graduated cross lines in center; hinged cover with two springs at rear of adapter permits plate holder to be placed in exact position without jarring apparatus; plate holder of special block form constructed, ensuring exact registration.
- Shutter**—Bausch & Lomb automatic shutter, No. 4570, with steel leaves, having a maximum opening of 40 mm; may be set for instantaneous, bulb or time exposure; supplied with tube for making light-tight connection with microscope eyepiece.
- Microscope Plate**—Of metal, 7 1/2 x 5 1/2 in., provided with three leveling screws to serve in bringing any microscope into exact alignment with optical axis of camera; fitted to main optical bed by clamping block and provided with vertical screw of 9 inch range, operated by hand wheel, for accommodation of varying center distances on different microscopes; so constructed that plate may be turned out 90° for locating field to be photographed by direct observation, and provided with a stop which brings it at once into alignment with optical axis of camera when turned back; support attached to plate carries universal joint and pulley with extension rod, by means of which fine line adjustment of microscope, whether level, prism or side adjustment, can be controlled from rear of camera box.

Prices on following page.

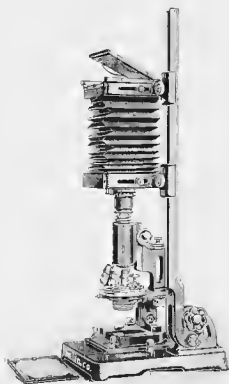


No. 33084 with Microscope in Vertical Position



No. 33084 Arranged for Macro-Photography

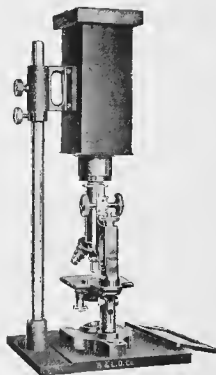
- 33084. **Large Micro-Photographic Apparatus**, as above described, complete with adjustable and stationary beds, arc lamp with adjusting rod, large light-tight lamp house, 5 ampere, 110 volt rheostat, complete condensing system, adjustable microscope plate with adjusting rod for microscope, camera and shutter as described. 300.00
 - 33088. **Large Micro-Photographic Apparatus**. Same as No. 33084 but with Single-Glowler Nernst lamp in place of arc, rheostat and adjusting rod. 287.50
 - 33092. **Large Micro-Photographic Apparatus**. Same as No. 33084 but with small lamp house and simple condensing system in place of complete. 280.00
 - 33096. **Large Micro-Photographic Apparatus**. Same as No. 33092 but with Single-Glowler Nernst lamp in place of arc, rheostat and adjusting rod. 267.50
 - 33100. **Automatic Arc Lamp**, will be furnished with any of the above outfits, in place of the hand-feed arc and adjusting rod, at an additional cost of 57.50
 - 33104. **Regular Double Plate Holder** for 8 x 10 plates, without reducing kits 2.00
 - 33108. **Regular Double Plate Holder**. Same as No. 33104, with reducing kits. 4.00
 - 33112. **Special Single Laboratory Plate Holder**, bookform, for 8 x 10 plates, with reducing kits. 5.50
- Note.—Special descriptive pamphlet sent on application. Be-cause of the many possible combinations and arrangements of this outfit we suggest the sending of information as to requirements so that we may submit detailed estimate on specific outfit.



No. 33116

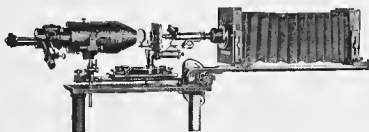
33116. **Micro-Photographic Camera.**

Bausch and Lomb, Model H. The Camera is the same as furnished with the combined apparatus and is mounted on a similar optical bed, graduated to 640 mm. The bed is mounted by a strong hinge joint on a heavy metal base, 13 x 9 1/2 in.; may be adjusted in any position between the vertical and horizontal and secured by a clamp. The adjustments on the plate will accommodate any standard microscope. The outfit does not include an illuminating apparatus or shutter. 45.00

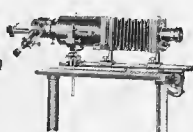


No. 33120

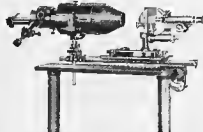
- 33120. **Micro-photographic Camera, Bausch & Lomb Model K**, a simplified outfit for quick operation. The plate holder will take 3 1/2 x 4 1/2 inch. plates. The camera may be rotated in and out of the axis of the microscope as shown in illustration and the base may be utilized on the work table as a regular support for the microscope at all times so that the vertical rod and camera need only be added when photographs are to be made. 20.00
- 33124. **Automatic Shutter**, with maximum opening of 40 mm, for use with instantaneous, bulb or time exposure, and ready to attach to either Model H or Model K cameras as listed above. 10.00



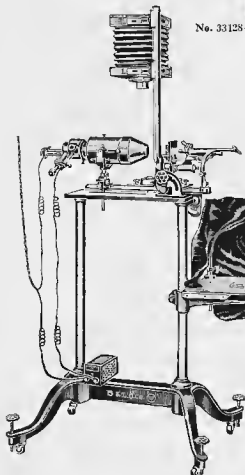
No. 33128—Arranged for Micro-Photography with Microscope in Horizontal Position



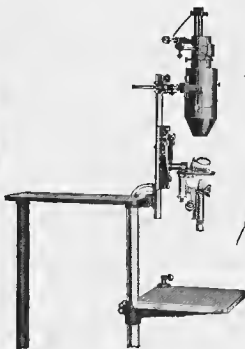
No. 33128—Arranged for Projection of Lantern Slides



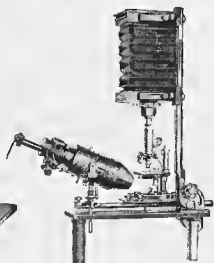
No. 33128—Arranged for Projection of Micro Slides



No. 33128—Arranged for Drawing



No. 33128—Arranged for Drawing



No. 33128—Arranged for Micro-Photography

COMBINED DRAWING, MICRO-PHOTOGRAPHIC AND PROJECTION APPARATUS, BAUSCH AND LOMB,
for use with any regular microscope as used for ordinary work and providing for the following:—

Drawing with apparatus in horizontal position.

Drawing with apparatus in vertical position.

Photo-micrography with camera horizontal.

Photo-micrography with camera vertical.

Gross photography with Micro-Tessar objectives, without microscope but with special stage having micrometer movement.

Gross photography of solid objects with regular photographic objectives.

Microscopic projection.

Lantern slide projection.

Drawing of large opaque objects by addition of opaque attachment.

Photo-micrography of opaque objects by addition of vertical illuminator.

Supporting Stand—Of cast iron, provided with both castors and leveling screws.

Optical Beds—Two in number, of lathe type, accommodating supports for different parts which may be adjusted as desired and rigidly clamped; one bed, graduated to 570 mm, carries illuminating accessories, microscope plate, and mirror, the other, graduated to 640 mm, carries camera; both are attached to base plate by strong hinge joints, permitting them to be adjusted in either horizontal or vertical position.

Illuminant—Either a hand-fed arc or single-glower Nernst electric lamp, as ordered, for use on direct or alternating current, enclosed in a small cylindrical hood with observation windows, attached to rear of condensing system mount; a rheostat is mounted on lower base of outfit equipped with the arc lamp.

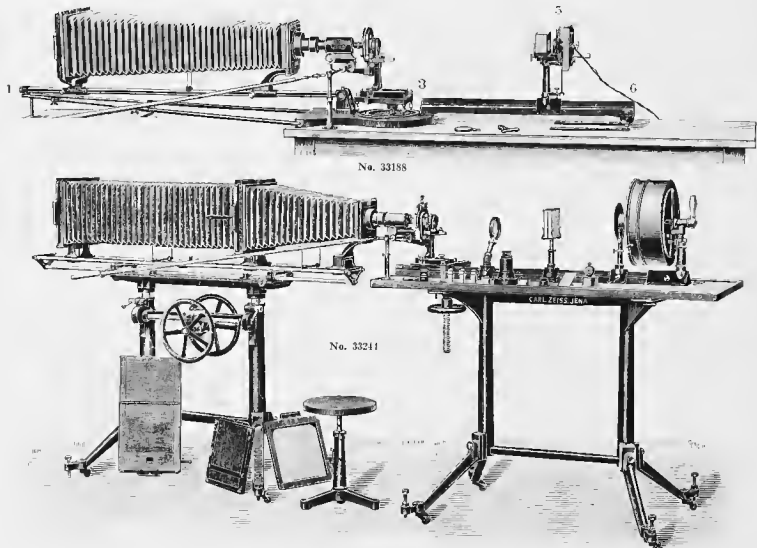
Condensing System—Regular 4½ in. diam. triple condensing system in patent ventilated mount, which in turn is mounted in a cylindrical shaped metal hood, in which the condensers may be easily adjusted to and fro with reference to the lamp; a conical shaped extension slips on the front of the cylindrical shaped hood and helps to render the apparatus more nearly light-tight; diaphragms of three different apertures are furnished to cut off superfluous light and heat when desired; entire illuminating apparatus is carried by a special fork and standard, adjustable for height and also to and fro on the optical bed, and provided with coarse and fine adjustment screws for shifting its direction vertically or laterally.

Camera—Regularly supplied with camera for 4 x 5 in. plates, having a maximum bellows draw of 24 in., equipped with a double plate holder with reducing kits for 3½ x 4½ in. plates and a ground glass focusing screen with clear center; in adjustable mounting on two supports clamped to optical bed; front standard fitted with sliding light-tight tube to connect with microscope. A similar camera to take 5 x 7 in. plates can be supplied at an extra cost.

Shutter—Automatic with steel leaves, having a maximum opening of 40 mm; may be set for instantaneous, bulb or time exposure.

Drawing Board—Of wood, neatly finished, 14 in. square, adjustable on front standard of supporting stand, which is graduated so that one can readily rest board at any particular position; supplied with velvet hood on adjustable standard to shield board from light.

- 33128. Combined Drawing and Micro-photographic Apparatus, as described, with hand-feed arc lamp and 5 ampere rheostat for 110 volts without microscope 155.00
- 33132. Combined Drawing and Micro-photographic Apparatus, but with 5 ampere rheostat for 220 volts. 137.50
- 33136. Combined Drawing and Micro-photographic Apparatus, but with single-glower Nernst lamp in place of arc. Please to specify voltage when ordering 150.00



MICRO-PHOTOGRAPHIC APPARATUS, ZEISS. We list below two typical micro-photographic outfits, one on the basis of the Zeiss Combined Horizontal and Vertical Camera with Nernst light and one on the basis of the Large Micro-photographic Camera with Mercury Vapor Lamp. Equipment for micro-photography should be selected in every case with special reference to the sources of light available and the kind of work to be accomplished and we recommend that we be permitted to make specific quotation wherever possible. Zeiss *Mikro-264*, a 50 pp. catalogue devoted exclusively to micro-photographic equipment, will be sent upon request. Modern research has shown that the large sources of light of great current consumption are unnecessary if a proper condensing system be used, and where electric current is available we recommend for alternating current the Nernst lamp with iris diaphragm and where direct current is available the Weule arc lamp requiring only 5 amperes of current as compared with the 20 and 30 ampere lamps formerly used, or the new Mercury Vapor Lamp as shown in lower illustration. This Lamp furnishes an extraordinarily uniform and bright light, which with the aid of simple light filters is rendered monochromatic to a very perfect degree. The Zeiss Weule arc lamp with rheostat and condensing lens is applicable to either of the outfits listed below at the following prices:—

33140.	Weule Direct Current Arc Lamp, 5 amperes, with casing.	Duty Free	50.00	Duty Paid	60.00
33144.	Condensing Lens U', on saddle stand with iris diaphragm.	Duty Free	15.00	Duty Paid	19.80
33148.	Adjustable Resistance for 110 volts direct current.	Duty Free	4.65	Duty Paid	6.14

Micro-photographic Outfit, Zeiss, on basis of Combined Horizontal and Vertical Camera (illustration shows Camera in horizontal position). Without Microscope or equipment for same.

33156.	Combined Horizontal and Vertical Camera, for plates 7 x 9 inches	45.00	59.40
33160.	Two sets of kits for smaller plates	1.50	1.98
33164.	Focussing Glass	5.00	6.60
33168.	Remote Focussing Gear for attachment to Zeiss Stands with Berger fine adjustment	14.50	19.14
33172.	Optical Bench	4.00	6.40
33176.	Nernst Lamp on saddle stand, with Adams Condenser and iris diaphragm	26.25	34.65
33180.	Rheostat for above, for 110 volts alternating or direct current	2.50	3.30
33184.	Ray Filter, for attachment to the lamp, with glass cell	2.50	3.30
33188.	Complete Outfit, as above	102.25	134.97

Micro-Photographic Outfit, Zeiss on basis of Large Camera with Mercury Vapor Lamp, for direct current only Without Microscope or equipment for same.

33192.	Large Camera, with cast iron stand for raising and lowering. For plates 10 x 12 inches	77.50	102.30
33196.	Three sets of kits for smaller plates	2.25	2.97
33200.	Focussing Lens	6.50	8.58
33204.	Projection Table, with optical bench mounted on rigid cast iron stand	35.00	45.90
33208.	Elevating Support for the microscope when it is to be used in upright position	13.00	17.16
33212.	Reflecting Prism, with sleeve for attachment to the camera when Microscope is to be used in vertical position	5.00	6.60
33216.	Remote Focussing Gear	12.75	16.83
33220.	Mercury Vapor Quartz Lamp, for 5 amperes direct current	32.50	42.90
33224.	Light-proof Lamp Casing, for above, on saddle stand so arranged that no injury can result from ultra-violet radiation	27.50	36.30
33228.	Rheostat for 110 volts	6.25	8.25
33232.	Condenser H on saddle stand with screw disc	7.50	9.90
33236.	Iris Diaphragm, on saddle stand	7.50	9.90
33240.	Ray Filter, on saddle stand with two cells	6.00	7.92
33244.	Complete Outfit, as above	229.25	302.61



No. 33736

MICRO-PHOTOGRAPHIC OUTFIT FOR ULTRA-VIOLET LIGHT, ZEISS. The special effects obtainable by the application of ultra-violet light to micro-photography are mainly as follows:—

Resolving power. In a microscope objective this increases in direct proportion to any decrease in the wavelength of the light used. With the quartz objective in this arrangement the resolving power is about doubled as compared with an objective of identical numerical aperture when made of glass and operated with daylight.

Permeability. Many colored organic objects, both in the fresh and preserved state, display considerable variation in their degree of permeability under ultra-violet light when they show no sign of color in white light.

Physiological effects. These are sometimes very pronounced upon living organic objects.

The objectives employed are the monochromats of quartz, corrected for wavelength $275 \mu\mu$ and with a numerical aperture of the high power 1.25. The entire optical system including slides, cover glasses, etc., must be of fused quartz or of glass permeable to the ultra-violet ray. The monochromatic objectives of quartz cannot be used with light of a different wavelength, such as daylight, nor can they be used with an immersion fluid differing in composition or having a refractive index other than that as supplied with each objective. The outfit consists essentially of a Cadmium arc as a source of light which is actuated by the secondary circuit from an induction coil. The beam of wavelength $275 \mu\mu$ from this sort of light is made available by quartz prisms and this beam, after passing through a quartz condenser lens, is used as a source of illumination for the microscope. As the ultra-violet of this wavelength is totally invisible to the eye, fluorescence screens must be used in order to find suitable field, etc. A list (*Zeiss Mitro 237*) of the complete literature referring to the use of this interesting method, and also *Mitro 170* giving more detailed information as to the outfit is sent upon request. The outfit listed below is the latest arrangement offered by the firm of Carl Zeiss.

	Duty Free	Duty Paid.
33348. Cast Iron Base Plate, with slides for the microscope	9.00	11.88
33352. Vertical Camera	23.75	31.35
33356. Adapter, with time shutter	1.00	1.32
33369. 2 Sheets for 9 x 12 cm plates	.75	.99
33364. Dark Slide, for two 9 x 12 cm plates, with diaphragm to insert into the register of the camera	8.75	11.55
33368. Searcher, with quartz objective, fluorescent screen and 12 x magnifier for direct observation	12.50	16.50
33372. Carrier for the Searcher, with sleeve and clamping screw to fix it on the rod of the vertical camera	1.25	1.65
33376. Totally Reflecting Prism of quartz, in sliding sleeve	6.25	8.25
33380. Monochromatic Objective 6 mm, 0.85 N.A.	50.00	62.00
33384. " 2.5 mm, 0.85 N.A.	100.00	121.99
33388. " 1.7 mm, 2.50 N.A.	150.00	186.00
33392. Achromatic Objective A	5.00	6.29
33396. Quartz Eyepieces 5, 7, 10, 14 and 20	37.50	46.50
34100. Huygenian Eyepiece 2	1.50	1.86
33404. Sliding Objective Changer for the three Monochromatic and the Achromatic Objective A	16.00	12.40
33408. Mahogany Case, with lock and key, for 6 objective slides and objectives attached	3.75	4.65

(Outfit continued on following page.)

Micro-Photographic Outfit for Ultra-Violet Light, Zeiss (continued)

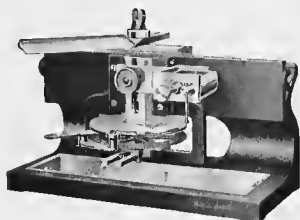
	Duty Free	Duty Paid
33112. Quartz Condenser, with iris diaphragm and with a single front and a doublet front, interchangeable	17.50	23.10
33416. Centering Appliance for the quartz condenser, or for objectives which are to be used as condensers	3.00	3.96
33120. Screen, of Uranium Glass, to insert into the diaphragm carrier of the Abbe illuminating apparatus, with roled circle	2.00	2.64
33424. Rectangular Plane Mirror, to place on the foot of the microscope stand	.38	.49
33428. 4 Object Slides of quartz, ground vertical to the optical axis, 0.5 mm thick, size 25 x 30 mm each	4.50	5.58
33432. 10 Object Slides of U V Glass, about 0.2 to 0.3 mm thick, size 20 x 30 mm	5.00	6.20
33436. 5 Aluminum Slides, as designed by Heidenhain	2.59	3.10
33440. 5 Cover Glasses, of fused quartz	3.75	4.65
33444. Stage Micrometer, 1 mm divided into 100 parts, on quartz slide under a cover glass of fused quartz with one Heidenhain aluminum slide	5.00	6.20
33448. Stand III E with large mechanical stage, 1 40 N.A.	91.25	113.15
33452. Horse shoe cast iron Base Plate	2.50	3.10
33456. Short Optical Bench, with three set screws and column for the collector	5.00	6.50
33460. Spark Stand, for horizontal electrodes	20.00	26.40
33464. Projection Lens Carrier, with slide for the collimator, on saddle stand, without micrometrical movement	3.50	4.62
33468. Collimator of quartz, of four lenses	6.25	8.25
33472. Prism Platform with two prism mounts screwed upon it, on saddle stand	5.75	7.59
33476. 2 Prisms of quartz, refractive angle 60°, with refractive surface about 3 cm high and 5 cm wide, inclined by 60° to the optical axis of the crystal	25.00	33.00
33180. 10 meters Cadmium Wire	2.50	3.30
33484. 10 meters Magnesium Tape	.75	.99
33488. Induction Coil, series H B, without condenser	45.00	59.40
33492. Electrolytic Contact Breaker, Simon, with porcelain nozzle	11.25	14.85
33496. Resistance Coil	12.00	15.84
33500. Amperemeter, Type A G, for 1 to 5 amperes, aperiodic	9.98	13.17
33504. Switch, for cut-off	1.75	2.31
33508. Fluorescent Screen, 3 x 3 cm	.38	.50
33512. Condenser, consisting of two Leyden jars	11.25	14.85
33516. Burner	6.25	8.25
33520. Table top and case for the illuminating apparatus	12.50	16.50
33524. Switch-board	35.00	46.20
33528. Wire and montage	12.50	16.50
33532. Support for the camera	4.25	5.61
33536. Complete Micro-photographic Outfit for Ultra-violet Light, as above listed	785.73	1037.15

ACCESSORIES FOR USE WITH MICRO-PHOTOGRAPHIC OUTFITS.

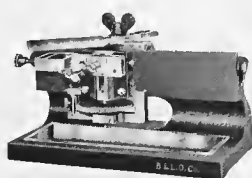
33540. Micro-Tessar Objective, Bausch & Lomb, Zeiss, constructed after the formulae of the large photographic lenses of the same name and particularly well adapted to photo-micrography. The angle of view is 55°, the illumination is uniform and the definition remarkably sharp. Each is mounted with a metal iris diaphragm and provided with a society screw. 72 mm equivalent focus	32.00
33544. Micro Tessar Objective. Same as above, but with 48 mm equivalent focus	26.00
33548. Micro Tessar Objective. Same as above, but with 32 mm equivalent focus	26.00
33552. Doublet Focusing Glass	4.00
33556. Achromatic Focusing Glass	8.00
33560. Light Filters, Wratten and Wainwright, Set of 9, etc., for micro-photography, cemented between glass, 2 inches square.	8.10
Duty Free	11.10



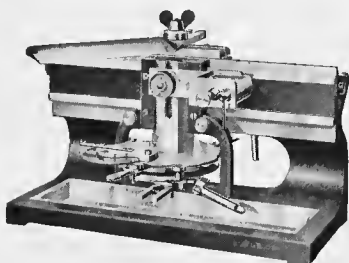
View In Salesroom Showing Microscopes, and Accessories, Apparatus for Cement and Asphalt Testing, etc.



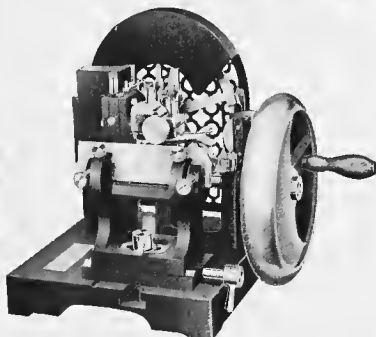
No. 33612



No. 33600



No. 33624



No. 33635

MICROTOME, STUDENT, BAUSCH AND LOMB, suitable for individual and elementary laboratory use.

Feeding Mechanism—Operated by hand; consists of accurately cut micrometer screw of 0.5 mm pitch, provided with a disc graduated into 100 parts each equal to 5 microns, the edge having 100 teeth which engage with a click and secure perfect control of the feed; whole supported in a metal stirrup, permanently attached to front of stand.

Object Clamp—Of one piece, extremely rigid; when fully extended will accommodate objects measuring 30 x 32 mm; adjustable vertically and orienting in one plane; may be attached at either side of vertical slide for paraffin or celloidin works.

Dimensions—Length, 240 mm; width, 127 mm; height, 148 mm.

Possible Attachments—Microtome regularly furnished without knife; plain knife No. 33741, 90 mm, with holder No. 33772 or shanked knife No. 33752 are recommended; CO₂ Freezing attachment can be fitted to this instrument.

- 33600. Student Microtome, without knife and holder, as described. 22.00
- 33604. Plain Microtome Knife 90 mm, without handle, in case, but with No. 33772 Knife Holder. 5.00
- 33752. Shanked Microtome Knife, 90 mm, in case. 5.00

MICROTOME, MEDIUM LABORATORY, BAUSCH AND LOMB, as widely used in hospital laboratories.

Feeding Mechanism—Operated by convenient hand lever; can be set by simple movement of the quadrant to feed any thickness from 2 to 60 microns, in steps of 2 microns; provided with split nut which releases carriage at any point of feed, enabling it to be returned to any point at once; whole supported in metal stirrup permanently attached to front of stand.

Object Clamp—Of one piece, extremely rigid; when fully extended will accommodate objects measuring 35 x 32 mm, adjustable vertically and orienting in one plane; can be set at either side of the vertical slide for paraffin or celloidin works.

Dimensions—Length, 300 mm; width, 143 mm; height, 188 mm.

Case—Microtome supplied in strong wooden box with handle.

Possible Attachments—Microtome regularly furnished without knife; plain knife No. 33744, 125 mm, with holder No. 33772 or shanked knife No. 33752, 125 mm, are recommended; CO₂ Freezing attachment can be fitted to this instrument, as can the Naples Universal Clamp.

- 33612. Medium Laboratory Microtome, without knife and holder, as described. 45.00
- 33616. Plain Microtome Knife, 125 mm, without handle, in case, but with No. 33772 Knife Holder. 6.50
- 33752. Shanked Microtome Knife, 125 mm, in case. 6.75

MICROTOME, AUTOMATIC LABORATORY, BAUSCH AND LOMB, a most satisfactory form of the sledge type of Microtome for general use. A special feature is the lateral adjustability of the feeding mechanism along the entire front of the stand, providing for different cutting angles and stroke lengths. The feeding is either automatic or by hand as desired.

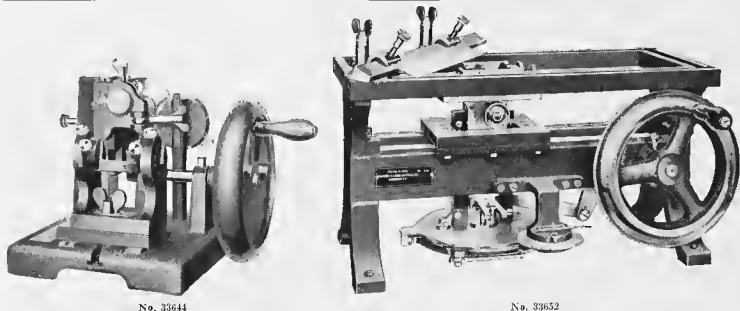
Feeding Mechanism—Automatically operated with stroke of knife by arm extending from rear of knife block—also provided with lever for hand feeding; controlled by adjustable cam with graduated knurled button and spring click, giving feed of 2 to 36 microns in steps of 2 microns; provided with split nut having convenient handles and with releasing lever, enabling carriage to be released at any point of feed and to be set at any desired position on the feed instantaneously; whole supported in a metal stirrup adjustable laterally along front of stand and secured in any position by clamping screws.

Object Clamp—Of one piece, extremely rigid; engages rigidly with slide; when fully extended will accommodate objects measuring 35 x 32 mm; adjustable vertically and orienting in one plane; can be set at either side of the vertical slide for paraffin or celloidin works.

Dimensions—Length, 344 mm; width, 158 mm; height, 218 mm.

Possible Attachments—Microtome regularly furnished with knife; plain knife No. 33744, 165 mm, with holder No. 33772 or shanked knife No. 33752, 165 mm, are recommended; Elder Freezing attachment can be fitted to this instrument, as can the Naples Universal Clamp.

- 33624. Automatic Laboratory Microtome, without knife, as described. 65.00
- 33628. Plain Microtome Knife, 165 mm, without handle, in case and No. 33772 Knife Holder. 8.00
- 33752. Shanked Microtome Knife, 165 mm. 8.00



No. 33644

No. 33652

MICROTOME, MINOT ROTARY, BAUSCH AND LOMB, as designed by Dr. Charles S. Minot of Harvard University and improved from time to time during the past twelve years. The most widely used and satisfactory instrument for paraffine cutting. (See illustration on preceding page.)

Feeding Mechanism—Consists of a micrometer screw revolved by a large ratchet wheel which engages a pawl; amount of feed controlled by a cam; wheel provided with knurled head which permits the adjustment of object in relation to knife with pawl disengaged and held off wheel by spring catch; cam disc graduated in single microns, numbered from 0 to 25, and operated by knurled head, micrometer screw fitted with split nut provided with handles and releasing lever, by means of which feed can be instantly brought to beginning, or any intermediate position, and held; feed wheel protected by strong iron guard of neat design.

Object Holder—Consists of disc 25 mm in diameter, adjustable in mounting which permits of orientation to give any desired cutting angle; securely held in position by convenient screws; moves on a vertical slide actuated by a crank operated by a heavy balance drive wheel with handle and stopped when desired by convenient locking device.

Knife Block—Consists of heavy iron casting which is attached to base and holds knife in fixed position; adjustable to and from object and from side to side to permit use of entire cutting edge; knife clamp may also be tilted in its support to set angle of cutting edge as desired.

Dimensions—Length, 196 mm; width, 212 mm; height, 274 mm.
Case—Supplied in strong wooden box with handle.

Possible Attachments—Regularly furnished without knife, unless otherwise specified; knife No. 33744, 125 mm blade, without handle is recommended and can be included at its additional cost; rotary object clamp, No. 33732 or No. 33728, can also be attached, and the ribbon carrier, No. 33720.

33636. Minot Automatic Rotary Microtome, without knife, as described with three object discs 75.00

33744. Knife, 125 mm blade, without handle in case 4.75

MICROTOME, MINOT SIMPLIFIED ROTARY, BAUSCH AND LOMB, designed to meet the demand for a Rotary Microtome at less expense than the original Rotary No. 33636.

Feeding Mechanism—Consists of a micrometer screw revolved by a ratchet wheel which engages a pawl; amount of feed controlled by a cam; wheel provided with a small handle, permitting the adjustment of object in relation to knife with pawl disengaged and held off wheel by spring catch, cam disc graduated in steps of 2½ microns, up to 25 microns, and operated by large knurled head.

Object Holder—Consists of disc 25 mm in diameter, having fixed ball on stem universally adjustable in socket holder; can be oriented to give any desired cutting angle and securely clamped in place by convenient screw; stem of disc projects through holder permitting convenient adjustment from the rear, holder moves on a vertical slide actuated by a crank which is operated by a heavy balanced drive wheel with handle and stopped by a convenient locking device. Object holder on Minot Automatic Rotary Microtome No. 33636 can be substituted for that above if desired.

Knife Block—Consists of heavy iron casting which is attached to base and holds knife in fixed position; adjustable to and from object and from side to side to permit use of entire cutting edge; knife clamp may also be tilted in its support to set angle of cutting edge as desired.

Dimensions—Length, 196 mm; width, 212 mm; height, 208 mm.
Case—Supplied in strong wooden box with handle.

Possible Attachments—Regularly furnished without knife, unless otherwise specified, knife No. 33744, 90 mm blade without handle is recommended; rotary object clamp, No. 33732 or No. 33728 can be attached, as can also the adjustable knife holder.

33644. Minot Simplified Automatic Rotary Microtome as described, without knife and with three object discs 40.00

33744. Knife, 90 mm blade, without handle, in case 3.50

MICROTOME, MINOT AUTOMATIC PRECISION, BAUSCH AND LOMB. This microtome, designed and recently improved under the supervision of Dr. Minot is unequalled, we believe, for all around work of the most accurate nature. It is intended for very precise section cutting of large specimens, either paraffin or celloidin, but can be used for serial work as well and has given eminent satisfaction in some of the most exacting laboratories of the world.

FEEDING MECHANISM—Consists of a micrometer screw with an available feeding length of 35 mm, turned by a large ratchet wheel which engages a pawl and is controlled by a cam; cam disc graduated in single microns, numbered from 0 to 25, and operated by knurled head, micrometer screw fitted with our split nut provided with handles and releasing lever, by means of which feed can be instantly brought to beginning, or any intermediate position, and held; feed wheel protected by metal cover of neat design. With rack and pinion device for raising and lowering object clamp.

KNIFE SUPPORT—Consists of oblong frame, carefully machined, with T-slot on all four sides and having two knife clamps mounted in slots to place knife at any horizontal angle with relation to object.

DIMENSIONS—Length, 405 mm; width, 194 mm; height, 245 mm.
POSSIBLE ATTACHMENTS—Microtome regularly furnished without knife, Minot knife, No. 33689 is listed for use with this model; adjustable knife clamps No. 33694 for tilting, Zabriskie object clamp No. 33656, can also be attached, as can the ribbon carrier, No. 33724.

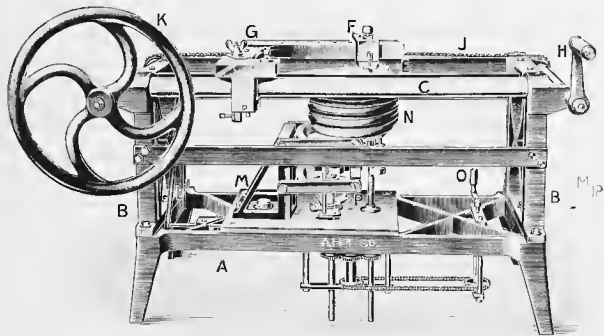
33652. Minot Automatic Precision Microtome, without knife, as described, 125.00

33656. Zabriskie Clamp for large objects, for use with above Microtome only 15.00

33660. Minot Knife, length 315 mm, in case 15.00

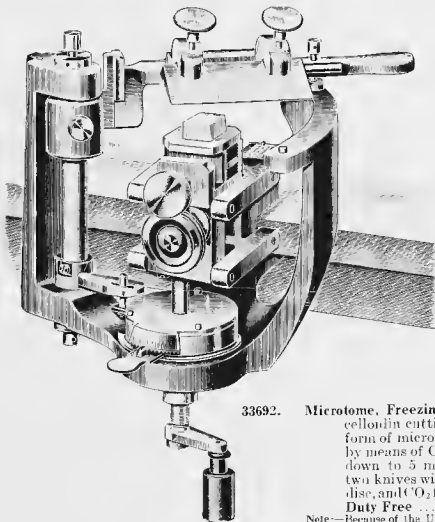
33664. Tilting Knife Clamps for Precision Microtome 7.50

33668. Minot Automatic Precision Microtome, with Zabriskie Clamp for objects 100 x 80 mm and less and with special clamps for elevating and tilting knife, as used at Rockefeller Institute for Medical Research, Neurological Institute and College of Physicians and Surgeons of New York City, etc. Complete 147.50

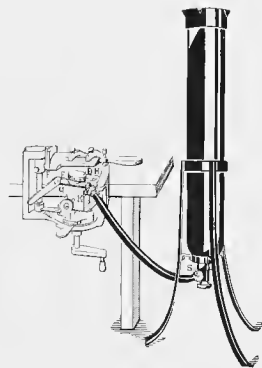


No. 33672

33672. **Microtome, Large Brain, Sartorius**, for cutting whole brain sections to a thickness of 15 microns. As used in leading neuropathological laboratories in both the United States and Europe. Will take a preparation 210 x 210 mm. The sectioning is done by the celloidin method and the knife operates under the surface of the alcohol. Special CO₂ freezing device may be used in connection with this microtome for freezing whole brain sections at extra price. Price includes one knife 45 cm long and wooden table for the microtome.
- | | | | | |
|--------|--|--------|-----------|--------|
| | Duty Free | 420.00 | Duty Paid | 560.00 |
| 33676. | Knife and Clamp to hold same in rectangular position for paraffin sections. | | Duty Paid | 40.00 |
| | Duty Free | 30.00 | | |
| 33680. | Extra Knife , 45 cm long for celloidin. | | Duty Paid | 28.80 |
| | Duty Free | 21.60 | | |
| 33684. | Object Disc , regular. | | Duty Paid | 20.00 |
| | Duty Free | 15.00 | | |
| 33688. | Object Disc , with clamp. | | Duty Paid | 28.00 |
| | Duty Free | 21.00 | | |

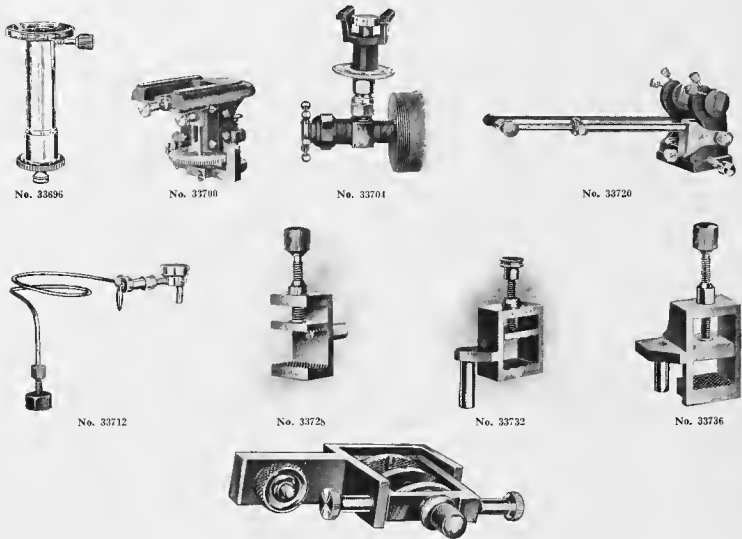


No. 33692

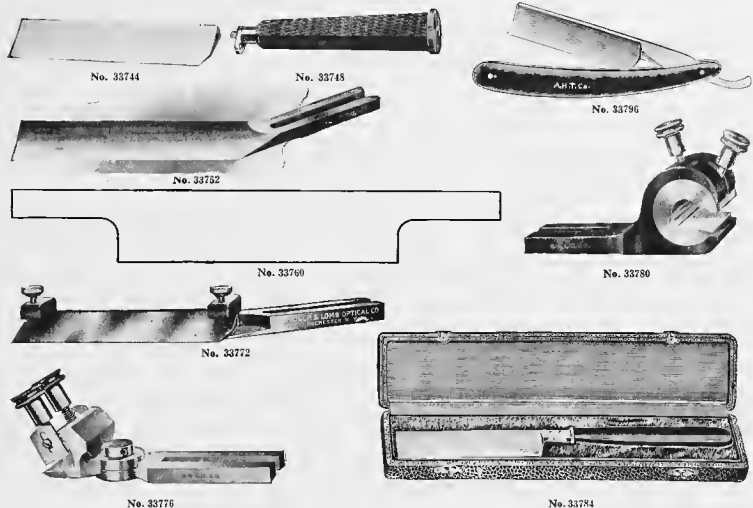


No. 33692—Attached to CO₂ Cylinder No. 29848

33692. **Microtome, Freezing, Sartorius**, suitable for both paraffin and celloidin cutting but widely used as the most convenient form of microtome for quick sectioning of specimens frozen by means of CO₂. With automatic adjustment for sections down to 5 microns in thickness. Including object clamp, two knives with box and springback for honing, embedding disc, and CO₂ freezing attachment but without CO₂ Cylinder.
- | | | | | |
|--|-----------|-------|-------|-------|
| | Duty Free | 37.25 | Stock | 50.00 |
|--|-----------|-------|-------|-------|
- Note—Because of the U. S. law requiring registration of cylinders in which CO₂ is sold we recommend the use of U. S. Standard Cylinders. See p. 252.



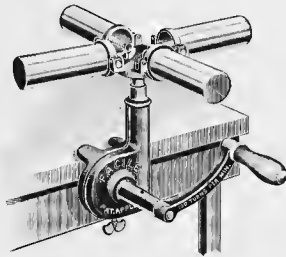
33696. **Microtome, Hand, Bausch & Lomb.** This convenient little microtome is carefully made and neatly finished. While designed primarily for cutting sections of stems and roots, it can be used for both animal and vegetable tissues. The feed is accurate and effected by means of a micrometer screw, the collar of which is graduated in steps of 25 microns each. Without knife..... 6.00
33700. **Microtome, Table, Bausch & Lomb.** This model attaches securely to a table edge or similar support and is adapted to all kinds of sectioning for thicknesses of 5 microns and over. It is used largely in work preliminary to surgical operations and by students in ordinary laboratory work. Without knife..... 12.50
33704. **Microtome Bardeen CO₂ Freezing, Bausch & Lomb.** This instrument was originally designed by Prof. C. R. Bardeen, formerly of Johns Hopkins University, now of the University of Wisconsin. It is indispensable for clinical work where sections of morbid tissues are required during an operation. The knife slides on glass guides. The finest feed is 20 microns. The object disc is scored concentrically and measures 36 mm in diameter. The microtome may be attached directly to a CO₂ cylinder. We recommend for use with this microtome a special knife No. 33708 with handle to fit the hand. Without knife..... 16.00
33708. **Special Knife**..... 4.00
33712. **CO₂ Freezing Attachment.** The freezing device in this attachment consists of a small metal cylinder. The object is placed on the flat disc top of the cylinder, which measures 36 mm in diameter, and is frozen by the expansion of the CO₂. This device is connected with the gas cylinder by a flexible copper tube, provided with a connecting nut for joining to the cylinder and the necessary adapter for fitting to the microtome. We furnish it also with an extra valve, which can be placed at either end of the tube. This attachment may be used with Students, Medium Laboratory, Automatic Laboratory or Table Microtomes. Complete with valve, but without cylinder of CO₂..... 9.00
33716. **CO₂ Freezing Attachment** as above but without valve..... 7.50
33720. **Ribbon Carrier**, for attaching to the knife block of either of the Minot Rotary Microtomes as shown in the illustration and is very useful in serial sectioning. The ribbon is of silk 40 mm wide, mounted on rollers and is easily operated by a knurled head..... 7.50
33724. **Ribbon Carrier**, same as above, for attaching to Precision Microtome..... 7.50
33728. **Object Clamp**, for Rotary Microtomes, to replace embedding disc. With closed back and open sides. Will take an object 26 mm thick..... 3.00
33732. **Object Clamp**, as above, but with closed sides. Will take an object 28 x 26 mm..... 3.00
33736. **Object Clamp, Coplin**, for Rotary Microtomes. Provides extreme rigidity and will take a block 32 x 29 mm..... 4.00
33740. **Object Clamp, Naples Universal** for the Automatic and Medium Laboratory Microtomes. Will accommodate a block 35 x 32 mm..... 15.00



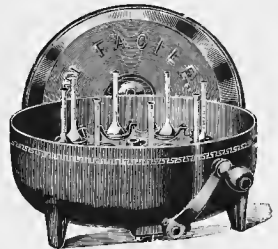
33744.	Microtome Knives, a plain, straight blade which may be held on the microtome either by the razor or knife holder, or by a special holder which supports the knife at both ends. The blades are true and evenly tempered. Base and rapidity in sharpening are secured by the use of an attachable ebony handle. Each knife is furnished in a velvet-lined case.	90	125	165
	Length of blade, mm.....	82	120	158
	Cutting edge, mm.....			
	Each.....	3.50	4.75	6.00
33748.	Handle for use in sharpening above knives.....			1.00
33752.	Microtome Knives, Shanked, for attaching directly to the knife block by means of the clamping screw. Each knife furnished in a velvet-lined case.	90	125	165
	Length of blade, mm.....	82	120	160
	Cutting edge, mm.....			
	Each.....	5.00	6.75	8.00
33756.	Microtome Knife, Shanked, 165 mm blade and 160 mm cutting edge. Same as No. 33752 but heavier.			10.00
33760.	Microtome Knife, Minot, for the Minot Automatic Precision Microtome. The handles are simply extensions of the back of which they are a part and have the same section, hence when the knife is placed in the clamps it is held perfectly true. The knife may be honed in the usual manner but, instead of stropping, the edge is polished by means of diamond powder on a plane glass plate, 315 mm long with cutting edge of 190 mm. In velvet-lined case.....			15.00
33764.	Glass Plate, for use in sharpening.....			1.25
33768.	Diamond Powder, per bottle.....			.50
33772.	Knife Holder designed to hold the plain knives for the Automatic and the Medium Laboratory Microtomes and for the Student Microtome. This holder is strong and rigid and when the knife is in position its upper surface is entirely exposed.	90	125	165
	To hold knife, mm.....	1.50	1.75	2.00
	Each.....			
33776.	Adjustable Knife and Razor Holder.....			4.00
33780.	Tilting Knife Clamp, for Precision Microtome, per pair.....			7.50
33784.	Section Knives, for Table or Hand Microtomes, or for free-hand sectioning. Of very best quality steel, with straight blade, flat on one side, and with fixed ebony handle. In case.....	75	95	125
	Length of cutting edge, mm.....	1.75	2.00	2.25
	Each.....			3.50
33788.	Section Razors, folding type with perfectly straight edge. Flat concave shape with blade 75 mm long.....			.85
33792.	Section Razor, same as No. 33788 but with both sides flat.....			1.00
33796.	Section Razor, same quality steel as above but better finished. Flat concave shape, with blade 100 mm long.....			1.25
33800.	Section Razor, same as No. 33796 but 75 mm long.....			1.00
33804.	" " " " No. 33800 but with both sides concave.....			1.00



No. 33932

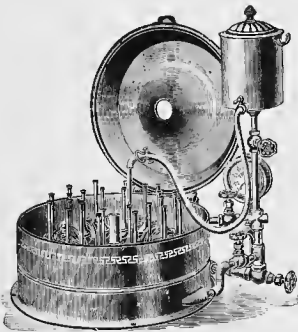


No. 33936

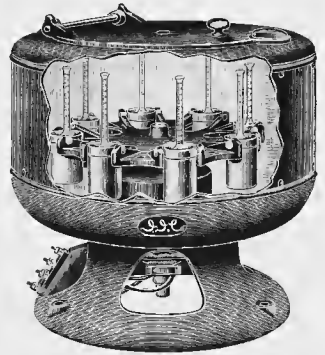


No. 33940

33924.	Lactometer, same as No. 33920 but 210 mm long . . . . .	.60
33928.	“ “ “ No. 33924 but with thermometer	1.50
33932.	Lactoscope, Feser, for determining the amount of fat in milk by its degree of translucency. With graduated pipette, in polished wooden case, complete with directions for use	4.50
33936.	Milk Tester, Babcock, fitted with deep, seamless brass tubes and malleable iron tinned head. Operates easily, without vibration or jar and may be readily attached to any table or bench. Complete with full set of glassware, consisting of test bottles, pipette, acid measure, bottle brush and bottle of acid. With directions for use.	
	Number of tubes	2 4
	Each	4.00 5.00
33940.	Milk Tester, Babcock, for hand operation, enclosed in cast iron case with cover. Operates easily and noiselessly at high speed. With complete set of glassware and directions for use.	
	Number of bottles	6 8 10 12
	Each	9.00 10.00 12.00 14.00

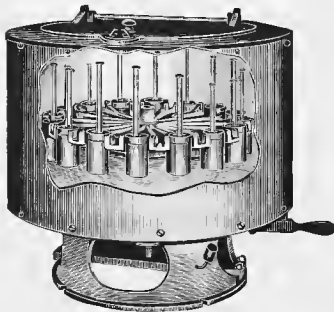


No. 33944

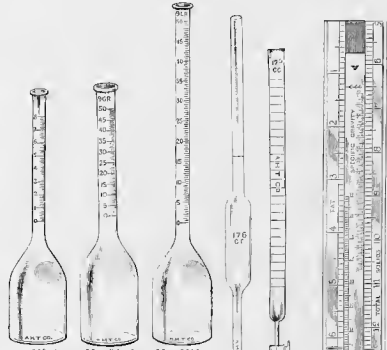


No. 33948

33944.	Milk Tester, Babcock, same as No. 33940, but for operation with steam turbine.	
	Number of bottles	12 18 24
	Each	25.00 27.50 30.00
33948.	Milk Tester, Babcock, International Electric Size 1, 8-Bottle. These are of same construction as the International Electric Centrifuges, for which the Babcock beads listed and shown here are interchangeable. With 8 trunnion buckets and with speed control rheostat but without glassware or heater.	
	Current	110 volts d. c. 220 volts d. c. 110 volts a. c. 220 volts a. c.
	Each	54.00 58.00 60.00 65.00
		60 cycles 80 cycles



No. 33952



No. 33964

No. 33968
6 in.

No. 33968
9 in.

No. 33972

No. 33984



No. 33976



No. 33980



No. 33988

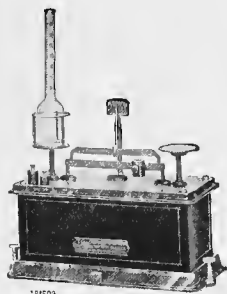


No. 33992



No. 34000

33952.	Milk Tester, Babcock, International Electric Size 2, 16-Bottle. The cups regularly furnished with this machine carry all the usual styles of 7 inch Babcock test bottles and, in addition the 9 inch cream test bottles may also be used. With 16 trunnion buckets, speed control rheostat and mechanical brake, but without glassware or heater.	110 volts d. c.	220 volts d. c.	110 volts a. c.	220 volts a. c.
	Each.....	76.00	80.00	105.00	107.00
33956.	Milk Tester, Babcock, International Electric Size 2, 24-Bottle. This is a modified form of the regular Size 2 Centrifuge, but of greater height, i. e., 40 inches and weighing about 200 lbs. With 24 buckets, speed control rheostat and mechanical brake but without glassware or heater.	110 volts d. c.	220 volts d. c.	110 volts a. c.	220 volts a. c.
	Each.....	125.00	130.00	140.00	145.00
33960.	Electric Heater for International Milk Testers, for convenience in heating the test bottles while in the centrifuge, operating on the same current as the motor.			33948	33952
	For Milk Tester Number.....			33948	33952
	Price of Electric Heater attached.....			11.50	12.50
	Glassware for Babcock Test, in accordance with the specifications formulated by the U. S. Bureau of Standards for standard Babcock glassware and adopted by the Official Dairy Instructors Association.				
33964.	Milk Test Bottle, 8%, 18 grams, so-called "0 inch" bottle. Each.....				.25
33968.	Cream Test Bottle, 50%, 9 grams. Length, inches.....				.40
	Each.....				.45
33972.	Pipette, Babcock, delivering 17.6 cc in 5 to 8 seconds at 20° C. Each.....				.20
33976.	Skim Milk Bottle, double bore, Patent. Graduated in.....				.30
	Each.....				.50
33980.	Acid Measure, 17.5 cc.....				.10
33984.	Acid Burette. Number of 17.5 cc charges.....	3	6	12	25
	Each.....	2.00	2.00	2.50	3.00
33988.	Combined Acid Bottle and Pipette. For storing acid and delivering charges of 17.5 cc.....				5.00
33992.	Milk Tester, Heeren (Pioscope), for determining the richness of milk by comparison with standard colors.....				1.00
33996.	Paper, Schleicher & Schüll, No. 571, fat extracted for milk analysis. See M. A. Adams, "Analyst," 1885, p. 46. In strips 56 x 65 mm. Per 50 strips.....				1.75
34000.	Slide Rule, Richmond, for calculating the total solids in milk.....				4.00



No. 40300



No. 40304



No. 40308



No. 40312

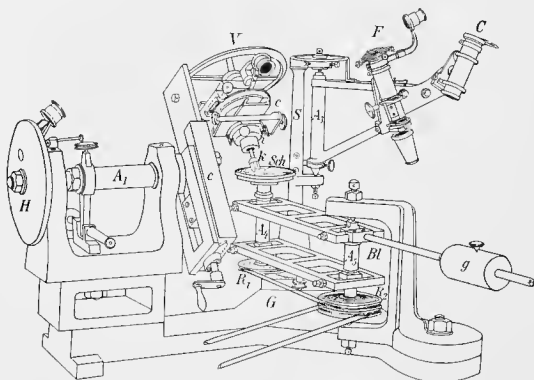
40300. Balance, Torsion, for cream test, with sliding tare weight, weight pan, special bottle holder and arrest; sensibility 1 centigram; with special 9 and 18 gram weights.
 For, bottles..... 1 2 4
 Each..... 12.00 13.00 15.00
40304. Fat Extraction Tube, Röhrig, for use in the Rose-Gottlieb method; 46 cm high with a capacity to base of neck of 87½ cc. The delivery tube with stopcock is so placed that its center line coincides with the surface of 23 cc of liquid in the main tube. With polished wooden base with indentation for flask, but without flask as shown in illustration. As used in the Dairy Laboratory, Bureau of Chemistry of the U. S. Department of Agriculture..... 2.25
40308. Galactometer, Adam, with two bulbs and glass stopcock..... 2.50
40312. Automatic Reckoner, Ackermann, for dry substances in milk, with directions..... 2.00



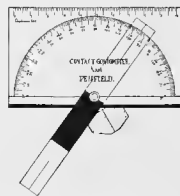
View in Salesroom showing special stands for the display of Beakers, Flasks, etc.

MINERALOGY, CRYSTALLOGRAPHY, PETROGRAPHY, ETC.

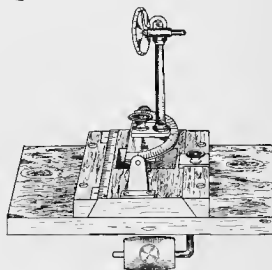
Note—We are enabled to offer by special arrangement with the maker, the optical measuring instruments for Crystallography as designed by Prof. Victor Goldschmidt, of Heidelberg. Original catalogue is sent on application.



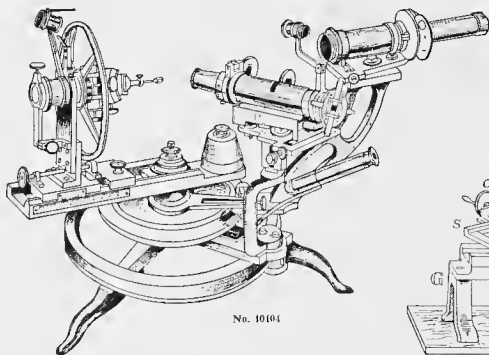
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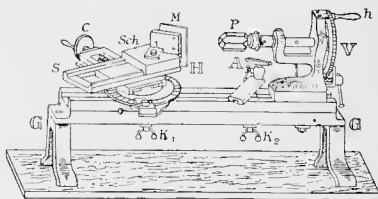
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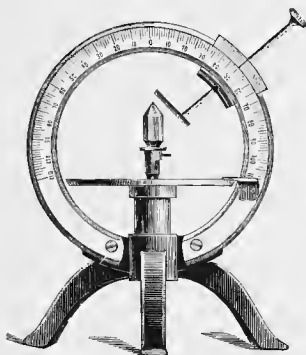


No. 10104



No. 40420

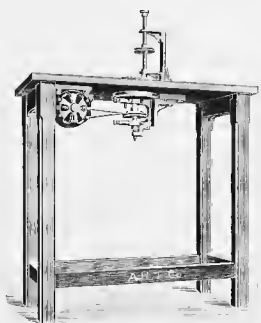
		Duty Free	Duty Paid
40400.	Goniometer, Grinding, Goldschmidt, complete as described in <i>Zeitschr. für Kristallogr.</i> , 1912, Bd. 51, Seite 359.	690.00	920.00
40404.	Goniometer, Two-Circle type, Goldschmidt, Model 1910, complete as described in <i>Zeitschrift für Kristallogr.</i> , 1898, Bd. 29, Seite 333.	360.00	480.00
40408.	Goniometer, Two-Circle type, Goldschmidt, as above, simplified model	240.00	320.00
40412.	Accessory to the above for the photography of oriented specimens	21.00	28.00
40416.	Application Goniometer, Penfield, pocket form, from stock		1.25
40420.	Crystal Modeling Apparatus, Goldschmidt, as described in <i>Zeitschrift für Kristallogr.</i> 1908, Bd. 45, Seite 573.	120.00	160.00
40424.	Mineral Sectioning Apparatus, Wülfing	11.40	15.20



No. 40432

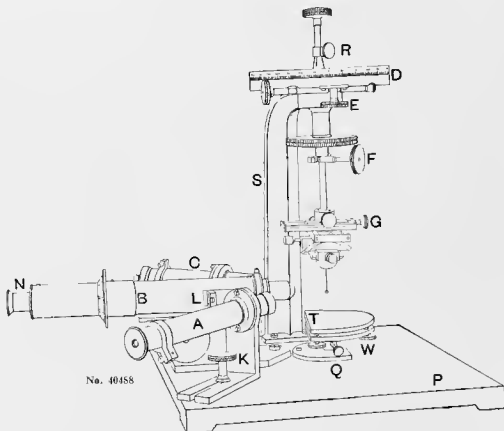


No. 40440



No. 40448

40428.	Goniometer, Goldschmidt, large model, for the measuring of very large crystals, complete as described in <i>Zeitschrift für Kristallogr.</i> 1910, Bd. 47, Seite 59.....	Duty Free 540.00	Duty Paid 720.00
40432.	Application Goniometer, Two-Circle type Goldschmidt, an improvement of the 1896 model, as described in <i>Zeitschrift für Kristallogr.</i> 1896, Bd. 25, Seite 321.....	11.40	15.20
40436.	Axial-Angle Apparatus, Wülfing, complete in accordance with <i>Neues Jahrbuch für Mineralogie</i> , 1899, Beil. Bd. 12, Seite 343.....	150.00	200.00
40440.	Tourmaline Tongs, with condensing lens. Price varies in accordance with the perfection of the tourmaline plates. A good specimen may be had for.....	7.50	10.00
40444.	Tourmaline Specimens, mounted in cork mounts, 4S x 2S mm, for demonstration of optical properties of crystals in polariscope, dichroscope, etc., and very suitable for use with tourmaline tongs, and illustrating all of the six crystal systems, are to be had at prices varying in accordance with the perfection of the specimens. On this account it is difficult to list these specimens but complete lists of the best European preparers will be sent on application.		
40448.	Grinding and Polishing Machine, Gasser, designed especially for the preparation of micro sections of bones and teeth. The table is rigidly constructed and is 1 meter in height, and is provided with a zinc dish in which the revolving lap operates, so that grinding may be done under water if necessary. The electric motor drives the lap at a speed of 1500 r.p.m. while above the table a heavy support carries the specimen spindle, provided with knob for hand guidance and adjustable ring for regulating the thickness of the specimen. The specimen discs are 5 cm in diameter. Bone sections may be ground and polished completely in ten minutes and teeth sections in 20 minutes. Outfit consists of apparatus with motor (Voltage must be specified in ordering), starting rheostat, connecting plug, two 15 cm grinding discs of different degrees of fineness, one 15 cm metal disc for polishing and four specimen discs.....	Duty Free 65.00	Duty Paid 80.00
40452.	Extra Grinding Discs, 15 cm, each.....	1.65	2.00
40456.	“ Polishing Discs, 15 cm, each.....	3.00	3.50
40460.	“ Specimen Discs, 5 cm, each.....	.70	.80
40464.	Grinding and Polishing Machine, for minerals and metals, identical in construction with above but with gear providing a speed of 2000 r.p.m. to the grinding disc and with disc 20 cm in diameter. With automatic gear for rotating the spindle carrying the specimen disc during the process. Removable lead weights provide means of regulating the pressure upon the specimen disc when automatic gear is used. An adjustment ring upon the spindle automatically ends the grinding when the desired thickness of specimen is reached. Outfit consists of motor (Voltage must be specified in ordering). With rheostat and connecting plug, two 20 cm grinding discs of silica-carborundum compound of different cutting capacities and 20 cm disc of metal for polishing and two specimen discs 5 cm diameter.....	Duty Free 92.40	Duty Paid 112.00
40468.	Grinding and Polishing Machine, as above, with two specimen spindles for simultaneously grinding two specimens and with four discs.....	118.80	144.00
40472.	Grinding and Polishing Machine, as above, with four specimen spindles for simultaneously grinding four specimens and with eight discs.....	151.80	184.00
40476.	Extra Grinding Discs, of Silica-Carborundum, 20 cm diameter, each.....	6.60	8.00
40480.	“ Polishing Discs, of metal, 20 cm diameter, each.....	4.00	4.80
40484.	“ Specimen Discs, each.....	.70	.80



GONIOMETER, HUTCHINSON UNIVERSAL, for use as an ordinary goniometer for the measurement of angles, as an axial-angle apparatus, as a Kohlransch total-reflectometer and for determining refractive indices by the prism method. It is intended primarily for the examination of small crystals and by its aid all the usual crystallographic and optical determinations can be readily carried out. In its design the attempt has been made to combine efficiency with simplicity and strength of construction, together with adaptability to a great variety of purposes.

A circle *D*, five inches in diameter, graduated to 1 degree and reading by a vernier to minutes, is supported by a stout bracket *S*, at a height of ten inches above a flat base-plate *P*, seven inches square. The circle is provided with a slow-motion attachment, and can be clamped by the screw *E*. A steel rod, which can be clamped at any convenient position by the screw *F*, passes through the centre of the circle and carries, at its lower end, the ordinary centering and adjusting arrangements shown at *G*. A loose collar, which can be clamped to the rod by the screw *B*, gives the means of raising the adjusting head and of again lowering it to its former position.

A telescope *A*, and a collimator *G*, are securely clamped to the base-plate in the manner shown at *K*, a number of holes being provided for this purpose at convenient positions. The object-glasses of the telescope and collimator are $\frac{1}{2}$ inch in diameter and about 4 inches in focal length. Their tubes are carried by collars, provided with adjusting screws. An additional lens of 2 inches focus is also supplied. This can be slipped into position in front of the objective of the telescope, thereby converting the latter into a microscope of low power with which the crystal can be examined.

The telescope and collimator are placed at any convenient angle to one another (some angle between 60° and 90° will be found suitable), and the microscope *B* is arranged so that its optical axis bisects the angle between them. The microscope tube, which is eight inches long, is moved by an ordinary coarse adjustment actuated by a pair of milled heads, one of which is seen in the figure just below the telescope. At one end it carries the fitting of an objective changer of the Zeiss pattern which enables different objectives to be rapidly slipped into position and provides a means of adjusting them to the axis of the microscope. Objectives of $\frac{1}{3}$ inch and of 2 inches focal length will be found the most generally useful, but others can be employed if desired. At the other end a nicol *N* slips on over the eye-piece; the latter and the nicol-holder are slotted to admit of the insertion of a quartz-wedge or mica-plate. A Bertrand lens *L* slides into the body of the microscope.

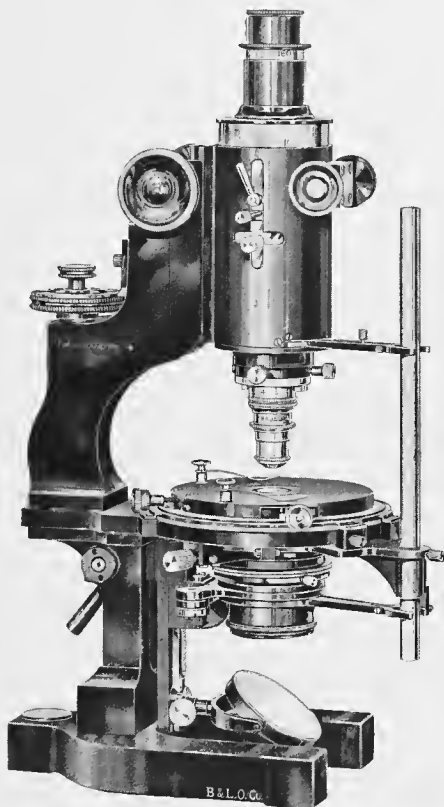
An adjustable table *T*, which can be levelled by the screws *W*, is carried by a steel rod which can be clamped by the screw *Q*; a loose roller clamped to the rod by a screw enables the table to be rotated when supported at any convenient height. On this table can be placed a tank, when it is desired to observe the crystal immersed in a liquid.

Two extra fittings, not shown in the figure, are also provided. One enables a short tube containing a nicol and a condensing lens to be placed opposite the objective of the microscope. The other can be clamped to the graduated circle; at its lower end it carries a collar into which the telescope *A* can be screwed, thus enabling the latter to be supported at the same height above the base-plate ($3\frac{1}{2}$ inches) as the collimator and microscope.

40488.	Universal Goniometer, as above, with 2 inch and $\frac{1}{3}$ inch microscope objectives and centering objective changes.....	Duty Free 210.00	Duty Paid 280.00
40492.	Special Objective, with centering changes and webbed eyepiece for using microscope as a telescope.....	15.00	20.00
40496.	Glass Tank, with optically plane face and Centigrade thermometer.....	5.60	7.50
40509.	Sliding tank holder.....	6.00	8.00
40504.	Case, for complete outfit.....	12.00	16.00



40512.	Dichroscope, von Lang, improved form, in case.....	Duty Free 4.20	Duty Paid 5.60
40516.	Dichroscope, with revolving stage and graduated circle, with spectroscopic attachment.....	12.00	16.00



No. 40529

MICROSCOPE, BAUSCH & LOMB PETROGRAPHICAL, RESEARCH MODEL LD. This microscope, except for certain mechanical details, is patterned after the microscope described by *F. E. Wright in Amer. Jour. of Science*, (4) 29, 407-414, 1910; also in "*The Methods of Petrographic Microscope Research*," Carnegie Institution of Washington Publication 158, 1911.

The special features of this research model are:—

Large Abbe Aplanatic Condenser, N. A. 1.40, which, together with an Abbe prism of 20 mm aperture, can be used both with high power and low power objectives.

Special Mounting for Polarizer, which can be swung in and out of axis of microscope at will.

Large Sensitive Tint Plate mounted in rotating carrier below condenser. This arrangement is superior in two respects to the usual method of inserting the plate above the objective: the optical system is not disturbed on insertion of the plate; the mounting enables the observer to rotate the sensitive tint plate and thus to vary at will the intensity of field illumination produced by the plate, also to pass from one quadrant to another. In very weakly birefracting minerals it is essential that the field illumination from the sensitive tint plate be very weak; otherwise the faint interference colors from the fine mineral grains, either in parallel or in convergent polarized light, will be veiled and lost to view in the intense illumination of the field produced by the sensitive tint plate in the usual diagonal direction.

Large Mechanical Stage, simple in design and construction and practically dust-proof, with a play of 24 mm in two directions at right angles, the divisions on the screw heads reading to 0.01 mm.

MICROSCOPE, PETROGRAPHICAL (continued)

Large space between stage and arm, necessary for manipulation of universal stage and other accessories; also for opaque mineral investigations in reflected light.

Objective clamp and rings of case-hardened steel.

Device for simultaneous rotation of Nicols.

Wide Draw Tube useful for photomicrographic work.

Entire analyzer carrier included within body tube and thus protected from dust. Even when the analyzer is withdrawn from axis of microscope, it is still within the tube.

Bertrand lens slide accurately constructed to insure exact centering. Below the Bertrand lens is an iris diaphragm and above it a small lens on an arm, which, together with eyepiece, forms a microscope focused on the plane of the iris diaphragm and enables the observer to bring the image of the object on the stage to coincidence with the plane of the iris diaphragm and thus to insure elimination of stray light from adjacent mineral grains in the case of the measurement of the optic axial angle of a mineral grain or plate in a specimen.

Rack and pinion movement for Bertrand lens, permitting one to raise or lower it and thus change the magnification of an interference figure from one to two diameters.

Specifications of Stand

Arm—Curved tube, providing ample vertical distance from stage to arm of 60 mm; horizontal distance from center of stage to base of arm, 80 mm.

Tube—Body tube, 55 mm outside diameter, with inner tube adjustable by rack and pinion (two heads) through a range of 25 mm; inner tube contains a Bertrand lens, with an auxiliary lens above it and an iris diaphragm below it, each adjustable from the right-hand side of the body tube; draw tube slides in metal fitting graduated in single millimeters and numbered 160, 170 and 180, taking standard sized (23 mm) eyepieces, which are supplied here with cross-hairs and the eye-lens adjustable for focusing upon them; notch in the upper edge of draw tube fires azimuth of the eyepiece; within the lower portion of the body tube the analyzer is mounted to slide in and out of the optical axis on the rotating arm; 45° slot in body tube with dust-proof shutter placed just beneath the analyzer for accessories; provided with non-detachable nose-piece, centering by means of two screws working at right angles in N and E positions.

Focusing Adjustments—Coarse adjustment by standard rack and pinion; fine adjustment of Baensch-Lomb lever type with micrometer screw head graduated in 100 parts, each equal to .0025 mm in vertical movement, and provided with a vernier sliding vertically to follow rise and fall of micrometer head for reading to .0005 mm; mechanism ceases to act when objective touches slide.

Stage—Leveling, with clamping device to set in any desired position; circumference graduated in single degrees with each tenth line numbered, the two verniers reading to 0.1°; two additional verniers, also reading to 0.1°, are attached to the support for bar connecting nicols; outside diameter of graduated circle, 112 mm; mounted on the revolving stage is an adjustable stage plate, 36 mm in diameter, with mechanical cross movements actuated by graduated heads set 90° apart, the graduations reading to 0.01 mm; stage aperture, 32 mm, with reducing disc having an aperture of 16 mm.

Substage—Adjustable by rack and pinion; carries condenser, iris diaphragm, selenite plate and polarizer.

Illuminating Apparatus—Automatic condenser, 1.40 N.A., with top two lenses removable, giving 0.40 N.A., with lower lens alone; placed in fixed substage arm with small set-screw and is easily removable; iris diaphragm below condenser; mirror, plane and concave, 50 mm in diameter, with fork in socket adjustable along substage support.

Polarizer—An Abbe's prism in revolving mount attached to swinging arm, permitting complete removal from optical axis; above the polarizer, attached to the iris diaphragm mount, is a revolving carrier for sensitive tint plate (30 mm outside diameter), itself carried in sliding mount allowing withdrawal from, and return to, optical axis.

Simultaneous Rotation of Nicols—Rigid bar is supported at plane of stage by arms moving through 90°, with two verniers to provide for reading angle of rotation; connection arms, with broad bearing surfaces, extending from analyzer and polarizer carriers engage bar in such a way as to permit free movement of body tube and substage when focusing and to eliminate lost motion; bar is movable in its support for instant release of arms, allowing independent rotation of polarizer or analyzer; a clamping device with milled head on one of the verniers sets the bar support against rotation, to permit the principal nicol planes to be set parallel with cross-hairs of eyepiece and to provide for rotating specimen on stage rather than rotating connected nicols.

Changing Nosepiece—Consists of two parts—the upper one with clamp permanently attached to centering nosepiece, the lower, a ring threaded to take objective; ring and socket in which it fits made of steel for long term service; with ring for each objective quick interchange is provided for.

Accessories Included—Bertrand lens, mounted; one selenite plate, mounted, to fit substage; one slide-plate to carry blue glass and ground glass for insertion below condenser iris diaphragm when sensitive tint plate is withdrawn from optical axis.

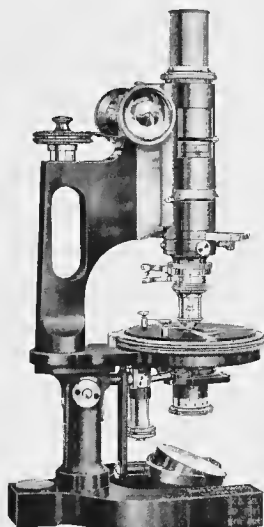
Finish—Principal parts in alcohol-proof black; smaller adjusting heads and bar nickel-plated; graduated circles in German silver.

Case—Of hard wood with polished finish, fitted with brass lock and key.

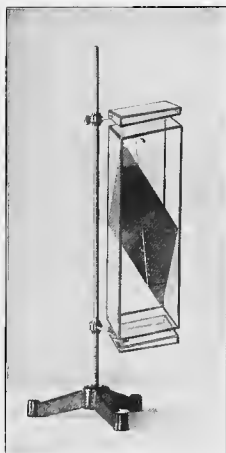
Outfit	Objectives	Cross-Hair Eyepieces	Quick Changing Nosepiece	Price
40520.	LD 16 mm, 4 mm	7.5X, 10X	With two rings	\$311.75
40524.	LD 32 mm, 16 mm, 4mm	7.5X, 10X, 12.5X	With three rings	320.00

For the measurement of the optical constants of mineral grains and plates, the following accessories are essential:

40528.	Universal Holder and Positive Eyepiece to be used with the following accessories.....	15.50
40532.	(a) Graduated Quartz Compensator for the measurement of birefringence.....	17.25
40536.	(b) Bi-Quartz-Wedge Plate for the measurement of extinction angles.....	19.50
40540.	(c) Co-ordinate Grating , 0.1 mm divisions, for the measurement of optic axial angles and for statistical mineral volume analysis after the Rosiwal method or the percentage area method.....	10.00
40544.	(d) Cap Analyzer with 2° graduations for use above positive eyepiece, fitting into recessed plate with means for a sufficient rotary adjustment to permit accurate setting of the index point with zero of the analyzer.....	8.00
40548.	Sliding Stop Eyepiece for the observation of interference figures from fine mineral grains; substituted for regular eyepiece; consists essentially of two adjustable slits at right angles with special eyepiece for focusing on the same.....	12.50
40552.	Adjustable Support for opaque objects; replaces condenser in substage; two adjustable screws set at right angles tilt the table in any direction desired; the object table revolves.....	10.00
40556.	New Model Vertical Illuminator	12.00
40560.	Petrographical Objective , 0.95 N. A., 4.5 mm E. F.....	8.00



No. 40564



No. 40572

MICROSCOPE, BAUSCH AND LOMB PETROGRAPHICAL TYPE LCH. The features of this new model are the unusually large space provided for manipulation of objects and super-stage accessories; the mounting of rotatable analyzer; the arrangement of the substage parts for quick change from polarized to ordinary and from parallel to convergent light. It is a high-grade instrument combining the efficiency and simplicity of adjustment which are commensurate with the requirements of laboratory work. In designing this instrument the Bausch & Lomb Optical Co., have had the kind assistance of Dr. Wright, of the Carnegie Institution of Washington, D. C.

Tube—Body tube, 35 mm outside diameter; draw-tube, sliding in metal fitting, graduated in single millimeters and numbered 160, 170 and 180; having slot for Bertrand lens, with an iris diaphragm above it; taking standard size (23 mm diameter) eyepieces, which are supplied here with cross-hairs and the eye-lens adjustable for focusing upon them; having two notches in upper edge for fixing the azimuth of the eyepiece; analyzer box slides in and out of body tube; slot in body tube with dust proof shutter placed just beneath analyzer for accessories; nosepiece with society screw thread, non-detachable, centering by means of two screws working at right angles in N and E positions.

Focusing Devices—Coarse adjustment by standard rack and pinion; fine adjustment of Bausch & Lomb lever type with micrometer screw head graduated in 100 parts, each equal to .0025 mm in vertical movement, and provided with a hinged vernier for reading to .0005 mm, mechanism ceases to act when objective touches slide.

Stage—Revolvable; circumference graduated in single degrees with each tenth line numbered, the double vernier reading to one-tenth degree in both directions; diameter of stage outside of graduations 102 mm, inside 90 mm; stage plate, vulcanite-covered, having inlaid for orientation two millimeter scales at right angles, 30 mm long, with each tenth line numbered.

Substage—Adjustable by long-range quick-acting screw, turning to the left completely clear of the optical axis when screw reaches limit of downward movement; carrying condenser, iris diaphragm and polarizer.

Illuminating Apparatus—Three-lens condenser, 1.10 N.A.; upper lenses in swinging arm operated by knurled head at the side, providing for quick change from convergent to parallel light without disturbing any of the other substage parts; iris diaphragm below condenser; mirror plane and concave, 50 mm diameter, on swinging arm with spring clip for central position.

Polarizer—A Nicol prism (angular field 19°) in revolving mount graduated in 15 degree parts, each alternate line numbered—0, 30, 60, 90 and so on up to 330; entire mounting with prism removable from optical axis by a double-swing movement to one side.

Analyzer—A Thompson prism, revolvable a quarter turn, in sliding-prism-box which carries graduations and indicator allowing withdrawal and return to optical axis without disturbing the reading on scale. Graduations in 5 degree parts, numbered 0, 30, 60 and 90.

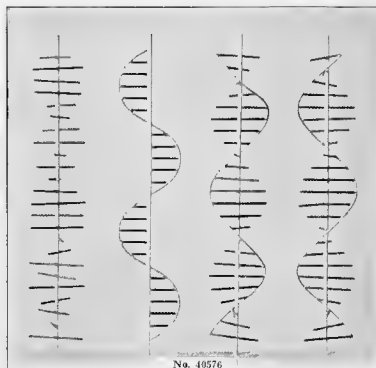
Changing Nosepieces—As shown in illustration, consists of two parts, the upper one with clamp screwing into centering nosepiece—the lower, a ring threaded to take objective. The ring and the socket in which it fits are made of steel for long service. With a ring for each objective, quick interchange is provided for.

Accessories Included—One selenite plate, mounted, one quartz wedge, mounted, one Quarter Undulation plate, mounted, and Bertrand lens, mounted; pinhole cap fitting draw-tube for observation of interference figures after Loauis method.

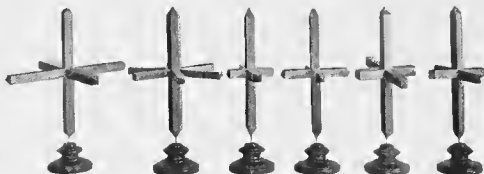
Finish—Main parts including body-tube in alcohol-proof black, pinion heads and adjacent parts in natural brass color, adjusting heads nickel plated; all graduations in German silver.

Case—Of hardwood with polished finish; fitted with brass lock and key.

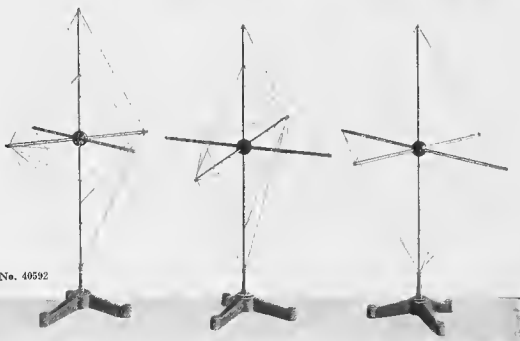
Outfit	Objectives	Cross Hair Eyepieces	Quick Changing Nosepieces	Price
40564.	LCH2 16 mm 4 mm	7.5 × 10 ×	With Two Rings	153.65
40568.	LCH4 32 mm 16 mm 4 mm	7.5 × 10 × 12.5 ×	With Three Rings	160.00
40572.	Glass Model of Nicol Prism, Vrba, on adjustable support, 30 cm in height, for lecture table use, duty free.			7.35



40576. **Polarization Model, Vrba**, consisting of four metallic rods with crosspieces of various lengths set at right angles thereto and representing:—
1. The ether vibrations in an ordinary beam of light, i.e. vibrations in various planes.
 2. " " " " a plain polarized beam of light, i.e. vibrations all in one plane.
 3. " " " " circular polarized beam of light, i.e. vibrations in a spiral plane, laevo-rotary.
 4. " " " " circular polarized beam of light, i.e. vibrations in a spiral plane, dextro-rotary.
- Set of 4 models 6.50
40580. **Glass Rhombohedron, Busz**, for demonstration of double refraction in calcspar, on adjustable support with base, duty free 6.75



40584. **Models of Crystal Axes**, a set of six wooden axes showing the axial arrangement of each of the six crystal systems, 15 cm size. When ordered with models, duty free 4.50
40588. **Models of Crystal Axes**, as above, 25 cm size, duty free 6.30

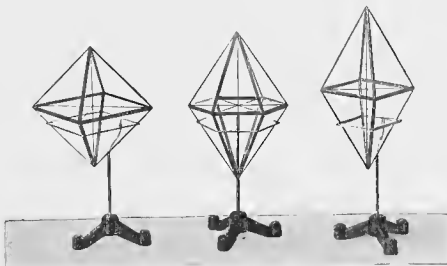


40592. **Models of Crystal Axes**, consisting of a set of six metal supports with colored silk threads to indicate positions of surfaces. The models are 38 cm in size, with supports and are very well suited for lecture table demonstrations, duty free 24.00
40596. **Models of Crystal Axes**, as above, 50 cm size, duty free 30.00



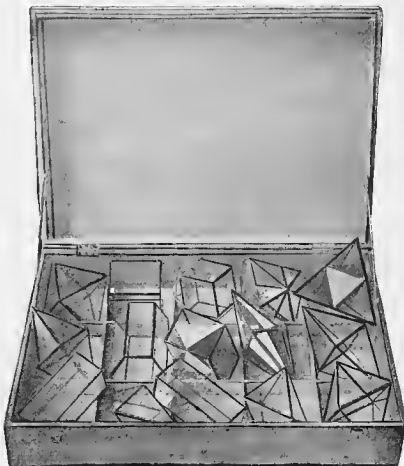
No. 40600

40600. **Crystal Models, Pear Wood**, consisting of a set of 30 models demonstrating the simpler fundamental forms of the six crystal systems as follows:—
- | | |
|--|--|
| <p>I. Regular, Nos. 1 to 13.
 II. Hexagonal, Nos. 14 to 19.
 III. Tetragonal, Nos. 20 to 23.</p> | <p>IV. Rhombic, Nos. 24 to 27.
 V. Monosymmetrical, Nos. 28 and 29.
 VI. Asymmetrical, No. 30.</p> |
|--|--|
- Models, as above, with 5 cm models, in polished compartment case, from stock 10.00
 " " " 10 cm " " " " duty free 18.75
40604. **Crystal Models, Pear Wood**, consisting of a set of 20 models supplementing the preceding set of 30 and which add some of the more ordinary combinations and twin developments.
 Models, as above, 5 cm size, in polished compartment case, from stock 12.00
 " " " 10 cm " " " " duty free 17.40
40608. **Crystal Models, Pear Wood**, lecture table set of 30 models, each of 20 to 25 cm size, with blackened surfaces for marking with crayons. The arrangement of the models is exactly the same as in set No. 40600. Imported to order only, duty free 24.60
40612. **Crystal Models, Pear Wood, Hintze**, consisting of a set of 50 models including the holohedral, hemihedral and tetartohedral forms, to which are added the designations of the new arrangement by Groth, *Physikal. Krystallographie*, 4. Aufl. and Liebisch, *Grundriss der physikal. Krystallographie* 1896.
 Models, as above, 5 cm size, in polished compartment case, duty free 21.60
 " " " 10 " " " " " " " duty free 60.00



No. 40616

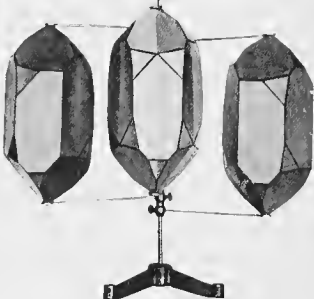
40616. **Crystal Models, Glass**, with colored silk axes, consisting of a set of six models representing the six crystal systems with a typical form of large size, i.e., 20 to 25 cm, from each system; specially adapted for lecture table use. In case without supports, from stock 9.00



No. 40620



No. 40652



No. 40660

40620. Crystal Models, Glass, consisting of a set of 15 models of the same size and execution as the above but representing the more important fundamental forms of the six systems. In polished wood case; duty free 14.40

Crystal Models, Glass, consisting of a set of 98 of the same size as above, i.e., 20 to 25 cm, and same execution as the preceding sets, composed of six separate collections which may, if desired be ordered separately as follows:

- 40624. Crystal Models, Set B, 14 models showing the simpler pyramidal and prismatic forms of the six crystal systems and their relative position to each other. In polished wood case. Duty free... 13.20
 - 40628. Crystal Models, Set D. 30 models showing the simpler fundamental forms, with colored axes in polished wood case. Duty free..... 34.20
 - 40632. Crystal Models, Set E, 10 models showing the simpler hemihedral forms, the holohedral form being made of cardboard and enclosed in the former. In polished wooden case. Duty free.. 16.80
 - 40636. Crystal Models, Set F, 18 models showing the simpler combinations; in polished wooden case. Duty free..... 30.00
 - 40640. Crystal Models, Set G, 16 models showing the complex crystals of holohedral and hemihedral forms. The combination is made of cardboard and is shown inside the glass model which corresponds to the faces of the simpler form of the combination. In polished wooden case. Duty free 26.70
 - 40644. Crystal Models, Set H, 10 models of twin crystals arranged so that each part may be rotated about the twinning axis. In polished wooden case. Duty free 20.40
 - 40648. Complete Set of 98 Models, consisting of six collections as above, without boxes and if ordered at one time, duty free 108.00
 - 40652. Crystal Models, Cardboard, Vrba. These models are of the large lecture table size, i.e., 16 to 25 cm, and are stoutly made of sized cardboard with yellow faces and black binding. Complete arrangement of 60 models, duty free..... 40.50
 - 40656. Crystal Models, Cardboard, Vrba, as above, but a smaller set consisting of 30 representative models, duty free..... 21.00
- Note—For large collections of 520 models arranged by Vrba, send for Krantz special catalogue No. 11.
- 40660. Supports for Crystal Models, Vrba, a three-arm support for simultaneously displaying three large glass or cardboard models. When ordered with models, duty free..... 3.60
 - 40664. Supports for Crystal Models, Krantz, a new set of ten holders on individual bases, suitable for demonstrating all ordinary forms; duty free..... 13.50
 - 40668. Supports for Crystal Models, a simplified set to support the six principal forms, on adjustable support with base, duty free..... 9.00



No. 40800



No. 40804



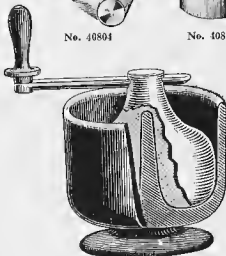
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No. 40820



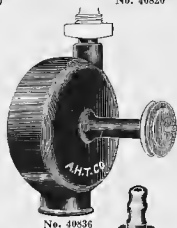
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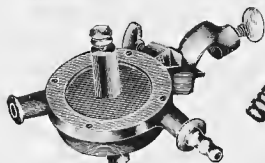
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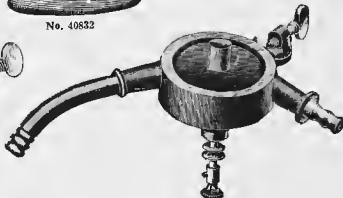
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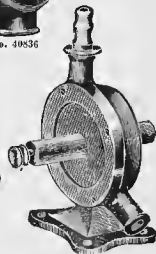
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No. 40840

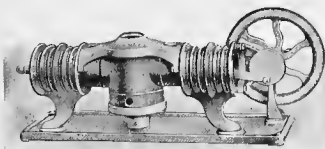


No. 40848

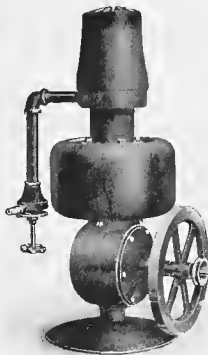


No. 40844

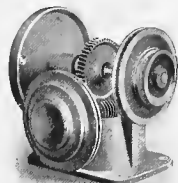
40800.	Mortars, Agate, carefully selected. With pestle. Dimensions given are outside.								
	Diameter, mm.....	35	40	50	65	75	90	100	120
	Each.....	1.50	1.75	2.00	3.50	4.50	7.00	8.50	15.00
40804.	Mortar, Diamond, Leads, of hardest steel.								2.00
40808.	“ Plattner, of hardest steel. Outside diameter, mm.....							15	25
	Each.....							4.00	6.00
40812.	Mortars, Glass, with pestle. Capacity, ounces.....			2		4		8	16
	Diameter, inches.....			2 1/4		4		4 1/2	5 1/2
	Each.....			.20		.30		.40	.90
40816.	Mortars, Iron, with pestle. Actual capacity, cc.....			250		350		750	1300
	Outside diameter, inches.....			4 1/4		4 1/2		5 1/2	6 1/2
	Each.....			.50		.60		.75	1.25
40820.	Mortars, Porcelain, with spout and pestle, glazed outside, rough inside.								
	Outside diameter, mm.....	65	80	110	130	150	175	200	260
	Each.....	.15	.20	.40	.50	.70	.90	1.10	2.40
40824.	Mortars, Porcelain, with spout and pestle, glazed inside and outside.								
	Outside diameter, mm.....	65	80	110	130	150	150	175	200
	Each.....	.30	.35	.55	.65	.80	.80	1.20	1.35
40828.	Mortars, Hard, Acid-proof Stoneware, so-called "Wedgewood," with pestles with wooden handle.								
	Diameter, inches..	3 1/2	3 1/2	4	4 1/2	5	5 1/2	6 1/2	7 1/2
	Each.....	.35	.40	.45	.50	.60	.70	.85	1.00
	Diameter, inches..	8	9	10	10 1/2	11 1/2	12 1/2	13	14
	Each.....	1.25	1.50	1.85	2.40	3.00	3.50	4.10	4.75
40832.	Mortar, Iron, Buck, for grinding and amalgamating. By rotation of the miller a large sample of quartz may be ground in contact with quicksilver. Diameter, inches.....							6	8
	Each.....							6.00	9.00
40836.	Motor, Water, for direct attachment to faucet; with 80 lbs. pressure will furnish 1/2 H.P. With pulley. 5.00								
40840.	Motor, Water, Rabe, improved construction with 75 mm diameter turbine, and clamp to hold same on an ordinary apparatus stand in either a vertical or horizontal position.....								5.00
40844.	Motor, Water, Rabe, same as No. 40840 but to screw on table.....								6.00
40848.	“ “ “ with clamp for vertical apparatus stand so that turbine revolves in a horizontal position. Convenient for stirring devices and with clamp to shaft to attach rods and other forms of stirrers and with long delivery tube to carry waste water away from apparatus.....								8.00



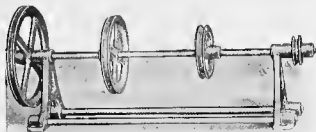
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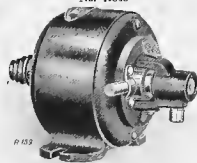
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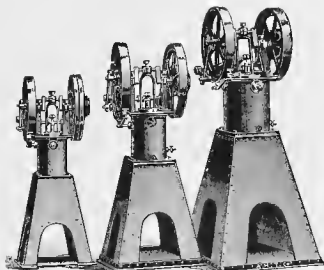
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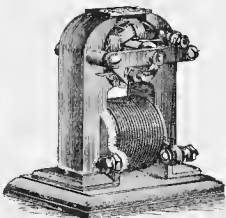
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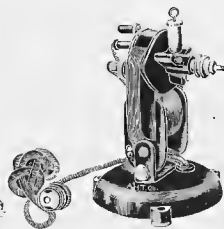
No. 40876



No. 40872



No. 40850



No. 40884

40852. **Motor, Hot Air**, may be used with either gas or alcohol; diameter of fly-wheel 6 inches, belt pulley 1 1/2 inches; speed about 300 r. p. m.; consumes 3 cu. ft. of gas per hour..... 15.00
40856. **Motor, Hot Air**, 1/2 H. P., similar to No. 40852 but larger; speed 300 r. p. m. With gas burner... 35.00
40860. " " " same as No. 40860 but for gasoline burner..... 40.00
40861. **Countershaft**, for use in power transmission with small laboratory motors; shaft 12 inches long, 1 1/2 inches in diameter with pulleys 1, 2, 3 and 4 inches in diameter..... 1.50
40868. **Speed Reducing Gear**, for small laboratory motors. Useful for converting the high speed of a motor into a slow, powerful motion. The round plate may be removed and apparatus directly connected to shaft of motor. The fast running pulley is provided with three grooves and the slow with two, thus effecting a wide range of speeds..... 5.00
40872. **Motor, Hot Air, Heinrici**, noiseless, and absolutely safe; for operating with gas burner. Motors of 1/2 H. P. can be furnished on special order for alcohol burner without increase in price. Motors of the four larger sizes are furnished on special order with either alcohol burner or patent petroleum burner at slightly extra prices.
- | | | | | | |
|-----------------------------|-------|-------|-------|-------|--------|
| Horse Power, approx..... | 200 | 200 | 180 | 160 | 140 |
| Revolutions per minute..... | 200 | 200 | 180 | 160 | 140 |
| Duty Free..... | 22.50 | 28.80 | 39.00 | 60.00 | 87.00 |
| Duty Paid..... | 30.00 | 38.40 | 52.00 | 84.00 | 116.00 |
40876. **Motors, Electric**, small ventilating type for operation on either direct or alternating current and either 110 or 220 volts circuit, with triple pulleys, 3/4, 1/2 and 3/8 inch in diameter. Current and voltage must be specified in ordering.
- | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|
| Horse Power..... | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| Revolutions per minute..... | 1000 | 1500 | 2000 | 3000 | 3000 |
| Each, for 110 volts..... | 12.50 | 12.50 | 12.50 | 12.50 | 12.50 |
| Each for 220 volts..... | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 |
40880. **Motor, Electric**, for operating on battery circuit, for any voltage up to 5 volts; size 3 1/2 x 4 1/2 x 4 1/2 inches high; weight 3 1/2 lbs.; pulley 3/4 inch diameter..... 4.50
40884. **Motor, Electric**, with variable speeds, i. e., from 100 to 1800 r. p. m.; without motor. Adjustable to any angle. For use on either 110 or 220 volt circuits. In ordering please specify voltage and whether current is direct or alternating..... 7.00



No. 4088



No. 4089



No. 4086



No. 4090



No. 4091



No. 4092



No. 4093



No. 4094



No. 4095

40888. Mould, Pouring, of cast iron, with three conical cavities 2 inches in diameter, with wooden handle. . 1.00

40892. Mould Pouring, of cast iron, with hemispherical cavities 1 1/4 inches in diameter, with 6 cavities. . 1.00

40896. Muffles, Battersea, regular form. Dimensions given are outside.

Number	B	C	D	E	F
Length, inches	7 1/2	8	8 1/2	9	10
Width, inches	4 1/2	4 1/2	5	5 1/2	6
Height, inches	2 1/2	3	3 1/2	3 1/2	4
Each	.45	.55	.65	.70	.80

40900. Muffles, Opaque Fused Silica.

Length, inches	4 1/2	7 1/2	6 1/2	9 1/2	9 1/2	15	15
Width, inches	2 1/2	3	4 1/2	5 1/2	6 1/2	9 1/2	11
Height, inches	2 1/2	3	3 1/2	5	4 1/2	6 1/2	7
Each	1.85	2.50	2.50	4.25	3.75	7.00	10.00

40904. Muffles, Alumina, D shaped.

Length, inches	4 1/2	4 1/2	6 1/2	7	9 1/2	12	12 1/2	13
Width, inches	3 1/2	3 1/2	5	4 1/2	5 1/2	6 1/2	7 1/2	6 1/2
Height, inches	2	2 1/2	3 1/2	3 1/2	3 1/2	4 1/2	4 1/2	4 1/2
Each	1.75	2.25	3.50	3.25	4.50	6.00	6.50	7.00

40908. Needle, Inoculating, a glass rod with 1 1/2 inches of No. 26 platinum wire fused in end. 50

40912. Needle, Inoculating, same as above but with 3/4 inches of No. 24 platinum wire. 1.00

40916. " " Kolle, consisting of a holder entirely of aluminum with a non-conducting inset to prevent extreme end from heating, without platinum loop. 80

40920. Needle, Inoculating, Kolle, new form, with demountable hard rubber handle, without platinum loop 1.20

40924. Needles, Inoculating, Ravenel, consisting of No. 24 platinum wire securely mounted in an aluminum rod with protecting cover made of a glass tube with one end closed. Furnished either with a straight needle or twisted loop. Style Straight Twisted

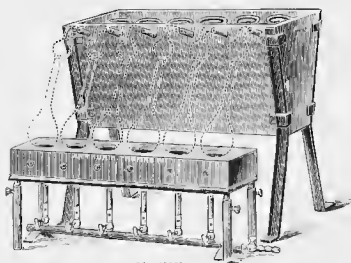
Each	.80	1.50
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40928. Needle, Inoculating, Roseberger, consisting of a rosewood handle with clamp for conveniently inserting platinum wire. 50

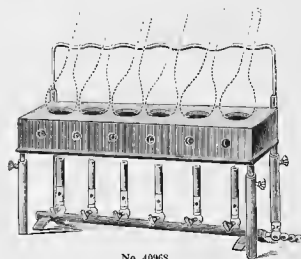
40932. Needle, Inoculating, same as above, but with 1 1/2 inches of No. 26 platinum wire. 75

40936. "Platinid" Wire, as recommended by Neisser for use in inoculating needles because of the present high price of platinum. Per foot. 10

APPARATUS FOR THE DETERMINATION OF NITROGEN



No. 40960



No. 40964

40960. Kjeldahl Distilling Apparatus, complete, consisting of No. 40964 Condenser with block tin tubes and Burner Shelf No. 40968. With burners but without glass flasks or connecting tubes.

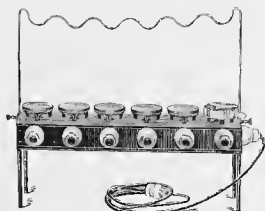
Number of burners	6	10
Each	42.00	60.00

40964. Kjeldahl Condenser, only, of copper, with coils of block tin, as shown in Kjeldahl outfit No. 40960.

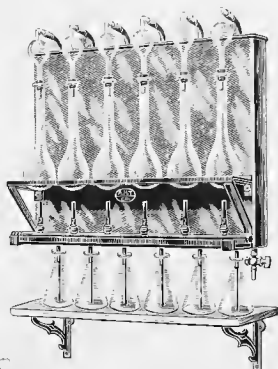
Number of coils	6	10
Each	28.00	42.50

40968. Kjeldahl Digesting Shelf with burners, with iron support for the necks of the flasks when used for digestions. This is identical with the distilling shelf used in outfit No. 40960

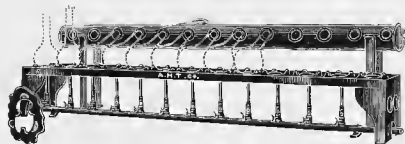
Number of burners	6	10
Each	17.50	24.00



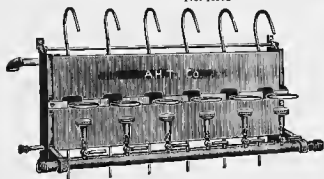
No. 40972



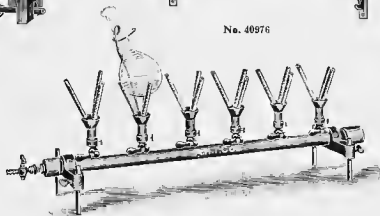
No. 40976



No. 40992

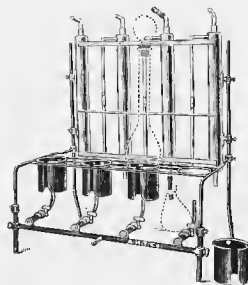


No. 40984



No. 40988

40972. Kjeldahl Digesting Shelf, Electric, same as No. 40968 but with individual electric heaters. Voltage must be stated in ordering. Number of heaters 6 10
 Each..... 40.00 64.00
40976. Kjeldahl Distilling Apparatus, improved form, made to hang on the wall. A very convenient apparatus for food chemists in the determination of ammonia and nitrogen. The burners, flasks and receivers are handled from the front and without interference. The burners are adjustable and may be used with natural, illuminating or gasoline gas. Condenser of heavy copper with block tin tubes. With six burners, but without glassware..... 60.00
40980. Kjeldahl Distilling Apparatus, same as above but with support to stand on table. With six burners. 63.00
40984. Kjeldahl Distilling Apparatus, Folin Modification, of heavy tinned copper, with quickly removable, adjustable and interchangeable ring supports of both 4 and 5 inch diameter. The copper still proper is bolted between cast iron end brackets by which the entire apparatus is fastened to the wall. Number of burners..... 6 12
 Each..... 35.00 60.00
 Extra Rings 5 inch, Each..... .30
 " 4 " Each..... .25
40988. Kjeldahl Digesting Rack, Folin Modification, which obviates the use of a shelf as the burners and bulb rack are a self-contained unit. Supports for the necks of the flasks are not regularly included because it is better to allow the necks to rest directly in the lead pipe connected with ventilating tube. Individual supports are furnished extra if desired.
 Number of burners..... 6 12
 Each..... 15.00 25.00
40989. Individual Rack Supports for necks of flasks, each..... .20
40992. Kjeldahl Digesting Shelf, Johnson, as used in the Connecticut Agricultural Experiment Station. Of heavy cast iron. The flask heaters are 4 1/2 inches apart from center to center and the flasks are supported by placing their necks within the openings in the large lead pipe which should be connected with the ventilating system. Each burner is furnished with stopcock and the price includes the lead pipe, 4 inches in diameter, on separate stand.
 Number of burners..... 6 10 13
 Each..... 34.00 44.00 50.00
40996. Kjeldahl Digesting Shelf only as listed in above outfit; without lead pipe or glassware.
 Number of burners..... 6 10 13
 Each..... 24.00 30.00 33.50



No. 41000



No. 41012



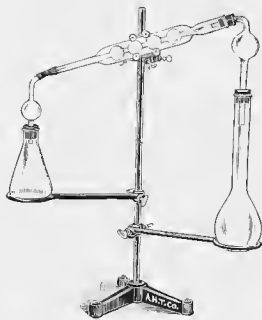
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No. 41020



No. 41024



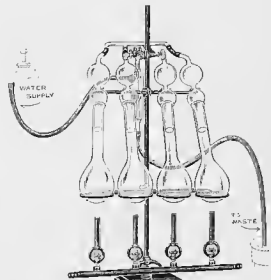
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No. 41028



No. 41032



No. 41004

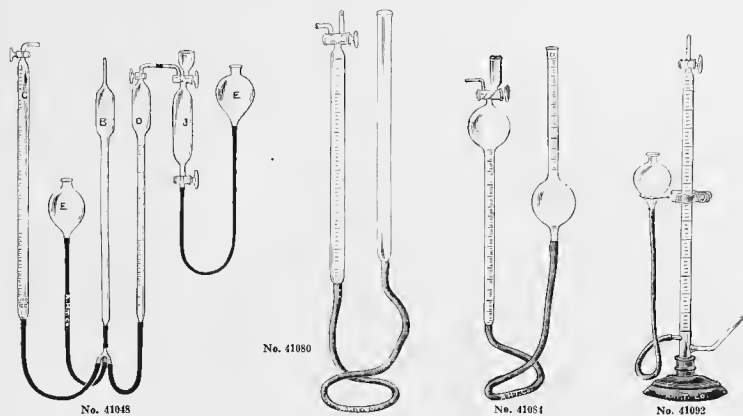


No. 41036



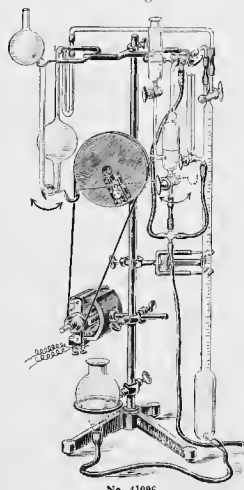
No. 41040

41000.	Kjeldahl Distilling Apparatus, new form, with individual condensers, light and portable and offers the advantage of complete adjustment in all directions so that different size flasks and connecting bulbs may be used. Each burner is furnished with a removable protecting shield and condenser jackets are of brass with condensing tubes of heavy block tin. With out glassware.	4	6
	Number of condensers.....		
	Each.....	30.00	40.00
41004.	Digestion Apparatus, Fumeless, Sy. See <i>Journal of Industrial and Engineering Chemistry</i> , September, 1912. With this apparatus digestions can be made without the use of a fume closet in any place having a water supply and drain. All fumes are disposed of by means of a filter pump and the price includes filter pump, connecting bulb tubes, stand, burners and four 500 cc Jena Kjeldahl flasks.		15.00
41008.	Kjeldahl Distilling Apparatus for Single Determinations. Convenient where but little work is to be done. Complete as illustrated, including glassware.		5.00
41012.	Kjeldahl Connecting Bulbs, spherical form, with one curved tip at top.	52	65
	Each.....	.50	.60
41016.	Kjeldahl Connecting Bulb, Jennings, as used in water analysis. With tubulature in bulb.		.75
41020.	Kjeldahl Connecting Bulbs, cylindrical form, with two curved tips inside of the bulb.	45	55
	Diameter of bulb, mm.....	100	120
	Length of bulb, mm.....	.65	.75
	Each.....		
41024.	Kjeldahl Connecting Bulbs, Hopkins, with single straight tubulation inside of bulb.	50	65
	Diameter of bulb, mm.....	.50	.60
	Each.....		
41028.	Nitrogen Bulb, Fresenius.....		.50
41032.	" " Vollhardt.....		.50
41036.	" " latest form.....		.60
41040.	" " Will-Varentrapp, with three bulbs.....		.35
41044.	" " " " " four ".....		.45



41048. Nitrometer, Dupont, latest modification. For original description see *Journal of the Society of Chemical Industry, 1900, p. 182*. As used by the manufacturers of explosives. Glass parts only, without support..... 18.75
- | | | | |
|---|------|---|-------|
| 41052. B. Compensating Tube, only..... | 1.75 | 41076. L. Large Iron Support with six uprights fitted with rings, rack and pinion movement for levelling bulb, etc. Made to order only..... | 50.00 |
| 41056. C. Large Measuring Tube, only..... | 4.00 | Note—For suitable tubing for use with above see our No. 46225. | |
| 41060. D. Levelling Reservoir, only..... | 5.00 | | |
| 41064. E. Levelling Reservoir, only..... | .75 | | |
| 41058. J. Reaction Bulb, only..... | 6.00 | | |
| 41072. K. Three-way Tube, only..... | .50 | | |
41080. Nitrometer, Lunge, with rubber tubing, but without support. Capacity... 50 cc in $\frac{1}{10}$ ths. 100 cc in $\frac{1}{5}$ ths
- | | | |
|-----------|------|------|
| Each..... | 4.00 | 4.50 |
|-----------|------|------|
41081. Nitrometer, Lunge, as used in the determination of nitrogen in gun powder, nitro-glycerine, dynamite, etc. Graduated from 100 to 140 cc in $\frac{1}{10}$ ths. With rubber connection but without support. 6.00
41088. Nitrometer, Lunge, same as No. 41081 but complete with support and clamps..... 10.00
41092. " Schiff, graduated to 100 cc in $\frac{1}{10}$ ths, on support, with reservoir, special clamp and rubber tubing..... 7.00

41096. Apparatus for the Gasometric Determination of Aliphatic Amino Groups, Van Slyke. See *Journal of Biological Chemistry VII, p. 275, 1911*, and *XVI, p. 121, 1913*, also *Abderhalden's Handbuch der biochemischen Arbeitsmethoden, V, p. 995*, and *VI, p. 278*. The nitrogen gas evolved from amino groups and nitrous acid in the reaction $\text{RNH}_2 + \text{HNO}_2 = \text{ROH} + \text{H}_2\text{O} + \text{N}_2$ is purified and accurately measured in a gas burette. A complete determination of the NH_2 nitrogen of amino acids requires but six to ten minutes, and the accuracy is equal to that of a Kjeldahl determination. An indefinite number of successive determinations can be performed without disconnecting any of the parts. The apparatus permits analysis of any volume of solution up to 10 cc and give results with an accuracy of $\frac{1}{10}$ th mg. of nitrogen. This method has been applied to varied problems, among which are study of protein digestion, both *in vitro* and *in vivo*; the determination of the nature of the amino acids yielded by hydrolysis of small amounts of protein, determination of free amino groups in fixing the constitution of various organic substances; and the determination of amino acid nitrogen in urine, blood and tissues. Complete with glass parts and supports, pulley, shaking device, etc., but without motor..... 25.00



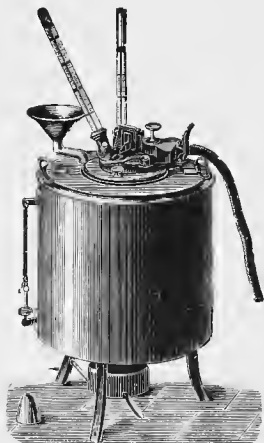
- Extra glass parts
41100. Reaction Vessel with filling funnel, burette and three glass stop-cocks..... 8.75
41104. Gas Burette, Schellbach, with three-way cock, levelling bulb and tubing..... 4.50
41108. Gas Pipette, new form, for shaking..... 1.50
- Note—We recommend our Motor No. 40884 suitable for connection to house circuit instead of that shown in the illustration which is intended to work on accumulators.

No. 41096



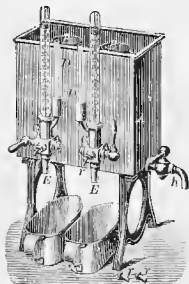
OIL TESTING APPARATUS

- 41200. Fire Tester, Elliott, for the flashing point of illuminating oil, only. With thermometer..... 11.70
- 41204. Fire Tester Foster, for the flashing point of illuminating oil only. With thermometer..... 13.50
- 41208. Fire Tester, open form, for the flash point of illuminating oil, with thermometer..... 5.85
- 41212. Fire Tester, Cleveland open form, small size, complete with thermometer..... 9.00
- 41216. " " " " large model, a most substantial tester. Complete with thermometer 80° to 640° F., alcohol lamp and Bunsen burner..... 13.50



No. 41220

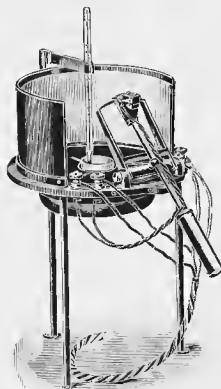
- 41220. Flash Point Tester, Abel-Pensky, for petroleum, latest model, with clockwork for opening cover and for depressing the test flame, with certificate of the Kaiserlichen Normal-Eichungs-Kommission; with one standard thermometer 10-55° C. and one 50-75° C. and aneroid barometer 65.00
- 41224. Standard Thermometer only for above, 10-55° C., with metal fitting and P. T. R. certificate..... 4.50
- 41228. Standard Thermometer only for above, 50-75° C., with metal fitting and P. T. R. certificate..... 4.50
- 41232. Flash Point Tester, Abel-Pensky, for both high and low temperatures. This outfit is identical with No. 41220 except that the joints of the heating bath are hard brazed and it is supplied with an additional pair of thermometers for high temperatures, i. e. one from 50-160° C. for the oil bath and one from 70-200° C. for the water bath, and is arranged for both gas heating and gas ignition, with certificate of the Kaiserlichen Normal-Eichungs-Kommission..... 80.00
- 41236. Thermometer, only, for above, 50-160° C..... 4.00
- 41240. " " " " 70-200° C..... 4.00
- 41244. Flash Point Tester, Abel-Pensky, for benzene, benzole, etc., with oil cup, similar in arrangement to No. 41220 and with two thermometers - 30 to + 40° C..... 40.00
- 41248. Thermometer only for above - 30 to + 40° C..... 3.50



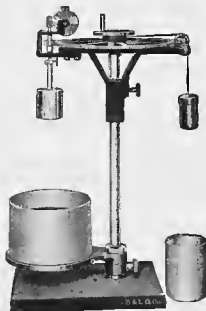
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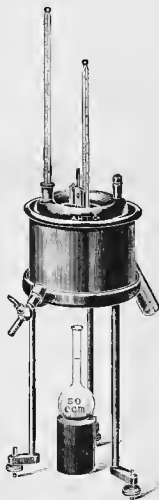
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No. 41281



No. 41328

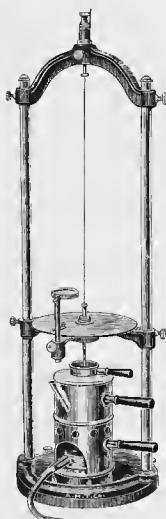


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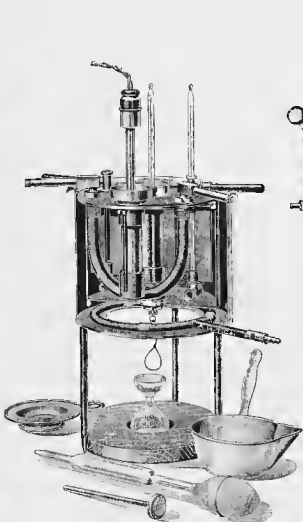


No. 41312

41284. Flash Point Tester, same as No. 41280 but with electric heating, for either 110 or 220 volts. Voltage must be specified in ordering; with adjustable resistance, switch, socket and cord..... 65.00
41288. Thermometer only for either No. 41280 or No. 41284, 80-280° C..... 4.50
41292. " " " " " " " " 180-400° C..... 5.00
41296. Porcelain Crucible only for either of above..... .45
41300. Viscosimeter, Scott. Each instrument is standardized and has stamped upon the handle the time in seconds and fractions of seconds required for 50 cc of distilled water at 70° F. to be discharged. Complete with thermometer to 212° F. in single degrees and 50 cc graduated cylinder..... 15.00
41304. Thermometer for above, 212° F. in single degrees..... 1.50
41308. Thermometer for lubricating oils, 50° to 120° F. in 1/10th degrees..... 5.00
41312. Viscosity Pipette, Dudley, delivering 100 cc of distilled water in 35 seconds at a temperature of 100° F..... 1.25
41316. Viscosimeter, Redwood, original English make, for testing the viscosity of oils and as adopted by the British Mineral Oil Association. With certificate of verification by Mr. J. A. Hicks, assistant to Sir Boverton Redwood. Complete with thermometers..... 45.00
41320. Thermometers for No. 41316, 340 to 300° F. Per pair..... 6.00
41324. Leptometer, for the direct comparison of the viscosity of two oils simultaneously and under equal conditions..... 40.00
41328. Viscosimeter, Stormer, new model. This instrument is constructed upon the principle of rotating a cylinder in the liquid under examination with a constant weight and at a known temperature. A revolution counter is connected and the time required for the cylinder to make a specified number of revolutions in distilled water and the substance under examination form the basis of comparison, or in other words, give a means for determining the viscosity of a liquid, with directions for use..... 30.00



No. 41332



No. 41340

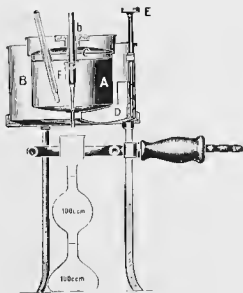


No. 41356



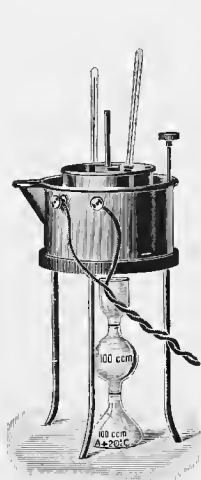
No. 41352

41332. Viscosimeter, Doolittle Torsion, improved, for measuring the viscosity or fluidity of oils, varnish, starch, glucose, glue, or any fluid whether containing solid particles in suspension or not. See *Journal of the American Chemical Society*, Vol. XV, 1893, pp. 173 and 145. Complete..... 75.00
41336. Viscosimeter, Saybolt Universal, original make and design..... 60.00
41340. Viscosimeter, Saybolt Universal, Improved Model, for testing cylinder, valve and similar oils with bath at 212° F and the oil at 210° F, for reduced black oils with oil at 130° F and for testing neutral, spindle, paraffine, red and other distilled oils with oil at 100° F or with oil at any temperature from 70° F to 212° F. The Viscosimeter is now furnished with an electric heating element for either 110 or 220 volt lighting circuit with cord and plug for lamp socket (voltage must be specified in ordering) and is also furnished with the usual gas heating arrangement as shown in illustration and also with a U-tube steam heater..... 75.00
41344. Extra Flask, graduated, 60 cc capacity..... 1.25
41348. Extra Thermometers, each..... 1.75
41352. Viscosimeter, Engler, with gold plated oil cup and platinum outlet tube, two certified thermometers, 10-50° C. and 10-150° C., ring burner, tripod and 200 cc certified flask with one mark; with certificate of the Kaiserlichen Normal-Eichungs-Kommission..... 38.00

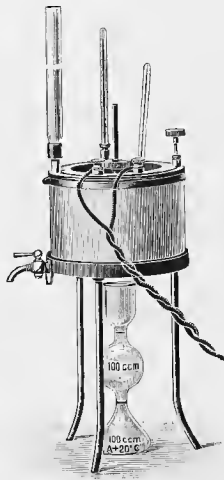


No. 41360

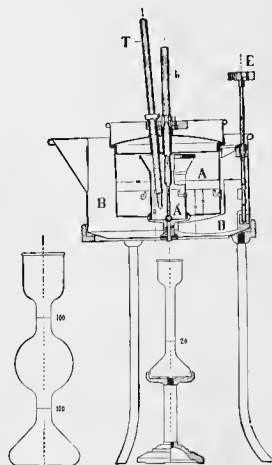
41356. Viscosimeter, Engler, for High Temperatures, similar to No. 41352 but with hand brazed bath and enclosed steam jacket; with two certified thermometers, 180-300° C and 200 cc certified flask with one mark, tripod and ring burner; with certificate of the Kaiserlichen Normal-Eichungs Kommission..... 55.00
41360. Viscosimeter, Engler, Improved Model, according to the specifications of the Petroleum Congress. This instrument differs from No. 41352 in that the oil bath is totally immersed in the water bath and the lid of the oil bath is doubled walled. The water bath is also provided with a stirrer D. The water bath is wider, permitting a more constant temperature and the special device F is provided to control the opening of the outlet tubulation; with two certified thermometers, 10-50° C and 10-150° C, 200 cc certified flask with two marks, tripod and ring burner; with certificate of the Kaiserlichen Normal-Eichungs Kommission..... 46.50



No. 41364

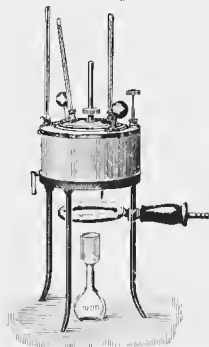


No. 41368



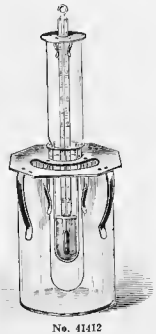
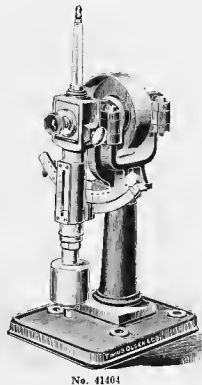
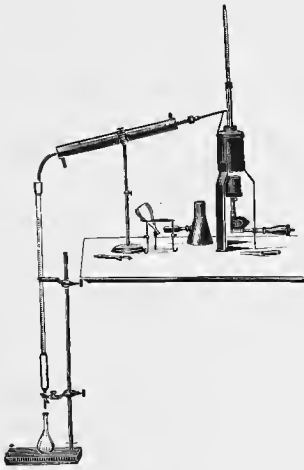
No. 41372

41364. **Viscosimeter, Engler, Improved Model for Electric Heating.** With two certified thermometers, 10-50° C and 10-150° C, adjustable resistance for maintenance of constant temperature, 200 cc certified flask with two marks, tripod; and certificate of the Kaiserlichen Normal-Eichungs Kommission. *Voltage must be specified in ordering.* 86.25
41368. **Viscosimeter, Engler, Improved Model for High Temperatures, for Electric Heating,** with enclosed bath in asbestos jacket, deflammator and outlet stopcock, with two certified thermometers, 100-300° C and 100-350° C, tripod, 200 cc certified flask with two marks and adjustable resistance. With certificate of the Kaiserlichen Normal-Eichungs Kommission. *Voltage must be specified in ordering.* 101.50
41372. **Viscosimeter, Engler, Improved Model, for Small Quantities.** 20 cc of oil is required for the test instead of 200 cc. By this arrangement much time is saved in the testing of thick oils by diminishing the time of outflow. Otherwise the instrument is similar to No. 41360. With 2 certified flasks, one of 200 cc with two marks and one of 20 cc with one mark; with support, tripod, gas burner and 2 certified thermometers, 10-50° C and 10-150° C. With certificate of the Kaiserlichen Normal-Eichungs Kommission. 70.00
41376. **Viscosimeter, Engler, for Electric Heating.** Otherwise as above, with adjustable resistance, and certificate of the Kaiserlichen Normal-Eichungs Kommission. *Voltage must be specified in ordering.* 109.50

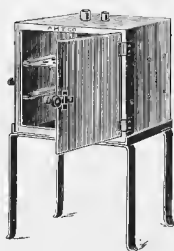


No. 41388

41380. **Viscosimeter, Ubbelohde, for Illuminating Oils,** for the testing of which the regular Engler Viscosimeter is not well adapted. The oil cup is wider and the same is provided with an overflow tube for bringing the oil to the correct height and the outlet tube is of greater length and of smaller diameter than for lubricating oils; with two certified thermometers 50° and 100° C, 100 cc certified flask with one mark, gas burner and tripod. 34.50
41384. **Viscosimeter, Ubbelohde, for Illuminating Oils, for Electric Heating.** Otherwise as above. With adjustable resistance. *Voltage must be specified in ordering.* 74.25
41388. **Viscosimeter, Ubbelohde, for Cylinder Oils.** This is similar in construction to the Petroleum Viscosimeter No. 41380 but the joints are hard brazed for high temperatures and the water jacket is enclosed in asbestos and furnished with cover and stirring device. With two certified thermometers, 100-300° C and 180-300° C, measuring flask 100 cc with one mark, tripod and ring burner. 47.50
41392. **Viscosimeter, Ubbelohde, for Cylinder Oils, for Electric Heating.** Otherwise as above. With adjustable resistance. *Voltage must be specified in ordering.* 86.75



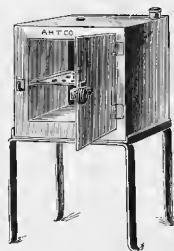
41396.	Tables, Ubbelohde, for use with Engler's lubricating oil Viscosimeters. The use of these tables dispenses with all calculations and gives direct readings in Engler degrees for the outflow periods of both 50 cc and 100 cc. They reduce the time of making tests to about 1/3 that required without the use of the tables. See "Handbuch der Chemie und Technologie der Oele und Fette." Each.....	1.50
41400.	Apparatus for the Distillation of Mineral Oils, Engler, consisting of a nickel plated receptacle for the mineral oil, on stand with burner and cover; with condenser with support, measuring flasks, and two burettes with stand; all packed in two portable wooden cases. With P. T. R. certificate for both the apparatus and the glassware. Duty Paid.....	107.00
41404.	Oil Testing Machine, Thurston. The journal of this tester is 1 1/8 inches in diameter by 1 1/2 inches long. The friction is measured on a graduated circular arc by motion of pendulum over same.....	160.00
41408.	Oil Testing Machine, Thurston, as above, with countershaft.....	190.00
41412.	Molecular Weight Determination Apparatus, Schimmel, as used for determining the solidification point of essential oils. Complete with special thermometer from -20 to +40° C. in 1/2°.....	6.50
41416.	Thermometer, only, for above apparatus. -20 to +40° C. in 1/2°.....	2.50
41420.	Thermometer, for Engler and Ubbelohde Viscosimeters, 10-50° C. with P. T. R. certificate.....	3.00
41424.	" " " " " " " " 10-150° C. " " " ".....	4.00
41428.	" " " " " " " " 10-200° C. " " " ".....	5.00
41432.	" " " " " " " " 180-300° C. " " " ".....	7.00
41436.	" " " " " " " " 10-300° C. " " " ".....	8.00
41440.	" " " " " " " " 100-300° C. " " " ".....	7.50
41444.	" " " " " " " " 100-350° C. " " " ".....	8.00
41448.	Flask, Engler, 200 cc, with one mark, usual form, as shown in illustrations of No. 41332 and No. 41356; without certificate.....	2.25
41452.	Flask, Engler, as above with P. T. R. certificate.....	3.75
41456.	" Engler, 200 cc, with two bulbs and two marks, as shown in illustration of No. 41360, etc.; without certificate.....	2.75
41460.	Flask, Engler, as above, with P. T. R. certificate.....	4.75
41464.	" " 20 cc with one mark, as used with No. 41372, without certificate.....	2.00
41468.	" " " " " " " " " " with P. T. R. certificate.....	3.50



No. 41500



No. 41504



No. 41508



No. 41516

41500. Oven, Single Wall, of heavy sheet copper, on wrought iron stand, with extra sheet iron bottom to prevent burning out. With perforated shelf.
- | | | | | |
|--------------------------------|-------|--------|---------|---------|
| Inside dimensions, inches..... | 6 x 8 | 8 x 10 | 10 x 12 | 12 x 16 |
| Each..... | 5.00 | 7.00 | 10.00 | 15.00 |
41504. Oven, Single Wall, exactly same as No. 41500 but with enclosed sheet iron base.
- | | | | | |
|--------------------------------|-------|--------|---------|---------|
| Inside dimensions, inches..... | 6 x 8 | 8 x 10 | 10 x 12 | 12 x 16 |
| Each..... | 6.00 | 8.00 | 12.00 | 18.00 |
41508. Oven, Double Wall, providing space for water jacket. Otherwise same as No. 41500.
- | | | | |
|--------------------------------|---------------|---------------|---------------|
| Inside dimensions, inches..... | 5 7/8 x 5 3/4 | 7 1/4 x 7 1/4 | 9 1/4 x 9 1/4 |
| Each..... | 8.00 | 10.00 | 14.00 |
41512. Oven, Double Wall, exactly same as No. 41508 but with enclosed sheet iron base.
- | | | | |
|--------------------------------|---------------|---------------|---------------|
| Inside dimensions, inches..... | 5 3/4 x 5 3/4 | 7 1/4 x 7 1/4 | 9 1/4 x 9 1/4 |
| Each..... | 9.00 | 11.00 | 15.00 |
41516. Cylindrical Rings on top so that oven may be used as a water bath. For all sizes. Extra..... 1.50
41520. Steam Coil for heating water in the jacket of 41508 and 41512 by direct connection with steam supply. For all sizes. Extra..... 18.00



No. 41524

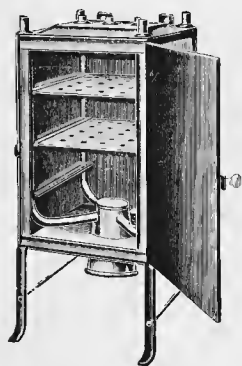


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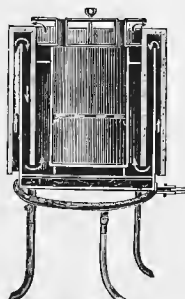


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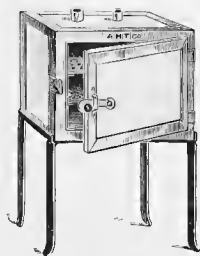
41524. Oven, Rammelsberg, cylindrical form, of polished copper, 6 in. high x 5 in. diameter..... 3.50
41528. Oven, Double Wall, Wiesneg original French make. Inside chamber is of heavy, solid porcelain in one piece, with porcelain shelves. The inside porcelain frame fits tight against the plate glass door so that no corrosive parts are exposed to the inside of the chamber. As supplied by us to the U. S. Department of Agriculture, Bureau of Chemistry, Food Inspection Laboratories. Inside dimensions 29 x 25 x 24 cm. With adjustable burner. Duty Free..... 33.00 Stock..... 50.00
41532. Oven, Single Wall, of heavy asbestos wood, set in metal frame. A removable sheet metal plate forms the bottom of the oven. The rack for the shelves and frame of the door are of cast aluminum, being non-corrosive. With perforated asbestos shelves adjustable to any height. For either gas or electric heating. For Gas Heating..... 10 x 10 x 12 18 x 12 x 14
- | | | |
|--------------------------------|-------|-------|
| Inside dimensions, inches..... | 16.50 | 22.50 |
| Each..... | 25.00 | 35.00 |
41536. Oven, Single Wall, for Electric heating, otherwise exactly as above..... 25.00 35.00



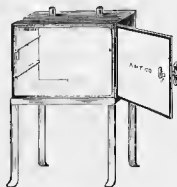
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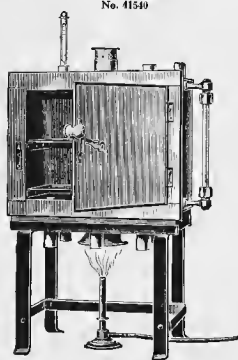
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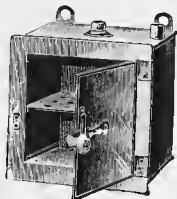
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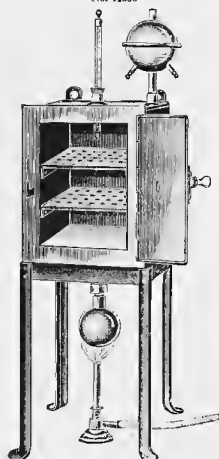
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No. 41551



No. 41558

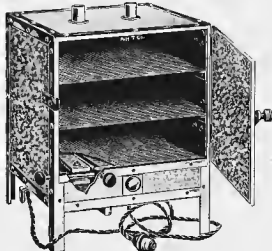


No. 41562

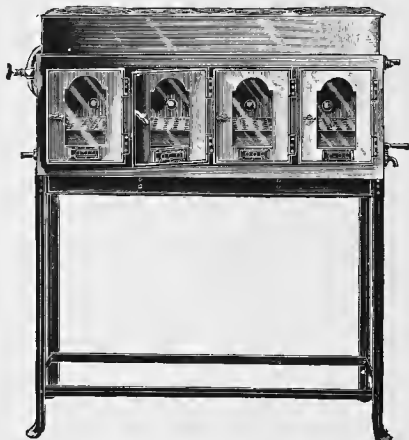
41540. Oven, Kaehler, Single Wall, of sheet iron covered with asbestos. The heat is distributed evenly throughout the interior chamber by means of tubes from the dome over the burner. Inside dimensions 30 x 30 x 45 cm. 40.00
41544. Oven, Lothar Meyer, consisting of three cylindrical walls with ventilation for hot air and with top and bottom insulated with infusorial earth. The inner cylindrical compartment may be removed. On stand with ring burner. Size 20 x 30 cm. Of iron. 20.00
41546. Oven, Lothar Meyer, as above, but of copper. 32.00
41550. Oven, Drying, Single Wall, of copper throughout with asbestos covering. Size 10 x 8 x 8 inches. As used by the Barrett Mfg. Co. for their tar and pitch testing in connection with their special apparatus for this purpose. 19.00
41554. Oven, Double Wall, High Temperature. Can be used up to 120° C. when glycerine, toluol or other high boiling point material is used in the jacket instead of water. With water gauge and ventilating system. 20 x 25 x 18 cm. 30.00
41558. Oven, Double Wall, High Temperature, for temperatures up to 300° C. when filled with oil or other material of high boiling point. Inside dimensions 15 x 15 x 15 cm. On stand not shown in cut. 17.00
41562. Oven, Double Wall, Abati, Constant High Temperature. With xylol used in the jacket a constant temperature of 136° C. can be attained and with mixture of xylol and cumol, 150° C. With heating bulb and spherical condenser, but without thermometer or burner. Inside dimensions 6 x 6 x 8 inches. Duty Free 26.40 Duty Paid 32.00
41564. Oven, Drying, Single Wall, lined throughout with white, acid resisting enamel, with stand and aluminum shelf not shown in illustration. 20 x 15 x 15 35 x 25 x 25
 Inside dimensions, cm. 7.50 12.50
 Each. 7.50 12.50



No. 41665

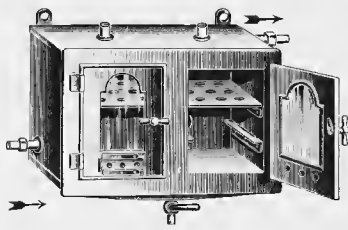


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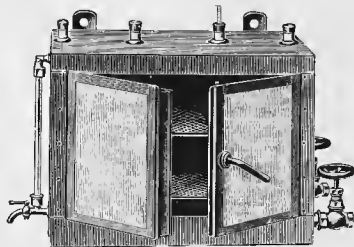


No. 41676

41668. Oven, Single Wall, Kaehler, of polished copper, with double bottom providing a circulation system and a constant temperature. Inside dimensions 10 x 10 x 12 inches. 25.00
41672. Oven, Electric, Sargent Patent, with automatic temperature control. Of asbestos material with metal trimmings. Temperature can be set at any point between 70° C. and 150° C. and will be maintained to within about 1° C. Heating units are easily replaceable. Plug is attached to ordinary lamp socket on either 110 or 220 volt current. Voltage must be specified in ordering. Inside dimensions 10 x 10 x 12 inches. Complete with cord, plug, thermometer and directions. 25.00
41676. Oven, Double Wall, for Steam Heating by direct connection with steam supply. Consisting of four drying compartments 8 x 10 inches, with massive brass doors; surmounted by a copper water bath carrying 5 sets of rings. The inside of the apparatus is made of zinc lined copper and distilled water can be used after being drawn off.
- Duty Free 105.60
- Duty Paid 128.00

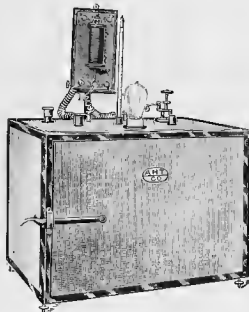


No. 41680

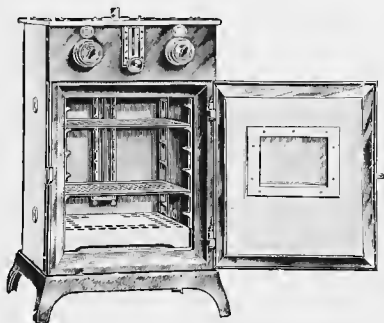


No. 41682

41680. Oven, Double Wall, for Steam Heating by direct connection with steam supply. Made of copper, with massive brass doors and inside compartments zinc lined. With safety valve and cock underneath for emptying. Compartments are each 10 x 8 x 8 inches inside.
- | | | |
|---------------------------------|-------|-------|
| Number of compartments. | 2 | 3 |
| Duty Free | 41.25 | 59.40 |
| Duty Paid | 50.00 | 72.00 |
41682. Oven, Double Wall, for Steam Heating by direct connection with steam supply. Of copper with copper steam coils, water gauge, double doors and asbestos covering.
- | | | | | |
|---------------------|--------------|--------------|--------------|--------------|
| Size, cu. | 15 x 25 x 15 | 20 x 30 x 20 | 25 x 40 x 25 | 30 x 50 x 30 |
| Duty Free | 19.80 | 26.40 | 45.00 | 67.50 |
| Duty Paid | 26.40 | 35.20 | 60.00 | 90.00 |



No. 41684

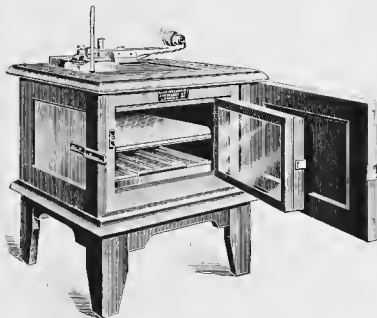


No. 41688

41684. **Oven, Electric**, with automatic expanding disc temperature regulator and magnetic circuit breaker. Of heavy asbestos board mounted in solid brass frame, giving a durable and rigid construction. Heating units are wound on hard porcelain and are easily replaceable, as is the expanding disc. The temperature control will regulate within 1° or 2° C. over long periods of time and is recommended as a thoroughly practical and satisfactory utensil which we have supplied to many important laboratories. Works equally well on direct or alternating current. Inside dimensions 16 x 10 x 9 inches. As regularly sent out the expanding disc will regulate from 75° C. to 160° C. Special windings of heating units and special capsules for other ranges of temperature, when desired. With diagram of connections and full information for operating.
- | | | |
|-------------------|-------|-------|
| For voltage | 110 | 220 |
| Each | 70.00 | 72.00 |

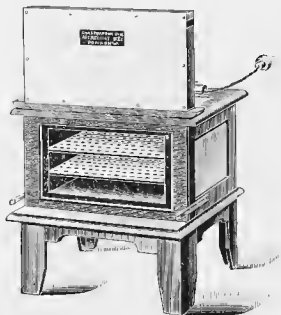
OVENS, FREAS PATENT ELECTRIC, with temperature control, as approved by the National Board of Fire Underwriters. May be set for any temperature desired from a degree or so above room temperatures to 175° C. Made of heavy, fire-proof asbestos wood which is not attacked by acids or alkalis. The temperature indicator is set at the temperature desired by turning the milled head as shown in illustration. The metal fittings of door, base, etc., are of aluminum. When ordering please state voltage and current of circuit on which oven is to be operated.

41688. **Oven, Freas Patent Electric No. 100**. Size of chamber 12 x 12 x 12 inches. Mounted on cast iron base for placing on table. Complete with flexible cord and plug to attach to regular lighting circuit. 75.00
41692. **Oven, Freas Patent Electric No. 110**. Inside dimensions 14 x 17 x 18 inches. Mounted on heavy iron base with legs, total height 5 ft. Complete with flexible cord and plug. 165.00
41696. **Oven, Freas Patent Electric No. 114**, same as No. 110 but graduated for temperatures up to 500° F. as used in the evaporating tests of asphalt, etc. 175.00

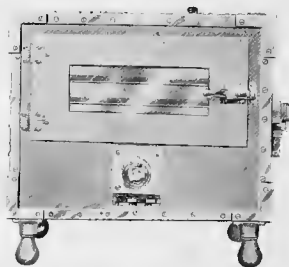


No. 41700

41700. **Oven, Hearson Electric**, specially designed for rapidly ascertaining the percentage of moisture in flour, tobacco, seeds and similar material. The oven is regularly sent out for operation at 115° C. but may be adjusted from 15° C. to 150° C. The air in the inner compartment is uniformly heated and passes over the trays containing the samples to be tested, taking up in its passage the moisture which is driven off, the whole being discharged through outlets at the back of the apparatus; with Hearson' Patent Capsule by means of which temperature variation may be kept to within 1° C. Inside dimensions 6 x 11 x 11 inches. Complete with thermostat, capsule, thermometer, two shelves, eight trays, wall plug and 3 ft. of flexible cord. Please specify voltage in ordering.
- | | |
|-----------------|--------|
| Duty Free | 100.80 |
| Duty Paid | 151.20 |



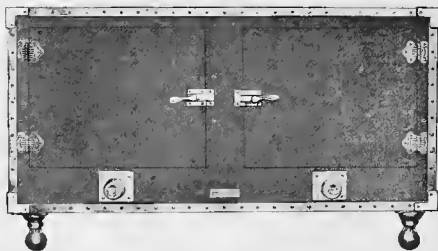
No. 41704



No. 41708



No. 41712



No. 41716

41704. **Oven, Hearson Electric**, similar in construction to above but specially arranged for testing tobacco. Complete with thermostat, capsule, thermometer, two perforated shelves, wall plug and 3 ft. of flexible cord. Please specify voltage in ordering.

Duty Free

100.80

Duty Paid

151.20

OVENS, DESPATCH, ELECTRIC. This series of Ovens is constructed of polished steel with nickel plated angle iron corner fittings and walls of asbestos from 1 to 2 inches apart, depending upon the size of the oven, packed with mineral wool. They have open wire heating units guaranteed not to burn out or crack. The alloy from which this wire is made does not oxidize at high temperatures or become brittle with repeated heating and cooling. These Ovens are provided with ventilators at both top and bottom designed especially for the carrying off of moisture, as in drying out of samples, thus expediting the drying process and enabling a very accurate temperature control without the use of a thermostat or other regulating device. The ovens are all provided with a three-heat switch and by adjustment of the ventilator the temperature can be maintained from 90° to 100° C. on the low point, 100° to 108° C. on the middle point and 140° to 150° C. on the high point, 150° C. being the highest temperature for which they are regularly built. The current consumption is exceedingly small, as will be noted from the data given below. These Ovens are widely used in the moisture test of soils, etc., Pekar slick tests in flour and baking laboratories and for testing sulphite in pulp mills as to moisture. The Ovens operate equally well on direct or alternating current but voltage must be specified in ordering.

41708. **Oven, Despatch, Electric**, as above described, with glass window for observation of the material during drying, with drying space 16 x 7 x 8 inches; current consumption 75-150-300 Watts... 32.00

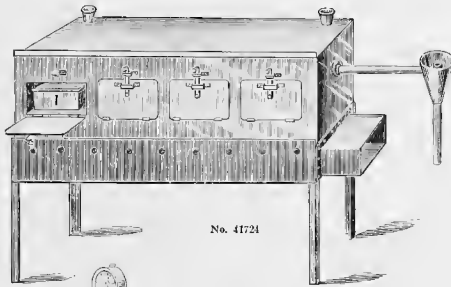
41712. **Ovens, Despatch, Electric**, as above, with removable shelves and thermometer.

Inside dimensions, inches.....	13 x 12 x 18	12 x 9 x 16	11 x 6 x 16
Number of shelves.....	4	3	2
Continuous current consumption, Watts.....	150	100	100
Each.....	85.00	80.00	75.00

41716. **Ovens, Despatch, Electric, Compartment**, specially designed for moisture test of soils.

Inside dimensions of each compartment, inches.....	20 x 16 x 18	20 x 60 x 18
Number of compartments.....	2	3
Maximum current consumption of each compartment, Watts.....	150	150
Each.....	175.00	215.00

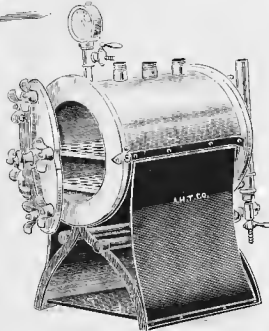
41720. **Oven, Despatch, Electric, Triple Compartment**, as above, specially designed for sulphite test in pulp mills. Inside dimensions of each compartment 14 x 9 x 20 inches, current consumption of each compartment 100 Watts... 215.00



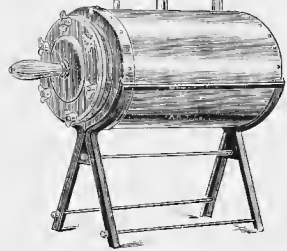
No. 41724



No. 41728

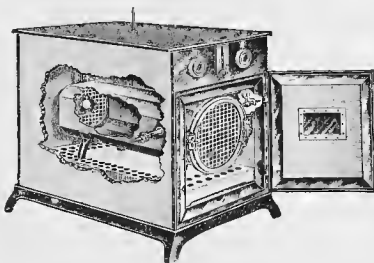


No. 41732



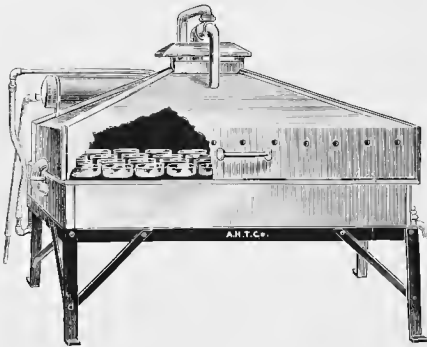
No. 41736

41724. Oven, Double Wall, Blair, of copper, on sheet iron base. As used in iron analysis; 24 inches long x 7 inches high and 7 inches deep. With four compartments $4\frac{1}{2} \times 6 \times 2\frac{1}{2}$ inches, with constant water level. Each compartment is supplied with a copper box $4 \times 4\frac{1}{2} \times 1\frac{1}{2}$ inches, with serial number. 40.00
41728. Oven, Single Wall, for Vacuum, Carr. Inside dimensions 12 x 8 inches, with copper shelf, vacuum gauge and openings for thermometer and thermostat. Made of heavy brass, with tightly clamping door. See Wiley's "Agricultural Products," Vol. III, p. 23. 65.00
41732. Oven, Double Wall, for Vacuum, for either steam or gas heating, inside dimensions 16 inches long by 8 inches in diameter. These ovens are widely used in various laboratories of the U. S. Department of Agriculture, sugar laboratories, etc., and are of robust and substantial construction intended for continuous operation in vacuum work. The body of the oven is a large cylindrical brass tube surrounded by 1 inch steam space or jacket built to withstand 40 lbs. pressure. The oven is provided with two perforated pipe burners for gas heating and a constant level for the water in the jacket is placed in the rear. Suitable openings for exhaust of air and moisture from the chamber, thermometer and vacuum gauge are provided 175.00

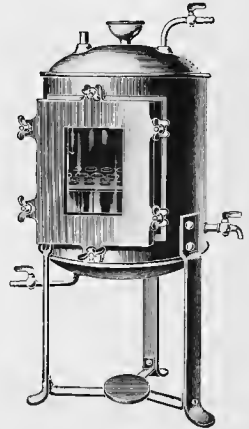


No. 41740

41736. Oven, Double Wall, cylindrical form, for drying in current of hydrogen etc. Substantially made, of heavy copper and provided with one shelf. Inside dimensions 17 x 6 $\frac{1}{2}$ inches. May also be used with glycerine or toluol in jacket and for temporary vacuums up to about 20 inches of mercury but not for high or continuous vacuum 40.00
41740. Oven, Freas Patent Electric for Vacuum. Inside dimensions of vacuum chamber 8 x 8 x 18 inches. Temperature range up to 180° C 250.00

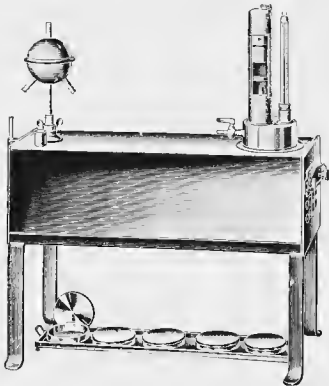


No. 41744

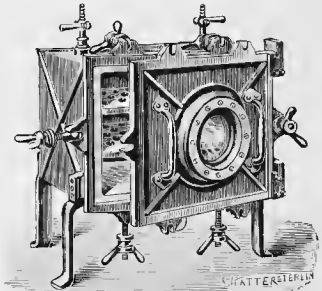


No. 41752

41744. **Oven, Drying, Alsop.** Designed for and widely used in tanning laboratories. Will accommodate 110 No. 26012 crystallizing dishes. Of heavy copper with condenser at side to supply distilled water. With steam outlet at top. Size 35 x 25 inches. For gas heating. 135.00
41748. **Oven, Drying, Alsop,** same as above but with coil for steam heating. 140.00
41752. **Oven, for Vacuum, Sidersky, improved model,** consisting of a double walled chamber with heavy metal door with plane glass inset. Inside dimensions 260 x 300 mm. 66.00
- Duty Paid 80.00

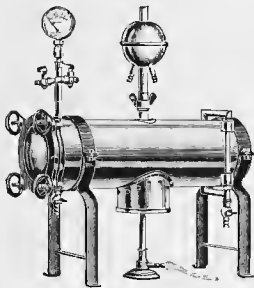


No. 41756

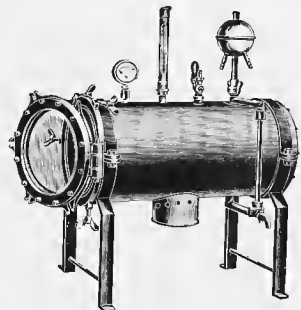


No. 41760

41756. **Oven, Soxhlet, of polished copper,** improved model with eight tubes, ball condenser, draft chimney and tray with five nickel dishes. Drying chamber is 50 x 100 x 3 1/2 cm. The tubes supplying heat to the chamber lie in a bath which is filled with a high boiling point material such as salt solution, glycerine, toluol, etc., according to the temperature desired. As used in the rapid determination of total solids in milk and other experiments. 36.30
- Duty Paid 45.00
41760. **Oven, Vacuum, of heavy cast brass.** With glass door, and interior lined with zinc. Inside dimensions 25 x 25 x 25 cm. 90.75
- Duty Paid 110.00

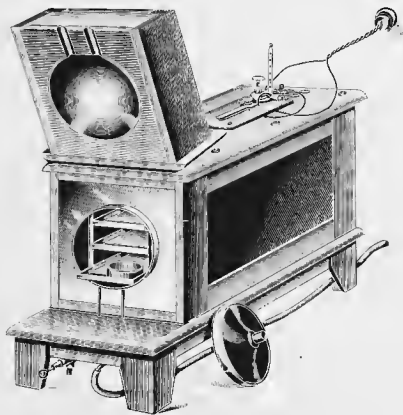


No. 41761



No. 41772

- 41764. Oven, Double Wall, for Vacuum, for gas heating, cylindrical form.** Space between the walls may be filled with glycerine, toluol, etc., when high temperatures are required. Of heavy copper, tinned on inside. Inside dimensions 95 x 405 mm. With vacuum gauge and ball condenser but without burner.
- | | | | |
|-----------|-------|-------|-------|
| Duty Free | 40.00 | Stock | 45.00 |
|-----------|-------|-------|-------|
- 41768. Oven, Double Wall, for Vacuum, as above, but for indirect steam heating with valves and connections.**
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 45.00 | Duty Paid | 60.00 |
|-----------|-------|-----------|-------|
- 41772. Oven, Double Wall, for Vacuum, cylindrical form, with heavy plate glass at each end and door fastened by clamps.** With thermometer in metal mounting, manometer, reflux condenser and two removable shelves. For gas heating. Size 180 x 410 mm.
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 66.00 | Duty Paid | 88.00 |
|-----------|-------|-----------|-------|
- 41776. Oven, Double Wall, for Vacuum, of the same general construction as No. 41772 but extra large size, i. e., 600 x 300 mm inside dimensions.** Massive construction with heavy plate glass at each end. May be fitted for direct steam heating without extra cost. With gauge and reflux condenser.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 125.25 | Duty Paid | 155.00 |
|-----------|--------|-----------|--------|



No. 41780

41780. Oven, Vacuum, Hearson Electric.
 This apparatus consists of an inner cylindrical chamber, the exposed end of which is furnished with a loose cover which can be clamped to this end of it in order to hermetically close it when it is desired to exhaust the air.

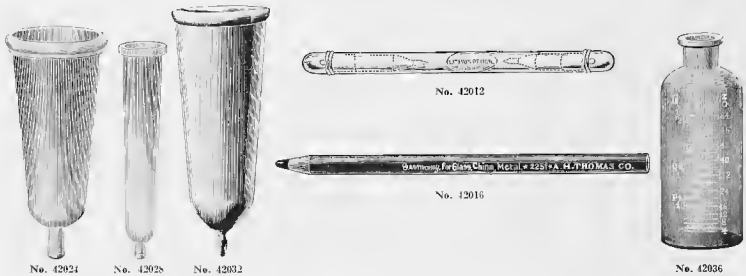
The inner cylinder is surrounded by another cylinder of larger capacity, which is filled with paraffine (not oil). In the space between the two vessels there is also, coiled around the inner cylinder, a long fine copper tube one end of which terminates in the inner cylinder, whilst the other end is furnished with a small valve which will be found on the left-hand side below the apparatus. Another small tube connected with and terminating in the inner cylinder will be found on the right-hand side also below the apparatus.

The regulator and the thermometer both dip into the vessel of molten paraffine in which the inner vessel and copper tube are both also submerged. It will be found in practice that the inside temperature indicated by self-registering thermometers, is about

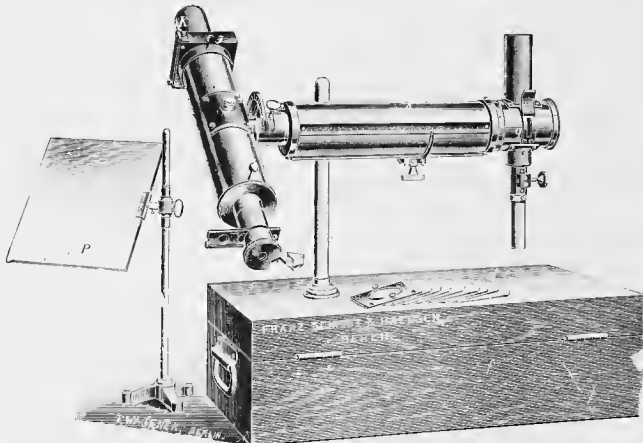
3 degrees above that shown on the scale of the thermometer outside when the inside is at 248 degrees Fah., allowance can be made accordingly if considered necessary.

The asbestos gaskets which serve to hute the cover should be painted frequently with black-lead mixed with turpentine. Air admitted to the inner cylinder through the small valve on the left is compelled to traverse the long length of copper tube before reaching the cylinder into which it is admitted at the back at practically the same temperature as that already in the interior. When the desired temperature is reached the electrical energy required to maintain it is only 60 Watts.

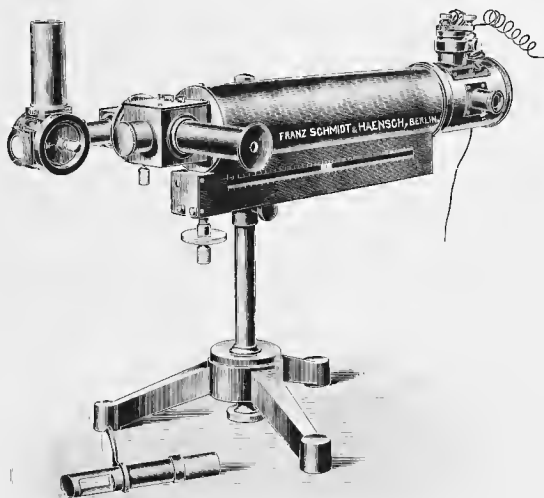
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 113.40 | Duty Paid | 170.10 |
|-----------|--------|-----------|--------|



42000. Paper, highly glazed on one side. Convenient for collecting filter ash, etc. In white, black, blue and yellow. Color must be specified in ordering. Sheets 20 x 24 inches. Per quire..... .25
42004. Paper, Parchment, for dialysers, etc., medium weight, in sheets 375 x 250 mm. Per sheet..... .10
42008. " " extra heavy, particularly selected for and used by the leading Antitoxin Laboratories for filtering antitoxin, serum, etc. Recommended as being the only thoroughly satisfactory paper for this purpose. In sheets 66 x 100 cm. Per sheet..... .30
42012. Pencil Litmus, Tyree, consisting of a red and a blue litmus pencil in metal case..... .25
42016. Pencils, Wax, best imported quality, for writing on glass, china, metal, etc. Selected especially for laboratory use and found highly satisfactory for this purpose. In white, blue, red and yellow. Color must be specified in ordering. Each..... .10
42020. Pencils, Wax, with the wax enclosed in hard rolled paper instead of wood. In white, blue, red or yellow. Please specify color in ordering. Each..... .12
42024. Percolators, conical shape of blown glass.
- | | | | | | | | | |
|---------------|-------------------|-------|-------|--------------------|--------|--------|--------|--------|
| Capacity..... | $\frac{1}{2}$ pt. | 1 pt. | 2 pt. | $\frac{1}{2}$ gal. | 1 gal. | 2 gal. | 3 gal. | 5 gal. |
| Each..... | .40 | .45 | .50 | .70 | 1.00 | 2.00 | 3.25 | 6.00 |
42028. Percolators, cylindrical or Oldberg's shape, of blown glass.
- | | | | | | | | |
|---------------|-------------------|-------|-------|--------------------|--------|--------|--------|
| Capacity..... | $\frac{1}{2}$ pt. | 1 pt. | 2 pt. | $\frac{1}{2}$ gal. | 1 gal. | 2 gal. | 3 gal. |
| Each..... | .40 | .45 | .60 | 1.00 | 1.50 | 3.25 | 4.00 |
42032. Percolators, with tubulation to fit $\frac{1}{4}$ inch rubber tubing.
- | | | | | | |
|---------------|-------------------|-------|--------------------|--------|--------|
| Capacity..... | $\frac{1}{2}$ pt. | 1 pt. | $\frac{1}{2}$ gal. | 1 gal. | 2 gal. |
| Each..... | .50 | .60 | .80 | 1.10 | 2.25 |
42036. Percolator Bottle, graduated in cc. Capacity. cc.....
- | | | | | | |
|-----------|------|------|------|------|------|
| Each..... | 500 | 1000 | 2000 | 4000 | 8000 |
| | 1.00 | 1.10 | 1.65 | 2.85 | 4.35 |



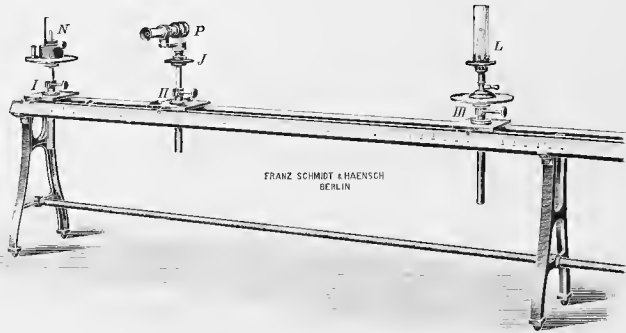
No. 42040—See description on following page



No. 42064

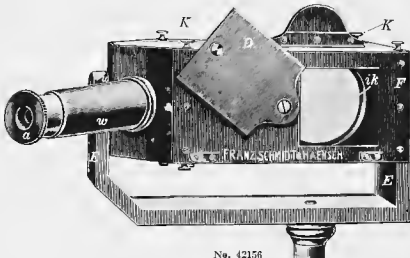
PHOTOMETERS

42040.	Photometer, Weber Portable, Opal Glass Plate Type, with Lummer-Brodhun prism, for comparison by similarity; with benzene lamp and Prof. Weber's table of constants. Complete in portable case.....	Duty Free 120.00	Duty Paid 160.00
42044.	Photometer, as above, but for comparison by both similarity and contrast... Accessories for Weber Photometer Nos. 42040 and 42044.....	127.50	170.00
42048.	Standard Incandescent Lamp for 2 volts for use with above, interchangeable with benzene lamp, in mounting.....	21.00	28.00
42052.	Reflecting Mirror Attachment, to be put on in place of tube "K".....	9.00	12.00
42056.	Table of Constants for the mirror attachment.....	3.00	4.00
42060.	Adjustable Laboratory Tripod, for either of above Photometers.....	3.60	4.80
42064.	Photometer, Weber, Improved Tube Form, latest construction with Lummer-Brodhun prism, for comparison by both similarity and contrast, with adjustable opal glass plate in the tube, diaphragm arrangement, but without percentage graduation, standard lamp, plate box or receiving screen. See <i>Zeitschrift für Instrumentenkunde XXVII Jahrgang, Juni 1907</i> . (Copy of reprint sent on request).....	159.00	212.00
	Accessories for No. 42064 Weber Photometer.		
42068.	Percentage Graduation on above.....	4.50	6.00
42072.	Standard 2 Volt Lamp, in adjustable mounting as shown in No. 42064.....	21.00	28.00
42076.	" Benzene Lamp, in adjustable mounting as shown in No. 42040.....	27.00	36.00
42080.	Plate Box, for plates μ and m , for the decimal extension of the range, etc. See <i>Zeitschrift für Instrumentenkunde, XXVII Jahrgang, Juni 1907</i>	43.50	58.00
42084.	Gypsum Plate, Gt.....	7.20	9.60
42088.	Plate Box, Weber model.....	15.00	20.00
42092.	" " " with divided scale and pointer.....	19.50	26.00
42096.	Table of Constants for either of the above plate boxes.....	7.50	10.00
42100.	Two Smoked Glasses in mounting, fitting in either of above plate boxes.....	7.50	10.00
42104.	Box for Smoked Glasses, to be used in place of Weber box.....	10.50	14.00
42108.	Improved Plate μ , for use in connection with Weber's plate box or the box for smoked glasses.....	7.20	9.60
42112.	Screen μ I.....	15.00	20.00
42116.	Spherical Receiving Screen.....	27.00	36.00
42120.	Case for complete instrument.....	12.00	16.00
	Note—As a comprehensive outfit for the measurement of illumination and intensities, either in the open or in enclosed spaces, the makers recommend an outfit consisting of Nos. 42064, 42068, 42072, 42092, 42096, 42104, 42112 and 42120	249.00	332.00
	Note—For Weston precision millivolt and ammeters for use with the above see p. 201.		

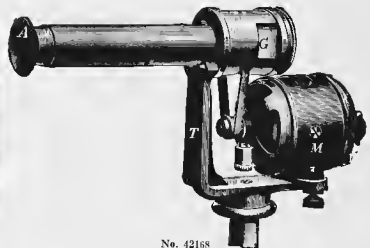


No. 42124

	Duty Free	Duty Paid
42124. Photometer Bench, Stationery, latest construction, consisting of optical bench on three cast iron standards, with scale divided in millimeters from 0 to 2500 mm and with three adjustable riders I, II and III, but without standard lamp, N, sight-box P or gas burner L.....	145.50	194.00
Accessories for above Photometer Bench.		
42128. Graduations in Direct Candle Power, extra.....	15.00	20.00
42132. Scale, divided from 20 to 3000 mm, extra.....	10.50	14.00
42136. Set of Six Screens, for above Photometer, consisting of four with circular opening and two without opening.....	43.20	57.60
42140. Illuminating Device for reading the scale, consisting of a small 2 volt Osram lamp arranged to illuminate only the portion of the scale to be read.....	10.80	14.40
42144. Holder for the Suspended Lamp, to fit on the optical bench, with 1 meter of connecting cord.....	7.20	9.60
42148. Holder for Incandescent Lamp, to hold the lamp to be tested in both vertical and horizontal position.....	30.00	40.00
42152. Rotator for Incandescent Lamp, without motor.....	31.50	42.00

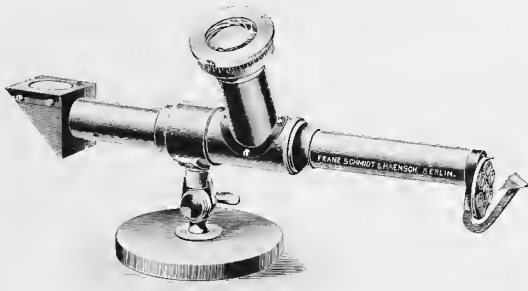


No. 42156



No. 42188

	Duty Free	Duty Paid
42156. Photometer Sight-box, Lummer-Brodhun, for comparison by similarity.....	40.50	54.00
42160. Photometer Sight-box, Lummer-Brodhun, for comparison by both similarity and contrast.....	46.50	62.00
42164. Photometer Sight-box, Lummer-Brodhun, for measuring of light sources from different angles and with a crossline scale for sighting and concave lens for the ocular.....	60.00	80.00
42168. Photometer Sight-box, Flicker type, including motor for 110 volts. See <i>Zeitschrift für Instrumentenkunde</i> , Februar 1905.....	48.00	64.00
42172. Photometer Sight-box, same as above, but adjustable for use through an arc of 180° See <i>Zeitschrift für Instrumentenkunde</i> , August 1905.....	55.50	74.00
42174. Adjustment for above, with horizontal graduations.....	7.50	10.00
42176. Photometer, Sight-box, same as No. 42168 but reversible, with vertical circle and enclosed adjusting arrangement with horizontal circle.....	64.50	86.00
42180. Photometer Sight-box, same arrangement as in No. 42176 but for use through an arc of 180°.....	72.00	96.00



No. 42200



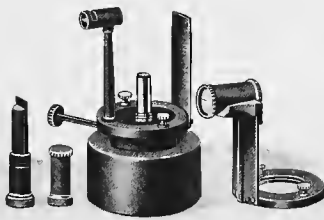
No. 42208



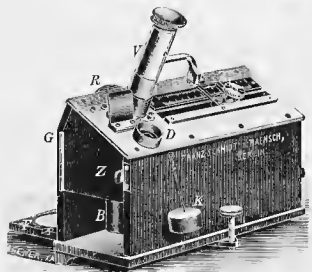
No. 42204



No. 42204

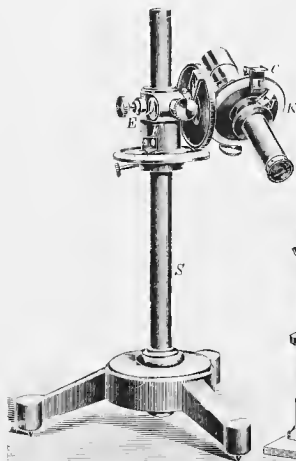


No. 42212



No. 42184

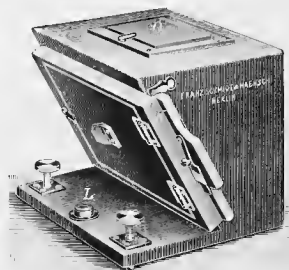
42184.	Illuminometer, or Relative Photometer, Martens, with benzene standard lamp and table of constants. See Schilling's <i>Journal für Gasbeleuchtung und Wasserversorgung</i> 1905.....									Duty Free	Duty Paid
										114.00	152.00
42188.	Illuminometer, Martens, as above, including a standard Osram lamp, but without accumulator or ammeter.									120.00	160.00
42192.	Additional Equipment, for above, arranged according to Dinnesen for the measurement of illumination on the street, etc., consisting of a 3 cell Edison accumulator, Type F 1, two resistances, 1.7 ohms to 7 amperes and 4 ohms to 15 amperes, carrying case and two wooden boxes for the accumulators and the photometer, but not including photometer No. 42184 itself or ammeter.									45.00	60.00
42196.	Precision Amperemeter, type W. K. a; from 0.7 to 1.2 amperes, for use with above.									30.00	40.00
42200.	Relative Photometer, Weber, particularly recommended for the determination of illuminating values on school desks, work tables, etc. See <i>Schriften des Naturwissenschaftlichen Vereins für Schleswig-Holstein, Band XV Heft 1</i>.									90.00	120.00
	Extra for certificate and test curve by Prof. Weber.....									7.50	10.00
42204.	Standard Incandescent Osram Photometer Lamps.										
	Type.....	E	G	C	E	B	C	A	F	B	A
	Hefner Candles.....	1	1	5	5	10	10	16	16	20	25
	Color.....	red	white	red	white	red	white	red	white	white	white
	Amperes.....	1.2	1.0	2.6	1.5	2.4	2.8	2.6	3	2.7	2.8
	Volts.....	4	2	5	6	10	6	11.5	8	12	13.5
	Lamp resistance in ohms....	3.3	2.0	1.9	4.0	4.2	2.1	4.4	2.7	4.5	4.8
	Watts per Hefner Candle....	4.8	2.0	2.6	1.8	2.4	1.7	1.9	1.5	1.6	1.5
	Cells necessary } red....	3		3		6		6			
	} white....		2		4		4		5	7	5
	Duty Free.....	1.50	1.20	1.50	1.50	1.95	1.95	1.95	1.95	2.25	2.25
	Duty Paid.....	2.00	1.60	2.00	2.00	2.60	2.60	2.60	2.60	3.00	3.00
42208.	Precision Mounting for Standard Incandescent Osram lamps.									6.00	8.00
42212.	Standard Hefner Lamp, with flame measuring device and sighting arrangement.									12.60	16.80
42216.	“ “ “ as above, with P. T. R. certificate.....									13.50	18.00
42220.	“ “ “ with flame measuring device after Kruss.....									13.50	18.00
42224.	“ “ “ as above, with P. T. R. certificate.....									14.40	19.20



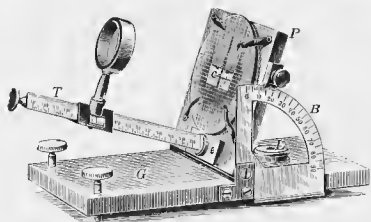
No. 42228



No. 42248



No. 42256

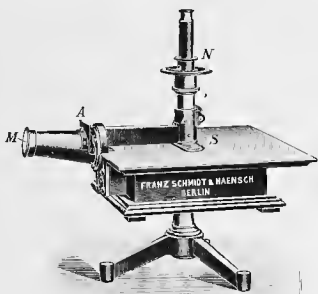


No. 42252

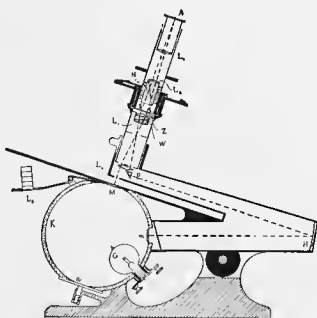


No. 42260

		Duty Free	Duty Paid
42228.	Polarisation Photometer, Martens, for white light on stand as shown in illustration.	89.40	119.20
42232.	" " " without stand.....	38.40	51.20
42236.	Stand only for above Photometer.....	51.00	68.00
42240.	Case " ".....	2.10	2.80
42244.	Comparison Lamp for above; very important for many measurements in fluorescence, etc., consisting of a small Osram lamp for 2 volts, with opal glass screen and mounting for immediate attachment to the Photometer....	22.50	30.00
42248.	Illumination Tester, Thorner, in box as shown in illustration. See <i>Hygienischen Rundschau</i> 1904, Nr. 18, and <i>Gesundheits-Ingenieur, Zeitschrift für die gesamte Stadt- und Gesundheits-Engineering</i> , 1908.....	12.00	16.00
42252.	Raumwinkelmesser, Weber, for the measurement of the angle of illumination and elevation angle with which a given area is illuminated.....	24.00	32.00
42256.	Raumwinkelmesser, Pleier.....	28.50	38.40
42260.	Illuminometer, Wingen, for measuring the illumination of a desk, work table, etc., within the limits of 10 and 50 meter candles in steps of 10. See <i>Journ. f. Gas- und Wasser-Technik</i> , 1902.....	9.30	12.40
42264.	Illuminometer, Wingen, reading in single meter candles up to 50 meter candles and with lamp extended to 500 meter candles by means of smoked glass disc to be inserted.....	19.50	26.00
Note—Complete descriptive German pamphlet of Schmidt and Haensch describing above Photometers and, in addition, the large <i>Physikalisch-Technische Reichsanstalt</i> model, sent on application.			



No. 42268



No. 42272

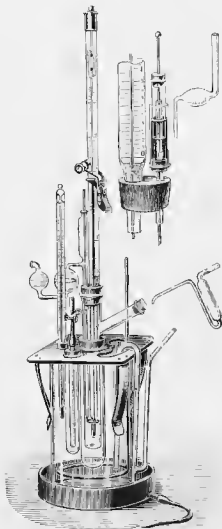
42268. Densitometer, Martens, for the measurement of the density of photographic plates, etc. This instrument is a specific application of the Polarisation Photometer, with convenient stage for the plates. See *Zeitschrift für wissenschaftliche Photographie, Photo Physik und Photochemie, Band VII, Heft 8, 1909.*
- | | | | |
|----------------|-------|----------------|--------|
| Duty Free..... | 78.00 | Duty Paid..... | 104.00 |
|----------------|-------|----------------|--------|
42272. Densitometer, latest construction, for use with two 10 candle power 4 volts standard lamps, with stage for plates, operating on the same principle as Martens Densitometer
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 195.00 | Duty Paid..... | 260.00 |
|----------------|--------|----------------|--------|



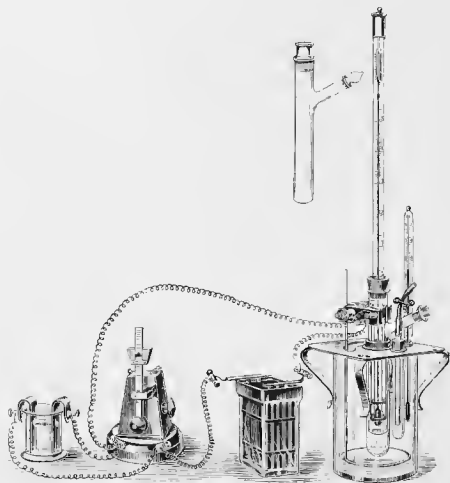
View in Salesroom showing samples of Analytical and other Balances, Waufler Bottles, Aspirator Bottles, etc.

PHYSICAL-CHEMISTRY APPARATUS

Apparatus for the Determination of Molecular Weight
 Apparatus for the Determination of the Conductivity of Electrolytes (Dielectric Constant)
 Apparatus for the Determination of Electro-Motive Force by the Potentiometer Method
 Ostwald Viscosity Outfits, etc., etc.



No. 42300



No. 42308

42300. Molecular Weight Determination Apparatus, Beckmann, by Depression of the Freezing Point. See *Zeitschrift für Physikalische Chemie, Band II, Seite 638 und Band VII, Seite 333-330*. Complete outfit consisting of the following:—

Cooling Jar, with nickel plated cover, stirrer, four air jackets, four freezing tubes with corks, three filling pipettes, one freezing rod and one rubber stopper.

Zinc Trough, with glass siphon to draw off cooling mixture.

Thermometer for the cooling mixture from -20 to $+40^{\circ}$ C. in single degrees.

Stirrer, for the solution, of glass with platinum ring (approximately 24 grams of platinum).

Sulphuric Acid Tube. When hygroscopic solutions are investigated the stirrer passes through this tube which should then be filled with sulphuric acid and attached to a filter pump with drying cylinders in order to obtain a current of dry air for the determination.

Thermometer, Beckmann Differential, with auxiliary scale, range 5 to 6° C. in $\frac{1}{100}$ ths. (No. 48288.)

Reading Device for Beckmann's Thermometer. (No. 48278.)

Duty Free 23.00 Duty Paid 31.50

42301. Molecular Weight Determination Apparatus, complete as above, but without Beckmann Differential Thermometer.

Duty Free 12.10 Duty Paid 16.50

42308. Molecular Weight Determination Apparatus, Beckmann, by the Depression of the Freezing Point, for Hygroscopic Solutions, with freezing tube hermetically closed against the moisture of the air and the stirrer operated by electromagnet. See *Zeitschrift für Physikalische Chemie Band XXI Seite 340 und Band XLIV Seite 169-184*. The outfit consists of the following:

Cooling Vessel, with nickel cover, stirrer, four air jackets, four freezing tubes with corks, three filling pipettes, one freezing rod and two rubber stoppers.

Thermometer, for the cooling mixture, from -20 to $+40^{\circ}$ C. in single degrees.

Stirrer, of platinum, mounted on enamelled iron ring for operation by electromagnet. Approximately 3.20 grams of platinum.

Electromagnet, for operating stirrer.

Thermometer, Beckmann Differential, with auxiliary scale, range 5 to 6° C. in $\frac{1}{100}$ ths. (No. 48288.)

Accumulator.

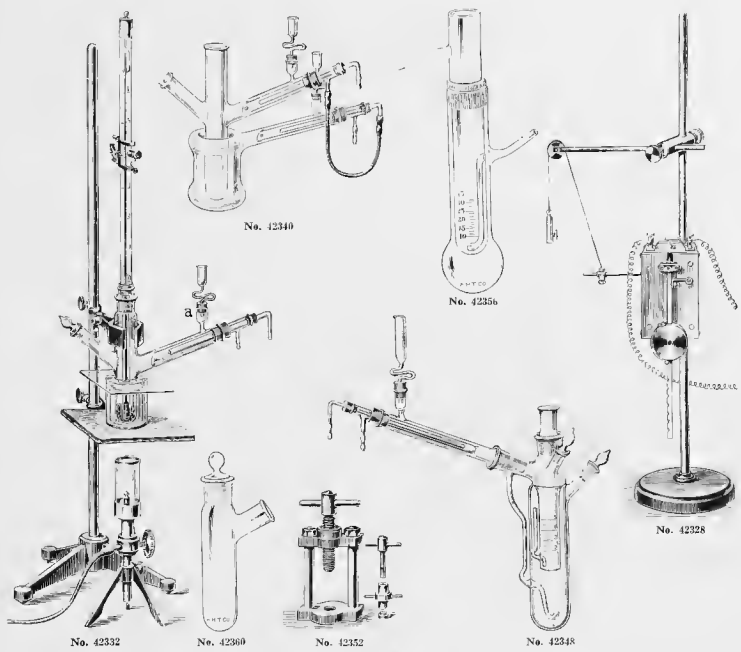
Metrohm's Contact Break, with clock-work running 40 minutes and platinum contact.

Spark Conductor, to suppress the first spark at the metrohm break in order to protect the contact.

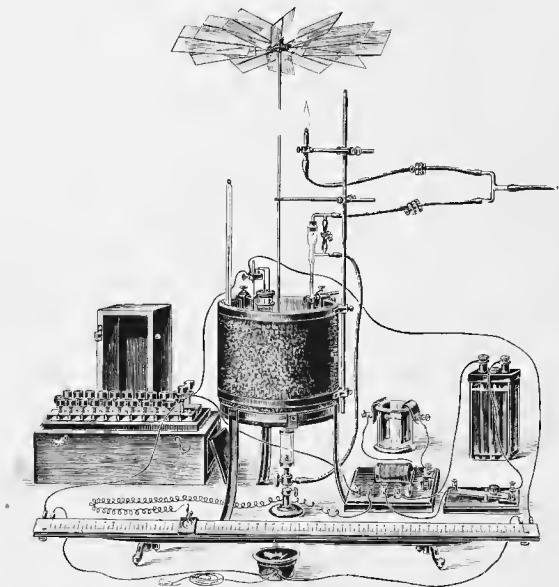
Duty Free 33.60 Duty Paid 45.80

42312. Molecular Weight Determination Apparatus, outfit complete as above but without Beckmann Differential Thermometer.

Duty Free 22.75 Duty Paid 30.95



- Extra Parts and Accessories for the preceding Molecular Weight Determination Apparatus.**
42316. Freezing Tube as used in outfit No. 42330. 1.00
 42320. " " with ground stopper and ground in tubulation for thermometer. 1.25
 42324. Thermometer, for cooling mixture from -20 to $+40^{\circ}$ C. in single degrees. 1.25
 42328. Mechanical Stirrer, with clockwork running two hours; on adjustable stand with contacts so that it may be used as an electromagnetic stirrer as well; pendulum bob is adjustable for different speeds. 15.00
42332. Molecular Weight Determination Apparatus, Beckmann, by Elevation of the Boiling Point. See *Zeitschrift für Physikalische Chemie Band XXI, Seite 245 und Band XL, Seite 130-144*. The outfit consists of the following:
 Support, with clamp, ring, etc.
 Boiling Tube, of Jena glass, with ground in stopper and tubulation for thermometer (which may be held in place by asbestos paper).
 100 grams Garnets for charging material. Platinum tetrahedrons for charging may be had at market price of platinum, which are not included with the outfit. The best charging mixture consists of from 2 to 3 grams of platinum tetrahedrons and 20 grams of garnets.
 Jacketed Tubes with mica cover and asbestos support.
 Micro Bunsen Burner, with regulating cock, and mica chimney.
 Thermometer, Beckmann Differential, with auxiliary scale, graduated from 5 to 6° C. in $\frac{1}{10}$ ths. (No. 45238). 23.60
42336. Duty Free. 17.30 Duty Paid. 8.70
 Molecular Weight Determination Apparatus, outfit complete as above but without Beckmann Differential Thermometer.
 Duty Free. 6.50 Duty Paid. 8.75
- Extra Parts and Accessories for above Molecular Weight Determination Apparatus.**
42340. Boiling Point Tube, Beckmann, of Jena glass, as supplied with outfit No. 42332. 3.25
 42344. Steaming Jacket for above when investigating solutions of high boiling point, of glass with condenser inside the arm. See *Zeitschrift für Physikalische Chemie Band XL, Seite 137-138*. 2.50
 42348. Boiling Point Tube, Beckmann, model of 1903. See *Zeitschrift für Physikalische Chemie, Band XLIV, Seite 162-168*; with two ground in stoppers and two ground in tubulations, with reflux condenser for discharging reflux into the jacket of the boiling tube as required. 7.50
 42352. Pastille Press, of steel, 5 mm bore. 7.00
 42356. Boiling Point Apparatus, McCoy, consisting of a graduated vessel with water jacket. See *Journal of the American Chemical Society, April, 1900*. 3.50
 42360. Boiling Point Apparatus, Jones. A glass vessel with ground in stopper and side tubulation. 3.00



No. 42364

42364. Apparatus for the Determination of the Conductivity of Electrolytes (Dielectric Constant), Kohlrausch-Ostwald, as used in the Leipzig laboratories. See *Phys.-chem. Mess.*, 3 Auflage, Seite 461. Outfit consists of the following:—

- Conductivity Vessel, Ostwald, of Jena glass, with electrodes 15 mm diameter; platinum weight approximately 2.2 grams.
- Constant Temperature Bath, Ostwald, 25 cm diameter and 25 cm high; with felt jacket, micro burner, two tubular regulators with supports and thermometer.
- Support for conductivity vessels, with removable base and clamp for hanging in thermostat.
- Thermometer, 0–60° C. in 1/10ths.
- Induction Coil, simple form, with felt insulation under base.
- Condenser for use with above induction coil.
- Storage Battery, without solution, capacity 10 ampere hours.
- Contact Key, with three binding posts, on polished wood base.
- Slide Wire Bridge, with scale 1 meter long divided into millimeters, model of the Phys.-chemischen Institute, Leipzig
- Telephone, for use with slide wire bridge.
- Resistance Box, from 0.1 to 300 ohms, with 17 coils, giving a total resistance of 1111.1 ohms, quality A, in accordance with the requirements of the Physikalisch-Technische Reichsanstalt.

Duty Free 112.00 Duty Paid 152.00

Extra Parts and Accessories for Apparatus for the Determination of the Conductivity of Electrolytes.

42368.	Conductivity Cell, Arrhenius, for poor conductors, with electrodes 24 mm in diameter with a separation of 10 mm. Approximately weight of platinum 5.6 grams; with extra cell of Jena glass	Duty Free	Stock
42372.	Extra Cell, only, for above, of Jena glass	12.15	18.40
42376.	Conductivity Cell, Arrhenius, for poor conductors, with electrodes sealed in, ground in glass stopper with stopcock.....	13.25	.40
42380.	Conductivity Cell, Ostwald, for poor conductors, with electrodes 15 mm in diameter with separation of 20 mm. Approximate weight of platinum 2.2 grams. With extra cell of Jena glass.....	6.10	20.00
42384.	Extra Cell, only, for above, of Jena glass.....	7.20	9.25
42388.	Conductivity Cell, Ostwald, for poor conductors; with electrodes sealed in and ground in glass stopper with stopcock.....	7.20	.50
42388.	Conductivity Cell, Kohlrausch, for poor conductors, with large, firmly fixed platinum electrodes. Approximate weight of platinum 4.2 grams. With ground in stopper with thermometer and graduations on cell	11.40	10.90
42392.	Conductivity Cell, Kohlrausch-Holborn, for poor conductors, with vertical electrodes with adjustable separation to be measured in millimeters. Approximate platinum weight 4.2 grams. When this cell is used with holder No. 42396 the larger rubber ring No. 42406 is necessary.....	12.80	17.25
		12.80	19.50



Nos. 42365 and 42396



No. 42376



No. 42388



No. 42101



Electrode Tubes
for No. 42494



No. 42350



No. 42412 with No. 42420



No. 42424



No. 42428



No. 42392

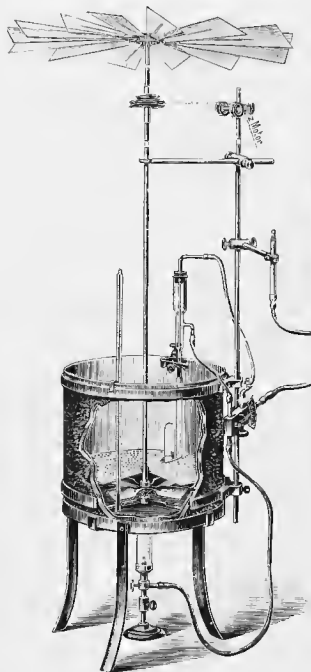


No. 42440

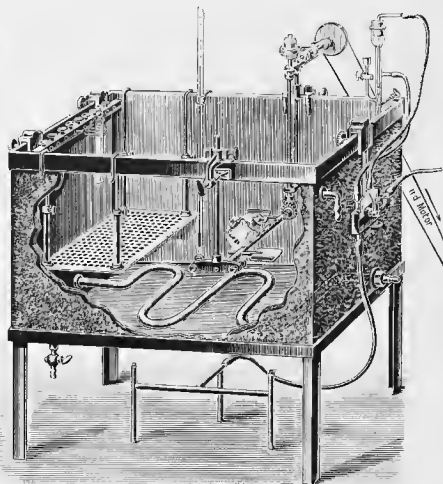


No. 42448

42396.	Support and Holder, for any of the above cells, with removable base and clamp for fixing to side of constant temperature bath and hard rubber terminals for electrodes with binding screws.	Duty Free 3.10	Duty Paid 4.65
42400.	Large Rubber Ring for above, for use with cells of wide diameter such as No. 42392.		.25
42404.	Conductivity Cell, Nernst, for good conductors. See <i>Deutsch. Phys. Ges. 1906. 1.</i> With five different glass electrode tubes of variable capacity for insertion through the cover. Glass parts of Jena glass. Platinum weight approximately 2.5 grams. This may be used with support and clamp No. 42396 and large ring No. 42400.	12.00	18.00
42408.	Extra Cell, only, for above, of Jena glass.		1.00
42412.	Conductivity Cell, Kohlrausch, for good conductors. See <i>Kohlrausch-Holborn Leitvermögen der Elektrolyte 1898 Seite 20.</i> With adjustable electrodes set in graduated tubes, each tube graduated in 45 capacities in 1/5ths. The platinum electrodes are set in silver rods. Approximate platinum weight .75 grams.	7.30	11.00
42416.	Extra Cell, only, with graduations but without electrodes.		2.00
42420.	Stand for above Cell, with removable base and with clamp for attaching to side of constant temperature bath.		3.00
42424.	Immersion Electrode, for good conductors, in protecting cylinder of glass. Platinum weight approximately 1.3 grams.	3.90	5.90
42428.	Conductivity Cell, Kohlrausch, for good conductors, with five extra cells of different capacities, with safety device for electrodes. Approx. platinum weight 4 grams.	12.50	19.00
42432.	Extra Glass Cells, each	.65	1.00
42436.	Holder for the above cell similar to No. 42396 with the exception that the clamp is oval as shown in illustration of No. 42428.	3.60	5.40
42440.	Conductivity Cell, Kohlrausch, with two glass stoppers and graduations on each arm of cell in 1/2cm. Platinum weight approx. 4.2 grams.	10.80	16.40
42444.	Holder for the above cell, similar to No. 42396 but with special double rim to take both arms of cell as shown.	3.50	5.25
42448.	Immersion Electrode, for poor conductors. Approx. platinum weight 1.2 grams	4.00	6.00
Note—Prices of conductivity cells involving the use of platinum vary according to the market price of platinum.			



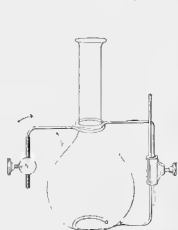
No. 42452



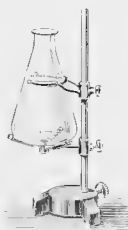
No. 42456

42452. Constant Temperature Bath, Ostwald, consisting of enamelled bath with felt cover, tripod, perforated nickel shelf, micro burner and two toluol regulators, but without thermometer as shown in illustration. With necessary clamps and either mica vanes for stirring by flame from the burner or pulley for stirring by motor. Type must be specified in ordering.
 Duty Free..... 18.50
 Stock..... 30.00

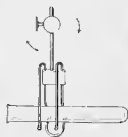
42456. Constant Temperature Bath, Ostwald, rectangular form, suitable for a great variety of work in Physical Chemistry. Bath is of tinned copper with outside jacket of felt. Complete with all fittings as shown in illustration with the exception of the thermometer and with two toluol regulators, 55 cm long, 35 cm wide and 35 cm high.
 Duty Free..... 55.50
 Duty Paid..... 75.60



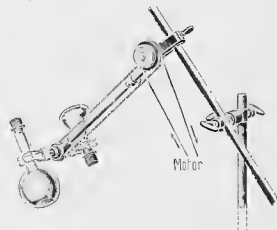
No. 42460



No. 42464



No. 42468



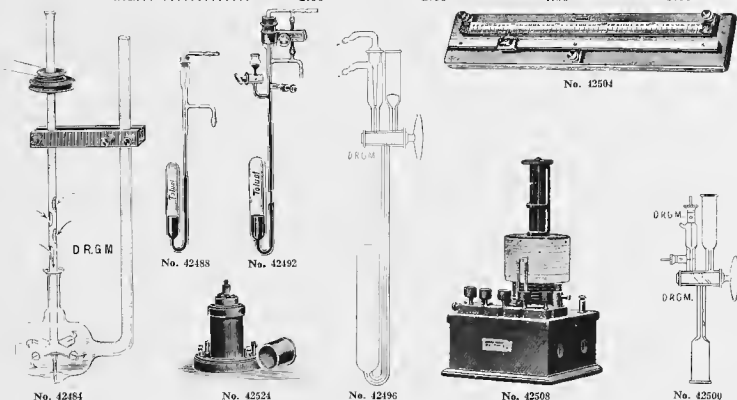
No. 42472

42460. Flask Holder, to take small flasks, for use in constant temperature bath..... .75
 42464. " " with removable base. When base is removed holder may be used in constant temperature bath..... 1.75
 42468. Test Tube Holder, for use in constant temperature bath..... .60
 42472. Shaking Device, for flasks, etc., for use in constant temperature bath. May be attached to any support..... 8.50

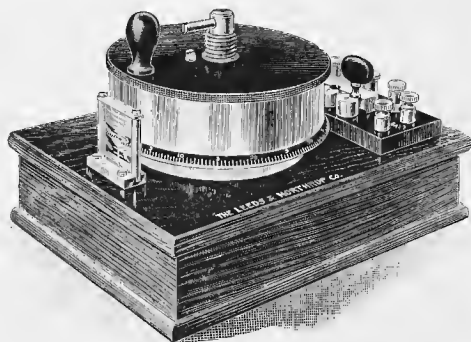
42476. **Constant Temperature Bath, Freas, Sensilve Water**, designed to furnish a continuous constant temperature for the range of temperature on the lower limit of the available hydrant water supply and on the upper limit of about 50° C. in a room of ordinary temperature. The extreme accuracy and small variation, which does not exceed .002° makes the thermostat especially suitable for the refined measurements of Physical Chemistry, botanical investigations, exact specific gravity determinations, etc. The apparatus consists of a well insulated tank of 340 liters water capacity, provided with spacious glass windows for observations and perforated shelf on which the experimental work can be placed. The tank is equipped with a stirring device and a mercury regulator which controls the heat through a thermal relay; long cylindrical filament lamps with low thermal capacity and motor suspended on adjustable springs to eliminate vibratory noise and vibration; device for maintaining constant water level and device for cooling the water in the tank when the room temperature is too great. Complete with regulator (without mercury) motor etc., ready for connection with water supply, drain and current. Further description, price and illustration on application.

42480. **Thermometers, Ostwald**, specially made for use in constant temperature baths, as used in Physical Chemistry, etc. With enclosed milk glass scale.

Range.....	+10° to +30° C.	0 to +60° C.	+50 to +105° C.	+100 to +150° C.
Graduated in.....	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
Each.....	2.00	2.50	4.00	5.00



42484. **Stirring Device, Luther**, for operation by suction and for chemically pure solutions and other liquids attacking metal. For use in constant temperature bath. 8.00
42488. **Toluol Regulator, Ostwald**, simple form, with by-pass, for use with gas regulating valve on Constant Temperature Baths No. 42452 or 42456. 1.50
42492. **Toluol Regulator, Ostwald**, same as above but with fine adjustment, reservoir and new form of clamp. 6.00
42496. **Toluol Regulator, Ostwald** new form, with by-pass and stopcock. 5.00
42500. **Contact Arrangement, Ostwald**, with regulating device as in preceding, to be attached to air, liquid or steam regulators so that the control of the gas may be operated by electricity. 7.50
42504. **Wheatstone Slide Wire Bridge**, 1000 mm long, with millimeter scale and ohm divisions for direct reading of the resistance in ohms. 10.00
42508. **Wheatstone Bridge**, cylindrical form, with two scales, one divided in 1000 equal parts and the other in ohms.
 Duty Free 45.00 Duty Paid 54.00
42512. **Wheatstone Bridge**, same as No. 42508 but with comparison resistances in the base plate of $\frac{1}{10}$, 1, 10, 100 and 1000 ohms.
 Duty Free 82.50 Duty Paid 100.00
42516. **Telephone**, for use with above bridges 3.00
42520. **Small Key** " " " " 1.50
42524. **Inductium** " " " " 12.00
42528. **Set of Pure Resistances, Leeds & Northrup**, with four coils, 1-5000 ohms, 1-10000 ohms and 2-20000 ohms. These coils are wound according to the specifications of the U. S. Bureau of Standards for pure resistances, i. e. resistances without any appreciable capacity or induction effect. See *Bulletin of the U. S. Bureau of Standards, Vol. 3, p. 495*. Bifilar winding gives very good results in coils of 1000 ohms or less, but in electrolytic work errors due to capacity and inductance become appreciable when using coils of higher values wound in that manner. Therefore, it is recommended that, when high resistances are required, this box be used in conjunction with one or the other of those previously listed. Each coil is connected to two small binding posts on the top rubber plate in order to keep the capacity of the connections at a minimum. 50.00



No. 42532



No. 42560A

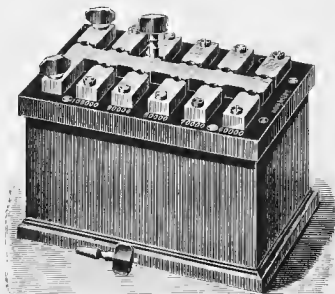


No. 42560B



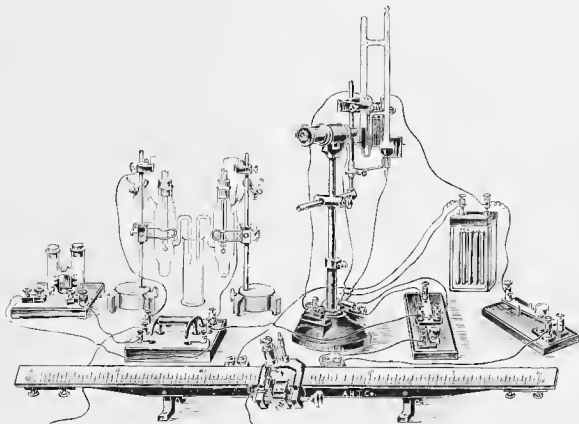
No. 42560C

42532. **Slide Wire Bridge, Kohlrausch, Leeds & Northrup**, with extension coils specially designed for use in the measurement of electrolytic resistances. The slide wire resistance is about 25 ohms and end coils are provided to increase the effective length of the slide wire. These coils are exactly $\frac{1}{4}$ times the resistance of the slide wire so that the slide wire is $\frac{1}{10}$ th of the total resistance. The position of the contact is read by means of the vertical glass scale which reads complete turns and also by the scale on the periphery of the hooil, which latter is divided into 100 parts, each division being about 6 mm. These divisions are further subdivided into halves so that it is possible to estimate to $\frac{1}{1000}$ th of a complete revolution or to $\frac{1}{10000}$ th of the total motion of the contact point. Used and recommended by many leading Physical Chemists. 68.00
42536. **Standard Resistance Box, Leeds & Northrup**, with coils .5, 1, 2, 3, 4, 10, 20, 30, 40, 100, 200, 300, 400, 1000 ohms. An infinity plug is also provided. The coils are arranged on the plug out plan and are guaranteed to be accurate to within $\frac{1}{2}$ %. The coils are bifilar wound and are practically free from capacity and inductance, and are particularly recommended for use in the measurement of electrolytic resistances. The wire used is of manganin which has a very low temperature coefficient. The accuracy of the coils is, therefore, practically unaffected by ordinary changes in temperature. The blocks and plugs are large, insuring good plug contacts 85.00
42540. **Standard Resistance Box, Leeds & Northrup**, similar to No. 42536 but containing the following coils; .5, 1, 2, 3, 4, 10, 20, 30, 40, 100, 200, 300, 400, 1000, 2000, 3000, 4000, 10000 ohms, and an infinity plug 100.00
42544. **Induction Coil for Electrolytic Measurements, Leeds & Northrup**, with extreme rigidity of the vibrator so that it will operate in spite of mechanical vibrations and short circuiting of the secondary coil. The vibrator is provided with a slow motion set screw so that fine adjustments are possible. Operates on a single cell of storage battery and is enclosed in a felt lined case, and consequently makes very little noise. 20.00
42548. **Head Band Telephone Receiver, Leeds & Northrup**, specially made for laboratory work, unusually sensitive and with strong permanent magnets. The receiver is thoroughly insulated from the head bands which are strong and light in weight. With 6 ft. of flexible cord. 5.00



No. 42552

42552. **Resistance Box, Otto Wolff**, in decades with plug connection. Decades 10 x 1000 with a total resistance of 100,000 ohms. Of manganin wire.
 Duty Free 49.50
 Duty Paid 66.00
42556. **Platinizing Solution**, according to Kohlrausch and Holborn, consisting of a 3% solution of platonic chloride and $\frac{1}{10}$ th of 1% solution of lead acetate. In 50 cc bottles, per bottle. 2.50
42560. **Binding Posts, Oswald**. Sheet or wire can be held equally tight.
- | Style | A | B | C |
|-------|-----|-----|-----|
| Each | .35 | .35 | .35 |



No. 42564

42564. Apparatus for the Determination of Electro-motive Force by the Potentiometer Method, arranged according to Ostwald and as used in the Leipzig laboratories. See *Phy.-chem. Mess.*, 3, *Auflage*, Seite 426. Outfit consists of the following:—

- Capillary Electrometer with microscope of 30 and 60 diameters and ocular micrometer divided into $\frac{1}{5}$ mm, with movable mirror and horizontal fine adjustment on the microscope.
- Electrometer Key, with platinum contact, on wooden base. See *Phy.-chem. Mess.* 308.
- Cadmium Normal Element, mounted on board, with binding posts.
- Slide Wire Bridge, with scale 1 meter long divided into millimeters, model of the Phys.-Chemischen Institute, Leipzig.
- Accumulator.
- Contact Key for one circuit, with three posts, on polished wooden base.
- 1 pair of Half Elements No. 42628 with Cylinder No. 42632, Stand and Clamp No. 42636 and with two each of No. 42640 Electrodes.
- Mercury Commutator with six binding posts.

Duty Free..... 46.75

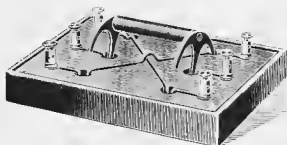
Duty Paid..... 63.75



No. 42568



No. 42572



No. 42580



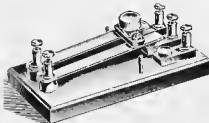
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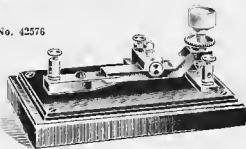
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No. 42592

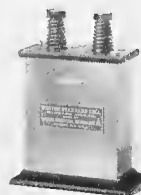


No. 42588



No. 42600

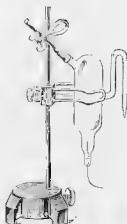
- 42568. Capillary Electrometer, with microscope of 30 and 60 diameters and ocular micrometer divided into $\frac{1}{5}$ mm, with movable mirror and horizontal fine adjustment on the microscope. Illustration shows Tube No. 42576 in position..... 25.00
- 42572. Capillary Electrometer Tube, Ostwald, vertical form..... 30
- 42576. " " Luther, with contacts and already filled..... 3.00
- 42580. Mercury Commutator, with six binding posts..... 4.00
- 42584. Contact Key, for one circuit, with three posts, on polished wooden base. As shown on right hand side of outfit No. 42564..... 2.25
- 42588. Contact Key, for two circuits, with five binding posts..... 4.25
- 42592. " du Bois-Reymond, on wooden base..... 4.25
- 42596. Plug Key, on polished wooden base..... 2.75
- 42600. Electrometer Key, with adjustable contact screw on spring, mounted on hard rubber..... 6.75



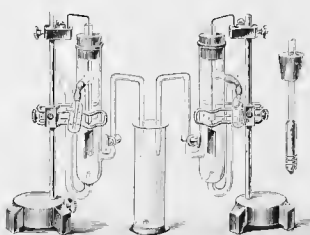
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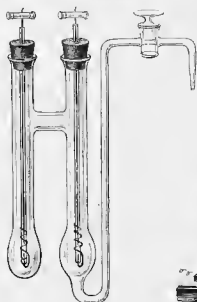
No. 42672



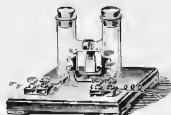
No. 42664 with 42666



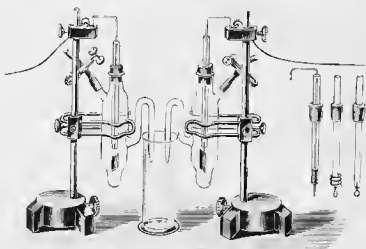
Nos. 42641 to 42656



No. 42680

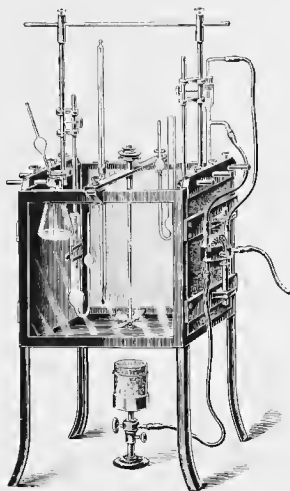


No. 42608



Nos. 42628 to 42640

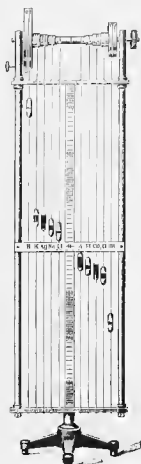
42604. Cadmium Normal Element, Drucker, with two platinum contacts, in protecting tube, with two corks, without any support and to be filled by user. See *Phys.-Chem. News*, 419. 1.25
42608. Cadmium Normal Element, on board, with binding posts and clamp to hold glass vessel in position. 3.25
42612. Battery of Five Cadmium Normal Elements, mounted on board as in No. 42608, with binding posts, clamps, etc. 14.85
42616. Chemically Pure Material and solution for filling above elements as the cells can not be sent out filled. In air-tight glass containers. 20.25
- | | | | |
|----------------------------|------|------|------|
| To fill, elements. | 1 | 2 | 5 |
| Each. | 1.75 | 3.00 | 6.00 |
42620. Weston Standard Cell, Unsaturated Form, Model 4. At ordinary working temperature (15° to 35° C) change in E.M.F. is so small as to be negligible in most work. The E.M.F. is about 1.0187 volts at 20° C. Each cell is accompanied by a certificate giving the exact E.M.F. and other necessary data. 15.00
42624. Weston Standard Cell, as above, with National Bureau of Standards certificate. 17.50
42628. Glass Cells for Half Elements, with syphon and tubulation with rubber tubing and pinchcock. Per pair50
42632. Cylinder for connecting the two half elements.15
42636. Supports, with element holder, mercury contact and binding posts. Per pair 4.50
42640. Metal Electrodes, mounted in glass tubes with rubber stopper to fit above glass cells.
- | Metal. | Platinum Foil | Platinum Ring | Silver Spiral | Gold Foil | Zinc Rod | Copper Rod |
|----------------|-------------------------|-------------------------|-------------------------|---------------------|--------------------|----------------------|
| Each | 2.00 | .75 | .75 | 1.75 | .50 | .50 |
42644. Glass Cells for Gas Electrodes, Ostwald, with syphon and glass stopcock. Per pair. 3.00
42648. Cylinder for connecting the two elements.15
42652. Supports, with element holder, mercury contact and binding posts. Per pair 4.50
42656. Electrodes, on glass tube, with rubber stopper, of platinum foil. Approximate platinum weight 1.2 grams. Per pair 5.50
42660. Platinum Electrodes, Luther, with internal contact. Per pair. 2.25
42664. Glass Cell, Drucker, for Calomel Normal Electrode, with fused in platinum wire, syphon and tubulation with rubber tubing and pinchcock. Each90
42666. Support, for above, with clamp and detachable base 1.75
42668. Glass Cell, Drucker, as above but with glass stopcock in syphon, as shown in illustration of No. 42672. 1.75
42672. Glass Cell, Drucker, as above but with electrical connection from above and with glass stopcock in syphon. 1.75
42680. Migration Tube, with silver and copper electrode. 3.50



No. 42684



No. 42696



No. 42700

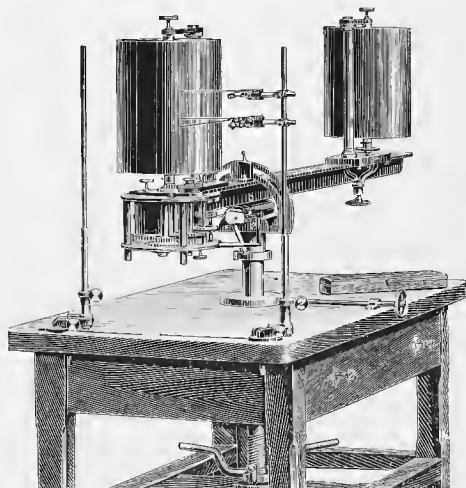
42684. **Outfit for the Determination of Viscosity, Ostwald**, consisting of rectangular constant temperature bath with two glass sides and with support for two viscosity tubes. With stirring device, three capillary tubes from 80 to 100 seconds outflow time, two toluol regulators, with clamp, micro burner, small flask, pipette and a thermometer holder.
 Duty Free..... 22.50 **Duty Paid**..... 30.75
42688. **Viscosity Tube**, only, as furnished with above outfit, from 80 to 100 seconds outflow time when not otherwise specified..... .75
42692. **Viscosity Tubes**, in sets of six, with varying times of outflow from 20 to 250 seconds. **Per set** . . . 3.75
42696. **Viscosity Tube, Drucker**, new form, with glass stopcock. Time of outflow 80 to 100 seconds unless otherwise specified..... 4.00
-
42700. **Model for Lecture Table Demonstrations of the Migration of Ions, Kohlrausch**. See *Zeitschrift für physikalische Chemie*, XXXIV, 5, 1900.
 Duty Free..... 16.50 **Duty Paid**..... 22.00

In the preceding section on Physical Chemistry and in the following section on Physiological Apparatus no effort has been made to list all of the apparatus offered by the leading European manufacturers. In the section on Physical Chemistry we have selected typical apparatus for routine and teaching work in the most important subjects under this heading.

In the section on Physiological and Clinical Apparatus the apparatus has been selected with special reference to laboratories of Experimental Pathology, Experimental and Clinical Medicine, Pharmacology and Experimental Therapeutics. We have made no attempt to list a complete section of apparatus for both teaching and research in Physiology as such.

We keep on hand a supply of European manufacturers' catalogues covering very completely the latest developments in apparatus for both Physical Chemistry and Physiology and these catalogues are sent to customers where wider choice of apparatus seems advisable.

PHYSIOLOGICAL AND CLINICAL APPARATUS



No. 42804

42800. **Kymograph, Hürthle**, mounted on heavy oak table, with two cylinders of 20 cm diameter and 25 cm high adjustable as to distance apart so that papers of from 60 to 330 cm in length can be used. With new reducing gear so that speeds can be obtained from 0.2 to 120 cm per second. As supplied by us to Rockefeller Institute for Medical Research, Harvard University, University of Wisconsin, University of Pennsylvania, University of California, Drs. Mayo, Graham, Plummer & Judd, U. S. Public Health & Marine Hospital Service, etc.

Duty Free..... 282.00
Duty Paid..... 338.40

42804. **Apparatus for smoking paper** with gas flame, after Hürthle.

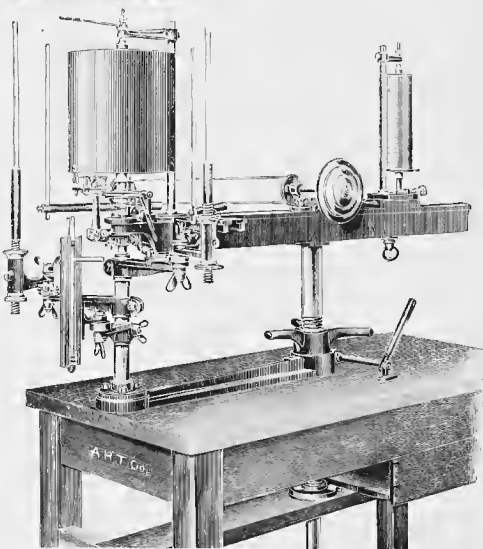
Duty Free..... 25.50
Duty Paid..... 30.60

42808. **Special glazed paper**, 50 cm wide, in rolls of 10 meters. Per roll, from stock..... 1.00

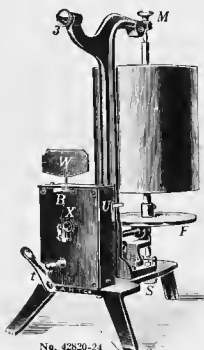
42812. **Kymograph, Brodie**, mounted on strong table with top 51x24 inches. The recording drum is 9 inches in diameter and 10 inches high and will take papers of varying length from 6 ft. 3 in. to 9 ft. 6 in. A fine adjustment is provided on the small drum for tightening the paper. The time marker and signal are conveniently placed under the drum so as not to interfere with the manometer. Price includes separate pair of drums for smoking and varnishing, mounted on wall brackets. A recent improvement is a two speed gear so that the speed may, at any moment, be increased from $1\frac{1}{2}$ to 24 times.

Duty Free..... 330.00
Duty Paid..... 400.00

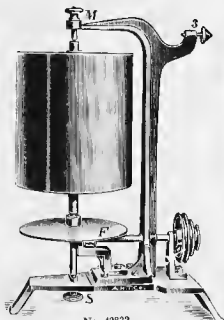
42816. **Special glazed paper**, 10 inches wide, in rolls of 200 yards, Per roll..... 4.00



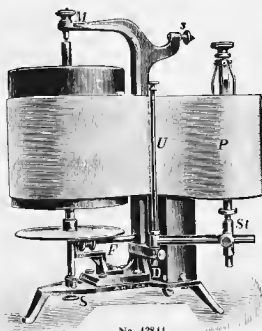
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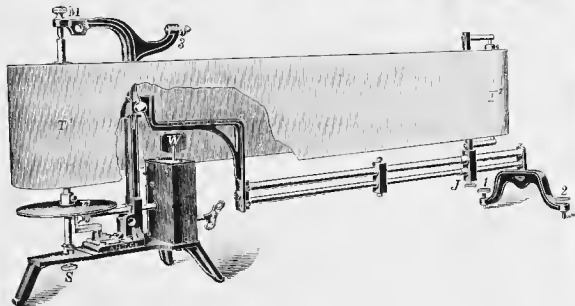
No. 42820-24



No. 42832



No. 42844



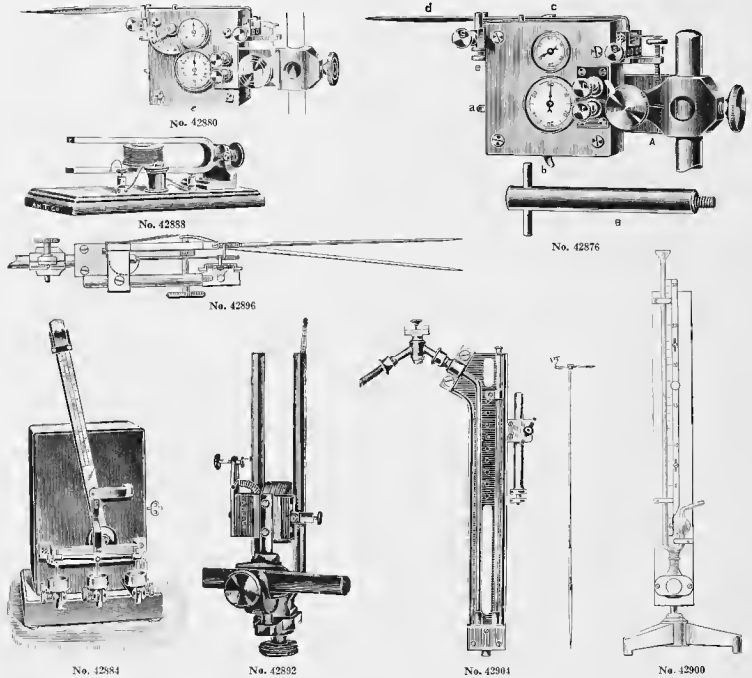
No. 42848



No. 42860

KYMOGRAPH, ZUNTZ, for practical class work in the laboratory. The drum is 18 cm high and is immediately detachable for the purpose of attaching the paper which may be readily smoked on the drum with the apparatus in the horizontal position. With variable speeds as noted in the descriptions below.

42820.	Kymograph, as above, with clock-work, for use either vertically or horizontally, surface speed of cylinder varying from 5 to 40 mm per second. By the use of the fan governor No. 42840 the speed may be reduced to one revolution per hour equal to a surface speed of 500 mm per hour.			
	Duty Free	30.00	Duty Paid	36.00
42824.	Kymograph, as above, but with Fühner's slow motion modification consisting of a supplementary lever by the use of which the speed may be reduced to one rotation in 24 hours. In addition to this slow motion the instrument will give all the speeds attainable with No. 42820.			
	Duty Free	43.50	Duty Paid	52.25
42828.	Kymograph, same as No. 42820 but with a special quick motion providing a surface speed of 200 mm per second, in addition to the regular speeds of No. 42820.	Duty Free	Duty Paid	
		40.50	48.60	
42832.	Kymograph, same as 42820, but without clock-work, with pulley wheel for driving by independent motor.	21.00	25.20	
42836.	Support, Adjustable, for kymographs listed above (see Sts of No. 42844). This support provides a convenient means of attaching the writing levers, etc.	4.50	5.40	
42840.	Fan Governors, for above kymographs in three sizes, each.	.90	1.10	
42844.	Attachment for Supporting a Continuous Ink Record. Price does not include adjustable support No. 42836 which must be added.	7.50	9.00	
42848.	Support, Extension, for use with endless papers by the Hering method.	18.00	21.60	
42852.	Carrying Case, with handle and lock.	7.50	9.00	
42856.	Glazed Paper, 510 x 180 mm, gummed. Per 100 sheets.	1.15	1.35	
42860.	Recording Drum, Sherrington-Staring, with drum 6 x 6 inches adjustable up and down the shaft. Two electric contact springs are provided by which contact at any two points in the revolution can be made. There are two driving gears within the base, a worm and wheel for the slow motion and a volute gear for the fast, with friction-clutch for stopping and starting. A change speed gear permits a range of speeds from 1 to 870 revolutions in a given time depending on the speed of the driving motor. Without driving motor.			
	Duty Free	35.25	Duty Paid	42.30
42864.	Recording Drum, as above, with screw lifting device.	38.25	45.90	
42868.	Extra Cylinder, 12 inches in diameter.	18.00	21.60	
42872.	Glazed Paper, per roll of 200 yards.	2.25	2.70	



42876.	Chronometer, Graphic, Jaquet, the most accurate and widely used time marker, reading in seconds and $\frac{1}{4}$ th seconds. For use in either vertical or horizontal position. See Jaquet "Studien über graphische Zeitregistrierung. Zeitschrift für Biologie, Bd. XXVIII, S. 3 1891.		
	Duty Free	33.75	Stock
42880.	Chronometer, Graphic, Jaquet, New Model, with arrangement for writing intervals of 3 and 6 seconds in addition to the $\frac{1}{4}$ th and single seconds, the additional adjustment being controlled by lever operating on small arc.	42.50	55.25
42884.	Metronome, Jaquet, with mercury contact, giving contact intervals, by adjustment of weight on the lever arm, from $\frac{1}{4}$ to $\frac{1}{2}$ second. A further interval of 3 seconds is possible by arrangement of the contact. Operates 30 hours at one winding.		
42888.	Tuning Fork, electro-magnetic, adjusted to 100 double vibrations per second.	18.75	24.40
42892.	" " " " with direct writing point, adjusted to 100 double vibrations per second.	15.00	18.00
42896.	Manometer, Spring, Hürthle, for registering arterial blood pressure in animals. See Pfliigers Archiv Bd. 47S. 6	16.50	19.80
42900.	Manometer, Mercury, Hürthle, for control of spring manometers, etc. See Pfliigers Archiv Bd. 43 S. 421	21.00	25.20
42901.	Manometer, Mercury, Ludwig-Cyon, in metal mounting, with three-way stop-cock, etc.	5.40	6.50
42908.	Manometer, Combined Spring and Mercury, Hürthle. See Pfliigers Archiv. 72 S. 570.	20.40	24.50
42912.	Calibrated U Tube for above.	48.00	57.60
42916.	Lever for adjusting the manometer to the height of the heart.	1.80	2.15
42920.	Piston Recorder, Hürthle, with three brass cylinders of 18, 24 and 30 mm in diameter and with counterpoised lever. Improved form operating without oiling of the piston	.90	1.10
		24.00	28.80



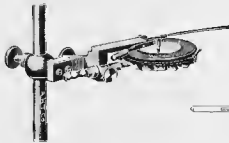
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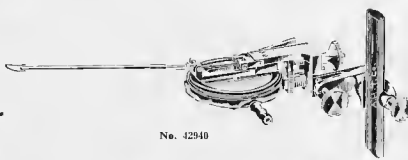
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No. 12932



No. 42918



No. 42940



No. 42952

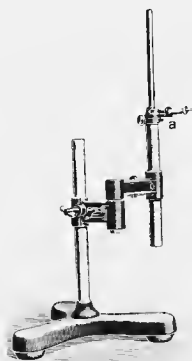


No. 42956



No. 42960

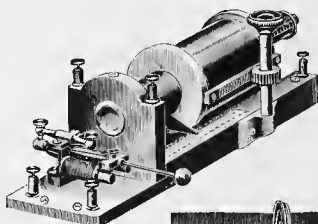
		Duty Free	Duty Paid
42924.	Signal Marker, electric, simple model	3.75	4.50
42928.	“ “ Deprez electric, for registering very small time intervals, with fine adjustment of writing point, rack and pinion adjustment for length, etc.....	21.00	28.80
42932.	Signal Marker, same as No. 42928 but with two writing points.....	42.00	50.40
42936.	“ “ electric, with the armature of the magnet controlled by a spring adjustable from 50 vibrations per second to 250, by means of a screw.....	27.50	35.75
42940.	Tambour, Marey, with fine adjustment and double transmission for the writing lever.....	9.00	10.80
42944.	Tambour, Marey, 5 cm in diameter.....	4.20	5.00
42948.	“ “ “ with fine adjustment of the writing point.....	4.80	5.75
42952.	“ “ 3 cm, with rubber membrane held in place by a clamped ring, with adjustment for changing fulcrum of writing lever in order to adjust capsule to the atmospheric pressure.....	13.25	17.25
42956.	Tambour, Marey, Straub's modification, with adjustment for the membrane by means of milled head, which can be carried on while experiment is in progress. Membrane is clamped in position by metal ring as in No. 42952 and apparatus is also furnished with air valve.....	24.25	30.85
42960.	Support, Adjustable, for physiological work, with vertical rod 10 mm diameter, 30 cm high, with fine adjustment on the vertical axis.....	14.50	17.25



No. 42964



No. 42968



No. 42972



No. 42992



No. 42996



No. 43000

No. 43008



No. 43012

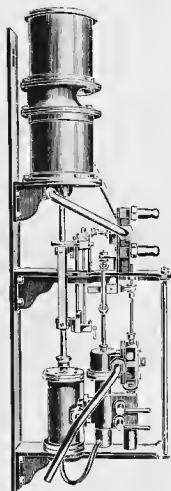


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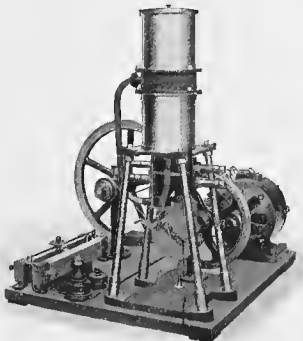


No. 43016

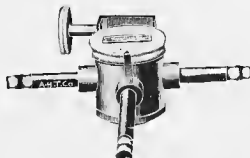
42964.	Support, Adjustable, for holding tambours, etc., in contact with the drum, with fine adjustment at "A"	Duty Free	Duty Paid
42968.	Support, Large Universal, for physiological use with all adjustments, 55 cm high	18.75	24.40
42972.	Inductorium, Du Bois-Reymond, for physiological work, with Meyer's interrupter and scale with which to read the position of the secondary coil, with 5,000 turns of wire.....	31.50	37.80
42976.	Inductorium, same as above, but with 10,000 turns of wire.....	18.00	21.60
42980.	" Vertical Form, secondary being carried by pulley over bars, with counterpoise. With 5,000 turns of wire.....	21.00	25.20
42984.	Inductorium, same as above, but with 10,000 turns of wire.....	36.00	43.20
42986.	Electrodes, Fleisch, unpolarizable. Per pair.....	40.50	48.60
42988.	" Ludwig, for deep seated nerves, in hard rubber mounting. Per set.....	1.35	1.75
42992.	Contact Key, Du Bois-Reymond, on heavy base.....	6.75	8.00
42996.	Commutator, Pohl.....	4.00	5.20
43000.	Canulae, of glass for arteries, with bore of from 2 to 8 mm, in sets of 20 pieces. Per set.....	3.75	4.90
43004.	Canulae, of metal, for arteries, with bore of from 2 to 4 mm in sets of 6 pieces. Per set.....	1.05	1.50
43008.	Canulae, of metal, for the trachia. State diameter in ordering. These canulae rotate and are provided with opening for control of expired air. Each.....	2.40	3.25
43012.	Canulae, same as above, in set of 11 from 2 to 12 mm diameter in steps of 1 mm. Per set.....	2.25	2.70
43016.	Respiration Pump, Brodie, with barrel 3 inches in diameter x 11 inches long. By a simple adjustment of the crank the throw of the piston may be quickly altered to deliver any quantity up to 1 liter of air per thrust. The valves are of simple construction and easily reached for examination. Mounted on a board for fixation on the wall of the laboratory.....	22.50	27.00
		57.00	68.40



No. 43020



No. 43025



No. 43040



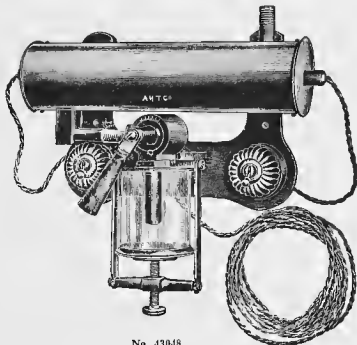
No. 43044

- 43020. Artificial Respiration Apparatus, Meyer. See *Archiv. f. exp. Path. u. Pharmacologie Bd. 47, pag 436.*
Adjustable from 20 respirations of 1000 cc of air per minute to 100 respirations of 25 cc. With water motor for pressure of at least 30 lbs.
- 43024. Artificial Respiration Apparatus, same as No. 43020 but for water pressure of from 15 to 30 lbs.
- 43025. Artificial Respiration Apparatus, same as No. 43020 but with electric motor. State voltage and current in ordering.
- 43032. Artificial Respiration Apparatus, same as No. 43020 but with small cylinders delivering from 0 to 350 cc of air per thrust.
- 43036. Anaesthetizing Valve, Meyer, with stopcock, for use in connection with artificial respiration apparatus to obtain proper mixture of air and anaesthetic. For small animals.

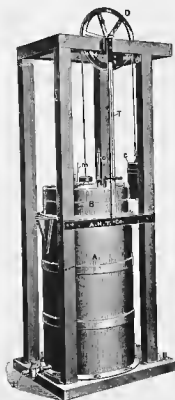
Duty Free	Duty Paid
165.00	200.00
185.00	225.00
175.00	210.00
150.00	180.00
10.80	13.00

- 43040. Anaesthetizing Valve, same as above but for large dogs.
- 43044. Respiration Valve, after Metzner.
- 43048. Anaesthetic Bottle and Air Warmer, Brodie, for use in connection with the above Respiration Pump No. 43016 and can be furnished with Dr. Brodie's animal operating table No. 2024H. The heater consists of a brass tube with removable ends, holding two ordinary electric light bulbs, each with separate switch. It is advisable to have lamps of different candle-power such as 8 or 16, which may be used singly or together in accordance with the amount of air and degree of heat required. The illustration shows the form as regularly supplied for attaching to the end of Dr. Brodie's operating table, but it is also furnished at same price mounted separately, where a more portable apparatus is required. In ordering please state voltage and whether table or portable form is desired. Complete with one extra glass anaesthesia bottle

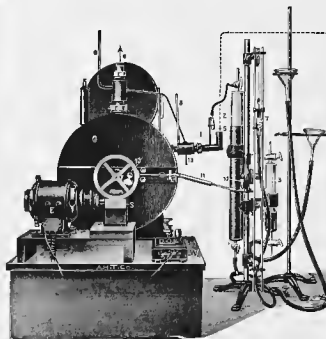
13.50	16.25
9.00	11.75
Duty Free	25.20
Duty Paid	30.25



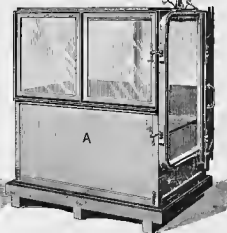
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No. 43052



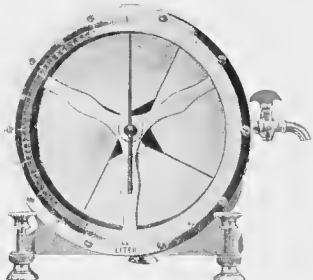
No. 43056



43052. **Spirometer, Jaquet**, for the investigation of the products of respiration. The analysis of the air from the Spirometer is best conducted by the exact method of Petersen and Palmquist (See No. 29388). See Prof. Jaquet—*“Über die Nachwirkung einer anstrengenden Muskelarbeit auf den Stoffwechsel.”* *Archiv für experimentelle Pathologie und Pharmakologie.* Bd. 62, pag. 341; and Gigon—*“Über einige Fragen des Stoffwechsels und der Ernährung.”* *Manchener Mediz. Wochenschrift* Nr. 25. 1911.
 Duty Free..... 200.00 Duty Paid 260.00
43056. **Respiration Apparatus, Jaquet**, for the convenient securing and the accurate measurement of the products of respiration, consisting of a large ventilating chamber constructed to order of any size for animals, children or adults. This illustration shows an instrument furnished the Pediatric Clinic at Strassburg with the respiration chamber of sufficient size for small children. The chamber is connected as shown by dotted lines to the large gas meter “G” which is driven by an electric motor. With a controlling rheostat the speed of the motor is changed to vary the ventilation of the chamber. The determination of the oxygen and carbon dioxide content of the tested air with the total volume passing through the meter makes it possible to estimate the total oxygen requirement as well as the carbon dioxide output of the individual under experiment. Price, depending upon the size of the respiration chamber, on application.

References.

Jaquet—*Ein neuer Apparat zur Untersuchung des respiratorischen Stoffwechsels des Menschen.* *Verhandl. d. Naturforschenden Gesellschaft Basel* 1903. B. 15, p. 252.
 Stähelin—*Zum Energiehaushalte bei der Lungentuberkulose.* *Verhandl. des XXIV. Kongr. für innere Medizin.* Wiesbaden 1907.
 Stähelin—*Der respiratorische Stoffwechsel eines Fettsüchtigen.* *Zeitschrift für klinische Medizin.* Bd. LXI.
 Gigon—*Über die Bedeutung der Gewürze in der Ernährung (nach Respirationsversuchen).* *Verhandlung des XXIX deutschen Kongresses für innere Medizin* Wiesbaden.
 Falta, Grote, Stähelin—*Versuche über Kraft- und Stoffwechsel u. s. v.* *Hofmeisters Beiträge zur chemischen Physiologie und Pathologie* 9.



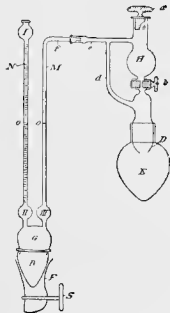
No. 43060

43060. **Gas Meter, Experimental, Bohr**, original Danish make, as widely used in physiological work in connection with respiration and nutrition experiments, etc. With level and regulating screw.

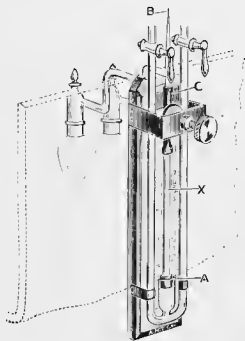
Capacity, liters $\frac{1}{2}$ $\frac{1}{1}$ 1 5 10

Duty Free..... 28.00 38.00 44.00 50.00 60.00

Duty Paid..... 35.00 47.50 55.00 62.50 75.00



No. 43064

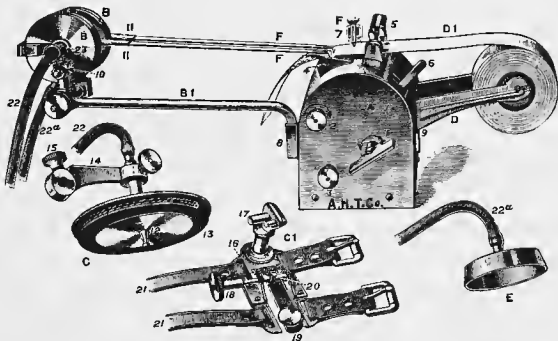


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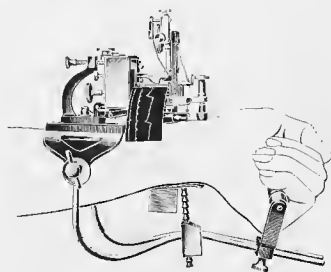
No. 43072

43064. Apparatus, Barcroft and Haldane, for Determining the Oxygen Capacity and Carbonic Acid Content of the Blood by the ferricyanide method modified by Plesch. See *J. Plesch. Haemodynamische Studien, Berlin 1909. Hirschwald* and *J. Plesch. Die Bestimmung des Schlagvolumens. D. Med. Wochenschrift 1909. No. 6.*
 Duty Free 7.80 Duty Paid 11.50
43068. Apparatus, Barcroft and Roberts, for Determining the Differential Pressure of Blood Gases. See *Journal of Physiology XLII, p. 512.*
 Duty Free 9.00 Duty Paid 13.20
43072. Apparatus for Determining the Differential Pressure of Blood Gases for the use of very small quantities of blood, i. e. $\frac{1}{10}$ cc. As used in the systematic determination of the haemaglobin worth or dissociation curves of human beings.
 Duty Free 3.25 Duty Paid 4.75

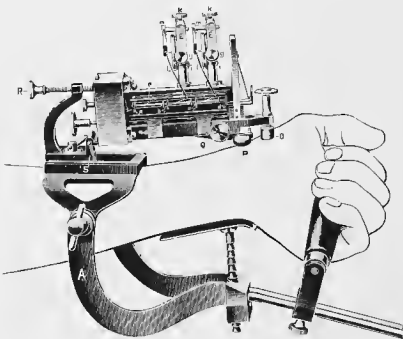


No. 43076

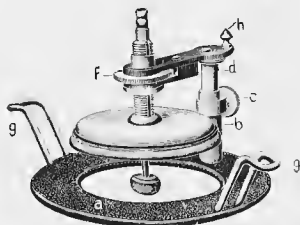
- MACKENZIE INK POLYGRAPH, English make.** This instrument records two simultaneous tracings only, i. e. radial pulse and one other, such as carotid, jugular, apex beat, etc., the great advantage being the avoidance of smoked paper and the convenience and permanency of the ink tracings which may be continued almost to any length from the long roll of paper supplied with the instrument. The instrument is not attached to the patient's wrist and by many is preferred because of this feature. The clock work operates at variable speeds permitting the taking of protracted records at different speeds.
43076. Mackenzie Ink Polygraph including a wrist cuff with tambour for the radial pulse, metallic receiving capsules, two sets of pens, one dozen rolls of paper, bottle of ink, brush for loading pens and necessary rubber tubes for connection.
 Duty Free 65.00 Stock 84.00
43080. Extra Paper Rolls, per dozen80
43084. Extra Writing or Time Marker Pens. In ordering please state length of pen desired. Each .60



No. 43096



No. 43104



No. 43108



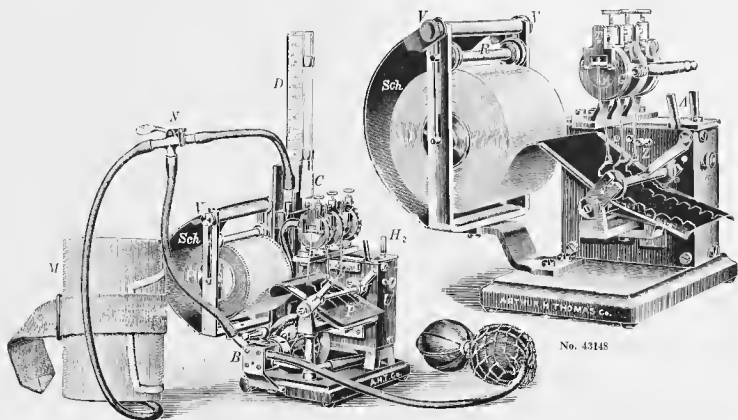
No. 43112

JAQUET SPHYGMOCARDIOGRAPH. In these instruments one tracing must always be that from the radial artery, over which the instrument is fixed in place, either by means of a cuff as in the older forms, or by means of the arm rest No. 43136 as shown in above illustrations. In the single tambour type, therefore, two simultaneous tracings are made in addition to the chronograph record, i. e. the radial pulse from the pelotte attached to the instrument and one other tracing through the single tambour and which may be taken from the jugular, carotid, apex beat, respiratory movements, etc. In the double tambour type two tracings may be made simultaneously in addition to that from the radial pulse and the chronograph record. The double tambour type is the most widely used form of Jaquet instrument. Both types are provided with two speeds so that tracings may be greatly magnified by the use of a high speed.

43092.	Jaquet Sphygmocardiograph, Single Tambour type, with cuff for attaching to wrist and 100 glazed paper recording strips, but without arm rest, cardiograph attachment or receiving tambour.	Duty Free.....	55.00	Duty Paid.....	71.50
43096.	Jaquet Sphygmocardiograph, Single Tambour type, with arm rest No. 43136, cardiograph attachment for apex beat No. 43108, receiving tambour, 30 mm in diameter, for jugular, carotid, etc., cylinder for smoking papers No. 43132, 100 paper recording strips and bath for fixing records in varnish No. 43128.	Duty Free.....	84.65	Duty Paid.....	110.00
43100.	Jaquet Sphygmocardiograph, Double Tambour type (the most widely used form) with cuff to attach to wrist and 100 paper recording strips, but without arm rest, cardiograph attachment or receiving tambour.	Duty Free.....	76.00	Duty Paid.....	100.90
43104.	Jaquet Sphygmocardiograph, Double Tambour type, with arm rest No. 43136, cardiograph attachment for apex beat No. 43108, receiving tambour, 30 mm in diameter, for jugular, carotid, etc., No. 43120, cylinder for smoking paper No. 43132, bath for fixing records in varnish No. 43128 and 100 paper recording strips.	Duty Free.....	105.75	Duty Paid.....	137.50

Accessories.

	Duty Free	Stock
43108. Cardiograph Attachment only for taking apex beat, with girdle, etc.....	13.75	18.00
43112. Pneumograph after Marey for taking respiratory movements.....	17 50	22.75
43116. Glycerine Pelotte for taking tracings from any superficially located arteries and as particularly recommended for use on children.....	6.25	8.15
43120. Receiving Tambour for jugular, etc., 30 mm in diameter.....	1 15	1.50
43124. " of special shape for the liver.....	1 65	2.25
43128. Bath for varnishing the tracings.....	1 25	1.75
43132. Cylinder for smoking papers.....	3 00	4.00
43136. Arm Rest new model as shown in illustrations.....	10.50	13.75
43140. Glazed Paper Recording Strips for single tambour instrument per 100 strips....	.40	.50
43144. Glazed Paper Recording Strips for double tambour instrument per 100 strips....	1.00	1.30



No. 43156

No. 43148

PORTABLE POLYGRAPH, with continuous roll (20 meters) of smoked paper. This instrument consists of an accurate clock movement imparting two speeds to the paper, a time marker recording in $\frac{1}{10}$ seconds and three recording tambours, each of which may receive impulses from three different parts of the body for simultaneous tracing. The instrument thus answers the purpose of a kymograph and is valuable for many purposes because of its extreme portability. The same instrument is furnished with a mercurial sphygmomanometer (No. 43156) indicating blood pressure and a cuff writing attachment. In this arrangement of the instrument one of the tambours must of necessity be used for recording the tracings of the brachial pulse under various pressures, while the other two tambours may be used to record any other two tracings such as the radial, jugular or carotid pulse, apex beat, respiratory movements, etc., under an accurately determinable blood pressure as is read in a manometer. The pressure applied to the cuff is transmitted to the manometer, and at the same time, to the writing tambour by means of a rubber bulb enclosed within a glass bulb, or Erlanger capsule.

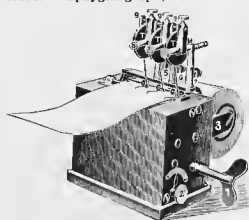
- 43148. **Portable Polygraph**, with three tambours, continuous roll attachment and one roll of prepared smoked paper strips 20 meters long, in polished wood case, but without other attachments.
 Duty Free 65.75 Duty Paid 85.00
- 43152. **Portable Polygraph**, as above, with Sphygmograph No. 43164 for taking radial pulse, Cardiograph No. 43168 for taking apex beat, receiving tambour for carotid with zero pressure valve, set of four glass receiving tambours for jugular and other venous pulses, and two rolls of prepared smoked paper strips, 20 meters long.
 Duty Free 80.00 Duty Paid 102.00
- 43156. **Portable Polygraph**, similar to No. 43148 but with the addition of a sphygmomanometer and cuff for recording brachial pulse under varying pressures, with two recording tambours for use with the two remaining writing tambours (one being in connection with the brachial pulse) and two rolls of smoked paper, 20 meters long.
 Duty Free 100.00 Duty Paid 128.00

- 43160. **Prepared Smoked Paper**, in rolls 20 meters long Duty Free 75 Duty Paid 1.00
- 43164. **Sphygmograph, Lehmann**, for taking the radial pulse Duty Free 4.00 Duty Paid 5.00

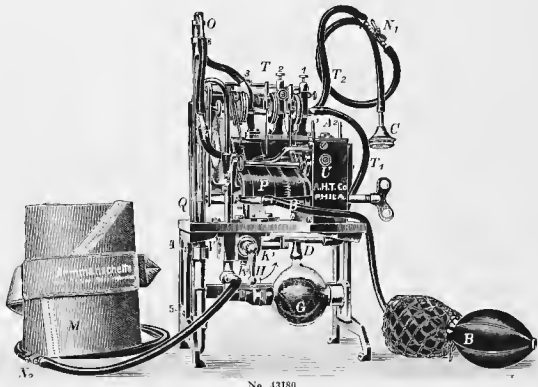
- 43168. **Cardiograph, Lehmann**, for apex beat 4.65 6.00
- 43172. **Pneumograph, Lehmann** 4.00 5.00

- 43174. **Portable Polygraph, Jaquet**, new model, with interchangeable writing points for both ink and smoked paper. Adjustable for speeds from 1 cm to 5 cm per second and for continuous tracing with time marker for $\frac{1}{10}$ seconds. With three receiving tambours in box without attachments.
 Duty Free 84.50 Duty Paid 109.85

- 43176. **Portable Polygraph, Jaquet**, complete outfit consisting of Polygraph as above with sphygmograph for radial pulse, cardiograph for apex beat, receiving tambour for carotid and two rolls of prepared paper.
 Duty Free 96.25 Duty Paid 125.15



No. 43176



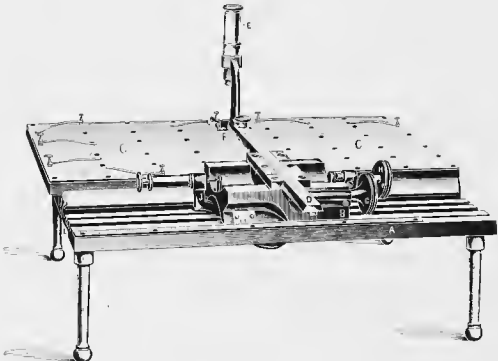
No. 43180

USKOFF SPHYGMOTONOGRAPH. The unique feature of this instrument is the simultaneous recording of blood pressure in millimeters of mercury, together with the brachial pulse at varying pressures, and one other tracing (jugular, carotid, apex beat, etc.) In other words, there are four tracings upon the paper, three of which are fixed by the limits of the apparatus, i. e. blood pressure in millimeters of mercury, arterial pulsations at various pressures and time tracing, while the fourth tracing may be taken at will from such sources as carotid, jugular, apex beat, etc. The instrument has been recently remodeled and improved, particularly by the addition of a continuous paper roll attachment, carrying 20 meters of prepared smoked paper, which is now recommended for use with the instrument. The instrument is now also provided with two speeds at the suggestion of Dr. Geo. W. Norris, of Philadelphia. See *Kraus und Hirsch, Krankheiten des Zirkulationsweges, in Fortschritte der gesamten Medizin, 43. Jahrgang II f. 121* and *Dr. Lindemann Münchener Medizin. Wochenschrift Nr. 45, 1903 f. 2338.*

- 43180. **Uskoff Sphygmotograph**, new model with two speeds and continuous paper roll attachment, including von Recklinghausen's arm cuff and polished mahogany case and one box containing 20 meters of smoked paper recording strips ready for use.

	Duty Paid	145.00
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- 43182. **Uskoff Sphygmotograph** as above, but with the addition of a receiving tambour with zero pressure valve, four glass receiving tambours for jugular and other venous pulses, cardiograph attachment for taking apex beat and two boxes smoked recording paper strips, 20 meters each.

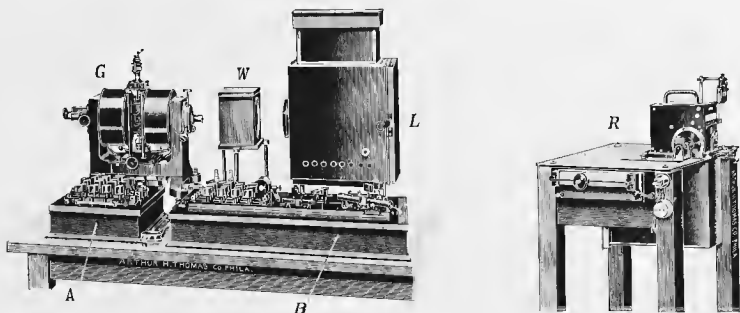
	Duty Paid	155.00
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- 43184. **Continuous roll of smoked recording papers**, 20 meters long
- 43188. **Glazed Paper Recording Strips**, 510 mm long, for use with instruments not provided with continuous roll attachment and which must be smoked before using



No. 43192

- 43192. **Curve Analyzer, Jaquet**, for the accurate measuring and analysis of tracings as taken in Physiological or other work. See *Jaquet, Studien über graphische Zeitregistrierung. Zeitschrift für Biologie, Bd. XXVIII.*

	Duty Free	68.75
	Duty Paid	90.00



Einthoven String Galvanometer with Illuminating System, Electrical Resistances, etc.

No. 43240 Photographic Register

EDELMANN LARGE ELECTRO-CARDIOGRAPHIC OUTFIT. It is impossible in the brief space at our disposal in this catalogue to properly describe the component parts of a complete installation on the basis of the large Edelmann outfit. Complete German literature will be sent upon request to those interested and we give below a summary of the equipment. In the illustrations above L represents the Arc Lamp, W the cooling cell, G the Einthoven String Galvanometer with optical system, R, the Photographic Registering Apparatus and A and B the Wheatstone Bridge, electrical resistances, etc. The equipment is divided into five principal parts, as follows:

I. Thread Galvanometer with accessories.

	Duty Free	Duty Paid
43196. Large String Galvanometer, Einthoven	\$245.00	300.00
43200. Zeiss Achromatic Objective, 4mm	35.00	43.40
43204. " Achromatic Objective, DD	12.50	15.50
43208. " Projection Ocular, No. 4	10.00	12.40

II. Illuminating Apparatus.

43212. Hand Regulating Arc Lamp	21.00	25.50
43216. Lamp Box, with condensing system	18.00	21.45
43220. Rheostat, for 220 volts	20.25	24.75
43224. " " 110 "	19.00	23.25
43228. Water Cooling Cell	2.75	3.30

III. Electrodes.

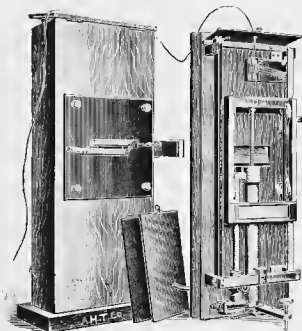
43232. Electrode Chair, consisting of a hospital chair with arm and leg baths of zinc, stands for arm baths, etc.	85.00	100.00
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IV. Electrical Equipment.

43236. Outfit B, consisting of a Weston Normal Element, resistance of about 100,000 ohms, induction coil with telephone, various keys and commutators, slide wire, rheostat, etc.	155.00	188.25
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V. Photographic Registering Apparatus.

43240. Outfit C. Photographic Register for variable lengths of exposure and interchangeable box for records from 6 to 12 cm wide complete	285.00	351.50
43244. Jaquet Graphic Chronometer	32.50	46.00
43248. Negative Paper, 75 meters long, 21 cm wide, per roll	15.00	18.00
43252. " " " " 6 cm " " "	7.25	9.00



No. 43256

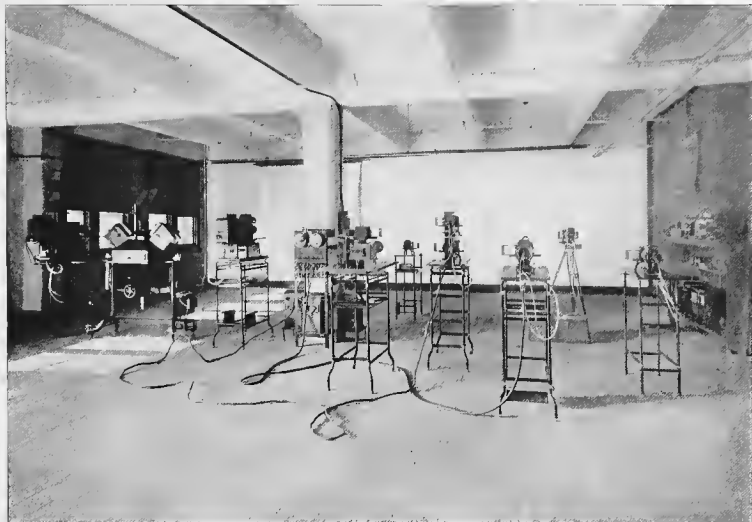
43256. Photographic Register, Dodge, for falling plates, taking regular stock plates 13 x 15 cm. Recommended for use with String Galvanometers and similar records or as a recording apparatus for smoked paper. Furnished with an adjustable slit and cylindrical lens with a vertical screen of fine platinum wire 2 mm apart, which projects abscissae of a directly photographed coordinate system. The slit and cylindrical lens may be removed when the apparatus is to be used as a smoked paper recorder. The speed of the plate may be varied instantly from 18 cm per hour to 18 cm per second and records with the latter speed may be correctly read to $\frac{1}{1000}$ second.
 Duty Free 112.50 Duty Paid..... 150.00



Cambridge Electro Cardiographic Apparatus in Position for Operation

ELECTRO CARDIOGRAPHIC OUTFIT, Cambridge Scientific Instrument Company Outfit No. 2, recommended as a most complete installation for research laboratories and hospitals. Prices given are in English currency and are f. o. b. Cambridge, England. Duty free and duty paid prices, f. o. b. Philadelphia, are quoted on request. Component parts are supplied at separate prices given. Numbers in text refer to original C. S. I. Co. Catalogue which is sent upon request.

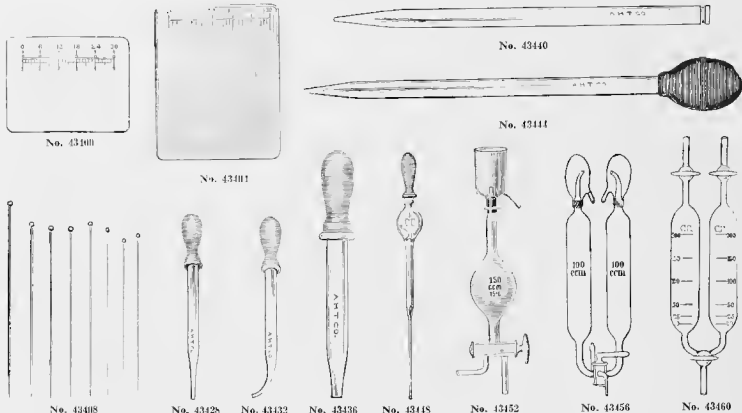
	£	s.	d.
43260. Einthoven String Galvanometer, consisting of No. 53112 field wound for 10 and 20 volts; No. 53151 Fibre Case with silvered glass fibre; optical system consisting of Zeiss No. 12 compensating eye-piece No. 34633 and two small diameter Zeiss objectives, i. e., 16 mm apochromat No. 34613 and AA achromat No. 34623.....	66	0	0
43264. Spare Fibre Case, with fibre, No. 53151.....	14	17	0
43268. Double Fibre Case, permitting the simultaneous recording of both electro and phonocardiograms on one plate and with but one galvanometer.....	27	10	0
43272. Battery, 10 volt, 50 ampere-hour, to excite galvanometer field, No. 53914.....	5	15	6
43276. Plate Cameras, No. 53311, to take plates 7½ x 5 inches, 6¼ x 3½ inches, 18 x 13 cm and 17 x 8.5 cm, with three dark slides with 3 doz. 6¼ x 3½ inch plates..	49	10	0
43280. Paper Camera, with 100 volt motor and reduction gear, No. 53334.....	50	12	0
43284. Automatic Projection Lantern, No. 53411, with series resistance for use on 110 volts, No. 53412.....	17	1	0
43288. Rotary Time Marker, consisting of synchronous motor, vibrating bar No. 53241, stand No. 53242 and spoked disc to give 5ths and 25ths of a second, No. 53246.....	13	4	0
43292. Battery, 4 volt, 20 ampere hour, No. 53912, for use with above Time Marker	1	3	2
43296. Cardiograph Control Board, No. 53211.....	39	12	0
43300. Large Dry Cell, for above, No. 53921.....	6	6	6
43304. Pair of Tables, to carry above apparatus, Nos 53353 and 53354.....	17	12	0
43308. Two Non-polarizable Hand Electrodes, "F" of illustration, immersion type, No. 53511.....	1	13	0
43312. Two Insulated Wooden Stands, for above, No. 53515.....	1	2	0
43316. Non-polarizable Foot Electrode, immersion type, No. 53512.....	2	4	0
43320. Insulated Wooden Stand, for above, No. 53516.....	11	0	0
43324. Twin Flexible Cable, for various connections, No. 49326, twenty yards.....	11	0	0
43328. Button Insulators, for fixing above cable, No. 49388, three dozen.....	2	6	0
43332. Complete Outfit, as above.....	309	6	8
Additional Equipment Necessary for Taking Phono-Cardiograms.			
43336. Special Transformer, No. 53611, with Sensitive Microphone on antivibration suspension, etc., No. 53612.....	11	11	0
43340. Rheostat, to adjust primary current, resistance approximately 40 ohms, No. 53931.....	16	6	0
43344. Accumulator, 4 volt, 20 ampere-hour, to supply current for primary, No. 53912.....	1	3	2
43348. Complete set of above accessories.....	13	10	8



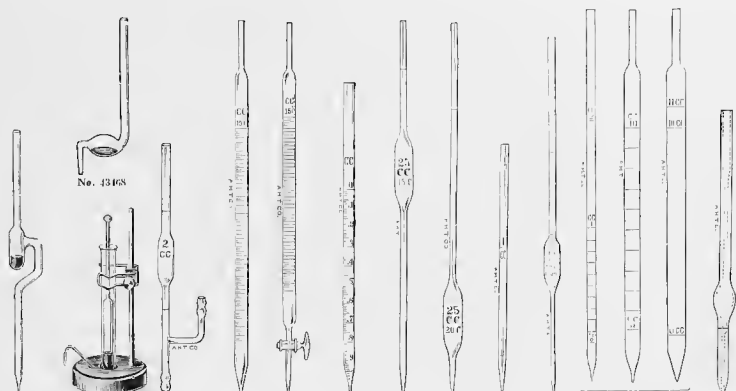
View of Projection Room in use as Showroom



View of Projection Room in use as Dark Room

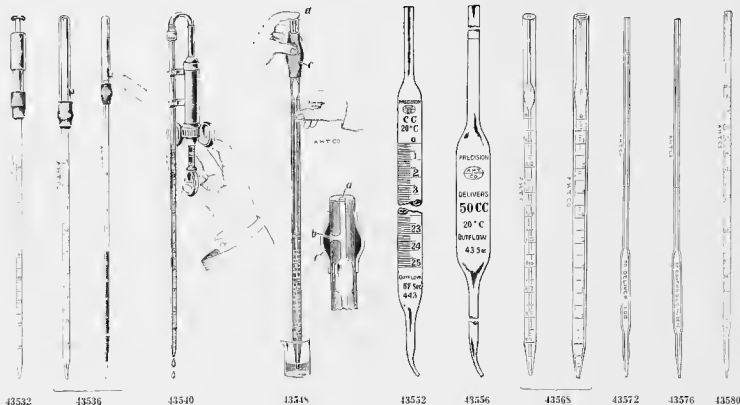


43400.	Pill Tiles , of glazed porcelain, square, with graduations. Size, inches	6	10
	Each .....	.40	1.50
43404.	Pill Tiles , of plate glass, square, engraved on the under side to be read through the glass; with the surface slightly roughened to hold pill mass while rolling; perfectly level and impervious to grease. Size, inches	8 x 10	10 x 12
	Each	1.50	2.00
43408.	Pins, Insect, Klaeger , special patent, black japanned steel pins. In packages of 100 and not sold in less than 100 of a size. Number	000	00-0
	Per 100 .....	.25	.10
43412.	Pins, Insect, Klaeger "Minuten Nadeln," black, for pinning small insects. Per 100 .....		.15
43416.	" " A. E. Co.'s indestructible. Number	00-0	1-7
	Per 100 .....	.30	.25
43420.	Pipe, Pure Block Tin , convenient for laboratory connections, water worms, etc. Weights given are for walls of medium thickness. Other sizes or weights to order. Inside diameter, inches	$\frac{3}{8}$	$\frac{5}{8}$
	Approximate weight per foot, ounces	4	5
	Per lb. ....	.75	.75
43424.	Pipe, Lead. Weights are given for walls of medium thickness. Other sizes or weights to order. Inside diameter, inches	$\frac{1}{2}$	$\frac{3}{4}$
	Approximate weight per foot, ounces ..	16	20
	Per lb. ....	.12	.12
43428.	Pipette, Dropping , 4 inches long, with straight top and bulb of red, non-blooming rubber of superior quality. Not to be confused with the ordinary medicine dropper. Per dozen .....		.40
43432.	Pipette, Dropping , same as above but with curved tip. Per dozen .....		.40
43436.	Pipette, Dropping , with glass tube of large bore and extra large rubber bulb, suitable for removing large pieces of sediment, small embryos, etc. Each .....		.10
43440.	Pipettes, Dropping, straight , without bulb. Length, mm	200	300
	Each .....	.05	.07
43444.	Pipettes, Dropping , same as above but with black rubber bulb about 20 cc capacity. Length, mm	200	300
	Each .....	.15	.20
43448.	Pipette, Dropping, Automatic , with rubber bulb. Very convenient for filling ampoules with repeated doses of 1 cc. Each		1.00
43452.	Pipettes, Automatic , with three-way stopcock. Capacity, cc	10	25
	Each	2.25	2.75
43456.	Pipette, Double Automatic, Friedrichs , with stopcock, so made that one pipette fills while the other empties. Capacity, cc	25	50
	Each	6.75	7.75
43460.	Pipette, Double Automatic, Rothe , for the rapid determination of iron by the ether method.		12.00



No. 43464 No. 43472 No. 43476 No. 43485 No. 43492 No. 43495 No. 43501 No. 43508 No. 43512 No. 43520 No. 43521 No. 43528

43464.	Pipette, Mercury, for taking up drops without danger of same entering the mouth.....	.30
43468.	Pipette, Mercury, for the convenient handling of small drops of mercury.....	.30
43472.	Mercury Pipette, Heerwagen, for delivery of small quantities of mercury, on stand with clamp. 2.00	
43473.	Extra Glass Tubes, for above, with piston.....	.50
43476.	Pipette, Ostwald, for calibrating, 2 cc, with two marks.....	.75
43480.	" " as above, with $\frac{1}{10}$ cc graduations over and under the upper mark.....	.75
43484.	" " " 5 cc, with two marks.....	.65
43488.	Pipettes, Mohr, accurately graduated in cubic centimeters and fractions thereof.	
	Capacity, cc.....	$\frac{1}{10}$ 1 1 2 2 5 5 10 10 25 50
	Graduated to, cc.....	$\frac{1}{100}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$
	Each.....	.35 .25 .30 .35 .30 .35 .10 .45 .15 .55 .65 1.20
43492.	Pipettes, Mohr, with glass stopcock. Capacity, cc.....	25 50
	Graduated to, cc.....	$\frac{1}{10}$ $\frac{1}{10}$
	Each.....	1.75 2.00
43496.	Pipettes, Serological, same as No. 43488 but with graduations extended to the extreme tip.	
	Capacity, cc.....	$\frac{1}{10}$ 1 1 5 10
	Graduated to, cc.....	$\frac{1}{100}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$
	Each.....	.35 .25 .35 .40 .45
43500.	Pipettes, Graduated, Stokes These pipettes are graduated to the tip and are of accurate specifications as to total length of graduations, inside and outside diameter, etc. The total length of the 1 cc pipette is 170 mm and of the 15 cc pipette 334 mm. Capacity, cc.....	1 15
	Graduated to, cc.....	$\frac{1}{10}$ $\frac{1}{10}$
	Each.....	.25 .60
43504.	Pipettes, Volume or Transfer, with bulb in middle of tube and accurately graduated to capacities named.	
	Capacity, cc.....	1 2 3 4 5 10 15
	Each.....	.10 .11 .12 .14 .15 .17 .24
	Capacity, cc.....	.20 25 50 75 100 200
	Each.....	.26 .28 .35 .45 .50 .75
43508.	Pipettes, Volume or Transfer, with bulb low on tube, accurately graduated to capacities named.	
	Capacity, cc.....	5 10 20 25 50 100 200
	Each.....	.15 .20 .25 .30 .40 .50 .70
43512.	Pipettes, Volume or Transfer, without bulb, as used in bacteriological work, water analysis, etc.	
	Capacity, cc.....	1 5 10
	Each.....	.10 .15 .20
43516.	Pipette, Spencer, for glucose, 50 cc, reading in Brix scale from 5 to 20° in $\frac{1}{10}$ ths.....	1.50
43520.	" " sucrose, capacity 52.096 cc, reading in Brix scale from 5-25° in $\frac{1}{10}$ ths.....	1.75
43524.	Pipettes, Graduated, designed particularly for use in water analysis and as used in the Hygienic Laboratory of the U. S. Public Health Service for this purpose. The 11 cc pipette has mark at 0, 10 and 11 cc only; the 10 cc pipette is graduated from 0 to 10 cc in single cc; the 2 cc pipette is graduated from 0 to 1 cc in $\frac{1}{10}$ ths and is ungraduated from the 1 cc mark to 2 cc.	
	Capacity, cc.....	11 10 2
	Each.....	.25 .25 .25
43528.	Pipette, Capillary, for use in preparing milk smears for microscopical counting of bacteria. Graduated to $\frac{1}{10}$ cc with one mark. With a Bausch and Lomb 6.4X ocular and a 1.9 mm oil immersion objective and a tube length of 195 mm, the apparent field covers approximately $\frac{1}{100}$ sq. cm. which gives a convenient factor for computation. See <i>Bulletin 373 and 378 of the New York Experiment Station</i>	1.00



43532. **Pipette, Weichardt Hygienic**, for bacteriological and serological work. With air filter in metal capsule and screw adjustment to control delivery of small drops. Capacity, $\frac{1}{10}$ cc in $\frac{1}{10}$ ths. 3.00
43536. **Pipette, Wassermann Safety**, for bacteriological and serological work. The glass cap with tubulation is withdrawn with finger over the opening, thus filling the pipette. Withdrawal of the finger from the tubulation provides exact control of the delivery. With pipette $\frac{1}{10}$ cc in $\frac{1}{10}$ ths, graduated to tip.75
43540. **Pipette, Syringe, Woihte**, for bacteriological and serological work. Complete with precision pipette 1 cc in $\frac{1}{10}$ ths. 6.00
43544. Syringe only for above. 5.25
43548. **Pipette Safety, Permin**, for bacteriological and serological work. Capacity cc. 1
 Graduated to, cc. $\frac{1}{10}$
 Each. $\frac{1}{10}$ 1.10

PIPETTES, PRECISION, graduated by weighing at 20° C. in accordance with the specifications of the Physikalisches-Technische Reichsanstalt with individual control number, etc. These pipettes are offered with our unofficial factory certificate and, in addition, with the Physikalisches-Technische Reichsanstalt certificate and control stamp, i.e., the official certificate of the German government.

Precision Pipettes with Unofficial Factory Certificate.

These certificates are made out in the factory in exact accordance with the methods used by the Physikalisches-Technische Reichsanstalt and no pipette is certified unless the error falls within the limit permitted by the P. T. R. The data on these certificates may be used as a check where pipettes are calibrated in the laboratory or with entire reliance upon the accuracy of the figures given.

43552. **Pipettes, Mohr, Precision**, with unofficial factory certificate.

Capacity, cc.	1	2	2	5	10	25	50
Graduated to, cc.	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
Each	.95	.80	1.00	.85	1.15	1.25	1.75

43556. **Pipettes, Volume or Transfer, Precision**, with unofficial factory certificate.

Capacity, cc.	1	2	3	5	10	15	20	25	30	50	100	200
Each	.40	.40	.45	.45	.50	.55	.60	.70	.80	.90	1.15	1.60

Precision Pipettes, with Physikalisches-Technische Reichsanstalt Certificate.

These pipettes are exactly the same as those described above in workmanship and accuracy but are furnished with the official Physikalisches-Technische Reichsanstalt certificate and control stamp, for which a higher price must be charged because of the German government fee.

43560. **Pipettes, Mohr, Precision**, with P. T. R. certificate.

Capacity, cc.	1	1	2	2	5	10	25	50
Graduated to, cc.	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
Each	3.00	3.00	3.10	3.00	3.15	3.45	5.25	6.20

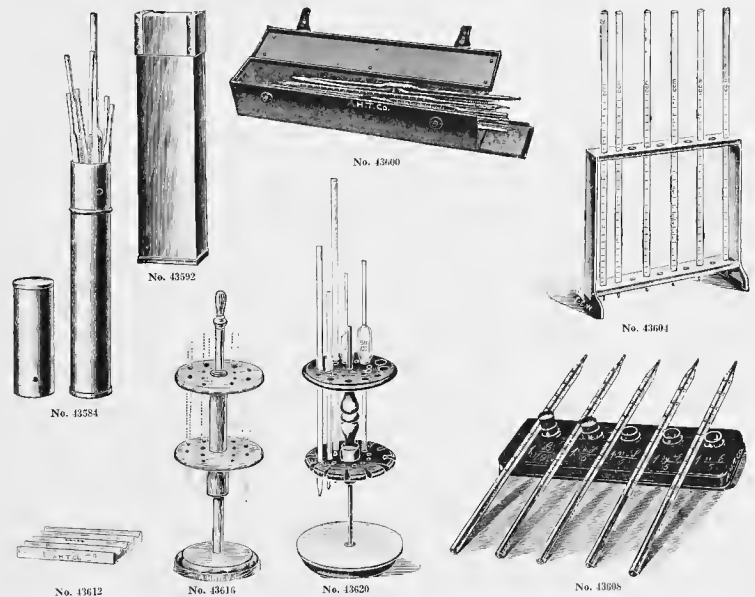
43564. **Pipettes, Volume or Transfer, Precision**, with P. T. R. certificate.

Capacity, cc.	1	2	3	5	10	15	20	25	30	50	100	200
Each	1.50	1.50	1.50	1.50	1.60	1.65	1.70	1.75	1.80	1.95	2.40	3.10

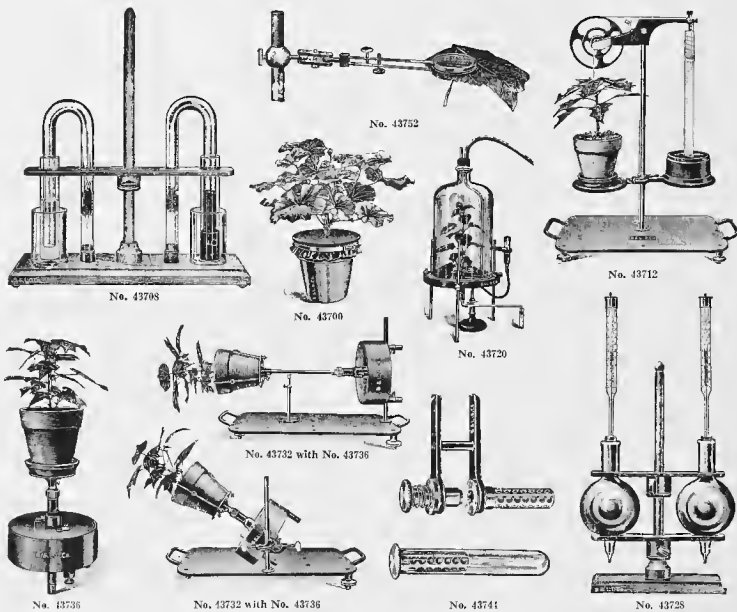
43568. **Pipettes, Serological, Precision**, with graduations extended to the tip. Recommended where great accuracy is required; with P. T. R. certificate. Capacity, cc. $\frac{1}{10}$ 1 1
 Graduated to, cc. $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$
 Each. 3.00 3.00 3.00

PIPETTES, PRECISION, as used in the Hygienic Laboratory of the U. S. Public Health Service for determining the immunity unit in the standardization of diphtheria antitoxin. See *Hygienic Laboratory Bulletin No. 21*. These pipettes are standardized at 20° C. in accordance with the requirements of the Bureau of Standards but are regularly furnished without certificate. They are furnished with certificates of either the Bureau of Standards or the Physikalisch-Technische Reichsanstalt on special order only. Outside diameter of the bulbs is in no case greater than 10 mm in order to permit use with special graduated cylinders used in the same technique. See illustration on preceding page.

43572.	Pipette Volumetric, Precision, graduated to deliver 1 cc. For purpose of easy manipulation this pipette is supplied with two etched bands near top	.....	75
43576.	Pipettes, Volumetric, Precision, as above, graduated to contain.		
	Capacity, cc	1 2 3 4 5 6 7 8 9 10	
	Each	.75 .75 .75 .75 .75 .85 .90 .95 1.00 1.10	
43580.	Pipettes, Graduated, Precision, so-called "Ehrlich" pipettes, graduated in $\frac{1}{100}$ cc.		
	Graduated from	..... .01 to 1 cc .07 to 2 cc 1.5 to 3 cc	
	Each	.....	2.50 2.50 2.50

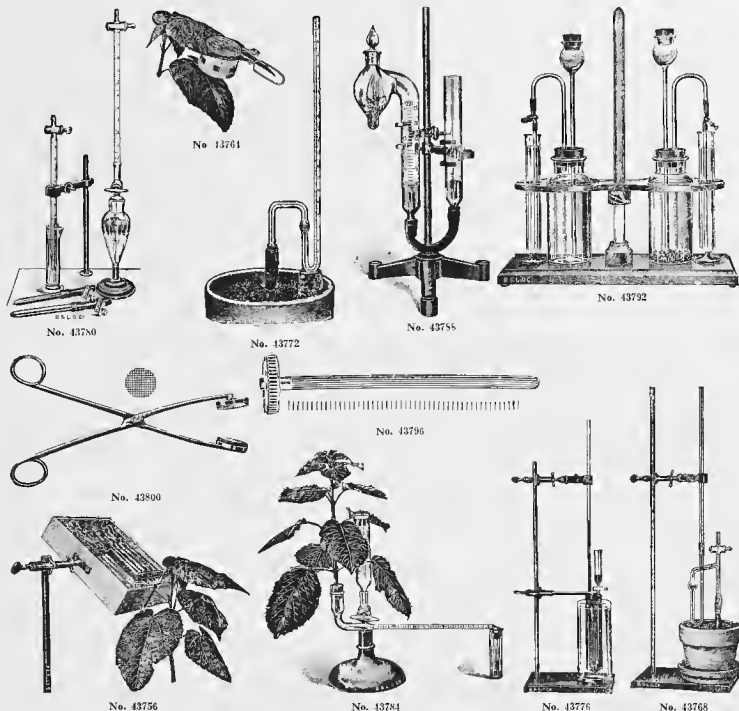


43584.	Pipette Box, for sterilizing pipettes, cylindrical form, of polished copper, with tightly fitting lid, 2 1/2 inches in diameter by 16 inches high. Will take about 75 graduated pipettes, 1 cc in $\frac{1}{10}$ ths or about 15 of the same 10 cc in $\frac{1}{10}$ ths	.....	1.75
43588.	Pipette Box, same as above but of sheet iron	.....	1.25
43592.	" " rectangular form, for sterilizing pipettes in bacteriological work, of copper.		
	Size, inches	1 1/2 x 2 1/2 x 10	1 1/2 x 2 1/2 x 16
	Each	.....	1.75 2.50
43596.	Pipette Box, same as above but of sheet iron.		
	Size, inches	1 1/2 x 2 1/2 x 10	1 1/2 x 2 1/2 x 16
	Each	.....	1.25 1.50
43600.	Pipette Box, for sterilizing and transporting pipettes, with lid and removable end; of brass, nickel plated, with asbestos lining; 2 inches deep by 4 inches wide by 16 inches long	.....	7.50
43604.	Pipette Support, of brass, nickel plated	.....	1.75
43608.	Pipette Rest, with ground glass surface for writing	.....	3.00
43612.	" " of porcelain, for pipettes, stirrers, etc., 75 x 65 mm	.....	.75
43616.	Pipette Support, of poli bed hardwood, revolving	.....	2.50
43620.	Pipette Support, for 24 pipettes, perforated discs are of polished wood, upright support of brass and base of glazed porcelain	.....	5.50

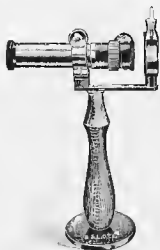


PLANT PHYSIOLOGY APPARATUS. GANONG. The apparatus here listed has been developed during a period of ten years by Prof. W. F. Ganong, of Smith College, and manufactured by the Bausch & Lomb Optical Company. A special catalogue entitled, "*Ganong Botanical Apparatus for use in Plant Physiology*," 53 pp. with introduction and descriptions of the apparatus with method of use, by Prof. Ganong, is sent on application. The use of the apparatus finds fuller descriptions in Ganong, "*A Laboratory Course in Plant Physiology*," Henry Holt & Co., New York and Ganong, "*The Teaching Botanist*," the Macmillan Co., New York.

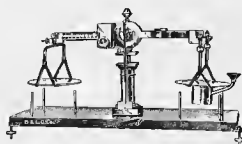
43700.	Aluminum Shells, for transpiration experiments, consisting of shell with band and screw as shown in illustration, but without rubber roof. Diameter, inches.....	3	4	5
	Each.....	1.25	1.75	2.75
43704.	Rubber Tissue, medium thickness, for use as roofs. Per ounce.....			.30
43708.	Anoxyscope, Demonstration, for showing the necessity for oxygen in plant growth. Complete with 5 oz. of caustic potash and 1 oz. of pyrogallic acid.....			4.25
43712.	Auxograph, Demonstration, for recording the rate and amount of growth. Complete with chain attachment for plant.....			25.00
43716.	Extra Recording Cylinder.....			1.50
43720.	Bell Jar Support, with split glass plate but without bell jar and Potometer as shown in illustration.....			10.00
43724.	Bell Jar, only, for above, complete with two hole rubber stopper and glass tubes.....			3.25
43728.	Caloriscopes and Calorimeter, for demonstrating the release of heat in respiration. Complete with two silvered Dewar bulbs, 500 cc, with thermometers and woolen support.....			18.00
43732.	Clamp Stand, portable, for use with Demonstration Clinostat, complete with two rods.....			8.00
43736.	Clinostat, Demonstration, for use either obliquely or horizontally in connection with the Clamp Stand above listed. Will take a 4 inch pot but operates with greater accuracy with a pot 3 inches in diameter. Complete with clockwork with disc, screw rods, spindle arm and extensible support, but without Clamp Stand.....			22.50
43740.	Gas Analysis Tubes, for demonstration of the percentage of carbon dioxide contained in a sample of gas. With two reagent tubes, suitable rubber connections and graduated stopcock gas tube.....			2.00
43744.	Leaf Area Cutter, for demonstrating the increase of organic substances through photosynthesis. With two cups, test tube and holder for same.....			12.00
43748.	Leaf Clamp, for applying special treatment to two exactly corresponding areas on the leaf surface as, for instance, Stahl's cobalt chloride method in the study of transpiration. Without support.....			6.50
43752.	Support, for above.....			.35



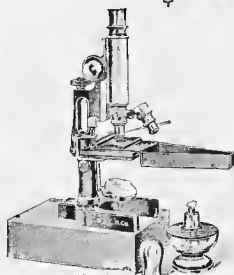
43756.	Light Screen , whole leaf form, with screen box with adjustable clamp, 7 x 7 clear glass plate with ground edges, two half plates with ground edges and 1 sq. ft. of tin foil, but without color screen bottles and support.....	9.00
43760.	Support , for above.....	.35
43764.	Light Screen , part leaf form, as shown in illustration, with $\frac{1}{2}$ sq. ft. of thin tin foil.....	1.25
43768.	Manometer, Demonstration Root-pressure , showing the force with which roots start the sap up the stems. With clamp and vertical support, 2 inches of rubber tubing, two feet of tire tape, 1 oz. of stopcock wax and 10 cc of mercury.....	4.75
43772.	Manometer, Normal , for measuring liquid pressure, particularly osmotic pressure, etc. With two glass sleeves, rubber tubing and tire tape for connections, 2 cc of mercury and 1 oz. of shellac for sealing.....	1.50
43776.	Osmoscope, Demonstration , to show osmotic absorption before the class. With support and clamps, storage bottle and two extra lengths of parchment paper tubing.....	4.25
43780.	Photosynthometer , for accurate measurement of the absorption of carbon dioxide by green plants in light with the eudiometric release of oxygen. Complete with reagent tubes, rubber connections, clamps and cylinder but without support and clamp.....	5.25
	Support and Clamp , for above.....	.75
43784.	Potometer , for the quantitative determination of transpiration by the measurement of water absorption by a cut shoot. With split rubber stopper, 1 oz. of stopcock wax, vial and slide piece.....	3.75
43788.	Respirometer , for demonstrating and measuring the gas exchanges in typical respiring material, as, for instance, in germinating seeds. With rubber connection, two clamps and support.....	8.25
43792.	Respiroscope, Demonstration , for showing the elimination of carbon dioxide to large classes. With 1 oz. of calcic oxide and 1 liter bottle for limewater.....	4.50
43796.	Space Marker, Root and Stem	1.00
43800.	“ “ Leaf	2.00



No. 43801



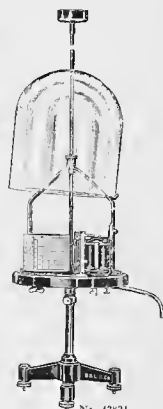
No. 43820



No. 43835



Nos. 43832 to 43844

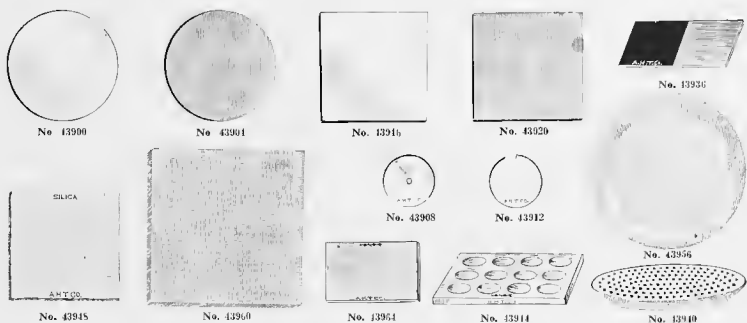


No. 43824

43801. Spectroscope, designed specially to show the absorption spectrum of chlorophyll in the study of the energy relations of photosynthesis. Consisting of Browning direct vision spectroscope with comparison prism, handle, frame and vial. 24.50
43808. Temperature Stage, for use on the microscope to show the relation of the rate of protoplasmic streaming to changes of temperature. With clamp and felt mat but without other accessories. 4.00
43812. Thermometer, for above. 1.50
43816. Spirit Lamp, for above.45
43820. Transpiration Balance, for measuring the alteration in weight as an accurate index of transpiration. Duty Free 80.00
43824. Transpirograph, a new self-registering transpirometer for bulk demonstrations and investigations. With 150 ball weights and 25 record papers 75.00
43828. Record Papers, per dozen25
43832. Water Culture Vessels, consisting of Aluminum Double Support 1.75
43840. Tumbler, plain glass, with felt paper cover10
43844. Paraffine, hard, for coating the supports, per lb20
43848. Lampblack, per lb12



View of Stock Room Where Goods are Stored in Original Cases



43900.	Plates, Glass, circular, plain, edges not ground.								
	Diameter, mm.....	75	100	150	200				
	Each.....	.06	.08	.15	.25				
43901.	Plates, Glass, circular, ground on one side, edges not ground.								
	Diameter, mm.....	75	100	150	200				
	Each.....	.08	.10	.18	.30				
43908.	Plates, Glass, with edges slightly ground and hole in center to admit stirring rod. Convenient for use as covers.								
	Diameter, mm.....			75	100				
	Each.....			.25	.30				
43912.	Plates, Glass, same as above but with hole at one edge.								
	Diameter, mm.....			75	100				
	Each.....			.25	.30				
43916.	Plates, Glass, square, plain, edges not ground.								
	Size, mm.....	75	100	125	150	200			
	Each.....	.03	.04	.06	.08	.16			
43920.	Plates, Glass, square, ground on one side, edges not ground.								
	Size, mm.....	75	100	150	200				
	Each.....	.04	.05	.10	.20				
43924.	Plates, Heavy Plate Glass, square, ground on one side, edges not ground.								
	Size, mm.....	150	175	200	225	250	300		
	Each.....	.30	.35	.40	.50	.80	1.00		
43928.	Plates, Heavy Plate Glass, square, ground on one side, with edges ground.								
	Size, mm.....	150	175	200	225	250	300		
	Each.....	.35	.45	.55	.70	1.00	1.25		
43932.	Plates, Blue Glass, so-called "Cobalt" glasses, for observing the potassium flame; edges not ground.								
	Size, mm.....	50 x 50	50 x 75	75 x 75	50 x 100	75 x 100	100 x 100		
	Each.....	.04	.05	.06	.06	.08	.10		
43936.	Plates, Glass, 200 x 100 mm, of finest plate glass 7 to 8 mm thick, with one end finished in pitch black and the other in pure white. For examination of sputum, feces, etc.....								.75
43940.	Plates, Porcelain, perforated, for use in funnels.								
	Diameter, mm.....	25	38	50	75	100	125	150	175
	Each.....	.15	.20	.25	.40	.60	.75	1.00	1.00
43944.	Plates, Royal Berlin Porcelain, for color reactions, 110 x 90 mm, with twelve concavities. Very superior to the common porcelain plate usually supplied.....								.75
43948.	Plates, Opaque Fused Silica, unglazed, preferable for use as heating plates to wire gauze on account of their cleanliness and absolute resistance to corrosion. Will stand extreme changes of temperature without cracking.								
	Size, inches.....	3 x 3	4 x 4	6 x 6	9 x 9	12 x 12			
	Each, $\frac{1}{8}$ inch thick.....	.27	.48	1.08	2.43	4.32			
	Each, $\frac{1}{4}$ inch thick.....	.54	.96	2.16	4.86	8.64			
43952.	Plates, Opaque Fused Silica, glazed throughout, $\frac{1}{8}$ inch thick.								
	Size, inches.....	3 x 3	4 x 4	6 x 6	9 x 9	12 x 12			
	Each.....	.72	1.28	2.88	6.48	11.25			
43956.	Plates, Porous, circular, for drying crystals and precipitates, 250 mm diameter.....								.15
43960.	Plates, Porous, square, for drying crystals and precipitates.								
	Size, mm.....	150	200	300	400				
	Each.....	.25	.55	1.25	3.00				
43964.	Plate, Streak, Royal Berlin Porcelain, unglazed, as used for arsenic test and by mineralogists; 100 x 65 mm.....								.45

PLATINUM WARE

The Platinum Ware listed below is genuine hammered ware from selected factories in both Europe and America. Our relations with the leading manufacturers enable us to offer it at the current daily quotations observed in the platinum trade. Most of the items listed can be furnished immediately from our own stock and when this is impossible delivery usually requires only three or four days. Approximate weights are given without price. The current prices per gram for the different classifications of ware used in the platinum trade are inserted from time to time on colored slips as our catalogues are sent out.

The Care of Platinum Ware.

W. C. Hervey, in the *Zeitschrift für anorganische Chemie*, 1912, Heft 37—and 1907, Heft 44, explains the causes of the destruction of platinum crucibles in the making of phosphate analyses and refers to the fact that the destruction of platinum ware (which is always only a chemical change of its properties) might in many cases be prevented if the crucibles or dishes were not exposed to unnecessarily high temperatures during the process of annealing.

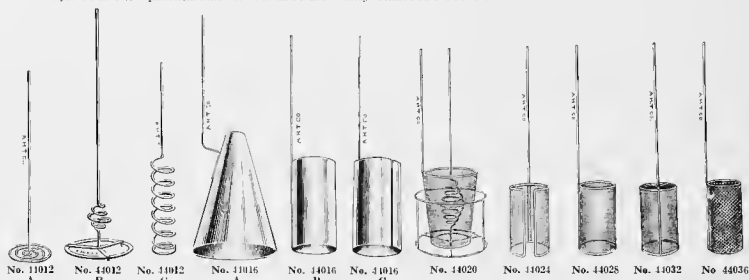
The melting of platinum with carbon, silicon, boron, phosphorus, etc., takes place only when the different salts are reduced at comparatively high temperatures.

The susceptibility of platinum toward hydrogen and hydrocarbon while annealing accelerates the reductions considerably. When the combustion is made in a gas furnace, Roessler furnace, etc., care should be taken for obvious reasons, that there is no reducing atmosphere in the furnace. The use of acetylene gas for the annealing of platinum ware is also harmful to the platinum.

The combustion of organic substances should be done at low temperatures and the annealing over a blowpipe or in a furnace only when all the carbon has been volatilized. At high temperatures platinum is very readily attacked when the melting of alkaline or alkali carbonate is done in the presence of sulphur or cyanide of potassium.

Metals of a low melting point and easily reducible oxides of metals should, of course, not be annealed in platinum; the same may be said of all reagents which give up chlorine, boron, iodine, sulphur or phosphorus.

Frequent cleaning of platinum ware with sea-sand removes alloys formed on the surface.



4400. Platinum Foil. This is carried in stock 8 inches wide and can be furnished in any length up to 24 inches.

Thickness mm.	Light	Medium	Heavy
0.03	.03	.04	.05
0.04	.04	.05	.06
0.05	.05	.06	.07
0.06	.06	.07	.08
0.07	.07	.08	.09
0.08	.08	.09	.10
0.09	.09	.10	.11
0.10	.10	.11	.12
0.11	.11	.12	.13
0.12	.12	.13	.14
0.13	.13	.14	.15
0.14	.14	.15	.16
0.15	.15	.16	.17
0.16	.16	.17	.18
0.17	.17	.18	.19
0.18	.18	.19	.20
0.19	.19	.20	.21
0.20	.20	.21	.22
0.21	.21	.22	.23
0.22	.22	.23	.24
0.23	.23	.24	.25
0.24	.24	.25	.26
0.25	.25	.26	.27
0.26	.26	.27	.28
0.27	.27	.28	.29
0.28	.28	.29	.30
0.29	.29	.30	.31
0.30	.30	.31	.32
0.31	.31	.32	.33
0.32	.32	.33	.34
0.33	.33	.34	.35
0.34	.34	.35	.36
0.35	.35	.36	.37
0.36	.36	.37	.38
0.37	.37	.38	.39
0.38	.38	.39	.40
0.39	.39	.40	.41
0.40	.40	.41	.42
0.41	.41	.42	.43
0.42	.42	.43	.44
0.43	.43	.44	.45
0.44	.44	.45	.46
0.45	.45	.46	.47
0.46	.46	.47	.48
0.47	.47	.48	.49
0.48	.48	.49	.50
0.49	.49	.50	.51
0.50	.50	.51	.52
0.51	.51	.52	.53
0.52	.52	.53	.54
0.53	.53	.54	.55
0.54	.54	.55	.56
0.55	.55	.56	.57
0.56	.56	.57	.58
0.57	.57	.58	.59
0.58	.58	.59	.60
0.59	.59	.60	.61
0.60	.60	.61	.62
0.61	.61	.62	.63
0.62	.62	.63	.64
0.63	.63	.64	.65
0.64	.64	.65	.66
0.65	.65	.66	.67
0.66	.66	.67	.68
0.67	.67	.68	.69
0.68	.68	.69	.70
0.69	.69	.70	.71
0.70	.70	.71	.72
0.71	.71	.72	.73
0.72	.72	.73	.74
0.73	.73	.74	.75
0.74	.74	.75	.76
0.75	.75	.76	.77
0.76	.76	.77	.78
0.77	.77	.78	.79
0.78	.78	.79	.80
0.79	.79	.80	.81
0.80	.80	.81	.82
0.81	.81	.82	.83
0.82	.82	.83	.84
0.83	.83	.84	.85
0.84	.84	.85	.86
0.85	.85	.86	.87
0.86	.86	.87	.88
0.87	.87	.88	.89
0.88	.88	.89	.90
0.89	.89	.90	.91
0.90	.90	.91	.92
0.91	.91	.92	.93
0.92	.92	.93	.94
0.93	.93	.94	.95
0.94	.94	.95	.96
0.95	.95	.96	.97
0.96	.96	.97	.98
0.97	.97	.98	.99
0.98	.98	.99	1.00

4404. Platinum Wire. Platinum loops for chemical laboratory work are usually made of No. 26 wire, as are platinum inoculating needles for bacteriological work. For a stiff inoculating needle we recommend No. 24. All weights given are approximate.

B. & S. gauge.	12	14	16	18	20	22	24
Diameter, inches	.081	.064	.050	.040	.031	.025	.020
mm	2.021	1.625	1.269	1.015	.787	.634	.507
Weight per foot, grams	21.27	13.62	8.31	5.36	3.20	2.08	1.33
B. & S. gauge	25	26	27	28	30	32	36
Diameter, inches	.017	.015	.014	.012	.010	.008	.005
mm	.431	.380	.355	.304	.253	.203	.126
Weight per foot, grams	.97	.75	.65	.48	.33	.213	.086

4408. Platinum Wire, special for calorimetry, exactly 1/16 mm in diameter

Anodes. Style	A	B	C
Height, mm	125	150	125
Diameter of spiral, mm	25	50	15
Approximate weight, grams	5-6	20	8-10
Cathodes. Style	A	B	C
Diameter, mm	57	25	25
Length of stem, mm.	75	75	75
Approximate weight, grams	20	12	12

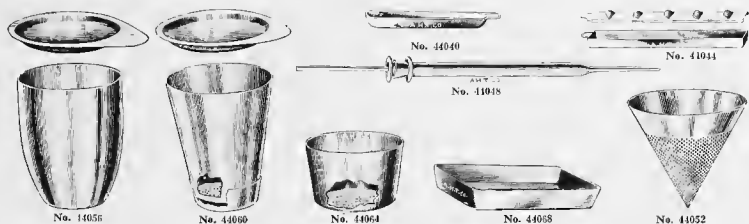
4420. Platinum Gauze Cathode with wire frame Anode. Approximate weight 40 to 45 grams.

4424. Platinum Electrode, with open gauze cylinder. Height 2 inches, diameter 1 inch, of 52 mesh gauze. Approximate weight 12 grams.

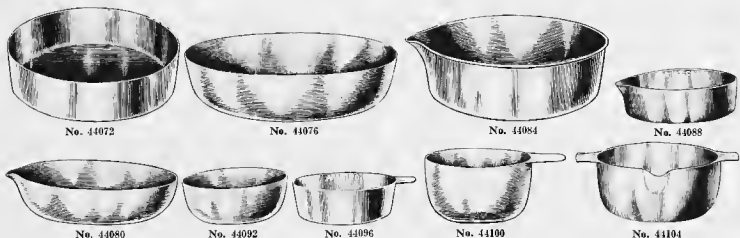
4428. Platinum Electrode, with closed gauze cylinder. Height 2 inches, diameter 1 inch, of 52 mesh gauze. Approximate weight 10 grams.

4432. Platinum Electrode, with rotating gauze cylinder. Height 2 inches, diameter 1 inch, of 52 mesh gauze. Approximate weight 15 grams.

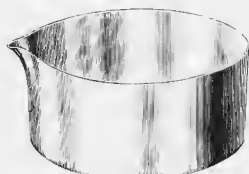
4436. Platinum Electrode, with perforated sheet cylinder. Height 2 inches, diameter 1 inch. Approximate weight 17 grams.



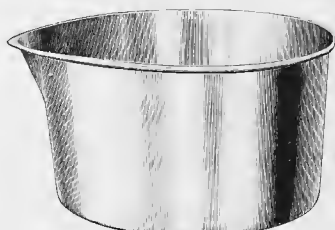
44040.	Platinum Combustion Boats.								
	Length, inches.....	1½	2	2½	3	3½	4		
	Approximate weight, grams.....	3.0	4.0	5.5	8.5	10.0	12.0		
44044.	Platinum Combustion Boats, Blair, ⅜ inches deep by 5½ inches long, approximate weight 35 grams; with or without cover.								
44048.	Platinum Combustion Tube, seamless, with German silver fittings. As used in iron and steel analysis. Made in any desired length or in special shapes according to specifications.								
44052.	Platinum Filter Cones, seamless, with perforations .020 inches in diameter.								
	Diameter, inches.....	¼	⅜	1	1½	1½	2		
	Approximate weight, grams.....	1.0	1.5	2.5	4.0	6.0	8.0	12.0	
44056.	Platinum Crucibles. Covers are always furnished unless otherwise ordered.								
	Number.....	1	2	2	4	5	6	7	8
	Capacity, cc.....	8	10	15	20	25	30	40	50
	Approximate weight, grams.....	8	10	15	20	25	30	40	56
44060.	Platinum Crucibles, Gooch form; weight includes cover and cap.								
	Capacity, cc.....			10	15	20	25	30	
	Approximate weight, grams.....			13	18	24	29	34	
44064.	Platinum Crucible, Gooch, low form, with bottom permanently fixed, as used in asphalt and bitumen analysis; capacity 30 cc, approximate weight 30 grams.								
44068.	Platinum Incinerating Pan, rectangular shape, with flat bottom.								
	Capacity, cc.....						15	20	
	Approximate weight, grams.....						10	14	



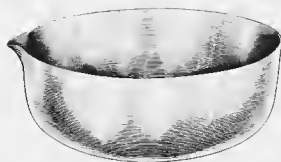
44072.	Platinum Dish, flat bottom, with straight sides and without lip, as used in milk analysis, capacity 45 cc, approximate weight 17 grams.							
44076.	Platinum Dish, without lip, as used in wine and water analysis; capacity 100 cc, approximate weight 20 grams.							
44080.	Platinum Dish, with lip, as used in water analysis and iron and steel work, 45 cc capacity, approximate weight 16 grams.							
44084.	Platinum Dish, Payne, flat bottom, with wire rim and lip, as used in fertilizer analysis; capacity 100 cc, approximate weight 40 grams.							
44088.	Platinum Dish, with flat bottom and straight sides, with lip, as used in sugar analysis; 35 cc capacity, approximate weight 16 grams.							
44092.	Platinum Dish, round bottom, without lip, as used in sugar analysis.							
	Capacity.....					20	25	
	Approximate weight, grams.....					10	12	
44096.	Platinum Dish, flat bottom, with handle and without lip. As used in sugar analysis. This dish is also made for sugar work without handle and with lip. Please specify in ordering.							
	Capacity, cc.....			10	20	25	35	
	Approximate weight, grams.....			10	14	18	20	
44100.	Platinum Dish, deep form, with handle, as used in sugar analysis. Also used in sugar work with lip and without handle. Please specify form in ordering. Capacity 30 cc, approximate weight 16 grams.							
44104.	Platinum Dish, deep form, with two handles and lip. Capacity 45 cc, approximate weight 15 grams.							



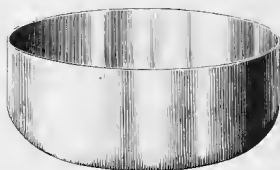
No. 41108



No. 41112



No. 41116



No. 41120

41108. Platinum Dish, with flat bottom and straight sides, with lip.
 Capacity, cc. 80 100 125 200 250 300
 Approximate weight, grams 32 35 40 56 70 80
41112. Platinum Dish, Blair, flat bottom, with or without lip, with either wire rim or solid rim. As used in iron and steel analysis. Capacity, cc 280 380 525
 Approximate weight, grams 80 100 120
41116. Platinum Dishes, with lip. Capacity, cc 15 20 25 35 50 65 75
 Approximate weight, grams 5 6 8 12 17 22 25
 Capacity, cc 100 125 150 175 200 250 300
 Approximate weight, grams 33 42 50 55 67 80 100
41120. Platinum Dish, Classen, for electrolytic separation, with either polished or sand blasted inner surface. Capacity 250 cc, approximate weight 40 grams.



No. 41124



No. 41128



No. 41121



No. 41125



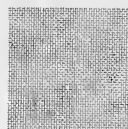
No. 41140



No. 41140



No. 41144



No. 41148



A

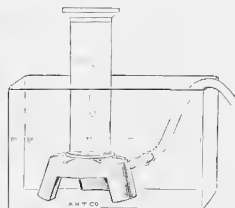
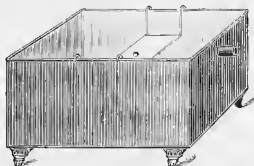
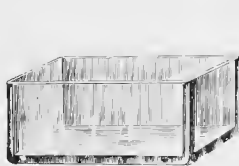
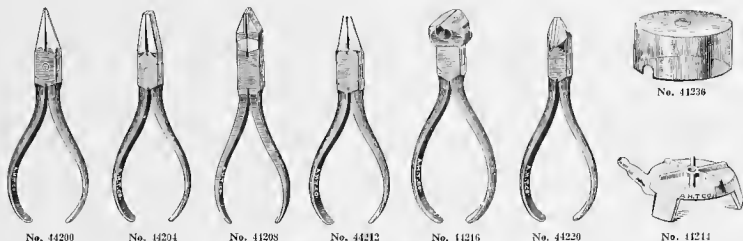


B



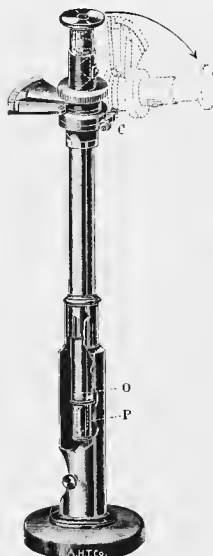
C

41124. Platinum Spatula, round end or square end, 3 inches long, approximate weight 7.5 grams.
 41128. " " same as above, but with woollen handle. Approximately same weight.
41110. Platinum Triangles, with either twisted or solid ends.
 To take crucible, cc. 10 15 20 25 30 40 50 60 70
 Approximate weight, grams 5 0 7 0 10 5 12 0 12 0 14 0 16 0 18 0 20 0
41144. Platinum Pan, with holder, for calorimetry. Weight of pan 5 grams, weight of holder 6 grams.
41148. Platinum Wire Gauze. Mesh 52 45
 Diameter of wire, inches 004 .0085
 Approximate weight per square inch, grams550 1 500
41156. Platinum Blowpipe Tips, as illustrated, types A, B or C.



44200.	Pliers, steel, with pointed nose. Jaws are flat inside.					
	Length, inches.....	4	5	6		
	Each.....	.40	.50	.60		
44204.	Pliers, steel, with flat nose.					
	Length, inches.....	4	5	6		
	Each.....	.20	.30	.35		
44208.	Pliers, steel, with flat nose, side cutting.					
	Length, inches.....	5	6	8		
	Each.....	.70	.80	1.40		
44212.	Pliers, steel, with round nose. For bending, etc.					
	Length, inches.....	4	5	6		
	Each.....	.20	.30	.35		
44216.	Pliers, steel, end cutting.					
	Length, inches.....	4	5	6		
	Each.....	.70	.75	.85		
44220.	Pliers, steel, with diagonal jaws for cutting					
	Length, inches.....	4	5	6		
	Each.....	.75	.80	.90		
44224.	Pliers, Button, straight, for holding buttons while brushing, 5 inches long.....			.50		
44228.	Pliers, gas tongs or pipe wrench, 8 inches long.....			.80		
44232.	Pneumatic Troughs, of heavy glass.					
	Length, mm.....	250	300	350		
	Width, mm.....	150	200	250		
	Height, mm.....	150	150	160		
	Each.....	2.50	4.00	5.50		
44236.	Cylindrical Shelf for pneumatic troughs, so-called "Beehive," of glass, 72 mm high by 104 mm diameter.....			.50		
44240.	Pneumatic Troughs, of japanned tin, with sliding shelf and overflow.					
	Length, inches.....	10	10	12	15	18
	Width, inches.....	7	7	9	11	12
	Height, inches.....	4	5	5	6	8
	Each.....	1.25	1.35	1.50	2.00	3.00
44244.	Porcelain Shelf for pneumatic troughs, of glazed porcelain with radiating lugs on the top, tubulation for rubber tubing and three supporting legs. The tubulation connects with the center opening only. Method of use is shown in illustration.....					1.25

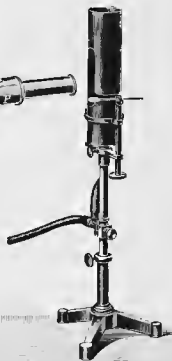
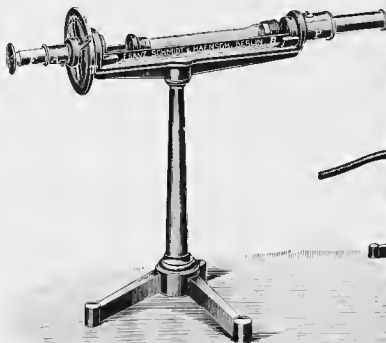
POLARISCOPES



For Urine Analysis

For General Purposes

For Sugar Analysis



No. 44300

No. 44312

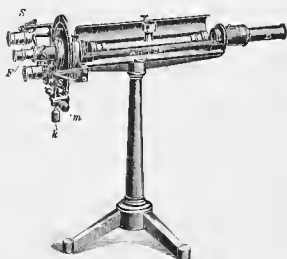
Polariscopes for Urine Analysis.

44300.	Polariscope, Ultzmann , for urine analysis by means of either day or lamp light. With a tube of special length so that the angular rotation in degrees is equivalent to 1% glucose content. By means of verniers readings are made to $\frac{1}{10}\%$. Complete with support as shown in illustration.		
	Duty Free	28.50	Stock
			38.00
44304.	Extra Glass Tube for urine work.		
	Duty Free	2.10	Stock
			3.50
44308.	Extra Glass Tube of 200 mm length by the use of which this instrument may be used for purposes other than urine analysis for substances where the specific rotary power is within the limits of the rotary scale.		
	Duty Free	2.10	Stock
			3.50
44312.	Polariscope, Schmidt & Haensch, Mitscherlich, with Laurent Polarizer . With circular scale reading to 1° of arc and by means of verniers to $\frac{1}{10}^\circ$, equal respectively to 1% and $\frac{1}{10}\%$ of glucose in urine when the special tube of 189.4 mm is used. For use only with monochromatic light from a sodium flame. With one patent tube of 189.4 mm and one tube of 94.7 mm and gas sodium lamp with platinum ring, but without case.		
	Duty Free	56.55	Stock
			75.40
44316.	Case , for above, of polished wood, with lock and key, taking polariscope tubes and vertical pillar but not providing for the lamp or tripod base.		
	Duty Free	10.50	Stock
			14.00

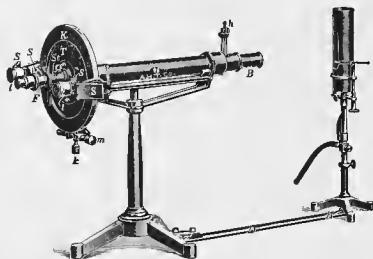
Explanation of the Use of Mitscherlich Polariscope in Urine Analysis.

For urine analysis tubes of special length, i.e., 189.4 and 94.7 mm, enable the user to determine the percentage by volume of glucose in the urine without special calculation. When the longer tube, i.e., 189.4 mm, is used the rotation obtained in degrees of arc is directly equal to the amount in grams of glucose contained in 100 cc of the solution. When the tube of 94.7 mm is used for darkly colored specimens, the result must, therefore, be multiplied by two. As the specific rotary power of albumen is the same as that of glucose except that the latter is laevo rotatory while that of glucose is dextro rotatory, this fact enables the investigator to determine the percentage of albumen when same is present. The usual method of procedure is as follows:—

Polariscopes for General Purposes, with Divided Circle. For use with Monochromatic Light.

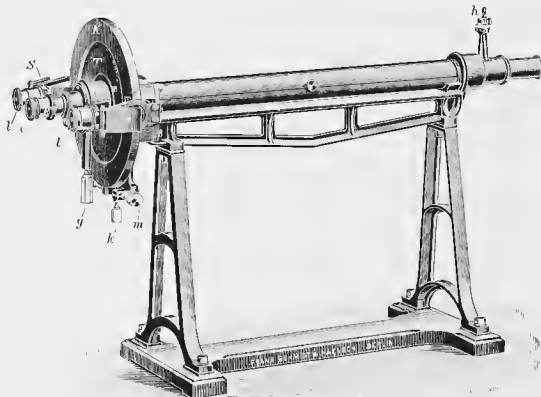


No. 14332



No. 14336

44328. **Polariscope, Mitscherlich, Schmidt & Haensch**, exactly the same as No. 44312 but with bichromate cell and tubes of 100 and 200 mm in length instead of the special urine tubes. Reading to $\frac{1}{2}^\circ$ and useful for a variety of work in the investigations of wine, beer, oils, etc., where a great degree of accuracy is not required. With gas sodium lamp with platinum ring. At extra cost a Ventzke degree scale is furnished on these polariscopes. See No. 44356.
 Duty Free 59.25 **Stock** 79.00
44332. **Polariscope, Mitscherlich, with Laurent Polarizer, Schmidt & Haensch**, with divided circle reading in single degrees and by means of verniers to $\frac{1}{20}^\circ$. With illuminating device for the divided circle by means of mirrors, and with bichromate cell and one each patent tubes 100 and 200 mm long, gas sodium lamp with platinum ring. In polished alderwood case with lock and key.
 Duty Free 138.60 **Stock** 184.80
44336. **Polariscope, with Lippich Polarizer, Lippich, Schmidt & Haensch**, with divided circle reading in $\frac{1}{2}^\circ$ and by means of verniers to $\frac{1}{10}^\circ$, with simplified protection and mirror illuminating device for the scale. On tripod support. With new arrangement for connecting the lamp stand to the base of the polariscope so that it is always in exactly the right position. With bichromate cell, gas sodium lamp, one each of 100, 200 and 220 tubes, in polished alderwood case. Recommended as the most satisfactory outfit for general laboratory work.
 Duty Free 187.50 **Duty Paid** 250.00
44340. **Polariscope**, same as above, i. e., including lamp, bichromate cell, alderwood case and new lamp arrangement, but for 400 mm tubes, and with one each tubes 100, 200, 220 and 400 mm long.
 Duty Free 200.70 **Duty Paid** 267.60

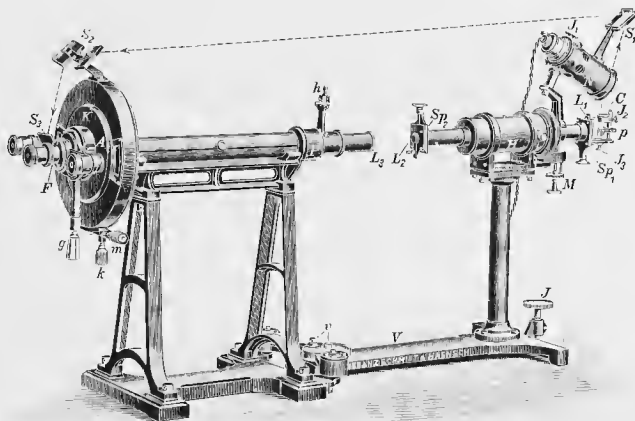


No. 44344

44344. **Polariscope**, exactly same as No. 44336, but on trestle support, and without case.
 Duty Free 211.50 **Duty Paid** 282.00
44348. **Polariscope**, exactly same as No. 44340, but on trestle support, and without case.
 Duty Free 223.20 **Duty Paid** 297.60

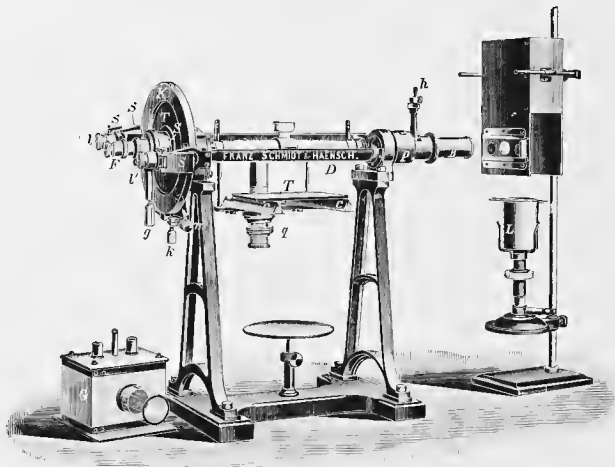
Optional Equipment for Polariscopes, Nos. 44336, 44340, 44344 and 44348.

44352.	Triple Field Polarizing Arrangement for greatly increasing the sensibility as well as the safety and convenience of the adjustment. Duty Free, extra..... 30.00	Duty Paid, extra..... 40.00
44356.	Extra Ventzke Degree Scale in addition to that reading in degrees of arc. The Ventzke scale by means of a third vernier reads to $\frac{1}{1000}$ of a degree of cane sugar. Duty Free, extra..... 12.00	Duty Paid, extra..... 16.00
44360.	Illuminating Device for the verniers consisting of a miniature 6 volt electric lamp in place of the reflecting mirrors. Duty Free, extra..... 9.00	Duty Paid, extra..... 12.00
44364.	Accumulator, three cell , for use with above. Duty Free, extra..... 21.00	Duty Paid, extra..... 28.00
44368.	Glass Case, Folding , for use with instruments with trestle support. For Polariscopes with tubes, mm..... 220 400 Duty Free..... 15.00 15.90 Duty Paid..... 20.00 21.20	
44372.	Glass Case, with Base Board , for use on instruments with trestle support. See illustration page 431. For Polariscopes with tubes, mm..... 220 400 Duty Free..... 25.50 27.90 Duty Paid..... 34.00 37.20	



No. 44376

44376.	Polariscope, Schmidt & Haensch, with Lippich Polarizer, for both Macro and Micro Polarisation Experiments. Consisting of Lippich Polariscopes No. 44344, on trestle support with the addition of three diaphragms of different sizes on the polarizer, a direct vision spectroscopie adjustable for all wave lengths and with Nernst lamp for illumination of spectroscopie which also serves to illuminate the mirrors of the scale of the polariscopie. Operating on either direct or alternating current. Voltage must be specified in ordering. Because of the great variety of work for which this instrument is intended no equipment of tubes is included. Without Case. For tubes, mm..... 220 400 600 Duty Free..... 382.50 351.50 403.50 Duty Paid..... 510.00 522.00 538.00	
44380.	Polariscope, Schmidt & Haensch, Landolt with Lippich Polarizer, with new arrangement for taking not only all kinds of polariscopie tubes but other heating vessels, cooling vessels, electrical devices, etc. The polariscopie proper is as described under No. 44344, with trestle support. With adjustment providing for the accurate centering of the optical system at all times. Without Landolt heating device G shown in cut. With special lamp after Landolt. For tubes up to 200 mm in length but without any tubes or case. Duty Free..... 223.80	Duty Paid..... 298.40



No. 44380

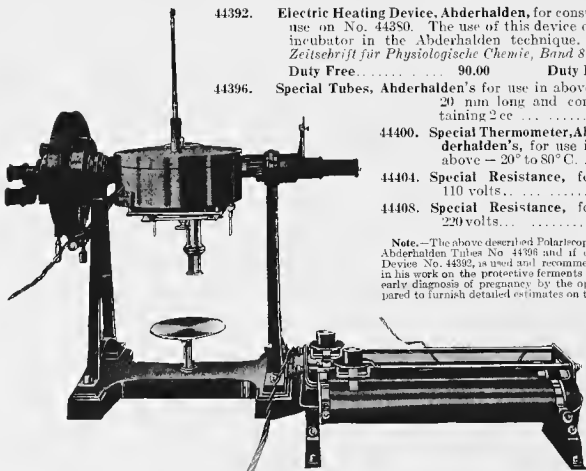
- 44384. Special V Shaped Trough to rest on supports ce for any kind of tubes.
Duty Free, extra 5.40 Duty Paid, extra 7.20
- 44388. Heating Device, Landolt (G in illustration) consisting of an asbestos jacketed brass vessel with adjustable lid, thermometer reading to 100° C. and a polariscope tube, gold plated inside, 100 mm long set in a glass cylinder.
Duty Free, extra 19.50 Duty Paid, extra 26.00

- 44392. Electric Heating Device, Abderhalden, for constant temperatures, for use on No. 44380. The use of this device obviates the use of an incubator in the Abderhalden technique. See *Hoppe-Seyler's Zeitschrift für Physiologische Chemie, Band 81, Heft 4.*
Duty Free 90.00 Duty Paid 120.00

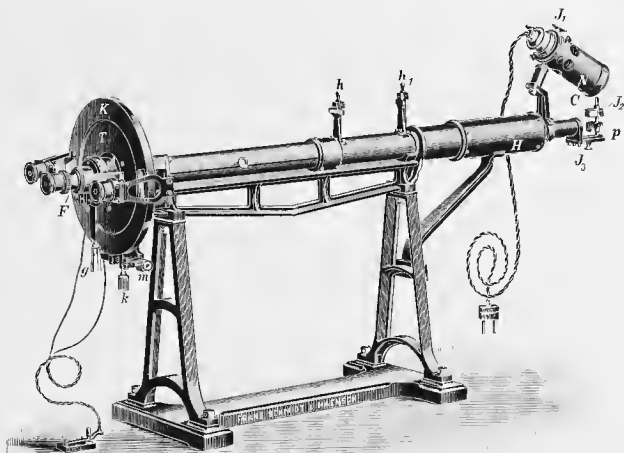
- 44396. Special Tubes, Abderhalden's for use in above,
20 mm long and containing 2 cc Duty Free Duty Paid
3.00 4.00

- 44400. Special Thermometer, Abderhalden's, for use in above - 20° to 80° C. ... 2.25 3.00
- 44404. Special Resistance, for 110 volts..... 12.00 16.00
- 44408. Special Resistance, for 220 volts..... 15.00 20.00

Note.—The above described Polariscope, No. 44380, with the special Abderhalden Tubes No 44396 and if desired, the special Heating Device No. 44392, is used and recommended by Prof. Abderhalden in his work on the protective ferments of animal organisms and the early diagnosis of pregnancy by the optical method. We are prepared to furnish detailed estimates on this equipment.

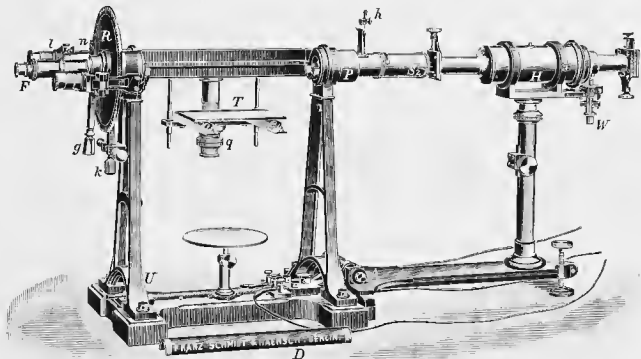


Abderhalden Electric Heating Device No. 44392 in position on Polariscope No. 44380 and with Rheostat



No. 4412

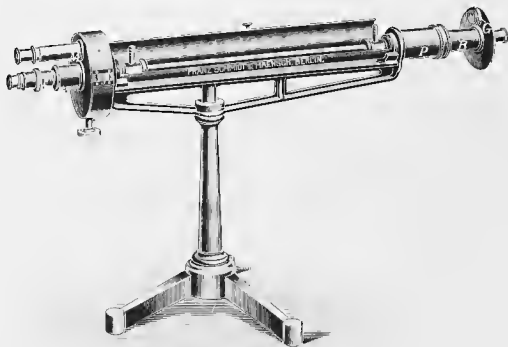
4412. Polariscope, Schmidt & Haensch, with Lippich Polarizer and Fischer Micro-Polarisation Attachment. On trestle support with direct vision Spectroscope with Nerust lamp illumination. Voltage must be stated in ordering. The spectroscope is permanently adjusted for the D line. With triple field polarizer arranged for the observations of very small fields. Will take ordinary tubes up to 220 mm in length. With one micro tube after Fischer 50 mm long .1 cc content, and one 100 mm long, .2 cc content, but without other tubes or accessories.
 Duty Free..... 367.20 Duty Paid 489.60



No. 4416

4416. Polariscope, Landolt, Schmidt & Haensch, similar to No. 44380 but with the addition of a Direct Vision Spectroscope, but without tubes, case, or source of light for the spectroscope.....
 4420. Nerust Lamp Illuminating Apparatus for the above Spectroscope, as shown in illustration of No. 44376. Extra.....
 4424. Direct Vision Spectroscope, only, as in above outfit, specially arranged for use with the Polariscope, mounted on special base.....

Duty Free	Duty Paid
385.50	514.00
27.00	36.00
150.00	200.00

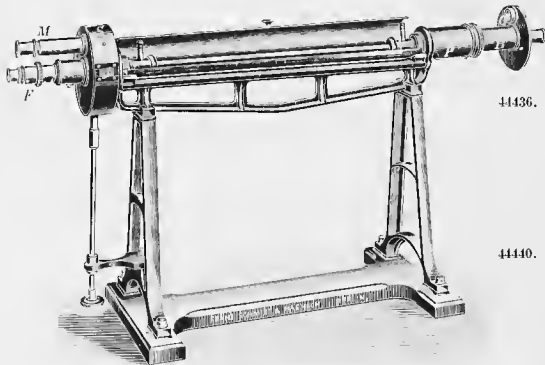


No. 4428

Polariscopes for Sugar Analysis (Saccharimeters)

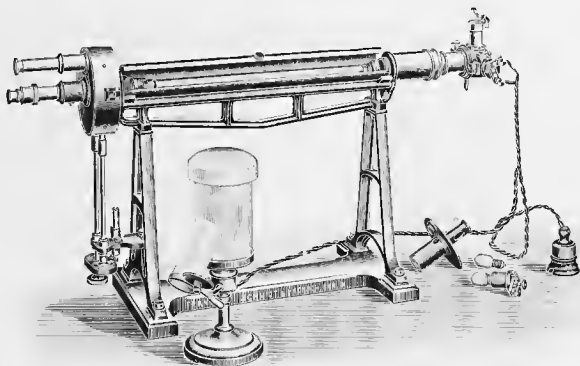
As these instruments are all supplied with either single or double wedge compensation they may be used with white light of any source but the electric illuminating device No. 44476 is specially recommended. All of the outfits are supplied with the bichromate cell as shown attached for use in illustration No. 44428. The scales are graduated in Ventzke degrees for sugar analysis but the instruments may be used for other purposes by using the factor $1^\circ \text{ Ventzke} = 0.34657^\circ$ angular rotation for D by which factor Ventzke degrees are converted into degrees of arc. As regularly listed the instruments are supplied with the double Lippich Polarizer with the triple field Polarizer as optional equipment.

44428. **Polariscope (Saccharimeter) Schmidt & Haensch, with Single Wedge Compensation**, with linear scale divided on Nickelin, reading directly from -25 to $+100^\circ$ Ventzke. With new dust proof mounting for scale and analyzer, double Lippich Polarizer and bichromate cell. For tubes up to 200 mm in length and including one each of patent tubes No. 44552 of 100 and 200 mm length but without lamp. On tripod support as shown in illustration. In polished alderwood case.
- | | | | |
|-----------------|--------|-------------|--------|
| Duty Free | 142.20 | Stock | 189.60 |
|-----------------|--------|-------------|--------|
44432. **Polariscope**, same as above, but for 400 mm tubes, and including one each of No. 44552 patent tubes 100, 200 and 400 mm length, in polished alderwood case.
- | | | | |
|-----------------|--------|-----------------|--------|
| Duty Free | 152.10 | Duty Paid | 202.80 |
|-----------------|--------|-----------------|--------|



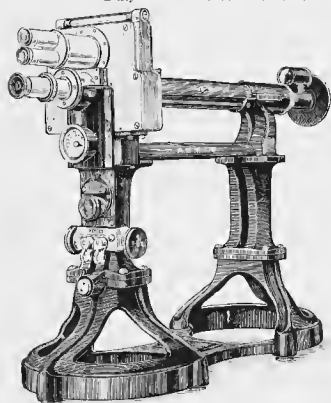
No. 44436

44436. **Polariscope**, exactly same as No. 44428, i.e., with 100 mm and 200 mm tubes, but on trestle support and without case.
- | | |
|-----------------|--------|
| Duty Free | 147.00 |
| Stock | 196.00 |
44440. **Polariscope**, exactly same as No. 44432, i.e., with 100 mm, 200 mm and 400 mm tubes, but on trestle support and without case.
- | | |
|-----------------|--------|
| Duty Free | 156.00 |
| Duty Paid | 208.00 |



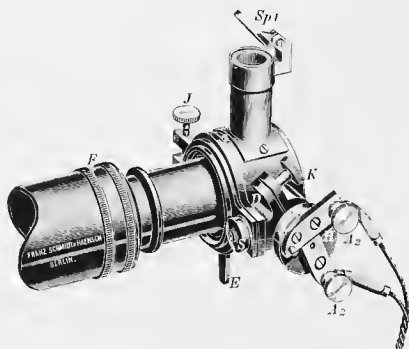
No. 44452 with 44476 Electric Illuminating Device and Reading Lamp used as Resistance

44444. **Polariscope (Saccharimeter), Schmidt & Haensch, with Double Wedge Compensation, and linear scale reading from -100 to +100° Ventzke.** Otherwise same as No. 44428. With one each 100 mm and 200 mm tubes, on tripod support, in polished alderwood case.
- | | | | |
|-----------|--------|-------|--------|
| Duty Free | 197.70 | Stock | 263.60 |
|-----------|--------|-------|--------|
44448. **Polariscope, same as No. 44444 but for 400 mm tubes, including one each 100 mm, 200 mm and 400 mm tubes, on tripod support, in polished alderwood case.**
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 210.60 | Duty Paid | 280.80 |
|-----------|--------|-----------|--------|
44452. **Polariscope, same as No. 44444 but on trestle support. Including one each 100 mm and 200 mm tubes but without case.**
- | | | | |
|-----------|--------|-------|--------|
| Duty Free | 202.50 | Stock | 270.00 |
|-----------|--------|-------|--------|
44456. **Polariscope, same as No. 44448, i.e., for 400 mm tubes, but on trestle support, including one each of 100, 200 and 400 mm tubes, but without case.**
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 217.50 | Duty Paid | 290.00 |
|-----------|--------|-----------|--------|



No. 44460

44460. **Polariscope (Saccharimeter) Bates, with Double Wedge Compensation, with variable sensibility and brightness (Fric's U. S. Patent, Feb. 12th, 1907).** By simply turning a milled head both analyzer and polarizer Nicols are rotated simultaneously through the correct angles to give any desired sensibility and brightness without change of the zero point or other corrections. The half-shadow angle is shown by the "degree of brightness" scale which is in plain view of the operator. This arrangement permits of readings under theoretically perfect conditions. The scales and verniers are etched upon ground glass and read by transmitted light. The objectionable black line between vernier and scale on the metal scales commonly used is thus avoided as well as the expansion coefficient. The scale can easily be interpolated to 0.01° Sugar. Scales read up to a 100° Sugar. Attached to the top of the analyzer case is a horizontal thermometer reading from 10°-40° C., whereby the temperature of the interior of the instrument can be ascertained. For 200 mm tubes, Complete on stand, with one each of 100 and 200 mm tubes, in case,..... 850.00
44464. **Polariscope, Bates, exactly same as above, but for 400 mm tubes. Complete on stand, with one each of 100, 200 and 400 mm tubes, in case..... 900.00**
44468. **Polariscope Tube, Bates, of metal, with a 9 mm bar to eliminate danger from bending and to give minimum deep polarization from wall reflection. The weight is carried upon two shoulders which are integral parts of the tube, and not upon the caps.**
- | | | |
|-----------------|------|------|
| Length, mm..... | 100 | 200 |
| Each | 4.00 | 4.00 |



No. 4476

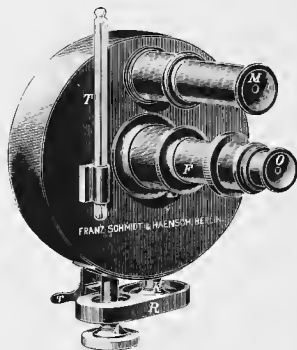


Fig. 13

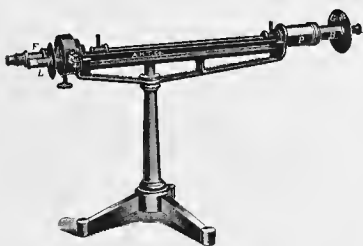
Note.—Fig. 13 illustrates the new arrangement for adjusting quartz wedges whereby one milled head is always protected when the other is exposed. The position of the milled heads in Fig. 13 is that of the instruments with tripod support, while on the instruments with trestle support the milled heads occupy the position shown in No. 44452.



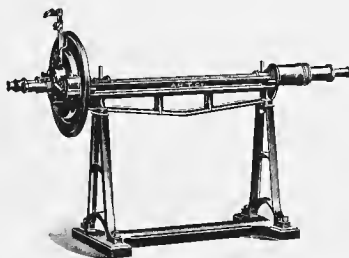
No. 4492

Optional Equipment for Sugar Polariscope. (Saccharimeters.)

4472.	Triple Field Polarizing Arrangement , for greatly increasing the sensibility as well as the safety and convenience of the adjustment. Cannot be attached to an instrument after delivery.		
	Duty Free, extra	30.00	Duty Paid, extra
			40.00
4476.	Electric Illuminating Device , with special Osram lamp. With mirror arrangement for the illumination of the scale, lamp for resistance provided with shade to illuminate note book; adaptable to ordinary lighting circuit. State voltage in ordering. Shown attached in No. 44452.		
	Duty Free, extra	40.50	Duty Paid, extra
			54.00
4480.	Special Tropical Finish , recommended where instruments are to be used in moist and tropical climates, insuring protection to both metal and optical parts.		
	Duty Free, extra	4.50	Duty Paid, extra
			6.00
4488.	Thermometer , in analyzer with projecting stem for convenient reading as in Fig. 13		
	Duty Free	4.50	Duty Paid
			6.00
4492.	Case , of polished alderwood, with glass sides and base board, for covering the Polariscope in its working position, with room for lamp. To cover polariscope taking tubes.	200 mm	400 mm
	Duty Free	25.50	27.90
	Duty Paid	34.00	37.20
4496.	Case, Folding , of polished alderwood, with glass sides, for conveniently covering Polariscope with trestle support in the laboratory. To cover polariscope taking tubes.	200 mm	400 mm
	Duty Free	15.00	15.90
	Duty Paid	20.00	21.20



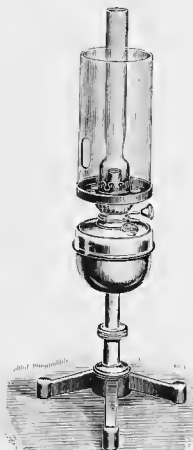
No. 44500



No. 44508

44500. **Polariscope (Saccharimeter) for Beet Sugar Investigations, Schmidt & Haensch**, with restricted scale reading from 0 to 35° Ventzke, single wedge compensation, for use with white light. With direct reading linear scale engraved on Nickelin, with new dust protecting device for analyzer and compensation, and with bichromate cell. On tripod support with two 200 mm tubes, in polished alder-wood case, but without lamp.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 100.20 | Duty Paid..... | 133.60 |
|----------------|--------|----------------|--------|
44504. **Polariscope**, exactly same as No. 44500 but on trestle support and without case.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 105.00 | Duty Paid..... | 140.00 |
|----------------|--------|----------------|--------|
44508. **Polariscope**, exactly same as No. 44504, but with both circular and linear scales.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 171.00 | Duty Paid..... | 228.00 |
|----------------|--------|----------------|--------|
44512. **Polariscope (Saccharimeter) for Beet Sugar Investigations, Schmidt & Haensch**, similar to No. 44500 but with special scale reading from 80 to 100% so that with the use of 400 mm tubes the reading is direct. For 400 mm tubes only. With two 400 mm tubes, but without case or lamp.
- | | | | |
|----------------|--------|----------------|--------|
| Duty Free..... | 110.10 | Duty Paid..... | 146.80 |
|----------------|--------|----------------|--------|

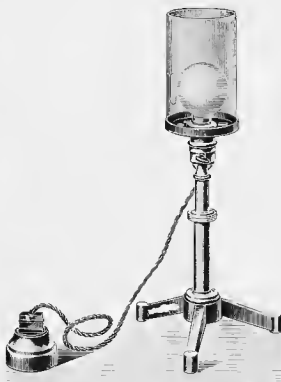
Note.—With the instruments for beet sugar investigations, i.e., No. 44500, 44504, 44508 and 44512 it is recommended that the normal quartz plate No. 44612, for the control of zero, be purchased.



No. 44516



No. 44520



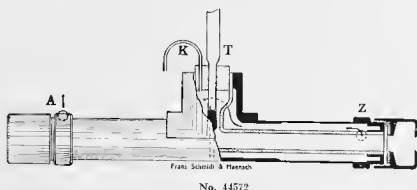
No. 44524

44516. **Polariscope Lamp, Schmidt & Haensch, Kerosene**, on adjustable stand with asbestos chimney.
- | | | | |
|----------------|------|------------|------|
| Duty Free..... | 7.20 | Stock..... | 9.60 |
|----------------|------|------------|------|
44520. **Polariscope Lamp, Schmidt & Haensch, Gas**, on adjustable support.
- | | | | |
|----------------|------|------------|------|
| Duty Free..... | 7.20 | Stock..... | 9.60 |
|----------------|------|------------|------|
44524. **Polariscope Lamp, Schmidt & Haensch, Electric**, on adjustable stand. State voltage in ordering.
- | | | | |
|----------------|-------|------------|-------|
| Duty Free..... | 10.80 | Stock..... | 14.40 |
|----------------|-------|------------|-------|

Note.—The above three lamps are recommended for use with all wedge compensation instruments when the special electric Osram is not used.



No. 4450	No. 4454 With slip cap	No. 4454 With screw cap	No. 4452 With slip cap	No. 4455 With screw cap	No. 4456	No. 4458			
44528.	Polariscope Lamp, Schmidt & Haensch, on adjustable stand, with sodium ring to give monochromatic sodium flame. As illustrated in No. 44328 and 44336. With Bunsen burner for gas.								
	Duty Free	10.20	Stock	13.60					
44532.	Polariscope Lamp, Schmidt & Haensch, Alcohol, with platinum ring for sodium flame.								
	Duty Free	12.60	Stock	16.80					
44536.	Polariscope Lamp, Schmidt & Haensch, Landolt, Gas, with special Bunsen burner, on adjustable stand, with rectangular chimney and two nickel holders for the sodium chloride, as illustrated in No. 44380.								
	Duty Free	13.80	Duty Paid	18.40					
44540.	Polariscope Tubes, Schmidt & Haensch, Glass, with either screw cap or slip cap.								
	Length, mm.	50	94.7	100	189.4	200	220	400	
	Duty, Free	2.40	2.40	2.40	2.40	2.40	2.40	2.70	
	Stock	4.00	4.00	4.00	4.00	4.00	4.00	4.50	
44544.	Extra Glass Tubes only for above								
	For tubes, mm.	50	94.7	100	189.4	200	220	400	
	Duty Free	.45	.45	.45	.45	.45	.45	.50	
	Stock	.75	.75	.75	.75	.75	.75	.90	
44548.	Polariscope Tubes, Schmidt & Haensch, Brass, nickel plated, for either screw cap or slip cap.								
	Length, mm.	50	94.7	100	189.4	200	220	440	
	Duty Free	2.70	2.70	2.70	2.70	2.70	2.70	3.00	
	Duty Paid	3.60	3.60	3.60	3.60	3.60	3.60	4.00	
44552.	Polariscope Tubes, Schmidt & Haensch, Patent Glass, with enlarged end to take air bubble, with either screw cap or slip cap.								
	Length, mm.	50	94.7	100	189.4	200	220	400	
	Duty Free	2.70	2.70	2.70	2.70	2.70	2.70	3.00	
	Stock	4.50	4.50	4.50	4.50	4.50	4.50	5.00	
44556.	Extra Patent Glass Tubes, only for above.								
	For tubes, mm.	50	94.7	100	189.4	200	220	400	
	Duty Free	.60	.60	.60	.60	.60	.60	.75	
	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.25	
44560.	Polariscope Tubes, Schmidt & Haensch, Inversion for filling and for thermometer, with either screw cap or slip cap.								
	Length, mm.	50	94.7	100	189.4	200	220	400	
	Duty Free	3.00	3.00	3.00	3.00	3.00	3.00	3.45	
	Stock	5.00	5.00	5.00	5.00	5.00	5.00	5.75	
44562.	Extra Glass Tubes only for above.								
	For tubes, mm.	50	94.7	100	189.4	200	220	400	
	Duty Free	.90	.90	.90	.90	.90	.90	1.05	
	Stock	1.50	1.50	1.50	1.50	1.50	1.50	1.75	
44564.	Polariscope Tube, Micro Tube, Fischer, Schmidt & Haensch.								
	Length, mm.							50	100
	Contents, cc.							0.1	0.2
	Duty Free							3.60	3.60
	Duty Paid							4.80	4.80
44568.	Polariscope Tube, Abderhalden, Schmidt & Haensch, 200 mm long, containing 2 cc, with water jacket.								
	Duty Free	7.20					Duty Paid	9.60	



No. 44572



No. 44576



No. 44580



No. 44588



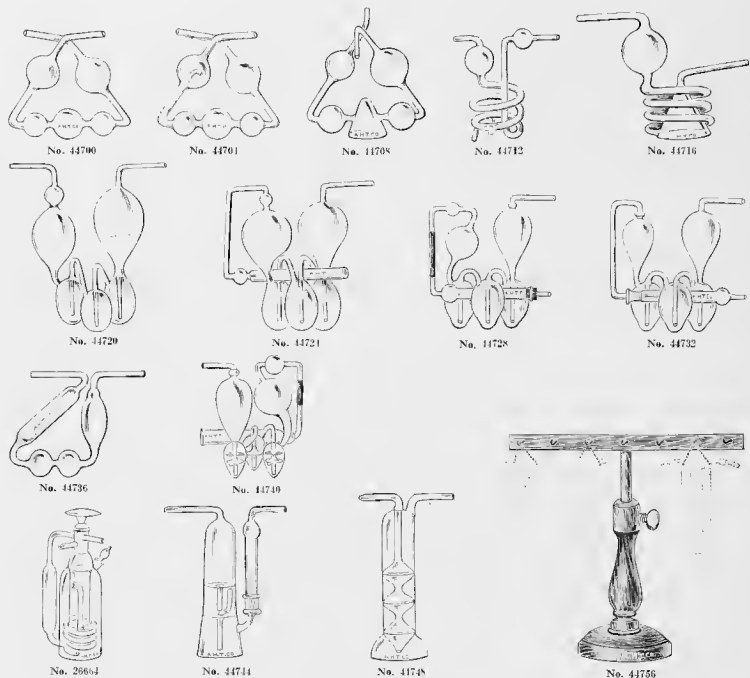
No. 44608

44572.	Polariscope Tube, Inversion, Landolt, Schmidt & Haensch, for general scientific work, of glass, with brass water jacket, thermometer tubulation, etc., including thermometer graduated from 10 to 32° C. in $\frac{1}{10}$ ths.					
	Length, mm.	50	100	200	220	400 600
	Duty Free.....	12.00	12.00	12.60	12.90	13.50 14.40
	Duty Paid.....	16.00	16.00	16.80	17.20	18.00 19.20
44576.	Polariscope Tube, Inversion, Schmidt & Haensch, with brass water jacket, tubulation for thermometer, etc., but without thermometer.			100	200	400 600
	Duty Free.....			6.00	6.30	7.20 8.10
	Duty Paid.....			8.00	8.40	9.60 10.50
44580.	Polariscope Tube, Pellet, Schmidt & Haensch, arranged for continuous flow of liquid to be observed.		100	200	400	600
	Duty Free.....		5.70	5.70	6.00	6.90
	Duty Paid.....		7.60	7.60	8.00	9.20
44584.	Polariscope Tube, same as above but with funnel and gauge tube.		100	200	400	600
	Duty Free.....		9.00	9.00	9.30	10.20
	Duty Paid.....		12.00	12.00	12.40	13.60

Note.—The above Duty Free prices given on Polariscope Tubes can only be extended when the tubes are imported in connection with a complete outfit.

44588.	Polariscope Control Tube, Schmidt & Haensch, of brass. Complete in case.	Duty Free.....	36.00	Duty Paid.....	48.00
44592.	Cover Glasses, 15.5 mm of optically inactive glass, diameter, for the regular polariscope tubes, per dozen.....				1.50
44596.	Cover Glasses, 23.7 mm diameter, for the patent tubes and the Inversion tubes, per dozen.....				2.25
44600.	Cover Glasses, 26.2 mm diameter, for the Abbe-Heiden tubes, per dozen.....				2.00
44604.	Rubber Rings, for use between above cover glasses.				
	For cover glasses, mm in diameter.....		15.5	23.7	26.2
	Per dozen.....		.25	.30	.35
44608.	Polariscope Test Plate of quartz, optically pure, for testing the scale anywhere between 25° and 100° Ventzke either right or left.	Duty Free.....	10.50	Stock.....	14.00
44612.	Polariscope Test Plate of quartz, optically pure, for testing the scale from -25 to +25° Ventzke. Designed especially for use with Polariscope, No. 44512.	Duty Free.....	15.00	Duty Paid.....	20.00
44616.	Polariscope Test Plates, set of 5 in accordance with the "Internationalen Kommission fur einheitliche Untersuchungsmethoden." In case.	Duty Free.....	60.00	Duty Paid.....	80.00

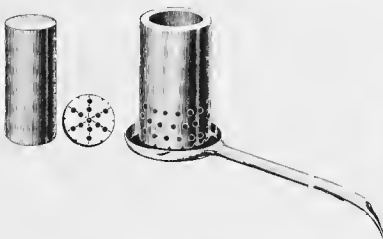
Note.—The above set of Test Plates, No. 44616, is furnished with certificate of the Physikalisch-Technische Reichsanstalt at extra price when so ordered.



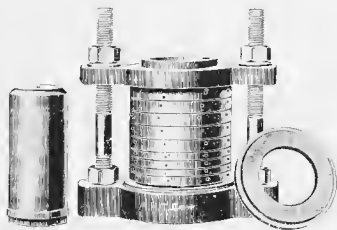
44700.	Potash Bulb, Liebig, with five bulbs.	.50
44701.	“ “ Liebig-Dittmar	.75
44708.	“ “ Liebig-Kyll	.75
44712.	“ “ Winkler. Height, mm	100 150
	Each	.80 1.25
44716.	Potash Bulb, Winkler-Kyll	1.30
44720.	“ “ Mohr.	.80
44721.	“ “ “ with CaCl_2 tube.	1.00
44728.	“ “ “ “ with rubber connections	1.20
44732.	“ “ “ “ ground in.	1.25
44736.	Potash Bulb, Norris	.50
44740.	“ “ Geissler-Wetzel, with a ball float valve in each of the lower bulbs	1.75
26664.	“ “ and Drying Tube Combined, Vanier. (See Vanier Combustion Train p. 150)	3.25
44744.	“ “ Gomberg, with ground in side tube.	1.50
44748.	Potash Bulb, Bowen, for very thorough absorption. Size	Small Large
	Each	1.50 2.00
44756.	Potash Bulb Support, of wood, adjustable as to height	1.50

We devote over eight thousand sq. ft. of floor space to our salesroom and offices, maintaining a permanent exhibit of Laboratory Apparatus amounting to over six thousand different pieces, conveniently arranged for the inspection and handling by our visitors, and a dark room for the demonstration of Projection and Micro-Photographic Apparatus.

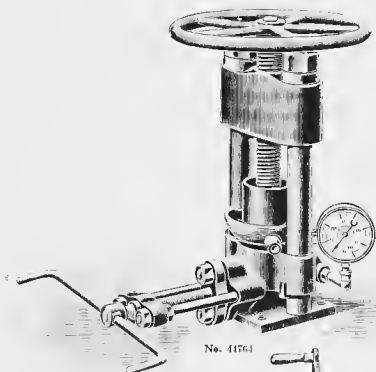
We recommend that customers visit our establishment when possible before the preparation of equipment lists and use this facility we provide for the careful selection of apparatus.



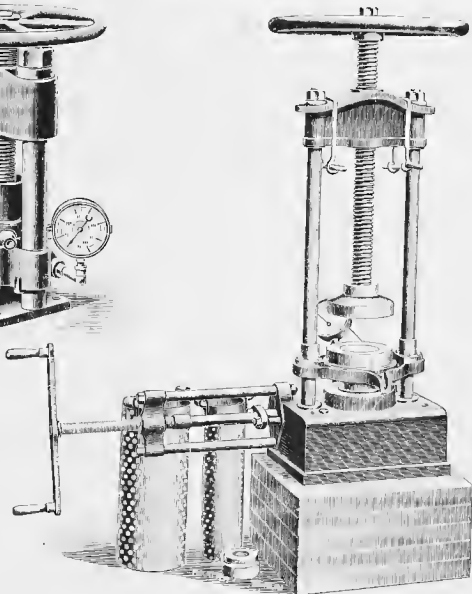
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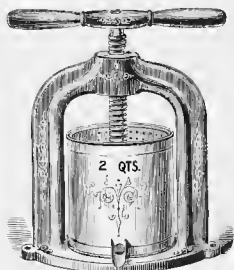


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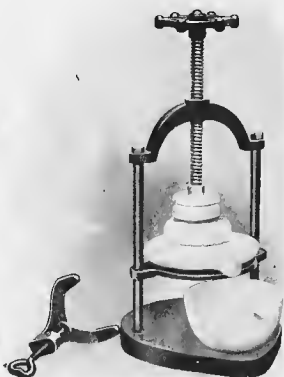


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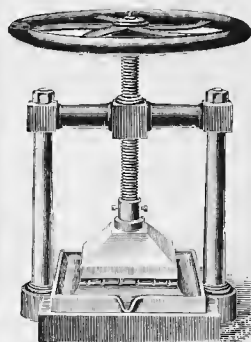
- | | | | |
|--------|---|--------|-----------------|
| 44760. | Press, Hydraulic, Büchner for 300 atmospheres pressure, with two cylinders of perforated tin, one 118 mm in diameter by 500 mm high, with a capacity of about 5 liters, and the larger one 200 mm by 500 mm with a capacity of about 15 liters. | | |
| | Duty Free | 205.00 | Duty Paid |
| | | | 245.00 |
| 44764. | Press, Hydraulic, of the same general construction as the large press after Büchner but of smaller dimensions and for very high pressures, i. e., 600 atmospheres. | | |
| | Duty Free | 128.75 | Duty Paid |
| | | | 155.00 |
| 44768. | Cylinder, Abderhalden, for use with the above presses, consisting of a perforated metallic cylinder, 55 mm in diameter, with removable bottom and piston, with collecting tray and spout. | | |
| | Duty Free | 14.85 | Duty Paid |
| | | | 17.85 |
| 44772. | Cylinder, Meyer, for use with the above presses, consisting of ten heavy, accurately fitting, metallic rings, 70 mm in diameter. See <i>Archiv f. exp. Path. u. Pharmacologie</i> , Bd. 47, pag. 426. | | |
| | Duty Free..... | 33.00 | Duty Paid |
| | | | 40.00 |



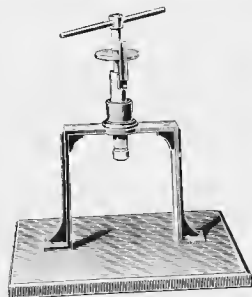
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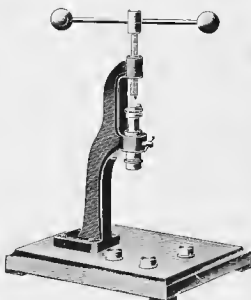
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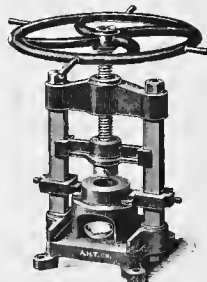
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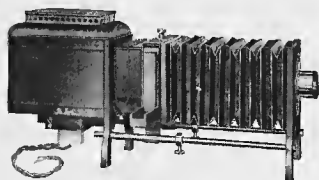
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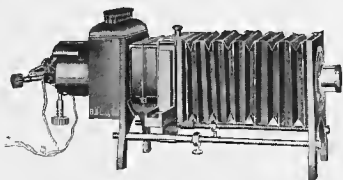
No. 44796

44776. Press, Tincture, extra heavy, for making tinctures, decoctions, infusions, etc.
Capacity, quarts..... 1 2 4 8
Each..... 3.75 4.50 6.50 10.00
44780. Press, Laboratory, for use where material must not be in contact with metal, exposed parts being made of porcelain; diameter of press plate, 80 mm 17.00
44784. Press, Laboratory, Witt, with porcelain plates, the lower one with trough and with pressing surface 150 mm square. Very heavily built to withstand strong pressure.
Duty Free 33.00 Duty Paid 40.00
44788. Press, Sodium, Kossel, for the direct preparation of $\frac{1}{2}$ Normal solutions without weighing of the sodium. See Hoppe-Seyler, Zeitschr. f. physiologische Chemie, Bd. 33.
Duty Free 21.00 Duty Paid 25.20
44792. Press, Sodium, Hofmann, with separate removable cylinder for producing both wire and ribbon. With molds for wire of $\frac{1}{4}$, $\frac{1}{2}$, 1 and 2 mm diameter and ribbon of 0.4 by 10 mm 17.50
44796. Press, Laboratory, for sugar beet samples, cylinder 60 mm diameter with fine perforations through which the juice is pressed into the dish shown below.
Duty Free..... 40.50 Duty Paid..... 54.00

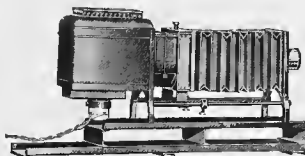
PROJECTION APPARATUS



No. 44800—Model B with Mazda Lamp



No. 44801—Model B with Budy Arc



No. 44820—Enlarging Outfit



PROJECTION APPARATUS, BAUSCH & LOMB MODEL B BALOPTICON. This little Balopticon is a high grade stereopticon for use in small classrooms, etc.

We furnish the Model B with either small arc lamp and compact rheostat or with the new 250 Watt nitrogen filled Mazda Lamp with silvered globe and concentrated filament. This new illuminant gives almost as brilliant a picture with lantern slides as does the arc lamp on direct current circuit and quite as brilliant as the arc lamp on alternating circuit. It is strongly recommended for school and home work where apparatus is to be operated by those not familiar with the manipulation of even a simple arc lamp. Both are furnished complete with connections for ready attachment to the lamp socket on any ordinary house wiring. Where electricity is not available, we furnish either an acetylene or Welsbach gas burner. If both types of illuminant are desired, we can supply the extra lamp in its lamp house for quick and easy interchange.

A feature of this lantern is the special ventilation of both lamp house and condenser mount, permitting one to use lantern slide films, if desired, without the expense and inconvenience of a water cell.

Lamp House—Of sheet metal with special ventilation; two styles—one for arc lamp measuring 6 1/2 x 2 1/2 x 5 in., and that for Mazda, acetylene or Welsbach lamp measuring 6 1/2 x 7 x 5 in.; both styles fit in grooves to rear standard and can be instantly interchanged by lifting out one and sliding in the other.

Illuminant—Bausch & Lomb Adjustable Budy Arc Lamp with small 4 1/2-ampere rheostat, 250-watt Mazda lamp, nitrogen filled with silvered globe, acetylene or Welsbach gas burner, as desired, carbons of arc lamp can be adjusted independently and then very easily fed forward by turning a single convenient button.

Projection Lens—Special acronimate lens of 10-inch focus in spiral focusing mount regularly supplied; either 8-inch or 12-inch focus lens can be furnished, by special order, without extra charge.

Dimensions—Length (ready for operation), 20 in. over all, with arc, or 22 in. with other lamps, height, 9 1/2 in.

Weight—Complete in case, 15 lbs. with arc and rheostat, or 12 lbs. with other lamps.

Case—Of sheet metal, 7 1/2 x 9 1/2 x 15 in., neatly lacquered in black and provided with carrying strap.

44800.	Model B Balopticon , as above described, with 250-watt Mazda lamp, cord and plug, in case, with directions	22.00
44804.	Model B Balopticon , with arc lamp, rheostat and switch	21.00
44808.	" " " with Welsbach gas burner and connections	20.00
44812.	" " " with acetylene burner	20.00
44813.	Acetylene Tank (Prest-o-lite) , charged with 10 cu. ft. of Acetylene	10.00
44820.	Lantern Slide and Enlarging Outfit , for use in connection with Model B Balopticon, consisting of the following:—	

Two sections of metal track, each 34 in. long, to be screwed to table or baseboard.
 Easel board, accommodating 11 x 14-in. paper either vertically or horizontally and mounted at one end of track.
 Supplementary track, 18 in. long, sliding on lens tracks and supporting the Balopticon at suitable height to align optical axis with center of board.

Special holder with two pieces of glass to accommodate films for enlarging, up to 4 x 5 in.

Frame to hold negatives for lantern slide making, 5 x 7 in. and smaller sizes.

Adapter with ground glass, attaching to rear of easel board to accommodate regular lamp house of Balopticon.

Special frame, fitting in slide carrier support to take ground glass and plate holder.

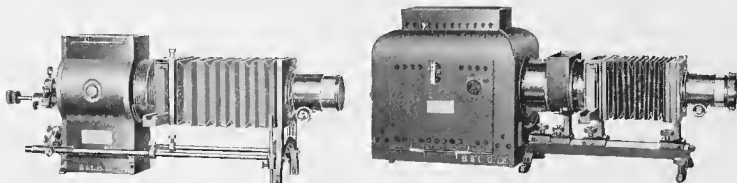
Piece of ground glass to place between condensing lenses when arc lamp is used.

Cap with ruby glass to place on projection lens when placing sensitized paper on easel.

Complete outfit, as above

44824.	Flange , for use when it is desired to use photographic lens from the camera, same to be attached to the front board of the Balopticon. Make and size of the photographic lens must be specified in ordering	2.00
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Note—For small enlargements the regular 10-inch e. f. projection objective supplied with the Model B is satisfactory. For larger work a shorter focus lens is recommended such as the 6-inch regular projection objective.



No. 4428—Model C, with Small Lamp House

No. 4452—Model D, with Large Lamp House

PROJECTION APPARATUS, BAUSCH & LOMB MODEL C BALOPTICON. This is the standard Balopticon for lantern slide work only and meets every requirement where lantern slides only are to be handled. The new 250 watt nitrogen filled Mazda lamp with silvered globe is recommended for use with the Model C when same is to be operated by those not familiar with the manipulation of arc lamps. It gives an illumination equal to the arc lamp with small carbons on $4\frac{1}{2}$ amperes alternating current circuit and nearly as bright as same on direct current circuit. It does not equal in illumination the arc lamp with the larger carbons with a current of ten to twenty-five amperes.

Lamp House—Two styles, small and large, both of sheet metal, fitted with B & L special patented light-tight ventilator and provided with two observation windows; small style measures $8\frac{1}{2}$ in. long, 11 in. high and 6 in. wide, asbestos lined; large style measures $12\frac{1}{2}$ in. long, 14 in. high and 7 in. wide, light-tight, constructed of double walls with air space between and provided with large light-tight door on the side—conforms to most rigorous requirements of Boards of Underwriters.

Illuminant—Hand-feed arc lamp for direct or alternating current or new 250 watt nitrogen filled Mazda lamp with silvered globe.

Projection Lens—Bausch & Lomb Standard lens with rack and pinion adjustment.

Dimensions—Length, extended, 27 in. without lens; height, 11 or 14 in.

Weight—Alone, 14 lbs., in case, 24 lbs.

Case—Regularly furnished only with small lamp house (see foot note under price lists); of metal, neatly lacquered in black measuring $22\frac{1}{2} \times 12 \times 7$ in. and provided with carrying strap.

Possible Attachments—The attachments for opaque materials, the simple microscope, the vertical attachment, and either adjustable slit can be used successfully with this Balopticon.

Special attention is called to the Model C Balopticon with large light-tight lamp house. We strongly recommend the selection of this outfit since it prevents any light from escaping into the room and is consequently more satisfactory in operation. A water cell, to minimize the heat passing through the slide, can be added to any Model C at an additional cost, as indicated in the foot note below.

4428.	Model C Balopticon, as above described, with small lamp house and 6-inch focus, $1\frac{1}{2}$ inch diameter projection lens	30.00
4432.	Model C Balopticon, as above, and 8-inch focus, $1\frac{1}{2}$ inch diameter projection lens	30.00
4436.	Model C Balopticon, as above, with 10-inch focus, $1\frac{1}{2}$ inch diameter projection lens	30.00
4440.	" " " " " " 10-inch " $2\frac{1}{2}$ inch " " " "	35.00
4444.	" " " " " " 12-inch " $2\frac{1}{2}$ inch " " " "	35.00
4448.	" " " " " " 15-inch " $2\frac{1}{2}$ inch " " " "	35.00
4450.	" " " " " " 10-inch " $2\frac{1}{2}$ inch " " " " but with new 250 watt nitrogen filled Mazda lamp with silvered globe instead of regular hand filled arc lamp	35.00

Note—Any of the above outfits may be supplied with large lamp house at an extra cost of \$7.50. These outfits are not regularly supplied with carrying case but one of lacquered metal can be supplied at \$2.50 additional.

Note—If any of the above Balopticons is desired with some lamp other than the hand feed arc, deduct the price of the latter, \$10.00, and add price of illuminant desired (see "Balopticon Accessories").

Note—A water cooling cell can be fitted to the Model C at an extra cost of \$5.00

PROJECTION APPARATUS, BAUSCH & LOMB MODEL D BALOPTICON, with heavy lathe bed optical bench of great rigidity and with sliding supports, particularly designed for laboratory work. This outfit, particularly when purchased with the large light tight lamp house may be used as a basis for the building up of the most elaborate outfits for special work as this form of optical bench takes all of the accessories provided for the Universal and Convertible outfits used in science teaching.

Base—Consists of cast iron supports of 6-inch spread, front and back, supporting optical bed $2\frac{1}{2}$ in. in height; front support provided with elevating screws.

Optical Bed—Of lathe type, carefully planned accommodating supports for different parts which may be adjusted as desired and rigidly clamped; measures 19 in. in length and accommodates projection lenses of longest focus.

Lamp House—Large style as shown in illustration of sheet metal, fitted with B & L special patented light-tight ventilator and provided with two observation windows; measures $12\frac{1}{2}$ in. long, 14 in. high and 7 in. wide, light-tight, constructed of double walls with air space between and provided with large light-tight door on the side—conforms to the most rigorous requirements of Boards of Underwriters.

Illuminant—Hand feed arc lamp for direct or alternating current.

Condensing System—Bausch & Lomb triple system in patented ventilated mount; provided with water cooling cell; diameter, 4 in.

Projection Lens—Bausch & Lomb Standard lens with rack and pinion adjustment.

Dimensions—Length, extended, 27 in. without lens; height, 11 or 14 in.

Case—Regularly furnished only with small lamp house (see foot note under price list); strongly built of wood, measuring $29 \times 13\frac{1}{2} \times 8\frac{1}{2}$ in. and provided with iron handle; fitted with strong spring catches and locks.

Possible Attachments—The attachments for opaque materials, the simple microscope, medium microscope, or large microscope, vertical attachments, the condenser polariscope and vertical attachment, and either a adjustable slit can be used successfully with this Balopticon.

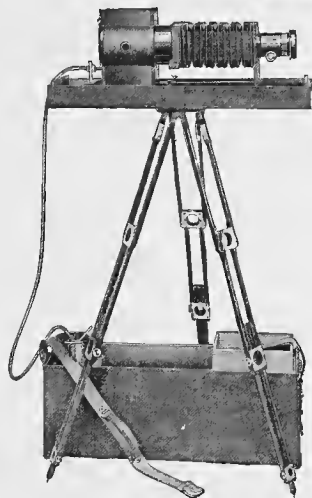
For scientific work we recommend the use of the large light tight lamp house as listed. Its use prevents the escape of any light into the room, an important feature in scientific projection, and because of its construction and large size, this house will remain cool throughout long demonstrations. The small lamp house can be furnished on Model D at a reduction of 7.50.

4452.	Model D Balopticon, as above described, with large light tight lamp house and 10-inch focus, $1\frac{1}{2}$ inch diameter projection lens	72.50
4456.	Model D Balopticon, as above, with 10 inch focus, $2\frac{1}{2}$ inch diameter projection lens	77.50
4460.	" " " " " " 12-inch " $2\frac{1}{2}$ inch " " " "	77.50
4464.	" " " " " " 15-inch " $2\frac{1}{2}$ inch " " " "	77.50

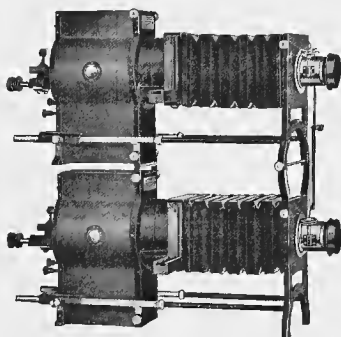
Note—These outfits are not regularly supplied with cases but a special woollen case can be supplied at \$4.00 extra.



No. 44876—Portable Model C in Case with Screen



No. 44876—Portable Model C with Tripod, Case and Acetylene Tank



No. 44868—Model C Dissolving

PROJECTION APPARATUS, BAUSCH & LOMB DOUBLE MODEL C FOR DISSOLVING EFFECT, with Bausch & Lomb patent iris diaphragm dissolver, which affords a perfect blending of one picture into the other. With the exception of the iris dissolver the outfits are standard Model C but when ordered together are furnished with the necessary connecting pieces to rigidly join them together.

- 44868. **Double Model C Balopticon**, with 6, 8 or 10-inch focus, $1\frac{1}{2}$ inch diameter projection lens, as specified, with iris dissolver. 75.00
- 44872. **Double Model C Balopticon**, with 10, 12 or 15-inch focus, $2\frac{1}{4}$ inch diameter projection lens, as specified, with iris dissolver. 85.00

PROJECTION APPARATUS, BAUSCH & LOMB PORTABLE MODEL C, as widely used by members of the staff of Agricultural Experiment Stations in their field work, Farmers Institute work, etc., and as supplied by us to all of the field lecturers employed by the Rockefeller Sanitary Commission for the Eradication of the Hookworm.

Lantern—Bausch & Lomb regular Model C Balopticon, fitted with $2\frac{1}{2}$ -inch diameter, 10-inch focus Standard projection lens and double condensing system in patent ventilated mount.

Illuminant—Acetylene lamp of two-jet type with capacity of $1\frac{1}{2}$ cubic feet of gas per hour; fitted with special mirror reflector.

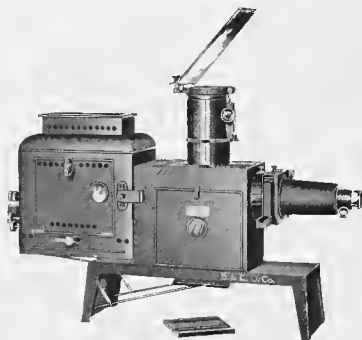
Supporting Table—Consists of strong tripod, adjustable to any desired height, with connection for screwing firmly into cover of carrying case, which forms the top.

Carrying Case—Ft. wood, measuring $29\frac{1}{2} \times 13\frac{1}{2} \times 8\frac{1}{2}$ in., covered with leatherette, cover is detachable, asbestos lined and fitted with neat metal plate into which tripod is screwed; case is carried by strong handle attached to heavy leather strap and, in addition to the regular outfit, contains space for gas tank of 10 cubic feet capacity and a second illuminant, both of which may be added at extra cost.

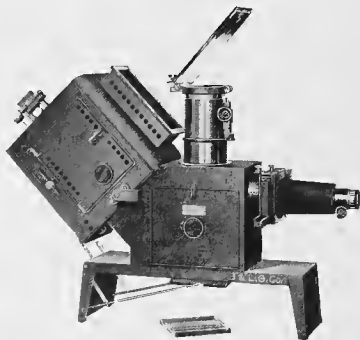
Weight—Outfit in case, with gas tank added, 40 lbs.

Suggested Accessories—Wherever electric wiring is available, an electric illuminant, particularly the arc lamp, is preferable, and it is well to be provided with one in addition to the acetylene lamp. They will be found listed elsewhere. For those desiring a portable screen we list below a 6 x 6-foot screen of heavy material on a plain roller. It is furnished in a canvas covered case with reinforced leather ends, which is fitted with a serviceable handle for carrying with the outfit, the whole weighing but 4 lbs.

- 44876. **Portable Model C Balopticon**, as above specified. 45.00
- 44880. " **Screen**, 6 ft. square, on plain roller in canvas covered case with reinforced leather ends. 8.00
- 44884. **Acetylene Gas Tank**, 10 cu. ft. capacity 10.00



No. 4885. Combined Balopticon in position for projection of lantern slides

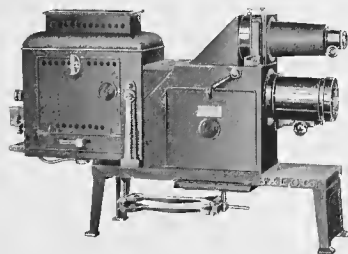


No. 4885. Combined Balopticon in position for projection of opaque objects without reversion of image

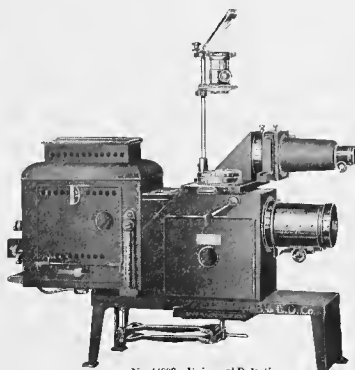
PROJECTION APPARATUS. BAUSCH & LOMB COMBINED BALOPTICON. NEW MODEL. providing for lantern slide projection and projection of opaque objects with immediate interchange from one to the other. The new model differs from the earlier model of the Combined Balopticon in that it is now provided with a horizontal object holder for opaque objects which has been found in the Universal and Convertible models to be distinctly better than the vertical object holder and, further, that opaque projection is accomplished with the object on the screen in the correct position from left to right, i.e. without reversion of the image. This is accomplished by illuminating the opaque object directly from the arc by placing the lamp house in the inclined position so that the image projected vertically through the opaque projection objective is reflected horizontally to the screen by the mirror over the opaque object. Lantern slides are projected with the lamp house in the horizontal position and the change from the projection of lantern slides to opaque projection, or vice versa, is accomplished by the simple shifting of the lamp house from the horizontal to the vertical position as shown in the illustration. The size of the area which may be projected through the opaque projection objective is 5 x 5 inches and the object holder is so constructed that large illustrations can be shifted about to cover any desired area for projection. For convenience in handling photographic plate and post cards two carriers are supplied with adjustable frames to take cards of varying width.

- Base**—Consisting of heavy sheet metal supports, front and rear, 8 inches wide, and carrying dark chamber at height of 9½ inches.
- Lamp House**—Measures 13½ inches long, 14½ inches high and 7½ inches wide; light tight and freely ventilated, constructed of double sheet metal walls with an air space between the two walls and the roof, fitted with special patented ventilator, with large light tight spring door on the side and observation windows on both sides; mounted between horizontal supports at front end and provided with handle at rear, permitting it to be easily tilted for projection of opaque objects and held rigidly in position by spring arm; conforms to the most rigorous requirements of Boards of Underwriters.
- Illuminant**—Hand-fed arc lamp for direct or alternating current.
- Condensing System**—Bausch & Lomb regular triple system, with two rear lenses mounted directly in front of the lamp house in ventilated mount, giving a parallel beam of light in the dark chamber, and the front lens placed in front of the dark chamber into-fore-wardly behind the slide carrier; diameter 4½ inches.
- Dark Chamber**—Of sheet metal, light tight, measuring 12 x 11½ x 7 inches; with opening in bottom for projected objects 5 inches square; provided with hinged door and observation window on right side.
- Object Holder**—Of square sheet metal mounted on arm controlled by two strong springs; accommodating objects of varying thickness, the holder always remaining parallel to base and automatically bringing object into proper plane of projection.
- Slide Carrier**—Double carrier with elevating device.
- Post Card Carrier**—Two adjustable carriers with wooden backs and frame which fit opaque object holder.
- Projection Lenses**—Two of Bausch & Lomb new standard lenses with rack and pinion focusing adjustment, of such relative focal lengths to project images of approximately equal size from opaque objects and lantern slides; lens for opaque objects fitted with adjustable first surface mirror.
- Dimensions**—Length from rear of lamp house to front of projection lens for lantern slides; height to top of mirror 33 inches.

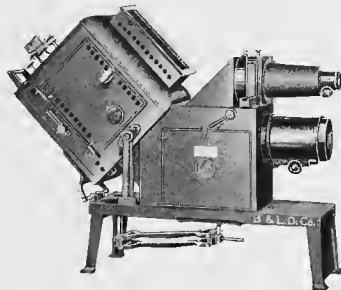
- 44885. New Combined Balopticon, as above, with 4 inch diameter, 15 inch focus lens for opaque projection and 1½ inch diameter, 10 inch focus lens for lantern slide projection; without rheostat 120.00
- 44886. New Combined Balopticon, as above, but with 18 inch focus lens for opaque projection and 12 inch focus lens for lantern slide projection 120.00



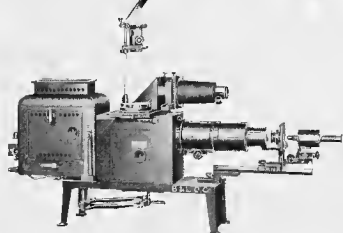
No. 4388—Universal Balopticon



No. 44892—Universal Balopticon
With Vertical Attachment



No. 4388B in Position for Opaque Projection



No. 44892 With Projection Microscope

PROJECTION APPARATUS, BAUSCH & LOMB UNIVERSAL BALOPTICON, New Model, providing for lantern slide projection, opaque object projection by reflected light from an area 6x6 inches, micro projection, and projection of objects in a horizontal position by transmitted light with the use of vertical attachment.

The interchange from lantern slide projection to projection of opaque objects is instantaneous without taking down or building up any part of the apparatus. With the vertical attachment in position the change is made instantly from opaque projection to either vertical or lantern slide projection. When the projection microscope is in position the change from micro projection to either lantern slide, vertical projection or opaque is instantaneous.

Base—Of cast iron, 25 in. in length; carried at height of 7 in. from table by two cast iron supports of 11-in. spread with elevating screws front and rear.

Lamp House—Measures 14 in. long, 13 in. high and 7 1/2 in. wide, light-tight and freely ventilated, constructed of double sheet metal walls, with an air space between the two walls and the roof fitted with B. & L. special patented ventilator; provided with large, light-tight spring door on the side and observation windows on both sides; mounted between uprights at front end and provided with handle at rear, permitting it to be easily tilted for opaque projection and held rigidly in position by strong spring arm; conforms to the most rigorous requirements of Boards of Underwriters.

Illuminant—Hand-fed arc lamp for direct or alternating current.

Condensing System—Consists of two rear lenses of B. & L. triple system, 8-in. diameter, in ventilated mount directly in front of lamp house, rendering light approximately parallel in dark chamber, and a plano-convex lens placed in front of the mirror box for lantern slide work, completing triple system.

Object Holder—Round, of heavy metal, mounted on double arm with spring hinge at each end and handle at holder end; the whole adjustable for height on a grooved vertical standard and provided with set screw; will accommodate objects of widely varying thickness and size, the holder always remaining parallel to base and automatically bringing object into proper plane of projection; dark curtain in front of opening prevents light from flooding room when object is being changed.

Mirror Box—Of sheet metal, prism shape and light-tight; mounted over opening in top of dark chamber and containing stationary mirror at suitable angle to reflect beam of light through lantern slide.

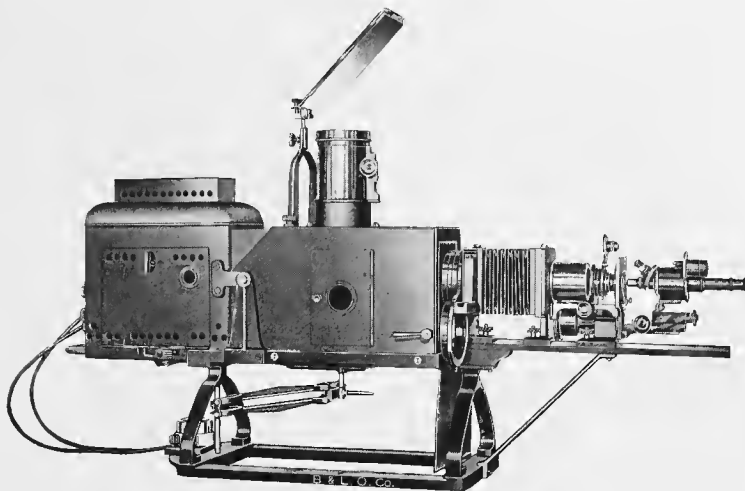
Projection Lenses—Two Bausch & Lomb Standard lenses with rack and pinion focusing adjustment, that for lantern slides regularly of 8-inch focus, 1 1/2-in. diameter, and that for opaque work of 15-inch focus, 1-in. diameter; lenses of other foci may be substituted if so specified.

Dimensions—Length over all, 38 in.; height, 24 in.

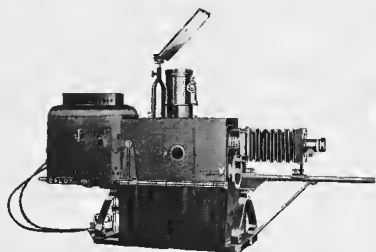
Vertical Equipment—Regularly furnished with Universal Balopticon No. 34892 only, but can be ordered separately and easily added to No. 3488; consists of a rectangular metal plate, 6 1/2 x 12 in., with circular opening at either end; over one end is mounted a plano-convex condensing lens with plane side up, to complete triple condensing system for vertical projection and provide stage upon which to work; upright grooved standard near opening carries 10-in. focus, 1 1/2-in. diameter projection lens and mirror for vertical work; over other opening provision is made for mounting mirror box with lantern slide equipment; for quick transformation from one form of projection to the other entire plate slides on metal rods and is operated by convenient handle.

Possible Attachments—The medium microscope, or large microscope, and any standard moving picture attachment can be used successfully with this Balopticon.

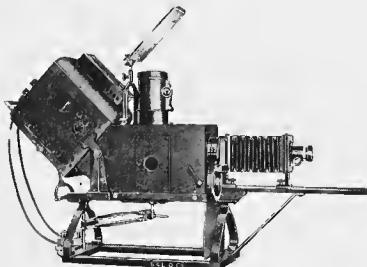
Price List on following page.



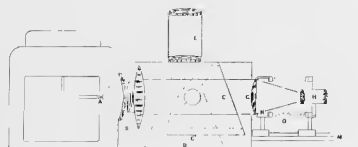
No. 44912. Convertible with Large Projection Microscope on Swinging Mount Providing Immediate Interchange with Lantern Slide Objective



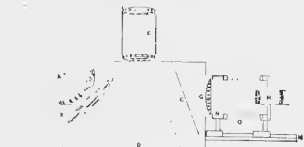
No. 44912. Convertible for Opaque and Lantern Slide Projection



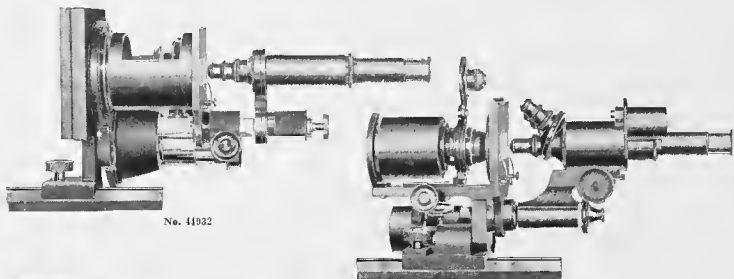
No. 44912 with Lamp House Tilted for Opaque Projection by Direct Illumination



No. 44912. Optical Scheme, showing Path of Light in both Lantern Slide Projection and Opaque Projection with Direct Reading Text

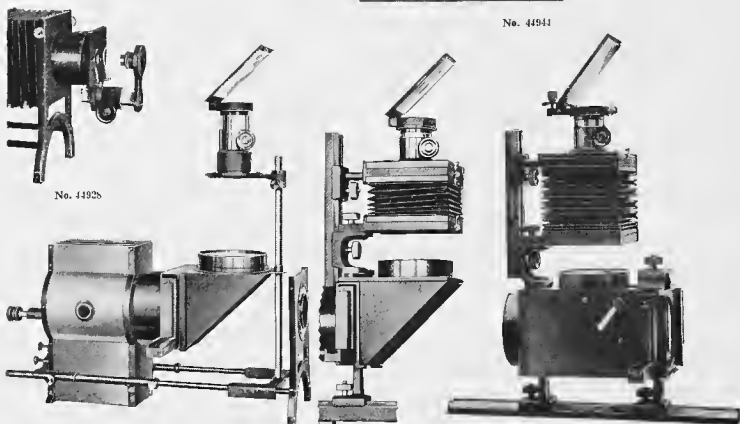


No. 44912. Optical Scheme, showing Path of Light in Opaque Projection by Direct Illumination, i.e., with Reversed Text



No. 41932

No. 44944



No. 44926

No. 44952

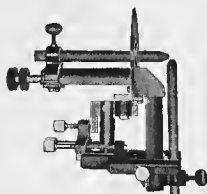
No. 19956

No. 44964

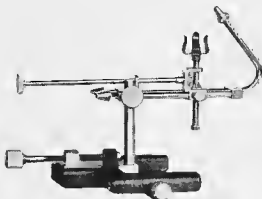
Bausch & Lomb manufacture three different models of Projection Microscopes—the Simple, Medium and Large—designed for use with their different Balopticons. The Simple Microscope has no eyepiece and is designed for work with low power objectives, particularly with their Model C Balopticon. The other two models are compound microscopes with both coarse and fine adjustments and high grade equipments. The Medium is illustrated with Universal Balopticon on page 442, and the Large with the Convertible Balopticon on page 444.

44928.	Simple Microscope, including substage condenser and three diaphragms for use in slide carrier.	15.00
44932.	Medium Microscope, including projection eyepiece, substage condenser and three diaphragms for use in slide carrier; without objectives	37.50
44936.	Medium Microscope, mounted on swinging arm for Model D or Convertible Balopticons	45.00
44940.	" mounted on special swinging arm for Universal Balopticon	45.00
44944.	Large Microscope, including amplifier, projection eyepiece, substage water cell, three substage condensers, triple revolving nosepiece and three diaphragms for use in slide carrier; mounted on swinging arm, without projection lens or objectives	100.00
44948.	Large Microscope, as above, but with 32, 16 and 8 mm objectives added	117.00
44952.	Vertical Attachment for Model C Balopticon	10.00
44956.	Vertical Attachment for Model D or Convertible Balopticon, with prism shaped mirror box and stationary mirror	15.00
44960.	Vertical Attachment for Convertible Balopticon or Model D, with rectangular dark chamber and movable mirror permitting interchange with other forms of projection	30.00
44964.	Vertical Attachment as described above, but with front standard, bellows and 1 1/4-inch diameter projection lens	42.00
44968.	Vertical Attachment, with reversing prism for use with microscope	37.50
44972.	Extra Front Standard for Convertible Balopticon	3.00

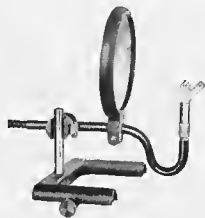
Note—When the vertical attachment remains in a permanent position on the Convertible Balopticon, it is well to have an extra front standard, so that one may be used on the horizontal and the other on the vertical bed.



No. 44976



No. 44984



No. 44988

- 44976. Hand-feed Arc Lamp, with centering support. 10.00
- 44980. Incandescent Electric Lamp, 250 watt nitrogen filled, with silvered globe, on support with 10-foot tension cable and Hubbel connection plug. 10.00
- 44984. Oxyhydrogen Lamp, on support. 10.00
- 44988. Acetylene Lamp with reflector and 6 feet of rubber tubing. 8.00
- 44992. Welsbach Gas Lamp with connection. 4.00
- 44996. Acetylene Gas Tank, 10 cubic ft. capacity. 10.00
- 45000. Plano-Convex Lens, 4-inch diameter, 6 $\frac{1}{2}$ -inch focus; rear lens of the regular Model C system, unmounted. 1.25
- 45004. Plano-Convex Lens, 4 $\frac{1}{2}$ -inch diameter; front lens of the regular Model C system, unmounted. Please state focus of projection lens when ordering. 1.50
- 45008. Plano-Convex Lens, 4 $\frac{1}{2}$ -inch diameter, 10-inch focus; middle lens of regular Model D system, or for special condensing system. 1.50
- 45012. Meniscus Convex Lens, 4-inch diameter, 11 $\frac{1}{2}$ -inch focus; for Model D system, or for special system. 2.50
- 45016. Plano-Convex Lens, 4 $\frac{1}{2}$ -inch diameter; front lens of the regular Model D, Universal or Convertible systems, unmounted. Please state focus of projection lens when ordering. 1.50
- 45020. Meniscus Convex Lens, 5 $\frac{1}{2}$ -inch diameter, 11 $\frac{1}{2}$ -inch focus; for Universal Balopticon, unmounted. 6.00
- 45024. Plano-Convex Lens, 6-inch diameter, 10-inch focus; for Universal Balopticon, unmounted. 3.00
- 45028. Meniscus Convex Lens, 6-inch diameter, 11 $\frac{1}{2}$ -inch focus; for Convertible Balopticon, unmounted. 7.00
- 45032. Double Convex Lens, 7 $\frac{1}{2}$ -inch diameter, 11-inch focus; for Convertible Balopticon, unmounted. 10.00
- 45036. Special Condenser System for opaque projection, in the Bausch & Lomb patented ventilated mount; for use in place of the regular double system when using the opaque attachment. 5.00
- 45040. Projection Lenses, Bausch & Lomb Standard.

Designation.	6"	7"	8"	10"	10"	12"	15"	18"	20"	15"
Size of mounting.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Diameter, inches.	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	2 $\frac{1}{16}$	4
Each.	7.00	7.00	7.00	7.00	14.50	14.50	14.50	18.00	18.00	50.00

Projection Table for Lantern Slides (2 $\frac{3}{4}$ x 3 inch opening) giving size of picture with objectives of various focus at different distances from the screen.

Lens Designation in Terms of Focus	Distance from lantern to screen								
	20 ft.	30 ft.	40 ft.	50 ft.	60 ft.	70 ft.	80 ft.	90 ft.	100 ft.
6-inch	10	15	20						
7-inch	8 $\frac{1}{2}$	12 $\frac{1}{2}$	17	21					
8-inch	7 $\frac{1}{2}$	11	15	18 $\frac{1}{2}$	22 $\frac{1}{2}$				
10-inch	6	9	12	15	18	21			
12-inch	5	7 $\frac{1}{2}$	10	12 $\frac{1}{2}$	15	17 $\frac{1}{2}$	21		
15-inch	4	6	8	10	12	14	16	22 $\frac{1}{2}$	
18-inch			6 $\frac{1}{2}$	8	10	11 $\frac{1}{2}$	13	15	20
20-inch			6	7 $\frac{1}{2}$	9	10 $\frac{1}{2}$	12	13 $\frac{1}{2}$	15 $\frac{1}{2}$

Example: Using a 12-inch lens at a distance of 40 ft. from the screen, the longest side of the screen image will measure 10 ft.

Projection Table for Opaque Objects, giving size of picture with objectives of various focus at different distances from the screen.

Distance from Lens to screen	4 $\frac{1}{2}$ x 5 inch Opening			6 x 6 inch Opening		8 x 8 inch Opening	
	12" lens	15" lens	25" lens	15" lens	18" lens	15" lens	18" lens
15 ft.	6	4 $\frac{1}{2}$		5 $\frac{1}{2}$	4 $\frac{1}{2}$	7 $\frac{1}{2}$	6
20 ft.	8	6		7 $\frac{1}{2}$	6	10	8
25 ft.	10	8		9 $\frac{1}{2}$	8	13	10 $\frac{1}{2}$
30 ft.	12	9 $\frac{1}{2}$		11 $\frac{1}{2}$	9 $\frac{1}{2}$		
35 ft.		11	5 $\frac{1}{2}$		11		
40 ft.		13	6 $\frac{1}{2}$				
50 ft.			8 $\frac{1}{2}$				
60 ft.			11				

Example: An 18-inch lens used at a distance of 20 ft. from the screen will project an image 5 ft. square.

PYROMETERS

We are not manufacturers of Pyrometers and are not equipped to design or make installations of Pyrometers for special purposes, as such service in every instance is better performed by the original manufacturers. It is our custom to refer inquiries involving special designs to the maker who, in our opinion, is best qualified to meet the requirements of the case. We are prepared, however, to furnish standard equipments, for both laboratory and works practice, from reliable makers of each type of Pyrometer and always at original factory prices. As a convenience to users of this catalogue we print the following fixed points of the provisional temperature scale now in use at the Bureau of Standards, Washington, D. C. (Circular No. 7, "Pyrometer Testing and Heat Measurements").

Freezing or Melting Points					
Tin.....	232° C.	450° F.	Gold.....	1063° C.	1945° F.
Cadmium.....	321° C.	610° F.	Copper.....	1083° C.	1981° F.
Lead.....	327° C.	621° F.	Nickel.....	1450° C.	2642° F.
Zinc.....	419° C.	785° F.	Palladium.....	1550° C.	2832° F.
Antimony.....	630° C.	1165° F.	Platinum.....	1755° C.	3190° F.
Aluminium.....	658° C.	1216° F.	Alumina.....	2050° C.	3720° F.
Ag(Cu).....	779° C.	1434° F.	Tungsten.....	3000° C.	5430° F.
Silver.....	961° C.	1762° F.			

Boiling Points (Centigrade)	
Naphthaline.....	217°, 9 + 0.955 (H - 760)
Benzophenone.....	305°, 9 + 0.963 (H - 760)
Sulphur.....	441°, 6 + 0.096 (H - 760)

TYPES OF PYROMETERS

EXPANSION PYROMETERS, suitable for measurements up to about 1400° F. These are based on the relative expansion of metals or of a metal and graphite, and are widely used in industrial establishments. Such instruments should be tested from time to time to correct for changes in zero.

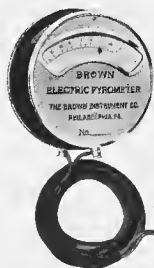
THERMO-ELECTRIC PYROMETERS. In pyrometers of this type temperatures are measured by the magnitude of the electromotive forces set up between wires of different materials when one junction is exposed to the temperature to be measured and the other junction (or junctions) is kept at some known temperature. For the measurement of temperatures in the interval 300° to 1000° C. thermocouples consisting of a wire of an iridium or rhodium alloy of platinum joined to a wire of pure platinum (usually designated as rare metal couples) are generally used. The most commonly used type, known as the Le Chatelier pyrometer, consists of a wire of 10% rhodium alloy with platinum joined to one of pure platinum. For the measurement of temperatures below 600° C. to that of liquid air (-200° C.) couples, known as the base metal couples, of iron-constantan, copper-constantan, etc., are used, as are also couples of iron, chromium, nickel, etc., and their alloys. These couples are more subject to oxidation than the platinum alloys and must be renewed more frequently.

ELECTRICAL RESISTANCE THERMOMETERS. The fundamental principle of the Resistance Thermometer is the fact that a change in the temperature of a pure metal causes a definite change in its resistance to an electrical current. The percentage change in resistance per degree change in temperature is more than twenty as great as the percentage change in the volume of mercury with temperature. The method of measurement employed is the Wheatstone Bridge in one or other of its forms. The bridge, instead of being calibrated in ohms, is calibrated in terms of temperature and is, therefore, direct reading in temperature units. This direct reading feature is made possible in the Leeds & Northrup product by a special method of adjustment which assures that, no matter how the purity of the metal may vary, all bulbs of a given class have not only the same resistance at a given temperature but also have the same rate of change of resistance with temperature. The merits of Resistance Thermometers and Pyrometers group themselves under the two headings of reliability and flexibility. There is no method of temperature measurements as flexible as the resistance thermometer. Not only may the bulb be made so small that its total volume need not exceed a cubic quarter inch, but this requisite volume may be of any desired form, flat or round, stiff or flexible. On the other hand, the bulb may integrate the temperature over as great an area as desired either as a large single unit or as a subdivided unit. Further, considering the equipment as a whole, the system is most flexible; any number of the various bulbs of a given class may be read on one indicator with any length or size of leads, and a system already installed may be increased at will by additional bulbs and additional switching facilities. In other words, all parts are electrically interchangeable. Further than this, the thermometer may be made, if so desired, in such form as to be practically free from thermometric lag; it may have a wide range at all points of which it is equally accurate, or it may have a short range selected for special work, giving an open scale of high accuracy. In short, throughout the range of temperature extending from the lowest known up to 1800° F. a resistance thermometer system may be laid out to have almost any desired characteristics.

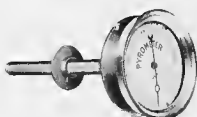
OPTICAL PYROMETERS. In optical pyrometers the intensity of the light emitted by an incandescent body whose temperature is sought is measured by comparing the intensity of the light which the body emits with that emitted by some standard source, such as a gaso-line lamp or an incandescent lamp under specified conditions. Optical pyrometers are, therefore, essentially in principle photometers adapted to meet the varying requirements of shop and laboratory use. In these pyrometers light of a single color is generally used to get rid of the difficulties in photometry incident to color differences and also for the reason that the laws connecting the temperature of a body and the intensity of the light emitted are simpler if we deal with a single wave length (color) only.

RADIATION PYROMETERS. In radiation pyrometers the energy of total radiation (i.e. that associated with the long waves which do not affect the eyes, as well as the energy of the short light waves) is measured in various ways by the heat effect which it produces, such as by the electric current set up when the radiation heats one or more junctions of two dissimilar metals, the expansion produced by the heating of a compound metal strip, and the change in resistance of a very fine metal ribbon.

All of the above types of Pyrometers are furnished with recording as well as indicating instruments, with the exception of the Optical and Expansion Pyrometers. The descriptions given in the preceding paragraphs are mostly taken from the Bureau of Standards Circular No. 7, "Pyrometer Testing and Heat Measurements." We offer reliable instruments of the types mentioned on the following pages.



No. 45204



No. 45200 Horizontal Stem



No. 45208



No. 45200 Vertical Stem



No. 45216



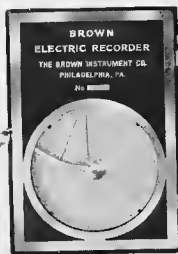
No. 45220



No. 45224



No. 45228

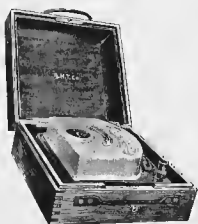


No. 45212

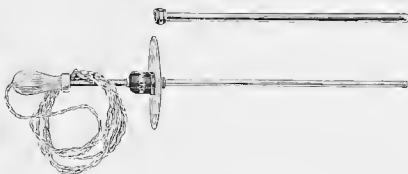
45200. Pyrometer, Expansion, Brown, with new patent improvement by which the pyrometer shows exactly the same temperature no matter how much of the stem or tube above 12 inches is inserted in the heat. With new non-tarnishing porcelain dial 6½ inches in diameter and with standard length of stem of 36 inches intended for 12 inches insertion in the heat. These instruments are furnished with either vertical or horizontal stem and with Centigrade or Fahrenheit dial as specified, without additional charge. With dial graduated to..... 800° F. 1200° F. 1500° F.
- | | | | |
|------|-------|-------|-------|
| Each | 12.00 | 15.00 | 20.00 |
|------|-------|-------|-------|
45204. Pyrometer, Thermo-electric, Brown Stationary Type, with round pattern, large size millivoltmeter, graduated in Fahrenheit or Centigrade degrees, with base metal thermo-couple, for occasional use up to 2400° F. but for constant use at not over 1800° F. Complete with 36 inch thermocouple in protecting case, as shown in illustration, and 50 ft. of double conducting wire..... 50.00
45208. Pyrometer, Thermo-electric, Brown Portable Type, similar to above but with galvanometer in portable case. The thermo-couple is usually supplied, as in illustration, with a protecting cap which is removed for instantly measuring temperatures up to 2400° F., or which can be left in position for permanent installation at temperatures up to 1800° F. For molten metals a special form of thermo-couple is furnished. Complete with scale graduated from 0-2400° F., with base metal thermo-couple and 15 ft. of flexible wire..... 50.00
45212. Pyrometer, Thermo-electric, Brown Recording Type, wall form for permanent installation, making a perfect ink record on a daily chart with eight day clock mechanism. The instrument is furnished at the same price in portable type for horizontal use on the laboratory table. Range of temperature the same as in preceding instruments. Complete with base metal thermo-couple and 100 ft. of leads..... 100.00
- Note—Galvanometers are furnished with temperature scale in Fahrenheit or Centigrade degrees at the same price; with both Fahrenheit and Centigrade scales or with temperature and millivolt scales at \$5.00 additional.

Accessories for Brown Thermo-electric Pyrometers.

45216. Thermocouples, Base Metal, in standard lengths of 36 inches, complete with mount. Each..... 7.50
45220. " Platinum Rhodium, in Marquardt porcelain or quartz protecting tubes as shown in illustration. For reading temperatures up to 3000° F. With iron head, porcelain block and binding posts, complete. Length, inches 12 18 24 27 33 36 39 50 60
- | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Each..... | 22.00 | 30.00 | 35.00 | 38.00 | 42.00 | 45.00 | 47.00 | 55.00 | 65.00 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
45224. Marquardt Porcelain Tubes, with metal caps, for thermocouples; to withstand a temperature of 3600° F. and with a glaze impervious to gases, but which must always be heated up slowly in order to avoid breakage. Length, inches..... 12 18 27 39
- | | | | | |
|-----------|------|------|------|------|
| Each..... | 3.00 | 4.00 | 6.00 | 8.00 |
|-----------|------|------|------|------|
45228. Quartz Pyrometer Tubes, with metal caps, for thermocouples, which may be inserted while cold into a high temperature without cracking and they have a wide application because of this feature. However, they are not suitable for temperatures above 2500° F. and are not as durable as Marquardt tubes for permanent installations. Length, inches 12 18 27 39
- | | | | | |
|-----------|------|------|------|------|
| Each..... | 3.00 | 3.50 | 4.50 | 6.00 |
|-----------|------|------|------|------|



No. 45232—Galvanometer



No. 45232—Heraeus Element with Tubes, etc.

45232.	Pyrometer, Thermo-electric, Le Chatelier, with Heraeus Element for temperatures up to 1600° C. with Heraeus platinum rhodium element 60 inches long mounted in double 50 inch porcelain tubes, and with latest type Siemens & Halske pivot type galvanometer, in carrying case...	163.05
45233.	Galvanometer, Siemens and Halske pivot or suspension type, without case.....	75.00
45234.	Carrying case for above	7.50
45235.	Heraeus Element, 60 inches long, bare.....	66.00
45236.	Porcelain Tubes, 50 inches long, for Heraeus Element, per pair.....	15.00
45237.	Heraeus Element, 30 inches long, bare.....	36.50
45238.	Porcelain Tubes, 22 inches long, for above Heraeus Element, per pair.....	10.00
45239.	Heraeus Element, 18 inches long, bare.....	23.00
45240.	Porcelain Tubes, 12 inches long, for above Heraeus Element, per pair.....	5.00
45241.	Recording Galvanometer, Siemens & Halske Pivot type, for use with any of the above Heraeus Elements as a Recording Pyrometer	180.00



No. 45242

POTENTIOMETER INDICATOR (THERMOCOUPLE POTENTIOMETER) Leeds & Northrup, a new Precision Instrument for use with Thermocouples and which greatly increases the range of their usefulness in both laboratory and shop practice. The instrument is based upon the potentiometer principle, so simplified in design as to be used by an ordinary workman. Some of the essential facts and advantages of this Indicator are as follows:—

The potentiometer indicator when calibrated in terms of millivolts may be used accurately with any thermocouple, regardless of its length, cross-section, or materials, or the length of its leads.

Many kinds of base metal thermocouples retain their calibration four or five times as long with this indicator as with a millivoltmeter.

It is completely portable and requires no levelling.

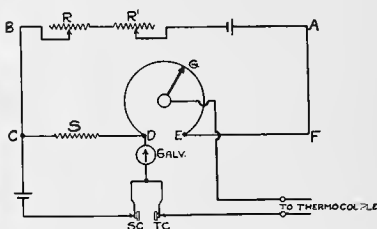
It has a scale 16 inches long—at least twice as long as the usual millivoltmeter; this means at least twice the accuracy in reading.

The thermocouples may, if desired, be long enough to have their cold ends located at the switch-board, thus having an equipment with one cold end.

The cold end temperature may be compensated for in the instrument.



No. 45250—Potentiometer Indicator



No. 45250—Electrical Scheme

The illustration of No. 45250 gives a view of the Indicator looking down on the face of the instrument. The regular routine reading is taken by depressing the key marked TC and by turning the handle which projects from the rubber plate, bringing the galvanometer to a balance. The reading is given by the scale under the index.

At intervals of say six hours, the keyed handle shown in the top of the box in the illustration should be inserted in the key ways at the side of the box, as shown in the illustration of No. 45250. The button SC should be depressed and the galvanometer brought to a balance by turning the keyed handle. This handle is keyed so that it may be removed to prevent tampering with the setting.

In course of time the dry cell of the equipment will become exhausted. At this time it will be impossible to secure a balance when the key SC is depressed. The dry cell used in the indicator is a No. 4 Columbia. To replace the dry cell turn the indicator upside down and remove the panel in the bottom of the case. The dry cell may now be changed, taking care to connect the new cell with its polarity the same as the old. For instruments which are to be permanently located at one point, we would recommend the use of an external battery consisting of two large dry cells (as Columbia No. 6) in parallel.

No. 45250 Indicator is provided with an auxiliary cold end adjustment, which, in effect, makes the instrument direct reading. This appears in the illustration as the small index and short scale lying just below the main scale. The small scale is set on its index at a point corresponding to the cold end temperature, and the readings of the instrument are then right without cold end correction.

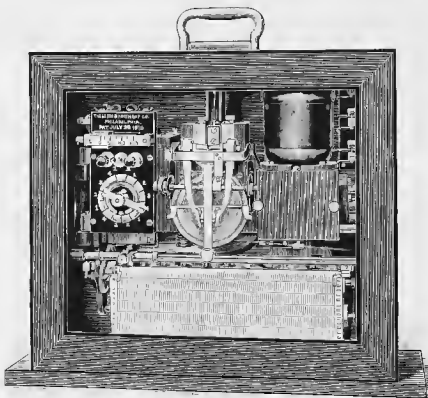
The Potentiometer Indicator measures by balancing against the electromotive force to be measured a continuously variable known electromotive force. When the two are equal, the measurement is complete. The operation of reading, as described above, consists of balancing the electromotive force of the thermocouple against the fall in potential caused by the current flowing from the dry cell through any portion DG of the slide wire DE (see diagram). Since the dry cell is not constant, the adjusting rheostats R' , are provided to maintain the current constant. By varying R' the current flowing is adjusted until the drop between C and D is just equal to the standard cell voltage. It is this operation which is performed when adjustment is made with removable handle. Particular attention is drawn to the fact that the Indicator may be used with any thermocouple if the scale is in millivolts as it is regularly furnished. If scale is to be graduated in degrees of temperature the couple with which it is to be used must be sent to the factory for calibration with the Indicator. Indicator with range in millivolts from 0 to 16 is intended for use with rare metal couples and from 0-40 or 0-70 with base metal couples. Prices do not include thermocouples.

45242.	Potentiometer Indicator, as above, without cold end compensation ranges, 0-10, 0-16, 0-40 or 0 to 70 millivolts	125.00
45244.	Extra for other ranges whether calibrated in millivolts or in temperature units	5.00
45248.	Extra for double range	20.00
45250.	Potentiometer Indicator, as above, with cold end compensator ranges, 0-10, 0-16, 0-40 or 0-70 millivolts.	140.00
45252.	Extra for other ranges whether calibrated in millivolts or in temperature units	5.00

TEMPERATURE INDICATOR, Leeds & Northrup Balance Type, for use with all Resistance Thermometers of class A, 40-260° F., Class B, up to 1000° F., and Class C, to 1800° F., as listed below. The Indicator consists of a direct reading Wheatstone Bridge with a self-contained Galvanometer of new design and great sensitivity. The Indicator is calibrated to read directly in degrees of temperature when connected to any bulb of a given class. The total length of the scale is 16 inches and, as a balance may be readily obtained to $\frac{1}{2}$ and of an inch, the Indicator is easily read to $\frac{1}{10}$ ths of 1%. To make a reading with this

RESISTANCE BULBS, CLASS C, for use with the above Temperature Indicator in the following ranges; 800°-1800° F., 200°-1800° F., 500°-1000° C. and 0-1000° C. These Bulbs are electrically interchangeable with each other and with those in Class C. The resistance material used is an especially pure platinum wound on a mica cross. The mica of this cross is treated by a process which leaves it of a hard, non-transparent, rock-like structure. In the standard type of construction this platinum wound form is encased in a Royal Berlin glazed porcelain tube. A clear quartz tube is at times desirable although it is slightly more expensive.

- 45280. **Platinum Resistance Bulb,** for measurements of the highest precision; porcelain tube with fibre head; length of bulb 3 inches; diameter of tube $\frac{1}{16}$ ths inch; entire length of tube 19 inches; diameter of head $\frac{1}{4}$ inches. These Bulbs are widely used in permanent installations for some of the largest chemical works in the U. S. When used in connection with the above Temperature Indicator No. 45252 the accuracy of the readings without correction is 3° in 500° or 6° in 1000° of range. 60.00
- 45284. **Platinum Resistance Bulb,** of same construction as No. 45280. When bulbs of this type are used in connection with No. 45252 the accuracy of the readings without corrections and direct from the scale is 8° in 500° or 12° in 1000° of range. 40.00
- 45288. **Extra per inch for Bulbs over 19 inches in length.** 50



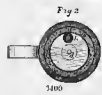
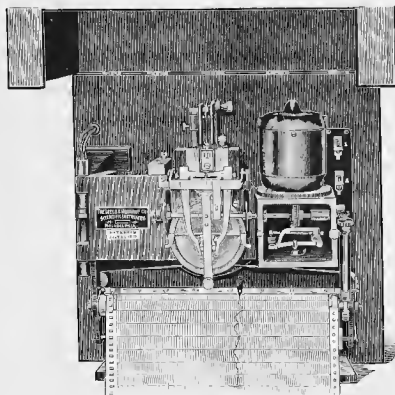
No. 45296 and No. 45304—Temperature Recorder. Curve Printing Type

TEMPERATURE RECORDERS, Leeds & Northrup Patent, for use with Leeds & Northrup Resistance Thermometers of class corresponding to the range required, and for use with Thermocouples. Consisting of a patented mechanism for moving with simple power a pen, print wheel, or other device, in response to the necessarily feeble deflecting forces of a sensitive galvanometer. These Recorders are furnished in the Curved Drawing Type for one temperature point, and in the Curved Printing Type for from two to sixteen temperature points. Motors will operate on 100-120 volts, a. c. or d. c., or 220-250 volts, a. c. or d. c., as specified. The paper speed is 3 inches per hour. The record in the Curve Drawing Type is made in ink by a pen, and in the Curve Printing Recorder by a print wheel drawn on a track by power supplied by the motor but controlled by the temperature. The process is entirely mechanical, only the motor and the measuring circuit involving electric current. The speed of the motor is automatically held constant even though the voltage on the line on which it is operated varies through a range of 20%.

- 45292. **Recorder for Resistance Thermometer, Curve Drawing Type,** for one temperature point. This instrument is a recording Wheatstone Bridge. When for use with resistance bulbs the recorder is calibrated to record directly in temperature units. The accuracy of the recorder is equal to 1% of the range of the instrument. The distance separating the recorder from the bulb whose temperature is being measured is without effect upon the record. Should it be desired to use the same recorder with different bulbs at different distances from the recorder this may be done by providing a suitable hand operated selector switch. The resistance thermometer has no feature corresponding to the "cold end" of a thermocouple. The indications of the recorder are controlled solely by the temperature of the sensitive end of the bulb. 200.00

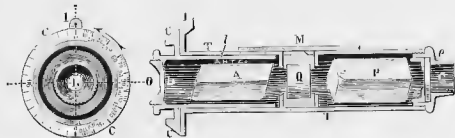
45296. **Recorder for Resistance Thermometers, Curve Printing Type,** for temperature points as indicated.

Number of points	2	4	6	8	10	12	14	16
Each	300.00	330.00	360.00	390.00	420.00	450.00	480.00	510.00



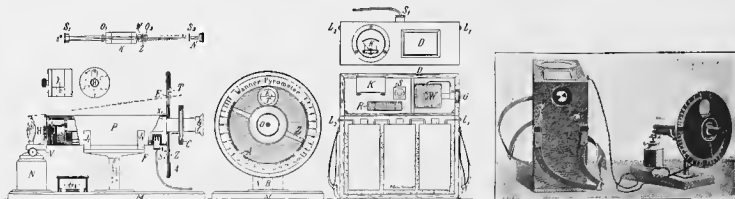
No. 45300 and No. 45292—Temperature Recorder. Curve Drawing Type

45300. Recorder for Thermocouples, Curve Drawing Type, for one temperature point, similar to No. 45292 except this instrument is a recording potentiometer. To record temperature it may be used with any thermocouple of any length, cross-section or material. With any thermocouple the accuracy of the record is entirely independent of the resistance of the leads and, therefore, of their length, cross-section and materials. For ranges of 15 millivolts and over, the accuracy of the record is $\frac{1}{2}\%$ of the range; 15 millivolts are equivalent to about 1500° C. on a platinum platinum-rhodium couple and to about 275° C. on an iron constantin couple. 250.00
45304. Recorder for Thermocouples, Curve Printing Type, for temperature points as indicated.
- | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|
| No. of points..... | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| Each..... | 400.00 | 430.00 | 460.00 | 490.00 | 520.00 | 550.00 | 580.00 | 610.00 |
| Extra for special range..... | | | | | | | | 30.00 |
| Extra for special paper speed..... | | | | | | | | 10.00 |
| 45316. Recorder Pen..... | | | | | | | | 1.50 |
| 45320. " Paper, per roll of 25 yards..... | | | | | | | | 2.50 |
| 45324. " Ink, per bottle..... | | | | | | | | .25 |
45328. Pyrometer, Siemens Water, for temperatures up to 1000° C. or 1800° F. The metallic cylinders supplied with the pyrometer are exposed to the heat to be measured after which they are carefully inserted into the vessel containing exactly 1 pt. of distilled water. The rise in temperature of the water is measured by the mercurial thermometer furnished with the outfit. This reading added to the temperature of the water before the insertion of the heated cylinder will give the temperature of the flue, furnace or heated space in which the metal cylinder has been placed.
- Duty Free..... 27.00 Stock..... 35.00



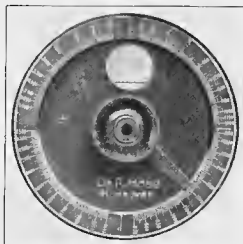
No. 45332

45332. Pyrometer, Optical, Mesure and Nouel, for temperatures up to 1500° C., consisting of a quartz plate Q interposed between Analyzer A and Polarizer P. When polarized light which is not monochromatic passes through a properly prepared quartz plate, the plane of polarization is rotated through an angle the magnitude of which depends on the wave length of the light and the thickness of the quartz. The field will, therefore, appear colored according to the composition of the light which passes through the instrument. When an incandescent body is viewed through the instrument the analyzer is rotated until the sensitive tint is observed. The reading on the circle C determines the temperature to be measured with the aid of the scale furnished with the instrument. Complete in leather case.
- Duty Free..... 32.50 Duty Paid..... 46.80
45336. Large Objective for use with above for accurate observations of temperatures below 900° C.
- Duty Free..... 11.25 Duty Paid..... 16.20

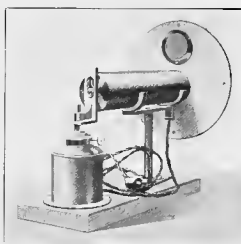


Optical Scheme

Standardization of Osram Lamp



Direct Reading Temperature Scale



Amyl-Acetate Lamp in Position



In Operation

PYROMETER, WANNER OPTICAL, 1914 Model, consisting of a photometric telescope containing a standard Osram lamp with which the quantity of light emanating from the heated mass to be measured is compared. The Osram lamp must be standardized from time to time by adjustment with a standard Amyl Acetate lamp and current from the accumulator supplied must be controlled by means of a rheostat and ammeter. The new 1914 models listed below are distinctive from the instruments listed heretofore in that the whole range of temperature from 650° to 4000° C. can be measured on one instrument, whereas with the old outfits two instruments are necessary to cover the entire range. The prices have also been distinctly reduced on the new models. Some of the distinctive features embodied in the new 1914 model are as follows:—

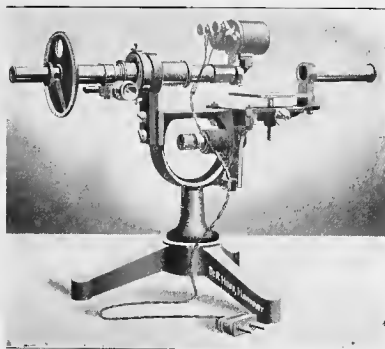
Optical parts enclosed in polished metal protecting tube of uniform diameter.
 Adjusting glasses placed entirely within the tube but adjustable from outside.
 Simplified arrangement for interchange of incandescent lamp after removing outside tube.
 Direct reading temperature scales very legible because of white graduations on black ground.

Outfits are complete for operation excepting the charging of the accumulators. Any of the Pyrometers are furnished with certificate of the Physikalisch-Technische Reichsanstalt at an extra cost of \$10.50 duty free and \$14.00 duty paid.

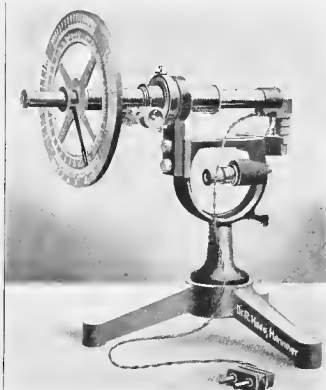
45340.	Pyrometer, Wanner Optical, for temperatures from 650° to 1200° C., as above described including amy l acetate lamp, support for standardizing, ammeter, resistance and accumulator; with graduations in degrees of arc and separate temperature scale	Duty Free 105.00	Duty Paid 140.00
45344.	Pyrometer, as above, but with direct reading temperature scale	112.50	150.00
45348.	Pyrometer, Wanner Optical, for temperatures from 650° to 2000° C., complete as above, with graduations in degrees of arc and separate temperature scale	135.00	180.00
45352.	Pyrometer, as above, but with direct reading temperature scale	142.50	190.00
45356.	Pyrometer, Wanner Optical, for temperatures from 650° to 3000° C., complete, with graduations in degrees of arc and separate temperature scale	142.50	190.00
45360.	Pyrometer, as above, but with direct reading temperature scale	150.00	200.00
45364.	Pyrometer, Wanner Optical, for temperatures from 650° to 4000° C., complete, with graduations in degrees of arc and separate temperature scale	165.00	220.00
45368.	Pyrometer, as above, but with direct reading temperature scale	172.50	230.00
45372.	Pyrometer, Wanner Optical, for temperatures from 600° to 7000° C., complete, with graduations in degrees of arc and separate temperature scale	195.00	260.00
45376.	Pyrometer, as above, but with direct reading temperature scale	202.50	270.00

Accessories for the Wanner Pyrometer.

45380.	Protecting Case for the Pyrometer proper and adjusting support	4.50	6.00
45384.	Amyl Acetate, tested, per bottle	1.05	1.40
Note—The above Protecting Case and a bottle of Amyl Acetate are regularly sent out with each outfit unless specifically ordered to be omitted.			
45388.	Incandescent Lamp	1.00	1.35
45392.	Tripod Support, adjustable in all directions and folding for convenient carrying; very convenient in factory use	9.00	12.00
45396.	Accumulator, in box with leather strap, but without ammeter, resistance or contact	16.50	22.00
45400.	Ammeter, resistance and contacts for above	25.50	34.00



No. 45404



No. 45412

45404. **Laboratory Combination of Wanner Pyrometer and König Spectrophotometer**, particularly recommended for laboratory measurements of both temperature and absorption investigations in spectrophotometry; with small scale with absorption angle only, for temperatures up to 2000° C.
45408. **Laboratory Combination**, as above, for temperatures up to 4000° C.
45412. **Laboratory Combination**, " " but with large scale including polarisation angle device and temperature scale, for temperatures up to 2000° C.
45416. **Laboratory Combination**, same as above, but for temperatures up to 4000° C.

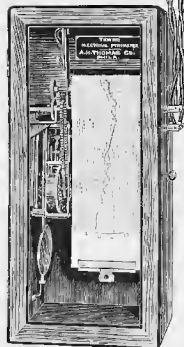
	Duty Free	Duty Paid
45404	195.00	260.00
45408	225.00	300.00
45412	217.50	290.00
45416	247.50	330.00



No. 45420



Method of Using Thwing Radiation Pyrometer



No. 45432

PYROMETERS, THWING TOTAL RADIATION, for the accurate measurement of high temperatures, based on Stefan-Boltzmann Radiation Law, i.e., the energy radiated by a black body is proportional to the fourth power of the absolute temperature. With no upper limit, and used commercially for temperatures as low as 500° C. Radiations of heat from a black body, or body under black body conditions as in an enclosed furnace, are concentrated by means of a receiving tube on a sensitive thermocouple and hence conveyed to the galvanometer, where temperatures are read directly in degrees. As the thermocouples have but small heat equilibrium, a reading can be obtained in five seconds. No tripod is required, the receiving tube being held in the hand and pointed at the object temperature of which is to be measured. No focussing is required as the instrument is practically independent of distance, so long as the diameter

Thwing Radiation Pyrometer (Continued)

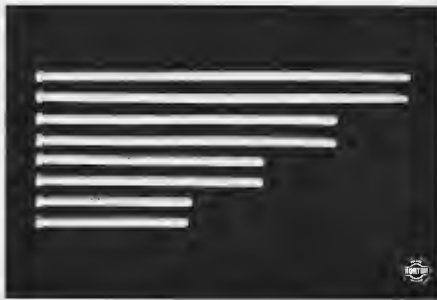
of the surface is 1 inch for each 8 inches of distance for a low range instrument and correspondingly less for instruments of higher range. Any intelligent workman can operate the instrument as nothing is required other than to point the receiving tube at the object and read the temperature from the scale. The outfit is not dependent upon storage batteries or standard of luminosity or upon the color perception of the observer and is equally accurate in determining temperature of hot metals in the open and not affected by extraneous light falling upon the body observed. Galvanometer is dead-beat, extremely sensitive and highly accurate. Complete outfit weighs 7 lbs.

- 45420. Pyrometer, Thwing Portable Indicating Radiation, with any single range temperature scale, complete..... 120.00
- 45424. Pyrometer, Thwing Portable Indicating Radiation, with any double range temperature scale, as 2500° F. to 3600° F., 2000° C. and 1400° C. These two scales are especially suited for open-hearth furnace work, giving correct temperatures of molten steel in the furnace and while pouring. Complete..... 130.00
- 45428. Pyrometer, Thwing, Wall Pattern Indicating Radiation, with ventilated receiving tube for permanent installation above a furnace, or barium chloride bath..... 120.00
- 45432. Pyrometers, Thwing, Recording Radiation, in single and multiple record units. These Pyrometers have been found of extreme value on cement kilns, in copper smelters, incinerators, sintered ore plants, etc. With single record recorder..... 180.00
- 45436. Pyrometers, Thwing, Recording Radiation, as above, with two record recorder..... 245.00
- 45440. Pyrometer Cones, Seger, for temperatures from 600° C. to 2000° C.
 Note—Prices of Multiple Records up to 15 records on a single 10 inch chart, quoted on request.

Per box of 100..... 1.00 Each, in quantities less than 100..... .05

The following are the official melting points:—

Cone Number	Degrees Centigrade	Cone Number	Degrees Centigrade	Cone Number	Degrees Centigrade	Cone Number	Degrees Centigrade	Cone Number	Degrees Centigrade	Cone Number	Degrees Centigrade
022	600°	012a	855°	02a	1060°	9	1280°	19	1520°	34	1750°
021	650°	011a	880°	01a	1080°	10	1300°	20	1530°	35	1770°
020	670°	011a	900°	1a	1100°	11	1320°	26	1550°	36	1790°
019	690°	09a	920°	2a	1120°	12	1350°	27	1610°	37	1825°
018	710°	08a	940°	3a	1140°	13	1380°	28	1630°	38	1850°
017	730°	07a	960°	4a	1160°	14	1410°	29	1650°	39	1880°
016	750°	06a	980°	5a	1180°	15	1435°	30	1670°	40	1920°
015a	790°	05a	1000°	6a	1200°	16	1460°	31	1690°	41	1960°
014a	815°	04a	1020°	7	1230°	17	1480°	32	1710°	42	2000°
013a	835°	03a	1040°	8	1250°	18	1500°	33	1730°		



No. 45444

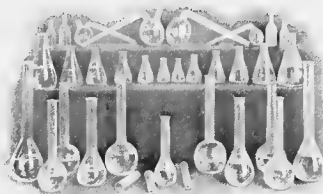
- 45444. Pyrometer Tubes, Alundum, impervious to gas under normal pressures through a wide range of temperature. With a high deformation point which, in connection with their imperviousness and high thermal conductivity, recommend them for this purpose. The tubes all have an internal diameter of $\frac{1}{8}$ inch and an external diameter of $\frac{1}{4}$ inch and are furnished with flange.
 Length, inches..... 12 18 24 27 30 36 42
 Each..... 2.40 3.60 4.80 5.40 6.00 7.20 8.40



No. 245504



No. 45512



No. 15516, etc.

QUARTZ APPARATUS. TRANSPARENT. Pure Fused Rock Crystal. Rock crystal has a very small coefficient of expansion, will not crack on subjection to the most violent and sudden changes of temperature and is insoluble in water and volatile acids, with the exception of hydrofluoric, and has a melting point of approximately 1600° C. The coefficient of expansion between 0° and 1000° C. is 0.0000054. The specific weight is 2.22. The coefficient of expansion for D is 1.4585 and the dispersion from C - F is 0.00676. It is transparent to ultra violet light above 185 μ . For prices on Opaque Fused Silica ware see headings of various apparatus, i.e., Beakers, Crucibles, Flasks, etc.

45500.	Beakers, Transparent Quartz, conical shape, either with or without spout.						
	Capacity, cc	30	50	100	200		
	Diameter mm	35	42	53	63		
	Each	3.60	1.80	8.00	12.00		
45504.	Crucibles, Transparent Quartz, without lids.						
	Capacity, cc	10	20	30	50	80	100
	Diameter, mm	28	35	40	50	58	65
	Each	2.40	3.95	4.75	7.09	9.00	10.50
45508.	Lids, Each	1.00	1.75	2.25	3.00	4.25	5.00
45512.	Dishes, Transparent Quartz, round bottom, with or without spout.						
	Capacity, cc	10	50	100	200	275	
	Diameter, mm	34	60	75	98	196	
	Each	2.90	4.80	7.25	12.00	16.00	
45516.	Flasks, Transparent Quartz, flat bottom, Erlenmeyer shape.						
	Capacity, cc		50	100	200	300	
	Each		4.00	7.25	11.00	16.00	
45520.	Flasks, Kjeldahl, Transparent Quartz.						
	Capacity, cc		100	200	300	700	
	Each		7.25	11.00	15.00	20.00	
45524.	Retorts, Transparent Quartz, plain.						
	Capacity, cc		50	100	200	500	
	Each		7.50	10.00	15.00	27.50	
45528.	Retorts, Transparent Quartz, with tubulature.						
	Capacity, cc		50	100	200	500	
	Each		8.50	11.25	16.50	29.59	
45532.	Test Tubes, Transparent Quartz.						
	Length, mm	100	100	150	150	200	200
	Diameter, mm	15	20	15	20	15	20
	Each	2.50	3.25	3.75	4.75	5.00	6.00
45536.	Tubing, Transparent Quartz, with walls .5 to .75 mm. In lengths up to two feet.						
	Bore, mm	1-2	3	4-5	6-7	8	9-10
	Per foot . . . . .	.95	2.00	2.65	3.10	3.65	4.25
	Bore, mm	12-13	14	15-16	17-18	19	22
	Per foot	5.25	5.75	6.25	7.75	8.60	10.00
							11.00

RADIO-CHEMISTRY APPARATUS

45540. **Radio-Active Minerals**, consisting of the strongest minerals from which radium is being extracted. Radiographs may be taken with any of these specimens by placing the mineral or ore on the sensitive side of a plate in a black and orange cover and allowing same to remain in a dark place for two or three days, after which development is carried on in the usual way. The specimens in this collection and their localities are as follows:—

Pitchblende	Jonchimsthal	Autunite	Portugal
Carnotite	Colorado	Aeschrynite	Urul
Fergusonite	Ceylon	Tantalite	Sweden
Monazite	Brazil	Pitchblende	Corwall
Samariskite	Norway	Cheveite	Sweden
Thoria	Ceylon	Orangite	Norway

Collection, as above, of twelve specimens. 7.50



No. 45542

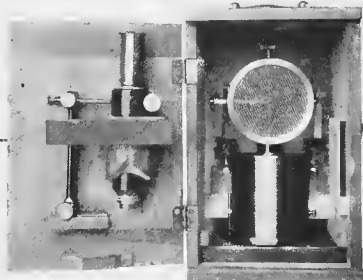


No. 45516

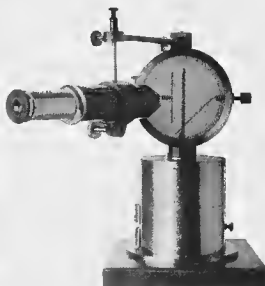
45542. **Spintharoscope**, a fluorescent screen over which is mounted a small particle of radio-active substance. When viewed through the magnifying lens brilliant scintillations are observed. When observations are made in daylight it is necessary to remain in a dark room for about five minutes before scintillations are plainly visible. Small radium photographs may be made with the instrument and exposures made on photographic negatives by removing the magnifying lens. 2.50

45546. **Standard Battery, Krueger**, for electrostatic measurements, consisting of 100 Weston Normal Elements of small size with a total electromotive force of about 100 volts and with 105 ohms internal resistance. With six terminals. As used in charging electrometers, standardizing electroscopes, etc.

Duty Free 18.00 Duty Paid 24.00



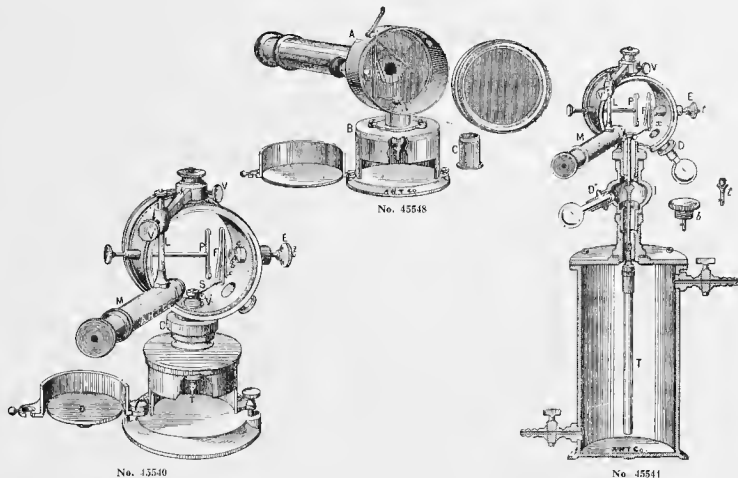
No. 45548—in portable carrying case



No. 45548—ready for use

45548. **Electroscope, Curie Type**, portable model of American make for field use in the determination of the radio-activity of American ores, such as the Colorado Carnotite, and as used in the U. S. Bureau of Mines laboratories for this work. The illustration shows the door of the ionizing chamber closed so that the circular plate, on which the powdered ore for testing is placed, is not shown. The instrument is furnished with a reading microscope with millimeter scale in the ocular and with portable carrying case as shown. In the case are provided receptacles for two standardized samples of powdered Carnotite as listed below. In the field the testing is made by measuring the rate of fall of the leaf with the ore to be tested as compared with a standardized ore of known Uranium content. With vulcanite charging rod and descriptive circular as to operation. 50.00

45550. **Carnotite**, powdered to 60 mesh, with percentage of Uranium Oxide (U_3O_8) determined by Ledoux & Co., for use as a reference standard with above Electroscope. Per 50 gram vial. 1.50



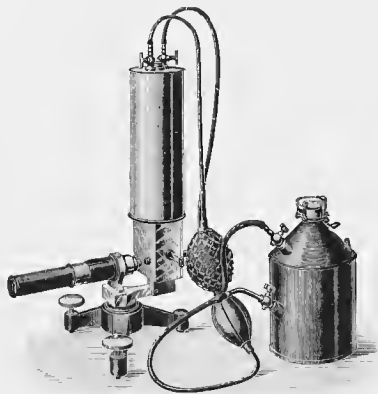
ELECTROSCOPE, CURIE, original French make. This instrument is furnished with equipment for measuring the radio-activity of solids, liquids and gases and also in a small portable form for field work. The laboratory form for solids is conveniently arranged so that measurements of a great range of radio-activity as compared with that of Oxide of Uranium are possible. These adjustments are accomplished either by varying the area exposed on the plate "D" of the material to be measured or by changing the form of the discharging rod "T". Illustration No. 4554 shows the Electroscope as arranged for solids, No. 4554 for liquids and gases and No. 4558, the portable form for field work. Each instrument is furnished with reading microscope "M", with micrometer scale on the ocular, with which the fall of the leaf during discharge is very accurately measured. The principal constants of this apparatus as furnished by the French makers are as follows:—

The potential required to deviate the leaf through the entire field of the microscope is about 300 volts and the value of each division in the eyepiece micrometer is 0.4 volt but readings may be estimated to 0.1 volt. The capacity of the Electroscope when mounted on a cylinder of 3 liters is 14 to 15 cm, this capacity being independent of the angle of deviation. The speed of the spontaneous fall of the leaf under the best conditions, for instance 0.0033 div/sec, is 0.0013 volt sec. The minimum speed of the fall measurable (ten times as great as the natural leak) is 0.01 volt sec. The minimum current measurable in the cylinder is 2×10^{-18} amperes. The minimum quantity of radium emanation measurable in the cylinders of 3 liters is 0.0019 mmg. min. The minimum amount of Radium Bromide which can be estimated by the emanation method (this quantity corresponds to that contained in 10 liters of sea water or in 50 grams of deep sea sand) is $2, 3 \cdot 10^{-7}$ mmg. See *M. Joly, Phil. Mag., mars et juillet 1908*. The minimum radio-activity measurable in solids, taking Oxide of Uranium as unity, is 1,200. See *P. Curie, OEuvres, p. 375, p. 531 et 633; Mme. P. Curie, Ann. Ch. Phys., Septembre, Oct. Nov., 1903; Mme. P. Curie, "Traité de Radioactivité" (Gauthier-Villars); Mme. P. Curie, "Le Radium," 7, 1910, p. 65 à 70; and A. Laborde, "Méthodes de mesure employées en Radioactivité" (Encyclopédie Larousse, Gauthier-Villars, r.h.).*

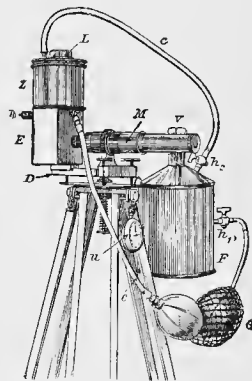
45552.	Electroscope, Curie, complete for mineralogists, with reading microscope and discharging apparatus with plate and accessories.	Duty Free..... 56.25	Duty Paid..... 67.50
45554.	Electroscope, Curie, as above but without the lower cylinder, base and plate D, for mounting specially to suit the work intended.	Duty Free..... 33.00	Duty Paid..... 39.60
45556.	Electroscope, Curie, complete portable outfit in case.	Duty Free..... 50.00	Duty Paid..... 60.00
45558.	Discharging Cylinder of 3 liters capacity, with metallic stopper and support for the Electroscope.	Duty Free..... 16.25	Duty Paid..... 19.50
45560.	Discharging Cylinder, as above, with removable cover.	Duty Free..... 17.50	Duty Paid..... 21.00
45562.	Discharging Cylinder, 450 cc capacity, with metal stopper and support for the Electroscope.	Duty Free..... 12.50	Duty Paid..... 15.00
45564.	Black Oxide of Uranium (U ₂ O ₅) for use as a relative standard. In 10 gram vials.	Duty Free..... 0.40	Duty Paid..... 0.50
45566.	Accessory for automatically stoppering above cylinders.	Duty Free..... 3.75	Duty Paid..... 4.50

ELECTROSCOPE, CURIE (cont.)

45568.	Connecting Support for cylinders.	Duty Free	3.00	Duty Paid	3.60
45570.	Connecting Support for cylinders, with automatic stopper.	Duty Free	6.25	Duty Paid	7.50
45572.	Dessicating Chamber.	Duty Free	6.25	Duty Paid	7.50
45574.	Extension Rod, with bayonet catch for removing the electrodes from cylinder.	Duty Free	.50	Duty Paid	.60
45576.	Connecting Tube for the two cylinders.	Duty Free	3.00	Duty Paid	3.60
45578.	Metallic tubular cooling device and boiler.	Duty Free	18.75	Duty Paid	22.50



No. 45580



No. 45582

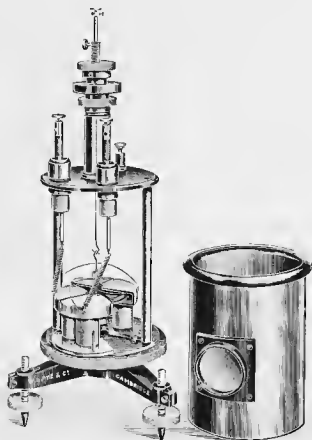
ELECTROMETER, SCHMIDT, for both solid and liquid substances, designed especially for the determination of very small Radium quantities by the emanation method, the emanation of spring and other natural waters by the so-called "shaking" method, for the plotting of decay curves and for the comparison of the radio-activity of minerals and other solids. See *Physik. Zeitschrift* Nr. 18, 1905, *Physik. Zeitschrift* Nr. 7, 1906, and *Fortschritte der Medizin* Nr. 27, 1909.

45580.	Electrometer, Laboratory Form, as above with shaking flask, blower, thermometer, connecting tubing, stopwatch, rubber rod; frame for winding up wires and dish.	Duty Free	67.50	Duty Paid	90.00
45582.	Electrometer, as above, portable form, with tripod, shaking flask, blower, thermometer, connecting tubing, stopwatch, rubber rod, frame for winding up wires, and dish.	Duty Free	82.50	Duty Paid	110.00
45584.	Radium Standard Solution, as made in Prof. Schmidt's laboratory, in Curie flask.	Duty Free	7.50	Duty Paid	10.00

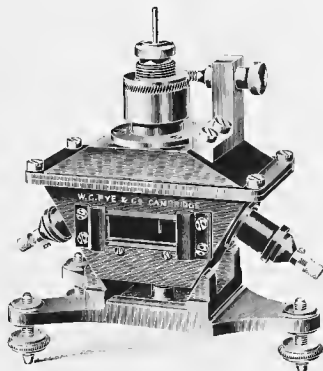


No. 45586

45586.	Charging Rod, for Electroscopes. The friction is produced between flannel and celluloid. Very convenient to use and produces both positive and negative charges.	Duty Free	4.50	Stock	6.00
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No. 45588



No. 45598

45588. **Electrometer, Dolezalek Pattern**, with long ambroid insulation to quadrants and terminals, the latter being placed in a very convenient position on top of the instrument and readily removable for cleaning. The suspension is strong phosphor-bronze with high sensitivity. Ample adjustment in height and rotation of the vane relative to quadrants is provided with zero adjustment without altering relative position of vane and quadrants. The scale readings are proportionate over a wide range. The use of phosphor-bronze suspension renders this instrument suitable for students' work, the sensitivity being approximately 300 millimeters at one meter radius for a difference of potential of one volt between the quadrants with the vane charged at 100 volts.

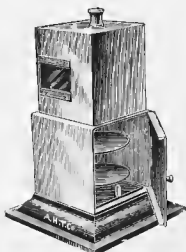
	Duty Free	43.50	Duty Paid	63.50
45590.	Extra Phosphor-Bronze Suspension, with hooks.			
	Duty Free	.75	Duty Paid	1.10
45592.	Extra Vane, for above, with either plane or concave mirror, complete with suspension.			
	Duty Free	3.15	Duty Paid	4.65
45594.	Electrometer, Dolezalek Pattern, same as No. 45588 but with a 50% higher sensitivity.			
	Duty Free	46.50	Duty Paid	68.20
45596.	Electrometer, Dolezalek Pattern, same as No. 45588 but with silvered quartz fibre suspensions, increasing the sensitivity about 100%. Price on application.			

45598. **Electroscope, Double-tilted Pattern, Bumstead.** The two plates attached to the terminals are charged to equal the opposite potentials, usually 200 volts, and the gold leaf kept vertical and central by means of levelling screws. The sensitiveness and stability are easily altered by raising or lowering the leaf by means of the fine adjustment provided. This instrument has a sensitivity about three times that of the ordinary tilted form listed below for equal stability. The plates are insulated with ambroid and an earthing terminal is fitted into the case. The insulation of the leaf is ambroid. See *American Journal of Science*, December, 1911.

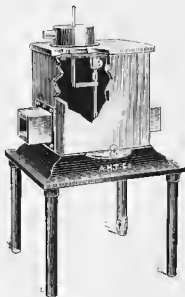


No. 45600

	Duty Free	21.00	Duty Paid	30.80
45600.	Electroscope, Bectangular Tilted Pattern, Wilson. with about insulation and ambroid insulation to the leaf. Complete on stand with levelling screws.			
	Duty Free	12.00	Duty Paid	17.60
45602.	Electroscope, as above, but with reading microscope with fifty division scale in ocular.			
	Duty Free	24.00	Duty Paid	35.20



No. 45650



No. 45658



No. 45668

45650. Electroscope, Alpha Ray, Rutherford, consisting of aluminum about 4 inches cube, with optical glass windows, removable gold leaf system, two circular tables, sulphur insulations, on cast iron base. Designed for the accurate comparison of radio-activities measurable by the Alpha ray. Without reading microscope.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 20.75 | Duty Paid..... | 27.10 |
|----------------|-------|----------------|-------|
45654. Electroscope, Alpha Ray, Rutherford, as above with Tele-Microscope with scale.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 40.60 | Duty Paid..... | 52.90 |
|----------------|-------|----------------|-------|
45658. Electroscope, Beta and Gamma Ray, Rutherford, consisting of an aluminum box with removable lid, lined with lead throughout, lead slides at bottom and with thin aluminum window, with quartz insulations. Mounted on four legs, one of which is adjustable. When the instrument is used for the measurement of the Gamma ray only the aluminum aperture beneath the leaf is closed by the lead slide. Without reading microscope.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 21.00 | Duty Paid..... | 31.25 |
|----------------|-------|----------------|-------|
45660. Electroscope, Beta and Gamma Ray, Rutherford, as above, with Tele-Microscope with scale.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 43.75 | Duty Paid..... | 57.00 |
|----------------|-------|----------------|-------|
45664. Electroscope, Alpha, Beta and Gamma Ray, Rutherford, fitted with Tele-Microscope with scale in eyepiece, rack and pinion table, upper box lined with lead on one side and with thin aluminum plate on opposite side, with quartz insulations, etc.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 69.30 | Duty Paid..... | 90.30 |
|----------------|-------|----------------|-------|
45668. Electroscope, Emanation, Rutherford, of variable capacity for the measurement of emanations from radio-active bodies and also to detect the presence of both Thorium and Actinium emanations. If a stream of air conveying the emanation under investigation is passed through the electroscope, the variation in the rate of movement of the gold leaf when the current of air is stopped indicates at once the nature of the emanation present. If the rate of movement increases with time, the Radium emanation is present; if it falls to half value in 54 seconds, the Thorium emanation is present; and if it practically disappears in the course of 20 seconds, the discharge is due to the Actinium emanation. When it is required to determine the amount of Radium emanation in a solution, the latter is boiled to drive off the emanation, and the gases mixed with emanation are collected over hot water and introduced into the partially exhausted electroscope. Air is then let in, and the pressure raised to atmospheric value. The rate of discharge of the electroscope increases rapidly after the introduction of the Radium emanation and reaches a maximum value after about three hours, and then slowly decays with a half value period of 3.86 days. Measurements of the rate of discharge are made either at a certain definite time after the introduction of the emanation, or preferably three hours after its introduction, and the rate of movement of the gold leaf (corrected for the natural leak) is a measure of the amount of emanation introduced. The electroscope is standardized by means of a Radium Standard Solution, containing about one-millionth of a milligram of Radium. The Radium in the form of solution is kept in a sealed flask and one month after sealing the amount of emanation reaches its equilibrium value. The Radium Solution is then boiled and the emanation transferred, as before, into the electroscope and the rate of movement measured under definite conditions. In an apparatus of this kind the emanation from 10^{-6} of a milligram of Radium gives a comparatively rapid rate of movement; a quantity corresponding to 10^{-7} milligram can easily be measured, while 10^{-8} milligram produces a detectable effect. The apparatus consists of a cylindrical chamber of brass closed at either end and provided with inlet and outlet tubes and having a capacity of about one liter. Fitted to the upper end of the cylinder is an insulated plug of special design, having an extremely small natural leak, and so arranged as to be quite tight against a high rate of exhaustion in the vessel beneath. Attached to above plug is a small brass rod of about one millimeter diameter the lower end reaching to within one or two millimeters of the bottom of cylinder; to the upper end is attached the gold leaf system in upper cylindrical cover and viewed through the windows as shown. The upper cylindrical cover of brass is fitted with a variable capacity device by means of which the capacity may be increased two or three times, this being effected by using two circular plates, one attached to the leaf support and the other to the end of adjustable rod, shown at right of illustration.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 34.65 | Duty Paid..... | 45.15 |
|----------------|-------|----------------|-------|
45672. Electroscope, Emanation, Rutherford, as above, with Tele-Microscope with scale.
- | | | | |
|----------------|-------|----------------|-------|
| Duty Free..... | 54.45 | Duty Paid..... | 70.95 |
|----------------|-------|----------------|-------|



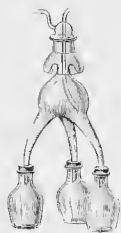
No. 45700



No. 45736



No. 45708



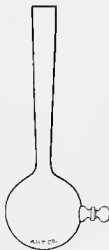
No. 45712



No. 45716



No. 45720



No. 45721



No. 45728



No. 45732

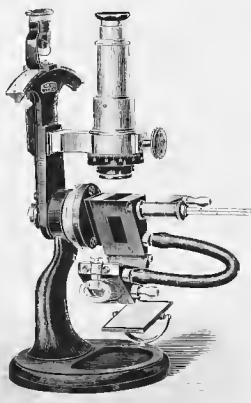
45700.	Reading Glasses in nickel plated mount, with handle of ebonized wood.									
	Diameter of lens, inches	2	2½	3	3½	4	4½	5	5½	6
	Focus, inches	5	6	7	8	10	12	13	14	15
	Each	.60	.80	1.00	1.50	2.00	2.25	2.50	3.00	3.50
45708.	Receiver, Buehl, for distillations in vacuum, with ground on lid, ground in stopper at top and one ground stopcock at side. With support for reagent glasses and with reagent glasses.									8.00
45712.	Receiver, Gautier, for distillations in vacuum, large model.									4.00
45716.	Receivers, of glass, plain.									
	Capacity, cc.								500	1000
	Each								.25	.35
45720.	Receivers, of glass, with tubulature.									
	Capacity, cc.		100	250	500	1000	2000			
	Each		.18	.24	.40	.45	.60			
45724.	Receivers, of glass, with tubulature and ground in glass stopper.									
	Capacity, cc.		100	250	500	1000	2000			
	Each		.30	.40	.50	.60	.70			
45728.	Reductor, Jones, for the determination of phosphorus by a rapid method as described in Blair's "Analysis of Iron, 5th Edition, p. 93. Tube only, with glass stopcock.									2.00
45732.	Reductor, Jones, same as No. 45728 but with support, clamp, two flasks, glass stopcocks and rubber tubing.									6.00
45736.	Reduction Tubes, of Hardest Bohemian Combustion Tubing, with one or more bulbs in center, as shown in illustration.									
	Number of bulbs				1	2	3			
	Length, mm.				300	350	400			
	Each				.22	.30	.35			

REFRACTOMETERS.

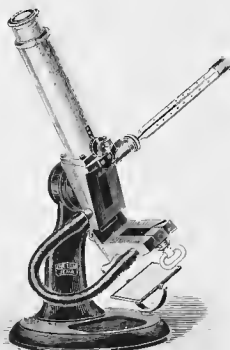
REFRACTOMETERS, ZEISS. The use of the Refractometer in its various forms in the modern chemical laboratory has increased with great rapidity. We recommend those who are not familiar with the construction or use of these instruments to apply to us for the following literature published by the firm of Carl Zeiss.

- | | |
|--|---|
| Mess 160. Optical Measuring Instruments. | Mess 292. New Sugar Refractometer. |
| “ 165. Dipping Refractometer. | “ 186. Use of the Abbe Refractometer in the Sugar Industry. |
| “ 172. Abbe Refractometer. | “ 189. Dr. Wagner's Tables regarding the Immersion Refractometer. |
| “ 173. Entter Refractometer. | |
| “ 188. Pulfrich Refractometer. | |
| “ 245. Interferometer for Gas and Water. | |

and particularly for the list of refractometrical literature, which has become too extensive to refer to in this description, all of which are sent free of charge.



No. 45760



No. 45764



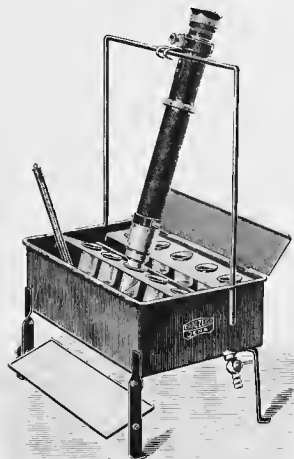
No. 45776



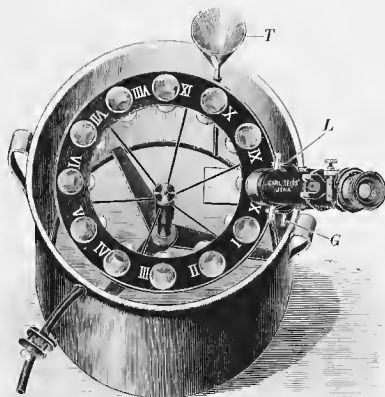
No. 45780

- 45760. Refractometer, Abbe, Zeiss, with Heatable Prism**, for the determination of refractive indices between $n_D = 1.3$ and $n_D = 1.7$ in fluid, plastic and solid bodies. The refractive index is read directly from the graduated circle. This instrument has found wide application in tests as to purity, the determination of the proportion of known components in a mixture and in the analysis of food products, particularly butter, cheese, margarine, cocoa fat, lard and other comestible fats; of salad oils, cod-liver oil, lubricants, alkalies, linseed oil, varnish, turpentine, petroleum, paraffin, ceresin and other kinds of wax; glycerine, aniline, aqueous, alcoholic and ethereal solutions as, for instance, the solution of ether and milk-fat adopted in Nanmann's method of determining the percentage of fat in milk; milk serum; and for determining the quantity of albumen in blood serum in clinical work. The Abbe Refractometer with heatable prisms may also be used for the purposes for which the Butter Refractometer and the Milk Fat Refractometer were originally intended by use of the conversion tables furnished with each instrument and the two special thermometers which are usually supplied only with the Butter and Milk Fat Refractometers. The accuracy in measurement is to about two units of the fourth decimal place. In case with Table of Dispersion and Conversion Tables, and stem thermometer divided in single degrees from 0-75° C.
- Duty Free** 100.90 **Stock** 137.30
- 45764. Refractometer, Butter, Zeiss**, for preliminarily testing butter refractometrically, also for investigating fats, salad oils, etc.; scope of the ocular scale from $n_D = 1.42$ to $n_D = 1.49$; micrometer screw for measuring the tenths of a division of the scale, accuracy in measurement one unit of the fourth decimal. With a small flask of "standard fluid" for the revision of the adjustment of the ocular scale, a table for converting the scale divisions into refractive indices. In case, with ordinary thermometer in $\frac{1}{2}^\circ$ from 0-50° C., with screw joint connection for attaching to the Refractometer.
- Duty Free** 50.90 **Stock** 69.30
- 45768. Refractometer, Milk Fat, Zeiss**. This Refractometer resembles externally the Butter Refractometer and in both construction and manipulation is the same. The essential difference between the two consists in the range, and in the case of the Milk Fat Refractometer is from $n_D = 1.33$ to $n_D = 1.42$, while the Butter Refractometer is from $n_D = 1.42$ to $n_D = 1.49$. The Milk Fat Refractometer has an accuracy in measurement to one unit of the fourth decimal. Complete in case, with table for conversion of scale divisions into refractive indices and vice versa, and including correction thermometer to reduce the observations to 17.5° C.
- Duty Free** 53.88 **Stock** 73.27
- Accessories for Above Refractometers.**
- | | | Duty Free | Stock |
|--------|---|------------------|--------------|
| 45772. | Stem Thermometer, only, 0-75° C. in single degrees..... | .90 | 1.80 |
| 45776. | Wolny Special Thermometer, with butter and lard scales, with screw joint connection for attaching to the Refractometer..... | 1.38 | 2.25 |
| 45780. | Baier Special Thermometer, with scales for summer butter, winter butter and lard, with screw joint connection for attaching to Refractometer..... | 1.81 | 3.65 |
| 45784. | Correction Thermometer, for milk fat investigations to reduce the observations to 17.5° C., with screw joint connection for attaching to Refractometer..... | 1.38 | 2.25 |

Note—Unless otherwise specified the above Refractometers are always supplied with the stem thermometer, as above listed.



No. 15788



Nos. 15508 to 45811

45788. **Refractometer, Dipping, Zeiss, for Investigating Fluids of Low Refractive Index, especially dilutions, alcoholic, volatile solutions, etc.;** scope of the ocular scale from $n_D = 1.325$ to $n_D = 1.367$ with an accuracy in measurement to one-third unit of the fourth decimal. In above illustration the refractometer hangs on the wire frame with its lower end, the prism, immersed in one of the glass beakers filled with the solution to be tested, the beakers being surrounded by flowing water at the required temperature. A rectangular mirror below the trough reflects the light from below through a glass plate into one of the rows of glass beakers. Because of its accuracy and extremely simple operation, the Dipping Refractometer has become an indispensable instrument in the examination of various products as to their purity, analysis of standard solutions, and to the rapid and very exact determination of the concentration of solutions. Dr. B. Wagner's tables of various substances which have been investigated by means of the Dipping Refractometer are recommended for use in connection with it (Price \$5.00). Complete in case, with free standing refractometer prism of acid-proof glass, with attachable beaker for the investigation of quickly evaporating solutions and with a table for the conversion of the scale readings into refractive indices, but without Auxiliary Prism, heating trough or thermometer. **Duty Free**..... 62.50 **Stock** 85.00

Accessories for the Dipping Refractometer.

45792. **Auxiliary Prism** for investigating fluids in very small quantities, for deeply colored solutions, such as molasses, dark beers, etc., and for the determination of albumen in blood serum. With unpolished surface of contact slightly countersunk. **Duty Free** **3.00** **Stock** **4.08**

45796. **Heating Trough**, as shown in illustration of No. 45788, for the reception of 12 glass beakers, each containing 20 cc, for investigations in bulk, with a glass plate at the bottom of the trough and mirror below, and with 24 beakers. **7.50** **10.20**

45800. **Thermometer**, 15-25° C. divided in $\frac{1}{4}$ ths, in metal case, with certificate of accuracy. **4.25** **6.12**

45804. **Stem Thermometer**, 15-25° C., divided in $\frac{1}{4}$ ths, about 8 cm long, with a red line at 17.5° C. **.56** **.81**

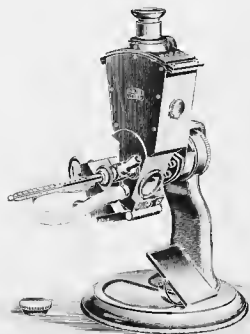
Tempering Bath, for use without a continuous flow of water, recommended when the Refractometer is only used occasionally and for investigations at indoor temperatures. The construction of this bath is based on the fact that a large volume of water with a comparatively small surface area is very slow in acquiring the temperature of the surrounding space. The outfit consists of the following:—

45808. **Enamelled Pan**, of about 10 liters capacity, with felt jacket and overflow joint, 1 meter of rubber tubing and stopcock. **Duty Free** **3.88** **Stock** **5.58**

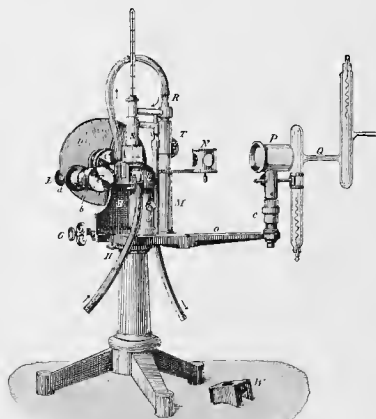
45809. **Filler**, for uniformly introducing fresh water into the pan without stirring, with funnel. **1.25** **1.70**

45810. **Carrier (L)** for Refractometer, with mirror. **6.06** **8.25**

45811. **Umbrella Frame**, for 12 beakers of 20 cc capacity; and with 24 beakers. **6.63** **9.01**



No. 45812

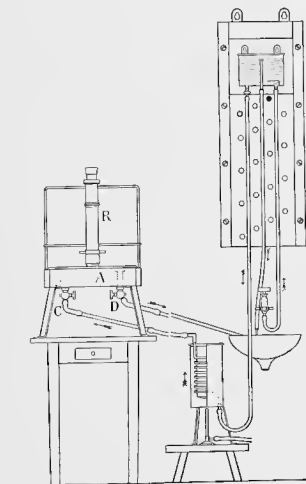


No. 45825

REFRACTOMETER, SUGAR, ZEISS, a new and special adoption of the Abbe Refractometer for the sugar industry. The wide adoption of the refractometric method of determining dry solids in sugar factory products has resulted in a simpler model of the Abbe Refractometer (heretofore widely used in the sugar industry), constructed with the cooperation of the Physikalisch-Technische Reichsanstalt and the International Commission for Uniform Methods of Sugar Analysis. A distinct improvement is in the prism which is an Abbe double prism made of lighter flint glass and which gives a more open scale than the prism used in the Abbe Refractometer and which noticeably reduces the error in the refraction quotient. The scale reads directly in percentages of dry substance and is now in the field of the telescope and is divided from 0-50 for whole percents and from 50-55 for half percents of dry substances. With this new instrument the darkest ordinary molasses may be accurately tested directly, without dilution. The instrument is adjusted regularly for 20° C. but, when intended for use in tropical countries, is adjusted for 28° C., the temperature of adjustment being engraved on each instrument.

45812.	Refractometer, Sugar, Standard Model , as above, adjusted for 20° C, with special thermometer from 0 to 50 in $\frac{1}{2}$ " with screw mounting.	Duty Free	75.90	Stock	103.22
45816.	Refractometer, Sugar, Tropical Model , adjusted for 28° C., with special thermometer as above.	Duty Free	75.90	Stock	103.22
45820.	Thermometer , only, 0 to 50°C in $\frac{1}{2}$ ", with screw mounting.	Duty Free	.90	Stock	1.30
45824.	Thermometer , only, as above, with fixed metal case.	Duty Free	1.25	Stock	1.80
45828.	Refractometer, Pulfrich, Zeiss , designed for measurements of refraction (n_D) and dispersion (difference of indices for the Fraunhofer lines C, D, F and G ²) of transparent, fluid and solid bodies, either single or double refracting; investigations of fluids at high temperatures, including bodies that are fluid only under such conditions; and the determination of the differences of refractive or dispersive power of such solid or fluid substances as differ but little in their optical properties. (The instrument is then used as a differential refractometer.) In the construction of the accessories which serve for the purposes mentioned above, special attention has been given to securing simplicity in the methods of observing and in the subsequent computations. All parts of the apparatus are, therefore, permanently fixed in position after being once properly adjusted, and hence are always ready for use. The computations for dispersion and other differential quantities from the data given by the observation are made by means of suitable tables in the same manner as hitherto for n_D without the use of logarithms. In regard to accuracy the apparatus is designed to meet the requirements which are usual in spectrometric measurements, i.e., exactness to a single unit of the fourth decimal place in the refractive index and to one or two units of the fifth decimal place in the dispersion and other quantities depending upon differential measurements. With Geissler tube, cabinet for the instrument and case for the prisms and accessories, and detailed directions for use, but without prisms or heating apparatus.	Duty Free	118.75	Duty Paid	161.50
Accessories for Pulfrich Refractometer.					
45832.	Geissler Tube, with H-filling		2.00		2.88
45836.	Prism I ($n_D=1.62$), for the determination of fluids having refractive indices varying from that of water $n_D=1.33$ to $n_D=1.61$; including mount, carrier and cemented glass cell.		12.50		18.00
45840.	Prism II ($n_D=1.75$) for the examination of solid substances (glasses, etc.) having refractive indices varying from $n_D=1.47$ to $n_D=1.74$; including mount and carrier.		14.25		19.44

45844.	Barium Mercuric Iodide solution ($n_D=1.78$) specific gravity=3.6, about 35 grams	Duty Free .63	Duty Paid .90
45848.	Prism III, for substances of exceptionally high refractive power, having refractive indices varying from $n_D=1.64$ to $n_D=1.88$; including mount and carrier	17.50	25.20
45852.	Tube, 5 mm inside diameter, for the investigation of very small quantities of fluid	1.25	1.80
45856.	Prism IV ($n_D=1.62$) for the differential examination of fluids, with mount, carrier and cover	18.00	25.92
45860.	Prism V ($n_D=1.75$) for the differential examination of fluids, with mount, carrier and cover	22.00	31.68
45864.	Heating Apparatus	13.75	18.70
45868.	Thermometer, from 0 to 75° C., in single degrees, with screw for fitting into the heating apparatus	.90	1.30
45872.	Thermometer, 0-50° C., divided in $\frac{1}{10}$ ths, with screw	4.00	5.76
45876.	" 50-100° C., divided in $\frac{1}{10}$ ths, with screw	5.00	7.20
45880.	Sodium Burner	3.63	4.93
45884.	Fluid Cell, with plano-parallel bottom ($n_D=1.65$), glass stopper and thermometer for the investigation of fluids on a prism, on which a glass tube is not cemented	4.50	6.48
45886.	Glass Dish, for cementing the glass cells	1.25	1.80
45888.	Capped Bottle, with glass rod for the application of drops	.25	.36
45890.	Monobromide of Naphthalene ($n_D=1.65$), as an immersion fluid for the investigations of glasses, etc., about 10 grams	.13	.18
45892.	Potassium Mercuric Iodide, solution, ($n_D=1.72$), specific gravity=3.1, about 35 grams	.50	.72
45894.	Refractometer, Pulfrich, Zeiss, with complete outfit, suitable for ordinary physical and chemical investigations as follows:— Pulfrich Refractometer, 1 extra Geissler Tube, Prisms I, II and IV; Heating Apparatus, Thermometer 0-75° C. in single degrees, Thermometer 0-50° C., in $\frac{1}{10}$ ths; Thermometer 50-100° C., in $\frac{1}{10}$ ths; Spiral Heater, Water Pressure Regulator, 2 Capped Bottles, with glass rods; 1 bottle of Monobromide of Naphthalene, Glass Dish, Sodium Burner	Duty Free 212.90	Duty Paid 289.54



No. 45908

Spiral Hot Water Heater with Water Pressure Regulator for use with any Zeiss Refractometers. The Dipping Refractometer as shown in No. 45788 with heating trough may, in many investigations, be used without a Spiral Heater and Water Pressure Regulator, it being sufficient to allow the water at the temperature of the room to flow slowly through the heating trough from a tank suspended up on the wall. Where it is necessary to maintain a given temperature for hours at a time to within a few tenths of a degree as, for instance, in Dr. Ackermann's rapid method for the estimation of alcohol and extract in beers, either a Tempering Bath No. 45808 or the Spiral Heater and Water Pressure Regulator must be used.

45908.	Spiral Heater, with support and Bunsen burner	Duty Free 15.25	Duty Paid 20.74
45912.	Cistern A, of Water Pressure Regulator	1.75	2.52
45916.	Cistern B, of Water Pressure Regulator	1.25	1.80

Note—Where the Water Pressure Regulator is to be used with an Abbe or Pulfrich Refractometer, the complete Water Pressure Regulator with Cisterns A and B is required.

Percent Sugar Table According to Refraction Indices with the Sugar Refractometer.

Refraction Exponent	Schonrock	Main	Tolman and Smith	Prinsen-Geerligns	Hübener
1,3403	5 ⁰⁰ / ₀	5.2 ⁰⁰ / ₀	5.0 ⁰⁰ / ₀	5.0 ⁰⁰ / ₀	5.1 ⁰⁰ / ₀
1,3479	10	10.2	10.1	10.1	10.0
1,3557	15	15.2	15.1	15.1	15.0
1,3638	20	20.1	20.1	20.2	20.0
1,3723	25	25.1	25.1	25.1	
1,3811	30	30.0	30.1	30.0	
1,3902	35	35.0	35.0	35.0	
1,3997	40	40.0	40.0	40.1	
1,4096	45	45.0	45.0	45.0	
1,4200	50	50.0	50.0	50.0	
1,4307	55	55.1	55.0	54.9	
1,4418	60	60.0	60.0	59.9	
1,4532	65	64.9	64.9	65.0	
1,4651		75	69.9	69.8	
1,4774		79	74.9	74.7	
1,4901		80	79.9	79.9	
1,5033		85	85.0	84.9	

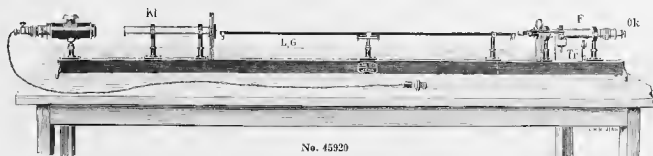
The first column in the above table shows the refraction quotient for sodium light in air at 20° C. and the second the corresponding sugar percents, i. e., the number of grams of sugar in 100 grams of pure sugar solution, calculated according to Schönrock. The remaining columns give the sugar percents for the corresponding refractive indices of the first column according to the calculations of Main, Tolman and Smith, Prinsen-Geerligns and Hübener, the value of Prinsen-Geerligns being transposed from 25° to 20° C. The variations in these tables (the first having been determined in Charlottenburg, the second in London, the third in Washington, the fourth in Java and the last in Halle) are within the limits of error permitted by the sugar trade.

DR. EMIL REISS' TABLE

for direct calculation of the Scale Divisions, percentage of Albumen, at 17.5° C. with the Dipping, Refractometer.

As this table is in frequent demand in Clinical Laboratories, but is otherwise somewhat difficult of access we are enabled, by the author's kind permission, to reproduce it in full.

Refractive Indices corresponding to Scale Divisions	Blood Serum			Exudations and Excretions		
	n_D for Dist. Water		1,33320	n_D for Dist. water		1,33320
	Δn_D for Non-albuminous matter		0,00217	Δn_D for Non-albuminous matter		0,00214
	Δn_D for 1% Albumen		0,00172	Δn_D for 1% Albumen		0,00134
	Scale Divisions	Percentage Albumen	Diff. of Albumen for 1 Scale Div.	Scale Divisions	Percentage Albumen	Diff. of Albumen Scale for 1 Div.
1.33590	22			22	0.14	
1.33628	23			23	0.35	- 0.210
1.33667	24			24	0.56	- 0.210
1.33705	25	0.63		25	0.77	- 0.210
1.33896	30	1.74	- 0.220	30	1.80	- 0.206
1.34086	35	2.84	- 0.220	35	2.83	- 0.206
1.34275	40	3.94	- 0.220	40	3.86	- 0.206
1.34463	45	5.03	- 0.218	45	4.89	- 0.206
1.34650	50	6.12	- 0.218	50	5.90	- 0.202
1.34836	55	7.20	- 0.216	55	6.91	- 0.202
1.35021	60	8.28	- 0.214	60	7.92	- 0.200
1.35205	65	9.35	- 0.212	65	8.92	- 0.200
1.35388	70	10.41		70	9.91	- 0.198



Laboratory Interferometer (about $\frac{1}{10}$ Full size). Kl = Collimator. L, G = Air and Gas Chambers. F and Ok = Reading Telescope.

REFRACTOMETER (GAS AND WATER INTERFEROMETER) ZEISS, a new instrument for the optical analysis of gas and water developed at the Zeiss works in cooperation with Prof. Haber, of Berlin, consisting of a modification of Lord Rayleigh's type of apparatus wherein readings are taken by means of a system of optical compensation instead of by a pressure gauge, affording a much more rapid and convenient means of working and which improvement permits the construction of the instrument in a portable form. The Gas Refractometer is made in two ranges of accuracy, the first known as the Laboratory Interferometer reading the per cent of CO_2 to within $1/500\%$ to $1/100\%$, and the Portable form reading to within 1% to $1/2\%$ of CO_2 .

Purposes for which the Gas Interferometer is available.

The Gas Interferometers serve for ascertaining the difference between the refractive indices of a given gas and a standard gas. The method of optical analysis is directly applicable to all binary mixtures of gases, i.e., all mixtures of two gases, which includes all commercially pure gases, such as oxygen, nitrogen, hydrogen, carbon dioxide, etc., provided the given gas is contaminated by only one other gas which is known from the nature of the process of manufacture. In this connection binary mixtures of gases may also take the form of a primary mixture of unvarying composition and a quantitatively variable component, i.e., normal air containing an admixture of a gas, such as carbon dioxide, chlorine, or acetylene; and, where the initial fuel was known, also flue gases which do not contain carbon monoxide may be regarded as binary mixtures of theoretical flue gas and an excess of air.

Finally, the method applies to all mixtures from which one or more components can be easily removed by quantitative absorption. A case in point is that of flue gases containing carbon monoxide. To determine the percentage of carbon dioxide in a mixture of this kind one of the gas chambers may be filled with dried flue gas, the other with dried flue gas freed of its CO_2 , when the reading will give the proportion of CO_2 present in the mixture. Similar cases arise in the examination of gaseous products occurring in the intermediate stages of chemical processes of manufacture.

The Gas Interferometers are now being used for the technical as well as scientific analysis of gases in connection with a great variety of experimental investigations carried on in laboratories attached to mines, experimental borings, chemical works manufacturing commercially pure compressed gases and others having to control the composition of gases occurring as intermediate products, public health offices and medical institutes for the systematic analysis of air, steam users' associations, and institutions devoted to researches in physics and physical chemistry. We shall be pleased to provide further information and suggestions respecting the application of the apparatus.

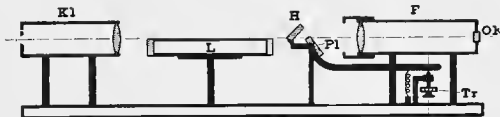


Fig. 3

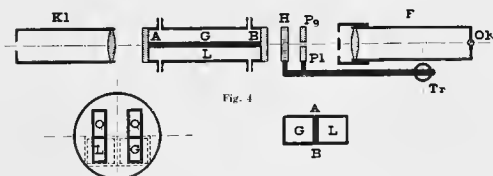


Fig. 4

Diagrammatic View (Fig. 3; Elevation; Fig. 4; Plan) of the Laboratory Interferometer. The parallel pencil of rays which proceeds from the collimator Kl splits up, the upper half passing over the gas chamber (Fig. 3) and through the auxiliary plate above the compensator Pl, next through the double slit (Fig. 4) into the telescope F, whilst the lower half passes partly through the gas chamber G, and partly through the air chamber L, thence under H, through the compensator plates Pg and Pl respectively, and through the double slit into the telescope F. The resulting diffraction spectra are seen in the eyepiece Ok. The interferometer screw with its drum Tr serves for turning the compensator plate Pl, whereas θ is stationary.

Applications of the Water Interferometer

The Water Interferometer is susceptible of a degree of accuracy which is 5 to 50 times greater than that of the Dipping Refractometer and is primarily intended for the rapid testing of natural waters. In the case of river water it serves for ascertaining the proportion of salts which enter rivers with the waste waters discharged by manufacturing establishments and which under local regulations are not allowed to exceed a certain percentage.

The Interferometer furnishes a convenient means of ascertaining the course of flowing subsoil water from the analysis of the samples.

The instrument furnishes, to quote another instance of its utility, a convenient means of continuously controlling the water supplied by mineral springs, wells, or storage basins. Water contained in engine boilers can be tested on the spot within a few minutes with respect to the whole of the salts present in solution.

The analysis of seawater, as required for oceanographic purposes, demands a degree of accuracy which can only be attained with the aid of volumetric analysis by titration immediately after the sample has been obtained, that is, on board. The Water Interferometer has from the outset been so designed as to be available for use on board, and, with a short water chamber, furnishes readings which are quite as exact as those obtainable by the method of titration, while when used with its longest water chamber it can be applied for minute investigations such as hitherto could not be thought of. Moreover, owing to the high degree of accuracy of which the Water Interferometer is capable very sparingly soluble substances have now been made to yield to the refractometric method of analysis, i. e., alkaloids, minerals, colloids, and other extremely dilute solutions, which previously could only be dealt with physically by measuring their electric conductivity.

The Water Interferometer is, in fact, a convenient and accurate water analyzer and as such admirably adapted for the permanent control of drinking water, river water, and the waste waters discharged by factories, and should prove valuable to water boards, public analysts, and others whose duty it is to test water systematically; for use in oceanographic laboratories and in connection with marine expeditions, and last but not least, for the equipment of laboratories appointed for researches in physics, physical chemistry, and mineralogical chemistry.

For more complete description write for a copy of *Zeiss Mikro 245* and see the following references, copies of which can be mostly sent on application.

The Gas Refractometer.

1. F. Hober, *Zeitschrift für angew. Chemie*, 19, p. 1717, 1906.
2. F. Hober, *Zeitschrift für Elektrochemie*, 13, p. 460, 1907.
3. L. Stückert, *Zeitschrift für Elektrochemie*, 16, p. 37, 1910.

Rayleigh's Interferometer (original arrangement).

Lord Rayleigh, *Proc. Royal Soc.*, 59, p. 291, 1896; p. 97, 1898.

Ramsay and Travers, *Proc. Royal Soc.*, 62, p. 225, 1897; 64, p. 190, 1899, and 67, p. 331, 1900.

E. A. J. Curmeur, *Zeitschrift für physik. Chemie*, 56, p. 231, 1902.

C. G. Gerrits, *Thesis*, Amsterdam, 1904.

Dr. Travers' book *Study of Gases* 1901 published by Messrs. Macmillan and Co., 81, Martin's Street Leicester Square, London W. C.

Rayleigh's Laboratory Interferometer (new type).

L. Stückert, *Zeitschrift für Elektrochemie*, 16, p. 37, 1910.

F. Hober and F. Loose, *Zeitschrift für angew. Chemie*, 23, p. 1393, 1910.

Portable Interferometers for gas and water.

F. Loose, *Physikalische Zeitschrift*, 11, p. 1017, 1910.

F. Löwe, *Zeitschrift für Instrumentenkunde*, 30, p. 321, 1910.

L. von Klemperer, *Chemiker-Ztg* 35, p. 557, 1911.



Water Interferometer No. 45964 is identical in appearance with Portable Gas Interferometer No. 45948



No. 45948—Portable Gas Interferometer without hood

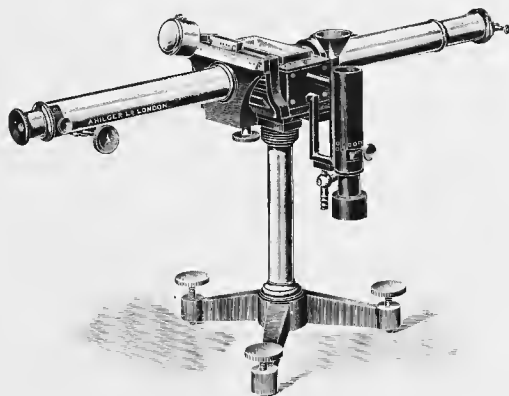
No. 45948—Portable Gas Interferometer with hood

45920. Laboratory Interferometer, Zeiss, with standard 10 cm wide, 20 cm high and 200 cm long. The gas to be examined and the standard gas are each contained in a chamber 100 cm long with a cross section of 1 sq. cm, making the capacity of each chamber 100 cc. In a gas chamber having a length of 100 cm the limit of error is similar to that obtainable by the exact method of analysis of gases in contact with mercury. Thus the percentage of carbon dioxide (CO₂) or methane (fire-damp CH₄) can be ascertained with a degree of accuracy within 0.01 to 0.02%. With detachable gas chamber 100 cm long and cover, but without lamp.

Duty Free	125.00	Stock	170.00
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Accessories for Laboratory Interferometer.

45924.	Nernst Lamp for a current of 100 volts, with extra burner, in fitting mounted on socket pin, with condenser, cable and plug switch for attachment to ordinary lamp fitting.....	Duty Free 15.00	Stock 20.40
45928.	Osram Lamp, 3.5 volts, with fittings and condenser, mounted on socket pin.....	6.25	8.50
45932.	Six additional Osram Lamps, only, without mounting.....	2.63	3.57
45936.	Accumulator, 4 volt, in wooden case, with switch and cable.....	8.75	11.90
45940.	Four-way Cock.....	1.13	1.53
45944.	Packing Case.....	4.00	5.44
45948.	Portable Gas Interferometer, Zeiss, consisting of an upright cylindrical pattern of about 10 cm diameter and 50 cm long, the only part which is detached from it being a small accumulator. With gas chambers 10 cm long it reads percentages of CO ₂ or CH ₄ with a degree of accuracy within 0.1 to 0.2%. The weight of the portable pattern is about 11 lbs. With interchangeable gas chamber 10 cm long and detachable protecting cover, including condenser and lamp fittings with 3.5 volt Osram lamp on condenser.	Duty Free..... 137.50	Stock..... 187.00
Accessories for the Portable Gas Interferometer.			
45952.	Interchangeable Gas Chambers, 2 or 5 cm long.....	Duty Free 13.75	Stock 18.70
45956.	Six additional Osram Lamps, only.....	2.63	3.57
45960.	Accumulator, 4 volt, in wooden box, with switch and cable.....	8.75	11.90
45964.	Water Interferometer, Zeiss, of exactly the same appearance as the Portable Gas Interferometer. In regard to accuracy it surpasses all Refractometers which have so far been in use for practical purposes and for ambulant research work. The water chambers are interchangeable and, according to their length, read the proportion of salt contained in a solution of NaCl, for instance, accurately within 0.03 to 0.003 per mille, and hence the instrument gives far more accurate results than the best readings obtainable with the pycnometer or by the methods of volumetric analysis. With an interchangeable water chamber 1, 1, 2 or 4 cm long and removable cover, including condenser and lamp fittings with 3.5 volt Osram lamp on condenser.	Duty Free..... 156.25	Stock..... 212.50
Accessories for Water Interferometer.			
45968.	Additional Water Chambers, each.....	Duty Free 18.75	Stock 25.50
45972.	Six Additional Osram Lamps, only.....	2.63	3.57
45976.	Accumulator, 4 volt, in wooden box, with switch and cable.....	8.75	11.90



No. 15980

45980. **Refractometer, Fery, Hilger**, a direct reading refractometer for taking the refractive index for sodium light of oils, solutions of acids, mixtures of glycerine, alcohols, etc., with water, sugar solutions, and other liquids of interest to the industrial chemist. This instrument possesses the following advantages:—

It reads direct the refractive index of any transparent liquid with a uniform accuracy of nearly 0.0001, from 1.3000 to 1.6726.
 The glass with which the liquid comes into contact is a crown glass, which resists to an exceptional degree the action of chemical reagents.
 The temperature control is extremely simple and effective and forms an integral part of the apparatus.
 The manipulation of the apparatus is extremely simple and convenient.

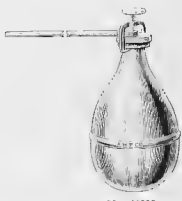
Duty Free	159.30	Duty Paid	218.30
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No. 46000



No. 46001



No. 46008



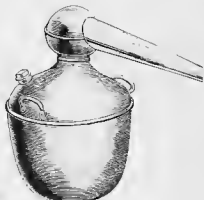
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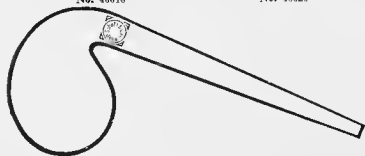
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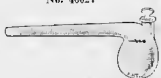
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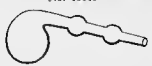
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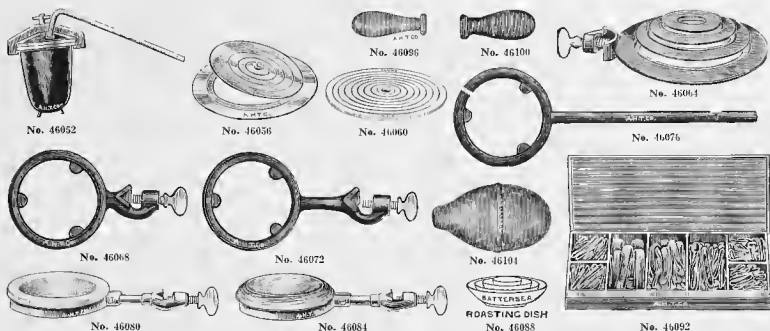


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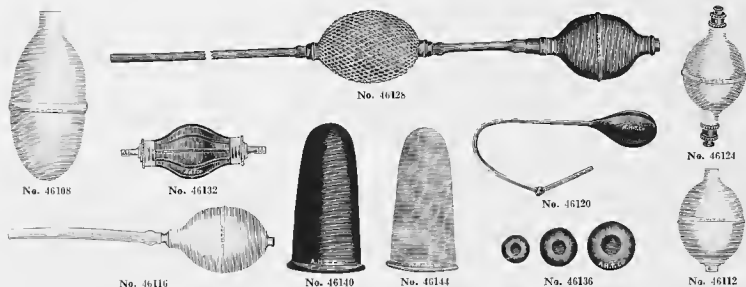


No. 46046

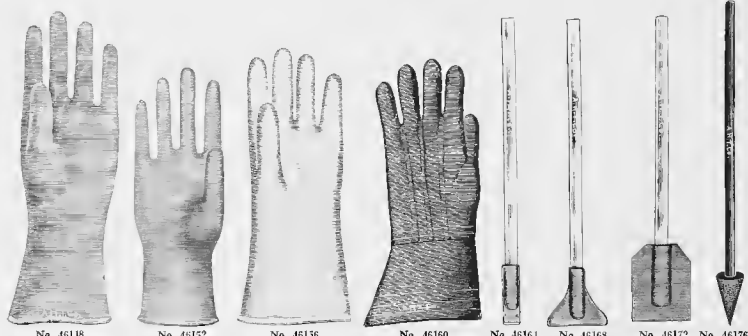
46000.	Respirator, Automatic, for protection of throat and lungs in laboratories, factories, mines, etc., where the atmosphere is filled with dust and poisonous gases.	2.00
46004.	Respirator, Automatic, of aluminum with pneumatic cushion which fits any face closely but without discomfort.	2.50
46008.	Retorts, Copper, for making oxygen; of heavy polished copper with iron clamp and brass delivery tube fitting with ground joint, diameter of tube 12 mm.	
	Capacity, cc.	250 500 1000 2000
	Each	3.00 3.25 3.75 4.00
46012.	Retorts, Heavy Copper, tin lined, as used in distilling apparatus No. 26548.	
	Capacity, gallons.	$\frac{1}{2}$ 1 2 3 5
	Each	7.00 8.00 10.00 13.50 24.00
46016.	Retorts, Best Bohemian Glass, plain	
	Capacity, cc.	25 50 75 150 250 500 1000
	Each	.10 .13 .14 .18 .20 .25 .35
46020.	Retorts, Best Bohemian Glass, with tubulature but without glass stopper.	
	Capacity, cc.	50 75 150 250 500 1000
	Each	.16 .18 .22 .25 .35 .45
46024.	Retorts, Best Bohemian Glass, with ground glass stopper.	
	Capacity, cc.	25 50 75 150 250 500 1000 2000 4000 8000
	Each	.17 .19 .21 .26 .30 .45 .55 .75 1.30 1.70
46028.	Retorts, Jena Glass, plain.	
	Capacity, cc.	50 100 250 500 1000 2000 3000 4000 8000
	Each	.11 .15 .21 .34 .45 .68 .93 1.00 2.10
46032.	Retorts, Jena Glass, with tubulature but without glass stopper.	
	Capacity, cc.	50 100 250 500 1000 2000 3000 4000 8000
	Each	.19 .21 .32 .50 .63 .95 1.30 1.45 2.90
46036.	Retorts, Jena Glass, with tubulature and glass stopper.	
	Capacity, cc.	50 100 250 500 1000 2000 3000 4000 8000 10000 15000
	Each	.40 .42 .55 .80 1.00 1.35 1.73 1.95 3.50 4.35 6.55
46040.	Retorts, Royal Berlin Porcelain, with tubulature and ground in stopper.	
	Capacity, cc.	40 140
	Each	1.95 2.85
46044.	Retort, Royal Berlin Porcelain, with removable top, 470 cc capacity.	3.60
46048.	Retort, Infusible Bohemian Glass, with two bulbs, as used for making oxygen.	
	Capacity, cc.	100 250
	Each	.45 .55



46052.	Retorts, Iron, for distilling mercury, etc., with removable cover fastened by screw clamp and with delivery tube ground into cover.				
	Capacity, cc.	250	500	1000	2000
	Each	2.25	2.50	3.00	4.50
46056.	Rings, Concentric, Copper tinned inside, for water baths, etc., with cover.				
	Number in set	3	4	5	6
	Outside diameter of set, inches	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{2}$
	Per set	.60	.80	1.00	1.25
46060.	Rings, Concentric, Royal Berlin Porcelain.				
	Number in set	3	4	5	7
	Outside diameter of set, mm.	74	94	115	156
	Per set	.80	1.20	1.65	2.70
46064.	Rings, Concentric, of japanned cast iron, with screw clamp on largest ring for attaching to upright support; outside diameter of largest ring 8 inches, with four rings in set. Per set				.75
46068.	Rings, Support, of japanned cast iron, with screw clamp with brass screw. Distance from center of support to center of rings 2 $\frac{1}{2}$ inches. Suitable for use on upright supports with tripod base and supports with rectangular base in the smaller sizes. When used on the same support rings will be concentric. Outside diameter, inches				3 $\frac{1}{2}$
	Each				.15
46072.	Rings, Support, similar to above but with distance from center of support to center of rings 4 $\frac{1}{2}$ inches. Suitable for use on supports with rectangular base in the three larger sizes. When used on the same support rings are concentric.				6 $\frac{1}{2}$
	Each	2 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	.25
46076.	Rings, Support, of japanned iron, with straight extension bar 8 inches long. Distance from end of shank to center of rings 9 $\frac{1}{2}$ inches. A clamp holder such as No. 24518 is necessary when these rings are to be attached to an upright support.				6 $\frac{1}{2}$
	Each	2 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	.20
46080.	Rings, Support, of brass with glazed porcelain inset, with screw clamp.				100
	Each				.55
46084.	Rings, Support, of brass, with wooden inset, with screw clamp.				100
	Each				.55
46088.	Roasting Dishes, Battersea.				
	Diameter, inches	3	4	5	6
	Per dozen	.80	.90	1.10	2.10
46092.	Rubber Bands, of pure gum, in boxes of seven assorted sizes. Per box				1.00
46096.	Rubber Bulb, of pure, acid-cured red rubber, for use in opsonic and serological work; about 2 cc capacity, as used in Dr. Wright's laboratories.				.15
46100.	Rubber Bulbs, of pure black gum, for dropping pipettes, medicine droppers, etc.; superior quality.				
	Capacity, cc (approximate)	2	3	5	
	Per dozen	.45	.50	.60	
	Per gross	4.80	5.50	6.75	
46104.	Rubber Bulbs, of red non-blooming rubber, stout walled, for pipettes.				
	Capacity, ounces	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	
	Length, inches	1 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$	
	Diameter, inches	$\frac{1}{2}$	$\frac{3}{16}$	$\frac{1}{8}$	
	Each	.10	.12	.15	

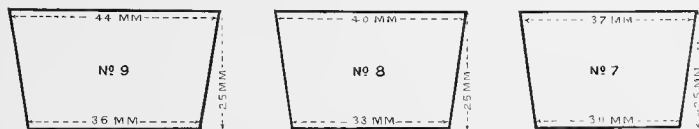


46108.	Rubber Bulbs, of white composition rubber, large size for large pipettes, etc.								
	Length, inches.....	3 $\frac{1}{2}$	3 $\frac{3}{4}$					4	
	Diameter, inches.....	1 $\frac{1}{2}$	1 $\frac{1}{4}$					1 $\frac{1}{2}$	
	Each.....	.20	.25					.30	
46112.	Rubber Bulb, with single valve, without extension tube, of white rubber 2 $\frac{1}{2}$ in. long by 2 in. diam.....							.25	
46116.	Rubber Bulb, with two valves, of white rubber, with 5 inches of tubing.....							.30	
46120.	“ “ of pure black gum, with long flexible tube, for use with gas analysis apparatus.....							.60	
46124.	“ “ with two valves, of hard rubber, giving the exhaust and pressure, i. e., the first compression of the bulb releases blast from one end, after which suction is produced from the opposite end when the bulb resumes its usual shape. As used in gas analysis, etc.....							.50	
46128.	Rubber Bulb, double, of pure black gum, with heavy silk net, for constant pressure.....							2.00	
46132.	“ “ of black acid-cured rubber, with double valve set in bone fittings.....							2.50	
46136.	Rubber Caps, for covering tops of test tubes, cylinders, etc., with rolled edges								
	Diameter, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	3
	Per dozen.....	.45	.50	.52	.55	.60	.70	.85	.95
	Per gross.....	4.75	5.00	5.25	5.50	5.75	7.00	8.50	9.75
46140.	Rubber Finger Cots, of pure gum, heavy weight. Size.....								
	Per dozen.....				.75	.75	.75	.75	
46144.	Rubber Finger Cots, of thinnest rubber tissue, for surgical use.								
	Size.....				Small	Medium	Large	Thumb	
	Per dozen.....				.50	.50	.50	.50	

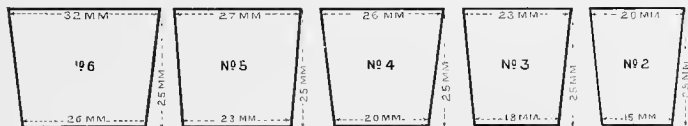


46148.	Rubber Gloves, of pure gum, chocolate color, medium weight. Sizes 6 to 10. Please specify size in ordering. No. 8 or No. 9 is required for normal male hand. Per pair.....	1.75
46152.	Rubber Gloves, of thinnest pure gum tissue, smooth finish, as used by surgeons. Sizes 6 to 10. Please specify size in ordering. Per pair.....	1.35
46156.	Rubber Gloves, of heavy white rubber, so-called "acid gloves." Gloves measure 8 $\frac{1}{2}$ inches from tip of thumb to end of gauntlet. Sizes 8, 9 and 10. Per pair.....	3.00
46160.	Rubber Gloves, of medium weight black rubber, with thin cotton lining and widely used in leading hospitals and laboratories for post mortem work, handling of pathological material, etc., with gauntlet. Sizes 6 to 10. Per pair.....	2.50
46164.	Rubber Policemen, for washing down precipitates, narrow shape, with glass rod. Per dozen.....	1.00
46168.	Rubber Policemen, wing shape, with glass rod. Per dozen.....	1.00
46172.	“ “ new form, with glass rod. Per dozen.....	1.50
46176.	“ “ with hard rubber handle and soft, cone shaped tip. Each.....	.25

DIAGRAMS SHOWING EXACT SIZES OF THE MOST USED NUMBERS OF RUBBER STOPPERS
No. 46180 REGULAR SHAPE

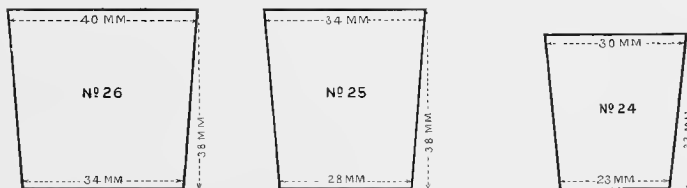


No. 46180—Exact Sizes

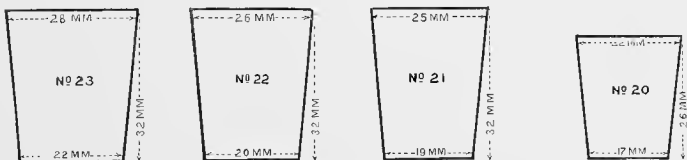


No. 46180—Exact Sizes

DIAGRAMS SHOWING EXACT SIZES OF THE MOST USED NUMBERS OF RUBBER STOPPERS
No. 46188 EXTRA LONG SHAPE



No. 46188—Exact Sizes



No. 46188—Exact Sizes

46180. **Rubber Stoppers, A. H. T. Co. Special Quality**, made of selected stock containing a large per cent of pure Para gum and distinctly superior to the stoppers ordinarily sold as pure gum. Each stopper bears our trade mark. They are carried in stock as solid, one hole or two hole, which specification must be given with order. When no specification is given solid stoppers are sent. Exact size of each number of stopper is shown in the diagram.

Number.....	00	0	1	2	3	4	5	6
Diameter at top, mm.....	14	17	18	20	23	26	27	32
" " bottom, mm.....	10	12	15	15	18	20	23	26
Number of solid stoppers per lb.....	109	72	51	49	36	30	24	19
Per lb.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

46184. **Rubber Stoppers**, same quality as No. 46180 but of red or antimony rubber. Sizes and numbers same as No. 46180. Per lb 4.00

46188. **Rubber Stoppers**, exactly same quality as No. 46180, but new extra long shape.

Number.....	20	21	22	23	24	25	26
Diameter at top, mm.....	22	25	26	28	30	34	40
" " bottom, mm.....	17	19	20	22	23	28	34
Number of solid stoppers per lb.....	38	27	23	20	15	11	7
Per lb.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Note—We furnish the ordinary pure gum stopper of the rubber trade on special order only at price very much lower than that charged for our special quality.

46192. **Rubber Stoppers**, for use with the official Brown Duvel Moisture Tester in stoppered glass and copper flasks. Made of a special composition to withstand high temperatures. See Bulletin 56 of the U. S. Bureau of Plant Industry. Size No. 5, one hole, Per dozen 1.25



No. 46200

46196. **Rubber Tissue**, or dental dam, of pure black unvulcanized gum. This tubing is the best imported quality without any bloom and, for many purposes, is the best tubing made. For convenience and economy we have it put up in the European factory in neat circular boxes containing 10 ft. and 25 ft. lengths. Customers are encouraged to use these original packages as far as possible. On large quantities taken at one time we quote on application a price per pound somewhat lower than the price per foot.

46200. **Rubber Tubing, Thick Wall**, of pure black unvulcanized gum. This tubing is the best imported quality without any bloom and, for many purposes, is the best tubing made. For convenience and economy we have it put up in the European factory in neat circular boxes containing 10 ft. and 25 ft. lengths. Customers are encouraged to use these original packages as far as possible. On large quantities taken at one time we quote on application a price per pound somewhat lower than the price per foot.

Inside diameter, mm.....	3	4	5	6	8	9	12	15	18	25
Thickness of wall, mm.....	1½	1½	1½	1½	1½	1½	2	3	3	4
Per foot in less than original lengths.....	.07	.10	.12	.24	.30	.35	.60	.80	.90	1.65
Per foot in 10 or 25 ft. lengths.....	.06	.08	.10	.20	.26	.30	.50	.65	.75	1.40



No. 46204

No. 46208

46204. **Rubber Tubing, Thin Wall**, same quality as No. 46200.

Inside diameter, mm.....	1½	3	4	5	6	8	9	12
Thickness of wall, mm.....	1	1	1	1	1	1	1½	2
Per foot when cut in less than original lengths.....	.05	.06	.09	.10	.15	.18	.25	.35
Per foot in 10 or 25 ft. lengths.....	.04	.05	.07	.08	.12	.15	.20	.30

46208. **Rubber Tubing, Extra Thick Wall**, same quality and color as No. 46200.

Inside diameter, mm.....	4	5	6	8
Thickness of wall, mm.....	3	3	3	3
Per foot.....	.15	.20	.25	.30

46212. **Rubber Tubing, Thick Wall**, of exactly the same quality as No. 46200, 46204 and 46208 but of pure red unvulcanized gum.

Inside diameter, mm.....	3	4	5	6	8	9	12	15	18	25
Thickness of wall, mm.....	1½	1½	1½	1½	2	2	3	3	3	4
Per foot in less than original lengths.....	.10	.12	.15	.27	.36	.42	.66	.85	.95	1.80
Per foot in 10 or 25 ft. lengths.....	.08	.10	.12	.23	.30	.35	.55	.70	.80	1.50

46216. **Rubber Tubing, Thin Wall**, same as No. 46212.

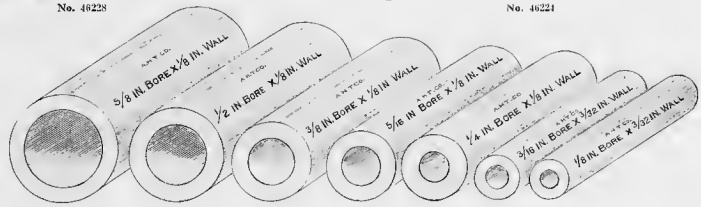
Inside diameter, mm.....	1½	3	1	5	6	8	9	12
Thickness of wall, mm.....	1	1	1	1	1	1½	1½	2
Per foot in less than original lengths.....	.06	.06	.10	.12	.15	.18	.26	.38
Per foot in 10 or 25 ft. lengths.....	.05	.05	.08	.10	.13	.16	.22	.32



No. 46228



No. 46221



No. 46220

46220. **Rubber Tubing, Thick Wall, Hand Made, Cloth Wrapped**. This is an extra fine quality of flexible tubing, guaranteed not to split and of great endurance when exposed to laboratory fumes. It is not regularly to be had in the rubber trade and is made specially for us and bears our trademark at frequent intervals. The ½ x ¼ inch is the standard size for Bunsen burner connections.

Inside diameter, inches.....	½	¾	1	1½	2	3	4	5
Thickness of wall, inches.....	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32
Per foot in less than original length.....	.06	.10	.12	.16	.20	.25	.30	.34
Per foot in original 12 ft. lengths.....	.04	.08	.10	.13	.15	.20	.24	.26

46224. **Rubber Tubing, Thin Wall, Hand Made, Cloth Wrapped**; same quality as above but with thinner wall. The ¼ x ¼ inch size is that mostly used for Bunsen burner connections.

Inside diameter, inches.....	¼	½	¾	1	1½	2	3	4
Thickness of wall, inches.....	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Per foot in less than original lengths.....	.05	.07	.10	.12	.15	.20	.25	.30
Per foot in original 12 ft. lengths.....	.04	.05	.08	.10	.12	.16	.20	.22

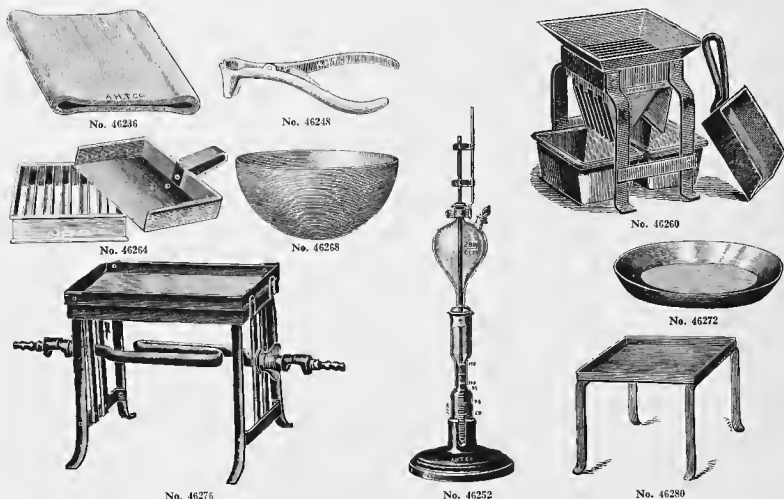
46228. **Rubber Tubing, Pressure, Black**, specially selected for use on Nitrometers. All our Nitrometers when ordered complete are fitted with this special tubing. Inside diameter ¼ inch with 1/16 inch wall. Per foot..... .45



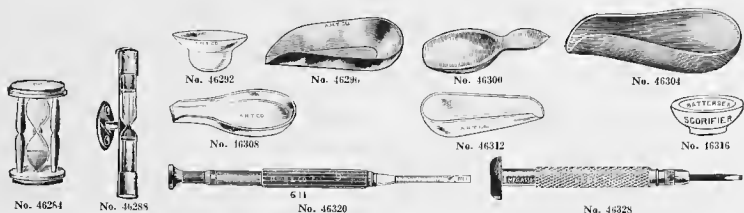
No. 46232

46232. **Rubber Tubing, Pressure**, of black semi-pure gum, very rigid to withstand heavy pressures. Recommended for use with filter pumps and similar connections.

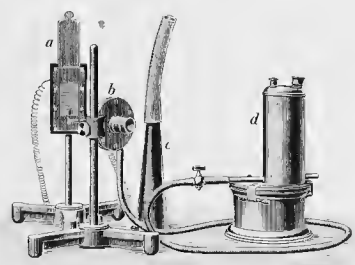
Inside diameter, inches.....	¼	3/8	½	¾	1
Thickness of wall, inches.....	1/16	1/16	1/16	1/16	1/16
Per foot.....	.20	.26	.36	.50	.85



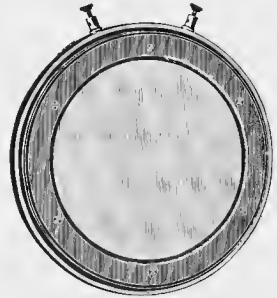
46236.	Rubber Tubing, for Gooch Crucibles, so-called "band" tubing, very elastic. The inside diameter given is when measured in cylindrical shape, i. e., in position as used on crucible, and outside diameter is when measured flat.				
	Inside diameter, inches.....	$\frac{3}{4}$	1	1 $\frac{1}{2}$	1 $\frac{3}{4}$
	Outside diameter, inches.....	$\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$
	Per foot.....	.20	.25	.30	.38
46240.	Rubber Tubing, Composition, Machine Made. This tubing is very inferior to our hand made, cloth wrapped tubing but is in some demand in laboratories and we carry in stock one size suitable for burner connections, etc., other sizes are furnished on order at lowest market price.				
	Inside diameter $\frac{1}{8}$ inch by $\frac{1}{16}$ inch wall. Per foot.....				.05
46244.	Rubber Tubing, Pressure, with canvas insertion moulded in the rubber; for very heavy vacuum connections.				
	Inside diameter, inches.....	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
	Thickness of wall, inches.....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$
	Per foot.....	.30	.40	.60	1.00
46248.	Rubber Tubing Stretcher, for increasing bore of tubing for conveniently slipping over connection tubes, etc.				1.00
46252.	Rubber Viscosimeter, Frank, as used in the rubber industry and as adopted as standard by the International Rubber Testing Committee. See <i>Gummzeitung</i> Nr. 27, 1911, and the <i>India Rubber Journal</i>, Vol. XLI, April, 1911. In wooden case, with thermometer, test solution and author's certificate of accuracy.				
	Duty Free.....	17.50			
	Duty Paid.....				25.00
46256.	Rupert Drops, per ten				.30
46260.	Sampler, Jones, for convenient, rapid and uniform sampling of ores, cement, etc.; consisting of a hopper, scoop, 4 sampling pans and brush. All parts may be readily cleaned.				
	Size, inches.....		4 x 4	6 x 6	8 x 10
	Trays, inches.....		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	Each.....		10.00	12.00	18.00
46264.	Sampler, with Scoop, 6 inches square with divisions $\frac{1}{2}$ inch wide.				2.00
46268.	Sand Baths, deep form, of sheet iron.				
	Diameter, inches.....	3	4	5	6
	Each.....	.10	.12	.15	.20
					.30
					.40
					.80
46272.	Sand Baths, shallow form, of sheet iron.				
	Diameter, inches.....	2	3	4	5
	Each.....	.08	.10	.12	.15
					.18
					.20
					.30
					.45
46276.	Sand Baths, of wrought iron, with burner to heat entire surface; adjustable to height.				
	Size, cm.....		25 x 15	40 x 20	60 x 45
	Each.....		7.50	8.50	14.00
46280.	Sand Baths, or Hot Plates, of iron, without burner.				
	Size, inches.....		6 x 8	8 x 10	10 x 12
	Each.....		1.50	2.00	2.50



46284.	Sand Glasses, in polished wooden frame.										
	Time, minutes.....	$\frac{1}{4}$	$\frac{3}{2}$	1	2	3	5	6	10	30	60
	Each.....	.30	.30	.30	.30	.30	.40	.40	.75	1.50	2.00
46288.	Sand Glasses, for screwing to table or wall in vertical position; in brass lacquered mount.										
	Time, minutes.....			1	2				3		5
	Each.....			.90	.90				1.00		1.00
46292.	"Schälchen," Hofmeister, of very thin glass, about $2\frac{1}{4}$ inches in diameter, as used in organic analysis.										.10
46296.	Scoop, Weighing, of German silver, with flattered bottom; total length $4\frac{1}{2}$ inches.....										3.00
46300.	Scoop, of horn, shallow form, with handle.										
	Length, mm.....			100		120		140			160
	Each.....			.20		.25		.30			.40
46304.	Scoop, of horn, deep form, without handle.										
	Length, mm.....			60		80		100			150
	Each.....			.20		.25		.35			.60
46308.	Scoop, Weighing, of glass, shallow form with flat bottom.										
	Length, inches.....								$2\frac{1}{2}$		$3\frac{1}{2}$
	Each.....								.40		.60
46312.	Scoop, Weighing, of glass, deep form, with flat bottom.										
	Length, inches.....								$2\frac{1}{2}$		$3\frac{1}{2}$
	Each.....								.40		.60
46316.	Scorifiers, Battersea original make.										
	Diameter, inches.....		2	$2\frac{1}{4}$		$2\frac{1}{2}$		$2\frac{3}{4}$		3	
	Per dozen.....		.20	.25		.25		.28		.32	
	Per 100.....		1.20	1.25		1.35		1.70		2.10	
46320.	Screw Driver, watch-maker's, nickel plated, very convenient in the laboratory for use on optical and other instruments; 5 inches long.....										.25
46324.	Screw Drivers, as above, set of four sizes, i.e. $3\frac{1}{4}$, 4, $4\frac{1}{2}$ and 5 inches long. Per set.....										1.00
46328.	Screw Driver, opticians, 3 inches long, with three blades, large, medium and small.....										.60



Nos. 46318, 46352, 46356

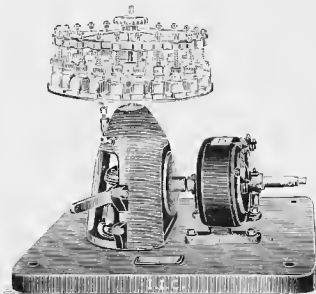


No. 46360

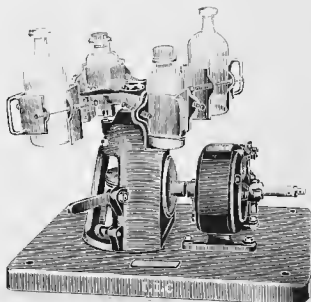
46344.	Selenium Cell, mounted, with 46 x 26 mm working surface, ebonite case, glass cover and brass slide for darkening the window. The selenium is spread over platinum iridium wire.....	Duty Free	Duty Paid
		25.50	32.30
46348.	Selenium Cell, as above but unmounted. Fig. A of illustration.....	15.00	19.00
16352.	Manometric Flame Apparatus with single flame acetylene burner and speaking tube, on stand. Figs. B and C of illustration.....	6.90	8.75
16356.	Acetylene Generator, small. Fig. D of illustration.....	6.00	7.60

46360. Selenium Cell, of new construction and great sensibility. These cells are mounted air-tight so that it is unnecessary to enclose them in exhausted vessels. The light of a match will reduce the resistance which the cell has in the dark by from 10% to 20%. The diameters given are for the sensitive surface and the cells are supplied in ebonite mount with terminals.
- | | | | |
|-----------|-------|-------|-------|
| Diameter | 45 | 60 | 75 |
| Duty Free | 9.25 | 11.90 | 14.60 |
| Duty Paid | 12.25 | 15.90 | 19.50 |
46361. Electromagnetic Relay, of high sensibility, with special contact, for use with above cells.
- | | | | |
|-----------|------|-----------|------|
| Duty Free | 7.20 | Duty Paid | 9.60 |
|-----------|------|-----------|------|

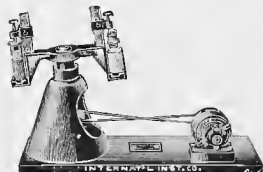
SHAKING APPARATUS



No. 46380



No. 46381

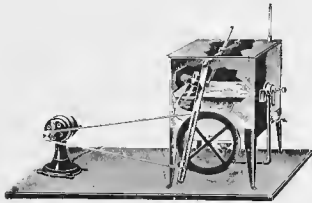


No. 46392 with 2-50 cc Bottle Head

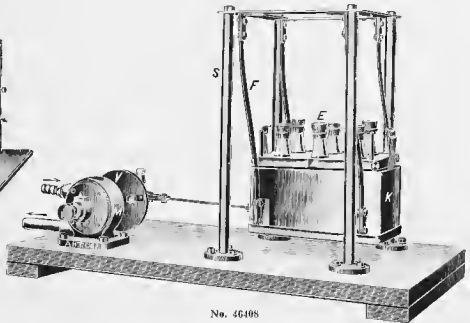


No. 46392 with 46396 Erlenmeyer Flask Head

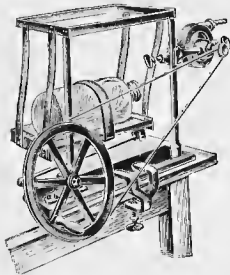
46380. Shaking Apparatus for Sputum, Rickards. This machine is widely and satisfactorily used in many large laboratories where routine sputum work is done on a large scale. The new model is a distinct improvement, is directly driven with adjustment for varying the speed. The sputum is shaken in the original bottles in which it is collected. Furnished with electric motor only.
- | | | | | |
|-------------|------------------|------------------|-------------------------------|-------------------------------|
| For current | 110 volts, d. c. | 220 volts, d. c. | 110 volts, a. c.
60 cycles | 220 volts, a. c.
60 cycles |
| Each | 90.00 | 93.00 | 97.00 | 99.00 |
46381. Head, only, for above Shaking Apparatus, carrying 4 bottles of from 125 to 1000 cc capacity 40.00
46384. Shaking Apparatus, exactly same as above, but with 4-bottle head taking 4 bottles of any size from 125 to 1000 cc capacity. Speed may be varied from 100 to 1000 revolutions per minute, according to the head. A practical and satisfactory apparatus for the preparation of vaccines, etc.
- | | | | | |
|---------|------------------|------------------|-------------------------------|-------------------------------|
| Current | 110 volts, d. c. | 220 volts, d. c. | 110 volts, a. c.
60 cycles | 220 volts, a. c.
60 cycles |
| Each | 90.00 | 93.00 | 97.00 | 99.00 |
46385. Head, only, for above Shaking Apparatus, carrying 21 bottles 40.00
46392. Shaking Apparatus in Combination with Low Speed Centrifuge. As a shaking device this apparatus is furnished with two heads, one size taking 2-50 cc bottles or two test tubes up to 5 inches in length and with which a maximum speed of 1000 r. p. m. is obtained. The larger head takes 2-500 cc bottles at a maximum speed of 300 r. p. m. These heads may be used interchangeably with the 2-Erlenmeyer Flask head. Price is the same for the Shaker with either the 2-50 cc bottle or 2-500cc bottle head, but does not include the 2-Erlenmeyer flask centrifuge head.
- | | | | | |
|---------|------------------|------------------|-------------------------------|-------------------------------|
| Current | 110 volts, d. c. | 220 volts, d. c. | 110 volts, a. c.
60 cycles | 220 volts, a. c.
60 cycles |
| Each | 55.00 | 59.00 | 65.00 | 67.00 |
46396. Head, only, 2-Erlenmeyer Flask Centrifuge Head, for attachment to above Shaker 10.00
46400. Head, only, 2-bottle Shaker Head. This head may also be attached to No. 24064 Centrifuge 20.00
46401. Head, only, 4-bottle Shaker Head. This head may also be attached to No. 24184 Centrifuge 22.00



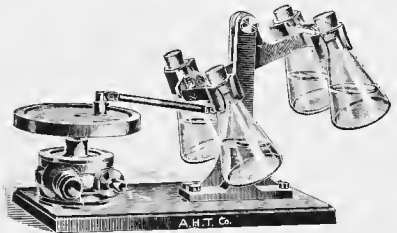
No. 46401



No. 46105

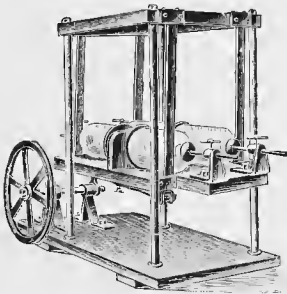


No. 46420



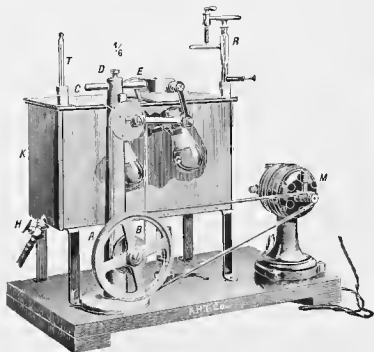
No. 46416

46404. **Shaking Apparatus, Hearson, with Water Bath.** For maintaining a constant temperature between 30° and 90° C. Price includes thermometer burner, capsule and motor for 110 volts direct current. As the range of each capsule is about 15° C., temperature at which the bath is to be used should be stated in ordering.
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 56.70 | Duty Paid | 85.05 |
|-----------|-------|-----------|-------|
46408. **Shaking Apparatus, Frankfurt model,** latest noiseless construction, carrying one 1 liter flask or 6 smaller Erlenmeyer flasks. With water motor, as shown in illustration.
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 56.10 | Duty Paid | 67.35 |
|-----------|-------|-----------|-------|
46412. **Shaking Apparatus, as above.** With electric motor. Voltage must be stated in ordering
- | | | | |
|-----------|-------|-----------|-------|
| Duty Free | 69.30 | Duty Paid | 83.20 |
|-----------|-------|-----------|-------|
46416. **Shaking Apparatus,** taking either four small Erlenmeyer Flasks or four large test tubes. A simple and convenient form of shaking apparatus of great efficiency. With water motor but without glassware.....
- | | | | |
|--|--|--|-------|
| | | | 15.00 |
|--|--|--|-------|

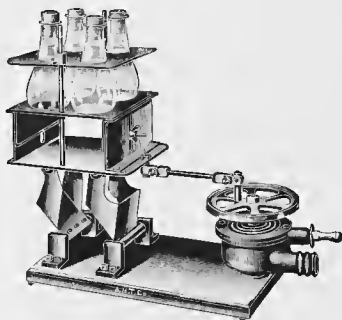


No. 46440

- | | | | | | |
|--------|--|-----------|-------|-----------|-------|
| 46420. | Shaking Apparatus, for one 1 liter bottle. With water turbine as shown in illustration. | Duty Free | 13.20 | Duty Paid | 16.00 |
| 46424. | Shaking Apparatus, as above, for two 1 liter bottles..... | | 16.50 | | 20.00 |
| 46428. | Shaking Apparatus, as above, for one 1 liter bottle, without turbine, for either hand or power driving..... | | 10.00 | | 12.50 |
| 46432. | Shaking Apparatus, same as above but for two 1 liter bottles..... | | 13.20 | | 16.00 |
| 46436. | Shaking Apparatus, for large bottles, operating on the same principle as above, for two 3 liter bottles, for power driving..... | | 24.75 | | 30.00 |
| 46440. | Shaking Apparatus, as above, for four 5 liter bottles..... | | 29.70 | | 36.00 |



No. 4644

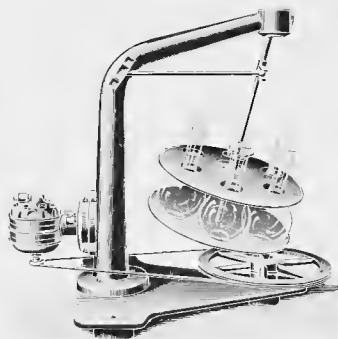


No. 4648

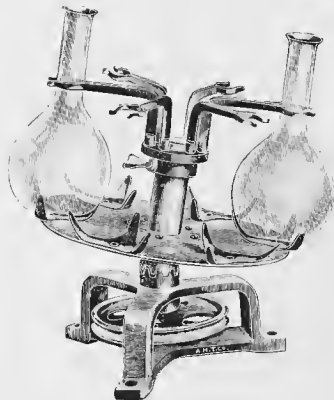
4644. Shaking Apparatus (Kinotherm), Uhlenhuth, for shaking in constant temperature. Without burner, thermometer, or thermo-regulator. See *P. Uhlenhuth and A. Weidanz; Prakt. Anleitung zur Ausführung des biologischen Eircissdifferenzierungsverfahrens, S 150, Jena 1909.*

Motor	Water	Alternating Current	Direct Current
Duty Free	28.05	49.50	44.55
Duty Paid	33.70	59.40	53.50

4648. Shaking Apparatus, Poppe, for the preparation of organic extracts, emulsions, etc.; taking four Erlenmeyer flasks. With water motor. 20.00



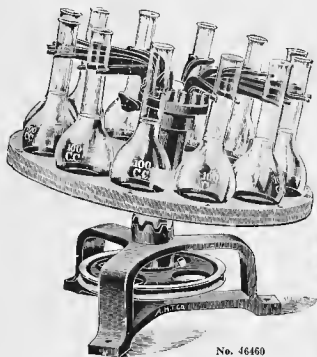
No. 46452



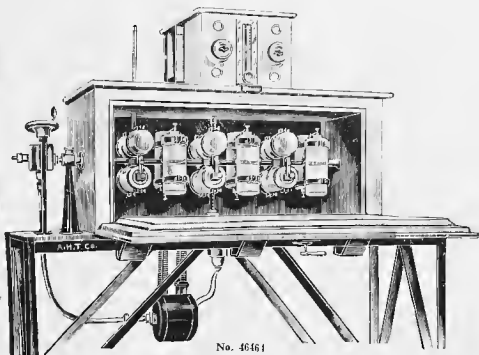
No. 46456

46452. Shaking Apparatus, New Model, with electric driving, of robust and rigid construction for continuous operation; with eccentricity of the stroke readily changeable. Motor is furnished for both alternating and direct currents, 110 and 220 volts. Voltage must be stated in ordering.
Duty Free 48.00
Duty Paid 57.60

46456. Shaking Apparatus, Camp, (Patented) particularly suited for the rapid precipitation of phosphorus by the molybdic method, and dissolving steels or pig-iron for carbon combustion. Made to hold 6 flasks from 6 to 24 ounces, either Florence or Erlenmeyer shape; pulley 6 inches in diameter; power required about 1/2 H. P. Can be operated by small electric motor with suitable countershaft to control speed, or by direct connection to a water motor 27.50



No. 46460



No. 46464

46460. Shaking Apparatus, Camp, as above but with wooden disc and clamps to accommodate 12 volumetric flasks 100 cc, for sugar analysis, etc. 35.00
46464. Shaking Apparatus, Freas Electric, specially designed for shaking soil samples at constant temperature; it can, however, be successfully employed for other purposes requiring constant temperature below 175° C. Consisting of a rectangular oven built of asbestos wool, inside dimensions 14 inches high, 14 inches deep, 30 inches wide; equipped with a shaft to which is fitted six double adjustable clamps, easily removable for holding 12 wide mouth bottles, 12 ounce capacity. The shaft is rotated by means of an electric motor fitted as shown in the illustration. The shaft can easily be removed to permit of the chamber being used as an oven. The heating is accomplished by a flat resistance wire wound heating plate, while the devices for maintaining constant temperature and quickly setting for any desired temperature are identical with those employed in the Freas' Electric Ovens. Mounted on heavy iron stand as shown in illustration, complete with motor and 12 glass stoppered bottles, 350 cc capacity. 175.00



View in Showroom Showing Incubators, Balances, Etc.



No. 46500



No. 46508



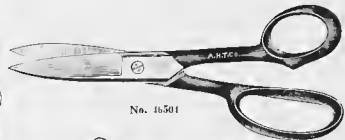
No. 46512



No. 46536



No. 46541



No. 46501



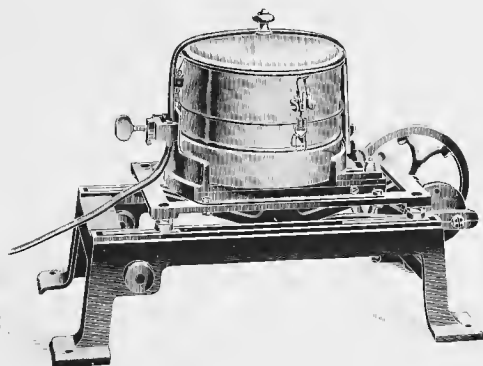
No. 46532



No. 46542

46500.	Shears, for cloth, with nicked blades and japanned handles.									
	Total length, inches		6	8	10	12				
	Length of cutting edge, inches		2½	3½	5	6				
	Each		.50	.75	1.00	1.25				
46504.	Shears, strong and heavy, with short blades, for general laboratory use; total length 8½ inches, length of cutting edge, 2½ inches					1.00				
46508.	Shears, Timmer's, for cutting metal and wire. Total length, inches			8½	11½	12½				
	Length of cutting edge, inches			2	2½	3				
	Each			1.50	2.00	2.25				
	Sieves, Brass Gauze, with Wooden Frame.									
	Mesh		10	20	40	60	80	100		
46512.	Each, 6 inches diameter		.35	.40	.45	.50	.85	1.10		
46516.	Each, 8 inches diameter		.45	.45	.60	.90	1.10	1.40		
46520.	Each, 10 inches diameter		.60	.60	.70	.90	1.35	1.75		
46524.	Each, 12 inches diameter		.70	.70	.80	1.10	1.50	2.00		
	Sieves, Brass Gauze with Brass Frame, without cover or receiver.									
	Mesh		10	20	40	60	80	100	200	
46528.	Each, 5 inches diameter	1.00	1.00	1.10	1.20	1.30	1.40	4.25		
46532.	Each, 8 inches diameter	1.50	1.50	1.60	1.70	1.80	2.60	7.00		
46536.	Cover and Receiver, for above sieves. For, diameter, inches							5	8	
	Each							1.00	1.10	
46540.	Sieves, Brass, in nest of five, 20, 40, 60, 80 and 100 mesh, with cover and receiver.									
	Diameter, inches							5	8	
	Per nest							6.00	9.00	
46542.	Sieve, Brass, with four removable brass plates with circular openings of ½, ⅓, 1 and 2 mm diameter, respectively. The plates may be quickly attached and detached; 90 mm diameter								5.00	
46544.	Sieves, Standard Testing, with seamless brass frame, according to the specifications of the American Society of Civil Engineers. These sieves are distinctly superior to those made of ordinarily woven brass cloth as the screen is absolutely square in mesh and made from the same gauge wire both ways; 8 inches in diameter.									
	Mesh		20	30	35	40	45	50	60	70
	Opening, inches		.0340	.0198	.0176	.0150	.0127	.0110	.0087	.0073
	" mm.		.864	.503	.447	.381	.323	.270	.221	.185
	Diameter of wire, inches		.016	.0135	.011	.010	.0095	.009	.008	.007
	Each		3.00	3.00	3.00	3.00	3.25	3.25	3.25	3.40
	Mesh		80	90	100	110	120	130	140	150
	Opening, inches		.0068	.0059	.0055	.0051	.0046	.0043	.0042	.0041
	" mm.		.173	.150	.140	.130	.117	.109	.107	.104
	Diameter of wire, inches		.00575	.00525	.0045	.004	.0037	.0034	.0029	.0026
	Each		3.70	4.00	4.30	4.45	4.60	4.95	5.20	5.50
	Mesh		160	170	180	190	200	220	240	300
	Opening, inches		.0038	.0035	.0033	.0031	.0029	.0028	.0026	.0017
	" mm		.096	.089	.084	.079	.074	.071	.066	.043
	Diameter of wire, inches		.0025	.0024	.0023	.0022	.0021	.0017	.0016	.0016
	Each		5.80	6.40	7.00	7.35	7.60	8.20	9.40	14.20
46546.	Cover and Receiver for above, per set of one each									2.50

46552.	Sieves, Standard Testing, as above, but in a telescoping nest of 8 sieves, varying in diameter from 5 to 8½ inches and consisting of one each of 10, 20, 30, 40, 50, 80, 100 and 200 mesh. Per set. 15.00				
46536.	Sieve, Cement, Bureau of Standards, of brass, 20 cm in diameter and 6 cm high, with standard woven brass screen. The 100 mesh sieve has .0055-inch openings and the 200 mesh has .0029-inch openings.				
	Mesh.....	100	200		
	Each, with Bureau of Standards certificate.....	6.00	12.00		
46560.	Sieve, Sand, Bureau of Standards, of brass, 20 cm in diameter and 6 cm high.				
	Mesh.....	20	30		
	Openings, inches.....	0.0335	0.0223		
	Each, with Bureau of Standards certificate.....	6.00	6.00		
46564.	Sieve, Brass, with circular openings in bottom as used in soil and fertilizer work; with seamless brass frame; 5 inches in diameter; of same construction as No. 46528 and 46532.				
	Size of openings, mm.....	½	1	2	3
	Each.....	1.50	1.50	1.25	1.25
46568.	Sieves, Brass, in set of 5 as above, with circular openings ½, 1, 2, 3 and 5 mm; 5 inches in diameter, with cover and receiver. Per set.....				7.75

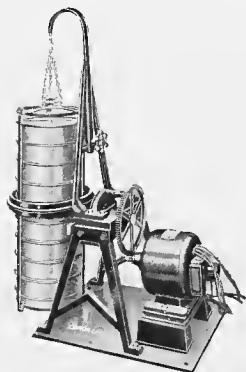


No. 46572

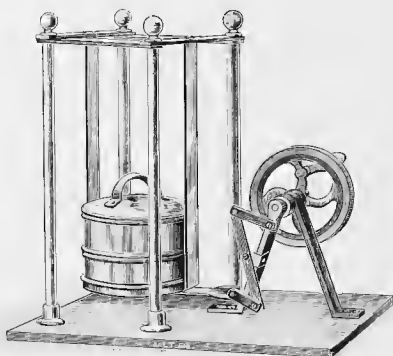


No. 46576

46572. Sieve Shaking Machine, for motor driving. The horizontal motion takes place on ball bearings operating in oil and the machine is noiseless in operation. With an enamelled sieve of 200 mm diameter with 6 inserts same diameter. Other sieves of same diameter in varying numbers may be used on this machine, being conveniently held in place by the strap over the top as shown in illustration..... 25.00
46576. Sieve Shaker, Braun, for 8 inch standard sieves. This apparatus will be found a great time and labor saver in grading samples of sand, cement, ores and other materials. In repeated tests, using the same sample, identical results are obtained, which guarantees the reliability of this machine. From one to eight sieves of 8 inch diameter can be placed in the machine at one time. These sieves are mounted in a brass frame supported by a chain. The supporting arch is adjustable so that when a small number of sieves are placed in the hanger it can be raised to the proper height, thus allowing the surrounding frame to strike the sieves. A special hanger allows the sieves to rotate slowly while being shaken. This rotation is caused by the peculiar shape of the surrounding frame which strikes the sieve on all sides, securing a complete separation of the various mesh products. The interior of the surrounding frame is lined with leather, which protects the sieves. It is very light running and requires little effort to operate. In a test run, using a 10 gram sample of sand, it requires 7 minutes to obtain an accurate separation using 8 sieves from 10 to 200 mesh. For hand operation, without sieves..... 50.00
46580. Sieve Shaker, as above, but with electric motor drive, for either alternating current of 110 volts, 60 cycles, or direct current of 110 volts. Current must be specified in ordering. Without sieves. 90.00

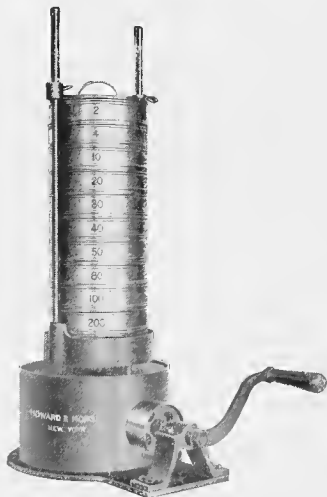


No. 46580

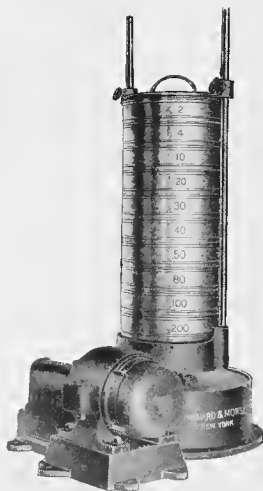


No. 46584

46584. Sieve Shaking Apparatus, for use with either hand or power, on wooden base 11 x 20 inches, height over all 17 inches. Will take conveniently from one to four sieves up to 6 inches in diameter. 30.00

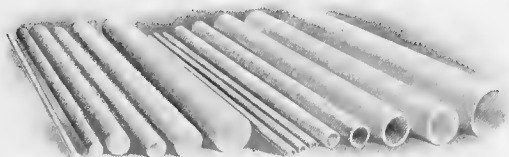


No. 46588



No. 46592

46588. Sieve Shaker, Per Se, taking standard 8 inch sieves, for power or hand driving; as used in sieving rice, drugs, emery, corundum, fire clay, litharge, silica, sulphur, cement, phosphates, pigments, sugar, gunpowder, guano, whiting, salt, starch, flour, linseed, cottonseed, boneblack, etc. The mechanical motion vertical drop or jog has been found very necessary in order to free the meshes from those particles which would ordinarily remain in the apertures of the cloth and to which in a great measure the efficiency of the device may be ascribed. These movements simulate very closely those obtained in hand manipulation of individual screens and the results secured show very close agreement between hand and the mechanical method. The machines are mounted on solid base with firm clamping device for the sieves. Without sieves 90.00
46592. Sieve Shaker, Per Se, as above but with directly connected direct current electric motor. Without sieves..... 150.00



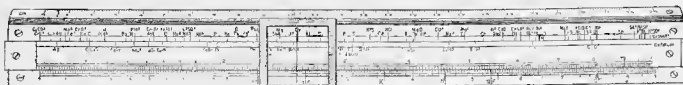
No. 46604

46600. Silica Rod, Opaque Fused Silica, useful for stirring and pouring at high temperatures, particularly in the case of high melting metals and alloys which do not form basic oxides, also for the construction of delicate physical apparatus where material is required with extremely small coefficient of expansion. Furnished in lengths up to 6 ft.

Diameter, mm.....	1-2	3	4-5	6-7	8	9-10
Per foot.....	.40	.50	.75	1.00	1.25	1.40

46604. Silica Tubing, Opaque Fused Silica. The unglazed tubes, while rough on the outside, are glazed as the ends and comparatively smooth on the inside. The glazed tubes are highly glazed on the outside and at the ends, presenting a distinctive homogeneous structure throughout. The unglazed tubing up to 9 mm bore is finished in so-called Satin finish. Furnished in all of the sizes listed in lengths up to 8 ft., but when lengths less than 1 ft. are ordered an advance of 10% is made in price. Larger diameters are furnished at special price.

Bore, mm.....	1-2	3	4-5	6-7	8	9-10	11	12-13	14	15-16	17-18
Thickness of wall, mm.....	.5-3	.5-2.5	.5-2	.5-2	.5-2	1-2	1-2	1-2	1-2.5	1-2.5	1-2.5
Unglazed, per foot.....	.25	.45	.75	.90	1.10	1.25	1.40	1.50	1.60	1.75	1.90
Glazed, per foot.....								1.75	2.10	2.25	2.40
Extra, closed at one end.....	.10	.15	.20	.20	.20	.25	.25	.25	.35	.35	.50
Bore, mm.....	19	22	25	28-29	31-32	35	38	41	44	48	51
Thickness of wall, mm.....	1-3	1-3	1-3	2-4	2-4	2-5	2-5	2-5	2-5	2-5	2-5
Unglazed, per foot.....	2.10	2.30	2.50	2.75	2.90	3.00	3.20	3.35	3.50	3.75	3.90
Glazed, per foot.....	2.60	2.80	3.25	3.50	3.65	4.00	4.20	4.50	4.75	5.10	5.30
Extra, closed at one end.....	.50	.65	.75	.75	.75	.90	.90	.90	1.00	1.00	1.00



No. 46608.

46608. Slide Rule, Nestler, for chemical calculations; of mahogany, with scale on white celluloid; providing for all calculations as met with in chemical practice. Complete in case with instructions for use..... 4.50



No. 46612. Front



No. 46612. Back

46612. Slide Rule, Duplex, designed to adapt the logarithmic and cologarithmic scales to the rapid solution of the problems encountered by the chemist. The symbols on the rule, being arranged in the order of their molecular weight, are easily found, while the application of a very simple rule enables the chemist to locate other symbols of less frequent occurrence. The rule carries 138 chemical symbols which include the common acids, bases, salts, oxides, and elements. As each symbol has its individual position corresponding to the logarithm of its molecular weight, the number of permutations and combinations possible covers the requirements of almost any problem. By using the logarithmic and cologarithmic scales in conjunction with the chemical gauge points, problems in Stoichiometry, such as gravimetric analysis, volumetric analysis, equivalents, percentage composition, conversion factors, volume of gas from a given weight of substance at different temperatures and pressures, and many other analogous problems are readily solved. The rule is accompanied by a manual giving the theory of its use together with numerous examples of both an arithmetical and chemical nature. Length 10 inches, engine divided, divisions on white facings, glass indicator, in morocco covered case, with directions..... 8.00



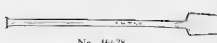
No. 46416



46616. Soil Borer, American type, regularly furnished with shaft 1 meter long but can be supplied in any length desired by means of extension pieces 1 meter in length.
 Diameter of cutter, mm..... 50 80 105 130 150
 Duty Free 3.45 3.80 4.15 5.15 5.75
 Duty Paid 4.60 5.00 5.50 6.85 7.70
 46620. Extra Extension Pieces, 1 meter long. Duty Paid 1.15



No. 46624



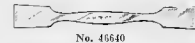
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No. 46632



No. 46636



No. 46640



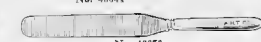
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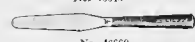
No. 46645



No. 46652



No. 46656



No. 46660



No. 46661

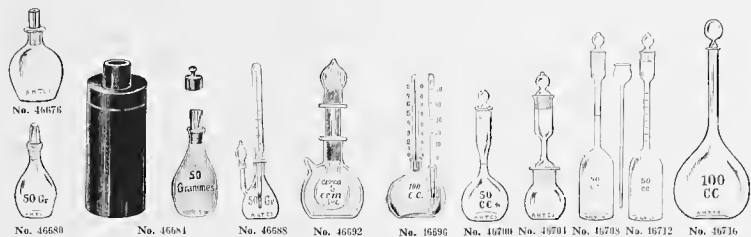


No. 46668

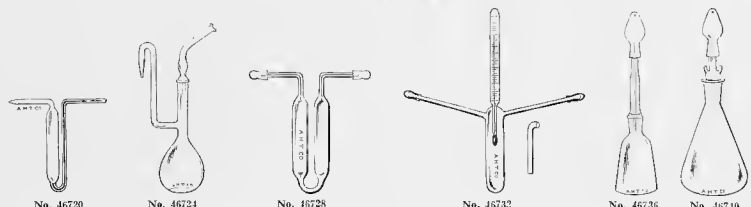


No. 46672

46624.	Sodium Spoon, with ramrod and tube mounted on handle.....											.25
46628.	Spatula, Glass, 6 inches long, with flat ground blade $\frac{1}{4}$ inch wide.....											.20
46632.	" Horn, double, with spatula on each end.											
	Length, mm.....	100	120	150	100	240	280	300				
	Each.....	.10	.12	.15	.25	.40	.60	.90				
46636.	Spatula, Bone, double, with spatula at each end.											
	Length, mm.....						150	200				
	Each.....						.20	.30				
46640.	Spatula, Solid Nickel, double, with spatula on each end, and not flexible.											
	Length, mm.....			120		150	180	210				
	Each.....			.50		.70	.80	1.25				
46644.	Spatula, Porcelain, double, with spatula on each end.											
	Length, mm.....		105	130	160	185	235	260				
	Each.....		.28	.28	.40	.40	.60	.80				
46648.	Spatula, Porcelain, single, i.e. with knob on one end and blade on other.											
	Length, mm.....					235	290	340				
	Each.....					.55	.70	.90				
46652.	Spatula, Steel, very flexible, with cocoa wood handle.											
	Length of blade, inches.....	3	4	5	6	7	8	10	12			
	Each.....	.25	.26	.30	.40	.50	.60	1.00	1.70			
46656.	Spatula, Steel, with nickel plated steel handle											
	Length of blade, inches.....		3	4	5	6	8					
	Each.....		.45	.50	.60	.65	.90					
46660.	Spatula, Steel, with very flexible narrow blade and blackwood handle. Very convenient for weighing.											
	Length of blade, inches.....		3	4	5	6						
	Each.....		.35	.40	.50	.60						
46664.	Spatula, Hard Rubber throughout, with very thin flexible blade.											
	Length, inches.....				4	6	8					
	Each.....				.45	.55	.80					
46668.	Spatula, folding form, i.e. like pocket knife; with thin flexible steel blade $\frac{1}{2}$ inch wide and 3 inches long, in ebony handle; very convenient for carrying in the pocket.											.75
46672.	Spatula, short form, with wide blade, so-called "Pill Knife," of steel with ebony handle.											
	Length of blade, inches.....						2 $\frac{1}{2}$	3 $\frac{1}{2}$				
	Each.....						.40	.50				



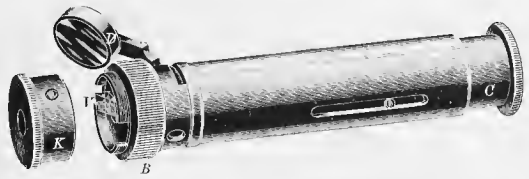
46676.	Specific Gravity Bottle, Gay-Lussac, unadjusted, but with perforated stopper for adjustment in the laboratory.	Capacity, cc.	1	2	5	10	25	50	100
	Each		.20	.20	.20	.25	.30	.40	.50
46680.	Specific Gravity Bottle, same as No. 46676 but accurately adjusted.	Capacity, cc.	1	2	5	10	25	50	100
	Each		.60	.60	.60	.70	.70	1.00	1.10
46684.	Specific Gravity Bottle, same as No. 46680 but in tin case with tare weight.	Capacity, cc.				10	25	50	100
	Each					1.50	1.60	2.00	2.40
46688.	Specific Gravity Bottle, new conical shape, with thermometer reading to 1° ground into neck.	Capacity, cc.				10	25	50	100
	Each					2.25	2.50	2.60	3.00
46692.	Specific Gravity Bottle, Boot, double wall with vacuum space between the walls. For constant temperature work; with ground cap.	Capacity, cc.					25	50	
	Each						2.50	3.00	
46696.	Specific Gravity Bottle, Kohl, with thermometer ground in the side tubulation and with capillary tube ground in the central tubulation and divided in millimeters.								3.25
46700.	Specific Gravity Bottle, Regnault, for liquids, with ground in stopper.	Capacity, cc.					25	50	
	Each						.50	.60	
46701.	Specific Gravity Bottle, Regnault, for solids, with ground in stopper and capillary ground into neck of flask.	Capacity, cc.					25	50	
	Each						.75	.90	
46708.	Specific Gravity Bottle, Reischauer, with ground in glass stopper and separate funnel tube for convenient filling.	Capacity, cc.				25	50	100	
	Each					1.00	1.25	1.50	
46712.	Specific Gravity Bottle, same as No. 46708 but with millimeter divisions on neck.	Capacity, cc.				25	50	100	
	Each					1.50	1.75	2.00	
46716.	Specific Gravity Bottle, Reischauer-Brinton. Consists of a 100 cc glass stoppered flask with special narrow neck so made that the 100 cc mark falls low on neck. Furnished without calibration. Empty flask with stopper weighs from 18 to 20 grams. Inside diameter of neck is 6 mm. See <i>Journal of the American Pharmaceutical Association, August, 1912.</i>								1.25



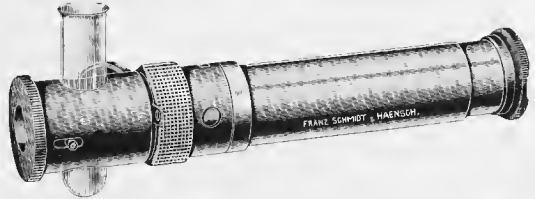
46720.	Specific Gravity Bottle, Nicol tube form, for liquids								.50
46724.	" " Hogarth, for iron ores and similar material								2.00
46728.	Specific Gravity Bottle, Sprengel, with caps ground on								.50
46732.	" " " with normal thermometer and ground in suction tube								4.00
46736.	Specific Gravity Bottle, Walker, for liquids, according to Bulletin No. 109 of the U. S. Department of Agriculture, Bureau of Chemistry								2.00
46740.	Specific Gravity Bottle, Walker, as above, for viscous liquids.								2.00



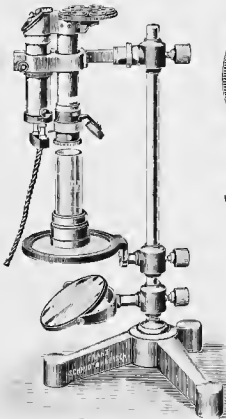
No. 46820



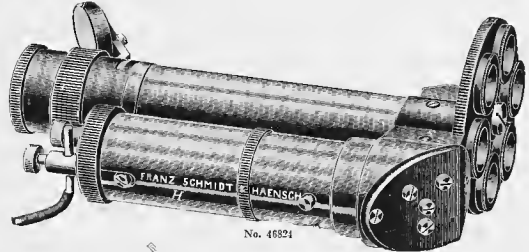
No. 46816



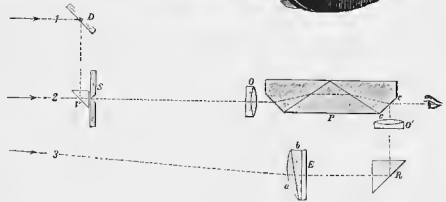
No. 46816 with Test Tube Holder



No. 46832

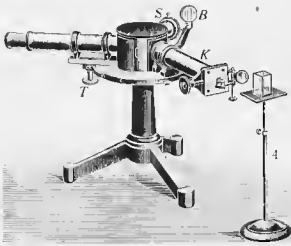


No. 46824

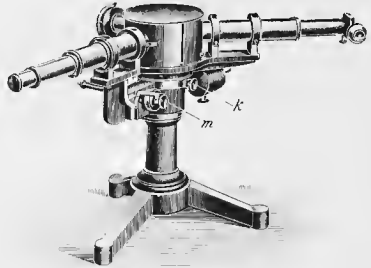


Optical Plan of No. 46824

- | | | |
|--------|--|---------------------|
| 46816. | Spectroscope, Vogel, Direct Vision, Schmidt & Haensch, total length 170 mm. With comparison prism, illuminating mirror, holder for small test tubes and six extra test tubes. In case. | |
| | Duty Free | 13.65 |
| | | Stock |
| | | 18.20 |
| 46820. | Stand for Direct Vision Spectroscopes, especially No. 46816, with absorption trough | 6.00 |
| 46824. | Spectroscope, Martens, Direct Vision, Schmidt & Haensch, with comparison prism and wave length scale. A rotating disc with lenses of different foci after Martens permits the accurate adjustment of the telescope for any eye. The diagram above illustrates the operation of this spectroscope when used without illuminating device which is only necessary, with very weak spectra and which may be operated by three cells of dry battery. In case. | |
| | Duty Free | 28.20 |
| | | Duty Paid |
| | | 37.60 |
| 46828. | Spectroscope, same as above but with the addition of Beckmann electric lighting arrangement with special cap for comparison prism, without accumulator. | |
| | Duty Free | 41.70 |
| | | Duty Paid |
| | | 55.60 |
| 46832. | Stand for Direct Vision Spectroscopes, particularly designed for Martens Wave Length Spectroscopes No. 46824 consisting of support, mirror glass, stage, clamp for spectroscope, absorption trough and absorption tube, with polished wooden case taking both spectroscope and support. | |
| | Duty Free | 21.45 |
| | | Duty Paid |
| | | 28.60 |

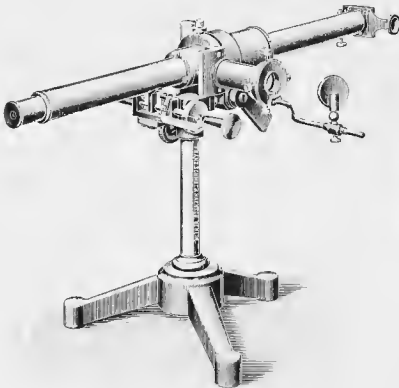


No. 46836

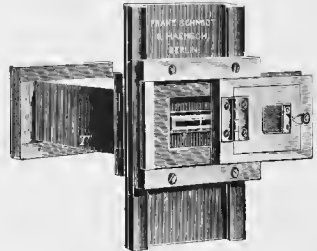


No. 46840

46836. Spectroscope, Kirchoff-Bunsen, Schmidt & Haensch, Model II, with enclosed prism case, rack and pinion adjustment for the telescope, 1 mm objective, flint prism of dispersion $C - F = 1^{\circ} 56'$ in mounting, unsymmetrical slit with micrometer head reading to $\frac{1}{100}$ mm, Ramsden ocular 28 mm focus, photographic scale with orienting device "S," wavelength scale, mirror for illuminating scale, mirror for illuminating slit, adjustable table support and glass cell as shown in illustration. Duty Free 73.95 Stock 98.65
46840. Spectroscope, Kirchoff-Bunsen, Schmidt & Haensch Model III, with unsymmetrical slit and 24 mm objective. The micrometer adjustment is furnished with a dispersion curve giving the wave length for different readings. With two Ramsden oculars of 28 and 11 mm focus, with cross hairs; with flint glass prism of Jena glass No. 0,102 $N_d = 1.649$, dispersion $C - F = 1^{\circ} 65'$, face 28 x 31 mm, photographic scale and mirror for illuminating slit. This instrument may be used for a great variety of work in connection with studies in both emissions and absorption spectra, spectrophotometry, etc., and with the camera listed below. Duty Free 121.05 Duty Paid 161.50

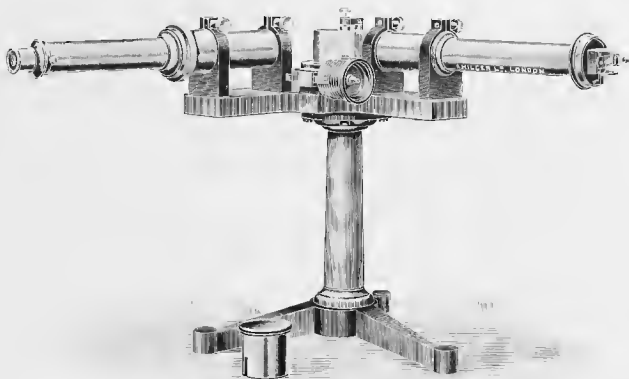


No. 46844



No. 46856

46844. Spectroscope, Hoffman, Direct Vision, Schmidt & Haensch, large model, with micrometer adjustment for telescope tube permitting same to move over the entire spectrum, with direct vision prism of dispersion $C - F = 5^{\circ} 30'$, telescope objective of 200 mm focus, adjustable slit with comparison prism, one ocular of 28 mm focus, with cross hairs, illuminated by prism inside, and one ocular of 11 mm focus with pointer scale, telescope with rotating scale and mirror for illumination of same. Suitable for general chemical analyses, wavelength determinations and for the securing of light of a given wavelength for other optical purposes as in spectrophotometry, etc. Duty Free 119.75 Duty Paid 160.00
46848. Rutherford Prism, with mounting, dispersion $C - F = 3^{\circ} 26'$. For use with Nos. 46840 and 46844. Duty Free 15.00 Duty Paid 20.00
46852. Wavelength Scale for use with Rutherford prism. For use with Nos. 46840 and 46844. Duty Free 9.60 Duty Paid 12.80
46856. Photographic Camera for 6 x 9 cm plates, with achromatic objective of 260 mm, camera tube and plate holder for photography of visible spectra only but can be adapted with quartz lens, uranium glass plate, etc., at an extra charge, for the ultra violet. For use with Nos. 46840 and 46844. Duty Free 86.25 Duty Paid 115.00



No. 46860

46860. **Wavelength Spectrometer, Hilger Constant Deviation Type.** This instrument, since first introduced in 1901, has been found useful for a great variety of purposes. The outfits here listed are those recommended for general spectrum analysis, spectrophotometry, (in combination with Nutting photometer) and quantitative estimation of colored salts, dyes and organic substances possessing suitable absorption bands when in solution. Accessories for the infra-red and spectrum observations of Zeeman effect are also supplied on special order and are fully described in the Hilger catalogue which will be sent upon application. The prism is of the "constant deviation" type. The telescope and collimator are both rigidly fixed, since to pass through the spectrum it is only necessary to rotate the prism; and as a result a construction is arrived at which is at once extremely convenient and mechanically sound. The table on which the prism stands is rotated by means of a fine steel screw, the point of which pushes against a projecting arm on the prism table. To the screw is fixed a drum on which the wavelengths of the line under observation are read off direct as indicated by the index which runs in a helical slot. In the most recent instruments this index is on the side of the drum towards the eye; so that the wavelengths of lines can be read off without quitting the eyepiece. The point of the micrometer screw is of hardened steel, and is permanently fixed before the screw thread is cut, to avoid the risk of periodic errors, the point forming one of the centers while the screw thread is being cut. This hardened steel point presses against a steel plug in the above mentioned projecting arm of the prism table, itself flint-hard and optically polished. The telescope and collimator are both rigidly fixed to the cast-iron base, and the whole is screwed to a strong cast-iron tripod. The object glasses of both telescope and collimator are of 11¼ inches (285 mm) focal length, and 1½ inches (31½ mm) clear aperture. The focussing of the telescope is obtained by the milled ring, which can be seen in the figure on the body of the telescope. By the turning of this ring the object glass is made to move by a carefully protected helical mechanism, the eyepiece remaining always fixed. By this means a more accurate focussing adjustment is obtained, without the liability to a sideways shift of the lines due to the focussing, which it is impossible to entirely avoid in the older form. With prism of 1.65 refractive index, which it is impossible for D, accurately calibrated from 385 μ to 800 μ **Duty Free 135.00 Duty Paid 185.00**

46864. **Wavelength Spectrometer, Hilger, exactly as above, but with denser prism, i. e., 1.74 refractive index for D, and correspondingly increased accuracy of calibration, being from 300 μ to 800 μ 149 85 205.35**

46868. **Universal Base attached to either of above. For detailed description of universal base see No. 46908..... 10.00 13.70**

46872. **Protecting Cover for prism table..... 2.84 3.90**

46874. **Levelling Screws..... 5.00 6.85**

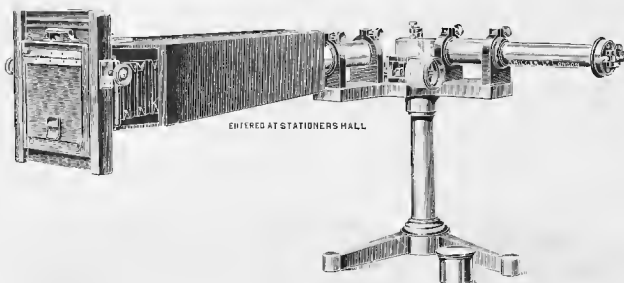
46876. **Case, with lock and key, for either of above..... 7.70 10.55**

46880. **Extra High-Power Eyepiece with its own zero adjusting cross-hairs..... 59.40 81.40**

46884. **Shutter Eyepiece with lateral adjustment to bright pointer..... 21.60 29.60**

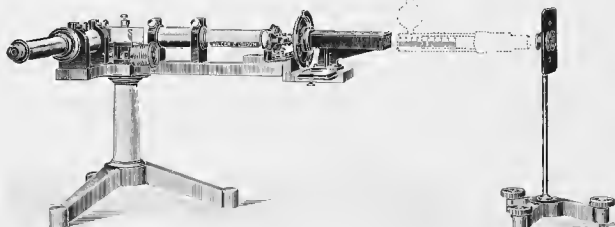
46888. **Slide with light filters to the shutter eyepiece for giving the pointer any desired color, by means of which an increase of accuracy and comfort in reading can be secured, especially in the violet part of the spectrum..... 6.75 9.25**

Note—This eyepiece has two shutters which can be shifted from either side in the focal plane so as to cover any desired part of the field, thereby observing any bright lines which, by their proximity prevent the observation of feebler lines. The metal pointer, the extremity of which is ground exceedingly fine and polished bright with the greatest care, is illuminated from above by a mirror. This bright pointer is adjustable laterally by the two milled head screws below, so that one can always return to the standard by setting the bright pointer on a reference line.



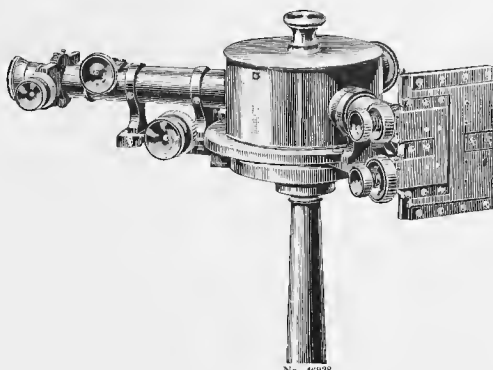
No. 46860 Hilger Wavelength Spectrometer with Camera No. 46842 Attached

- | | | | |
|--------|---|-------|-----------|
| 46892. | Camera, with 21-inch focus lens, tilting adjustment for accurately focussing the whole spectrum, and shutter for exposure. | | |
| | Duty Free | 35.90 | Duty Paid |
| 46896. | Telescope fixed to side of the camera, and internal mirror with external milled head by means of which the spectrum can be reflected into the telescope for observation immediately before photography. | | 49.20 |
| | Duty Free | 54.00 | Duty Paid |
| 46900. | Replica of Rowland Diffraction Grating, interchangeable with the prism. Only supplied if ordered with the Spectrometer. Price includes calibration in wavelengths for both prism and grating. | | 74.00 |
| | Duty Free | 59.55 | Duty Paid |
| 46904. | Apochromatic Triple Object Glasses. In place of the usual achromatic doublet object glasses extra. | | 81.60 |
| | Duty Free | 35.10 | Duty Paid |
| | | | 48.10 |



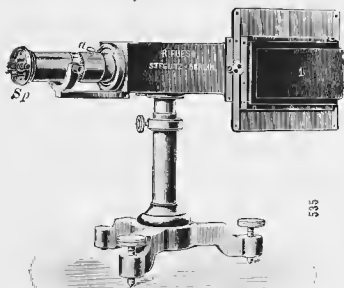
Hilger Wavelength Spectrometer with Universal Base and Nutting Polarisation Photometer Attachment in position and Stand for two parallel beams of light

- | | | | | |
|--------|---|--------|-----------|-----------|
| 46908. | Wavelength Spectrometer, Hilger Constant Deviation Type, with Universal Base, in which the base plate and tripod are of the form shown, the tripod being heavier and larger than in the ordinary Wavelength Spectrometer and the base-plate having an extended arm. The base-plate is drilled with all necessary holes for the addition of the Nutting Photometer. The Universal Base also provides for the attachment of the complete accessories for high resolving power (Michelson echelon, Lummer-Gehrcke plate, and Fabry-Perot etalon). With prism of 1.65 refractive index for D and Universal Base. | | | |
| | Duty Free | 113.10 | Duty Paid | 136.10 |
| 46912. | Wavelength Spectrometer, Hilger, with Universal Base, as above, but with denser prism, i. e., 1.74 refractive index for D. | | Duty Free | Duty Paid |
| | Case, with lock and key, for either of above. | | 157.95 | 216.45 |
| | | | 10.15 | 13.90 |
| 46916. | Nutting Polarisation Photometer Attachment, particularly designed for attachment to the Hilger Wavelength Spectrometer with Universal Base, as above listed. The combination results in a Spectrophotometer for the visible spectrum accurate as regards wavelength and photometric measurements. The circle is divided both in densities and degrees. The price includes an arrangement on separate stand for producing two parallel beams of light, by which means, together with an adjustment on the photometer itself, the correct conditions of illumination may be secured with two columns of liquid of any desired length. | | | |
| | Duty Free | 175.20 | Duty Paid | 244.20 |
| 46920. | Nutting Photometer Attachment, as above but on separate stand with levelling screws, suitable for use with any ordinary Spectroscope. | | Duty Free | Duty Paid |
| | | | 179.55 | 246.05 |
| 46924. | Stand for Tubes of Absorbing Liquids, such as Baly tubes, etc. | | 14.85 | 20.35 |

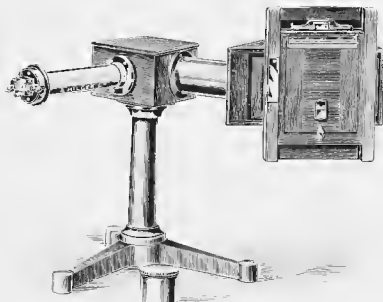


No. 46928

46928. **Spectroscope, Krüss Universal**, for quantitative and qualitative analysis, spectro-photometry, etc. Large model with flint glass prism of 60° and triple Rutherford prism, providing a great range of dispersion. Micrometer adjustment for observation telescope, etc. Equipped for qualitative analysis with simple micrometer slit, with divided drum and platinum edges, comparison prism and lamp for illumination of scale. Equipped for quantitative analysis and photometry with micrometer double slit, with two divided drums after Vierordt, adjustable eye-piece, absorption vessel with parallel walls, Schultz's cell, micrometer support and observation lamp. With two unsymmetrical slits.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 157.50 | Duty Paid | 210.00 |
|-----------|--------|-----------|--------|
46932. **Spectroscope, Krüss Universal**, exactly same as above but with two symmetrical slits.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 190.50 | Duty Paid | 254.00 |
|-----------|--------|-----------|--------|

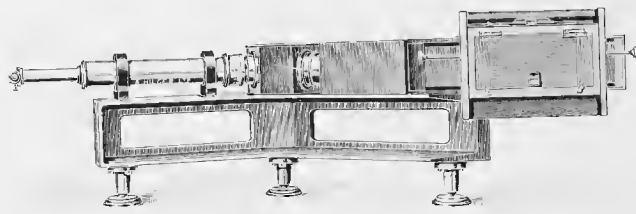


No. 46936



No. 46944

46936. **Spectrograph, Fuess, Gehrke and Reichenheim**, as used at the Physikalisches-Technische Reichsanstalt. With optical system of quartz for investigations of the ultra-violet. For photographic plates $6\frac{1}{2} \times 9$ cm. A small compact instrument which has been supplied to many leading chemical and physical laboratories in Europe and America. Complete with extra large Cornu prism.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 142.50 | Duty Paid | 190.00 |
|-----------|--------|-----------|--------|
46940. **Spectrograph, Fuess**, identical with above but with glass lenses and two dense flint glass prisms $n_D = 1.75$ for investigations of visible spectra.
- | | | | |
|-----------|--------|-----------|--------|
| Duty Free | 120.00 | Duty Paid | 160.00 |
|-----------|--------|-----------|--------|
46944. **Spectrograph, Hilger**, for the Ultra-Violet, with optical system of Uviol glass. Recommended as an inexpensive outfit for ultra violet work, having been used very successfully for experiments in blood, absorption spectra, etc. Each instrument is sent out in complete adjustment ready for photographs to be taken. Specimen photographs sent on application. With two prisms and lenses of the most transparent ultra-violet glass, the lenses of 8 inch (203 mm) focus, the spectrum from $300 \mu\text{m}$ to $800 \mu\text{m}$, about 40 mm in length. Size of plate $4\frac{1}{2}$ by $3\frac{1}{2}$ inches.
- | | | | |
|-----------|-------|-----------|--------|
| Duty Free | 89.10 | Duty Paid | 122.10 |
|-----------|-------|-----------|--------|



No. 46948

46948. **Spectrograph, Hilger, for the Ultra-Violet, Size C, with quartz optical system;** designed to be in permanent adjustment; to give the whole spectrum from 200 μ to 800 μ on one plate; to give good definition over the whole spectrum on the ordinary photographic plate and to give as large an amount of light as is consistent with the above conditions, thus enabling spectrograms to be taken with relatively short exposures. The instruments are sent out completely adjusted, ready for photographs to be taken. Specimen photographs will be sent on application. With lenses of 24 inches (610 mm) focus, the instrument giving a spectrum from 210 μ to 800 μ of about 200 mm in length; prism 41 mm high by 65 mm length of face; size of plate 10 x 4 inches; with No. 2 Slit. The dispersing system consists of one Cornu prism. There is a vertical motion by rack and pinion to the dark slide, with scale, whereby a number of exposures can be taken one below the other.

Duty Free 317.25 Duty Paid 434.75

46952. **Wavelength Scale for above Spectrograph mounted internally** in such a manner as to be brought at will in contact with the photographic plate. Illumination is provided by means of a small electric lamp, and a contact print of the wavelength scale can thus be obtained on the same plate as, and in juxtaposition to, the photograph of the spectrum. The above Quartz Spectrograph in connection with the wavelength scale is widely used for experiments in the absorption of light of complex chemical substances and in the study of molecular constitution. If desired the scales can be divided to read frequencies instead of wavelengths, the price being the same. Price applies only if ordered with Size C Spectrograph, including small battery in case with push key for illuminating lamp; the whole being attached to the Spectrograph in a convenient position for use.

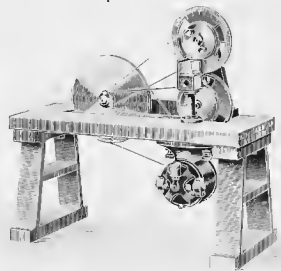
Duty Free 70.30 Duty Paid 96.20

46956. **Wavelength Scale on Glass, for above Spectrograph.** These scales are photographed on glass and can be laid direct on the spectrograms to read off the wavelengths. They are prepared to suit each individual instrument and are sufficiently accurate to determine the identity of most lines.

Duty Free 8.10 Duty Paid 11.40

46960. **Metal Slides for the Plate-holder for above Spectrograph,** same being attached to the base of the instrument by a rigid metal bracket. In this construction the wooden cone and bellows of the apparatus are still retained, but play no part in the support of any essential portions of the apparatus.

Duty Free 94.50 Duty Paid 129.50



No. 46964

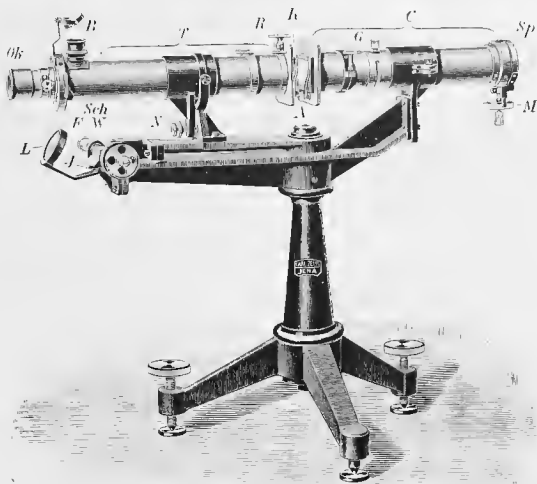
Sector Photometer, Hilger, for Quantitative Spectrophotometry in the Ultra-Violet in connection with the Hilger Ultra-Violet Spectrograph Size C. With wavelength scale by the measurements of the actual proportion of each wavelength absorbed in its passage through the substance or for some function of it, as for instance the absorption constant. The great interest which the measurement of selective absorption has assumed for the chemist will be noted from the extensive bibliography concerning the chemical significance of the absorption spectra of organic compounds and rare earths. Much of this work has been unsatisfactory because it has not been of a quantitative character. The Sector Photometer consists of a slit and a bi-prism which receives the light from the solution through the substance to be examined and the rotating sector so that two spectrum photographs are obtained in close juxtaposition, one of which is of reduced density throughout its whole length and the other—that which has passed through the material

under test—being more dense than the first in certain parts and less so in others, there being certain wavelengths where the density of the two is equal. Spectrum photographs and more complete description, with complete bibliography, will be sent upon application. With motor for either 110 or 220 volt circuit. Voltage must be specified in ordering.

Duty Free 145.80 Duty Paid 199.80

46968. **Tubes, with quartz ends, for solutions, length of liquid 10, 20 or 40 mm.**

Duty Free, each 4.05 Duty Paid, each 5.55



No. 16970

K. A. H. KUNGER, JENA

SPECTROSCOPE, GRATING, ZEISS, primarily designed for the analysis of absorption spectra but applicable at the same time to the study of emission spectra. In grating spectra the wavelength for any line of the spectrum is proportional to the corresponding angle of deflection, and this property has been made a means of dividing the head of the micrometer screw by which the telescope is moved through the spectrum in terms of wavelengths. Using none but the most perfect gratings, Zeiss have been enabled by the excellent definition of the spectra to depart from the usual division in terms of $\mu\mu$ or millionths of a millimeter and have divided the drum into units which are ten times finer, i.e. into Angstrom units ($1 \text{ \AA.} = 0.1 \mu\mu$). The Fraunhofer lines of the solar spectrum can accordingly be set accurately to within $1-2 \text{ \AA.}$ For sharply focusing the spectrum with respect to the cross lines in the telescope the collimator is very rigidly mounted and fitted for this purpose with a milled ring. The slit, which is of the highest order of precision, moves symmetrically and can be adjusted during observations by means of a wheel and cord transmission gear. The jaws of the slit are protected from the access of dust and accidental injury by a detachable glazed cap, the latter being interchangeable with a similar cap fitted with a comparison prism. Each division of the slit drum, which has one hundred divisions, changes the width of the slit by an amount equal to 0.01 mm.

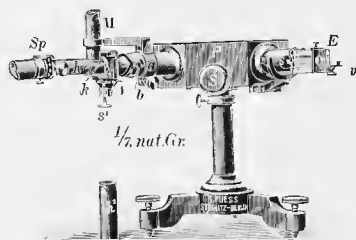
When the instrument is applied to the analysis of absorption spectra the absorption bands are much more clearly defined owing to the comparatively small dispersion of the grating, which contributes greatly to the accuracy with which it can be adjusted with respect to the cross lines. This renders the instrument particularly well adapted for the spectroscopic analysis of pigments by Formánek's method. To render the cross lines clearly visible in the presence of very dark absorption bands the telescope is fitted with a convenient device for illuminating the cross lines, which entirely fulfils the purpose of the arrangement recommended by Formánek, though it differs from it in the means adopted by Zeiss.

The most suitable source of light is a Nernst lamp with exposed glower, i.e. a glower not surrounded by a heating spiral, an image of the glower in its natural size being projected upon the slit by means of a condenser lens. With this source of light the slit should as a rule be reduced to a width of 0.02 to 0.03 mm. An inverted incandescent gas burner supported on a stand and provided with screen is equally convenient to manipulate, though it gives a less intense light than the Nernst lamp.

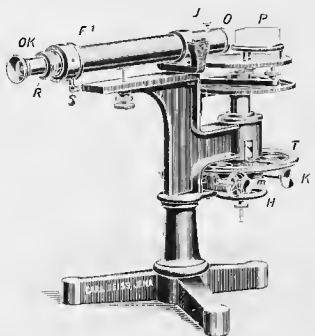
Spark spectra and arc spectra are examined by projecting with the aid of a converging lens an image of the radiant upon the jaws of the slit, which for this purpose are lacquered white. Care should be taken to insure that the exit pupil of the telescope may be completely filled with light. This may be ascertained by viewing the small bright circle in front of the eyepiece with a magnifier. See *F. Löwe Zeitschr. f. Instrumentenkunde* 1908, 23 N. 261; or *J. Formánek "Untersuchung und Nachweis organischer Farbstoffe auf spectrokopischem Wege,"* II Auflage, Berlin 1908, or "*Die qualitative Spektralanalyse anorganischer und organischer Körper*" II Auflage.

46970. Grating Spectroscope, as above, with transmission grating, protecting cap for the slit, comparison prism, reader for the micrometer screw and two interchangeable eyepieces of different foci, in case with lock and key.

Duty Free..... 200.00 Duty Paid..... 272.00

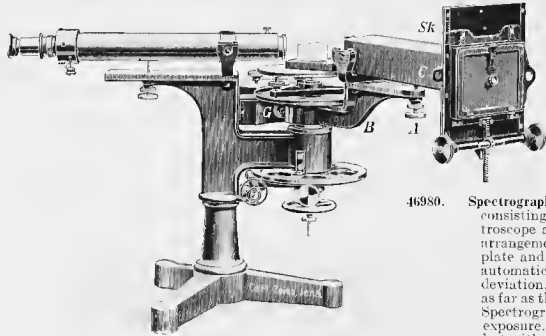


No. 46972



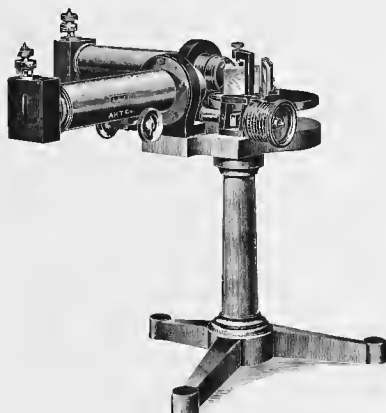
No. 46974

46972. **Monochromator, for Visible Rays, Fuess.** Convenient as a source of homogeneous light for spectrometers, refractometers, polariscopes, microscopes, goniometers, etc. Illustration shows same in position before the collimator tube of a spectrometer. With two flint prisms $n_D = 1.67$, and with two Ramsden oculars with cross hairs. See E. A. Wülfing, *Tschermak's Mineral u. petrogr. Mit.*, 15, S. 74; *ferner: C. Leiss, Zeitschr. f. Instr. Kunde.* 18, S. 209, *ferner: C. Leiss, Die opt. Instr.*, S. 25, Fig. 19-21.
Duty Free 162.90 **Duty Paid** 217.20
46974. **Spectroscope, Autocollimation, Zeiss.** Light reaches one-half of the slit through the window at F, while a similar window on the left admits light to the other half of the slit, and thence passes through the objective O to the prism P, where it is reflected back from one of the silvered faces and in the focal plane of the objective O produces a spectrum which can be passed through the field of view of the fixed telescope by turning the screw head M. The arrangement of the two windows furnished a convenient means of comparing two spectra. Wavelengths can be accurately measured within a fraction of a μ by reference to spectrum lines of known wavelengths, while for the identification of the various regions of the spectrum a dispersion curve is furnished with the double Rutherford prism. With double Rutherford prism and dispersion curve.
Duty Free 185.00 **Duty Paid** 251.60
46976. **Prism of 30°, on silvered back with metal stage, for use interchangeably with Rutherford prism.**
Duty Free 8.25 **Duty Paid** 11.22

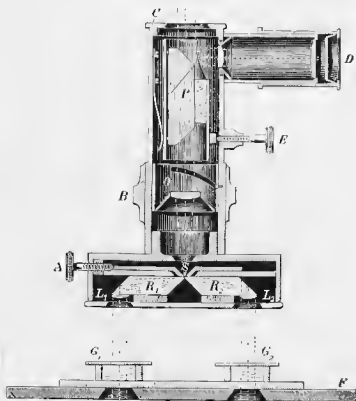


No. 46980

46980. **Spectrograph with Divided Circle, Zeiss,** consisting of the Autocollimation Spectroscope above, with metal camera with arrangement for ten exposures on one plate and a base plate for the prism for automatically obtaining the minimum deviation. The objectives are inserted as far as they will go by which means the Spectrograph is focused and ready for exposure. With a 6x9 cm plate holder, but without objectives and prisms.
Duty Free 206.25 **Duty Paid** 280.50
46982. **Pair of Achromatic Objectives, f = 250 mm, with fittings to slide into the collimator and camera.**
Duty Free 15.00 **Duty Paid** 20.40
46984. **Pair of Double Quartz-Fluorite Achromatic Objectives, f = 250 mm, for use in the ultra-violet.**
Duty Free 47.50 **Duty Paid** 64.60
46988. **Rutherford Prism, on base plate.** **Duty Free** 25.00 **Duty Paid** 34.00
46990. **Cornu Double Prism, on base plate.** **Duty Free** 22.50 **Duty Paid** 30.60
46992. **Condenser, with quartz lens, on stand.** **Duty Free** 18.75 **Duty Paid** 25.50



No. 46994



No. 46996

46994. **Monochromatic Illuminator, for the Ultra-Violet Light and Visible Rays, Hilger**, reading from 200μ to 700μ in direct wavelengths. This instrument is particularly suitable for experiments on the photo electric effect, etc. The collimator and telescope both have symmetrical slits with divided drum heads for width adjustment of the jaws which have an effective length of 20 mm. The lenses are of 31 mm aperture and 210 mm focal length for $\lambda = 300\mu$. The beam of light from the collimator passes at minimum angle through a Cornu prism of quartz (height 32 mm, length of face 42 mm) and is then reflected from a plane mirror into the telescope. The prism and mirror stand on one table, which is rotated by means of a fine steel screw, the wavelength of the portion of the spectrum under observation being read off direct on a helical drum. The average accuracy of reading throughout the range is to about 1μ . The collimator and telescope are rigidly fixed to the cast-iron base.

Duty Free 279.18

Duty Paid 382.58

Note—This instrument may be converted into a spectrometer for infra-red rays by the addition of rocksalt prism, two nickel-steel concave mirrors, thermopile, etc. Price upon application.

46996. **Spectroscope, Comparison, Zeiss**, for the convenient comparison of the absorption spectra of fluids, glasses, ray filters, etc. In case with a number of lithographs of wave length scale for guidance in observations. The illustration shows the optical arrangement only, the whole being mounted on an adjustable upright support with base, for convenient manipulation.

Duty Free 77.50

Duty Paid 105.40

46998. **Spectroscope, Comparison, Zeiss**, with triple field, i.e. for the simultaneous observation of three spectra. Similar in construction to the preceding. This instrument is intended for practical color analysis in the arts, such as three color photography, three color printing and also physiological investigations on color sensations, etc. For more detailed description send for Mess 260. In case with lock and key.

Duty Free 93.75

Duty Paid 127.50

47000. **Cylindrical Absorption Cells**, for use with either of above with cover glasses, with height of fluid 1 mm, 5 mm, 10 mm and 20 mm.

Duty Free, per set 3.00

Duty Paid, per set 4.08

47002. **Absorption Cell, for variable fluid height**

Duty Free 8.75

Duty Paid 11.90



No. 47004

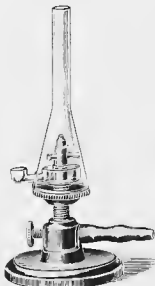
47004. **Hand Spectrophotometer, Nutting, Model I**, a combination of direct vision pocket spectroscope with polariscope consisting of two Nicol prisms. Dispersion of Amici prism $C - F = \text{ca. } 5^\circ$. See P. G. Nutting, Bulletin of U. S. Bureau of Standards, Vol. 2, No. 2, p. 317, Fig. 1 u. 2, 1906; ferner: C. Leiss, Zeitschr. f. Instr. Kunde 26, S. 307, 1906.

Duty Free 27.00

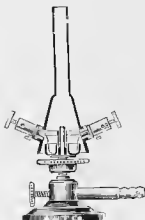
Duty Paid 36.00



No. 47008



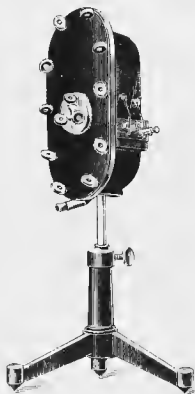
No. 47012



No. 47016



No. 47020



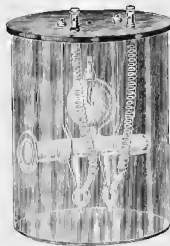
No. 47024



No. 47028



No. 47032



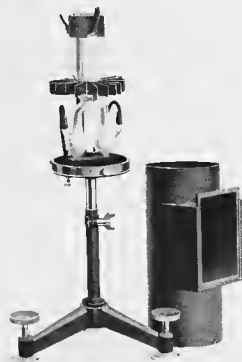
No. 47036



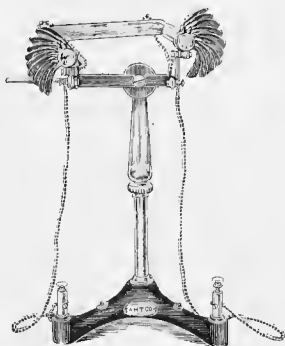
No. 47040

Spectroscope Accessories.

47008.	Spectrum Burner, Beckmann. A simple and practical method for coloring a Bunsen flame by means of chemical vapors. See <i>Zeitschrift für angewandte Chemie</i> , XX Jahrgang 1907, Heft 14, Seite 564. Complete with stand and porcelain dish	4.00
47012.	Spectrum Burner, Riesenfeld. A new, low priced burner for producing vapors from chemical solutions for coloring spectral flames.	3.00
47016.	Spectrum Burner, Riesenfeld and Wohlers for electrolytic vaporizing	6.00
47020.	Lamp, Riesenfeld, for spark spectra. By means of an iridium electrode a pure spectrum of the metal containing solution to be investigated is secured without the presence of air lines or of iridium lines. Price does not include iridium electrode which is supplied at the market price.	
	Duty Free	22.50
	Duty Paid	31.50
47024.	Mercury Vapor Lamp, Lummer-Straubel, for 25 to 30 volts direct current.	
	Duty Free	6.00
	Duty Paid	8.00
47028.	Stand and Cooling Bath, for above.	
	Duty Free	10.25
	Duty Paid	15.50
47032.	Mercury Vapor Lamp, Lummer-Straubel, with quartz window on tube for the ultra violet.	
	Duty Free	9.25
	Duty Paid	13.65
47036.	Cooling Cell, for use with above, of dark glass, with quartz window, hard rubber top, etc	
	Duty Free	6.50
	Duty Paid	9.75
47040.	Mercury Vapor Lamp, Immersion Type of Uviol Glass, on stand with resistance for 110 or 220 volt circuit. Current, volts.	
		110
		220
	Duty Free	30.50
	Duty Paid	33.50
47044.	Extra Uviol Lamp, only for above.	
	Duty Free	8.00
	Duty Paid	13.50



No. 47048



No. 47052

47048. Mercury Vapor Lamp, Perot-Fabry, with protecting cylinder with rectangular opening 9 x 12 cm to take Ray Filters, etc. The lamp is provided with a cooling ring consisting of radial arms of blackened brass and copper. The entire lamp is mounted on adjustable stand with levelling screws and the whole makes a very convenient source of light for polariscope, spectroscope and other laboratory purposes where a monochromatic beam of short wave-length is desired.

Duty Free 21.00 Duty Paid 28.00

MERCURY VAPOR ARC LAMP OF QUARTZ, HERAEUS. On 220 volt lines the lamp may be burned at all potentials between the electrodes from 25 to 185 volts by means of a variable resistance of 55 or 95 ohms (depending on the type of lamp) connected in series; on 110 volt lines at all potentials from 25 to 80 by means of a variable resistance of 25 or 40 ohms. If the lamp is not required to burn at low voltages resistances of 30 or 50 ohms and of 12 or 20 ohms are sufficient. The specific intensity of the visible and ultra-violet radiation is the same, and the economy equally as good in 110 volt as in 220 volt lamps. The mercury vapor arc is extremely rich in ultra-violet rays and quartz glass is transparent for such rays above 185 μ wave-length. See article in the "Annalen der Physik," 4th Series, Vol. 20, 1906, by Dr. R. K \ddot{u} ch and T. Retschinsky on *Photometric and spectro-photometric measurements in the high pressure mercury vapor lamp.*

For 220 volts, direct current, 12 cm arc. $3\frac{1}{2}$ amp. current consumption and 3000 c. p.

47052.	Lamp, complete on stand	145.00
47056.	Rheostat, adjustable series, large, 55 ohms	15.00
47060.	" " small, 30 ohms	10.65
	2 amp. current consumption and 1500 c. p.	
47064.	Lamp, complete on stand	125.00
47068.	Rheostat, adjustable series, large, 95 ohms	10.65
47072.	" " small, 50 ohms	8.50
	For 110 volts, direct current, 7 cm arc. $3\frac{1}{2}$ amp. current consumption and 1500 c. p.	
47076.	Lamp, complete on stand	125.00
47080.	Rheostat, adjustable series, large, 25 ohms	10.65
47084.	" " small, 12 ohms	8.50
	2 amp. current consumption and 800 c. p.	
47088.	Lamp, complete on stand	105.00
47092.	Rheostat, adjustable series, large, 40 ohms	6.15
47096.	" " small, 20 ohms	6.15

Note—These are direct current Lamps and cannot be run with alternating current. Because of the extremely fragile nature of these Lamps packing is charged extra at cost and while it is carried out with the greatest care, Lamps are shipped at buyer's risk only. They can be specially insured against breakage in transportation at the following rates —

1000 miles, or under	4.00
1000 to 2000 miles	6.00
Over 2000 miles	8.00

47100.	Ray Filters, Wratton & Wainwright, Set of Eight for Spectroscopy, consisting of filters for removing of ultra-violet, transmission of only red, etc. Cemented in glass, 2 inches square, in case.	
	Duty Free	7.45
	Duty Paid	10.05
47104.	Ray Filters, Wratton & Wainwright, Complete Set of Fifty-one, in mahogany case. Filters 2 inches square, cemented between optical glass of good quality, containing all the filters required for contrast, photomicrography or spectroscopy.	
	Duty Free	67.50
	Duty Paid	91.15



No. 47108



No. 47112



No. 47116



No. 47120



No. 47124

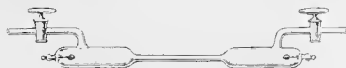
47108. **Prism, Hollow**, with faces of highly polished mirror glass and glass stopper; cemented together in an electric furnace and resistant to heat, acids and alkalis; with transparent opening through faces 25 mm in diameter. 6.00
47112. **Spectrum Cells**, for absorption spectra, etc., bottle form, with ground in stopper and plane parallel sides. 60
47116. **Spectrum Cells**, for absorption spectra, etc., largest size being suitable for lantern experiments. Inside dimensions, mm. 30 x 20 x 5 30 x 20 x 10 100 x 80 x 8
Each 1.15 1.50 2.70
47120. **Spectrum Cells**, for absorption, with round opening 20 mm in diameter by 4 mm deep. 1.00
47124. " with lid cemented on and with a small ground in stopper, 40 x 40 x 10 mm. 4.00
47128. **Spectroscope Prisms, Hilger, 60° Angle**, accurate to within 10', with rectangular faces and with the ratio of the length of surface becoming greater in proportion to the height as the refractive index increases, thus securing a more satisfactory and effective aperture.

Light Flint					Dense Flint						
Refractive index for D=1.58 to 1.62 (approximately)					Refractive index for D=1.63 to 1.65 (approximately)						
Length of face		Height of prism		Price		Length of face		Height of prism		Price	
inches	mm	inches	mm	Duty Free	Duty Paid	inches	mm	inches	mm	Duty Free	Duty Paid
1½	32	1	25	6.53	8.95	1½	35	1	25	8.91	12.21
1½	42	1½	32	8.91	12.21	1½	44	1½	32	10.09	13.83
2	51	1½	38	12.62	17.29	2½	54	1½	38	14.25	19.53
2½	60	1½	44	17.82	24.42	2½	64	1½	44	19.89	27.26

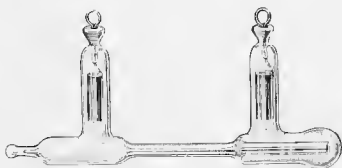
47132. **Spectroscope Prisms, Hilger Right-Angle**, of white, clear and thoroughly annealed crown glass, with guaranteed definition and angles accurate to within 5'. Length of square cathetus surface, mm. 10 15 20 25 30
Each, Duty Free 4.75 7.43 10.40 13.36 16.34
Each, Duty Paid 6.51 10.18 14.25 18.32 22.40
47136. **Quartz Prisms, Cornu**, refracting angle of 60°, composed of two prisms of right and left rotation quartz, respectively, each of 30° angle. This improved construction results in greater optical perfection, removal of double image caused by reflection between the two inside surfaces without the necessity of any liquid between the two surfaces, a gain in light transmitted and greater convenience in handling.
Height of prism 19 mm 32 mm 42 mm
Length of external faces 25 mm 25 mm 32 mm
Duty Free 20.79 28.51 48.13
Duty Paid 28.49 39.07 65.95
47140. **Quartz Lenses**, unmounted, accurately cut with the crystallographic and optical axes coincident; of the finest definition, the focal length for wavelength 400 μ being not less than ten times the diameter.
Clear aperture, mm 25.4 32 38 44 51 57 64
Duty Free 11.88 13.37 15.44 17.82 21.98 29.70 40.10
Duty Paid 16.28 18.32 21.16 24.42 30.12 40.70 54.40
47144. **Quartz Lenses**, plano-convex, second quality, suitable for condensing lenses, etc.
Diameter, inches 1 1½ 1½ 1½ 2 2½
Focal length, inches 3 3½ 4½ 5½ 6 6½
Duty Free 4.46 5.80 7.13 8.91 13.07 18.71
Duty Paid 6.10 7.94 9.77 12.21 17.91 25.64
47148. **Rocksalt, Prism, 60°** length of face 32 mm, height of face 25 mm.
Duty Free 20.52 Duty Paid 28.11
47152. **Rocksalt, Lenses**, with second quality surfaces, focal length for D not less than five times the diameter.
Diameter 25 mm 31 mm 38 mm 44 mm
Duty Free 5.64 6.24 7.13 8.32
Duty Paid 7.73 8.55 9.77 11.40
- Note—First quality Lenses of Rocksalt, focal length for D not less than 1th the diameter, curves such as to give minimum spherical aberration for wavelength 10 μ , price 2½ times that of above.
47156. **Gratings, Replica**, made from Rowland originals, each in case.
Number of lines 15,000 14,438 15,000
Size, inches 1½ x 1½ 1½ x 1½ 1½ x 1½
Each 6.00 5.00 11.00



No. 47160

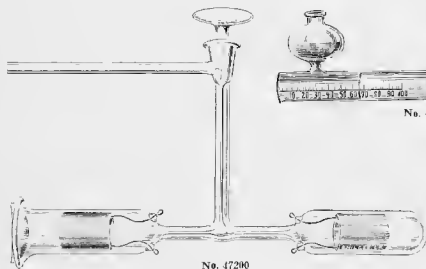


No. 47168



No. 47172

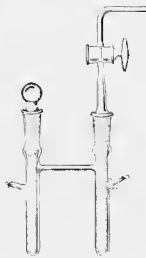
47160. **Spectrum Tubes, Plucker**, with simple electrodes. Filled with either O, H, NO, CO, CO₂, Cl, Cy, Cl₂, I or Br. Each 2.00
47164. **Spectrum Tubes, Plucker**, with simple electrodes. Filled with either Helium or Argon at $\frac{1}{2}$ to 5 mm pressure. Each 5.00
47168. **Spectrum Tubes, Plucker**, empty, with simple electrodes and two Jena stopcocks ground absolutely tight, for filling in the laboratory with any desired gas. Each 3.00
47172. **Spectrum Tubes, Dorn-Goetze**, with square cut end of capillary, as used for observation of anode and cathode ray, with cylinder electrodes of large capacity. Particularly recommended for the investigation of rare gases. Filled with either O, H, N, NO, N₂O, NO₂, NH₃, H₂O, ordinary air, CO, CO₂, SO₂, Br, Cl, Si Flu, Sn Cl₂, H₂S, Cy, HCY, C₂H₄, CH₄, C₂H₂ or with solids I, G, Se, Hg or Hg₂Cl.
- Duty Free, each**..... 2.75 **Duty Paid, each**..... 4.15
47176. **Spectrum Tubes**, same as No. 47172 but filled with following rare gases.
- | | Helium | Argon | Neon | Krypton | Xenon |
|-------------------|-----------------|------------------|-------|---------|-------|
| | at low pressure | at high pressure | | | |
| Filled, with..... | 4.50 | 4.50 | 8.00 | 6.00 | 20.00 |
| Duty Free..... | 4.50 | 4.50 | 8.00 | 6.00 | 20.00 |
| Duty Paid..... | 6.75 | 6.75 | 12.00 | 9.00 | 30.00 |
47180. **Spectrum Tubes**, same as No. 47172, empty, with two stopcocks, for filling in the laboratory..... 3.75
47184. **Spectrum Tubes, Dorn-Goetze**, exactly same as No. 47172 but made of Uviol glass transparent to the ultra-violet up to 2530 Å. E., and filled with the same gases or material as No. 47172.
- Duty Free, each**..... 3.75 **Duty Paid, each**..... 5.75
47188. **Spectrum Tubes**, same as No. 47184 but filled with the following rare gases.
- | | Helium | Argon | Neon | Krypton | Xenon |
|-------------------|-----------------|------------------|-------|---------|-------|
| | at low pressure | at high pressure | | | |
| Filled, with..... | 5.50 | 5.50 | 9.00 | 7.00 | 21.50 |
| Duty Free..... | 5.50 | 5.50 | 9.00 | 7.00 | 21.50 |
| Duty Paid..... | 8.25 | 8.25 | 13.50 | 10.50 | 32.00 |
47192. **Spectrum Tubes**, same as No. 47184, empty, with two stopcocks for filling in the laboratory..... 5.25



No. 47200

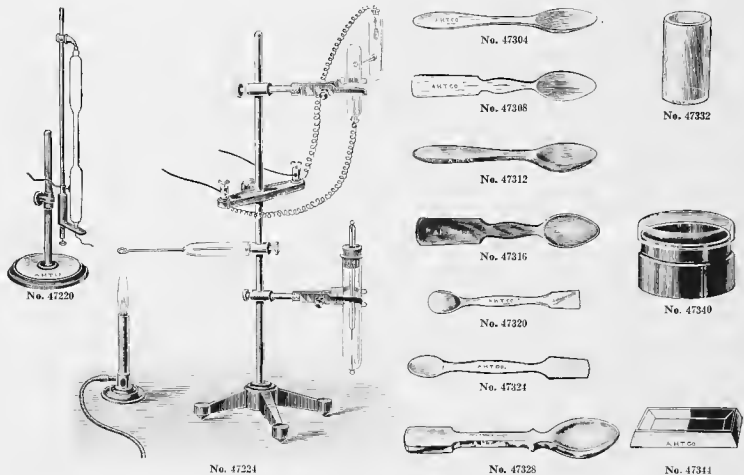


No. 47196



No. 47216

47196. **Spectrum Absorption Tube, Baly**, consisting of two tubes with polished quartz ends, the outside tube being graduated in mm. Complete with two quartz plates and rubber tubing..... 7.50
47200. **Spectrum Tube, End-on Type** for experimental work, with stopcock and condenser to concentrate the beam. The spherical portion of the condenser is fitted air-tight to the ground and polished cup at the end of the vacuum tube; with glass condenser.
- Duty Free**..... 13.52 **Duty Paid**..... 18.52
47204. **Spectrum Tube**, same as above, with quartz condenser.
- Duty Free**..... 22.43 **Duty Paid**..... 30.73
47208. **Spectrum Tube, Pure Fused Silica, End-on Type**, for ultra-violet work, with secure mercury seals. Unfilled, with tube for exhaustion.
- Duty Free**..... 15.60 **Duty Paid**..... 21.37
47212. **Spectrum Tube, Pure Fused Silica**, with external electrodes, which, while they do not give as brilliant a discharge as the usual form, have the advantage of absolute permanence. Unsealed, for experimental purposes, with tube for exhaust.
- Duty Free**..... 5.35 **Duty Paid**..... 7.33
47216. **Spectrum Tube**, with ground stopper and stopcock, for Dupré's test for mercury in gun-cotton.
- Duty Free**..... 3.38 **Duty Paid**..... 4.63

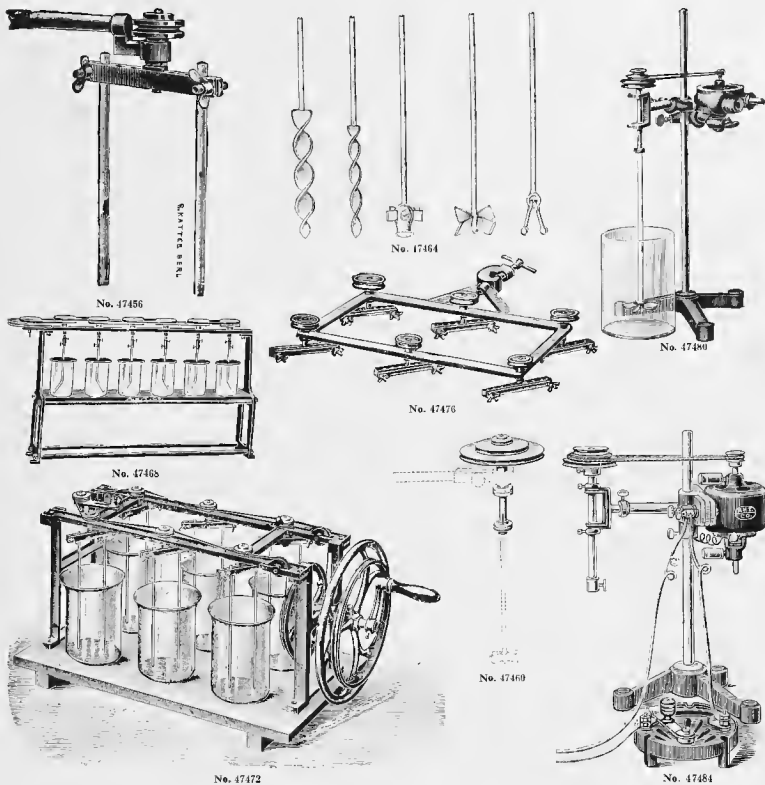


47220. Spectrum Tube Holder for Plucker tubes, without tubes 6.00
 47224. Spectrum Tube Support, Universal, with two clamps, binding post, with platinum wire, complete as per illustration but without spectrum tubes, or Bunsen burner 8.00
 47228. Photographic Plates, Wratten and Wainwright, very sensitive, for use in spectrographic work. These are supplied in the following grades:

Panchromatic "A," sensitive from the ultra-violet up to 6500 Å. u.
 "B," rather less green sensitive than Panchromatic "A," but sensitive to about 7800 Å. u.
 Wratten "M," of similar sensitiveness to Panchromatic "A," but of much finer grain and about one-third the speed.
 Altechrome, evenly sensitive to about 5600 Å. u.
 Double Instantaneous, a fast "ordinary" plate of fine grain suitable for ultra-violet work.

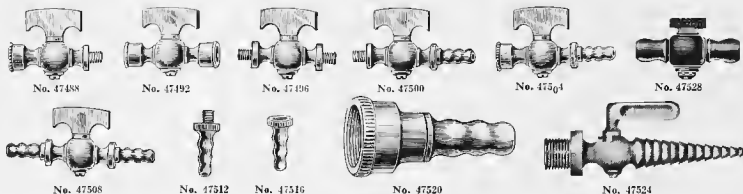
Grade	Panchromatic "A"	Panchromatic "B"	Wratten "M"	Altechrome	Double Instantaneous
Size 4½ x 3½ inches, per doz.	.55	.85	.55	.55	.55
" 10 x 4 " per doz.	1.65	2.50	1.65	1.65	1.65
" 6 x 9 cm. per doz.	.50	.75	.50	.50	.50
" 6½ x 9 cm. per doz.	.50	.75	.50	.50	.50

47300. Sponges, for laboratory use; \$1.50 to \$5.00 per lb., depending upon quality.
 47304. Spoons, Bone. Length, mm 100 120 150 170
 Each12 .15 .25 .30
 47308. Spoons, Bone, with spatula end. Length, mm 100 120 150 170
 Each15 .20 .25 .30
 47312. Spoons, Horn. Length, mm 80 100 120 150 180 200 220 240 280 300
 Each08 .10 .12 .15 .20 .25 .30 .35 .50 .75
 47316. Spoons, Horn, with spatula end. Length, mm 80 100 120 150 180 200 220 240 280 300
 Each12 .13 .15 .18 .25 .30 .40 .50 .75 1.00
 47320. Spoons, Pure Nickel, with spatula end. Length, mm 120 150
 Each50 .65
 47324. Spoons, Porcelain, with spatula end.
 Length, mm 105 120 145 160 200 220 280
 Each14 .17 .20 .25 .40 .45 .80
 47328. Spoons, Heavy Cut Glass. Size Teaspoon Dessertspoon Tablespoon
 Each30 .50 .90
 47332. Sputum Bottles. A heavy, green glass bottle, 2 inches high and 1 inch in diameter, for mailing sputum and other samples inside of mailing tubes as required by the U. S. Post Office Department. Widely used in Board of Health work. Without corks. Per gross 4.00
 47336. Sputum Bottles, same as No. 47332 but with corks to fit tight. Per gross 4.70
 47340. Sputum Dish, for sputum examinations, of black glass, with transparent glass lid, 2½ inches in diameter by 1½ inches high25
 47344. Sputum Tray, for sputum analysis, of porcelain, half white and half black75

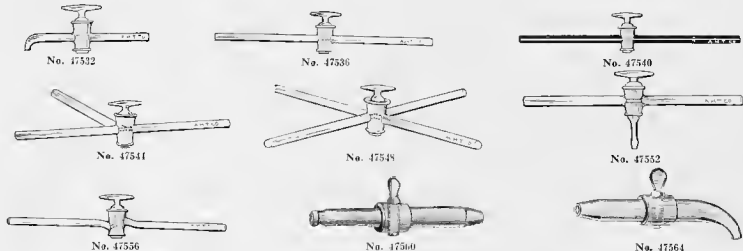


47456. **Stirring Apparatus**, consisting of pulley only with support for glass rods at different distances and rod to clamp to apparatus support. Very convenient in arranging various stirring apparatus 1.75
47460. **Stirring Apparatus, Schulze**, consisting of pulley with clamp, for single glass rods of various forms. Without clamp or glass stirrer. 2.00
47464. **Stirring Rods**, of glass, for use with above or other stirring apparatus.
- | Style | A | B | C | D | E |
|-------|-----|-----|------|------|-----|
| Each | .75 | .50 | 1.25 | 1.00 | .50 |
47468. **Stirring Apparatus, Blair**, as used in iron analysis. Complete with stirrers. 6 beakers with covers, asbestos plate, etc., but without motor. 17.00
47472. **Stirring Apparatus**, for hand or power, on wooden base, with iron supports, including stirring rods and beakers.
- | | | |
|-------------------|-------|-------|
| Number of beakers | 6 | 8 |
| Each | 17.50 | 20.00 |
47476. **Stirring Apparatus**, similar to above but for attaching by clamps to an apparatus support, without beakers or support, as shown in illustration.
- | | | |
|-------------------|------|-------|
| Number of beakers | 4 | 6 |
| Each | 8.00 | 10.25 |
47480. **Stirring Apparatus, Fischer**, including Rabes water turbine, adjustable clamp, pulley, support, glass rod with vanes and glass jar. 12.00

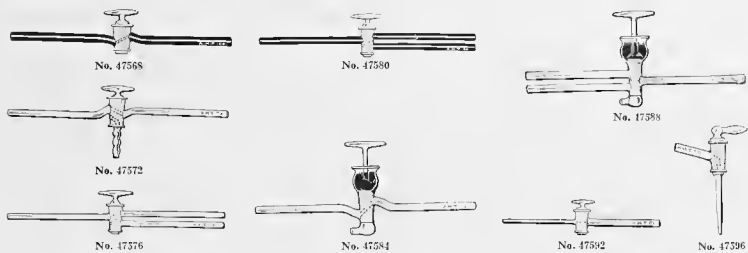
47484. **Stirring Apparatus, Electric**, consisting of motor which can be furnished for either alternating or direct current, 110 or 220 volts, adjustable arm for holding the stirring rod and rheostat for regulating speed from 50 to 1000 r. p. m. Please specify voltage and current in ordering. . . 25.00



47488.	Stopcock, Brass , specially made for laboratory purposes, guaranteed oil and air tight, with both male and female thread. Bore, inches. $\frac{1}{2}$		
	Each . . . . .	.50	.65
47492.	Stopcock, as above with both ends having female thread. . . . .	.50	.65
47496.	“ “ “ “ “ male . . . . .	.50	.65
47500.	“ “ “ “ “ one end for tubing and the other with male thread . . . . .	.50	.65
47504.	“ “ “ “ “ both ends “ “ “ female “ . . . . .	.50	.65
47508.	“ “ “ “ “ both ends for tubing . . . . .	.50	.65
47512.	Connectors, Brass , for making hose connections to above stopcocks, with male thread. Bore, inches. $\frac{1}{2}$		$\frac{1}{2}$
	Each . . . . .	.15	.15
47516.	Connectors, as above, for stopcocks, with female thread. . . . .	.15	.15
47520.	“ “ “ “ “ hydrant . . . . .		.30
47524.	Stopcock, Brass, nickel plated , with long spout for gas connections; very convenient for laboratory connections as the tubulation for tubing is $2\frac{1}{2}$ inches long tapering from $\frac{1}{4}$ inch at the small end to $\frac{1}{2}$ inch at the large end; provided with 12 indentations so that it may be safely used with tubing from $\frac{1}{4}$ to $\frac{1}{2}$ inch bore. . . . .		.60
47528.	Stopcock, Hard Rubber , for acids, H ₂ S, etc., $\frac{1}{4}$ inch bore, with tubulations for rubber connections at both ends		1.00



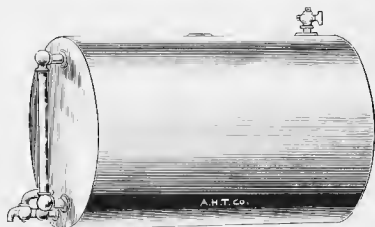
47532.	Stopcock, Glass , lampblown form, with curved outlet.		2	3	4
	Bore, mm. . . . .		.90	1.15	1.35
47536.	Stopcock, Glass , as above, but straight.				
	Bore, mm.	1	2	3	4
	Each . . . . .	.75	.90	1.10	1.35
47540.	Stopcock, Glass , lampblown form, straight, but with the inlet and outlet of capillary tubing of 1 mm bore and an outside diameter of from 6 to 7 mm.				1.00
47544.	Stopcock, Glass , lampblown form, three-way. Bore, mm.			2	4
	Each			1.25	1.50
47548.	Stopcock, Glass , as above, four-way. Bore, mm.			2	4
	Each			1.50	1.75
47552.	Stopcock, Glass , as above, three-way, with downward outlet at end of stopper.				
	Bore, mm.			2	4
	Each			1.25	1.75
47556.	Stopcock, Glass , as above, two-way, with plug bored at an angle, 2 mm bore.				1.10
47560.	Stopcocks, Glass , heavy molded form, straight. Bore, mm.		4	6	8
	Each	1.10	1.25	1.50	1.50
47564.	Stopcocks, Glass , heavy molded form, curved. Bore, mm.		4	6	8
	Each	1.10	1.25	1.50	1.50



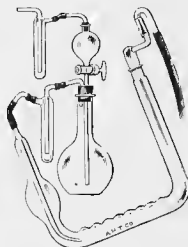
47568.	Stopcock, Glass, with capillary tubing with 1 mm bore.....	1.40
47572.	Stopcock, Glass, three-way, with downward outlet at end of stopper. Bore, mm.....	2 4
	Each.....	1.50 2.25
47576.	Stopcock, Glass, with stopper with two oblique holes and two outlets on one side. Bore, mm.....	2 4
	Each.....	1.50 2.40
47580.	Stopcock, Glass, same as No. 47576 but with capillary tubing of 1 mm bore.....	1.75
47584.	“ Glass, two way, with plug bored at an angle and with mercury seal. Bore, mm.....	2 4
	Each.....	2.35 3.00
47588.	“ Glass, same as above but three way with two outlets on one side.	
	Bore, mm.....	2 4
	Each.....	3.00 4.00
47592.	Stopcock, Glass, straight, light weight for making burette tips, etc.; with inlet tube of 4 mm bore and outlet tube of 2 mm bore.....	.75
47596.	Stopcock, Glass, angle form, for burette tips, etc.; with inlet tube of 5 mm bore and outlet tube of 2 mm bore.....	.90
47600.	Grease, suitable for use with above stopcocks, Per stick.....	.25



47604.	Stopclock, Center Seconds, a convenient substitute for the stopwatch for timing laboratory experiments; furnished with an indicator hand to show the point of starting.....	7.50
47608.	Stopwatch, ordinary quality, similar in appearance to No. 47612; as used in timing various laboratory experiments, particularly measurements of viscosity, etc.; reading in 1/3 seconds.....	6.50
47612.	Stopwatch, Jaquet, Anti-Magnetic, absolutely guaranteed. In solid nickel case; recommended as a thoroughly satisfactory watch for laboratory purposes.....	12.00
47616.	Stopwatch, Jaquet, Anti-Magnetic, with double second hand. By the first pressure both second hands are released. At the second pressure the first second hand stops while the other second hand continues until the third pressure. At the fourth pressure both hands return to zero.....	20.00
47620.	Storage Tanks, of acid-proof stoneware, widely used for distilled water, acids, etc., in laboratories. With symbol lettered on front; with ground in stoneware stopcock but without wooden support shown in illustration.	
	Capacity in gallons.....	6½ 13 26½ 39½
	Each.....	10.50 18.00 26.00 40.00



No. 47624



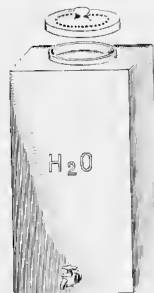
No. 47636



No. 47628



No. 47632



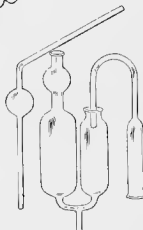
No. 47620



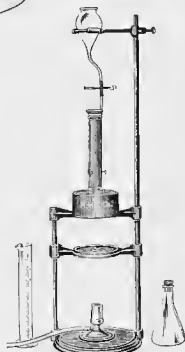
No. 47644



No. 47648



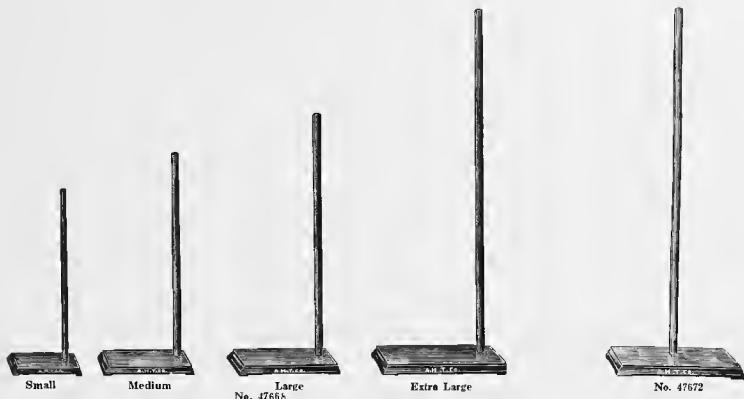
No. 47660



No. 47664

47624. Storage Tanks, for distilled water, of tin lined copper. These tanks are of stout construction of 16 oz. cold rolled copper, tin lined throughout, are cylindrical in shape, with a cover at top and tin lined faucet at bottom and with water gauge at the side. The 100 gallon size is reinforced with a heavy iron band around the middle.
- | | | | |
|------------------------|-------|-------|-------|
| Capacity, gallons..... | 25 | 50 | 100 |
| Each..... | 35.00 | 40.00 | 50.00 |
47628. Straw Rings, plaited, for use as supports for flasks, dishes, beakers, etc.
- | | | | | | | |
|--------------------------|-----|-----|-----|-----|-----|-----|
| Inside diameter, mm..... | 50 | 75 | 100 | 125 | 150 | 200 |
| Each..... | .15 | .18 | .20 | .25 | .30 | .40 |
47632. Suberite Rings, for supporting flasks, dishes, etc. These are superior to straw rings commonly used for this purpose, being neater and more durable.
- | | | | | | | |
|---------------------------|-----|-----|-----|-----|-----|-----|
| Inside, diameter, mm..... | 30 | 60 | 90 | 120 | 150 | 180 |
| Each..... | .25 | .35 | .45 | .55 | .65 | .75 |
47636. Sulphur Apparatus, Dudley, improved form, as used at the present time in the Pennsylvania Railroad laboratories and which eliminates the complicated and delicate bromine holder. Glass parts only. 12.00
47640. Sulphur Apparatus, Meyer, for the determination of carbon in iron and steel by the use of barium hydrate, and the determination of sulphur by the aid of bromine; without stopcock.
- | | | |
|----------------------|------|------|
| Number of bulbs..... | 6 | 10 |
| Each..... | 1.25 | 1.50 |
47644. Sulphur Apparatus, Meyer, for the determination of sulphur in iron and steel by the bromine method; with stopcock.
- | | | |
|----------------------|------|------|
| Number of bulbs..... | 6 | 10 |
| Each..... | 2.50 | 2.75 |
47648. Sulphur Apparatus, Wiborgh, for the exact colorimetric determination of sulphur in iron. Glass parts, with ring and clamp. 6.00
47652. Standard Color Scale, with percentage table. 10.00
47656. Prepared linen discs treated with cadmium, for use with the above. Per 100. 4.00
47660. Sulphur Apparatus, as used in oil refining, consisting of three glass parts with wooden base. 1.75
47664. Sulphur Photometer, Parr, for indicating the percentage of sulphur in coal, coke, petroleum, etc., by making use of a fused mass secured as a by-product in combustions with the Parr Calorimeter. The mass is dissolved in water precipitated with barium chloride and the density of the precipitate estimated by reading the depth of the liquid in the graduated tube at which the light from the flame disappears, which reading shows the percentage of sulphur 35.00

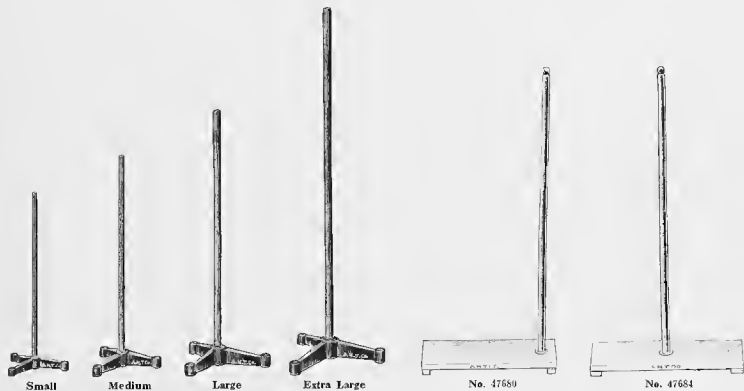
SUPPORTS



47668. Supports, without Fittings, with rectangular base, of japanned cast iron with copper plated rod.

Size.....	Small	Medium	Large	Extra Large
Size of base, inches.....	4 x 6	5 x 8	5½ x 9	6 x 11
Height of rod, inches.....	15	20	24	36
Diameter of rod, inches.....	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Each.....	.30	.40	.60	1.00

47672. Support, without Fittings, with rectangular base of japanned cast iron 5 x 8 inches with rod in center, 20 inches high by $\frac{3}{8}$ inch in diameter..... .50

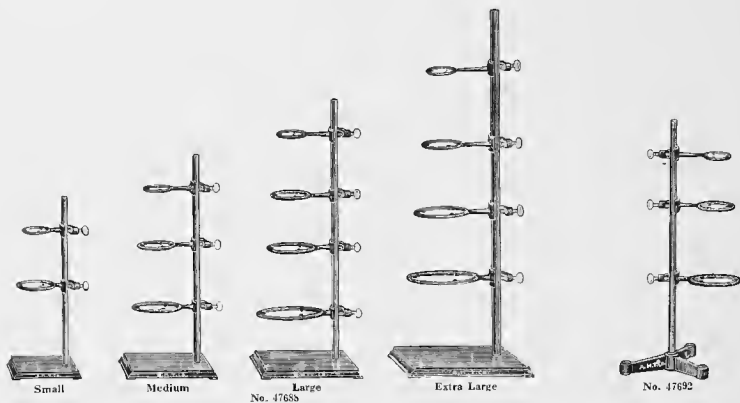


47676. Supports, without Fittings, with tripod base, of japanned cast iron with copper plated rod.

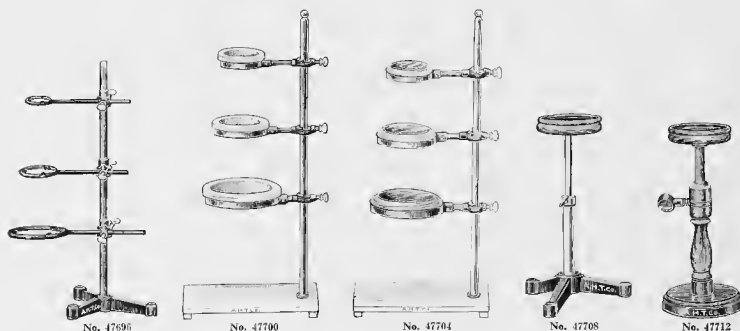
Size.....	Small	Medium	Large	Extra Large
Height of rod, inches.....	18	20	26	36
Diameter of rod, inches.....	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Each.....	.30	.45	.65	1.00

47680. Support, without Fittings, with solid glazed porcelain base 6½ x 8½ inches, with rod of polished brass, 18 inches high..... 4.00

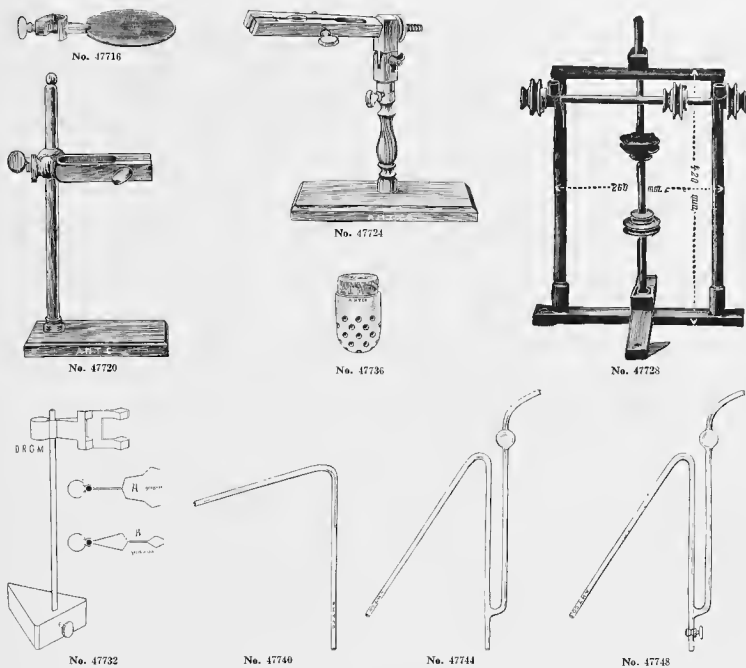
47684. Support, without Fittings, with solid glazed porcelain base 14 x 5½ inches with brass rod in center, 24 inches high..... 5.00



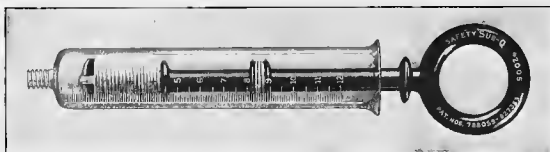
47688.	Supports, with Rings, consisting of Supports No. 47668 with rectangular base with No. 46072 Rings.				
	Size.....	Small	Medium	Large	Extra Large
	Number of rings.....	2	3	4	4
	Each.....	.50	.75	1.00	1.50
47692.	Supports, with Rings, consisting of Supports No. 47676 with tripod base with No. 46072 Rings.				
	Size.....	Small	Medium	Large	Extra Large
	Number of rings.....	2	3	4	4
	Each.....	.50	.80	1.05	1.50



47696.	Support, with Rings, consisting of No. 47676 with tripod base, medium size; three extension rings No. 46076, 31 inches outside diameter, and three clamp holders No. 24518 large size.....	1.60		
47700.	Support, with Rings, consisting of No. 47680 with rectangular porcelain base with three brass rings with porcelain inset and screw clamp, No. 46080, 80 mm diameter.....	5.50		
47704.	Support, with Rings, consisting of No. 47680 with rectangular porcelain base with three brass rings with wooden inset and screw clamp, No. 46084, 80 mm diameter.....	5.50		
47708.	Support Tables, with iron tripod, brass rod and wooden top, adjustable as to height.			
	Height extended, mm.....	200	300	400
	Diameter of top, mm.....	70	90	125
	Height closed, mm.....	120	190	240
	Each.....	1.50	1.75	2.00
47712.	Support Tables, of polished wood, adjustable as to height, same sizes as No. 47708.			
	Height extended, mm.....	200	300	400
	Each.....	.80	1.00	1.25

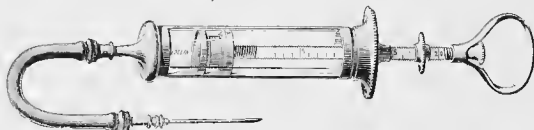


47716.	Support Table, of cast iron, with clamp for fastening to upright of apparatus support, 5 inches in diameter.....									.40
47720.	Support, Schellbach, of hardwood.....									2.00
47724.	Support, Gay-Lussac, of wood, adjustable in all directions.....									2.00
47728.	Support, Transmission, with horizontal and vertical shaft and two fixed and three adjustable pulleys. Very convenient in transmitting power from water, hot air, electric or other motors to stirring devices, etc., in the laboratory; 37 cm high by 18 cm wide.....									9.00
47732.	Support, on triangular base, with one clamp No. 24678, particularly suited for conductivity vessels, calomel normal electrodes, etc.....									1.50
47736.	Swimming Cups, Amberg, of porcelain, with perforations, for washing specimens; with cork stopper which floats the cup in the washing fluid.									
	Height, mm.....								35	.55
	Diameter, mm.....								26	.36
	Each.....								.50	.65
47740.	Syphons, of glass, plain form.									
	Length, mm.....	200	300	375	500	750	1000			
	Each.....	.25	.25	.30	.40	.75	1.00			
47744.	Syphons, of glass, with suction tube.									
	Length, mm.....	200	300	375	500	750	1000			
	Each.....	.35	.40	.50	.65	1.00	1.30			
47748.	Syphons, of glass, with suction tube and glass stopcock.									
	Length, mm.....		300	375	500	750	1000			
	Each.....		1.50	1.75	2.25	2.50	3.00			



No. 47756

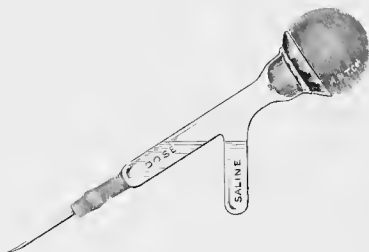
47756. **Syringe, Sub-Q Safety**, for bacteriological and serological work. A very satisfactory glass syringe at low price. With a piston of black glass and safety device preventing the loosening of the asbestos packing and the larger sizes have ring handle. The needles are attached by screw thread except in the larger sizes which have a flexible coupling. Price includes leather case and two steel needles.
- | | | | | | | | |
|--|------|------|------|------|------|------|------|
| Capacity, cc..... | 2 | 4 | 6 | 12 | 20 | 50 | 100 |
| Each..... | 1.25 | 1.50 | 1.75 | 2.00 | 2.50 | 5.00 | 7.50 |
| 47760. Extra Steel Needles for above, Per dozen..... | | | | | | | 2.75 |



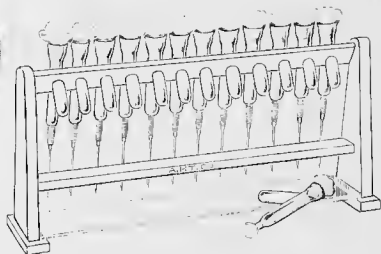
No. 47764

Syringe, Roux, for bacteriological and serological work, as used in the Pasteur Institute of Paris; original French make; widely in Pasteur treatment and for tuberculin injections in veterinary practice.

- | | | | | | |
|--|------|------|-------|-------|-------|
| Capacity, cc..... | 5 | 10 | 20 | 50 | 100 |
| 47764. Syringe, only, without needles or case..... | 2.80 | 3.60 | 5.60 | 8.80 | 11.20 |
| 47765. Syringe in case with two steel needles..... | 6.00 | 7.20 | 10.00 | 14.00 | 20.00 |
| 47766. Extra glass barrels..... | .30 | .30 | .40 | .80 | 1.20 |
| 47767. " pistons..... | .20 | .20 | .20 | .40 | .60 |
| 47768. " rubber washers..... | .10 | .10 | .10 | .20 | .30 |
- Needles, for Roux Syringes.**
- | | | | | |
|------------------------------------|------|------|------|------|
| Length, mm..... | 25 | 30 | 40 | 50 |
| Inside diameter, mm..... | .65 | .9 | .9 | .1 |
| 47770. Steel, each..... | .60 | .60 | .60 | .70 |
| 47772. Platinum iridium, each..... | 1.15 | 2.00 | 2.25 | 3.25 |



Nos. 47776 and 47780



No. 47784

Syringe, Hitchens, for Injecting of Precise Amounts. This syringe provides a convenient method of washing out the entire dose from the syringe with a normal salt solution without the removal of bulb or syringe barrel or the assistance of another person. The glass parts are made of Jena alkali-free glass which is practically insoluble even during sterilization with the normal salt solution. See *Journal of Experimental Medicine*, Vol. VIII, No. 5, October 12, 1906.

- | | |
|--|-----|
| 47776. Syringe Barrel of Jena alkali-free glass, with rubber connection and needle..... | .25 |
| 47780. Bulb, only, of red rubber, for injecting..... | .60 |
| 47784. Rack, Rosenau, for 12 syringes, with glass shelf at bottom. See <i>Bulletin 19, 1904, U. S. Public Health and Marine Hospital Service</i> | .50 |



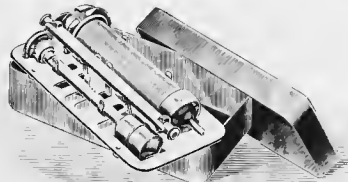
No. 47788—1 cc in



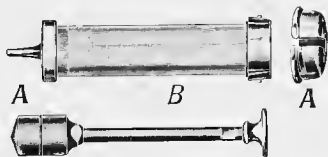
No. 47788— $\frac{1}{2}$ cc in



No. 47804



No. 47792



No. 47788—5 cc in

SYRINGE, RECORD, ORIGINAL MAKE. Not to be confused with many imitations now on the market; with improved conical plunger to expel the last drop. When glass barrels are broken, customers are requested to return to us all the metal parts of the syringe, whereupon we will send a complete new syringe at the prices indicated under the heading "Repair Exchange" in the price list below. This is necessary because each barrel must have its piston individually ground in and because of the difficulty in the use of the special solder used in joining the glass to the metal in these syringes.

	Capacity, cc.	$\frac{1}{2}$	1	1	2	5	10	20	
	Graduated in, cc.	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2	
47788.	Record Syringe, only, without case of needles.	2.50	2.50	2.10	2.60	3.80	4.40	4.80	
47792.	Record Syringe, in metal case with two steel needles.	3.00	3.00	2.60	3.20	4.60	5.60	7.20	
47796.	Record Syringe, in metal case with two platinum-iridium needles.	3.65	3.65	3.40	5.00	8.00	9.25	10.80	
	Repair Exchange.	1.60	1.60	1.40	1.80	2.00	2.40	2.80	
	Sizes of needles regularly furnished.	2 H 20 $\frac{1}{2}$	H 16 & H 20	2 H 10 $\frac{1}{2}$	H 1 & 12	S 1 & 4	S 1 & 4	S 1 & 4	
47804.	Set of 5 Record Syringes, 1 cc, 2 cc, 5 cc, 10 cc and 20 cc, in metal case, with 20 steel needles.								25.00

Directions for Sterilizing Syringes of the Record Type.

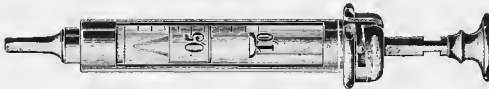
Detach piston from barrel before sterilization. Put syringe into cold water and light lamp of sterilizer. After sterilization let syringes become cold before placing them into the cold disinfectant. Do not use any other sterilizers but those with perforated trays. Record syringes should not be sterilized in any other way than by boiling them in water.



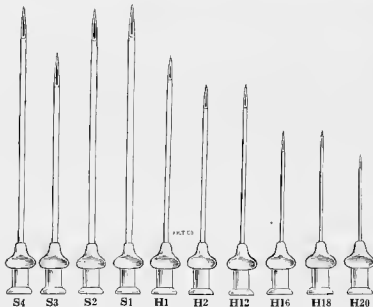
No. 47805

SYRINGE, RECORD-BRUNEAU. Construction the same as the regular Record Syringe, with the exception of the removable cap which is made long enough to retain the piston during sterilization, etc., thus obviating the necessity of complete withdrawal. This improvement effects a great saving in time and breakage and insures certainty of aseptic conditions. When glass barrels are broken, customers are requested to return to us all the metal parts of the Syringe, whereupon we will send a complete new Syringe at the prices indicated under the heading "Repair Exchange," in the price list below. This is necessary because each barrel must have its piston individually ground in and because of the difficulty in the use of the special solder used in joining the glass to the metal in these syringes.

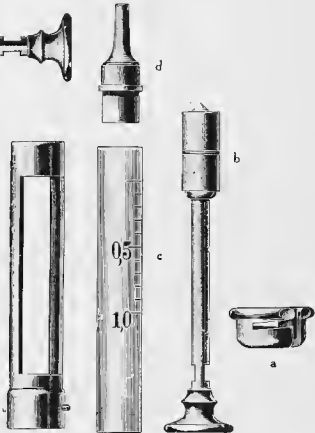
Capacity, cc.....	1	2	5	10	20
47808. Syringe, only, without case or needles.....	2.50	3.15	4.30	5.10	5.75
47812. Syringe in metal case with two steel needles.....	3.00	3.60	5.00	6.20	7.40
47816. Syringe " " " " platinum-iridium needles.....	5.00	6.00	8.50	10.60	13.80
Repair Exchange.....	1.40	1.80	2.20	2.40	2.80
Sizes of needles regularly furnished.....	2 H 16's	H 1 & 12	S 1 & 4	S 1 & 4	S 1 & 4



No. 47824 Assembled



Nos. 47840 and 47844



No. 47824 with parts disassembled

SYRINGE, REFORM. The distinctive feature of this syringe is the entire absence of metallic solder of any kind. The glass barrels are ground to fit the metal parts and the syringe may be dismantled for cleaning, or the replacement of the glass barrel and immediately reassembled. As each glass barrel is individually ground to its accompanying piston, it is necessary in ordering new glass barrels to order a piston fitted to each. These are kept in stock as per price list below and glass barrel with fitted piston may be used with any Reform syringe of the same capacity.

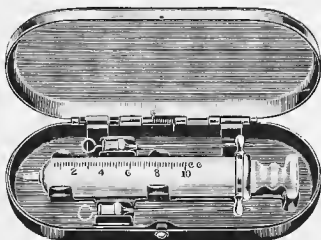
Capacity, cc.....	1	2	5	10	20
47824. Syringe, only without case or needles.....	2.40	2.85	4.40	5.20	6.20
47828. Syringe, in metal case with two steel needles.....	3.20	3.80	5.60	6.50	8.00
47832. Syringe, " " " " platinum-iridium needles.....	5.25	6.20	9.00	11.00	14.40
47836. Glass Barrel with piston ground in to fit.....	1.40	1.80	2.20	3.20	4.00
Sizes of needles regularly furnished.....	2 H 16's	H 1 & 12	S 1 & 4	S 1 & 4	S 1 & 4

NEEDLES, FOR THE RECORD, RECORD-BRUNEAU AND REFORM SYRINGES. The letter "S" refers to the needles from the serum group of sizes and "H" refers to the regular hypodermic series. Prices of platinum-iridium needles are subject to market fluctuations.

Size.....	S1	S2	S3	S4	H1	H2	H12	H16	H18	H20
47840. Steel, Needles each.....	.20	.20	.18	.18	1.00	1.00	1.00	1.00	1.00	1.00
" " per dozen.....	2.25	2.25	1.75	1.75	1.00	1.00	1.00	1.00	1.00	1.00
47844. Platinum-iridium Needles, each.....	3.35	2.75	1.60	1.65	1.40	1.15	1.15	.65	.60	.60



No. 47848 20cc. size



No. 47852



No. 47848 1cc. size

Syringe, Luer, for bacteriological and serological work; an all glass, aseptic syringe with slip-on needles, American make. Considered by many to be superior to the original French make.

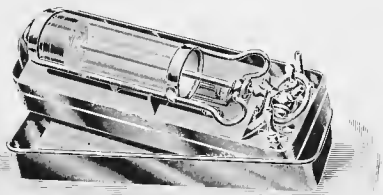
Capacity, cc.....	1	5	10	20
Graduated in, cc.....	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{2}$	1
47848. Luer Syringe, only, without needles or metal case.....	1.75	2.25	3.00	4.50
47852. Luer Syringe, with metal case and two steel needles.....	2.75	3.50	4.50	6.00
47856. Luer Syringe, with metal case and two platino-iridium needles.....	3.75	6.00	7.00	8.50

Needles, only, for Luer Syringes. American make.

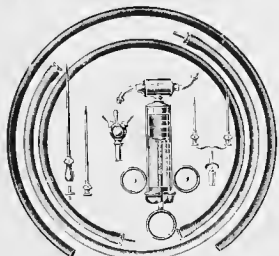
Size.....	22 G	20 G	20 to 22 G
Length, inches.....	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ to 2
47860. Steel Needles, per dozen.....	2.50	2.50	3.00
47864. Platino-iridium Needles, per dozen.....	16.00	19.00	



No. 47868



No. 47872

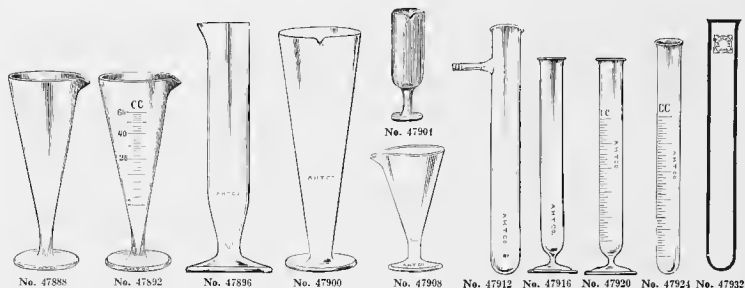


No. 47880

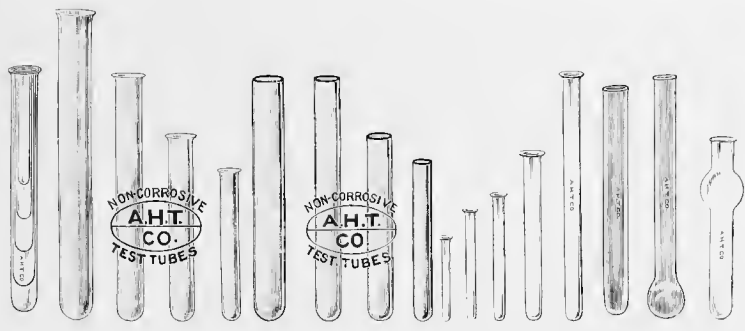


No. 47876

47868. Syringe, for injecting in veins and arteries, each with three canulae, with stopcock, nickel plated.				
Capacity, cc.....	50	100	150	200
Each.....	3.50	8.25	9.50	11.00
47872. Syringe, or Aspirator, Record, 100 cc capacity as used by manufacturers of biological products for injecting live bacteria into horses, etc. Complete in case with 3-way cock, 2 connecting tubes with metallic connections for same, 2 long steel canulae, 1 trocar, 1 conical tubulation for direct attachment of the canulae and 1 olive form tubulation.....				21.60
47876. Syringe, same as above, with 2 canulae and 3-way cock, but without needles, trocars, tubes or case.			50	100
Capacity, cc.....			10.00	11.25
Each.....				
47880. Syringe, Record Universal, for infusions, injections, punctures and aspiration, consisting of a 10 cc Record Syringe with three finger rings, attachable ventilating head, 3-way cock, needle connection, steel needles for serum and other subcutaneous injections, puncture canula, infusion canulae, tubing with metallic connections, long tube for injections in connection with ventilating head. Complete in case.....				14.50
47884. Syringe, Record Universal, same as above but without attachable ventilating head, needle connection, needles, tubes or case.....				8.00



47888.	Test Glasses, for collecting sediment, conical form, with foot and spout.								
	Capacity, cc.....	30	50	100	200	300			
	Each.....	.15	.15	.20	.30	.35			
47892.	Test Glasses, same as above, graduated.								
	Capacity, cc.....	30	50	100	200	300			
	Each.....	.40	.45	.50	.75	1.00			
47896.	Test Glass, cylindrical form, Snydenham Hospital model; height 240 mm, diameter 40 mm, capacity 180 cc; with blunt conical bottom.....					.40			
47900.	Test Glass, tall conical form, with blunt bottom, 200 cc capacity, 20 cm high, with spout.....					.25			
47904.	Test Glasses, lecture table form, with spout.						125	250	
	Capacity, cc.....								
	Each.....						.25	.40	
47908.	Test Glasses, low wide form with broad flattened bottom instead of point as in No. 47888; convenient for cleaning or for crushing crystals with glass rod; with spout.								
	Capacity, cc.....			50	100	250			
	Each.....			.18	.25	.40			
47912.	Test Tubes, with side neck and lip.								
	Length, mm.....		120	150	180	200			
	Each.....		.05	.06	.10	.12			
47916.	Test Tubes, with lip and foot.								
	Height, mm.....	100	125	150	175	200	250		
	Each.....	.07	.08	.10	.12	.15	.20		
47920.	Test Tubes, graduated, with lip and foot.								
	Capacity, cc.....				5	15	25		
	Graduated in, cc.....				$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$		
	Each.....				.45	.50	.60		
47924.	Test Tubes, graduated, with lip, but without foot.								
	Capacity cc.....	5	10	15	20	25	30		
	Graduated in, cc.....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$		
	Each.....	.30	.35	.40	.45	.45	.50		
47928.	Test Tubes, Opaque Fused Silica, heavy wall, with lip.								
	Length, inches.....		4	5	5	6	6	7	
	Diameter, inches.....		$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	
	Each.....		.85	1.00	1.20	1.45	1.75	2.25	
47932.	Test Tubes, Thin Wall, of Jena Fiolax Tubing. These tubes are to be identified by a black longitudinal stripe. This glass is easily worked with the blowpipe flame and is not to be confused with the hard or combustion tubing. It is practically alkali free and is recommended for use wherever the greatest insolubility in water, alkalies and acids is desired, as well as great resistance to sudden temperature changes.								
	Length, mm.....	100	120	140	140	160	160	180	200
	Outside diameter, mm.....	14	16	18	20	18	20	22	25
	Each.....	.03	.04	.05	.05	.05	.06	.07	.09
	Per 100.....	2.00	2.80	3.60	4.00	3.60	4.40	5.60	7.20
47936.	Test Tubes, Thick Wall, of Jena Combustion Tubing, containing very little alkali and fairly tractable in the blowpipe flame, although as hard to fuse as the best Bohemian potash tubing.								
	Length, mm.....	100	120	140	160	180	200		
	Outside diameter, mm.....	12	15	18	20	22	25		
	Each.....	.05	.07	.09	.11	.14	.18		
	Per 100.....	4.00	5.60	7.20	8.80	11.20	14.40		



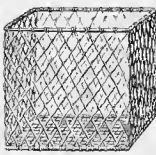
No. 47940 No. 47944 No. 47948 No. 47952 No. 47956 No. 47960 No. 47964

NOTE:—We do not carry in stock test tubes made of commercial glass tubing because of the crystallization on the surface of this tubing which frequently takes place in laboratory use. The diameters of all test tubes are approximate outside diameters of the tubing. A considerable variation must be allowed for here in the diameter of the tubing and, in the case of heavy wall test tubes, in the thickness of the wall, because of the unavoidable variation in drawing the tubing. Where test tubes must be furnished of an absolutely uniform diameter and thickness of wall they must be selected from our regular stock and a higher price charged. Prices given per 1000 apply only on orders of at least 1000 or more. All test tubes are neatly packed in cartons of 100 each.

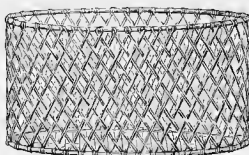
47940. Test Tubes, Thin Wall, With Lip, of good German glass, for chemical work.	Length, mm.....	100	120	120	120	120	150	150	150	200
	Outside diameter, mm.....	12	13	15	18	16	18	20	25	
	Per 100.....	.65	.85	1.05	1.25	1.25	1.55	1.80	2.50	
	Per 1000.....	5.15	6.60	8.40	10.00	10.00	12.35	14.35	31.25	
47944. Test Tubes, "Non-Corrosive," Thin Wall, With Lip, for chemical work.	Length, mm.....	75	100	120	120	120	120	150	150	
	Outside diameter, mm.....	11	12	13	15	15	18	18	25	
	Per 100.....	.85	1.10	1.30	1.55	1.55	1.65	1.80	2.50	
	Per 1000.....	6.80	8.80	10.40	12.40	12.40	13.20	14.40	31.25	
	Length, mm.....	150	150	150	200	200	200	250	250	
	Outside diameter, mm.....	18	20	25	20	20	25	25	25	
	Per 100.....	11.95	2.00	3.60	3.00	3.00	4.00	5.50	5.50	
	Per 1000.....	5.60	16.00	28.80	24.00	24.00	32.00	44.00	44.00	
47948. Test Tubes, "Non-Corrosive," Thick Wall, Without Lip, for use as culture tubes in bacteriology.	Length, mm.....	100	100	120	120	120	150	150	150	
	Outside diameter, mm.....	12	15	13	16	18	16	18	20	
	Per 100.....	1.75	2.10	2.00	2.40	2.60	2.60	2.85	3.50	
	Per 1000.....	13.60	16.80	16.00	19.20	20.80	20.50	22.80	35.00	
47952. Test Tubes, "Non-Corrosive," for Serological Work, of medium weight wall, with flat well formed lip;	Length, mm.....	50	65	65	65	65	75	100	100	150
	Outside diameter, mm.....	4	4	6	10	12	6	10	6	10
	Per 100.....	1.00	1.00	1.00	1.25	1.25	1.10	1.25	1.25	1.40
47956. Test Tubes, of Hardest Bohemian Combustion Tubing, very heavy wall, with slight lip.	Length, mm.....	100	125	150	150	200	200	250	250	
	Diameter, mm.....	16	16	18	18	25	25	25	25	
	Each.....	.10	.12	.15	.15	.25	.25	.30	.30	
47960. Test Tubes, of Hardest Bohemian Combustion Tubing, heavy wall, with slight lip and bulb at bottom.	Length, mm.....	100	120	150	150	180	180	200	200	
	Each.....	.15	.18	.20	.20	.25	.25	.35	.35	
47964. Test Tubes, with bulb near top which tends to prevent boiling over of contents and which enables tube to be laid on the table without the contents overflowing.	Length, mm.....	125	150	150	150	150	150	150	150	
	Diameter, mm.....	16	18	18	18	18	18	18	18	
	Each.....	.10	.12	.12	.12	.12	.12	.12	.12	



No. 47968



No. 47972



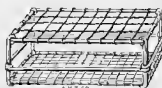
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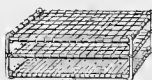
No. 47988



No. 47980



No. 47992

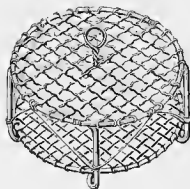


No. 47996

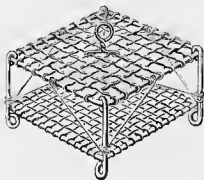


No. 47984

47968. **Test Tube Baskets**, cylindrical, of heavily galvanized wire, for use in incubators and sterilizers; 6 inches high by 5 inches diameter..... .50
 47972. **Test Tube Basket**, similar to above but rectangular, 6 x 5 x 4 inches..... .45
 47976. " " cylindrical, 10 inches in diameter by 6 inches high; for use in medium size autoclave No. 20936..... 1.50
 47980. **Test Tube Cleaner**, Neisser, for the cleaning of test tubes, particularly culture tubes, by means of water and steam; consisting of a rectangular copper box 40 x 16 cm, with 65 rods with springs at the top, to prevent the breaking of the test tubes, and outlet for both steam and water.
Duty Free..... 27.25 **Duty Paid**..... 32.75
 47984. **Test Tube Filling Attachment**, for measuring out exact quantities of fluid; consists of a separatory funnel with two-way stopcock and graduated side tube. Price does not include support and ring.
 Capacity, cc..... 250 500 1000
 Each..... 2.50 3.00 4.00
 47988. **Test Tube Support**, nickel plated on iron base 6 inches high by 11 inches long; for 10 test tubes..... 2.00
 47992. " " " of tinned wire, for 40 test tubes up to 35 mm diameter..... .50
 47996. " " " with double shelf, for 90 test tubes of not over 12 mm outside diameter, as used in serological work; entire rack may be immersed in water bath..... 1.00



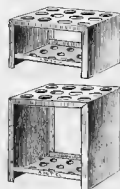
No. 48000



No. 48004



No. 48008



No. 48012

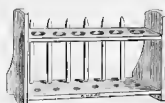
48000. **Test Tube Support**, of tinned wire, circular form, holding 40 test tubes of 18 mm diameter..... .75
 48004. " " " same as No. 48000 but square form..... .75
 48008. **Test Tube Support**, of copper, for use in water baths, incubators, sterilizers, etc.; holes are 23 mm diameter.
 Diameter, inches..... 5 6 8 10
 Number of holes..... 14 24 36 48
 Each..... .75 1.00 1.25 1.75
 48012. **Test Tube Support**, of copper with bottom shelf having flange to receive contents of tube in case of breakage; for use in incubators, sterilizers, etc.; with twelve 1/4 inch holes.
 Size, inches..... 3 x 4 x 2 1/2 3 x 4 x 4 1/2
 Each..... 1.00 1.25



No. 48016



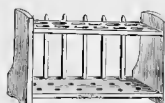
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No. 48024



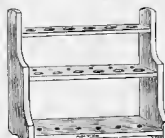
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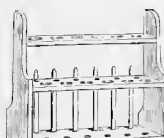
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No. 48040



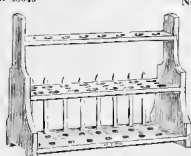
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No. 48048



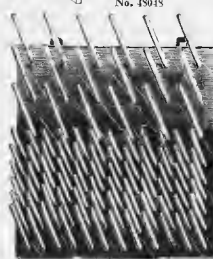
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No. 48056



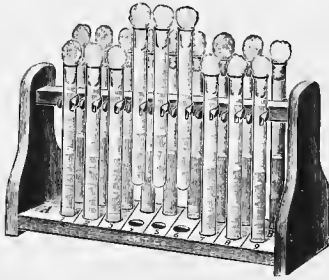
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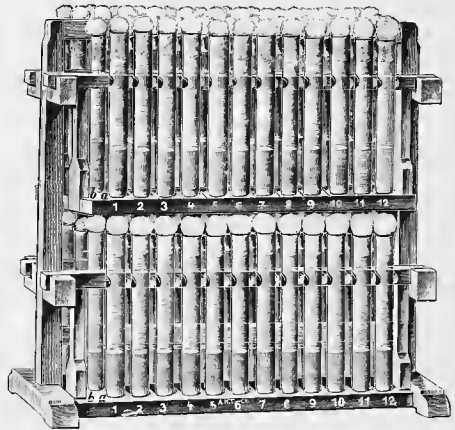
No. 48064

Note—Our Test Tube Supports are put together with brass pins, and do not come apart. All holes in the bottom deck are full $\frac{1}{4}$ inch in diameter and all holes at top are $\frac{1}{8}$ inch in diameter.

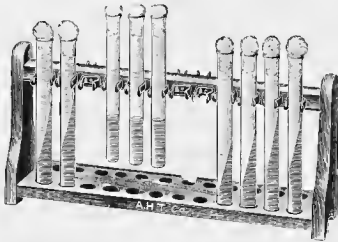
48016.	Test Tube Support , of beechwood, oil finish, single row, on turned wood supports.		
	Number of holes.....	6	12
	Each.....	.20	.25
48020.	Test Tube Support , of beechwood, oil finish, single deck, single row.		
	Number of holes.....	6	12
	Each.....	.25	.30
48024.	Test Tube Support , of beechwood, oil finish, with pins in rear, single row, single deck.		
	Number of holes.....	6	12
	Each.....	.30	.45
48028.	Test Tube Support , of beechwood, oil finish, single deck, double row.		
	Number holes.....	12	24
	Each.....	.30	.45
48036.	Test Tube Support , of beechwood, oil finish, single deck, double row, with pins in rear.		
	Number of holes.....	12	24
	Each.....	.40	.60
48040.	Test Tube Support , of black walnut, oil finish, single deck, double row, with 12 heavy pins in rear and with 12 extra large holes; very heavy construction		
	Number of holes.....		.80
48044.	Test Tube Support , of beechwood, oil finish, double deck.		
	Number of holes.....	12	24
	Each.....	.35	.60
48048.	Test Tube Support , of beechwood, oil finish, double deck, with pins in rear.		
	Number of holes.....	12	24
	Each.....	.40	.80
48052.	Test Tube Support , of beechwood, oil finish, double deck, with two rows on lower deck and one on upper deck. Number of holes.....	12	24
	Each.....	.70	1.00
48056.	Test Tube Support , of beechwood, oil finish, double deck, with two rows on lower deck and one on upper deck, with row of pins in rear. Number of tubes.....	24	40
	Each.....	.90	1.25
48060.	Test Tube Support , consisting of block with 12 drying pins.....		.30
48064.	“ “ “ for hanging on wall, consisting of board with 18 large and 72 small pins.....		2.50



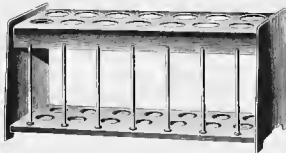
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No. 48092



No. 48084



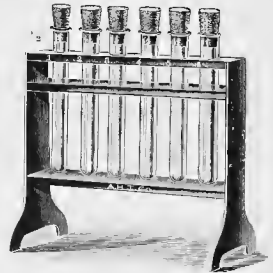
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No. 48076



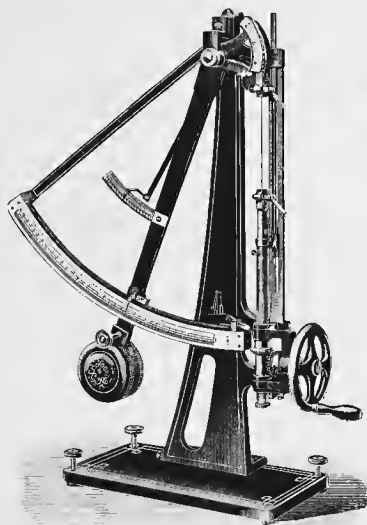
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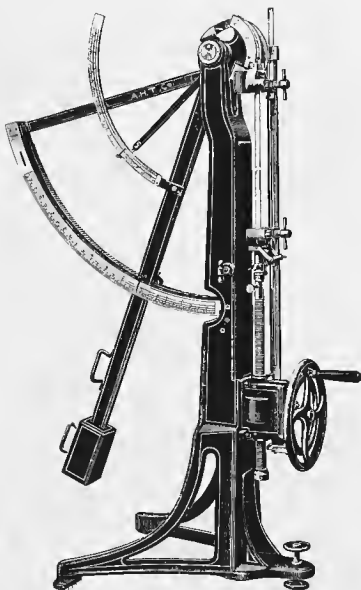
No. 48068

48068. **Test Tube Support, Weidanz**, of copper, for use in serological work; tubes supported so that reaction may be readily observed and each hole stamped with number.
 For, tubes 6 10
 Each 1.75 3.00
48072. **Test Tube Support**, of stamped steel, black enamelled, with 14 holes of 1 inch diameter and with 7 pins40
48076. **Test Tube Support**, with spring clip; also convenient for use with centrifuge tubes.25
48080. " " " " with ground glass plate on base for writing.80
48084. **Test Tube Support, Woithe**, arranged especially for bacteriological and serological work, permitting the entire contents of the tube to remain in sight. The test tubes are held in place by strong spring clips making it possible to hold them at any height. For 24 test tubes; size of support 32 cm long, 7½ cm wide and 16 cm high. 1.00
48088. **Test Tube Support, Woithe**, similar to above but for 18 tubes so arranged that all are visible from either side of the rack, i.e., in alternating series with bottom of racks numbered. 1.15
48092. **Test Tube Support, Woithe**, similar to above but for 96 tubes and with main support 38½ cm long by 19 cm wide by 37 cm high and with separate support carrying each series of 12 tubes quickly demountable. 7.50

TESTING APPARATUS FOR PAPER, YARNS, TEXTILES, RUBBER, LEATHER, ETC.



No. 48096



No. 48104

48096. Paper Tester, Schopper, for testing all kinds of paper as to both tearing strength in grams and as to tensile strength in both millimeters and percentage; for strips 15 x 180 mm. Stretching scale reads from 0 to 27 mm and from 0 to 15%. With single scale 0 to 30 kilos in 100 gram divisions.

Style	For hand power	With pulley for power driving	With hydraulic motor
Duty Free	120.45	174.90	150.15
Duty Paid	146.00	212.00	182.00

48100. Paper Tester, as above, with double scale, 0 to 5 kilos in 10 gram divisions and 0 to 30 kilos in 100 gram divisions.

Style	For hand power	With pulley for power driving	With hydraulic motor
Duty Free	127.05	181.50	156.75
Duty Paid	154.00	220.00	190.00

48104. Cloth and Leather Tester, Schopper, for cloths and woven textiles of all sorts, and for leather, etc. For specimens of from 100 to 400 mm in length and 50 mm in width. With stretch scale reading in both mm and percentage. Operating on the same principle as the paper and yarn testers but specially adapted for the materials above mentioned. As supplied by us to the leather testing laboratories of the U. S. Bureau of Chemistry. With two scales, from 0 to 60 kilos in $\frac{1}{16}$ lbs and 0 to 100 kilos in $\frac{1}{4}$ kilos.

Duty Free	270.60	Duty Paid	328.00
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48108. Cloth and Leather Tester, as above, with two scales, from 0 to 130 kilos in $\frac{1}{4}$ kilos and from 0 to 500 kilos in single kilos.

Duty Free	363.00	Duty Paid	440.00
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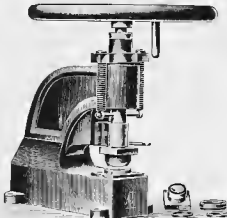
Note—Where leather and yarns are to be tested on the same machine a special clamp is provided at small extra expense.



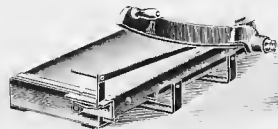
No. 48128



No. 48132

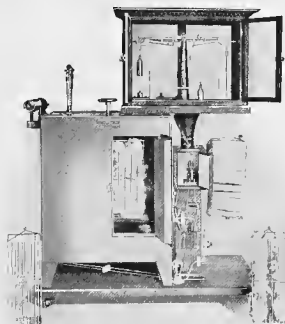


No. 48136

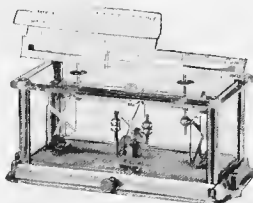


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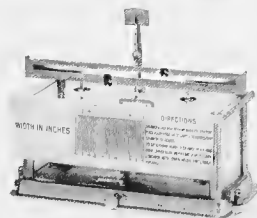
48128. Rubber Testing Machine, Schopper—Dalen—Martens, for testing the elasticity and tensile strength of rubber. The test specimen is of ring shape and is rotated during the experiment, which makes possible the establishment of a numerical expression of the test. The machine is operated by water pressure and requires about 40 lbs. pressure. A recording device for automatically making a diagram of the relation of the load to elongation is provided at extra charge. Strength is indicated in both millimeters and percentage. See "The Influence of the Shape of the Test Body upon the Results of the Strength Test," Communications of the Royal Material Testing Institute of Grosslichterfelde, Vol. 4, 1909. With two scales, 0 to 50 kilos in 100 gram divisions and 0 to 100 kilos in 200 gram divisions.
 Duty Free 539.55 Duty Paid 654.00
48132. Rubber Testing Machine, as above, but with automatic recording device.
 Duty Free 664.95 Duty Paid 806.00
48136. Test Ring Cutter, for making test specimens for above machine, with three knives.
 Duty Free 125.40 Duty Paid 152.00



No. 48172



No. 48176



No. 48180

48172. **Conditioning Oven, Emerson**, for the determination of the moisture content in textile materials, consisting of an electrically heated oven automatically maintained at the proper temperature by a thermostat. Arrangement is made within the oven for supporting four removable wire baskets or containers into which is placed the material to be conditioned. Balances are provided for weighing the material before and after conditioning, the latter weighing being made in the oven. A motor driven fan produces an artificial circulation of heated air through the oven and removes the moist atmosphere, thereby greatly reducing the time for testing. The apparatus is mounted on a wooden base and occupies a floor space of 2½ x 4 ft., with a total height of about 6 ft. The heating device operates on either alternating or direct current but voltage must be stated in ordering. 350.00
48176. **Balance, Torsion**, for determining the exact weight in ounces or grams of a running yard or meter of cloth of any width without calculation or the use of weights. A two inch square sample is cut by means of a special die and the scale brought to balance by means of a slide weight. The beam is so graduated that either 1 oz. or 5 grams can be read. 35.00
 Special Die, to cut 2 inch squares. 3.50
 Mallet, 2 lbs. in weight, for use with above die. 1.00
48180. **Balance, Torsion**, for determining the number of yards per pound of fabric of any width without calculation or the use of weights. A three inch square sample is weighed and the position of the weight on the beam indicates the number of yards per pound of sample. 40.00
 Special Die, to cut 3 inch squares. 3.50

We maintain a reference catalogue file of over seven hundred manufacturers and dealers in Laboratory Apparatus. Where large equipment lists are in preparation we recommend that customers avail themselves of the opportunity we provide for the convenient and undisturbed consultation of these catalogues before lists are finally prepared for estimates. The use of these catalogues involves no obligation to make purchase of us.

THERMOMETERS

$$\text{Fahrenheit}^\circ = \frac{\text{Centigrade}^\circ \times 9}{5} + 32. \quad \text{Centigrade}^\circ = \frac{\text{Fahrenheit}^\circ - 32 \times 5}{9}$$

Ready Reference Comparison of Centigrade and Fahrenheit Thermometer Scales

Cent.°	Fah.°	Cent.°	Fah.°	Cent.°	Fah.°	Cent.°	Fah.°	Cent.°	Fah.°	Cent.°	Fah.°
-40	-40	7	44.6	38	100.4	69	156.2	99	210.2	245	473
-35	-31	8	46.4	39	102.2	70	158.0	100	212.0	250	482
-30	-22	9	48.2	40	104.0	71	159.8	105	221.0	255	491
-25	-13	10	50.0	41	105.8	72	161.6	110	230.0	260	500
-20	-4.0	11	51.8	42	107.6	73	163.4	115	239.0	265	509
-19	-2.2	12	53.6	43	109.4	74	165.2	120	248.0	270	518
-18	-0.4	13	55.4	44	111.2	75	167.0	125	257.0	275	527
-17	1.4	14	57.2	45	113.0	76	168.8	130	266.0	280	536
-16	3.2	15	59.0	46	114.8	77	170.6	135	275.0	285	545
-15	5.0	16	60.8	47	116.6	78	172.4	140	284.0	290	554
-14	6.8	17	62.6	48	118.4	79	174.2	145	293.0	295	563
-13	8.6	18	64.4	49	120.2	80	176.0	150	302.0	300	572
-12	10.4	19	66.2	50	122.0	81	177.8	155	311.0	310	590
-11	12.2	20	68.0	51	123.8	82	179.6	160	320	320	608
-10	14.0	21	69.8	52	125.6	83	181.4	165	329	330	626
-9	15.8	22	71.6	53	127.4	84	183.2	170	338	340	644
-8	17.6	23	73.4	54	129.2	85	185.0	175	347	350	662
-7	19.4	24	75.2	55	131.0	86	186.8	180	356	360	680
-6	21.2	25	77.0	56	132.8	87	188.6	185	365	370	698
-5	23.0	26	78.8	57	134.6	88	190.4	190	374	380	716
-4	24.8	27	80.6	58	136.4	89	192.2	195	383	390	734
-3	26.6	28	82.4	59	138.2	90	194.0	200	392	400	752
-2	28.4	29	84.2	60	140.0	91	195.8	205	401	420	788
-1	30.2	30	86.0	61	141.8	92	197.6	210	410	440	824
0	32.0	31	87.8	62	143.6	93	199.4	215	419	460	860
1	33.8	32	89.6	63	145.4	94	201.2	220	428	480	896
2	35.6	33	91.4	64	147.2	95	203.0	225	437	500	932
3	37.4	34	93.2	65	149.0	96	204.8	230	446	520	968
4	39.2	35	95.0	66	150.8	97	206.6	235	455	540	1004
5	41.0	36	96.8	67	152.6	98	208.4	240	464	560	1040
6	42.8	37	98.6	68	154.4						



Nos. 48200 to 48205

48200. Thermometers, with enclosed paper scale, with either Centigrade or Fahrenheit scales, as indicated; outside diameter 9 to 10 mm.
 Range..... 100° C. 150° C. 200° C. 250° C. 300° C. 212° F. 300° F. 400° F. 600° F.
 Length, mm..... 300 300 350 350 350 300 300 350 400
 Each..... .50 .60 .65 .75 .90 .50 .60 .75 .90
48204. Thermometers, with enclosed paper scale, with both Centigrade and Fahrenheit scales, outside diameter 9 to 10 mm.
 Range, Centigrade..... 100° C. 150° C. 200° C. 360° C.
 " Fahrenheit..... 212° F. 300° F. 400° F. 600° F.
 Length, mm..... 300 300 350 400
 Each..... .80 .90 1.00 1.25
48208. Thermometers, with enclosed paper scale, short form, with both Centigrade and Fahrenheit scales; outside diameter 7 mm.
 Range, Centigrade..... -10° to +100° C. 100° to 220° C.
 " Fahrenheit..... +14° to +212° F. 212° to 450° F.
 Length, mm..... 100 120
 Each..... .75 1.00



Nos. 48212 to 48216

48212. Thermometers, with enclosed opal glass scale, with capillary of Jena glass; with either Centigrade or Fahrenheit scales, as indicated; outside diameter from 9 to 10 mm.
 Range..... 100° C. 150° C. 200° C. 360° C. 212° F. 300° F. 400° F. 600° F.
 Length, mm..... 300 300 350 400 300 300 350 350
 Each..... 1.10 1.20 1.40 1.80 1.10 1.20 1.40 1.80
48216. Thermometers, with enclosed opal glass scale and capillary of Jena glass; with both Centigrade and Fahrenheit scales; outside diameter 9 to 10 mm.
 Range, Centigrade..... 100° C. 150° C. 200° C. 360° C.
 " Fahrenheit..... 212° F. 300° F. 400° F. 600° F.
 Length, mm..... 290 300 360 390
 Each..... 1.35 1.50 1.75 2.00

Nos. 48220 to 48224

48220. **Thermometers**, engraved on stem, with opal glass background and safety reservoir at top of capillary; diameter 6 mm; with either Centigrade or Fahrenheit scales as indicated. A widely used laboratory thermometer.

Range	100° C.	150° C.	200° C.	360° C.	212° F.	300° F.	400° F.	600° F.
Length, mm.	300	300	350	400	300	300	350	400
Each	1.00	1.10	1.25	1.50	1.00	1.10	1.25	1.50

48224. **Thermometer**, engraved on stem, with opal glass background and safety reservoir at top of capillary, diameter 6 mm; with both Centigrade and Fahrenheit scales.

Range, Centigrade	100° C.	150° C.	200° C.	360° C.
" Fahrenheit	212° F.	300° F.	400° F.	600° F.
Length, mm.	300	300	350	400
Each	1.25	1.50	1.75	2.00

48226. **Thermometers, A. H. T. Co. Special**, engraved on stem, with safety reservoir at top of capillary, of Jena 16 III glass; recommended for laboratory work generally where accuracy is required but where the expense of a precision thermometer is not justified.

Range, Centigrade	0-50°	0-50°	0-100°	0-100°	100-200°	0-200°	100-200°
Graduated to	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$
Length, mm.	330	380	400	600	500	600	600
Each	3.00	3.25	3.25	4.00	3.50	4.25	5.00

48228. **Thermometer, Precision**, etched on stem, with white background, of Jena 16 III glass. Those reading over 250° C. are filled with nitrogen. In the higher ranges the glass used is the Jena Borosilicate 59 IV.

Range	-10 to +100° C.	-10 to +100° C.	-10 to +100° C.	-10 to +100° C.	-10 to +200° C.
Graduated in	1°	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	1°
Each, without certificate	2.75	3.50	5.00	9.00	2.75
Each, with P. T. R. certificate	3.65	4.40	7.25	11.50	5.75
Range	-10 to +250° C.	-5 to +360° C.	-5 to +360° C.	-5 to +500° C.	-5 to +550° C.
Graduated in	$\frac{1}{2}^{\circ}$	1°	$\frac{1}{2}^{\circ}$	1°	1°
Each, without certificate	4.50	5.00	6.50	7.50	9.00
Each, with P. T. R. certificate	7.50	7.25	8.75	10.85	13.45

48232. **Thermometers, Normal**, with enclosed glass scale, constructed in exact accordance with Paragraph 12 of the regulations of the Physikalisch-Technische Reichsanstalt; capillary is of Jena Normal glass. Thermometers reading from 250° to 400° C. are filled with nitrogen and those reading from above 100° C. to 550° C. with nitrogen at a pressure of 20 atmospheres

Range	-10 to +100° C.	-10 to +100° C.	-10 to +100° C.	-10 to +100° C.	-5 to +200° C.
Graduated in	1°	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	1°
Each, without certificate	4.50	7.00	10.00	15.00	6.00
Each, with P. T. R. certificate	5.40	7.90	12.25	17.50	8.50
Range	-5 to +200° C.	-5 to +200° C.	-5 to +360° C.	-5 to +360° C.	-5 to +360° C.
Graduated in	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$	1°	$\frac{1}{2}^{\circ}$	$\frac{1}{2}^{\circ}$
Each without certificate	7.50	11.75	9.00	12.00	12.00
Each, with P. T. R. certificate	10.00	15.15	11.25	14.25	14.25

48236. **Thermometers, Normal**, same as above but etched on stem and with zero point indicated.

Range	+180 to +550° C.	+100 to 550° C.
Graduated in	1°	5°
Each, without certificate	11.00	13.50
Each, with P. T. R. certificate	15.45	17.95

Note—The above Normal Thermometers are the most accurate thermometers made for scientific work and are only surpassed by the Primary Standard Thermometers of the few European makers qualified for such work and which are used in research and are not intended for general laboratory use. These we import from such makers on special order only.



48244. **Thermometers**, engraved on stem, with white background and safety reservoir at top of capillary; nitrogen filled, for high temperature work; with Fahrenheit scale.

Range.....	212° to 750° F.	212° to 1000° F.
Graduated in.....	2°	5°
Length, mm.....	400	450
Each.....	6.00	8.00



No. 48244

48248. **Thermometers, of Quartz Glass**, with opal glass scale. These thermometers have the important advantage over all other thermometers that they do not crack by the application of either sudden heat or cold; such a thermometer, for instance, can be plunged directly into molten metal without any danger of its cracking. The temperature readings of a Quartz Glass thermometer, even when used for years, remain always constant because of the extraordinarily low expansion coefficient of quartz glass. These thermometers are about 6 mm in diameter and are graduated in single degrees.

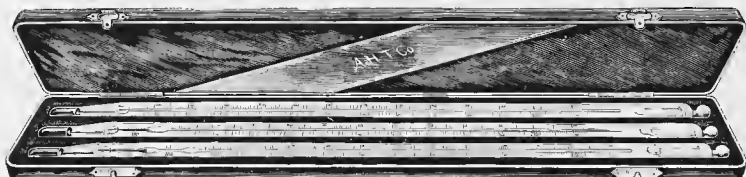
Range.....	-10 to +400° C.	+100 to +400° C.	+100 to +450° C.
Length, cm.....	20	16	20
Each.....	18.00	18.00	20.00

48252. **Thermometers, of Quartz Glass**, with scale engraved on nickel-steel tube and filled with nitrogen above the mercury at a pressure of 50 atmospheres; range from +300° to +750° C in 5° divisions.

Duty Free 28.50 Duty Paid ... 45.00

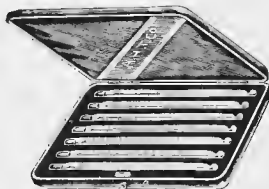
48256. **Protecting Tube** of steel, for above.

Duty Free 2.25 Duty Paid ... 3.00



No. 48260

48260. **Thermometers, Normal, Allihn**, with enclosed glass scale, in set of three with ranges of -15 to +100° C., +100° to +200° C., and +200° to +300° C. The thermometers are each about 30 cm long and about 8 mm in diameter, with zero and boiling point correction. In leather case without certificate..... 24.00
With P. T. R. certificate 32.50



No. 48268

48264. **Thermometers, Normal, Anschütz**, with enclosed glass scale and small bulbs, as used for fractional distillations. Thermometers No. 2 to No. 7, inclusive are nitrogen filled, and all the thermometers of the series are 16 cm long and about 6 mm in diameter.

Number.....	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Range.....	-10 to +60° C.	+40 to +100° C.	90 to 160° C.	150 to 220° C.	200 to 270° C.	250 to 310° C.	300 to 360° C.
Graduated in.....	1°	1°	1°	1°	1°	1°	1°
Each.....	4.50	4.50	4.50	4.50	6.00	6.00	6.00

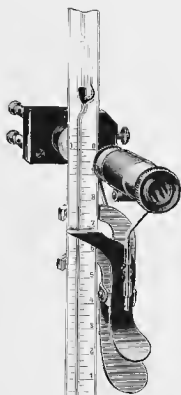
48268. **Thermometers, Normal, Anschütz**. Complete set of seven as above described, in leather case... 32.50

Note—Anschütz Thermometers as above are supplied with certificate of the Physikalisch-Technische Reichsanstalt on special import order.

48272. **Thermometers, for Low Temperatures, etched on stem; as used in liquid air and similar work. The thermometer reading to -100° C. is filled with toluol and that reading to -200° C. with pentane; graduated in single degrees.**
 Range..... $+30^{\circ}$ to -100° C. $+30^{\circ}$ to -200° C.
 Each..... 5.00 9.00



No. 48286



No. 48276

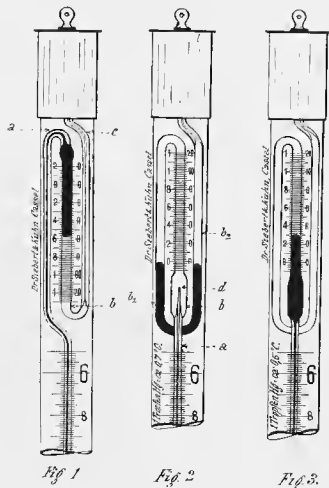


Fig. 1

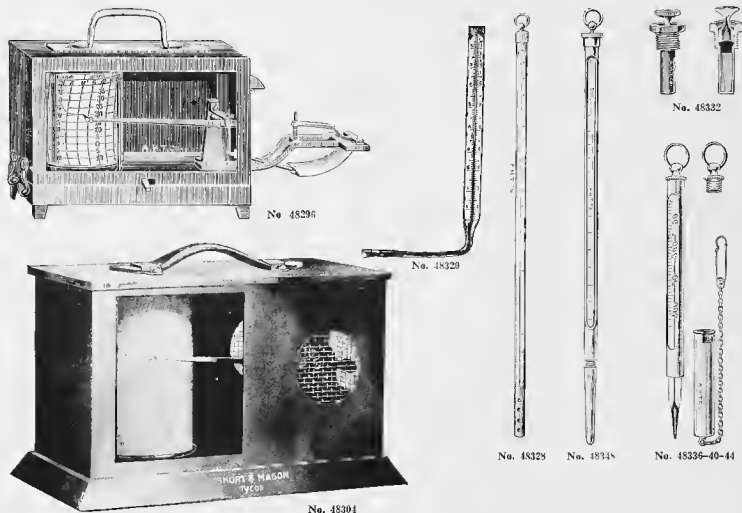
Fig. 2

Fig. 3.

No. 48292

48276. **Reading Device for Beckmann Thermometer, with 2 volt incandescent lamp for reading in a dark room.**..... 3.50
 48280. **Reading Device, as above, without incandescent lamp.**..... 2.00
 48284. **Thermometer, Beckmann, with total range of about 5° C. divided in $\frac{1}{100}$, with capillary held in place by glass wool; without auxiliary scale. Regularly furnished with scale reading from 0 to 5° C. as convenient for calorimetric use. This thermometer is of good German make of reasonable accuracy but is not regularly furnished with certificate.**..... 7.50
 48288. **Thermometer, Beckmann, Goetze make, with scale held in place by glass sealing, with auxiliary scale with range from -10 to 120° C. in 2° divisions under reservoir; for use by either boiling point or freezing point method; range 5° to 6° C. divided in $\frac{1}{100}$; highly recommended and widely used in calorimetry. Without certificate.**..... 15.00
With P. T. R. certificate...... 25.00

48292. **Thermometer, Beckmann, similar to No. 48288 as to range, accuracy, etc., but with improved patent adjustment of auxiliary scale by means of mercury drops instead of by tapping. This is accomplished by the introduction of a short capillary in the lower part of the reservoir, the point of which is adjusted for delivering drops of mercury each equivalent to a definite range of the thermometer scale, which information is engraved on the scale of each thermometer as, for instance, 1 drop = 1.5° C. This arrangement prevents the dropping down of the mercury when an upward movement is necessary, and superfluous mercury may be transferred to the two arms at the side of the reservoir by simply inclining the thermometer. When a reservoir has become filled during transportation it will empty itself automatically if the thermometer is held perpendicularly. In other reservoir arrangements this is frequently prevented by the small particles of air which are often present in thermometers of best make. In this new arrangement such air particles are caught and held below the inlet in the reservoir. This arrangement makes possible very exact setting, greater durability and less risk of breakage in transportation and obviates the continuous tapping down of the mercury column as heretofore practiced. See *Chemiker-Zeitung*, 1912, Nr. 88, S. 843. Without certificate.**..... 18.00
With P. T. R. certificate...... 28.00



48296. Thermometer, Recording (Thermograph) Richard. The thermometer consists of a copper tube of elliptical cross section, hermetically closed and filled with a volatile liquid. This thermometer is of great sensibility and has wide application in the accurate control of temperature in large incubators, incubating rooms, malting rooms, drying rooms, etc. The chart regularly furnished with this thermometer is weekly and the range is from 0 to 50° C. Other scales up to 110° C. or 230° F. are furnished on order and charts may be arranged for hourly, daily or monthly records. The movement of the pen is approximately 1 mm = 1° C. The thermometer is furnished with a wire guard (removed in illustration) to protect same against injury.

Duty Free 24.00 Stock 35.00
48300. Weekly Charts for above, 0 to 50° C. Per 100..... 2.50

48304. Thermometer, Recording (Thermograph) Short & Mason high drum clock type, with charts for from -62 to +128° F.; with thermometer enclosed; consists of a bimetallic lamina arranged in such manner that there are no levers other than the pen arm. This instrument permits of adjustment to show temperatures covering any 75° F., 150° F., or 300° F. and is furnished with blank charts in addition to the printed charts which by means of the key certified thermometer supplied with the instrument enable the range of the instrument to be adjusted to meet special conditions. Price includes certified thermometer..... 40.00

48308. Extra Charts, per 100..... 2.50
 " Pens, each..... .70
48316. Special Ink, per bottle..... .75

48329. Thermometer, Angle, with vertical tube 30 cm long and 2 cm in diameter and horizontal stem 15 cm long and 1 cm in diameter; graduated in single degrees to 100° C. or 212° F..... 1.50

48324. Thermometer, Angle, same as above but with opal glass scale..... 2.00

48328. " Armored, engraved on stem with white background. The armor is of seamless steel tubing heavily nickel plated. The thermometers are graduated on a basis of 3 inch immersion.

Range.....	0° to	+30° to	+30° to	+30° to	+100° to
	220° F.	400° F.	600° F.	750° F.	1000° F.
Graduated in.....	2°	2°	2°	2°	5°
Length, inches.....	12	14	16	16	16
Each.....	4.50	5.25	6.00	7.50	10.50

48332. Steel Mercury Wells, for use with above armored thermometers, as used in steam engineering practice. These wells have a very thin steel wall and insure quick transmission of heat. They are provided with close fitting taper plugs to prevent the spilling of mercury in transportation.

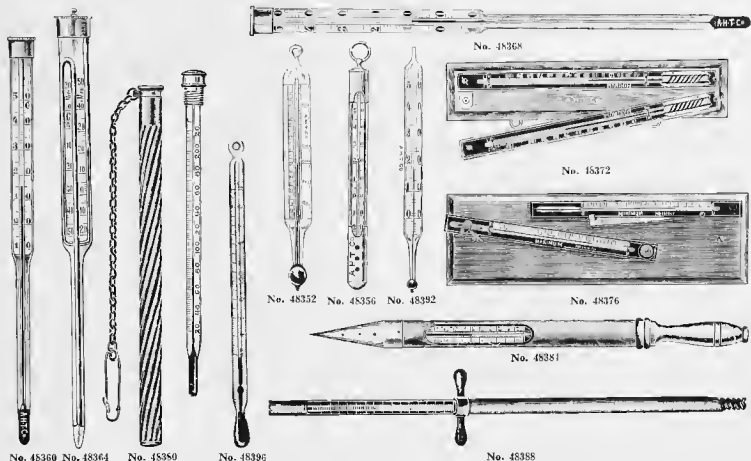
Length of stem below thread, inches..	1	2	3	4	5	6
Each.....	1.50	1.80	2.40	3.00	3.60	4.80

48336. Thermometers, Armored, for asphalt and sand testing. The glass is double the thickness of ordinary glass stem thermometers and the bulb is pointed and so constructed as to reduce liability of breakage to a minimum; 6 inches long, range 100° to 600° F..... 6.00

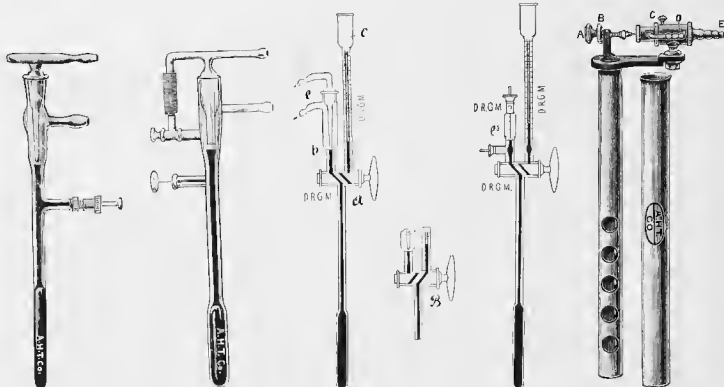
48340. Thermometer, as above, for use in sand testing, range 200° to 750° F..... 7.50

48344. " " for inspector's use, 6 inches long and with a range of 200° to 400° F..... 4.50

48348. Thermometer, Armored, for asphalt testing, range from 200° to 450° F in 1°..... 5.00



No. 48360	No. 48364	No. 48350	No. 48396	No. 48352	No. 48356	No. 48392	No. 48376	No. 48381	No. 48388								
48352.	Thermometer, Dairy, with enclosed paper scale, 0 to 150° F., length about 8 inches.	48356.	Thermometer, Incubator, short form, for hanging inside the incubating chamber. The thermometer is enclosed in a metal case with perforated outer sheath which turns so as to entirely enclose the thermometer, range from 0 to 50° C.	48360.	Thermometer, Incubator, with very distinct graduations on a white background, so as to be readily seen at a distance; range from 0 to 50° C. with the standard temperature 37½° C. indicated by a red line. Length 250 mm.	48364.	Thermometer, Incubator, self-registering maximum and minimum on Sixe's system; with opal glass scale 160 mm long graduated from -20° to +50° C. The standard temperature 37½° C. is indicated by a red line. The lower part for insertion in the tubulature of the incubator is 200 mm long. Complete with horseshoe magnet for adjusting the indicators.	48368.	Thermometers, Incubator, with enclosed opal glass scale with Jena capillary. The standard temperature 37½° C., at which incubators are ordinarily operated, is indicated by a red line. Range 0 to 50° C. 10° to 60° C. Graduated in ½ ⅓ Length, cm. 45 50 Each 4.00 5.00								
48372.	Thermometer, Maximum and Minimum, mounted in wooden frame with each tube mounted on a separate plate attached at one end with a thumbscrew so that the thermometers may be reset; range 10° to 40° F. below zero for the maximum tube and 20° to 60° below for the minimum tube, and up to 120° F. above; ordinary quality.	48376.	Thermometer, Maximum and Minimum, standard Weather Bureau pattern, of high quality and with certificate; with engraved stem, magnifying tube, cylindrical bulb, porcelain strip at side of tube on which are marked the figures and every fifth degree line of the scale, oxidized brass plate, insulating brass support with binding screws; board 15 by 5 inches, with mahogany finish.	48380.	Thermometers, Pocket, 5 inches long, mounted in a case similar to clinical thermometers; very convenient for various kinds of field work. Range -30 to 120° F. +30 to 220° F. 0 to 50° C. 0 to 100° C. Graduated in 2° 2° 1° 1° Each 2.25 2.25 2.25 2.25	48384.	Thermometer, Soil, mounted in wooden frame with handle and brass pointed ferrule.	48388.	Thermometer, Soil, mounted in strong metallic case and with scale reading from 0 to 60° C. in ¼ths and with bore of various lengths depending upon the depth at which temperature is to be read. Length of bore below handle, cm. 50 100 Each 12.50 15.00	48392.	Thermometer, Sugar Factory, with enclosed paper scale 0 to 50° F. in 1° divisions, diameter ⅝th inch.	48396.	Thermometer, Veterinary Clinical, with magnifying tube, as used in laboratory practice in taking animal temperatures; in 5 inch hard rubber case; range from 92° to 110° F. in ¼ths.	48400.	Thermometer, as above, in nickel case with chain and pin similar to 48380.	48404.	Thermometers, Titre Test, for soap and fat laboratories, engraved on stem with magnifying glass and bulbs of Jena Normal glass; graduated in ⅓° divisions. Range 0-20° C. 10-30° C. 15-25° C. 20-30° C. 20-40° C. 30-50° C. 40-60° C. Each 5.00 5.00 5.00 5.00 5.00 5.00 5.00



Nos. 48412, 48416 and 48420

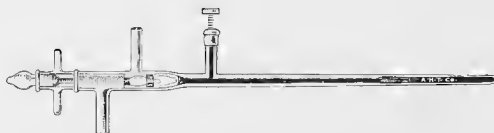
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No. 48428

No. 48432

No. 48436

48412. Thermo-regulator, Reichert. This regulator is carefully made and is the most widely used among the several forms constructed of mercury and glass, adjusted for high temperatures 2.00
48416. Thermo-regulator, Reichert, same construction as No. 48412 but adjusted for low temperatures. 2.00
48420. Thermo-regulator, Reichert, same construction as No. 48416 but made shorter for use in paraffine baths 2.00
48424. Thermo-regulator, Reichert, improved form, with stopcock to prevent total extinguishing of flame, 4.00
48428. Thermo-regulator, New Mercury Form, with reservoir tube with thermometer scale and two-way stopcock for adjustment. In setting the regulator the stopcock is set at position "A" and the bulb warmed until the mercury reaches the position "B" at the tip of the glass outlet tube. The stopcock is then turned to position "B" and the mercury column allowed to rise until it reaches the temperature at which the regulator is to operate, when the cock is turned again to position "A" and the thermo-regulator is in adjustment. 7.50
48432. Thermo-regulator, as above, with electric contact, otherwise operating on the same principle and by the same method as above. 10.00
48436. Thermo-regulator, Roux Bimetallic. The great advantage of this regulator consists in the entire absence of mercury and glass, the control depending upon the unequal expansion of the different metals composing the metallic couple. It has come into very wide use of recent years and is in many ways the most satisfactory form of thermo-regulator now offered. All of our bimetallic regulators are furnished with an additional brass jacket as shown in illustration. It is recommended that this jacket be inserted in the tubulature of the incubator and the same filled with glycerine, into which the regulator proper is immersed. This prevents the corroding of the bimetallic couple (which occurs in many localities because of the action of the water) and at the same time makes the regulator last longer.
- | | | |
|----------------|------|------|
| | 10 | 12 |
| Each | 7.00 | 7.50 |

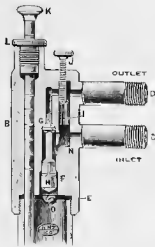


No. 48440

48440. Thermo-regulator, Reichert-Novy. This regulator is based upon the principle of the Reichert Thermo-regulator with modifications. It works equally well for high or low temperatures and is specially recommended for accurate control when used with a gas pressure regulator. 5.00



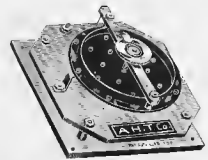
No. 4844



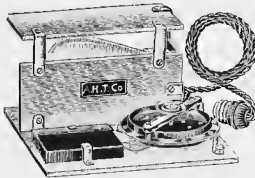
No. 4844 Sectional View



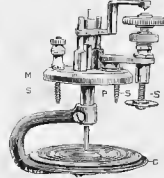
No. 48152



No. 48456



No. 48460

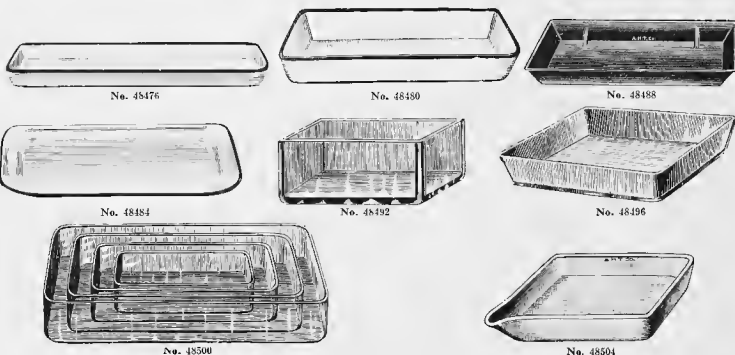


No. 48461



No. 48465

48444. **Thermo-regulator, Greenman.** Constructed entirely of steel and recommended as being the most accurate form of mercury regulator. Controls temperature within $\frac{1}{2}^{\circ}$ regardless of gas pressure or room temperature. For use with this regulator burner No. 22936 is recommended. With brass jacket for glycerine to be inserted in tubulature of incubator. See *Anatomical Record*, Sept., 1908. Without mercury 12.50
48448. **Thermo-regulator**, same as No. 48444 but filled with mercury. 12.50
48452. **Gas Pressure Regulator**, for delivering gas to apparatus at a constant pressure, regardless of the variations of pressure in the house supply. Particularly recommended for use with the Reichert-Neovy Gas Regulator No. 48440, with which it is possible to maintain very constant temperatures. Made of copper throughout. 5.00
48456. **Thermo-regulator, Electric, with Condenser.** Will automatically maintain a constant temperature through a wide range, i. e., between 30° and 80° C. The diaphragm consists of rubber and metal clamped securely between steel rings. As the expansion of rubber when exposed to heat is greater than that of metal, the diaphragm will move away from the platinum point at the slightest increase in temperature. This breaks the circuit and allows the incubator to cool until the diaphragm again touches the point. By varying the pressure between the adjusting screw and the diaphragm different degrees of heat in the incubator are thus obtained. Contact points are of platinum iridium and the condenser protects these contacts from being destroyed providing the electric current passing through same does not exceed $\frac{1}{2}$ amperes, i. e., the current from usual incandescent sockets. 10.00
48460. **Thermo-regulator, Electric, with Incandescent Lamp Heater**, for heating incubators, paraffine baths, etc., not specially built for electric heating and control; consisting of thermo-regulator similar to above, with an incandescent lamp mounted on same board, with cord and plug for attachment to any lamp socket. It is usually sufficient to place same on the bottom of the incubator or oven and run the connecting cord through the horizontal hole found at the side of most incubators. The space required by the entire equipment is $8 \times 8 \times 4\frac{1}{2}$ inches. 12.50
48464. **Thermo-regulator, Electric, expanding capsule type, "Break" form**, for use alone with any electrical heating medium which does not require more than 3 or 4 amperes. May be used on either 110 or 220 volt circuits either alternating or direct and for temperatures from 15° to 160° C. The range of each capsule is about 20° in the lower temperatures and nearly 100° in high temperatures. The capsule "C" must be within the heated chamber and the post "P" may be made longer or shorter depending upon the length of the tubulation into which post must be inserted, i. e., tubulation from the outside of the utensil through the air jacket, water jacket, etc., to the inner chamber. The screws "S" need not be used in many utensils it is sufficient to allow the metallic cap "M" to rest on the top of the tubulation or of the incubator. Very satisfactory on incubators, ovens, water and oil baths, whether rise heaters, resistance coils or lamps are used for the heating medium. In ordering please state whether current is alternating or direct, range of temperature desired, size of chamber, and thickness and material of the walls of same for length of post "P" and whether thermo-regulator is to be placed in a vertical or horizontal position, vertical being preferable. With instructions for wiring, and connections 7.00
48465. **Extra Expansion Capsules** 1.00
48468. **Thermo-regulator, Electric, expanding capsule type, similar in operation to No. 48464 but known as the "Make" form** and for currents up to 5 or 10 amperes. Must be used with circuit breaker as a relay which indirectly interrupts the heating current. This is furnished with a circuit breaker consisting of a solenoid wound with a heavy wire and with large platinum iridium contacts 21.00



48472.	Tiles, Earthenware, glazed on one side only; very convenient for supplying either a black or white background.			
	Color.....		Black	White
	Each.....		.30	.25
48476.	Tray, Aseptic Enamel Ware, of seamless steel, white enamelled, both acid and fire proof; convenient for dissecting instruments, size 12 x 3½ x 1½ inches.....			.90
48480.	Trays, Aseptic Enamel Ware, of seamless steel, white enamelled, both acid and fire proof; deep form. Size, inches.....	10½ x 6½ x 2½	15 x 9 x 2½	
	Each.....	1.00	2.00	
48484.	Trays, Aseptic Enamel Ware, of seamless steel, white enamelled, both acid and fire proof; shallow form; very convenient in the laboratory for dissections on small animals.			
	Size, inches.....	12 x 9	16 x 12	20 x 15
	Each.....	.80	1.30	2.35
48488.	Tray, Dissecting, of heavily tinned metal, japanned, with metal loops on the corners to which the limbs of animals are tied during dissection. Melted wax may be conveniently run into these pans in the laboratory if wax bottom is desired. Size 11 x 9 x 1½ inches.....			.25
48492.	Trays, Glass, with vertical sides and polished edges.			
	Length, mm.....	100	115	120
	Width, mm.....	40	50	60
	Height, mm.....	40	50	35
	Each.....	.50	.60	.70
48496.	Trays, Glass, with slanting sides and polished edges; much superior to ordinary photographic trays.			
	Length, mm.....	160	210	260
	Width, mm.....	130	160	210
	Each.....	.90	1.25	2.00
48500.	Trays, Glass, with vertical sides and polished edges.			
	Length, mm.....	200	265	350
	Width, mm.....	100	165	170
	Height, mm.....	45	50	60
	Each.....	1.00	2.00	3.00
48504.	Trays, Sanitatis Porcelain, deep form, with spout.			
	Length, mm.....	155	255	290
	Width, mm.....	125	195	240
	Each.....	.75	2.50	3.00



No. 48508



No. 48516

48508.	Tongs, Crucible, of polished brass, single bent.			
	Length, mm.....		200	250
	Each.....		.50	.80
48512.	Tongs, Crucible, of nickel plated brass, single bent.			
	Length, mm.....		200	250
	Each.....		.60	.90
48516.	Tongs, Crucible, of steel with black oxidized finish, double bent, 200 mm long; recommended for students' use.....			.25



No. 48518



No. 48540 with Platinum Shoes



No. 48544



No. 48548



No. 48552



No. 48556



No. 48560



No. 48564

48518.	Tongs, Crucible, of polished brass, double bent.			
	Length, mm.....	200	250	300
	Each.....	.55	.90	1.20
48520.	Tongs, Crucible, of nickel plated brass, double bent.			
	Length, mm.....	200	250	300
	Each.....	.65	1.00	1.30
48524.	Tongs, Crucible, of forged steel, nickel plated, single bent.			
	Length, mm.....	200	250	300
	Each.....	.50	.70	1.00
48528.	Tongs, Crucible, of forged steel, nickel plated, double bent.			
	Length, mm.....	200	250	300
	Each.....	.65	.85	1.20
48532.	Tongs, Crucible, of pure wrought nickel, double bent; 200 mm long.....			2.00
48536.	“ “ “ solid German silver, double bent, 230 mm long.....			1.50
48540.	“ “ “ with platinum tips or shoes. Our crucible tongs of steel No. 48528, of pure nickel No. 48532 and of solid German silver No. 48536 are furnished with platinum shoes or tips at the lowest market price of platinum.			
48544.	Tongs, Crucible, of pure wrought nickel with nickel chromium tips, double bent, 200 mm long. A new substitute for platinum tipped tongs and highly recommended.....			2.50
48548.	Tongs, Crucible, of malleable iron, single bent, heavy, for assay crucibles.			
	Length, inches.....	12	17	
	Each.....	.40	.50	
48552.	Tongs, Crucible, of wrought iron, double bent, 30 inches long; heavy for assay crucibles.....			1.75
48556.	Tongs, Cupel, of steel with curved ends and guide pin; 22 inches long.....			1.00
48560.	“ “ “ with bent ends and guide pin. Length, inches.....	20	25	30
	Each.....	1.00	1.00	1.00
48564.	Tongs, Scorifier, of spring steel. Length, inches.....	20	30	36
	Each.....	1.00	1.00	1.00



No. 48568

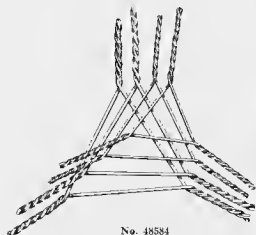


No. 48572



No. 48576

48568.	Triangles, of twisted iron wire. Length of side, inches.....	1½	2	3
	Each.....	.05	.05	.05
	Per dozen.....	.50	.50	.50
48572.	Triangles, of iron wire covered with pipe-stem.			
	Length of side, inches.....	1½	2	2½
	Each.....	.05	.05	.05
	Per dozen.....	.50	.50	.50
48576.	Triangles, of iron wire covered with pipe-stem, flanged in center.			
	Length of side, inches.....	1½	2	2½
	Each.....	.08	.08	.08
	Per dozen.....	.75	.75	.75



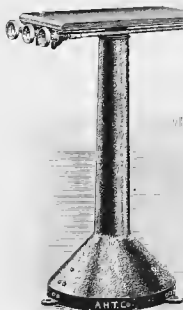
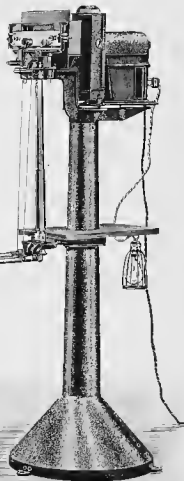
No. 48584



Nos. 48580 and 48592

48580.	Triangles, Solid Nickel.						
	Length of side, inches.	1½	2	2½	3		
	Each	.15	.20	.25	.30		
48584.	Triangles, Hoskins Nickel Chromium, of heavy wire of square cross section and distinctly superior to triangles made of other market alloys of nickel and chromium. The alloy of which these triangles is made contains practically no iron and takes on a thin adherent protective coat of oxide which neither peels nor rubs off and which prevents the triangle adhering to platinum ware placed upon it.						
	Length of side, inches.	1½	2	2½	3		
	Each	.20	.25	.30	.35		
48588.	Triangles, Opaque Fused Silica.						
	Length of each side, inches.	1½	2	2½	3	3½	4
	Each	.75	.75	.90	1.00	1.15	1.25
48592.	Triangles, Nichrome Wire covered with pure fused opaque silica.						
	Length of each side, inches.	1½	2	2½	3		
	Each	.25	.25	.35	.40		

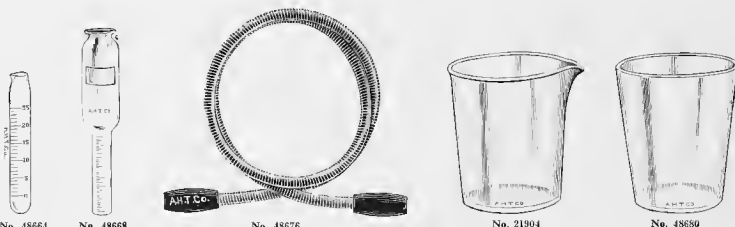
48596. **Trichinoscope, for the Trichina Test by Micro Projection.** The compressorium sample is covered square by square in the field of the microscope and thrown on the screen. The observer controls both the focusing of the microscope and the movement of the specimen while observing the screen from position at table. The operation is much less laborious and more satisfactory than with the ordinary microscope. As furnished by us to the U. S. Department of Agriculture, Bureau of Animal Industry. The outfit includes iron supports, projecting system with two objectives, compressorium, nosepiece for revolving the objective, cooling chamber and hand regulating arc lamp for 5 amperes, direct current rheostat for same for 110 volts, and 50 pairs of carbons.
- Duty Free 155.00 Duty Paid 208.00
48600. **Trichinoscope, as above, but with automatic arc lamp.**
Duty Free 190.00 Duty Paid 253.00
48604. **Resistance, for 220 volt circuit.**
Duty Free 5.40 Duty Paid 7.20



No. 48596



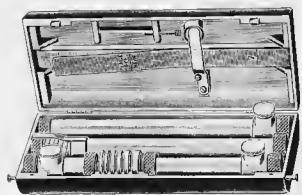
48608.	Tripod, of cast iron, 6 inches high with ring 3 inches inside diameter; suitable for alcohol lamps or small burners.....					.20
48612.	Tripods, of cast iron, smoothly finished and well japanned; 9 inches high.					
	Outside diameter, inches.....	4	5	6	8	10
	Each.....	.25	.25	.30	.50	.65
48616.	Tripods, of cast iron, smoothly finished and well japanned, with concentric rings; height 9 inches.					
	Outside diameter, of rings inches.....	5	6	8	10	12
	Number of rings.....	2	3	5	6	8
	Each.....	.35	.40	.75	1.00	1.40
48620.	Tripod, of iron, with adjustable support for burner, 9 inches high with ring 3½ inches inside diameter					.75
48624.	Tripod, of iron, with triangular top; 9 inches high.					
	Length of side, cm.....	10	12	15	20	20
	Height, cm.....	18	20	23	25	25
	Each.....	.50	.60	.70	.80	.80
48628.	Tripod, Genth. exactly as used in the John Harrison Chemical Laboratory, University of Pennsylvania; of cast iron, with slip-in legs and removable plate; diameter 10½ inches, diameter of removable plate 7½ inches, height 7½ inches.....					1.00
48632.	Tripods, of sheet iron, with metal chimney for the protection of the flame; very convenient for flat bottom flasks or wire gauze.					
	Height, mm.....	240	265	290		
	Height of chimney, mm.....	100	115	130		
	Inside diameter of chimney, mm.....	100	125	130		
	Each.....	.50	.65	.90		
48636.	Tripod, of sheet iron, with metal chimney for protection of the flame, with supports curved downward to take round bottom flasks, evaporating dishes, etc.; height 200 mm by 60 mm diameter of chimney.....					.60
48640.	Tubes, Brass, T-shape. Bore, inches.....	¼	⅜	½	⅝	¾
	Each.....	.30	.35	.40	.45	.50
48644.	Tubes, Brass, Y-shape. Bore, inches.....	¼	⅜	½	⅝	¾
	Each.....	.30	.35	.40	.45	.50
48648.	Tubes, Glass, T-shape. Bore, mm.....	3	5	6	9	12
	Each.....	.06	.08	.09	.10	.14
48652.	Tube, Glass, T-shape, with two Geissler stopcocks, bore 5 mm.....					2.25
48656.	Tubes, Glass, U-shape. Bore, mm.....	3	5	6	9	12
	Each.....	.06	.08	.09	.10	.14
48660.	Tubes, Glass, Y-shape. Bore, mm.....	3	5	6	9	12
	Each.....	.06	.08	.09	.10	.14



48664. Tube, Vivien, for sugar analysis, as described in Fruhling & Schultz. 60
 48668. Tube, Hortvet, for use in the centrifuge in determining lead precipitates in the analysis of sugar and syrup. See *Bulletin No. 107 of the U. S. Department of Agriculture, Bureau of Chemistry*. 75
 48672. Tubing, Flexible Metallic, recommended as being safer and much more permanent than rubber tubing. $\frac{3}{8}$ inch diameter. Per foot. 20
 48676. Tubing, Flexible Metallic, in lengths for Bunsen burner connections; with rubber connectors at both ends; $\frac{1}{2}$ inch diameter.
 Length, feet. 2 2 $\frac{1}{2}$ 3
 Each.25 .30 .50
 48678. Extra Rubber Connectors, each.05
 21904. Tumbler, of glass, with spout, capacity 7 oz.10
 48680. " as above, without spout.05



No. 48681

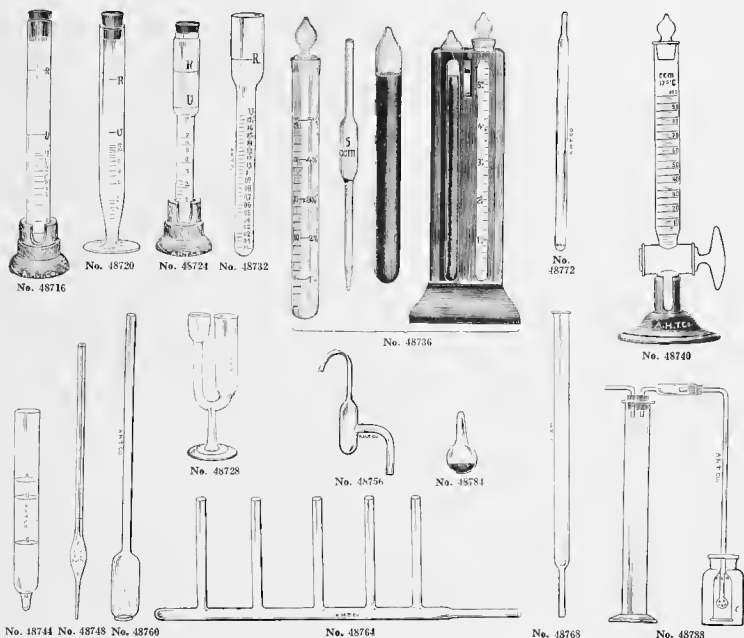


No. 48704

48684. Turbidimeter, Jackson, for determining sulphates in water analysis, etc., complete with 22 cm tube. 12.00
 48688. Extra 22 cm tube, for above. 2.50
 48692. " 75 cm. 5.00
 48696. Brass extension for use with long tubes. 3.00
 48700. Candles, per dozen. 2.50
 48704. Turbidimeter, U. S. Geological Survey type, as used in water analysis in connection with water plants, filtration installations, etc., as described in *Bulletin 151 of the U. S. Geological Survey* and *Bulletin 8 of the Division of Hydrography*. Complete for both color and turbidity, packed in morocco covered case. 30.00
 48708. Turbidimeter, as above, color outfit only, consisting of 6 amber color discs and 4 aluminum color tubes, packed in morocco covered case. 27.00
 48712. Turbidity Tape, flexible, with rod, in wooden case. 5.00

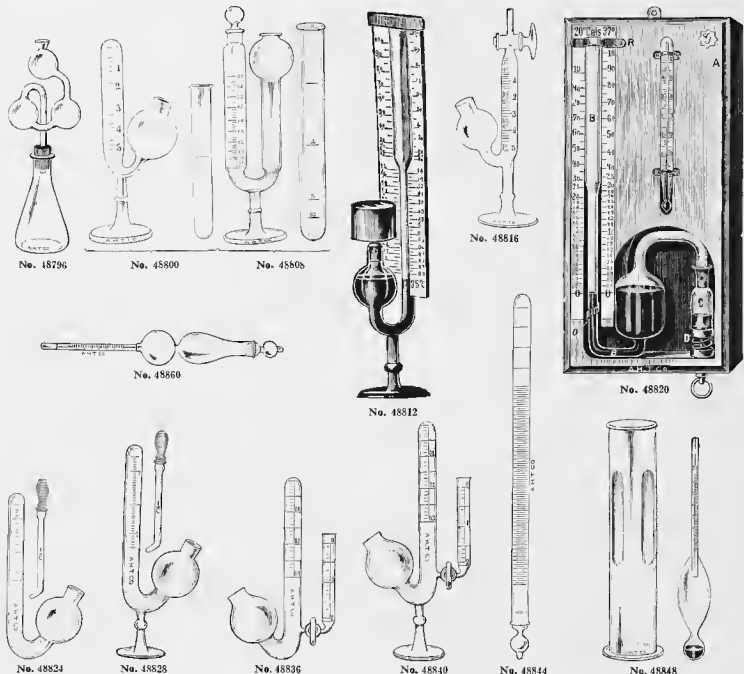
Large equipment lists can not always be made up from the catalogues of any one manufacturer or dealer. The leading European manufacturers of Laboratory Apparatus supply us with their original catalogues in limited quantities for distribution to intending purchasers. A partial list of such manufacturers is found on page V.

A selection of catalogues of the leading manufacturers of Europe can be obtained from us more promptly than by writing to all of the firms in whose goods you are interested.

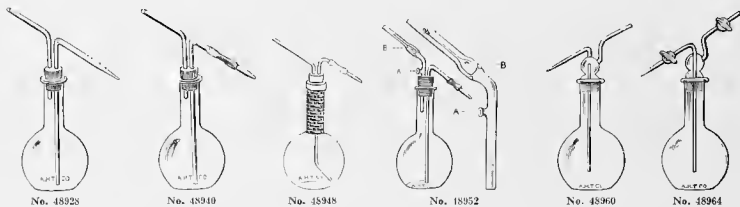


URINE ANALYSIS APPARATUS.

48716.	Albuminometer, Esbach, for the quantitative determination of albumen in urine, graduated to read grams of albumen per liter of urine; in wooden case.....	.60
48720.	Albuminometer, Esbach, on glass foot.....	1.00
48724.	“ Esbach-Schelenz, with constriction near base for more accurate reading of small quantities; in polished wooden case.....	.90
48728.	Albuminometer, (Horismascope,) for the detection of albumen in urine with nitric acid.....	1.00
48732.	Albuminometer, for the rapid quantitative determination of albumen in urine by the use of the tube in a centrifuge.....	1.25
48736.	Chromo-Saccharometer, for the determination of sugar in urine to within 1/2% by the colorimetric method; rapid and accurate; complete with directions.....	5.00
48740.	Purinometer, Hall, for the quantitative determination of purin bodies in urine, with wooden base; without solution.....	7.50
48744.	Reaction Glass, Ranke, for Ehrlich's diazo reaction.....	.60
Apparatus for Folin's New Method of Determination of Total Nitrogen, Urea and Ammonia in Urine. See <i>Journal of Biological Chemistry</i> , Vol. XI, No. 5, June, 1912.		
48748.	Ostwald Pipette, 1 cc capacity, delivering 1 cc at 20° C.....	.60
48752.	“ “ “ 2 cc “ “ “ “.....	.75
48756.	Glass Trap for Ammonia.....	.50
48760.	Fume Absorption Tube, furnished straight for bending at desired angle in the laboratory.....	.50
48764.	Connecting Tube, for use with above Absorption Tubes. Number of arms.....	4 .85 5 1.00 6 1.15
48768.	Condenser Tube for urea, 250 x 15 mm.....	.15
48772.	Ammonia Absorption Tube, small, with perforated end, 265 x 8 mm.....	.20
48780.	Jena Glass Test Tube, 200 x 20 mm.....	.10
48784.	Temperature Bulb, filled with mercury chloride iodide.....	.40
48788.	Ammonia Apparatus, Folin, complete, consisting of special ammonia absorption tube No. 48790, cylinder, drying tube and bottle, with rubber stopper.....	2.50
48790.	Ammonia Absorption Tube, Folin.....	1.00

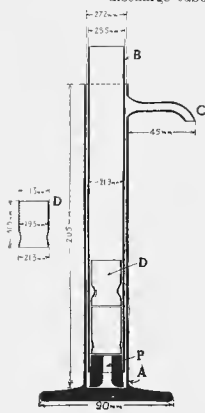


48792.	Urea Bulb, Folin, for determination of urea.....	1.00
48796.	Urea Apparatus, Folin, complete, consisting of special urea bulb No. 48792, flask and rubber stopper.....	1.30
48800.	Saccharometer, Einhorn Fermentation, for the determination of sugar in urine; consisting of a graduated fermentation tube and a graduated test tube. The percentage of sugar present is read directly on the tube.....	.75
48804.	Saccharometers, set of two, one for the urine under examination and the other for a normal urine to which glucose has been added for the purpose of testing the efficiency of the yeast used.....	1.50
48808.	Saccharometer, Lohnstein, for the accurate determination of sugar in diluted urine.....	2.25
48812.	Saccharometer, Lohnstein Precision or large model, for use with undiluted urine.....	6.00
48816.	Fermentation Saccharometer, Einhorn's improved form with glass stopcock and graduated test tube as furnished with No. 48800.....	2.00
48820.	Fermentation Saccharo-manometer, on wooden board for hanging on the wall. As described in <i>Medizinischen Wochenschrift</i> , 52, Jahrg., Heft 48. A new and convenient device for estimating the sugar in urine with an accuracy approximating the polarimetric method.....	9.00
48824.	Ureometer, Doremus, for the quantitative determination of urea in urine by the hypobromite method; with pipette, but without glass foot.....	.75
48828.	Ureometer, Doremus, same as No. 48824, on glass foot.....	1.00
48832.	Dropping Pipette, only, for use with No. 48824 or No. 48828.....	.20
48836.	Ureometer, Doremus-Hinds, improved form, with graduated side tube with glass stopcock from which the exact amount of urine may be introduced into the fermentation tube without any gas escaping from the bulb; without foot.....	2.50
48840.	Ureometer, Doremus-Hinds, same as No. 48836 on glass foot.....	2.75
48844.	Uricometer, Ruhemann, for the quantitative determination of uric acid.....	2.50
48848.	Urinometer, Squibb, graduated from 1.000 to 1.060; length 120 mm; in case with cylinder but without thermometer.....	.75
48852.	Cylinder only for above.....	.15
48856.	Thermometer only for above.....	.40
48860.	Urino-Pycnometer, Saxe, for the rapid determination of the specific gravity of small quantities of urine, with cylinder, in case.....	2.50



48928.	Washing Bottle, consisting of a No. 28104 Flask, extra heavy, rubber stopper and glass tubes. Capacity, cc.....	250	500	1000	2000
	Each.....	.40	.50	.75	1.00
48932.	Fittings only for Washing Bottle No. 48928, i.e., rubber stopper and glass tubes without flask.....				.10
48936.	Washing Bottle, New Jena Glass, with rubber corks and Jena glass tubes. Capacity, cc.....	250	500	1000	1500
	Each.....	.68	.90	1.05	1.20
48940.	Washing Bottle, Faraday, consisting of a No. 28104 flask, extra heavy, with rubber stopper, glass tubes with rubber joint in outlet tube to give flexibility. Capacity, cc.....	250	500	1000	2000
	Each.....	.40	.50	.75	1.00
48944.	Fittings only for Washing Bottle No. 48940, i.e., rubber stopper and glass tubes without flask.....				.10
48948.	Washing Bottle, same as No. 48940 but with rattan covered neck. For convenient holding while hot. Capacity, cc.....			500	1000
	Each.....			.70	.90
48952.	Washing bottle, arranged for continuous flow, 500 cc capacity.....				.70
48956.	Fittings only for Washing Bottles, consisting of rubber stopper, and glass tubes arranged for continuous flow.....				.50
48960.	Washing Bottle, for volatile liquids, with ground in glass stopper. Capacity, cc.....	125	250	500	1000
	Each.....	.80	1.00	1.25	1.50
48964.	Washing Bottles, for volatile liquids, with ground in glass stopper and two glass stopcocks. Capacity, cc.....	125	250	500	1000
	Each.....	2.25	2.50	2.75	3.00

48968. Washing Apparatus, Bain, for microscopic material; consisting of a glass cylinder with base and a discharge tubulation at the top; with a plain glass tube fitting into same with a one-hole cork stopper at bottom and a set of 6 sieve thimbles, one end of which is bound with fine silk bolting cloth. The washing liquid is allowed to drop into the inside cylinder and, after passing through the sieves, rises in the outside cylinder and flows off through the outlet "C," with 6 sieve thimbles..... 2.50

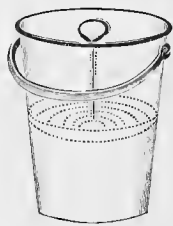


No. 48968

48972. Extra Sieve Thimbles, each..... .25



48976. Waste Pail, Aseptic Enamel Ware; of seamless steel, white enameled, both acid and fire proof; very convenient in the laboratory; with perforated tray which retains the solid matter such as filter paper, etc.; which may be lifted out before the bucket is emptied; 16 inches high, 12 inches diameter, 5 gallons capacity. 6.00



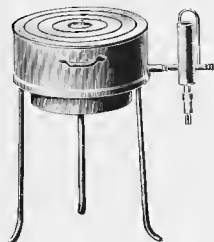
No. 48976



49040.	Water Baths, of heavy copper, tin lined; hemispherical form, with concentric rings, cover and steam escape.	Diameter, inches.....	4	5	5½	6	8	10	12
	Each		1.00	1.25	1.40	1.60	2.50	5.00	9.50
49041.	Water Baths, same as No. 49040 but with cock and exhaust for steam heating.	Diameter, inches.....				6	8	10	
	Each					3.50	4.50	8.00	
49048.	Water Baths, same as No. 49040 but with constant water level.	Diameter, inches.....	4	5	5½	6	8	10	12
	Each		1.60	1.85	2.00	2.20	3.10	5.60	10.10
49052.	Water Baths, of cast iron, white enamelled inside; with flange for supporting tripod and copper rings.	Diameter, mm.....				120	150	200	240
	Each					1.50	2.25	3.50	4.60
49056.	Water Bath, of pressed sheet steel, inside white enamelled, outside maroon enamelled; with copper rings but without tripod.	Diameter, mm.....						160	200
	Each							3.50	5.00
49060.	Water Bath, of polished copper, tin lined; with cover, steam escape, copper concentric rings and perforated plate for test tubes.	Diameter, inches.....					6	8	
	Each							3.00	4.50
49064.	Water Bath, Blair, with test tube rack; of polished copper, 175 mm diameter; as used in iron analysis								3.50
49068.	Water Bath, Hofmann, of heavy polished copper with diameter at top 8 inches, with a set of concentric rings and plate with five holes of different sizes each with cover. With constant water level and handles, without tripod.....								6.75
49072.	Water Bath, Royal Berlin Porcelain, consisting of two porcelain dishes fitting one inside the other.	Outside diameter, mm.....						110	140
	Each							1.20	1.90
49076.	Water Level Regulator, of brass, can be attached to any of our water baths. The level of the water is regulated by adjusting the center brass tube; length 3½ inches.....								1.50



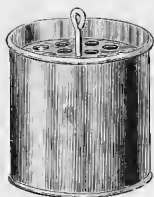
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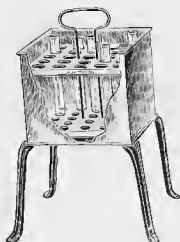
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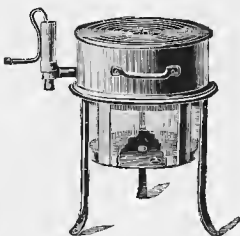
No. 49088



No. 49092



No. 49096



No. 49100



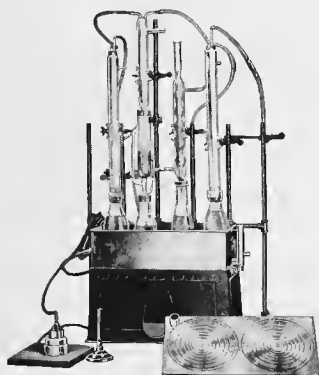
No. 49104

49080. Water Bath, new form, with water level regulator; of polished copper, 6 inches in diameter by 4 inches deep, on tripod 9 inches high. 6.00
49084. Water Bath, consisting of Bath No. 49040 of sheet steel, white enamelled inside and maroon enamelled outside, with copper rings, water level and special tripod to fit; 160 mm diameter. 6.00
49088. Water Baths, funnel form, with tripod and constant water level.
 Diameter, inches. 6 8
 Each. 3.50 4.50
49092. Water Bath, for dissolving steel samples; of heavy, polished copper, tinned inside, with test tube rack, 6 inches in diameter by 7 inches high, taking eighteen 6 x 3/8 inch dissolving tubes. 4.50
49096. Water Bath, rectangular, for dissolving steel samples, of heavy copper 7 1/2 inches square by 6 1/2 inches high; with perforated tray to hold 25 test tubes 8 x 7/8 inches; on support with iron legs. 6.50
49100. Water Bath, of cast iron, white enamelled inside, with copper rings, constant water level, tripod and safety gauge; for use with inflammable liquids.
 Diameter, mm. 160 200
 Each. 9.00 11.50
49104. Perforated Inset, of polished copper, for use in water baths No. 49040 and No. 49064.
 For bath, mm. 160 200
 To hold test tubes. 18 34
 Each. 1.50 2.00

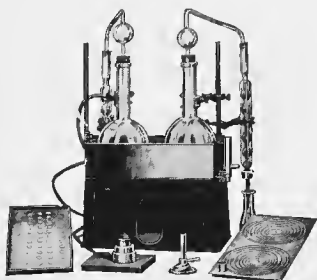


No. 49108

49108. Water Bath, Wiley, Patented, heavy copper, for economizing time and gas; with twelve holes 3 1/2 inches in diameter and two holes 5 1/2 inches in diameter. The top of the bath is 14 x 25 1/2 inches; the cup is of heavy spun copper and easily replaced when burnt out; without porcelain rings. 25.00

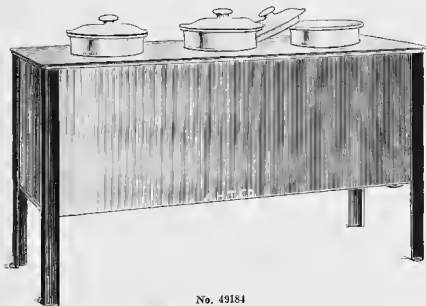


No. 49164

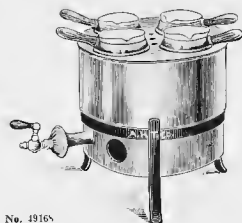


No. 49164

49164. **Water Bath, Electric**, of heavy polished copper, tin lined, with heating coil immersed in the water chamber. This coil is arranged for three heats, controllable by means of a one-plug switch. It will hold water at the boiling point when running on the high heat. The smaller size bath takes 400 Watts per hour on the high heat. At the rate of 8¢ per KW, the operating expense on the high heat is 3.2¢ per hour, on the medium heat 1½¢ and on the low heat ¾¢ per hour. A removable cover is provided containing two sets of rings on the small bath and four sets on the large bath, also a removable copper tray resting inside of the bath for use with beakers, evaporating dishes, etc., immersed in the water as shown in illustration. The bath provides a very convenient method for the distillation of volatile liquids with absolute safety because of the immersion of the heating element, also fat extractions, etc., as shown in illustration. The bath provides a very convenient method for the distillation of volatile liquids with absolute safety because of the immersion of the heating element, also fat extractions, etc., as shown in illustration. No special wiring is necessary, the connection being made with ordinary lighting circuit either alternating or direct current but voltage must be specified in ordering.
- | | | |
|--------------------|------------|-------------|
| Size, inches | 15 x 8 x 5 | 15 x 15 x 5 |
| Each | 35.00 | 54.00 |

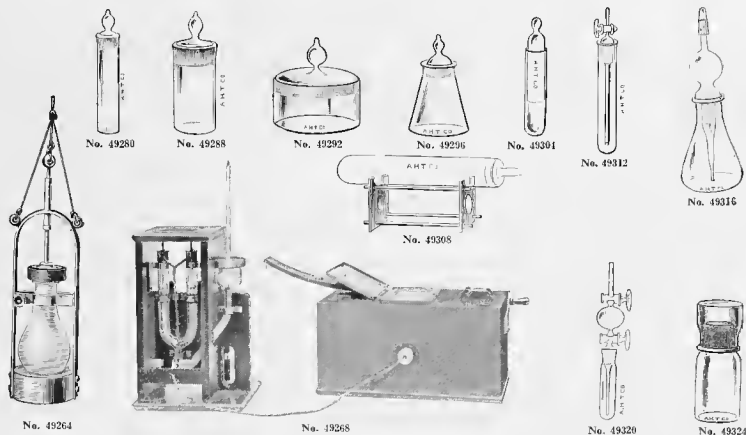


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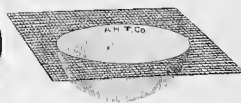
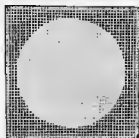
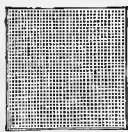


No. 49165

49168. **Water Bath, Matthews**, as used in the Philadelphia Textile School, with four porcelain beakers, 325 cc capacity, with spout. Complete with gas burner, protection plate and beaker collars. 21.00
49176. **Water Bath, Matthews**, as above, for use with either glycerine or calcium chloride as heating medium; of extra heavy copper with hard brazed seams; with four porcelain beakers. 26.00
49184. **Water Bath, for Dyers** as widely used in the textile industry; with beakers or dye pots our No. 21832 with lid but without burner. Number of beakers 3 6
- Each 20.75 36.50
49192. **Water Bath, for Dyers** same as above but of heavy copper and with hard brazed seams for use with glycerine or calcium chloride as a heating medium. Number of beakers. 3 6
- Each 25.75 44.00



49264.	Water Sampling Apparatus, Esmarch, consisting of a glass bottle in a metal frame with parts so arranged that when the apparatus is lowered to the desired depth the stopper is removed, whereupon the bottle fills, after which the stopper is replaced.....							
49268.	Water Tester, Dionic, for the exact measurement of small quantities of known substances in water by measurement of the electric conductivity of the solution. Consisting of a special glass vessel with terminals for the water under test and a conductivity meter reading directly and without calculation the conductivity of any electrolytic solution in the tube, as well for measuring leakage into surface condensers, testing of boiler feed water, hard material in sewage, determination of sewage effluent, the purity of distilled water, etc.; for very weak solutions.	Duty Free	111.00	Duty Paid				148.00
49272.	Water Tester, Dionic, for use with sea water and solutions of a similar nature.	Duty Free	114.00	Duty Paid				152.00
49276.	Wax, Sealing, first quality, in sticks.	Per lb.						.50
49280.	Weighing Bottles, high form, with flat bottom and ground glass stopper.							
	Height, mm.		60		80	100	120	
	Diameter, mm.		10		15	23	32	
	Each .....		.18		.20	.30	.40	
49284.	Weighing Bottles, same as No. 49280 but with round bottom.							
	Height, mm.		60		80	100	120	
	Diameter, mm.		10		15	23	32	
	Each .....		.18		.20	.30	.40	
49288.	Weighing Bottles, wide form with flat bottom and ground glass stopper.							
	Height, mm.	40	50		60	70	80	
	Diameter, mm.	25	30	38	30	35	45	
	Each .....	.25	.30	.40	.35	.40	.50	
49292.	Weighing Bottles, low form, with flat bottom.							
	Height, mm.				30	30	30	
	Diameter, mm.				50	60	70	
	Each .....				.85	1.10	1.50	
49296.	Weighing Bottle, conical form with flat bottom and ground glass stopper.							
	Capacity cc.				15	30	60	
	Each .....				.35	.40	.50	
49300.	Weighing Bottle, conical form, with extra wide mouth and with lower part of stopper sealed over. Otherwise the same as No. 49296. Capacity, 15 cc. ....							.35
49304.	Weighing Bottle, 60 mm long, consisting of two cylindrical tubes, one sliding into the other. ....							.20
49308.	Weighing Bottle Support, of metal, for bottles such as No. 49284 and No. 49304. Can be used either vertically or horizontally.							1.50
49312.	Weighing Bottle, Grethen, with ground in stopper, with glass stopcock. For weighing corrosive liquids. Capacity 2 cc.							2.00
49316.	Weighing Bottle, Hill, 30 cc, with ground in bulb, pipette and glass cap.							1.50
49320.	Weighing Bottle, Lunge, with ground in stopper with bulb and two glass stopcocks. For weighing corrosive liquids.							3.50
49324.	Weighing Bottle, Mc Myn Patent, with glass cap ground on outside of neck, 25 cc capacity. Very convenient because contents never interfere with the ground surface.							5.00



	No. 49336	No. 49330	No. 49396	No. 49404	No. 49408					
49328. Wire, Aluminum. B. & S. gauge.....				12	16	18	20	22		
Per oz.....				.08	.08	.10	.10	.12		
Per lb.....				1.00	1.00	1.25	1.25	1.50		
49332. Wire, Soft Brass, wound on spools of 1/4 lb. each.										
B. & S. gauge.....		16	18	20	22	24	26	28	30	32
Per spool.....		.18	.18	.18	.20	.22	.23	.28	.35	.40
49336. Wire, Copper, bare, wound on spools of 1/4 lb. each.										
B. & S. gauge.....		16	18	20	22	24	26	28	30	32
Per spool.....		.18	.18	.18	.20	.22	.23	.28	.35	.40
49340. Wire, German Silver, wound on spools of 1/4 lb. each.										
B. & S. gauge.....		16	18	20	22	24	26	28	30	
Per spool.....		.35	.35	.40	.45	.50	.50	.60	.70	
49344. Wire, Copper, single cotton coated, wound on spools of 1/4 lb. each.										
B. & S. gauge.....		12	14	16	18	20	22	24	27	30
Per spool.....		.20	.20	.20	.20	.25	.25	.25	.30	.35
49348. Wire, Copper, single silk coated. B. & S. gauge		12	14	16	18	20	22	24	27	30
Per ounce.....		.15	.15	.15	.15	.15	.20	.20	.25	.30
49352. Wire, Iron, chemically pure for standardizing, containing 99.85% Fe.										
Per ounce.....										.15
Per pound.....										.90
49356. Wire, Pure Nickel. B. & S. gauge.....		16	18	20	22	24	26	28	30	32
Per ounce.....		.16	.16	.17	.18	.19	.19	.20		
Per pound.....		2.10	2.10	2.15	2.20	2.25	2.25	2.30		
49360. Wire, Nichrome. This alloy is practically non-corrosive with an extremely high melting point, i.e., 2800° F., and with a specific resistance equal to that of mercury.										
B. & S. gauge.....		14	16	18	20	22	24	26	28	30
Per ounce.....		.26	.28	.30	.35	.40	.45	.50	.55	.60
Per pound.....		3.40	3.60	4.00	4.40	4.85	5.40	6.00	6.80	7.70
49364. Wire, Nichrome, ribbon form, in widths from 1/32nd to 1 inch and any thickness from B. & S. gauge No. 14 to 40. Prices on application.										
49368. Wire Gauze, Brass, for general use.										
Mesh.....		10	20	30	40	60	80	100		
Per square foot.....		.50	.50	.55	.60	.70	1.00	1.45		
49372. Wire Gauze, Copper, for combustion. Mesh.....										
Per square foot.....		.50	.60	.70	1.00	1.45				
49376. Wire Gauze, Iron. Mesh.....		6	10	14	16	20	30	40	60	
Per square foot.....		.22	.27	.28	.32	.35	.37	.45	.70	
49380. Wire Gauze, Brass, in squares of proper thickness and mesh for heating beakers, dishes, etc., over flame. Size, inches.....							4	5	6	
Per square.....							.10	.15	.20	
49384. Wire Gauze, Nickel, 30 mesh. Per square foot.....							.40	.60	.80	1.50
49388. Wire Gauze, Nickel Chromium, of great durability because of the high heat resisting quality of this alloy. Size, inches.....							4	5	6	
Per square.....							.40	.60	.80	1.50
49392. Wire Gauze, Iron, in squares, for supporting dishes, etc. Size, inches.....							4	5	6	8
Per square.....							.05	.06	.08	.18
Per dozen squares.....							.50	.60	.80	2.00
49396. Wire Gauze, with Asbestos Center, of tinned iron wire, in squares. Size, mm.....							100	120	150	
Per square.....							.12	.15	.20	
49400. Wire Gauze, Asbestos Covered, Carlizek, of brass but with each wire covered with asbestos coating by a new process; very much more durable and economical of heat than those with asbestos center pressed on the wire gauze; in squares. Size, cm.....							10	12	15	
Per square.....							.35	.45	.50	
49404. Wire Gauze, as above, in circles with metallic binding. Diameter, cm.....							10	12	15	
Per square.....							.85	1.00	1.25	
49408. Wire Gauze, of tinned iron wire, with hemispherical asbestos center.										
Size, inches.....							4	5	6	
Per square.....							.45	.55	.60	

APPENDIX

Mendeleeff's Periodic System of the Elements

Revised by CHARLES BASKERVILLE

Series	Zero Group	Group I	Group II	Group III	Group IV	Group V	Group VI	Group VII
0	x							
1		y 11=1.008						
2	He=3.99	Li=6.94	Cl=9.1	B=11.0	C=12.00	N=14.01	O=16.00	F=19
3	Ne=20.2	Na=23.00	Mg=24.32	Al=27.1	Si=28.3	P=31.04	S=32.07	Cl=35.46
4	A=39.9	K=39.10	Ca=40.07	Sc=44.1	Ti=48.1	V=51.0	Cr.=52.0	Mn=51.93
5		Cu=63.57	Zn=65.37	Ga=69.9	Ge=72.5	As=74.96	Se=79.2	Br=79.92
6	Kr=82.92	Rb=85.45	Sr=87.63	Yt=89.0	Zr=90.6	Cb=93.5	Mo=96.0	
7		Ag=107.88	Cd=112.4	In=114.5	Sn=119.0	Sb=120.2	Te=127.5	I=126.92
8	Xe=130.2	Cs=132.81	Ba=137.37	La=139.0	Ce=140.25	(Pr=140.6)	(Nd=141.3)	
9				Er=167.7		Yb=172.0		
10						Ta=181.5	W=184.0	
11		Au=197.2	Hg=200.0	Tl=204.0	Pb=207.10	Bi=208		
12	Nt=222.4		Ra=226.4		Th=232.4		U=238.5	

Rare earth metals not placed:—Dy=162.5, Lu=174, Tb=159.2, Tm=168.5.

International Atomic Weights for 1913*

O = 16

Name	Symbol	Atomic Weight	Name	Symbol	Atomic Weight	Name	Symbol	Atomic Weight
Aluminium	Al	27.1	Holmium	Ho	163.5	Rhodium	Rh	102.9
Antimony	Sb	120.2	Hydrogen	H	1.008	Rubidium	Rb	85.45
Argon	A	39.88	Indium	In	114.8	Ruthenium	Ru	101.7
Arsenic	As	74.96	Iodine	I	126.92	Samarium	Sm	150.4
Barium	Ba	137.37	Iridium	Ir	193.1	Scandium	Sc	44.1
Bismuth	Bi	208.0	Iron	Fe	55.84	Selenium	Se	79.2
Boron	B	11.0	Krypton	Kr	82.92	Silicon	Si	28.3
Bromine	Br	79.92	Lanthanum	La	139.0	Silver	Ag	107.88
Cadmium	Cd	112.40	Lead	Pb	207.10	Sodium	Na	23.00
Caesium	Cs	132.81	Lithium	Li	6.94	Strontium	Sr	87.63
Calcium	Ca	40.07	Lutecium	Lu	174.0	Sulphur	S	32.07
Carbon	C	12.00	Magnesium	Mg	24.32	Tantalum	Ta	181.5
Cerium	Ce	140.25	Manganese	Mn	54.93	Tellurium	Te	127.5
Chlorine	Cl	35.46	Mercury	Hg	200.9	Terbium	Tb	159.2
Chromium	Cr	52.0	Molybdenum	Mo	96.0	Thallium	Tl	204.0
Cobalt	Co	58.97	Neodymium	Nd	144.3	Thorium	Th	232.4
Columbium	Cb	93.5	Neon	Ne	20.2	Thulium	Tm	168.5
Copper	Cu	63.57	Nickel	Ni	58.68	Tin	Sn	119.0
Dysprosium	Dy	162.5	Nitrogen	N	14.01	Titanium	Ti	48.1
Erbium	Er	167.7	Osmium	Os	190.9	Tungsten	W	184.0
Euroium	Eu	152.0	Oxygen	O	16.00	Uranium	U	238.5
Fluorine	F	19.0	Palladium	Pd	106.7	Vanadium	V	51.0
Gadolinium	Gd	157.3	Phosphorus	P	31.04	Xenon	Xe	130.2
Gallium	Ga	69.9	Platinum	Pt	195.2	Ytterbium	Yb	172.0
Germanium	Ge	72.5	Potassium	K	39.10	(Neoytterbium)		
Glucium	Gl	9.1	Praseodymium	Pr	140.6	Yttrium	Yt	89.0
Gold	Au	197.2	Radium	Ra	226.4	Zinc	Zn	65.37
Helium	He	3.99				Zirconium	Zr	90.6

*Compiled by the International Committee on Atomic Weights consisting of F. W. Clarke, W. Ostwald, T. E. Thorpe, and G. Urbain.

Comparison of Metric and Customary Units from 1 to 10*

LENGTHS

Inches	Millimeters	Inches	Centimeters	Feet	Meters
0.03937	= 1	0.3937	= 1	1	= 0.304801
0.07874	= 2	0.7874	= 2	2	= 0.609601
0.11811	= 3	1	= 2.54001	3	= 0.914402
0.15748	= 4	1.1811	= 3	3.28083	= 1
0.19685	= 5	1.5748	= 4	4	= 1.219202
0.23622	= 6	1.9685	= 6	5	= 1.524003
0.27559	= 7	2	= 5.08001	6	= 1.828804
0.31496	= 8	2.3622	= 6	6.56167	= 2
0.35433	= 9	2.7559	= 7	7	= 2.133604
1	= 25.4001	3	= 7.62002	8	= 2.438405
2	= 50.8001	3.1496	= 8	9	= 2.743205
3	= 76.2002	3.5433	= 9	9.84250	= 3
4	= 101.6002	4	= 10.16002	13.12333	= 4
5	= 127.0003	5	= 12.70003	16.40417	= 5
6	= 152.4003	6	= 15.24003	19.68500	= 6
7	= 177.8004	7	= 17.78004	22.96583	= 7
8	= 203.2004	8	= 20.32004	26.24667	= 8
9	= 228.6005	9	= 22.86005	29.52750	= 9

AREAS

Square Inches	Square Millimeters	Square Inches	Square Centimeters	Square Feet	Square Meters
0.00155	= 1	0.1550	= 1	1	= 0.00290
0.00310	= 2	0.3100	= 2	2	= 0.18581
0.00465	= 3	0.4650	= 3	3	= 0.27871
0.00620	= 4	0.6200	= 4	4	= 0.37161
0.00775	= 5	0.7750	= 5	5	= 0.46452
0.00930	= 6	0.9300	= 6	6	= 0.55742
0.01085	= 7	1	= 6.452	7	= 0.65032
0.01240	= 8	1.0850	= 7	8	= 0.74323
0.01395	= 9	1.2400	= 8	9	= 0.83613
1	= 645.16	1.3950	= 9	10.764	= 1
2	= 1,290.33	2	= 12.903	21.528	= 2
3	= 1,935.49	3	= 19.355	32.292	= 3
4	= 2,580.65	4	= 25.807	43.055	= 4
5	= 3,225.81	5	= 32.258	53.819	= 5
6	= 3,870.98	6	= 38.710	64.583	= 6
7	= 4,516.14	7	= 45.161	75.347	= 7
8	= 5,161.30	8	= 51.613	86.111	= 8
9	= 5,806.46	9	= 58.065	96.875	= 9

VOLUMES

Cubic Inches	Cubic Millimeters	Cubic Inches	Cubic Centimeters	Cubic Feet	Cubic Meters
0.000061	= 1	0.0610	= 1	1	= 0.02832
0.000122	= 2	0.1220	= 2	2	= 0.05663
0.000183	= 3	0.1831	= 3	3	= 0.08495
0.000244	= 4	0.2441	= 4	4	= 0.11327
0.000305	= 5	0.3051	= 5	5	= 0.14159
0.000366	= 6	0.3661	= 6	6	= 0.16990
0.000427	= 7	0.4272	= 7	7	= 0.19822
0.000488	= 8	0.4882	= 8	8	= 0.22654
0.000549	= 9	0.5492	= 9	9	= 0.25485
1	= 16,387.2	1	= 16.3872	35.314	= 1
2	= 32,774.3	2	= 32.7743	70.629	= 2
3	= 49,161.5	3	= 49.1615	105.943	= 3
4	= 65,548.6	4	= 65.5486	141.258	= 4
5	= 81,935.8	5	= 81.9358	176.572	= 5
6	= 98,323.0	6	= 98.3230	211.887	= 6
7	= 114,710.1	7	= 114.7101	247.201	= 7
8	= 131,097.3	8	= 131.0973	282.516	= 8
9	= 147,484.5	9	= 147.4845	317.830	= 9

* Table of Equivalents, U. S. Bureau of Standards.

CAPACITIES

Milliliters (cc.)	U. S. Liquid Ounces
1	= 0.03381
2	= 0.06763
3	= 0.10144
4	= 0.13526
6	= 0.16907
8	= 0.20288
7	= 0.23670
8	= 0.27051
9	= 0.30432
29.574	= 1
59.147	= 2
88.721	= 3
118.295	= 4
147.869	= 5
177.442	= 6
207.016	= 7
236.590	= 8
266.163	= 9

Milliliters (cc.)	U. S. Apothecaries' Drams
1	= 0.2705
2	= 0.5410
3	= 0.8115
3.6967	= 1
4	= 1.0820
6	= 1.3525
6	= 1.6231
7	= 1.8936
7.3934	= 2
8	= 2.1641
9	= 2.4346
11.0901	= 3
14.7869	= 4
18.4836	= 5
22.1803	= 6
25.8770	= 7
29.5737	= 8
33.2704	= 9

U. S. Apothecaries' Scruples	Milliliters (cc.)
0.8115	= 1
1	= 1.2322
1.6231	= 2
2	= 2.4645
2.4346	= 3
3	= 3.6967
3.2461	= 4
4	= 4.9290
4.0577	= 5
4.8692	= 6
6	= 6.1612
5.6807	= 7
6	= 7.3934
6.4923	= 8
7	= 8.6257
7.3038	= 9
8	= 9.8579
9	= 11.0901

MASSES

Grains	Grams
1	= 0.06480
2	= 0.12960
3	= 0.19440
4	= 0.25920
5	= 0.32399
6	= 0.38879
7	= 0.45359
8	= 0.51839
9	= 0.58319
15.4324	= 1
30.8647	= 2
46.2971	= 3
61.7294	= 4
77.1618	= 6
92.5941	= 6
108.0265	= 7
123.4589	= 8
138.8912	= 9

Avoirdupois Ounces	Grams
0.03527	= 1
0.07055	= 2
0.10582	= 3
0.14110	= 4
0.17637	= 5
0.21164	= 6
0.24692	= 7
0.28219	= 8
0.31747	= 9
1	= 28.3495
2	= 56.6991
3	= 85.0486
4	= 113.3981
5	= 141.7476
6	= 170.0972
7	= 198.4467
8	= 226.7962
9	= 255.1457

Troy Ounces	Grams
0.03215	= 1
0.06430	= 2
0.09645	= 3
0.12860	= 4
0.16075	= 5
0.19290	= 6
0.22506	= 7
0.25721	= 8
0.28936	= 9
1	= 31.10348
2	= 62.20696
3	= 93.31044
4	= 124.41392
6	= 155.51740
6	= 186.62088
7	= 217.72437
8	= 248.82785
9	= 279.93133

Avoirdupois Pounds	Kilograms
1	= 0.45359
2	= 0.90718
2.20462	= 1
3	= 1.36078
4	= 1.81437
4.40924	= 2
5	= 2.26796
6	= 2.72155
6.61387	= 3
7	= 3.17515
8	= 3.62874
8.81849	= 4
9	= 4.08233
11.02311	= 6
13.22773	= 6
15.43236	= 7
17.63698	= 8
19.84160	= 9

Troy Pounds	Kilograms
1	= 0.37324
2	= 0.74648
2.67923	= 1
3	= 1.11973
4	= 1.49297
5	= 1.86621
5.35846	= 2
6	= 2.23945
7	= 2.61269
8	= 2.98593
8.03769	= 3
9	= 3.35918
10.71691	= 4
13.39614	= 6
16.07537	= 6
18.75460	= 7
21.43383	= 8
24.11306	= 9

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REAGENTS
FOR
ANALYSIS, BACTERIOLOGY,
MICROSCOPY, ETC.

BAKER ANALYZED

MERCK BLUE LABEL

KAHLBAUM CERTIFIED FOR ANALYSIS

PART II—REAGENTS

COPYRIGHT, 1914
BY ARTHUR H. THOMAS COMPANY

EDITION SEPTEMBER 1914

ARTHUR H. THOMAS COMPANY

WEST WASHINGTON SQUARE

(230-2-4 SOUTH 7th ST.)

PHILADELPHIA

U. S. A.

Our experience has shown us that no chemist wishes to confine his purchases of high grade reagents for analytical purposes to those produced by any one manufacturer.

The advantage of placing orders with a dealer offering the three most reliable lines of analyzed and tested reagents is, therefore, obvious in that the products of various manufacturers can be purchased at one time, on one order and received in one shipment.

Where competitive bids on high grade reagents are required the customer will please specify the maker whose goods are preferred, using such maker's nomenclature as to purity, size of package, etc.

It is impossible to make intelligent competitive bids upon specifications such as "Kahlbaum, Merck or Baker;" "all chemicals to be c.p.;" "all chemicals to be of highest grade;" "Kahlbaum c.p.;" "Merck c.p.;" as no two bidders will quote on the products of the same maker for each of the items in the list and also because both Merck and Kahlbaum omit entirely the use of the designation c.p.

We believe that the responsibility as to the choice of maker belongs to the buyer rather than to the dealer and that such responsibility should be assumed by the buyer when preparing lists for competitive bids. This does not apply, however, in quoting upon goods of ordinary grade carried in stock in bulk and packed in quantities as desired.

PREFACE

In this price list we offer in original factory packages three leading makes of tested reagents, i. e., BAKER ANALYZED, MERCK BLUE LABEL and KAHLBAUM'S CERTIFIED FOR ANALYSIS, and, in addition, less expensive chemicals carefully selected to meet less exacting requirements. These are secured from reliable factories in both Europe and America, and in most cases, are distinctly superior to the ordinary so-called "commercial" grade.

The chemicals herein listed are those which have been most frequently ordered from our stock in the past fourteen years as shown by carefully kept records during this period. We have not attempted to include all the chemicals which may be required in modern laboratory work, particularly in the line of organic preparations which our experience has shown to be demanded mostly by buyers entitled to duty free importation for educational use, and which we furnish in most cases by direct importation from Europe upon orders made out from manufacturer's price list. Chemicals not in stock are secured promptly and economically from specified or best available makers.

Stains and reagents required in Bacteriology, Microscopy and other of the Biological Sciences have been given special attention and our list is offered as being unusually complete in this direction.

DUTY FREE IMPORTATION. Buyers entitled by law to duty free importation are encouraged to secure from us the original catalogues of the European makers such as Kahlbaum, Marquart, Schuchardt, DeHaen, etc. Duty free quotations on products of the European factory of E. Merck must be made specially as this firm does not permit the distribution of their German catalogue in the United States. Our facilities for prompt and economical duty free importations are the result of years of effort and insure the buyer lower cost and less trouble than when orders are placed directly with the European manufacturers. **Parallel, competitive bids for duty free importation cannot be accurately made unless the buyer specifies the exact grade of chemical desired in terms of the maker's price list.**

CONTAINERS. Containers are charged for extra at price indicated in marginal column except where designation "incl." is given, in which case the container cost is included in the cost of the chemical. Our designations for containers in the marginal column are as follows:—

ch. Cork stoppered bottle.	cn. Tin can.
gh. Glass stoppered bottle.	hx. Box.
rb. Rubber stoppered bottle.	jj. Jug.
cc. Cylindrical carton.	

We emphasize the convenience of our cylindrical, paraffined card-board cartons in which many of our ordinary chemicals are furnished. They are much superior to the paper bag in common use and provide a suitable container until contents are used. We allow credit, if returned to us charges paid in clean condition, for five pint and one pound acid bottles and carboys, when original purchase has been made from us and containers bear our label. Other glass stoppered bottles, and cork stoppered bottles are not returnable for credit. Arrangements are made with those regularly buying Baker's acids and ammonia of us for the direct shipment of containers to the factory at Phillipsburg, N. J.

SHIPMENT RESTRICTIONS. Under United States laws and regulations established by the Interstate Commerce Commission, certain chemicals are prohibited from express shipment and must in all cases be shipped by freight. These are indicated by an asterisk thus (*). Chemicals designated thus (°) are accepted by express companies under definite restrictions as to quantity, size of package, method of packing, etc. As all of these restrictions are without our control we accept all orders and make all contracts subject to them and charge extra for all extra packing expenses as required by the above mentioned regulations.

TERMS AND PRICES. All prices are subject to change without notice. With the exception of Baker's Analyzed Chemicals on which we extend special net prices considerably less than the printed list, the prices in this catalogue may be generally taken as net. It has been found impracticable to quote a uniform discount rate because of price fluctuations. Special prices will be extended on large quantities of single items or on large general lists.

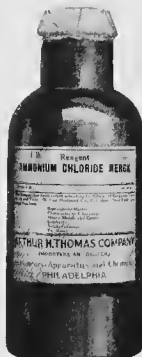
We are not manufacturers of chemicals but are dealers and importers. Our function is to afford scientists an economical and convenient source of supply for the chemicals they most frequently require, no matter where or by whom they are manufactured, and, in the case of the purest grades of chemicals to deliver in the manufacturer's original packages so that full responsibility as to quality rests definitely upon the manufacturer, where it belongs. Chemicals are freely added to our price list and carried in stock when demand develops or our attention is called to future need.

BAKER, MERCK AND KAHLBAUM

ANALYZED, STANDARDIZED AND CERTIFIED
REAGENTS FOR ANALYSIS



BAKER BOTTLE



MERCK BOTTLE



KAHLBAUM BOTTLE

BAKER ANALYZED CHEMICALS—In making the analysis samples are taken 50 or 100 lbs. of material and tests are made for all probable impurities. Each lot is numbered and every package filled from the lot bears the lot number so that the contents of any package can be identified and traced back through the entire process of manufacture. When impurities are found and can be determined quantitatively the amount is stated in percentages. The minus sign (–) means that the amount of impurity is less than is indicated by the figures, the term “None” that no appreciable amount of the impurity tested for has been found in the sample. The term “Trace” indicates the presence of a minute amount of impurity only detectable by qualitative methods. The analyses given throughout the catalogue are intended as typical and goods furnished are not guaranteed to be exactly in accordance with these analyses.

MERCK BLUE LABEL REAGENTS—These reagents are standardized as well as analyzed as each reagent must conform to the standard of purity given in Krauch’s “*Chemical Reagents, Their Purity and Tests*” before packing under the Blue Label. The standard of purity given on the printed label and under each item throughout this catalogue is, therefore, absolutely guaranteed. A reagent under Merck’s Blue Label is, therefore, standard at all times so long as it is delivered in the original package. The distinctive Blue Label is used on these tested and standardized reagents in contradistinction to the White Label as used on Merck photographic, medical and technical chemicals. To avoid confusion and mistakes customers will kindly use the term “Merck Blue Label” or “M.B.L.” in ordering these goods.

KAHLBAUM CERTIFIED FOR ANALYSIS REAGENTS—These reagents are high in price but embody a degree of purity offered by no other maker as will be seen by comparison of the analyses printed under each substance. The method of analysis, i.e. amount of impurity present in a definite weighable quantity, has commended itself to those interested in using reagents of highest possible purity. These reagents are listed in the Kahlbaum German price-list as “zur Analyze, mit Garantieschein” and are more expensive than those listed under the designation “zur Analyze.” A quantity of 10 grams is used for each analysis and the statements on the labels are based on the following explanation:—

Spur (trace)	=	less than $\frac{1}{10}$ milligram	} in 10 grams of material
Kaum Spur (slight trace)	=	" " $\frac{1}{100}$ "	
Hauch (faint trace)	=	" " $\frac{1}{1000}$ "	

The bottles are all sealed with lead in the Kahlbaum factory and in addition to the statement on each label a printed guarantee is furnished with each package. There may be a slight variation in the amount of impurity shown by the analysis on packages sent out from different lots but this variation is always exceedingly slight. We keep on hand for free distribution a supply of Kahlbaum’s latest price list for the use of customers placing import orders, particularly those for Educational Institutions, which may be imported free of duty.

A R T H U R H. T H O M A S C O M P A N Y

		Dounce and pound prices				Price in other size packages					
		Maker or Brand		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
ACID,	Arsenious, powdered	Kahlbaum "C.f.A."						100 grm.	.50	incl	
	Arsenious, powdered	Kahlbaum "C.f.A."						500 grm.	.85	incl	
	Nonvolatile matter.....	trace	} in 10 grams	Certified Analysis							
Arsenic Sulphide.....	none										
Content	99.99%										
ACID,	Benzoate (from Toluene)	Baker Analyzed		.10	incl	.43	ce	.05			
	Benzoic (from Toluene)	Baker Analyzed		.10	incl	.55	cb	.12	1/4 lb.	.15 incl	
	Boric, crystals	Baker Analyzed		.10	incl	.15	ce	.05			
	Boric, powdered	Baker Analyzed		.10	incl	.15	ce	.05			
	Boric, c. p., crystals	Baker Analyzed		.10	incl	.25	cb	.09	1/4 lb.	.15 incl	
	Boric, c. p., powder	Baker Analyzed		.10	incl	.30	cb	.09	1/4 lb.	.15 incl	
	Fe.....	0.002%	} Typical Analysis								
	CaO.....	none									
	Na (flame test).....	trace									
	Pb.....	none									
Cl.....	0.01%										
SO ₂	none										
ACID,	Boric, c. p., fused, anhyd, powd					1.50	cb	.08			
	Boric, fused	Kahlbaum "C.f.A."						50 grm.	.70	incl	
	Boric, fused	Kahlbaum "C.f.A."						200 grm.	1.80	incl	
	Alkalies.....										
	Silica.....	unweighable	} in 10 grams	Certified Analysis							
	Earths, etc.....	unweighable									
	Content	99.10%									
	Hygroscopic moisture	remainder									
ACID,	Boric Anhydride	Merk Blue Label		.25	incl				1/2 lb.	1.35 incl	
	Silica, Alkalies, etc.....										
	Butyric, c. p., 100%			.15	incl	1.50	cb	.08	1/4 lb.	.50 incl	
	Carbolic, pure, white crystals					.25	cb	.09			
	Carbolic, c. p., loose crystals					.50	gb	.15			
	Carbolic, c. p., loose crystals	Baker Analyzed				.60	cb	.09			
	Nonvolatile matter.....	0.01%	} Typical Analysis								
	M. P.....	35-39°C									
	B. P.....	182°C									
		Soluble in 15 parts of water									
ACID,	Carbolic, by synthesis, fused					.80	gb	.15	1/4 lb.	.30 incl	
	Carbolic, crude, #100. As recommended by Drs. Mali and Keiller for the preservation of cadavers. In bbls. of 50 gals. at 65¢ per gal.	A. H. T. Co. #100							bbl.	32.50 incl	
ACID,	Carmic	Merk Blue Label		5.50	cb	.04			15 grs.	.40 incl	
	Carmic	Merk Blue Label							15 grs.	.70 incl	
	Tested for solubility and sensitiveness										
ACID,	Chromic, coml.					.35	gb	.15			
	Chromic, pure					.50	gb	.15			
ACID,	Chromic, c. p.	Baker Analyzed		.20	incl	1.50	gb	.16	1/4 lb.	.55 incl	
	Sulphur.....	0.04%	} Typical Analysis								
	HNO ₃	trace									
	K.....	trace									
	Na.....	trace									
	CaO.....	none									
	Fe.....	0.02%									
	ACID,	Chromic, free from H ₂ SO ₄	Merk Blue Label		.25	incl				1/2 lb.	1.00 incl
		Sulphuric Acid..... less than 0.005% as SO ₂	Guaranteed Analysis								
		Potassium Sulphate..... not more than 1%									
ACID,	Chromic, for Carbon determination. Tested for..... Carbon	Merk Blue Label				1.25	incl		1/4 lb.	.40 incl	
	Cinnamic, c. p.			.35	incl						
	Citric, crystals, or powder					.75	ce	.05			
	Citric, c. p., crystals	Baker Analyzed		.15	incl	1.00	cb	.08	1/4 lb.	.40 incl	
	Citric, c. p., powder	Baker Analyzed		.15	incl	1.10	cb	.08	1/4 lb.	.40 incl	
	Nonvolatile matter.....	0.003%	} Typical Analysis								
	SO ₂	none									
	CaO.....	none									
	Pb.....	none									
	Fe.....	0.0005%									
	Oxalic Acid..... none										
	Tartaric Acid..... none										
ACID,	Citric	Merk Blue Label				1.25	incl		1/4 lb.	.40 incl	
	Oxalic Acid.....										
	Tartaric Acid.....										
	Sugar.....										
	Sulphuric Acid.....										
	Lead.....										
	Calcium.....										
	Nonvolatile matter.....										
		less than 2.8%	} Guaranteed Analysis								
		less than 1%									
	less than 0.05% Saccharose										
	less than 0.002% as SO ₂										
	less than 0.001%										
	less than 0.01%										
	less than 0.05%										
ACID,	Dichloroacetic			1.40	gb	.07					
	Formic, pure, 85%					.75	gb	.15			
ACID,	Formic, c. p.			.22	incl	1.25	gb	.15	1/4 lb.	.40 incl	
	Gallic, U. S. P			.10	incl	.70	cb	.10			

	Maker or Brand	Ounce and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
ACID, Gallic.	Merck Blue Label			1.20	incl	$\frac{1}{4}$ lb.	.40	incl
Tested for solubility in water								
Water content not more than 19%	Guaranteed Analysis							
Sulphuric Acid less than 0.005% as SO ₂								
Inorganic matter less than 0.05%								
ACID, Hydriodic, c. p., sp. gr. 1.50	Merck Blue Label	.40	incl			$\frac{1}{4}$ oz.	.25	incl
Nonvolatile matter less than 0.01%								
Phosphorus none	Guaranteed Analysis							
Sulphuric Acid less than 0.01% as SO ₂								
Heavy metals none								
Earths less than 0.005% as Ca								
Hydrochloric Acid and Hydromic Acid less than 0.002% as Cl	Merck Blue Label	1.00	incl			$\frac{1}{4}$ oz.	.35	incl
Same impurities as sp. gr. 1.50								
ACID, Hydrobromic, sp. gr. 1.31	Merck Blue Label	.25	incl	1.35	gb .15	$\frac{1}{4}$ lb.	.50	incl
Nonvolatile matter not more than 0.01%								
Arsenic less than 0.0015%	Guaranteed Analysis							
Sulphuric Acid less than 0.0075% as SO ₂								
Heavy metals none								
Iron less than 0.00015%								
Hydrochloric Acid less than 0.08%								
Hydriodic Acid less than 0.0156%								
Phosphorous and Phosphoric Acids 0.0075% P ₂ O ₅								
Calcium less than 0.005%								
*ACID, Hydrochloric, coml., pale, in 6 lb. bottle				.05		6 lbs.	.30 gb .25	
* " Hydrochloric, coml., pale, in case of 10 glass stoppered bottles.				.04		60 lb.	2.40	3.30
* " Hydrochloric, coml., pale, in carboy				.02$\frac{1}{2}$		118 lb.	3.54	2.00
* " Hydrochloric, c. p., sp. gr. 1.18-1.19	Baker Analyzed			.14	gb .15			
* " Hydrochloric, c. p., in 6 lb. bottle.	Baker Analyzed			.09		6 lbs.	.54 gb .25	
* " Hydrochloric, c. p., in case of 10 glass stoppered bottles	Baker Analyzed			.08		60 lb.	4.80	3.30
* " Hydrochloric, c. p., in carboy	Baker Analyzed			.07$\frac{1}{2}$		112 lb.	8.40	2.00
Sp. gr. 1.18-1.19								
HCl 35-37.5%								
SO ₂ -0.0001%	Typical Analysis							
Free Cl none								
Fe 0.0001%								
As trace								
Sb none								
Nonvolatile matter 0.0005%								
*ACID, Hydrochloric, c. p.	Baker Special			.15		6 lb.	.90 gb .25	
(Free from Arsenic and Antimony)								
* " Hydrochloric, sp. gr. 1.190	Merck Blue Label			.40	incl	6 lb.	1.80	incl
Sulphuric Acid less than 0.00125% as SO ₂								
SO ₂ less than 0.0005%	Guaranteed Analysis							
Free Chlorine less than 0.00016%								
Sulphurous Acid less than 0.005% as SO ₂								
Heavy metals less than 0.0001%								
Iron less than 0.001%								
Calcium less than 0.001%								
Arsenic not more than 0.00001%								
*ACID, Hydrochloric, sp. gr. 1.050	Merck Blue Label	.40	incl			6 lb.	1.80	incl
The same impurities as sp. gr. 1.190								
* " Hydrochloric, sp. gr. 1.124	Merck Blue Label	.40	incl			6 lb.	1.80	incl
The same impurities as sp. gr. 1.190								
*ACID, Hydrofluoric, tech., 48%				.13		5 lb.	.65	ig 1.25
* " Hydrofluoric, tech., 48%				.13		10 lb.	1.30	ig 2.00
* " Hydrofluoric, pure.		.10	incl .70	incl		$\frac{1}{4}$ lb.	.25	incl
* " Hydrofluoric, c. p.	Baker Analyzed	.20	incl	1.25	incl	$\frac{1}{4}$ lb.	.50	incl
* " Hydrofluoric, c. p.	Baker Analyzed					$\frac{1}{2}$ lb.	.76	incl
JF 48%								
SiF ₄ 0.0001%	Typical Analysis							
SiF ₂ none								
HCl trace								
Fe 0.0001%								
Pb none								
Nonvolatile matter 0.0008%								
*ACID, Hydrofluoric.	Merck Blue Label	.55	incl			$\frac{1}{2}$ lb.	1.75	incl
Nonvolatile matter not more than 0.005%								
Sulphuric Acid less than 0.005% as SO ₂	Guaranteed Analysis							
Calcium less than 0.001%								
Magnesium less than 0.005%								
Heavy metals none								
Hydrochloric Acid less than 0.601% as Cl								
Hydrofluoric Acid less than 0.3%								
Sulphurous Acid less than 0.005% as SO ₂								
ACID, Hydrosilicofluoric, tech., 10% (Hydrofluosilicic)				.46	gb .14			
" Hydrosilicofluoric, c. p.				1.85	incl			

	Maker or Brand	Ounce and pound prices				Price in other size packages			
		per oz.	cont.	per lb.	cont.	size pkgs.	per pkg.	cont.	
ACID, Hydrosilicofluoric	Merk Blue Label	.30	incl			¼ lb.	.75	incl	
Nonvolatile matter									
Heavy metals									
Sulphuric Acid									
Tested for									
Nonvolatile matter									
ACID, Iodic, c. p., crystal	Merk Blue Label	.90	incl			¼ oz.	.40	incl	
Tested for									
Nonvolatile matter									
ACID, Iodic Anhydride, c. p.	Merk Blue Label	1.10	incl			¼ oz.	.50	incl	
(Iodine Pentoxide)									
ACID, Iodic Anhydride	Merk Blue Label	1.50	incl			¼ oz.	.50	incl	
The same impurities as Acid Iodic									
ACID, Lactic, pure, sp. gr. 1.20									
Heavy metals									
Phosphoric Acid									
Tested for									
Nonvolatile matter									
ACID, Lactic, c. p., sp. gr. 1.21		.15	incl	1.00	cb .08	¼ lb.	.30	incl	
Heavy metals									
Phosphoric Acid									
Tested for									
Nonvolatile matter									
ACID, Molybdic, c. p., 85%	Baker Analyzed	.55	incl	5.00	cb .07	¼ lb.	1.75	incl	
MoO ₃									
NH ₃									
As									
P									
Nitrate									
Residue insoluble in Ammonia									
ACID, Molybdic	Merk Blue Label	.40	incl			¼ lb.	2.50	incl	
Tested for									
Heavy metals									
Phosphoric Acid									
Tested for									
Nonvolatile matter									
ACID, Molybdic, pure, for analysis	Marquart			5.75	cb .09				
Heavy metals									
Phosphoric Acid									
Tested for									
Nonvolatile matter									
ACID, Molybdic, c. p., special, 100%	Baker Analyzed	.80	incl	7.50	cb .07	¼ lb.	2.50	incl	
MoO ₃									
NH ₃									
As									
P									
Nitrate									
Residue insoluble in Ammonia									
ACID, Molybdic Anhydride, free from Ammonia and Nitric Acid	Merk Blue Label	.60	incl			¼ lb.	2.00	incl	
Tested for									
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Molybdic, free from Ammonia	Marquart			7.25	cb .09				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Monochloracetic				1.50	incl				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Monochloracetic, c. p.				1.75	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Naphthylaminesulphonic, (α) tested reagent	Merk Blue Label	.60	incl			¼ oz.	.25	incl	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, concl., 38°, in 7 lb. bottle						7 lb.	.70	gb .25	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, concl., 38°, in case of 10 glass stoppered bottles				.07	½	70 lb.	5.25	3.30	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, concl., 38°, in carboy				.06	½	139 lb.	9.04	2.00	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Nitric, c. p., sp. gr. 1.42	Baker Analyzed			.17	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, c. p., in 7 lb. bottle	Baker Analyzed			.12		7 lb.	.84	gb .25	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, c. p., in case of 10 glass stoppered bottles	Baker Analyzed			.11		70 lb.	7.70	3.30	
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, c. p., in carboy	Baker Analyzed			.10		139 lb.	13.90	2.00	
Sp. gr.									
HNO ₃									
SO ₂									
NO									
Fe									
I									
Nonvolatile matter									
Cl									
As									
Sb									
* ACID, Nitric, pure, sp. gr. 1.52 fuming				.15	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
* ACID, Nitric, c. p., sp. gr. 1.50	Baker Analyzed			.25	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Nitric, pure, sp. gr. 1.60, red fuming				.40	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Nitric, c. p., sp. gr. 1.60, red fuming	Baker Analyzed			.50	gb .15				
Heavy metals									
Phosphoric Acid									
Nitric Acid									
ACID, Nitric, sp. gr. 1.153	Merk Blue Label			.40	incl	7 lb.	2.10	incl	
The same impurities as sp. gr. 1.40									
ACID, Nitric, sp. gr. 1.20	Merk Blue Label			.40	incl	7 lb.	2.10	incl	
The same impurities as sp. gr. 1.40									

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages		
		per oz.		per lb.		size pkg.	per pkg.	cont.
		cont.	incl.	cont.	incl.			
*ACID, Nitric, sp. gr. 1.30	Merck Blue Label		.40	incl.		7 lb.	2.10	incl.
The same impurities as sp. gr. 1.40								
*ACID, Nitric, sp. gr. 1.40	Merck Blue Label		.40	incl.		7 lb.	2.10	incl.
Nonvolatile matter less than 0.0047%								
Sulphuric Acid less than 0.00005% as SO ₃								
Hydrogen halogen acids less than 0.000015% as Cl								
Heavy metals none								
Earths less than 0.0002% as Ca								
Iodic Acid and Iodine less than 0.0005% as I								
Arsenic less than 0.000075%								
*ACID, Nitric, fuming, sp. gr. 1.486-1.500	Merck Blue Label		.50	incl.				
The same impurities as sp. gr. 1.40								
" " Nitric, crude, sp. gr. 1.38	Merck Blue Label		.40	incl.				
Nonvolatile residue less than 0.007%								
ACID, Oleic, pure			.30	cb .09				
" Osmic						1 grm.	1.90	incl.
" Osmic						½ grm.	1.00	incl.
" Oxalic, coml., crystals			.16	cc .05		5 lb.	.70	incl.
" Oxalic, pure	Baker Analyzed		.20	cb .09				
" Oxalic, c. p.	Baker Analyzed		.45	cb .08		¼ lb.	.20	incl.
Nonvolatile matter 0.040%								
SO ₂ 0.001%								
Ca 0.01%								
Fe 0.002%								
Pb none								
ACID, Oxalic, c. p., (carefully dried for standardizing)	Baker Special	.15	incl.	.75	cb .09	¼ lb.	.35	incl.
" Oxalic	Merck Blue Label		.70	incl.		¼ lb.	.25	incl.
Ash less than 0.017%								
Sulphuric Acid less than 0.004% as SO ₃								
Chlorides less than 0.0004% as Cl								
Heavy metals none								
Ammonium compounds less than 0.002% as NH ₃								
Nitric Acid less than 0.007% as N ₂ O ₅								
ACID, Oxalic	Kahlbaum "C.f.A."					100 grm.	.90	incl.
" Oxalic	Kahlbaum "C.f.A."					500 grm.	2.50	incl.
Nonvolatile matter none								
Chlorine none								
Sulphuric Acid none								
Nitric Acid none								
Ammonium salts none								
Heavy metals none								
Content 99.90%								
*ACID, Perchloric	Merck Blue Label	.35	incl.					
Nonvolatile matter less than 0.005%								
Sulphuric Acid less than 0.005% as SO ₃								
Hydrochloric Acid less than 0.0005% as Cl								
Barium less than 0.0025%								
Heavy metals none								
ACID, Phosphomolybdic, c. p., 10% sol.		.20	incl.	1.35	gb .15	¼ lb.	.60	incl.
" Phosphomolybdic, crystals		.65	cb .04					
" Phosphomolybdic	Merck Blue Label	.90	incl.			¼ oz.	.30	incl.
Tested for solubility								
Heavy metals at most a trace								
Earths less than 0.02% as Ca								
ACID, Phosphoric, c. p., 85%	Baker Analyzed	.15	incl.	.40	gb .15	¼ lb.	.25	incl.
Sp. gr. 1.71								
SO ₂ 0.005%								
FeO ₂ trace								
HCl 0.0003%								
As none								
CaO none								
ACID, Phosphoric, ortho, sp. gr. 1.7	Merck Blue Label		.70	incl.		¼ lb.	.30	incl.
Volatil acids less than 0.0023% as HNO ₃								
Nitric Acid less than 0.0048% as N ₂ O ₅								
Hydrogen halogen acids less than 0.0003% as Cl								
Phosphorous Acid less than 0.005% as Fe ₂ O ₃								
Sulphuric Acid less than 0.0025% as SO ₂								
Metaphosphoric Acid none								
Heavy metals none								
Earths, etc. less than 0.01% as Ca								
Substances oxidizable by Permanganate none								
Arsenic less than 0.0002%								
ACID, Phosphoric, c. p., 50%			.35	gb .15				
" Phosphoric, ortho, sp. gr. 1.12	Merck Blue Label		.45	incl.		¼ lb.	.20	incl.
The same impurities as sp. gr. 1.7								
" Phosphoric, ortho, sp. gr. 1.057	Merck Blue Label		.60	incl.		¼ lb.	.25	incl.
The same impurities as sp. gr. 1.7								
" Phosphoric, c. p., meta			.15	incl.	1.00	gb 15	¼ lb.	.45
" Phosphoric, meta, stick (contains Sodium Phosphate)			.15	incl.	.70	cb .08	¼ lb.	.30

A R T H U R H T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices			Price in other size packages		
		per oz.	cost.	per lb. cont.	size pkg.	per pkg.	cont.
ACID, Phosphoric, meta	Merck Blue Label						
Nitric Acid..... less than 0.016% as N_2O_5							
Sulphates..... less than 0.083% as SO_3							
Hydrogen halogen acids.....							
Heavy Metals..... none	Guaranteed Analysis						
Earths, etc..... less than 0.02% as Ca							
Arsenic..... less than 0.0015%							
Oxidizable substances..... none							
* ACID, Phosphoric Anhydride.....		.25	incl	1.25	gb	.15	1/4 lb. .45 incl
Arsenious Acid..... less than 0.01%	Merck Blue Label	.20	incl				1/2 lb. .80 incl
" Phosphotungstic, 10% solution				1.00	cb	.08	
" Phosphotungstic, crystals.....		.35	gb	.07			
" Phosphotungstic	Merck Blue Label	.45	incl				1/4 lb. 1.35 incl
Nitroses..... less than 0.0032% as N_2O_2	Guaranteed Analysis						
Ammonium salts..... less than 0.0045% as NH_3							
* ACID, Phthalic, c. p., anhydrous	Baker Analyzed	.25		2.50	cb	.12	1/4 lb. .75 incl
" Picric, c. p., crystals. Dry Picric Acid is classed as a high explosive and can only be shipped subject to the regulations governing the transportation of goods of this class. If 20% water is added Picric Acid can be shipped with other chemicals.....		.20	incl	1.25	cb	.08	1/4 lb. .35 incl
ACID, Pyrogallie, resublimed.....		.17	incl	1.75	incl		1/4 lb. .50 incl
" Pyrogallie	Merck Blue Label	.35	incl				
Inorganic matter..... less than 0.05%	Guaranteed Analysis						
Galleic Acid..... less than 1%							
ACID, Pyroigneous, technical.....				.10	cb	.00	
" Rosolic.....		.25	incl				
" Rosolic	Merck Blue Label	.40	incl				
Tested for..... Sensitiveness							
" Salicylic, pure.....				.40	cb	.09	
" Salicylic, from Wütergreen Oil.....		.22	incl	3.00	cb	.09	
" Silicic, coml., powder.....				.12	ce	.04	
" Silicic, c. p.	Baker Analyzed	.10	incl	.80	cb	.12	1/4 lb. .30 incl
" Silicotungstic	Merck Blue Label	1.50	incl				
Sulphates..... none	Guaranteed Analysis						
Chlorides..... less than 0.0025% as Cl							
Tungstate..... none							
Mercury and other heavy metals..... none							
Residue on ignition..... 85-91%							
ACID, Stearic, U. S. P., powder.....				.35	cb	.10	
" Succinic, c. p......		.60	incl				
" Succinic	Merck Blue Label	.80	incl				1/4 oz. .25 incl
Nonvolatile matter..... less than 0.05%	Guaranteed Analysis						
Oxalic Acid..... less than 0.07%							
Tartaric Acid..... less than 2%							
Sulphates..... less than 0.001% as SO_2							
Chlorides..... less than 0.002% as Cl							
Ammonium salts..... less than 0.0035% as NH_3							
Heavy metals..... none							
ACID, Sulphanilic, crystals.....		.20	incl	1.50	cb	.09	1/4 lb. .55 incl
" Sulphanilic	Merck Blue Label	.25	incl				
Inorganic matter..... less than 0.05%	Guaranteed Analysis						
Sulphuric Acid (Aniline Sulphate)..... less than 0.004% as SO_3							
Hydrochloric Acid (Aniline Hydrochloride)..... less than 0.002% as Cl							
* ACID, Sulphuric, coml., in 9 lb. bottle.....				.06			9 lb. .54 gb .25
" Sulphuric, coml., in case of 10 glass stoppered bottles.....				.03 1/2			90 lb. 3.15 3.30
" Sulphuric, coml., in carboy.....				.02 1/2			187 lb. 4.68 2.00
" Sulphuric, c. p., sp. gr. 1.835-1.84	Baker Analyzed			.14	gb	.15	
" Sulphuric, c. p., in 9 lb. bottle	Baker Analyzed			.09			9 lb. .81 gb .25
" Sulphuric, c. p., in case of 10 glass stoppered bottles	Baker Analyzed			.08			90 lb. 7.20 3.30
" Sulphuric, c. p., in carboy	Baker Analyzed			.07			187 lb. 13.09 2.00
Sp. gr. 1.835-1.84	Typical Analysis						
H ₂ S%..... 95-98.4%							
HCl..... none							
As..... none							
Fe..... —.0001%							
Nonvolatile matter..... .0002%							
NH ₃ trace							
Sb..... none							

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounces and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
ACID, Sulphuric, sp. gr. 1.84.	Merck Blue Label				
Nonvolatile matter.....	less than 0.0005%				
Nitric Acid.....	less than 0.0008% as N_2O_5				
Selenium.....	less than 0.0033%				
Substances oxidizable by Permanganate (Nitrous and Sulphurous Acids)	less than 0.001% as SO_2				
Hydrogen halogen acids.....	less than 0.003% as Cl				
Lead.....	less than 0.003%				
Heavy metals.....	none				
Calcium.....	less than 0.005%				
Ammonium salts.....	less than 0.0015% as NH_3				
Arsenic.....	less than 0.000023%				
	Guaranteed Analysis				
ACID, Sulphuric, diluted, 16%.	Merck Blue Label	.40	incl	9 lb.	2.70 incl
The same impurities as sp. gr. 1.84					
ACID, Sulphuric, diluted, 10%.	Merck Blue Label	.40	incl	9 lb.	2.70 incl
The same impurities as sp. gr. 1.84					
ACID, Sulphuric, c. p.	Baker Special			9 lb.	1.08 gb .25
(Free from Nitrogen Compounds)					
ACID, Sulphuric, coml, fuming, 20% SO_3.		.12		9 lb.	1.08 gb .25
ACID, Sulphuric, c. p., fuming, 15% SO_3.		.25	gb .15		
ACID, Sulphuric, fuming.	Merck Blue Label	.45	incl		
Nitrogen.....	less than 0.001%				
ACID, Sulphuric, fuming, free from Nitro- gen.	Merck Blue Label	.75	incl		
Nonvolatile matter.....	less than 0.0009%				
Nitric Acid.....	less than 0.004% as N_2O_5 = 0.001% N				
Ammonium salts.....	less than 0.002% as NH_3				
Halogens.....	less than 0.0015% as Cl				
Lead.....	less than 0.003%				
Arsenic.....	less than 0.0001%				
	Guaranteed Analysis				
ACID, Sulphuric, with P_2O_5.	Merck Blue Label	.60	incl		
Nitric Acid.....	less than 0.004% as N_2O_5				
Ammonium salts.....	less than 0.003% as NH_3				
ACID, Sulphuric, fuming, with P_2O_5.	Merck Blue Label	.20	incl	½ lb.	.75 incl
Nitrogen.....	less than 0.001%				
ACID, Sulphuric Anhydride, tested reagent	Merck Blue Label			1 Kilo Tins	1.25 incl
ACID, Sulphuric Anhydride, tested reagent	Merck Blue Label			50 gm	.65 incl
ACID, Sulphurous, c. p., 6% SO_2.	Baker Analyzed	.20	gb .15	5 lb.	.60 gb .25
SO_2	6%				
SO_3	6%				
Fe.....	0.003%				
Nonvolatile matter.....	0.0006%				
	Typical Analysis				
ACID, Sulphurous, 6%.	Merck Blue Label	.45	incl		
Nonvolatile matter.....	less than 0.048%				
ACID, Sulphurous, cubes, 20%, tested reagent.	Merck Blue Label	.60	incl	¼ lb.	.25 incl
ACID, Tannic, pure.		1.10	cc .08		
ACID, Tannic, c. p.		1.50	incl		
ACID, Tannic.	Merck Blue Label	.20	incl	½ lb.	.80 incl
Inorganic matter.....	less than 0.12%				
Zinc.....	less than 0.006%				
Sugar and Dextrin.....	none				
Water.....	not more than 12%				
	Guaranteed Analysis				
ACID, Tartaric, cryst.		.45	cc .05		
ACID, Tartaric, powdered.		.45	cc .05		
ACID, Tartaric, c. p., crystals.	Baker Analyzed	.10	incl .75	cb .08	¼ lb. .30 incl
ACID, Tartaric, c. p., powder.	Baker Analyzed	.10	incl .80	cb .08	¼ lb. .30 incl
Nonvolatile matter.....	0.01%				
SO_2	0.03%				
Oxalic Acid.....	none				
CaO	none				
Fe.....	0.01%				
Pb.....	none				
	Typical Analysis				
ACID, Tartaric.	Merck Blue Label	.90	incl	¼ lb.	.30 incl
Sulphuric Acid.....	less than 0.005% as SO_2				
Oxalic Acid.....	less than 0.033%				
Calcium.....	less than 0.01%				
Lead and other metals.....	none				
Inorganic matter.....	less than 0.05%				
	Guaranteed Analysis				
ACID, Thioacetic.	Merck Blue Label	.30	incl	¼ lb.	.90 incl
Nonvolatile matter.....	less than 0.0047%				
Sulphuric Acid.....	less than 0.003% as SO_2				
	Guaranteed Analysis				
ACID, Titanic, c. p., anhydrous (Tita- nium Oxide).		.80	incl		
ACID, Trichloroacetic, pure, crystals.		.18	gb .07	2.00 gb .14	
ACID, Tungstic.		.25	cb .03		
ACID, Tungstic, c. p.		.45	incl		
ACID, Uric, c. p.		.75	cb .03		
ACID, Valerianic (Valeric).		.20	gb .07	1.75 gb .15	
ADONITE				1 grm.	1.50 incl

	Maker or Brand	Dounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
AGAR AGAR, in shreds, prime, white.					
This is a specially selected grade for preparation of culture media	A. H. T. Co. No. 40		.85 incl		
" powder	Witte	.25 cb	.03 2.00 cb	.08	
ALBUMEN, from blood			.45 incl		
" from eggs, soluble scales			1.15 cb	.09	
" from eggs, impalpable powder			1.25 cb	.09	
°ALCOHOL, Amylic			.60 cb	.09	
" Amylic, purified			.75 cb	.09	
" Amylic, c.p.	Baker Analyzed		1.25 cb	.08	1 1/4 lb. .40 incl
Sp. gr.	814				
B. P.	128°-130°C				
°ALCOHOL, Amylic, for Gerbers fat determination, tested reagent	Merck Blue Label		1.25 incl		1/4 lb. .40 incl
" Amylic	Merck Blue Label		1.60 incl		3/4 lb. .50 incl
Nonvolatile matter	less than 0.005%				
Foreign organic matter (Furfural, etc.)	none				
°ALCOHOL, Butylic, iso, b. p. 100° C			1.15 cb	.09	
" Ethylic, denatured					1 pt. .15 cb .09
" Ethylic, denatured					1 qt. .25 cb .12
" Ethylic, denatured					1/2 gal. .40 cb .18
" Ethylic, denatured					1 gal. .75 cb .25
" Ethylic, denatured					5 gal. 3.50 cb .50
" Ethylic, 90%	Merck Blue Label		1.10 incl		1 1/4 lb. .35 incl
Residue	none				
Fusel Oil	none				
Molasses-Alcohol	none				
Aldehyde	none				
Organic impurities	none				
Metals and Tannin	none				
Acetone	less than 0.02%				
Furfural	less than 0.0001%				
°ALCOHOL, Ethylic, 95% (grain)					1 pt. .50 cb .09
" Ethylic, 95% (grain)					1 qt. 1.00 cb .12
" Ethylic, 95% (grain)					1/2 gal. 1.75 cb .18
" Ethylic, 95% (grain)					1 gal. 3.25 cb .25
" Ethylic, 95% (grain)					4 7/8 gal. 15.35 cb .50
" Ethylic, 95% (grain)	Baker Analyzed		.55 cb	.08	1 gal. 3.25 cb .25
Sp. gr.	816				
B. P.	78°C				
Nonvolatile matter	0.005%				
°ALCOHOL, Ethylic, 90% (grain)	Merck Blue Label		1.35 incl		1 1/4 lb. .45 incl
Residue	none				
Fusel Oil	none				
Molasses-Alcohol	none				
Aldehyde	none				
Organic impurities	none				
Metals and Tannin	none				
Acetone	less than 0.02%				
Furfural	less than 0.0001%				
°ALCOHOL, Ethylic, absolute, 99.8%					1 pt. .70 cb .09
" Ethylic, absolute, 99.8%					1 qt. 1.40 cb .12
" Ethylic, absolute, 99.8%					1/2 gal. 2.50 cb .18
" Ethylic, absolute, 99.8%	Baker Analyzed		.75 cb	.08	1 gal. 4.40 cb .25
" Ethylic, absolute, 99.75%	Baker Spectal		.85 cb	.08	1 gal. 4.50 cb .25
" Ethylic, absolute, 99.46%	Merck Blue Label		1.60 incl		1 1/4 lb. .50 incl
Residue	none				
Fusel Oil	none				
Molasses-Alcohol	none				
Aldehyde	none				
Organic impurities	none				
Metals and Tannin	none				
Acetone	less than 0.02%				
Furfural	less than 0.0001%				
ALCOHOL, Ethylic, absolute, 99.8%	Kahlbaum				500 grm. 1.50 incl
" Ethylic, absolute, 99.8%	Kahlbaum				1000 grm. 2.75 incl
" Ethylic, absolute, 98%	Squibb				500 grm. 1.35 incl
°ALCOHOL, Methylic (wood)					1 pt. .15 cb .09
" Methylic (wood)					1 qt. .25 cb .12
" Methylic (wood)					1/2 gal. .40 cb .18
" Methylic (wood)					1 gal. .75 cb .25
" Methylic (wood)					5 gal. 3.50 cb .50
" Methylic, 95%	Baker Analyzed		.25 cb	.08	1 gal. .95 cb .25
" Methylic, absolute	Baker Analyzed		.50 cb	.08	1 gal. 2.75 cb .25
Sp. gr.	801				
Methyl Alcohol	99% ^{100%}				
Nonvolatile matter	none				
Acetone	none				
Ethyl Alcohol	none				

A R T H U R H. T H O M A S C O M P A N Y

		Maker or Brand	Ounce and pound prices				Price in other size packages		
			per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
ALUMINUM	Potassium Sulphate, c. p., crystals	Baker Analyzed			.25 cb	.08	¼ lb.	.15	incl
"	Potassium Sulphate, c. p., powdered	Baker Analyzed			.30 cb	.08	¼ lb.	.15	incl
	Fe	} Typical Analysis							
	Cl								
	CaO								
	MgO								
ALUMINUM	Sodium Sulphate, c. p. (Sodium Alum)	Baker Analyzed			.60 cb	.08			
"	Sulphate, coml.				.10 cc	.05			
"	Sulphate, pure				.20 cb	.08			
"	Sulphate, c. p., crystals	Baker Analyzed			.30 cb	.08			
"	Tartrate, c. p.	Baker Analyzed			1.90 cb	.08	¼ lb.	.60	incl
ALUNDUM	RR, 60, 90 or 120 mesh	Baker Analyzed			.50	incl	½ lb.	.30	incl
"	RR, 60, 90 or 120 mesh (Specially treated and free from surface alkali)				.75	incl	½ lb.	.40	incl
"	RR, 60, 90 or 120 mesh (Specially treated and free from surface alkali)						2 lb.	1.50	incl
AMMONIA,	gas, in valve top steel cylinders, returnable for credit if in good condition						10 lb.	10.00	15.00
AMMONIUM	Acetate, c. p.	Baker Analyzed	.15	incl	.75 cb	.09	¼ lb.	.25	incl
	Nonvolatile matter	} Typical Analysis							
	Cl								
	SO ₂								
								
AMMONIUM	Acetate	Merck Blue Label			.80	incl	¼ lb.	.30	incl
	Chlorides	} Guaranteed Analysis							
	Sulphates								
	Heavy metals								
	Earths								
AMMONIUM	Arsenate, c. p.	Baker Analyzed	.15	incl	1.35 cb	.07	¼ lb.	.45	incl
"	Arsenite, c. p.	Baker Analyzed	.15	incl	1.20 cb	.08	¼ lb.	.40	incl
"	Benzoate, c. p.				1.00 cb	.09			
"	Bicarbonate, c. p.	Baker Analyzed			.60 cb	.08	¼ lb.	.20	incl
"	Bichromate .....				.45 cb	.05			
"	Bichromate, c. p.	Baker Analyzed			.75 cb	.07	¼ lb.	.30	incl
"	Bifluoride, c. p.	Baker Analyzed			1.50 cb	.09			
"	Binoxalate, c. p.	Baker Analyzed			.70 cb	.08	¼ lb.	.25	incl
"	Bisulphate, c. p.	Baker Analyzed			.50 cb	.08			
"	Bisulphite, c. p., conc. sol.	Baker Analyzed			.85 gb	.15	¼ lb.	.35	incl
	Sp. gr	} Typical Analysis							
	Nonvolatile matter								
	Cl								
	SO ₂								
								
AMMONIUM	Bitartrate				.75 cc	.05			
"	Bitartrate, c. p.	Baker Analyzed			1.50 cb	.08			
"	Borate, c. p.	Baker Analyzed			1.15 cb	.08			
"	Bromide, c. p.	Baker Analyzed			1.00 cb	.08	¼ lb.	.35	incl
"	Carbonate, lump				.20 cc	.05	5 lb.	.90	incl
"	Carbonate, c. p.	Baker Analyzed	.10	incl	.30 cb	.09	¼ lb.	.15	incl
	Nonvolatile matter	} Typical Analysis							
	Fe								
	Cl								
	SO ₂								
								
AMMONIUM	Carbonate	Merck Blue Label			.55	incl	¼ lb.	.25	incl
	Nonvolatile matter	} Guaranteed Analysis							
	Calcium								
	Sulphate								
	Chlorides								
	Thiosulphates								
	Phosphates								
	Heavy metals								
	Sulphocyanates, less than 0.12% as SCN								
	Tar bases								
AMMONIUM	Carbonate	Kahlbaum "C.f.A."					100 grm.	.50	incl
"	Carbonate	Kahlbaum "C.f.A."					500 grm.	.95	incl
	Nonvolatile matter	} Certified Analysis							
	Chlorine								
	Sulphocyanate								
	Sulphate								
	Thiosulphate								
	Heavy metals								
AMMONIUM	Chloride, granular, pure				.17 cc	.05			

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices			Price in other size packages			
		per oz.	cost.	per lb. cont.	size pkg.	per pkg.	cont.	
AMMONIUM	Chloride, c. p.	Baker Analyzed	.10	incl	.30	cb	.10	
	Nonvolatile matter.....							
	SO ₂							
	Aniline derivatives.....	Trace						
AMMONIUM	Chloride.....	Merck Blue Label			.65	incl	1/4 lb. .25	
	Nonvolatile matter.....							
	Phosphates.....	less than 0.001% as P ₂ O ₅						
	Arsenates.....	less than 0.003% as As ₂ O ₃						
	Heavy metals.....	none						
	Calcium.....	less than 0.01%						
	Sulphates.....	less than 0.005% as SO ₂						
AMMONIUM	Chloride.....	Kahlbaum "C.f.a."					100 grm. .60	
	Chloride.....	Kahlbaum "C.f.a."					500 grm. 1.20	
AMMONIUM	Chloride.....	Baker Analyzed			.40	cb	.10	
	Nonvolatile matter.....							
	Aniline derivatives.....	Trace						
	AMMONIUM	Chromate, c. p.	Baker Analyzed			1.80	cb	.10
		Chromate.....	Merck Blue Label	.25	incl			1/2 lb. 1.25
		Alkalies.....	not more than 0.25%					
		Chlorides.....	less than 0.0025% as Cl					
AMMONIUM	Chromium Sulphate, c. p.	Baker Analyzed			2.00	cb	.08	
	Citrate, c. p.	Baker Analyzed			1.50	cb	.09	
	Citrate Solution.....	Merck Blue Label					1/2 liter .50	
AMMONIUM	Dithiocarbonate Solution.....	Merck Blue Label					1/2 lb. .50	
	Nonvolatile matter.....	less than 0.005%						
	Ammonium Carbonate.....	less than 0.0045% as (NH ₄) ₂ CO ₃						
	Calcium.....	less than 0.003%						
AMMONIUM	Fluoride, c. p.	Baker Analyzed	.20	incl	2.00	incl	1/4 lb. .75	
	Fe.....	.001%						
	SO ₂.....	.001%					
	Nonvolatile matter.....	.008%						
AMMONIUM	Fluoride.....	Merck Blue Label	.25	incl			1/4 lb. .65	
	Nonvolatile matter.....	less than 0.005%						
	Chlorides.....	less than 0.003% as Cl						
	Sulphates.....	less than 0.3% as SO ₂						
	Silicofluorides.....	less than 0.015% (NH ₄) ₂ SiF ₆						
AMMONIUM	Fluoride.....	Kahlbaum "C.f.a."					100 grm. 1.15	
	Nonvolatile matter, unweighable.....	none						
	Sulphate.....	none						
	Silicofluoride.....	none						
AMMONIUM	Formate, c. p.	Baker Analyzed			1.75	cb	.09	
	Hydroxide, 20° (17.5% Ammonia), in 4 lb. bottle.....				.10		4 lb. .40	
	Hydroxide, 20°, in case of 10 glass stoppered bottles.....				.09		40 lb. 3.60	
	Hydroxide, 20° in carboy.....				.08		85 lb. 6.80	
AMMONIUM	Hydroxide, c. p., sp. gr. 0.90.....	Baker Analyzed			.13	gb	.15	
	Hydroxide, c. p., in 4 lb. bot.....	Baker Analyzed			.12		4 lb. .48	
	Hydroxide, c. p., in case of 10 glass stoppered bottles.....	Baker Analyzed			.11		40 lb. 4.40	
	Hydroxide, c. p., in carboy.....	Baker Analyzed			.10		94 lb. 9.40	
AMMONIUM	Hydroxide, c. p., free from Pyridine.....	Baker Special			.18		4 lb. .72	
	Hydroxide, 10% and 20%.....	Merck Blue Label			.35	incl	4 lb. 1.00	
	The same impurities as the 28%.....							
	Sp. gr.....	.90						
	NH ₃	23-26%						
AMMONIUM	CO ₂	Trace						
	Pyridine.....	Trace						
	Nonvolatile matter.....	0.0004%						
	Sp. gr.....	.90						

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices			Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
°	AMMONIUM Hydroxide, 25%.....	Merck Blue Label		.40	incl	4 lb.	1.20	incl	
	Nonvolatile matter.....								
	Chlorides.....								
	Pyridine.....								
	Tar bases (Aniline, Pyridine, Pyrol, etc.).....								
	Heavy metals.....								
	Sulphates.....								
	Carbon Dioxide.....								
	Sulphides.....								
	Calcium.....								
	Magnesium.....								
	Phosphates.....								
	Substances oxidizable by Potas- sium Permanganate.....								
	AMMONIUM Hydrosulphide, (See Sul- phide).								
°	“ Iodide, c. p.....		.50	incl	4.50	cb .08	¼ lb.	1.50	incl
°	“ Molybdate, c. p., Nitric Acid solution.....				.25	gb .15			
°	“ Molybdate, c. p., crystals.....	Baker Analyzed	.55	incl	5.00	cb .06	¼ lb.	1.75	incl
	MoO ₃								
	P.....								
	As.....								
	Nitrate.....								
	AMMONIUM Molybdate.....	Merck Blue Label	.40	incl			¼ lb.	2.50	incl
	Phosphates.....								
	Heavy metals.....								
	Sulphates.....								
	Chlorides.....								
	Nitrates.....								
°	AMMONIUM Nitrate, pure, crystals.....		.25	cc .05			¼ lb.	.20	incl
°	“ Nitrate, c. p.....	Baker Analyzed	.10	incl	.50	cb .09			
	Nonvolatile matter.....								
	Fe.....								
	Cl.....								
	SO ₂								
	I.....								
	CaO.....								
°	AMMONIUM Nitrate.....	Merck Blue Label	.70	incl			¼ lb.	.25	incl
	Nonvolatile matter.....								
	Phosphates.....								
	Arsenates.....								
	Heavy metals.....								
	Calcium.....								
	Sulphates.....								
	Sulphocyanates.....								
	Tar bases.....								
	Chlorides.....								
	Nitrates.....								
°	AMMONIUM Nitrate.....	Kahlbaum “C.f.A.”					100 grm.	.60	incl
°	“ Nitrate.....	Kahlbaum “C.f.A.”					500 grm.	1.10	incl
	Nonvolatile matter, unweighable								
	Sulphate.....								
	Sulphocyanate.....								
	Chloride.....								
	Phosphate.....								
	Arsenate.....								
	Nitrite.....								
	Heavy metals.....								
AMMONIUM	Nitrite, liquid.....		.65	cb .08			¼ lb.	.35	incl
“	Oxalate, pure.....		.38	cc .05					
“	Oxalate, c. p.....	Baker Analyzed	.50	cb .08			¼ lb.	.20	incl
	Nonvolatile matter.....								
	CaO.....								
	Fe.....								
	Na (flame test).....								
	Cl.....								
	SO ₂								
AMMONIUM	Oxalate.....	Merck Blue Label	.80	incl			¼ lb.	.30	incl
	Nonvolatile matter.....								
	Sulphates.....								
	Chlorides.....								
	Heavy metals.....								
AMMONIUM	Oxalate.....	Kahlbaum “C.f.A.”					100 grm.	.60	incl
“	Oxalate.....	Kahlbaum “C.f.A.”					500 grm.	1.50	incl
	Nonvolatile matter, unweighable								
	Chloride.....								
	Sulphate.....								
	Heavy metals.....								
	Content.....								
*AMMONIUM	Perchlorate.....	Kahlbaum “C.f.A.”					10 grm.	.70	incl
*	“ Perchlorate.....	Kahlbaum “C.f.A.”					50 grm.	2.00	incl
	Nonvolatile matter.....								
	Chloride.....								
	Sulphate.....								
	Barium.....								
	Heavy metals.....								

		Ounce and pound prices				Price in other size packages			
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
AMMONIUM	Persulphate, c. p. Baker Analyzed	.85	cb	.08		¼ lb.	.30	incl	
	Nonvolatile matter..... 03% Fe..... 005% CaO..... 006% Cl..... 001% Mn..... none	} Typical Analysis							
AMMONIUM	Persulphate Merck Blue Label	.80	incl			¼ lb.	.30	incl	
	Nonvolatile matter not more than 0.066% Chlorides less than 0.002% as Cl Heavy metals none, or at most, a trace	} Guaranteed Analysis							
AMMONIUM	Persulphate Kahlbaum					500 grm.	3.00	incl	
"	Phosphate, 98% coml......	.25	cc	.05				
"	Phosphate, c. p., Dibasic {(NH ₄) ₂ HPO ₄ }..... Baker Analyzed	.80	cb	.08		¼ lb.	.30	incl	
	Cl..... trace SO ₃ 001% As..... 001% Fe..... 001% CaO..... none	} Typical Analysis							
AMMONIUM	Phosphate, Dibasic {(NH ₄) ₂ HPO ₄ }..... Merck Blue Label	1.25	incl			¼ lb.	.40	incl	
	Alkalies not more than 0.15% Arsenic less than 0.0015% Carbonates less than 2% CO ₂ Sulphates less than 0.0015% as SO ₃ Chlorides less than 0.0015% as Cl Nitrates less than 0.0015% as NaO ₃ Heavy metals none	} Guaranteed Analysis							
AMMONIUM	Phosphate Kahlbaum "C.f.A."					100 grm.	.80	incl	
"	Phosphate Kahlbaum "C.f.A."					500 grm.	2.25	incl	
	Nonvolatile matter..... trace Carbonate..... none Sulphate..... none Chloride..... faint trace Nitrate..... none Arsenic..... none Heavy metals..... none Content..... 99.99%	} In 10 grams } Certified Analysis							
AMMONIUM	Phosphate, c. p., monobasic {(NH ₄)H ₂ PO ₄ }..... Baker Analyzed	.90	cb	.08		¼ lb.	.35	incl	
	As..... trace HNO ₃ none SO ₃ 0.003% Cl..... 0.002% Fe..... 0.001%	} Typical Analysis							
AMMONIUM	Phospho-Molybdate, c. p. 1.00	incl							
"	Potassium Phosphate, c. p. Baker Analyzed	.75	cb	.08					
"	Potassium Tartrate, c. p.	1.50	cb	.08					
"	Silicofluoride, c. p.	1.40	cb	.08					
"	Sulphate, coml......	.10	cc	.05				
"	Sulphate, pure.....	.20	cb	.08				
"	Sulphate, c. p. Baker Analyzed	.30	cb	.08		¼ lb.	.15	incl	
	Nonvolatile matter..... 0.001% Cl..... 0.002% CaO..... none Fe..... 0.002%	} Typical Analysis							
AMMONIUM	Sulphate Merck Blue Label	.65	incl			¼ lb.	.25	incl	
	Nonvolatile matter less than 0.01% Chlorides less than 0.0025% as Cl Heavy metals none Sulphocyanates less than 0.12% as SCN Phosphates less than 0.001% as P ₂ O ₅ Arsenic less than 0.005% as As ₂ O ₃ Nitrates less than 0.0016% as NaO ₃	} Guaranteed Analysis							
AMMONIUM	Sulphate Kahlbaum "C.f.A."					100 grm.	.55	incl	
"	Sulphate Kahlbaum "C.f.A."					500 grm.	1.15	incl	
	Nonvolatile matter none Chloride..... none Nitrate..... none Phosphate..... none Arsenic..... none Sulphocyanate none Heavy metals..... none	} In 10 grams } Certified Analysis							
AMMONIUM	Sulphide, (Hydrosulphide) light or dark.....	.30	gb	.15		5 lb.	1.10	gb .25	
"	Sulphide Solution Merck Blue Label	.60	incl			¼ lb.	.25	incl	
	Arsenic less than 0.006% Antimony less than 0.004% Tm less than 0.0012% Nonvolatile matter less than 0.005% Ammonium Carbonate less than 0.005% as CO ₂ Chloride less than 0.005% as Cl	} Guaranteed Analysis							
AMMONIUM	Sulphite, c. p., crystals Baker Analyzed	1.00	cb	.08		¼ lb.	.35	incl	
"	Sulphocyanate, c. p. Baker Analyzed	.65	cb	.09		¼ lb.	.20	incl	
	Nonvolatile matter..... 0.015% Fe..... 0.008% Cl..... 0.008% SO ₃ 0.001%	} Typical Analysis							

A R T H U R H. T H O M A S C O M P A N Y

		Counce and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
AMMONIUM	Sulphocyanate.....	Merk Blue Label	.20	incl		½ lb.	.75	incl
	Nonvolatile matter, less than 0.025% Substances insoluble in Alcohol, none Sulphates, less than 0.01% as SO ₄ Heavy metals, none Iron, less than 0.0004%	Merck Blue Label						
AMMONIUM	Sulphocyanate.....	Kahlbaum "C.f.A."				100 grm.	.80	incl
	Sulphocyanate.....	Kahlbaum "C.f.A."				500 grm.	2.25	incl
AMMONIUM	Tartrate, c. p.....	Baker Analyzed	1.25	cb	.08	¼ lb.	.40	incl
	Tetroxalate, c. p.....	Baker Analyzed	.75	cb	.08			
AMMONIUM	Thioacetate Solution.....	Merck Blue Label	.50	incl				
	Nonvolatile matter, less than 0.005% Ammonium Carbonate, less than 0.003% as (NH ₄) ₂ CO ₃ Sulphates, less than 0.002% as SO ₄	Merck Blue Label						
AMMONIUM	Thiocyanate (See Sulphocyanate).							
AMMONIUM	Thiosulphate, c. p.....	Baker Analyzed	1.10	cb	.08	¼ lb.	.35	incl
	Vanadate.....		.80	incl				
AMMONIUM	Zinc Sulphate, c. p.....		.80	cb	.08			
AMYGDALIN						10 grm.	.55	incl
AMYL	Acetate, 98% (so called absolute).....		.70	cb	.09			
ACETATE	(iso), as recommended for use in Photometry for Heffner's Standard Lamp	Kahlbaum	2.75	gb	.12			
ACETATE	tested, for use with Wanner Optical Pyrometer					Per bottle	2.10	incl
NITRITE	pure.....		.25	incl				
ANILINE	pure.....		.25	cb	.08			
ANILINE	Hydrochloric and Nitrobenzene, none	Merck Blue Label	.80	incl		¼ lb.	.30	incl
ANILINE	c. p., as specially recommended for use in microscopy		1.00	cb	.08			
ANILINE	Hydrochloric, c. p.....		1.00	cb	.08			
ANILINE	Sulphate, c. p.....		1.00	cb	.10			
"ANTIFORMIN,"	as used in staining sputum for B. tuberculosis		.50	incl		¼ lb.	.25	incl
ANTIMONY	metal.....		.25	cc	.04			
ANTIMONY	metal, powder.....		.30	cc	.04			
ANTIMONY	metal, granular.....	Baker Analyzed	.50	cb	.06	¼ lb.	.20	incl
ANTIMONY	Fe..... 0.01% Cu..... none As..... trace Pb..... -0.001% Zn..... none Sn..... none							
ANTIMONY	metal.....	Kahlbaum				100 grm.	1.10	incl
ANTIMONY	Chloride (Tri), c. p.....	Baker Analyzed	.15	incl	1.30	gb	.15	¼ lb. .40 incl
ANTIMONY	Chloride (Penta), c. p., fuming.....	Baker Analyzed	1.40	gb	.15	¼ lb.	.45	incl
ANTIMONY	Oxide (Tri), c. p.....	Baker Analyzed	1.00	cb	.06	¼ lb.	.35	incl
ANTIMONY	Fe..... 0.00% Cl..... 0.001% SO ₃ -0.001% Insoluble residue..... trace							
ANTIMONY	Oxide (Penta), c. p.....	Baker Analyzed	1.00	cb	.06	¼ lb.	.35	incl
ANTIMONY	Oxide (Tri).....	Merck Blue Label	.30	incl				
ANTIMONY	Arsenic, less than 0.0015% Foreign heavy metals, none Chlorides, less than 0.05% as Cl							
ANTIMONY	Oxychloride, c. p.....	Baker Analyzed	1.20	cb	.06	¼ lb.	.40	incl
ANTIMONY	Potassium Tartrate, purified, powder.....		.45	cc	.05			
ANTIMONY	Potassium Tartrate, c. p., powder.....	Baker Analyzed	.75	cb	.07	¼ lb.	.25	incl
ANTIMONY	SO ₃ 0.002% Cl..... 0.001% Fe..... 0.001% Pb..... none CaO..... none Au..... none							
ANTIMONY	Sulphate, c. p.....	Baker Analyzed	.85	cb	.08			
ANTIMONY	Sulphide (Tri), c. p., red.....	Baker Analyzed	1.50	cb	.09	¼ lb.	.50	incl
ANTIMONY	Sulphide (Penta), c. p., yellow.....		1.00	cb	.09			
ANTIMONY	Tartrate, c. p.....		1.00	cb	.08			

	Maker or Brand	Ounce and pound prices		Price in ether size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
ARABINOSE						5 grm.	2.25	incl
ARGOLS (Potassium Bitartrate, crude) ..				.10 cc	.04			
ARSENIC , metal, lump.....				.45	incl			
" Chloride (Tri), pure liquid.....				.25 cc	.05			
" Sulphide, yellow (Orpiment).....				.25 cc	.05			
" Sulphide, red.....				.25 cc	.05			
" Trioxide (Arsenic Acid), lump or powdered.....	Merck Blue Label			.40	incl	¼ lb.	.20	incl
Nonvolatile matter..... less than 0.005%								
Barium Sulphate, Talcum, Calcium Sulphate, etc..... none	Guaranteed Analysis							
Arsenic Sulphide..... less than 0.0005% as S								
ARSENIC Trisulphide , c. p.....				1.00 cb	.07			
ASBESTOS , wool, clean for filtering.....				.50	incl			
" Italian, short fibre.....				2.00	incl			
" Italian, short fibre, washed in acid.....				2.50	incl			
" Italian, short fibre, washed and ignited.....				2.75	incl			
" Special for Gooch crucibles. This is short fibre suitable for rapid filtering and con- tains a trace of iron.....				.25	incl	2.50	incl	
" Italian, long fibre.....				2.50	incl			
" Italian, long fibre, washed in acid.....				3.50	incl			
" extra long fibre, selected, white.....				3.50	incl			
" for Gooch crucibles.....	Kahlbaum			.75	incl			
" platinized 5%.....				4.50	incl			
ASPARAGIN				1.00 cb	.04			
ASPHALTUM.....				.10 cb	.03	.25 cb	.08	
AZOLITMIN						5 grm.	.50	incl
" Kahlbaum.....						5 grm.	.70	incl
" Kahlbaum.....						10 grm.	1.30	incl
" Kahlbaum.....						25 grm.	3.00	incl
AZOLITMIN	Merck Blue Label					½ oz.	1.75	incl
" Merck Blue Label.....						¾ oz.	.50	incl
Tested for..... sensitiveness								
BALSAM , Canada (See Microscopic Mounting Media, Section II).								
BARIUM Acetate , c. p.....	Baker Analyzed			.80 cb	.08	¼ lb.	.30	incl
Na..... trace								
Cl..... -0.001%	Typical Analysis							
CaO..... -0.001%								
SO ₃ 0.001%								
Fe..... 0.0003%								
BARIUM Acetate	Merck Blue Label	.20	incl			½ lb.	.70	incl
Chlorides..... less than 0.002% as Cl	Guaranteed Analysis							
Calcium and alkalis..... not more than 0.08%								
Heavy metals..... none								
Nitrates..... less than 0.0002% as N ₂ O ₅								
BARIUM Acetate	Kahlbaum "C.F.A."					100 grm.	.80	incl
" Acetate.....	Kahlbaum "C.F.A."					500 grm.	2.25	incl
Nonvolatile alkalis present after precipitating Barium..... 1.95 mg } in 10 } Certified Analysis								
Nitrate..... none } Chloride..... none } Heavy metals..... none }								
BARIUM Borate	Baker Analyzed			.80 cb	.12			
" Carbonate, native, powdered (Witherite).....				.15 cc	.04			
" Carbonate, precipitated, pure, white.....				.30 cc	.05			
" Carbonate, c. p.....	Baker Analyzed			.60 cb	.07	¼ lb.	.22	incl
Fe..... 0.001%	Typical Analysis							
Cl..... 0.001%								
Na (flame test)..... trace								
CaO..... 0.005%								
BARIUM Carbonate	Merck Blue Label	.20	incl			½ lb.	.70	incl
Tested for solubility in Hydrochloric Acid	Guaranteed Analysis							
Barium Hydroxide..... not more than 0.23%								
Calcium and alkalis..... not more than 0.08%								
Heavy metals..... none								
Chlorides..... less than 0.0005% as Cl								
Nitrates..... less than 0.0002% as N ₂ O ₅								
BARIUM Carbonate , precipitated.....	Kahlbaum "C.F.A."					100 grm.	.75	incl

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		Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
BARIUM	Carbonate, precipitated..... Heavy metals.....none Insoluble in Hydrochloric Acid.....none Nonvolatile residue present after precipitating Barium.....14 mg. in 10 grams } Chloride.....trace Nitrate.....none	Kahlbaum "C.f.a."				500 grm.	1.80	incl
BARIUM	Chloride, crystals.....			.10 cc	.04			
"	Chloride, pure.....			.12 cb	.07			
"	Chloride, c. p..... Fe.....0.0003% CaO.....0.002% Sr.....none Na (flame test).....trace	Baker Analyzed		.25 cb	.07	¼ lb.	.15	incl
BARIUM	Chloride, c. p. special.....	Baker Analyzed		.40 cb	.07	¼ lb.	.15	incl
BARIUM	Chloride..... Alkalies.....not more than 0.0333% Strontium and Calcium Chlorides.....less than 0.025% as Cl	Merck Blue Label		.40	incl	¼ lb.	.20	incl
BARIUM	Chloride..... Heavy metals.....none Nitrates.....less than 0.0032% as Na ₂ O Chlorates.....less than 0.025% as ClO ₂	Guaranteed Analysis						
BARIUM	Chloride..... Alkaline residue present after precipitating Barium.....1 mg Nitrate.....none Chlorate.....none Strontium and Calcium Chloride (faint trace).....in 10 grams }	Kahlbaum "C.f.a." Kahlbaum "C.f.a."				100 grm. 500 grm.	.50 .90	incl incl
BARIUM	Chloride, c. p., anhydrous.....	Baker Analyzed		.50 cb	.07			
"	Chromate, c. p.....	Baker Analyzed		.80 cb	.07	¼ lb.	.35	incl
"	Dioxide (See Peroxide).....							
"	Fluoride, c. p.....	Baker Analyzed		.85 cb	.07			
"	Hydroxide, pure, crystals.....			.25 cb	.08			
"	Hydroxide, c. p., crystals..... CaO.....-0.001% Fe.....0.0004% Cl.....0.0003% CO ₂.....trace S.....none Sr.....none	Baker Analyzed		.35 cb	.08	¼ lb.	.15	incl
BARIUM	Hydroxide..... Chlorides.....less than 0.0005% as Cl Calcium and alkalies.....not more than 0.067% Heavy metals.....less than 0.0027% as S Sulphides.....none	Merck Blue Label		.60	incl	¼ lb.	.25	incl
BARIUM	Hydroxide, c. p., anhydrous.....	Baker Analyzed		.60 cb	.06	¼ lb.	.22	incl
"	Hydroxide, Solution, 3.2%..... Chlorides.....less than 0.0005% as Cl Calcium and alkalies.....not more than 0.067% Heavy metals.....none Sulphides.....less than 0.0027% as S	Merck Blue Label		.50	incl			
BARIUM	Hydroxide, alkali free.....	Kahlbaum "C.f.a."				100 grm.	.55	incl
"	Hydroxide, alkali free..... Alkalies.....none Lime.....none Chloride.....faint trace Sulphides.....none Heavy metals.....none Content found.....100.5%	Kahlbaum "C.f.a."				500 grm.	1.00	incl
BARIUM	Nitrate, powder.....			.15 cc	.04			
"	Nitrate, c. p..... Cl.....0.001% CaO.....0.001% Fe.....0.001% Na (flame test).....trace Sr.....none	Baker Analyzed		.30 cb	.06	¼ lb.	.17	incl
BARIUM	Nitrate..... Chlorides.....less than 0.0005% as Cl Alkalies.....not more than 0.0667% Heavy metals.....none	Merck Blue Label		.50	incl	¼ lb.	.20	incl
BARIUM	Oxalate, c. p.....	Baker Analyzed		.90 cb	.09			
"	Oxide, c. p., hydrated.....	Baker Analyzed		.60 cb	.06			
"	Peroxide (Dioxide).....			.30 cc	.04			
"	Peroxide, c. p..... BaO ₂89% Fe.....0.020% Al ₂ O ₃0.020% CaO.....0.001% SiO ₂trace	Baker Analyzed		.60 cb	.06	¼ lb.	.22	incl
BARIUM	Peroxide, tested reagent.....	Merck Blue Label		.65	incl	¼ lb.	.25	incl

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	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
*BARIUM Peroxide, c. p., hydrated.....	Baker Analyzed			.70	cb .06			
Fe.....	0.001%							
CaO.....	0.001%							
Cl.....	0.001%							
Na.....	trace							
BARIUM Phosphate, c. p.....	Baker Analyzed			1.65	cb .08			
" Sulphate, coml.....				.13	cc .05			
" Sulphate, c. p., powdered.....	Baker Analyzed			.30	cb .07			
" Sulphide, pure.....	Baker Analyzed			.65	cb .07	1/4 lb.	.20	incl
Cl.....	0.010%							
CaO.....	0.001%							
Fe.....	0.0003%							
Free S.....	present							
As.....	trace							
BARIUM Sulphide.....	Merck Blue Label			.70	incl	1/4 lb.	.25	incl
Arsonic.....	less than 0.0001%							
BARIUM Sulphite, c. p.....				.75	cb .07			
" Tartrate, c. p.....	Baker Analyzed			2.00	cb .08			
" Thiosulphate, c. p. (for stand- ardizing).....	Baker Special			1.00	cb .08	1/4 lb.	.35	incl
BEEF Extract, for preparation of culture media.....	Liebig's			2.75	incl	1/4 lb.	.90	incl
BENZALDEHYDE (Essential Oil of Al- monds).....				.85	cb .09			
*BENZENE (Benzol) 50% water white.....						1 pt.	.10	cb .08
" (Benzol) 50% water white.....						1 gal.	.75	cn .25
" (Benzol) 50% water white.....						5 gal.	2.75	cn .50
" (Benzol) 90% water white.....						1 pt.	.15	cb .08
" (Benzol) 90% water white.....						1 gal.	.90	cn .25
" (Benzol) 90% water white.....						5 gal.	3.25	cn .50
*BENZENE (Benzol) c. p., crystallizable, water white.....						1 pt.	.17	cb .08
" (Benzol) c. p., crystallizable, water white.....						1 gal.	1.00	cn .25
" (Benzol) c. p., crystallizable, water white.....						5 gal.	3.75	cn .50
" (Benzol), c. p.....	Baker Analyzed			.85	cb .08			
Sp. gr.....	0.883							
B. P.....	80 °C							
M. P.....	4 °C							
Thiophene.....	none							
*BENZENE (Benzol).....	Merck Blue Label			.55	incl			
Thiophene.....	none							
Carbon Disulphide.....	less than 0.0072%							
BENZIDINE.....	Merck Blue Label	1.00	incl			1/4 oz.	.35	incl
Sulphates.....	less than 0.025% as SO ₄							
Nonvolatile matter.....	less than 0.05%							
BENZIDINE, for Blood Test.....	Merck Blue Label	1.00	incl			1/4 oz.	.35	incl
Tested for suitability for blood detection								
*BENZIN (Naphtha).....				.15	cb .08	1 gal.	.40	cn .25
*BENZIN (Petroleum Ether).....	Merck Blue Label			.50	incl			
Nonvolatile matter and heavy oils.....	none							
Acids.....	none							
Sulphur compounds and reducing agents.....	none							
BENZOYL Chloride.....				.20	gb .07	1.75	gb .15	
BENZYL-CHLORIDE, pure.....				.65	gb .12			
BERLIN Blue (See Injecting Media).....								
*BERYLLIUM Nitrate, c. p., crystals.....		1.00	incl					
BISMUTH, metal.....				2.75	cc .04			
BISMUTH, metal.....	Baker Analyzed	.30	incl	3.00	incl	1/4 lb.	1.00	incl
Pb.....	0.003%							
Fe.....	0.003%							
Cu.....	none							
As.....	none							
Sb.....	none							
Sn.....	none							
BISMUTH, metal, c. p., sticks.....		.75	incl					
" Carbonate, c. p.....	Baker Analyzed	.45	incl	4.25	cb .09	1/4 lb.	1.50	incl
" Chloride, c. p.....	Baker Analyzed	.45	incl	4.25	gb .12	1/4 lb.	1.50	incl
Fe.....	0.002%							
Pb.....	0.001%							
SO ₂	0.001%							
As.....	trace							
BISMUTH Hydroxide, c. p.....	Baker Analyzed	.45	incl	4.25	cb .06	1/4 lb.	1.50	incl
" Nitrate, c. p.....	Baker Analyzed	.30	incl	3.00	gb .12	1/4 lb.	1.00	incl
" Oxide, c. p.....	Baker Analyzed			5.00	cb .04	1/4 lb.	1.75	incl
" Oxychloride, c. p.....	Baker Analyzed			4.25	cb .06			
" Subgallate, pure.....				3.00	cb .08			
" Subnitrate, pure powder.....		.25	incl	2.25	incl			

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		Ounce and pound prices				Price in other size packages			
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
BISMUTH	Subnitrate, c. p.	Baker Analyzed	.40	incl	3.75	cb .06	1 1/4 lb.	1.25	incl
	Cl								
	SO ₂								
	Pb								
BISMUTH	Subnitrate	Merck Blue Label	.30	incl			1/2 lb.	1.75	incl
	Carbonates								
	Lead								
	Copper								
BISMUTH and Potassium Iodide Solution,	tested reagent	Merck Blue Label	.30	incl			1/4 lb.	.90	incl
	" Tetraoxide, c. p., free from Mn.	Baker Analyzed	.60	incl	6.00	cb .07	1 1/4 lb.	2.00	incl
	BLEACHING Powder (Calcium Hypochlorite) (Oxychloride)						1 can	.10	incl
	" Powder						10 lb.	.60	incl
	BONE ASH, best quality for cupels				10 cc	.05			
	BORAX (See Sodium Borate)								
	BRAZILWOOD				.20	incl			
	BROMINE, U. S. P.		.25	incl	1.00	incl	1 1/4 lb.	.35	incl
	" U. S. P.						1 1/2 lb.	.60	incl
	BROMINE, c. p.	Baker Analyzed	.20	gb .15	.85	gb .20	1 1/4 lb.	.30	gb .15
" c. p.						1 1/2 lb.	.50	gb .15	
BROMINE	Cl	Merck Blue Label	.30	incl			1 1/2 lb.	1.00	incl
	Nonvolatile matter								
	Sulphuric Acid								
	Organic Bromine compounds (Bromoform and Carbon Tetrabromide)								
BROMINE	Water, 3%	Merck Blue Label			.60	incl			
	Sulphuric Acid, less than 0.00002% as SO ₂								
	Tested for Bromine content								
	Guaranteed Analysis								
BRUCINE	Water of crystallization	Merck Blue Label					1/2 oz.	.30	incl
	Nitric acid								
CADMIUM	metal, powder				3.00	incl			
	metal, sheets				3.75	incl			
	metal, sticks, gran. and mossy				1.75	incl	1 1/4 lb.	.60	incl
CADMIUM	Acetate, c. p.	Baker Analyzed			2.50	cb .07			
	Borotungstate Solution, sp. gr. 3.28, tested reagent	Merck Blue Label	.80	incl			1 1/4 oz.	.30	incl
	Bromide, c. p.				2.00	cb .07	1 1/4 lb.	.65	incl
	Carbonate, c. p.	Baker Analyzed			2.50	cb .07	1 1/4 lb.	.75	incl
CADMIUM	Chloride, c. p., crystals	Baker Analyzed	.20	incl	1.85	cb .07	1 1/4 lb.	.60	incl
	Zn								
	SO ₂								
	Fe								
CADMIUM	Chloride, c. p., anhydrous				2.25	cb .06	1 1/4 lb.	.60	incl
	Hydroxide, c. p.	Baker Analyzed			4.00	cb .09	1 1/4 lb.	1.25	incl
	Iodide, c. p.				5.50	cb .07	1 1/4 lb.	1.60	incl
	Nitrate, c. p.	Baker Analyzed	.20	incl	1.85	cb .07	1 1/4 lb.	.65	incl
	Oxide, c. p.	Baker Analyzed			4.00	cb .07	1 1/4 lb.	1.25	incl
	Potassium Iodide	Merck Blue Label	.80	incl			1 1/4 oz.	.30	incl
	Foreign metals								
	Sulphates								
	Iodic Acid, less than 0.00125% as HI ₃								
	CADMIUM	Sulphate, c. p.	Baker Analyzed			1.85	cb .07	1 1/4 lb.	.65	incl
Sulphide, c. p.		Baker Analyzed			2.75	cb .08	1 1/4 lb.	.90	incl
CALCIUM	electrolytic	Kahlbaum					100 gm.	1.00	incl
	Acetate, purified				.70	cb .09			
	Acetate, c. p.	Baker Analyzed			.75	cb .10	1/4 lb.	.25	incl
	Na (flame test)								
CALCIUM	SO ₂								
	Cl								
	Fe								
	MgO								
	Arsenate, c. p.				1.50	cb .08	1 1/4 lb.	.45	incl
	Arsenite, c. p.				1.50	cb .08	1 1/4 lb.	.45	incl
CALCIUM	Bisulphite, c. p., solution				.35	cb .08			
	Carbide, lump		.20	incl	.20	incl	10 lb.	1.75	incl
	Carbonate, precipitated				.10	cc .05			
	Carbonate, lump (Marble)				.10	cc .04			
	Carbonate, pure				.40	cb .08			

		Ounce and pound prices				Price in other size packages		
	Maker or Brand	per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
CALCIUM	Carbonate, c. p.	Baker Analyzed						
	Fe	0.0003%						
	Na.K	none						
	MgO	0.0002%						
	Nitrate	trace						
CALCIUM	Carbonate, precipitated	Merck Blue Label	1.00	incl		¼ lb.	.35	incl
	Tested for Solubility in Hydrochloric, Nitric and Acetic Acids							
	Heavy metals	none						
	Magnesium	less than 0.002%						
	Sulphates	less than 0.0125% SO ₄						
	Chlorides	less than 0.0005% as Cl						
	Phosphates	less than 0.001% as P ₂ O ₅						
	Alkalies and Calcium Oxide	not more than 0.02%						
CALCIUM	Carbonate, precipitated	Kahlbaum "C.f.A."				100 grm.	.75	incl
	Carbonate, precipitated	Kahlbaum "C.f.A."				500 grm.	1.60	incl
	Magnesium	none						
	Caustic Potash	none						
	Sulphate and phosphates	none						
	Chloride	none						
	Soluble alkali	7.5 mg complete						
	Solubility in dilute Acetic Acid	complete						
	Heavy metals	none						
CALCIUM	Carbonate, c. p., for standardizing	Baker Special	1.00	cb	.08	¼ lb.	.35	incl
	Carbonate, (Iceland Spar) for standardizing		.45	incl	4.50	incl	¼ lb.	1.40
	Chloride, granular, purified							
	Chloride, pure, lump or granular, anhydrous							
	Chloride, c. p., anhydrous for drying tubes, 4, 8, and 12 mesh	Baker Analyzed						
	Fe	0.001%						
	CaO	trace						
	Free Cl	none						
	MgO	0.008%						
	SO ₄	0.001%						
CALCIUM	Chloride, dry, granulated	Merck Blue Label	.45	incl				
	Neutrality	less than 0.0028% as CaO						
	Arsenic	less than 0.0002%						
CALCIUM	Chloride, c. p., crystals	Baker Analyzed	.35	cb	.08	¼ lb.	.18	incl
	Ba	0.001%						
	Fe	0.001%						
	Sr	none						
	MgO	0.001%						
	SO ₄	0.001%						
CALCIUM	Chloride, crystals	Merck Blue Label	.45	incl				
	Substance insoluble in Absolute Alcohol	none						
	Heavy metals	none						
	Sulphates	less than 0.0038% as SO ₄						
	Ammonium salts	less than 0.0015% as NH ₃						
	Barium	less than 0.002%						
	Arsenic	less than 0.0002%						
	Nitrates	less than 0.0032% as N ₂ O ₅						
CALCIUM	Chloride, fused, tested reagent	Merck Blue Label	.80	incl		¼ lb.	.30	incl
	Chloride, anhydrous, sticks		.50	cb	.09			
	Chromate, c. p.		1.25	cb	.08	¼ lb.	.40	incl
	Fluoride, native, powder		1.10	cc	.04			
	Fluoride, c. p.	Baker Analyzed	1.00	cb	.08	¼ lb.	.35	incl
	Formate, c. p.	Baker Analyzed	2.00	cb	.08	¼ lb.	.65	incl
	Hydroxide, pure	Baker Analyzed	.40	cb	.08			
	Hydroxide	Merck Blue Label	.60	incl		¼ lb.	.25	incl
	Carbonates	less than 5% Ca						
	Silica	less than 0.1%						
	Alumina	less than 0.25% Al						
	Sulphates	less than 0.03% as SO ₄						
	Chlorides	less than 0.002% as Cl						
CALCIUM	Hypochlorite (Bleaching Powder) (Oxychloride)					1 can	.10	incl
	Hypochlorite					10 lb.	.60	incl
	Hypochlorite, c. p., (Oxychloride)							
			.55	cb	.08	¼ lb.	.25	incl
CALCIUM	Lactate		.10	cb	.03	.70	cb	.09
	Nitrate, pure					.80	cc	.05
	Nitrate, c. p.	Baker Analyzed	.15	incl	.90	cb	.08	¼ lb.
	Fe	0.001%						
	MgO	0.002%						
	BaO	none						
	SO ₄	0.001%						
CALCIUM	Oxalate, c. p.	Baker Analyzed	1.40	cb	.08	¼ lb.	.40	incl
	Oxide (Caustic Lime)		.10	cc	.05			

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		Maker or Brand	Ounce and pound prices				Price in other size packages		
			per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
CALCIUM	Oxide, from Marble.....	Baker Analyzed			.25	cb .07			
	SiO ₂	0.130%							
	MgO.....	0.500%							
	SO ₃	0.200%							
	Cl.....	0.014%							
CALCIUM	Oxide, from Marble.....	Kahlbaum			.50	cb .10			
	Oxide, from Marble.....	Merck Blue Label			.60	incl	¼ lb.	.25	incl
	Carbonates.....	less than 9% CO ₂							
	Silica.....	less than 0.1%							
	Alumina.....	less than 0.25% Al ₂ O ₃							
CALCIUM	Oxide.....	Kahlbaum "C.f.A."					50 grm.	1.20	incl
	Oxide.....	Kahlbaum "C.f.A."					100 grm.	2.05	incl
	Solubility in Hydrochloric Acid.....	complete							
	Sulphate and Phosphate.....	none	In 10	} Certified Analysis					
	Silicates.....	none	grams						
CALCIUM	Oxide, from Iceland Spar.....	Merck Blue Label					¾ oz.	.40	incl
	Oxide, from Iceland Spar.....	Merck Blue Label					½ oz.	1.25	incl
	Carbonates.....	less than 0.7% CO ₂							
	Silica.....	less than 0.017% as SiO ₂							
	Sulphates.....	less than 0.00015% as SO ₃							
CALCIUM	Phosphate, c. p., dibasic (CaHPO ₄ + 2H ₂ O).....		.10	incl	.75	cb .08	¼ lb.	.25	incl
	Phosphate, dibasic (CaHPO ₄ + 2H ₂ O).....	Merck Blue Label			1.00	incl	¼ lb.	.35	incl
	Arsenic.....	less than 0.0005%							
	Chlorides.....	less than 0.002% as Cl							
	Heavy metals.....	none							
CALCIUM	Phosphate, dibasic (CaHPO ₄ + 2H ₂ O).....	Kahlbaum "C.f.A."					50 grm.	.50	incl
	Phosphate, dibasic.....	Kahlbaum "C.f.A."					100 grm.	1.25	incl
	Arsenic.....	none	In 10	} Certified Analysis					
	Sulphate.....	none	grams						
	Chloride.....	none							
CALCIUM	Phosphate, c. p., monobasic [Ca(H ₂ PO ₄) + H ₂ O].....		1.00	cb .08			¼ lb.	.35	incl
	Phosphate, monobasic [Ca(H ₂ PO ₄) ₂ + H ₂ O].....	Merck Blue Label			1.25	incl	¼ lb.	.40	incl
	Arsenic.....	less than 0.0005%							
	Chlorides.....	less than 0.002% as Cl							
	Heavy metals.....	none							
CALCIUM	Phosphate, precipitated (contains about 96% Calcium Phosphate tribasic).....				.43	cb .12			
	Phosphate, c. p., tribasic [Ca ₃ (PO ₄) ₂].....		.15	incl	.90	cb .12	¼ lb.	.35	incl
	Phosphate, tribasic [Ca ₃ (PO ₄) ₂].....	Merck Blue Label	.20	incl			½ lb.	1.00	incl
	Arsenic.....	less than 0.0005%							
	Sulphates.....	less than 0.002% as SO ₃							
CALCIUM	Phosphate, tribasic [Ca ₃ (PO ₄) ₂].....	Kahlbaum "C.f.A."					50 grm.	.90	incl
	Phosphate, tribasic [Ca ₃ (PO ₄) ₂].....	Kahlbaum "C.f.A."					100 grm.	1.40	incl
	Chloride.....	none							
	Sulphate.....	none	In 10	} Certified Analysis					
	Carbonate.....	none	grams						
CALCIUM	Sulphate, calcined (Plaster of Paris).....				.10	cc .05			
	Sulphate, native, (Gypsum).....				.10	cc .05			
	Sulphate, c. p.....	Baker Analyzed			.40	cb .09			
	Fe.....	0.001%							
	SiO ₂	0.003%							
CALCIUM	Sulphate.....	Merck Blue Label	1.00	incl			¼ lb.	.35	incl
	Iron.....	less than 0.00375%							
	Magnesium and alkalis.....	not more than 0.1%							
	Sulphate.....	Kahlbaum "C.f.A."					100 grm.	.65	incl

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages		
		per oz.		per lb.		size pkg.	per pkg.	cont.
CALCIUM	Sulphate.	Kahlbaum "C.F.A."				500 grm.	1.80	incl
	Iron Oxide.	none						
	Alkalies and Magnesia present after precipitating Calcium.	3 mg. trace		In 10 grams				
	Magnesia.	none		Certified Analysis				
CALCIUM	Sulphide, pure. . . . .			.40 cb .12				
"	Sulphide, cubes, according to Professor Otto. . . . .			.75 jg .07				
"	Sulphide.	Merek Blue Label		1.00 incl		1 lb.	.35	incl
	Arsenic. less than 0.0001%							
CALCIUM	Sulphate, c. p.	Baker Analyzed		.50 cb .08		1/4 lb.	.20	incl
"	Tartrate, c. p.	Baker Analyzed		1.50 cb .08				
CANADA	Balsam (See Microscopic Mounting Media).							
CAMPHOR	, refined.			1.00 cc .04				
*CARBON	Bisulphide, coml. (also furnished in 25, 50, 100 and 500 lb. cans, and 1000 lb. drums. Price on applica- tion). . . . .			.28 en .07		5 lb.	1.15 en	.12
*CARBON	Bisulphide, c. p.	Baker Analyzed		.40 cb .08				
	Sp. gr. 1.27%							
	B. F. 46-49°C							
	SO ₂ none							
	Free Sulphur none							
	Nonvolatile matter 0.001%							
*CARBON	Bisulphide.	Merek Blue Label		.50 incl		1/4 lb.	.20	incl
	Nonvolatile matter. less than 0.0008%							
	Hydrogen Sulphide and foreign organic Sulphur compounds. none							
	Sulphuric and Sulphurous Acids. none							
CARBON	Dioxide, supplied in seamless steel cylinders containing 20 lbs. each.					per cyl.	18.00	incl
	Cylinders purchased from us will be refilled at \$3.00 each.							
"	Tetrachloride, coml. . . . .			.25 en .05		5 lb.	1.00 en	.12
"	Tetrachloride, pure. . . . .			.30 cb .08				
"	Tetrachloride, c. p.	Baker Analyzed		.70 cb .08				
	Sp. gr. 1.620							
	B. F. 78°C							
	Free Chlorine. none							
	H-S none							
	Nonvolatile matter. 0.0004%							
CARBON	Tetrachloride.	Merek Blue Label		.75 incl		1/4 lb.	.25	incl
	Nonvolatile matter. less than 0.0012%							
	Chlorine. less than 0.0002%							
	Hydrochloric Acid. less than 0.0001% as Cl							
	Organic matter none							
	Aldehyde none							
	Carbon Disulphide. less than 0.02%							
CARBORUNDUM	, powder, 40, 60, 80, 100 and 180 mesh. . . . .			.40 cc .05				
				.15 incl				
CARD TEETH	. . . . .			.35 cb .04				
CARMINE	No. 40.	Merek Blue Label		.80 incl		1/4 oz.	.30	incl
	Tested for. proper solubility							
	Water. not more than 25%							
	Ash. not more than 8%							
CARMINE-Fibrin	, tested reagent.	Merek Blue Label		.50 incl		1/4 oz.	.20	incl
CASEIN	, from milk, washed. . . . .			.30 cc .05				
	according to Hammarstein. . . . .			.40 cb .03				
CASEIN-Sodium	(Nutrose), in original containers.					1/4 lb.	1.00	incl
°CELLOIDIN	shreds.	Schering		1.00 incl				
CEMENT	, Gutta Percha, for sealing mu- seum jars.			100 grm. .90		incl		
"	Gutta Percha, for sealing mu- seum jars.			500 grm 4.50		incl		
				.25 incl				
CERESINE	, black. . . . .			.30 incl				
"	, white. . . . .			.25 incl				
"	, yellow. . . . .			.40 cb .09				
°CERIU	Nitrate, granular. . . . .			.20 cb .04		2.00 cb .08		
"	Nitrate, c. p. . . . .			.75 incl				
"	Oxalate, pure. . . . .			.10 incl				
°CHARCOAL	, animal, granular. . . . .			.10 cc .05				
"	, animal, powder. . . . .			.35 cb .09				
"	, animal, purified. . . . .			.50 incl				
"	, animal, treated with acid, and washed, moist. . . . .			.20 cb .03				
"	, animal, c. p., dry.							

		Ounce and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
CHARCOAL,	animal, c. p., powdered.....							
CHARCOAL,	animal, tested reagent.....	Merck Blue Label	.25	incl		½ lb.	1.40	incl
CHARCOAL,	blood, c. p.....							
CHARCOAL,	blood, purified by acid.....	Merck Blue Label	.30	incl		½ lb.	1.75	incl
	Material soluble in Water.....							
	Material soluble in Alcohol, not more than 0.1%.....							
	Sulphates.....							
	Chlorides.....							
	Nitrates.....							
	Copper.....							
	Iron.....							
	Calcium.....							
	Residue on ignition.....							
	Hydrogen Sulphide.....							
	Tested for.....							
	Deodorizing power.....							
CHARCOAL,	from sugar, c. p.....					1¼ lb.	.75	incl
"	wood, powder.....			.10	cc	.06		
"	wood, lumps.....			.10	cc	.06		
CHLORAL	Hydrate, crystals.....			.60		incl		
CHLORETONE	.....	1.00	incl					
CHLORINATED	Lime, cubes, for generating Cl.....			.30	cb	.10		
"	Lime, cubes.....	Merck Blue Label		.35		incl		
	Active chlorine.....							
	yield at least 25% by weight.....							
CHLORINE	Water.....	Merck Blue Label		.50		incl		
	Nonvolatile matter.....							
	Hydrochloric Acid.....							
CHLOROFORM,	U. S. P.....			.40	cb	.08	5 lb.	1.90
CHLOROFORM,	c. p.....	Baker Analyzed		1.00	cb	.08		.14
	Sp. gr.....							
	B. P.....							
	Free acid.....							
	Alcohol.....							
CHLOROFORM	.....	Merck Blue Label		.60		incl	1¼ lb.	.25
	Nonvolatile matter.....							
	Hydrochloric Acid.....							
	Free Chlorine.....							
	Phosgen.....							
	Aldehyde.....							
	Foreign organic matter.....							
CHOLESTERIN	.....	Kahlbaum					10 grm.	2.50
CHROMIUM,	metal, c. p., crystals.....						1 grm.	.50
"	Acetate, c. p., basic.....	Baker Analyzed		2.00	cb	.08	¼ lb.	.65
"	Ammonium Sulphate, c. p. (30% solution).....	Baker Analyzed		1.00	cb	.08		
"	Carbonate, c. p., basic.....	Baker Analyzed		2.50	cb	.10	¼ lb.	.75
"	Chloride, c. p. (50% solution).....	Baker Analyzed		.75	gb	.15	¼ lb.	.25
	Fe.....							
	Ni.....							
	Cu.....							
	SO ₃							
CHROMIUM	Chloride, c. p., dry.....		.15	incl	1.50	cb	.08	¼ lb.
"	Hydroxide, c. p.....	Baker Analyzed			1.00	cb	.09	¼ lb.
"	Nitrate, c. p. (40% solution).....	Baker Analyzed			1.00	gb	.15	
"	Nitrate, c. p., dry.....		.20	incl	2.00	cb	.08	¼ lb.
"	Oxide, c. p.....	Baker Analyzed			1.15	cb	.09	
"	Potassium Sulphate, pure crystals (Chrome Alum).....				.15	cc	.05	
"	Potassium Sulphate, powder.....				.18	cc	.05	
"	Potassium Sulphate, c. p.....	Baker Analyzed	.10	incl	.30	cb	.08	¼ lb.
	Fe.....							
	CaO.....							
	MgO.....							
	Cl.....							
CHROMIUM	Sulphate, c. p. (30% solution).....	Baker Analyzed		.80	gb	.15	¼ lb.	.35
"	Sulphate, c. p., dry.....		.20	incl	1.75	cb	.08	¼ lb.
"	Trioxide (See Chromic Acid).....							
CHRYSAROBIN	.....			3.50		incl	¼ lb.	1.00
CINNABAR,	red.....							
COBALT,	metal, 98-99% cubes.....		.50	cb	.03			
"	metal, c. p., (Nickel free).....						10 grm.	.50
"	Acetate, c. p.....			4.00	cb	.08	¼ lb.	1.25
"	Ammonium Sulphate, c. p.....			2.00	cb	.08	¼ lb.	.65
"	Bromide, c. p.....		.50		incl			
"	Carbonate, c. p.....	Baker Analyzed		2.50	cb	.10	¼ lb.	.75
"	Chloride, c. p.....	Baker Analyzed		2.50	cb	.08	¼ lb.	.75
"	Chloride, c. p. (Nickel free).....	Baker Special	.75	incl				
"	Chloride (Nickel free).....	Kahlbaum.....	.75	incl				

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
°COBALT	Nitrate, c. p.	Baker Analyzed	.20	incl	2.00	cb .08	¼ lb.	.65 incl
	Fe.....							
	Ni.....							
	Cu.....							
°COBALT	Nitrate.....	Merck Blue Label	.40	incl			¼ lb.	1.35 incl
	Sulphates.....							
	Chlorides.....							
	Alkali salts.....							
°COBALT	Nitrate, c. p. (Nickel free).....	Baker Special	.75	incl				
	“ “ Nitrate (Nickel free).....	Kahlbaum.....	.75	incl				
	“ “ Nitrate (Nickel free).....	Merck Blue Label	.75	incl			¼ oz.	.25 incl
	Nickel.....							
COBALT	Oxalate, c. p.				3.50	cb .09	¼ lb.	1.05 incl
	“ Oxide, c. p.	Baker Analyzed			3.00	cb .06	¼ lb.	.95 incl
	“ Oxide Sulphur.....	Merck Blue Label	1.00	incl			¼ oz.	.35 incl
	“ Sulfur.....							
“	Sodium Nitrite, c. p. ....		.50	incl				
	“ Sulphate, c. p.	Baker Analyzed			1.75	cb .08	¼ lb.	.60 incl
	Fe.....							
	Ni.....							
COBALT	Sulphate, c. p. (Nickel free).....	Baker Special	.30	incl				
	COCHINEAL, bugs.....				.75	cc .06		
	“ powder.....				.85	cc .05		
	“ U. S. P. ....				.55	incl		
°COLLODION,	4%.....	Merck Blue Label			.60	incl	¼ lb.	.25 incl
	“ Acids.....							
	“ Residue.....							
	“ 3.8-4.0%.....							
COLOPHONY	(Rosin), yellow, lump.....		.10	cc .04				
“	(Rosin), white, lump.....		.12	cc .04				
CONGO (See Test Paper).....								
COPPER,	metal, shot form.....		.40	cc .01				
	“ metal, turnings, short.....		.45	incl				
	“ metal, granulated.....		.60	incl				
	“ metal, sheet .008 in.....		.75	incl				
“	metal, by Electrolysis.....	Merck Blue Label	1.00	incl			¼ lb.	.35 incl
	Foreign metals (Sb, Sn, Pb, Ag).....							
	“ (Fe, Cr, Ba, O).....							
	“ (total metals).....							
COPPER,	metal, foil .002 in.....		1.50	incl				
	“ metal, c. p., foil, 0.06-0.1 mm.....		.15	incl	1.50	incl		
	“ Acetate (Verdigris), powdered.....		.40	cb .08				
	“ Acetate, pure, crystals, neutral.....		.55	cb .09				
“	Acetate, c. p.	Baker Analyzed			.60	cb .08		
	“ Aceto Arsenite, c. p.		2.50	cb .08				
	“ Ammonium Chloride, c. p.	Baker Analyzed			.50	cb .08	¼ lb.	.20 incl
	CuCl ₂				48	47%		
COPPER	Ammonium Chloride.....	Merck Blue Label	1.00	incl			¼ lb.	.35 incl
	Free acids.....							
	Sulphates.....							
	Salts of the alkalis, earths, etc.....							
COPPER	Ammonium Sulphate, c. p.	Baker Analyzed			.60	cb .08		
	“ Arsenate, c. p.	Baker Analyzed			1.00	cb .09		
	“ Arsenite, c. p.		1.25	cb .07				
	“ Bromide, c. p. ....		.40	incl				
“	Carbonate, true, powdered.....		.30	cc .09				
	“ Carbonate, pure.....		.45	cb .08				
	“ Carbonate, c. p.	Baker Analyzed			.70	cb .08	¼ lb.	.24 incl
	Cl.....							
COPPER	Chloride, pure.....		.50	cb .08				
	SO ₄							
	Fe.....							
	Na.....							

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages			
		per oz.		per lb.		size pkg.	per pkg.	cont.	
		cont.	cont.	cont.	cont.				
COPPER	Chloride, c. p. (cupric).....	Baker Analyzed	.10	incl	.60	cb .05	1/4 lb.	.22	incl
	SO ₂	0.001%	Typical Analysis						
	Fe.....	0.001%							
	Pb.....	none							
	Nitrate.....	none							
COPPER	Chloride, (cupric).....	Merek Blue Label	.20	incl			1/2 lb.	.90	incl
	Substances insoluble in Alcohol.....	none	Guaranteed Analysis						
	Sulphates.....	less than 0.01% as SO ₂							
	Salts of the alkali metals.....	not more than 0.008%							
	Iron.....	not more than 0.028%							
	Arsenic.....	less than 0.001%							
COPPER	Chloride (cupric).....	Kahlbaum "C.F.A.".....					100 grm.	.95	incl
	Chloride (cupric).....	Kahlbaum "C.F.A.".....					500 grm.	2.70	incl
	Iron.....	1.0 mg							
	Alkaline residue present after precipitating Copper 3.0 mg.....	In 10 grams	Certified Analysis						
	Arsenic.....	none							
	Sulphate.....	none							
	Solubility in Alcohol.....	complete							
COPPER	Chloride, c. p. (cuprous).....	Baker Analyzed	.15	incl	1.50	cb .06	1/4 lb.	.45	incl
	SO ₂	0.001%	Typical Analysis						
	Fe.....	0.0002%							
	Na.....	trace							
	CaCl ₂	trace							
COPPER	Chloride (cuprous) tested reagent.....	Merek Blue Label	.20	incl			1/2 lb.	.90	incl
	Chloride (cuprous).....	Kahlbaum "C.F.A.".....					100 grm.	1.00	incl
	Chloride (cuprous).....	Kahlbaum "C.F.A.".....					500 grm.	3.10	incl
	Residua present after precipitating Copper, unweighable.....	In 10 grams	Certified Analysis						
	Iron Oxide.....	none							
	Color.....	normal, white							
COPPER	Hydroxide, c. p.	Merek Blue Label	.25	incl	.90	cb .08	1/4 lb.	.35	incl
	Hydroxide.....	less than 0.001% SO ₂							
	Sulphates.....	none							
	Alkalies.....	none							
COPPER	Nitrate, pure crystals.....	Baker Analyzed			.45	cb .09			
	Nitrate, c. p.	Baker Analyzed	.10	incl	.65	cb .07	1/4 lb.	.24	incl
	Fe.....	0.0002%	Typical Analysis						
	Cl.....	0.0001%							
	SO ₂	none							
COPPER	Oxalate, c. p.	Baker Analyzed			1.50	cb .08	1/4 lb.	.45	incl
	Oxide, c. p., black, fine.....	Baker Analyzed			.80	cb .06	1/4 lb.	.35	incl
	Oxide, c. p., black, coarse.....	Baker Analyzed			1.00	cb .06	1/4 lb.	.35	incl
	Fe.....	0.010%	Typical Analysis						
	SO ₂	0.001%							
	Nitrate.....	trace							
COPPER	Oxide, c. p., wire.....	Baker Analyzed			1.50	cb .07	1/4 lb.	.45	incl
	Fe.....	0.001%	Typical Analysis						
	AlO ₂	0.0002%							
COPPER	Oxide, c. p., red.....	Baker Analyzed			1.50	cb .07	1/4 lb.	.45	incl
	SO ₂	0.050%	Typical Analysis						
	Cl.....	0.050%							
	Fe.....	0.041%							
COPPER	Oxide Asbestos.....	Merek Blue Label	1.00	incl			1/4 oz.	.35	incl
	Phosphate, c. p.	Baker Analyzed			2.00	cb .10	1/4 lb.	.65	incl
	Potassium Chloride, c. p.	Baker Analyzed			.45	cb .07	1/4 lb.	.20	incl
	CuCl ₂	42.1%	Typical Analysis						
	Fe.....	0.0003%							
	SO ₂	0.0002%							
	Nitrate.....	trace							
	Carbon (soluble).....	none							
COPPER	Potassium Sulphate, c. p.	Baker Analyzed			.50	cb .07	1/4 lb.	.20	incl
	Sulphate, coml., crystals (Blue Stone).....				.10	cc .05			
	Sulphate, coml., (powder).....				.15	cc .05			
	Sulphate, pure, crystals.....				.20	cb .07			
	Sulphate, c. p., crystals, coarse or fine.....	Baker Analyzed			.27	cb .07	1/4 lb.	.15	incl
	Fe.....	0.002%	Typical Analysis						
	Cl.....	0.0002%							
COPPER	Sulphate.....	Merek Blue Label			.60	incl	1/4 lb.	.25	incl
	Salts of the alkalis, earth, etc., not more than 0.033%.....	Guaranteed Analysis							
	Iron.....	not more than 0.014%							
COPPER	Sulphate.....	Kahlbaum "C.F.A.".....					500 grm.	1.15	incl
	Sulphate.....	Kahlbaum "C.F.A.".....					1000 grm.	1.95	incl
	Iron.....	0.15 mg							
	Alkalies present after precipitating Copper 1.00 mg.....	In 10 grams	Certified Analysis						
	Other metals.....	none							
COPPER	Sulphate, c. p., cryst. precip. by Alcohol.....	Baker Special			.50	cb .07	1/4 lb.	.20	incl
	Fe.....	0.0002%	Typical Analysis						
	Cl.....	none							
COPPER	Sulphate, c. p., anhydrous.....	Baker Analyzed	.10	incl	.70	cb .07	1/4 lb.	.24	incl
	Sulphate, anhydrous in junice.....				.50	cb .08			

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
COPPER, Sulphide, c. p.				1½ lb.	.40 incl
“ Thiocyanate, c. p. (cuprous)....	Baker Analyzed		1.25 cb .07	1½ lb.	.60 incl
COTTON, absorbent.....			1.60 cb .08		
“ non-absorbent.....			.35 incl		
“ wool, specially selected for plugging culture tubes.....			.35 incl		
CREOLIN, Pearson's.....			.25 incl		
CREOSOTE, from Beechwood as recommended for use in biological laboratories.....			.67 cb .08		
“ from coal tar.....			.80 gb .09		
CRESOL, U. S. P.....			.40 gb .09	5 lb.	1.10 cb .15
CUBES, Chlorine, for generating Chlorine (Also see Chlorinated Lime).....			.30 cb .10		
“ Oxygen, for generating Oxygen (Also see Oxone).....				2 lb.	1.50 incl
“ Sulphide, for generating Sulphuretted Hydrogen.....			.45 cb .10		
“ Sulphite, for generating Sulphurous acid.....			.50 cb .10		
“ Acid Sulphurous, 20% tested reagent.....	Merck Blue Label		.60 incl	1½ lb.	.25 incl
CUMARIN.....			.35 cb .03		
CUMOL.....			.70 cb .10		
CURARE, tested.....				15 grs.	1.35 incl
DEVARDA'S ALLOY (See metal)					
DEXTRINE, yellow, coml.....			.10 cc .05		
“ white, coml.....			.10 cc .05		
“ c. p., alcohol precipitated.....			.90 cb .09		
DEXTROSE (Glucose) white, lump.....			.10 cc .06		
“ anhydrous, pure, granular.....			.15 cc .05		
“ c. p., anhydrous.....			.15 cb .03	1.40 cb .08	
DI-AMIDO-BENZOL (See Phenylene-diamine)					
DIAMOND INK.....			.55 incl		
DIASTASE of Malt (Maltine).....			.65 cb .04		
DICHLORETHYLENE.....			.35 cb .08		
DICYANDIAMINE SULPHATE.....	Merck Blue Label		.60 incl	1½ oz.	.20 incl
Tested for suitability as a reagent for Nickel					
DIMETHYL-AMIDO-BENZALDEHYDE (Para).....	Kahlbaum			10 grm.	1.00 incl
DIMETHYL-AMIDO-BENZOL (See Dimethyl-aniline)					
DIMETHYL-AMIDO-AZO-BENZOL (Para), c. p.....			.90 cb .03		
DIMETHYL-ANILINE.....			.15 cb .03	1.80 cb .09	
DIMETHYLGLOXIME.....			1.50 incl	1½ lb.	4.75 incl
“.....	Merck Blue Label		2.00 incl	1½ lb.	7.50 incl
“.....	Merck Blue Label			1½ oz.	.35 incl
Tested for suitability as a reagent for Nickel					
DIMETHYL-PARAPHENYLENE-DIAMINE HYDROCHLORIDE.....	Merck Blue Label			1½ oz.	1.25 incl
DIMETHYL-PARAPHENYLENE-DIAMINE HYDROCHLORIDE.....	Merck Blue Label			15 grm.	.30 incl
Nonvolatile matter... less than 0.05%					
DIMETHYLSULPHATE.....			1.30 incl		
DIPHENYLAMINE, c. p., crystals, whitest.....			.25 ch .03	2.50 ch .08	
DIPHENYLAMINE.....	Merck Blue Label		.25 incl		
Nitric Acid... less than 0.95% as N ₂ O ₅					
Aniline... less than 0.05%	Guaranteed Analysis				
DISTILLED WATER, in 5 gal. crated bottle.....				5 gal.	.75 I.00
DULCITE (Melampyrite).....				5 grm.	4.50 incl
DUTCH LEAF.....				book	.10 incl
EDINOL.....			.70 cb .03		
EIKONOGEN.....			.35 cb .03		
EMERY, fine, 180 mesh.....			.15 cc .04		
“ medium, 80 mesh.....			.12 cc .04		
“ coarse, 40 mesh.....			.10 cc .04		
ESCHKA'S Mixture (See Magnesium Oxide and Sodium Carbonate).					
ETHER (Sulphuric), U. S. P.....				1½ lb.	.15 incl
“ (Sulphuric), U. S. P.....				1½ lb.	.20 incl

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont. per lb.	cont.	size pkg.	per pkg.	cont.	
GELATINE, Extra, for preparation of bacteriological culture media.....	Coignet							
GLASS WOOL, best Bohemian, Lead free.....		.65	incl	6.00	incl	1 1/2 lb.	2.25 incl	
“ best Bohemian, coarse.....		.50	incl	5.00	incl	1 1/2 lb.	1.75 incl	
“ best Bohemian, fine.....		.55	incl	5.75	incl	1 1/2 lb.	2.00 incl	
GLASS WOOL.....	Merck Blue Label	.50	incl			1 1/2 lb.	1.50 incl	
GLASS, Powder.....				.10	incl			
GLUCOSE (Dextrose), white, lump.....				.10	cc	.06		
“ (Dextrose), c. p. anhydrous.....		.15	cb	.03	1.40	cb	.08	
GLYCERIN, c. p., neutral.....				.35	cb	.08	5 lb.	1.60 cn 18
“ c. p., neutral.....				.8			10 lb.	2.80 cn 25
“ c. p., neutral.....				.25			50 lb.	12.50 incl
In drums of 550 or 1100 lbs., price on application.								
GLYCERIN, sp. gr. 1.25.....	Merck Blue Label			.60	incl			
Tested for.....	Neutrality							
“ Arsenic.....	less than 0.001%							
“ Inorganic matter.....	less than 0.003%							
“ Substances which reduce Ammoniacal Silver.....								
“ Nitrate solution.....	none							
“ Fatty acid esters.....	less than 0.115% as Ethyl Butyrate							
“ Hydrochloric Acid and Chlorides.....	less than 0.0004% as Cl							
“ Sulphuric Acid.....	less than 0.0024% as SO							
“ Oxalic Acid.....	less than 0.006%							
“ Heavy metals.....	none							
“ Calcium.....	less than 0.005%							
“ Sugars.....	less than 0.04% as Saccharose							
“ Readily carbonizable matter.....	none							
“ Dextrose and organic bodies.....	none							
“ Ammonium compounds.....	less than 0.003% as NH ₃							
GLYCERIN, sp. gr. 1.23.....	Merck Blue Label			.60	incl			
Same impurities as above.								
GLYCOCOLL.....						15 gr.	.35 incl	
GOLD LEAF.....						book	.50 incl	
“ Chloride pure crystals.....						15 gr.	.45 incl	
GRAPE SUGAR (See Glucose or Dextrose).								
GRAPHITE, powder.....				.15	cc	.06		
GUAIAICIN, tested reagent.....	Merck Blue Label					1/2 oz.	.80 incl	
GUM Arabic, white, granular.....		.10	cc	.03	.60	cc	.05	
“ Arabic, white, powder.....		.10	cc	.03	.60	cc	.05	
“ Camphor, refined.....				1.00	cc	.06		
“ Damar.....				.45	cc	.05		
“ Guaiac.....				.50	cc	.05		
“ Mastic, tears.....				1.15	incl			
“ Shellac, orange, flake.....				.45	cc	.04		
“ Shellac, bleached.....				.50	cc	.04		
“ Tragacanth, powdered.....				1.00	cc	.05		
GYPSPUM (Calcium Sulphate).....				.10	cc	.05		
HAEMOGLOBIN, powder.....		.30	cb	.04				
“ scales.....		.25	cb	.03				
HEMATEIN, tested reagent.....	Merck Blue Label					1/2 oz.	.60 incl	
(See also Grublers Stains)								
HEMATOXYLIN, tested reagent.....	Merck Blue Label					1/2 oz.	1.10 incl	
“ “.....	Merck Blue Label					1/2 oz.	.30 incl	
(See also Grublers Stains)								
HIDE POWDER, for standardizing.....				3.50	incl	1/4 lb.	1.05 incl	
“ American Standard.....		.40	cc	.03	4.00	cc	.06	
“ tested reagent.....	Merck Blue Label	.50	incl			1/4 lb.	1.50 incl	
HIRUDIN, for preventing coagulation of blood, 1 milligram of Hirudin keeps 7 1/2 cc. of blood in a liquid condition.....						1/16 gm.	3.75 incl	
“ same as above.....						1/16 gm.	.45 incl	
HYDRAZINE Sulphate.....	Merck Blue Label	1.00	incl			1/4 oz.	.35 incl	
Chlorides.....	less than 0.002% as Cl							
“ Heavy metals.....	none							
“ Nonvolatile matter.....	less than 0.03%							
HYDROCHINONE.....		.15	incl	.80	incl	1/4 lb.	.25 incl	
HYDROGEN Peroxide, U. S. P.....				.20	incl	5 lb.	.80 incl	
HYDROGEN Peroxide, c. p.....	Baker Analyzed			.50	cb	.08		
H ₂ O.....	2.30%							
Fe.....	0.001%							
SO ₄	0.025%							
MgO.....	0.005%							
Nonvolatile matter.....	0.100%							
HYDROGEN Peroxide.....	Marchand			.75	incl			

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	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
HYDROGEN Peroxide (Dioxogen)	Oakland Chem. Co.			.65	incl			
" Peroxide (30% weight)	Merck Blue Label					200 grm.	2.50	incl
" Peroxide (30% weight)	Merck Blue Label					50 grm.	.85	incl
Free acids	none.							
Sulphuric Acid	less than 0.0075% as SO ₃							
(Residue on evaporation + Sulphuric and Phosphoric Acids, etc.)	less than 0.0045%	} Guaranteed Analysis						
Oxalic Acid	less than 0.035%							
Hydrochloric Acid	less than 0.0005% as Cl							
Hydrofluoric Acid	less than 0.0005%							
Phosphoric Acid	less than 0.0006% as P ₂ O ₅							
HYDROGEN Sulphide Water	Merck Blue Label			.50	incl			
Iron	none							
HYDROXYLAMINE Hydrochloride	Merck Blue Label	1.00	incl			1 1/4 oz.	.30	incl
Nonvolatile matter	less than 0.05%							
Ammonium Chloride	less than 0.3%	} Guaranteed Analysis						
Sulphuric Acid	less than 0.0005% as SO ₃							
Heavy metals	at most a trace							
Arsenic	less than 0.0015%							
ICELAND SPAR , for standardizing .....		.40	incl					
INDIGO , Madras, lump .....				.75	cc .04			
" Bengal, lump .....		.10	incl	1.25	cc .04			
INDIGO , Vegetable, 60%	Merck Blue Label	.40	incl					
Ash	not more than 12%	} Guaranteed Analysis						
Moisture	not more than 9%							
INDIGO Synthetic, 95%	Merck Blue Label	.50	incl			1/4 oz.	.20	incl
Ash	not more than 1%	} Guaranteed Analysis						
Moisture	not more than 1%							
INDIGO Solution, 1-40	Merck Blue Label			.75	incl	1/4 lb.	.30	incl
INDIGO Solution, 1-1000	Merck Blue Label			.75	incl	1/4 lb.	.30	incl
INDOL						1/16 grm.	.55	incl
"						1 grm.	3.00	incl
INFUSORIAL EARTH (Kieselguhr) .....				.10	cc .04			
INULIN , white (Alant Starch)						10 grm.	.15	incl
" Dragendorff						10 grm.	.25	incl
" Kiliani .....		.60	incl			10 grm.	.25	incl
IODEOSIN	Merck Blue Label	.75	incl			1/4 oz.	.25	incl
Tested	for sensitiveness							
IODINE , pure, resublimed .....		.35	gb .07	4.25	gb .13			
IODINE , resublimed	Merck Blue Label	.45	incl	5.50	incl	1/4 lb.	1.50	incl
Nonvolatile matter	less than 0.05%	} Guaranteed Analysis						
Cyanogen	less than 0.03%							
Chlorine and Bromine	less than 0.12% total as Cl							
Arsenic	less than 0.0028%							
IODINE Pentoxide, e. p		1.10	incl					
IODINE Water	Merck Blue Label			.50	incl			
Tested	for strength							
IRON Filings, coarse .....				.10	cc .04			
" Filings, fine .....				.10	cc .04			
" by Hydrogen, 90% .....				.55	cb .08			
IRON by Hydrogen	Merck Blue Label			1.25	incl	1/4 lb.	.40	incl
Residue insoluble in Sulphuric Acid	not more than 0.5%	} Guaranteed Analysis						
Sulphides	less than 0.007% as S							
Sodium Carbonate	not more than 0.06%							
Nitrogen	not more than 0.0028%							
Arsenic	less than 0.0045%							
IRON, Powder	Merck Blue Label	.50	incl			1/4 lb.	.20	incl
Tested for insolubility in Hydrochloric Acid Nitrogen	not more than 0.0028%	} Guaranteed Analysis						
Arsenic	less than 0.0045%							
Foreign heavy metals	none							
IRON Wire , for standardizing, on spool .....		.15	incl			1/4 lb.	.30	incl
" Wire , Same as above						1/2 lb.	.45	incl
" Wire , for standardizing on spool	Merck Blue Label					50 grm.	.50	incl
" Acetate, e. p. , solution, (ferric) .....				.50	cb .08			
" Ammonium Citrate (ferric)		1.25	cb .08			1/4 lb.	.40	incl
" Ammonium Oxalate, e. p. (ferric)	Baker Analyzed	.80	cb .08			1/4 lb.	.30	incl
" Ammonium Oxalate, e. p. (ferrous)	Baker Analyzed	.75	cb .08			1/4 lb.	.25	incl
" Ammonium Sulphate, e. p. (ferric) (Iron Alum)	Baker Analyzed	.10	incl	.50	cb .08	1/4 lb.	.20	incl
Cl	-0.001%	} Typical Analysis						
Ferrous Salt	trace							
Nitrate	trace							
IRON Ammonium Sulphate (ferric)	Merck Blue Label	.60	incl			1/4 lb.	.25	incl
Ferrous salt	less than 0.0025%	} Guaranteed Analysis						
Chlorides	less than 0.003% as Cl							
Zinc	less than 0.003%							
Copper	less than 0.01%							
Alkali salts	not more than 0.04%							

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		Ounce and pound prices				Price in other size packages			
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.		
		Maker or Brand				cont.			
IRON	Ammonium Sulphate, c. p. (ferrous)	Baker Analyzed	.10	incl	.45	cb .08	1 1/4 lb. .20	incl	
	Fe in one gram..... 0.145-0.143								
	Ca..... none	Typical Analysis							
	Zn..... none								
	Cl..... 0.0002%								
	..... trace							
IRON	Ammonium Sulphate (ferrous)	Merck Blue Label			.60	incl	1 1/4 lb. .25	incl	
	Ferric salts..... less than 0.0008% Fe ³⁺	Guaranteed Analysis							
Copper..... less than 0.01%									
Zinc..... less than 0.003%									
	Alkali salts..... less than 0.0107%								
IRON	Ammonium Sulphate, c. p. (ferrous)	Baker Special			.75	cb .08			
	(Phosphorus free).....								
"	Ammonium Sulphate, c. p., (ferrous)				.60	cb .08	1 1/4 lb. .25	incl	
	large crystals, for standardizing.....				.50	cb .08	1 1/4 lb. .20	incl	
"	Carbonate, c. p., moist (ferric).....	Baker Analyzed			.35	cb .07	1 1/4 lb. .15	incl	
"	Carbonate, c. p., moist (ferrous).....	Baker Analyzed			.25	cb .09			
"	Chloride, pure, lump (ferric).....	Baker Analyzed	.10	incl	.35	cb .08	1 1/4 lb. .17	incl	
	Chloride, c. p. (ferric).....								
	Ferrous Salt..... none	Typical Analysis							
	HCl..... trace								
	SO ₂ 0.005%								
	HNO ₃ trace								
	P..... trace								
IRON	Chloride, c. p. (ferric) (Phosphorus free).....	Baker Special	.15	incl	.90	cb .08	1 1/4 lb. .35	incl	
	Chloride (ferric).....	Merck Blue Label			.60	incl	1 1/4 lb. .25	incl	
"	Basic salt and other substances difficultly soluble in Water..... none	Guaranteed Analysis							
	Hydrochloric Acid..... less than 0.35% HCl and								
	and Chlorine..... less than 0.001% Cl ₂								
	Arsenic..... less than 0.0011%								
	Ferrous salt..... less than 0.0025% Fe ²⁺								
	Copper..... less than 0.005%								
	Zinc..... less than 0.015%								
	Nitric Acid..... less than 0.025% as N ₂ O ₅								
	Alkali salts and Calcium..... not more than 0.0117%								
	Sulphates..... less than 0.0025% as SO ₂								
IRON	Chloride, solution (ferric).....		Merck Blue Label			.55	incl	1 1/4 lb. .25	incl
	The same impurities as above.								
IRON	Chloride (ferric).....	Kahlbaum "C.F.A."					100 grm. .60	incl	
	Chloride (ferric).....	Kahlbaum "C.F.A."					500 grm. 1.30	incl	
	Free Hydrochloric Acid..... none	Certified Analysis							
	Free Chlorine..... none								
	Ferrous salts..... none								
	Sulphate..... none								
	Nitrate..... none								
	Alkalies and Calcium Oxide..... none								
	Manganese..... none								
	Copper..... none								
	Arsenic..... none								
	Basic salts..... none								
IRON	Chloride, c. p. (ferrous).....	Baker Analyzed	.10	incl	.55	cb .08	1 1/4 lb. .20	incl	
	SO ₂ 0.005%	Typical Analysis							
Ferric Salt..... present									
	(Oxidizes readily in the air)								
IRON	Chloride (ferrous).....	Merck Blue Label			.70	incl	1 1/4 lb. .30	incl	
	Oxychloride..... at most a small amount	Guaranteed Analysis							
Sulphates..... less than 0.0075% as SO ₂									
Copper..... less than 0.03%									
Zinc..... less than 0.0075%									
Alkali salts..... not more than 0.03%									
	Arsenic..... less than 0.0015%								
IRON	Ferrocyanide, insoluble.....				.50	cb .12			
	Hydroxide, c. p., moist (ferric).....	Baker Analyzed			.60	cb .08	1 1/4 lb. .25	incl	
IRON	Nitrate, c. p., crystals (ferric).....	Baker Analyzed	.10	incl	.80	gb .15	1 1/4 lb. .27	incl	
	Cl..... 0.005%	Typical Analysis							
SO ₂ 0.001%									
Free acid..... trace									
IRON	Nitrate (ferric).....	Kahlbaum "C.F.A."					50 grm. .80	incl	
	Nitrate (ferric).....	Kahlbaum "C.F.A."					200 grm. 2.00	incl	
	Sulphate..... none	Certified Analysis							
	Chlorides..... none								
	Alkalies..... none								
	Iron Oxide..... 19.407%								
	equivalent to Crystallized Ferric Nitrate 98.08%								
	Moisture..... remainder								
IRON	Oxalate, c. p., crystals (ferric).....	Baker Analyzed			1.25	cb .08	1 1/4 lb. .40	incl	
	Oxalate, c. p. (ferrous).....	Baker Analyzed			1.00	cb .08	1 1/4 lb. .35	incl	
"	Oxide, red (ferric), (Jewelers rouge for polishing purposes).....				.35	cb .08			
IRON	Oxide, c. p. (ferric).....	Baker Analyzed			.55	cb .08	1 1/4 lb. .25	incl	
	Oxide, c. p., from Oxalate (ferric).....	Baker Special			1.25	cb .08	1 1/4 lb. .40	incl	
	Cl..... 0.005%	Typical Analysis							
	SO ₂ 0.001%								

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	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
IRON Oxide (ferric)	Merk Blue Label	.80	incl			¼ oz.	.30	incl
Water and volatile substances.....								
Substances soluble in water.....								
Chlorides.....								
Nitrates.....								
Sulphates.....								
Silicates.....								
Ferrous Oxide.....								
Substances insoluble in Hydrochloric Acid.....								
Foreign heavy metals.....								
Alumina.....								
Calcium.....								
Magnesium.....								
IRON Oxide (ferric)	Kahlbaum "C.f.a."					50 grm.	1.70	incl
Ferric Oxide.....								
Moisture.....								
Manganese.....								
Alkalies.....								
IRON Pyrites.....				.10	cc .04			
Sulphate, c. p. (ferric)	Baker Analyzed			.35	cb .08	¼ lb.	.15	incl
CaO.....								
H ₂ O.....								
Ferrous Salt.....								
IRON Sulphate, congl. (ferrous) (Copperas).....				.10	cb .08			
Sulphate, pure, crystals (ferrous).....				.12	cb .08			
Sulphate, c. p. (ferrous)	Baker Analyzed			.35	cb .08	¼ lb.	.20	incl
P.....								
Cu.....								
Ph.....								
Cl.....								
Ferric Salt.....								
IRON Sulphate (ferrous)	Merk Blue Label			.50	incl	¼ lb.	.20	incl
Substances insoluble in Water.....								
Alkali salts.....								
Zinc.....								
Copper.....								
IRON Sulphate, c. p., precipitated by alcohol (Phosphorus free) (ferrous).....				.50	cb .08			
Sulphate, c. p., anhydrous (ferrous).....				.50	cb .08			
Sulphide, fused, lump (ferrous).....				.12	cc .04	100 lb.	8.00	incl
Sulphide, granular (ferrous).....				.12	cc .04	100 lb.	8.00	incl
Sulphide, fused, sticks (ferrous).....				.15	cc .05	100 lb.	13.00	incl
Sulphide, granular, sticks, or lumps (ferrous) tested reagent	Merk Blue Label			.40	incl			
KAOLIN.....				.10	cc .04			
acid washed.....				.20	cc .04			
KIESELGUHR (Infusorial Earth).....				.10	cc .04			
LACMOID, c. p., scales	Merk Blue Label	.65	cb .04					
Tested for.....		1.00	incl			¼ oz.	.35	incl
Sensitiveness.....								
LACTOSE (See LITMUS).....				.22	incl			
LACTOSE, powder (Milk Sugar)								
LACTOSE, c. p., free from Dextrose, for bacteriological work	Kahlbaum			.50	cb .09			
LAMPBLACK.....				.15	incl			
LEAD, in sheets.....				.20	incl			
metal, free from silver, sheets, 6 inches wide.....				.25	incl			
foil (Test Lead), free from silver 0.04 mm thick.....				.80	incl			
granulated (Test Lead), free from silver.....				.25	cb .06			
metal, free from silver. Sticks 6 inches by ½ inches.....				.30	incl			
Acetate, congl., crystals.....				.20	cb .07			
Acetate, pure, crystals.....				.25	cb .07			
LEAD Acetate, c. p.	Baker Analyzed			.30	cb .07			
Fe.....								
Cl.....								
CaO.....								
Na.....								
LEAD Acetate	Merk Blue Label			.50	incl	¼ lb.	.20	incl
Earths and alkalis.....								
Copper.....								
Iron.....								
Aluminum.....								
Lead Carbonate and substances insoluble in Water.....								
Chlorides.....								
Nitrates.....								
LEAD Acetate	Kahlbaum "C.f.a."					100 gm.	.90	incl

		Ounce and pound prices				Price in other size packages		
Maker or Brand		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
LEAD Acetate.						500 grm.	2.75	incl
Nitrate	none							
Carbonate	none							
Chloride	slight trace							
Alkalies and earths in residue	0.4 mg (30 16 grams)							
Iron	none							
Copper	trace							
LEAD Acetate, c. p., basic, solution, for sugar analysis.				.25	gb .15			
Acetate, basic, solution, sp. gr. 1.24				.40	incl			
Copper	less than 0.0006%							
Iron	less than 0.0002%							
LEAD Acetate, c. p., basic, dry, for sugar analysis.				.50	cb .06	1 1/4 lb.	.20	incl
Fe	0.005%							
CaO	0.001%							
Cl	0.001%							
Na	trace							
LEAD Acetate, c. p., tribasic.				.77	incl			
Borate, c. p.				.20	incl	2.00	cb .06	1 1/4 lb. .65 incl
Carbonate, purified.				.60	cb .09			
LEAD Carbonate, c. p., basic.				.50	cb .06	1 1/4 lb.	.20	incl
Chloride				.50	cb .06	1 1/4 lb.	.20	incl
Fe	0.001%							
Cu	none							
CaO	none							
Na	trace							
LEAD Chromate, c. p., powdered or fused.				.70	cb .07	1 1/4 lb.	.25	incl
Fe	0.003%							
CaO	none							
Cu	none							
Na	trace							
SO ₄	0.002%							
LEAD Chromate.				1.20	incl	1 1/4 lb.	.40	incl
Substances soluble in Water	not more than 0.02%							
Organic substances	none							
LEAD Iodide, c. p.				3.50	cb .07	1 1/4 lb.	1.00	incl
Nitrate, pure, crystals				.21	cc .06			
Nitrate, c. p.				.25	cb .06			
Fe	0.0003%							
CaO	0.001%							
Cl	0.0002%							
SO ₄	none							
LEAD Oxalate, c. p.				.90	cb .06	1 1/4 lb.	.35	incl
Oxide, brown (Lead Peroxide)				.30	cc .04			
Oxide, brown (Peroxide), c. p.				.80	cb .06	1 1/4 lb.	.25	incl
PbO ₂	93.6%							
Mn	none							
Cl	0.01%							
SO ₄	0.70%							
Nitrate	trace							
Oxide, brown (Peroxide), c. p.				1.25	cb .06	1 1/4 lb.	.40	incl
LEAD Oxide, brown, for ultimate analysis				.25	incl	1 1/2 lb.	1.20	incl
Chlorides	less than 0.001% as Cl							
Calcium and alkalies	not more than 0.5%							
Sulphates	less than 0.0008% as SO ₄							
Nitrates	less than 0.0032% as N ₂ O ₅							
Carbonates	none							
LEAD Oxide, brown, granulated, for use in elementary analysis.				.25	incl	1 1/2 lb.	1.20	incl
Oxide (Orange Mineral) (Manganese free)				.25	cb .04	1 1/2 lb.	1.20	incl
LEAD Oxide, brown (Manganese free)				.25	incl	1 1/2 lb.	1.20	incl
Chlorides	less than 0.001% as Cl							
Sulphates	less than 0.0015% as SO ₄							
Substances soluble in water (Lead Nitrate, etc.)	less than 0.0375%							
Calcium and alkalies	not more than 0.5%							
Manganese	less than 0.0002%							
LEAD Oxide (Red Lead)				.18	cc .06			
Oxide (Red Lead), c. p.				.20	cb .04			
Cl	0.003%							
SO ₄	0.005%							
C	trace							
Insoluble matter	trace							
LEAD Oxide, yellow (Litharge)				.15	cc .04			
Oxide, yellow, (Litharge) c. p.				.20	cb .04			
Al ₂ O ₃	0.010%							
CaO	0.003%							
Cl	0.005%							
Nitrate	none							
Ag	none							

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Draque and pound prices		Price In other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
LEAD Oxide, yellow.	Merck Blue Label	.20	incl			½ lb.	.80	incl
Substances insoluble in								
Acetic Acid		not more than 0.25%						
Carbonates		not more than 0.1%						
Copper		less than 0.001%						
Iron		less than 0.002%						
Aluminum		less than 0.1%						
Nitrates and nitrites		less than 0.010% as N ₂ O ₅						
Chlorides		less than 0.002% as Cl						
Earths, Gypsum, and alkalis		not more than 0.3%						
LEAD Oxide (Litharge).	Kahlbaum "C.f.a."					100 grm.	.95	incl
" Oxide (Litharge).	Kahlbaum "C.f.a."					500 grm.	2.90	incl
Carbonate								
Chloride		none						
Residue present after precipitating Lead (earths and alkalis)		12 mg.						
Alumina and Iron Oxide		none						
Copper		none						
Nitrates and nitrites		none						
Solubility in Acetic Acid		complete						
LEAD Phosphate, c. p.	Baker Analyzed		1.35	cb	.07	¼ lb.	.40	incl
" Sulphate, c. p.	Baker Analyzed		.50	cb	.06			
Fe		0.000%						
Acetate		none						
Nitrate		none						
LEAD Sulphide, c. p.	Baker Analyzed		.50	cb	.06	¼ lb.	.20	incl
" Tartrate, c. p.	Baker Analyzed		1.50	cb	.07	¼ lb.	.45	incl
LECTHIN, from eggs.		1.40	incl			½ oz.	.25	incl
LEVULOSE (Diabetin)	Schering		1.60	incl				
*LIGROIN (See Ether Petroleum)								
LIME, Chlorinated, Cubes.	Merck Blue Label		.35	incl				
Active Chlorine yields at least 25% by weight								
LIME WATER, tested reagent.	Merck Blue Label		.40	incl				
LITHARGE (See Lead Oxide, Yellow).								
LITHIUM, metal, pure.						1 grm.	1.50	incl
" Acetate, c. p.	Baker Analyzed		1.75	cb	.00			
LITHIUM Carbonate, c. p.	Baker Analyzed		2.00	cb	.00	¼ lb.	.65	incl
SO ₂		0.050%						
Fe		0.002%						
Al ₂ O ₃		0.001%						
LITHIUM Chloride, c. p.	Baker Analyzed	.25	incl	2.50	cb	.08	¼ lb.	.75
SO ₂		0.050%						
Fe		0.002%						
Al ₂ O ₃		0.005%						
LITHIUM Citrate, c. p.	Baker Analyzed		2.50	cb	.08	¼ lb.	.75	incl
" Nitrate, c. p.	Baker Analyzed	.25	incl	2.50	cb	.08	¼ lb.	.75
SO ₂		0.050%						
Fe		0.002%						
Al ₂ O ₃		0.001%						
Cl		0.015%						
LITHIUM Sulphate, c. p.		.25	incl	2.25	cb	.08	¼ lb.	.70
LITHIUM, cubes				.25	cc	.04		
" powder.				.40	cc	.04		
LITMUS	Merck Blue Label	.40	incl			¼ lb.	1.25	incl
Tested for Sensitiveness								
LITMUS, Paper (See Test Paper).								
" Pencils, each with one red and one blue point.						each	.20	
" Solution (Indicator)			.60	cb	.05			
LITMUS	Kahlbaum					500 grm.	1.80	incl
" Solution, according to Kubel and Tiemann in original packages.	Kahlbaum					1 kilo	3.50	incl
" Milk (Lakmusmolke künstlich nach Seitz).	Kahlbaum					100 grm.	.25	incl
" Milk (Lakmusmolke künstlich nach Seitz).	Kahlbaum					500 grm.	.75	incl
LOGWOOD Extract.			.30	incl				
LYCOPODIUM.		.10	cb	.03	1.20	cb	.08	
LYSOL.	Lehn & Fink		.75	cb	.08	1 gal.	5.00	incl
MAGNESITE.	Merck Blue Label		.40	incl		¼ lb.	.20	incl
Loss on ignition, about 50%								
*MAGNESIUM, metal, powder.		.25	incl	2.60	incl			
" metal, ribbon.		.45	incl					
" metal, rods.		.30	incl					
" metal, wire.		.45	incl					
MAGNESIUM Acetate, c. p.	Baker Analyzed		.90	cb	.10	¼ lb.	.35	incl
" Aluminum Sulphate, c. p.			.65	cb	.09	¼ lb.	.25	incl

A R T H U R H. T H O M A S C O M P A N Y

		Quare and pound prices		Price in other size packages		
		per oz.	per lb.	size pkg.	per pkg.	cont.
	Maker or Brand	per oz.	cont.	per lb.	cont.	
MAGNESIUM	Ammonium Chloride, c. p. Baker Analyzed		.35 cb .08	1/4 lb.	.15	incl
	Fe..... -0.0005%					
	CaO..... 0.001%					
	P..... none					
	SO ₂ 0.001%					
MAGNESIUM	Ammonium Chloride, c. p. Merck Blue Label		.80	incl	1/4 lb.	.30 incl
	Sulphates..... less than 0.01% as SO ₃					
	Heavy metals..... none					
	Calcium..... less than 0.005%					
	Barium..... less than 0.002%					
	Phosphates..... less than 0.001% as P ₂ O ₅					
	Arsenates..... less than 0.005% as As ₂ O ₃					
MAGNESIUM	Ammonium Phosphate, c. p. Baker Analyzed		1.00 cb .08	1/4 lb.	.35	incl
"	Ammonium Sulphate, c. p. Baker Analyzed		.35 cb .08	1/4 lb.	.15	incl
"	Borate, c. p.....	.15	incl			
"	Bromide, c. p.....	.25	incl			
"	Carbonate, pure, powder.....		.25 cb .05			
"	Carbonate, c. p., basic Baker Analyzed		.90 cb .10	1/4 lb.	.35	incl
	Fe..... 0.001%					
	Cl..... 0.020%					
	SO ₂ -0.001%					
	CaO..... none					
	Al ₂ O ₃ 0.002%					
	Nitrate..... trace					
MAGNESIUM	Carbonate..... Merck Blue Label		.50	incl	1/4 lb.	.20 incl
	Substances soluble in Water..... not more than 0.75%					
	Sulphates..... less than 0.0125% as SO ₃					
	Substances insoluble in Hydrochloric Acid..... none					
	Chlorides..... less than 0.92% as Cl					
	Barium..... less than 0.015%					
	Calcium..... less than 0.005%					
	Aluminum..... less than 0.6%					
	Heavy metals..... none					
	Iron..... less than 0.015%					
MAGNESIUM	Chloride, pure, crystals.....		.25 cb .10			
"	Chloride, c. p., crystals..... Baker Analyzed		.30 cb .09	1/4 lb.	.17	incl
	NH ₃ trace					
	Fe..... 0.0003%					
	CaO..... 0.005%					
	SO ₂ 0.001%					
MAGNESIUM	Chloride, crystals..... Merck Blue Label		1.00	incl	1/4 lb.	.35 incl
	Substances insoluble in Alcohol..... none					
	Sulphates..... less than 0.01% as SO ₃					
	Phosphates..... less than 0.0010% as P ₂ O ₅					
	Arsenates..... less than 0.005% as As ₂ O ₃					
	Ammonium salts less than 0.001% as NH ₃					
	Barium..... less than 0.002%					
	Heavy metals..... none					
	Calcium..... less than 0.005%					
MAGNESIUM	Chloride, crystals..... Kahlbaum "C.f.A."			100 grm.	.65	incl
"	Chloride, crystals..... Kahlbaum "C.f.A."			500 grm.	1.60	incl
	Calcium Oxide and Baryta..... none					
	Heavy metals..... none					
	Ammonium salts..... none					
	Sulphate..... none	In 10				
	Phosphate..... none	grams				
	Arsenate..... none					
	Insoluble in Alcohol..... none					
MAGNESIUM	Chloride, c. p., fused, lump (Ammonia free).....		.70 cb .08	1/4 lb.	.25	incl
"	Chloride, c. p., sticks (Ammonia free).....		.80 cb .08	1/4 lb.	.25	incl
"	Nitrate, c. p..... Baker Analyzed	.10	incl .50 cb .09	1/4 lb.	.20	incl
"	Nitrate, c. p., fused..... Baker Analyzed	.15	incl .90 cb .09	1/4 lb.	.35	incl
"	Oxalate, c. p..... Baker Analyzed		1.25 cb .09	1/4 lb.	.40	incl
"	Oxide, light, powder.....		.60	incl		
"	Oxide, heavy, powder.....		.65	incl		
"	Oxide, c. p. Baker Analyzed		1.00 cb .12	1/4 lb.	.35	incl
	Fe..... 0.007%					
	Cl..... 0.260%					
	SO ₂ 0.005%					
	Al ₂ O ₃ 0.012%					
	CO ₂ 1.8%					
MAGNESIUM	Oxide..... Merck Blue Label		1.00	incl	1/4 lb.	.35 incl
	Substances soluble in water..... not more than 0.75%					
	Substances insoluble in Hydrochloric Acid..... none					
	Sulphates..... less than 0.375% as SO ₃					
	Chlorides..... less than 0.01% as Cl					
	Carbonates..... less than 4% as CO ₂					
	Nitrogen..... not more than 0.005%					
	Barium..... less than 0.02%					
	Calcium..... less than 0.01%					
	Heavy metals..... none					
	Iron..... less than 0.02%					
MAGNESIUM	Oxide, c. p. Baker Special		1.50 cb .12	1/4 lb.	.45	incl
	CaO..... 0.10%					
	Fe..... 0.005%					
	Cl..... 0.20%					
	SO ₂ -0.001%					

		Maker or Brand	Ounce and pound prices				Prices in other size packages			
			per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
MAGNESIUM	Oxide, free from Sulphates	Merk Blue Label	.30	incl			1 1/4 lb.	.90	incl	
	Substances soluble in Water	not more than 0.75%								
	Substances insoluble in Hydrochloric Acid	none								
	Chlorides	less than 0.01% as Cl								
	Carbonates	less than 4% as CO ₂								
	Nitrogen	not more than 0.005%								
	Barium	less than 0.02%								
	Calcium	less than 0.01%								
	Heavy metals	none								
	Iron	less than 0.025%								
Sulphates	less than 0.016% as SO ₄									
MAGNESIUM	Oxide and Sodium Carbonate, c. p. (Eschka's Mixture)	Baker Analyzed			1.00	cb	.10	3/4 lb.	.35	incl
	MgO	66.2-3%								
	Na ₂ CO ₃	33.1-3%								
MAGNESIUM	Phosphate, c. p. (tribasic)	Baker Analyzed			.85	cb	.08	1 1/4 lb.	.30	incl
	Pyrophosphate, c. p.				1.75	cb	.08			
	Sulphate, pure, crystals (Epsom Salts)				.10	cc	.05			
	Sulphate, c. p.	Baker Analyzed			.20	cb	.08			
	Cl	0.001%								
MAGNESIUM	Sulphate	Merk Blue Label			.50	incl	1 1/4 lb.	.20	incl	
	Chlorides	less than 0.0005% as Cl								
	Phosphates	less than 0.0016% as P ₂ O ₅								
	Arsenates	less than 0.05% as As ₂ O ₃								
	Heavy metals	none								
MAGNESIUM	Sulphate	Kahlbaum "C.F.A."					500 grm.	.85	incl	
	Phosphate	none								
	Arsenate	none								
	Chloride	none								
	Iron	none								
MAGNESIUM	Sulphate, c. p., anhydrous				.45	cb	.08	1 1/4 lb.	.20	incl
	Tartrate, c. p.	Baker Analyzed			2.00	cb	.08	3/4 lb.	.65	incl
	MALTINE (Diastase of Malt)		.65	cb	.03					
MALTOSE		Kahlbaum					10 grm.	.40	incl	
			.20	cb	.03					
MANGANESE	metal, coml., 94%		.30	cb	.03					
	pure, fused									
	Acetate, c. p.	Baker Analyzed			1.00	cb	.08	1 1/4 lb.	.35	incl
MANGANESE	Borate, c. p.				.85	cb	.10			
	Carbonate, c. p.	Baker Analyzed			.70	cb	.10	1 1/4 lb.	.24	incl
	Al ₂ O ₃	0.002%								
MANGANESE	Chloride, c. p.	Baker Analyzed			.40	cb	.08	1 1/4 lb.	.20	incl
	CaO	0.002%								
	Fe	0.002%								
	Manganic Carbonate	trace								
	Fe	0.001%								
MANGANESE	Chloride	Merk Blue Label			.50	incl	1 1/4 lb.	.20	incl	
	Sulphates	less than 0.01% as SO ₄								
	Chloride	less than 0.0023% as Cl								
	Calcium	less than 0.05%								
	Iron	less than 0.005%								
MANGANESE	Chloride	Kahlbaum "C.F.A."					100 grm.	.50	incl	
	Free chloride	none								
	Sulphate	none								
	Lime	none								
	Zinc	none								
MANGANESE	Dioxide, native, granular		10	cc	.04					
	Dioxide, native, powder		.10	cc	.04					
	Dioxide, c. p. (Carbon free)	Baker Analyzed			.75	cb	.06	1 1/4 lb.	.25	incl
	Dioxide, tested reagent	Merk Blue Label			.50	incl	1 1/4 lb.	.20	incl	
	Metaphosphate, solution, tested reagent	Merk Blue Label			1.25	incl	1 1/4 lb.	.40	incl	
MANGANESE	Nitrate, c. p.	Baker Analyzed			1.25	gb	.15	1 1/4 lb.	.40	incl

		Ounce and pound prices		Prices in other size packages				
	Maker or Brand	per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
MANGANESE	Oxide, c. p., hydrated	Baker Analyzed		.50 cb	.08	¼ lb.	.20	incl
"	Oxide, c. p., brown			1.00 cb	.08	¼ lb.	.35	incl
"	Phosphate, c. p.	Baker Analyzed		2.00 cb	.10	¼ lb.	.65	incl
"	Sulphate, pure, crystals			.38 cb	.09			
"	Sulphate, c. p.	Baker Analyzed		.45 cb	.07	¼ lb.	.20	incl
	Fe	0.002%						
	Cl	0.005%						
	CaO	0.050%						
	Na	trace						
		Typical Analysis						
MANGANESE	Sulphate	Merck Blue Label		.60	incl	¼ lb.	.25	incl
	Chlorides	less than 0.002% as Cl						
	Substances reducing Potassium Permanganate	at most a trace						
	Iron	less than 0.0008%						
	Zinc	less than 0.2%						
	Other foreign metals	none						
	Salts of Magnesium and the alkalis	not more than 0.033%						
	Calcium	less than 0.03%						
		Guaranteed Analysis						
MANGANESE	Sulphate	Kahlbaum "C.F.A."				100 grm.	.60	incl
"	Sulphate	Kahlbaum "C.F.A."				500 grm.	1.15	incl
	Line	none						
	Zinc	none						
	Iron	none						
	Other metals	none						
	Chloride	trace						
	Alkalies	present at or precipitating Manganese						
		In 10 grams						
		Certified Analysis						
MANGANESE	Sulphide, c. p.			2.50 cb	.08	¼ lb.	.75	incl
MANGANESE	Tartrate, c. p.	Baker Analyzed		2.80 cb	.08	¼ lb.	.80	incl
MANNITE				.30 cc	.04	3.25	incl	
MANNOSE						10 grm.	3.00	incl
MARBLE LUMPS	(See Calcium Carbonate)							
MELETOSE	(See Raffinose)							
MERCURY				.80	.05			
"	redistilled			.90	.05			
"		Merck Blue Label		1.60	incl	¼ lb.	.50	incl
	Foreign metals	none						
MERCURY	Acetate, c. p. (ic)			.25	incl	2.50 gb	.08	¼ lb.
"	Acetate, c. p. (ous)			.30	incl			
"	Bichloride, crystals (Corrosive Sublimite)			.90 cc	.04			
"	Bichloride, powder (Corrosive Sublimite)			.90 cc	.04			
"	Bichloride, crystals, c. p.	Baker Analyzed		.20	incl	1.75 cb	.06	¼ lb.
	Fe	0.0005%						
	SO ₂	0.001%						
	Mercurous Salt	trace						
	Nonvolatile matter	0.004%						
		Typical Analysis						
MERCURY	Bichloride	Merck Blue Label		.25	incl	¼ lb.	1.20	incl
	Foreign metals not precipitated by Hydrogen Sulphide	less than 0.01%						
	Arsenic	less than 0.008%						
	Mercurous Chloride and other substances insoluble in Ether	none						
		Guaranteed Analysis						
MERCURY	Bichloride	Kahlbaum "C.F.A."				100 grm.	1.10	incl
"	Bichloride	Kahlbaum "C.F.A."				500 grm.	3.60	incl
	Insoluble in Ether	trace						
	Arsenic	none						
	Foreign substances	unweighable						
		In 10 grams						
		Certified Analysis						
MERCURY	Bromide, c. p.			.35	incl			
"	Chloride, powder (ous)			.95 cb	.06			
"	Chloride, c. p. (ous)	Baker Analyzed		.20	incl	1.75 cb	.06	¼ lb.
	Nonvolatile matter	0.0003%						
	Fe	0.0002%						
	Mercuric Salt	trace						
		Typical Analysis						
MERCURY	Iodide, c. p., red (ic)			.30	incl			
"	Iodide, (ous)			.30	incl			
"	Nitrate, c. p. (ic)	Baker Analyzed		.15	incl	1.50 gb	.12	¼ lb.
	Nonvolatile matter	0.0003%						
	Fe	0.004%						
	Pb	none						
	SO ₂	none						
	Cl	0.0001%						
		Typical Analysis						
°MERCURY	Nitrate, c. p. (ous)	Baker Analyzed		.15	incl	1.50 gb	.12	¼ lb.
	Nonvolatile matter	0.0003%						
	Mercuric Salt	trace						
	Fe	0.0001%						
°MERCURY	Nitrate (ous)	Merck Blue Label		.30	incl	¼ lb.	1.50	incl
	Nonvolatile matter	less than 0.025%						
	Mercuric salts	at most a trace						
		Guaranteed Analysis						

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
MERCURY Oxide, c. p., red (ic).....	Baker Analyzed	.20	incl	1.70 cb	.06 ¼ lb. .60 incl
Nonvolatile matter.....					0.003%
Fs.....					0.002%
Nitrate.....					trace
Pb.....					none
Cl.....					0.0001%
SO ₂					0.001%
MERCURY Oxide, red (ic).....	Merck Blue Label	.25	incl		½ lb. 1.20 incl
Nonvolatile matter.....					less than 0.025%
Chlorides.....					less than 0.002% as Cl
Sulphates.....					less than 0.175% as SO ₄
Nitrates.....					less than 0.010% as N ₂ O ₅
MERCURY Oxide, c. p., yellow, (ic) Hydrated.....	Baker Analyzed	.20	incl	2.00 cb	.16 ¼ lb. .65 incl
Nonvolatile matter.....					0.010%
Nitrate.....					none
Na.....					trace
Cl.....					trace
SO ₂					0.250%
MERCURY Oxide, yellow (ic).....	Merck Blue Label	.25	incl		½ lb. 1.40 incl
Nonvolatile matter.....					less than 0.025%
Chlorides.....					less than 0.002% as Cl
Sulphates.....					less than 0.175% as SO ₄
Nitrates.....					less than 0.010% as N ₂ O ₅
MERCURY Oxide, precipitated (ic).....	Kahlbaum "C.f.A."				100 grm. 1.15 incl
" Oxide, precipitated (ic).....	Kahlbaum "C.f.A."				500 grm. 3.70 incl
Nonvolatile matter.....					unweighable
Nitric Acid.....					none
Chlorides.....					none
Sulphuric Acid.....					none
Iron.....					none
MERCURY Oxide, c. p., (ous).....				2.00 cb	.07 ¼ lb. .65 incl
MERCURY Potassium Iodide.....	Merck Blue Label	.65	incl		¼ oz. .25 incl
Tested for.....					Solubility
" Sulphate, c. p. (ic).....	Baker Analyzed			1.75 cb	.06 ¼ lb. .60 incl
" Sulphate, c. p. (ous).....	Baker Analyzed			2.00 cb	.06 ¼ lb. .65 incl
" Sulphide, c. p. (ic).....	Baker Analyzed			1.50 cb	.06 ¼ lb. .45 incl
MERCURY Thiocyanate, c. p. (ic).....	Baker Analyzed	.25	incl	2.50 cb	.07 ¼ lb. .75 incl
METAL, Devarda's Alloy, for reductions.....	Baker Analyzed			1.50	incl ¼ lb. .45 incl
Copper.....					50%
Aluminium.....					43%
Zinc.....					6%
METAL, Devarda's Alloy.....	Merck Blue Label	.35	incl		¼ lb. 1.00 incl
Nitrogen.....					not more than 0.0056%
METAL, Rose's Alloy, fusible.....	Baker Analyzed	.30	incl	3 00	incl ¼ lb. .95 incl
Bismuth.....					2 parts
Lead.....					1 part
Tin.....					1 part
M. P.....					93.75°C
METAL, Wood's Alloy, fusible.....	Baker Analyzed	.30	incl	3 00	incl ¼ lb. .95 incl
Bismuth.....					4 parts
Lead.....					2 parts
Tin.....					1 part
Cadmium.....					1 part
M. P.....					60.5°C
METAPHENYLENEDIAMINE, pure crystals.....		.85	cb	.03	
METAPHENYLENEDIAMINE HYDRO-CHLORIDE.....	Merck Blue Label	1.00	incl		¼ oz. .30 incl
Inorganic impurities.....					less than 0.05%
METHYL Acetate, c. p.....	Baker Analyzed	.30	incl		
" Iodide.....		.65	gb	.05	
" Orange, true indicator.....		.50	incl		
" Orange, indicator.....	Merck Blue Label	.50	incl		¼ oz. .20 incl
Tested for Sensitiveness.....					
METHYL Red, indicator.....	Merck Blue Label				1 8 oz. 1.25 incl
" Red, indicator.....	Merck Blue Label				15 grn. .50 incl
Tested for Sensitiveness.....					
METHYLENE Iodide.....		1.25	gb	.05	
METOL, Hauffs.....		.65	incl		
MICROCOSMIC SALT (See Sodium Ammonium Phosphate).....					
M LK SUGAR (See Lactose).....					
MOLYBDENUM, metal powder, 95%.....		.40	cb	.03	
" Wire, No. 28 B & S gauge.....					Per foot .30 incl
" Oxide, pure (mono).....		1.00	cb	.03	
NAHRSTOFF, Heydens, in original tins.....					¼ lb. 1.50 incl
NAPHTHALENE, white, sublimed, flakes.....				.10 cc	.04
NAPHTHALENE, c. p., purified by Alcohol.....	Baker Analyzed			.75 cb	.09
NAPHTHOL (alpha).....				.6 cb	.08
" (alpha) recrystallized.....		.20	cb	.04	2.00 cb .08
" (beta) resublimed.....		.10	cb	.03	.50 cb .08
" Nitroso-beta.....		1.00	incl		

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
NAPHTHYLAMINE (alpha), pure		.30	cb .04					
" (beta), pure		.40	cb .03					
" Chloride (alpha), pure		.30	cb .03					
" Chloride (beta), pure		.25	cb .03					
NESSLER'S TEST SOLUTION		.15	incl	1.10	incl			
NICKEL, metal, 98.9% cubes or granular				1.10	cc .04			
" metal, pure, sheet such as used for making boats for the direct combustion of iron and steel, No. 26 B & S gauge		.20	incl	2.00	incl			
" metal, wire		.30	incl	3.00	incl			
" metal, pure (Cobalt free)		.75	incl					
" metal, for anodes, cast in following sizes: 200 x 100 x 4 mm. and 200 x 100 x 5 mm.				1.00	incl			
" metal, for anodes, forged, 200 x 100 x 2 mm.				1.00	incl			
NICKEL Acetate, c. p.	Baker Analyzed	.20	incl	1.60	cb .05	1/4 lb.	.60	incl
" Ammonium Sulphate, pure crystals				.20	cc .04			
" Ammonium Sulphate, c. p.	Baker Analyzed			.75	cb .08	1/4 lb.	.25	incl
" Carbonate, c. p.	Baker Analyzed	.25	incl	2.50	cb .10	1/4 lb.	.75	incl
" Chloride, pure crystals				.75	cb .08			
NICKEL Chloride, c. p.	Baker Analyzed			1.50	cb .05	1/4 lb.	.45	incl
Fe 0.0001%								
Cu none	Typical Analysis							
Co 0.02%								
SO ₄ none								
NICKEL Chloride, c. p. (Cobalt free)	Baker Special	.30	incl					
" Nitrate, c. p.	Baker Analyzed	.15	incl	.90	cb .08	1/4 lb.	.35	incl
" Nitrate, c. p., (Cobalt free)	Baker Special	.30	incl					
" Oxide, c. p., green	Baker Analyzed			1.50	cb .09	1/4 lb.	.45	incl
Fe 0.002%								
Co trace	Typical Analysis							
Cu trace								
SO ₄ 0.150%								
NICKEL Oxide, black, pure		.20	cb .03	1.25	cb .08			
" Sulphate, pure, crystals				.26	cb .09			
" Sulphate, c. p.	Baker Analyzed			1.50	cb .08	1/4 lb.	.45	incl
Fe 0.0005%								
Cu none	Typical Analysis							
Co 0.005%								
Cl 0.001%								
NICKEL Sulphate, c. p. (Cobalt free)	Baker Special	.40	incl			1/8 grm.	.25	incl
NINHYDRIN								
NITROBENZALDEHYDE, Ortho, tested reagent	Merck Blue Label					1/4 oz.	.75	incl
" Ortho, tested reagent	Merck Blue Label					15 grm.	.25	incl
NITROBENZENE, (solvent)	Baker Analyzed			.30	cb .08			
NITROBENZOL, twice rectified, (Oil of Mirbane)				.25	cb .08			
NITRON, tested reagent	Merck Blue Label	4.00	incl			1/4 oz.	.60	incl
NITROPHENOL, Ortho, tested reagent	Merck Blue Label	.55	incl			1/4 oz.	.20	incl
" Para, tested reagent	Merck Blue Label	.55	incl			1/4 oz.	.20	incl
NITROSOBETANAPHTHOL		1.00	incl					
" tested reagent	Merck Blue Label	1.00	incl			1/4 oz.	.30	incl
NORMAL SOLUTIONS (See Solutions)...								
NUTROSE (Casein-Sodium) in original package						1/4 lb.	1.00	incl
OIL, Aniline (See Aniline)								
" Bergamot, hand pressed		.60	incl	7.50	cb .08			
" Cajeput, rectified				1.25	cb .08			
" Cedar, for use as a clearing agent in microscopy				.90	cb .08			
" Cedar, Special, for use as clearing agent in microscopy, guaranteed to mix with alcohol in all proportions without cloudiness				1.50	cb .05			
" Cedar, Special for Immersion Objectives		.25	cb .03	3.00	cb .05			
" Cedar, Special for Immersion Objectives	Zeiss					1/2 oz.	.30	incl
" Cloves, twice rectified		.25	cb .03	2.75	cb .08			

	Maker or Brand	Ounce and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
OIL Cottonseed.....				.15	cb.	.08		
° " Linseed, raw.....				.20	cb.	.08		
° " Linseed, boiled.....				.20	cb.	.08		
" Mirbane (See Nitrobenzole).								
" Olive, Luca Cream.....				.60	cb.	.08	1 gal.	3.50 incl
" Origanum, Creticum.....				30	cb.	.03	4.00	cb. .08
" Paraffine, white, pure.....				.20	cb.	.08		
" Sperm.....				.20	cb.	.08		
" Turpentine (See Turpentine).....								
ORCIN, pure crystals.....							1 grm.	.15 incl
ORPIMENT, (See Arsenic Sulphide).....								
ORTOL.....				.75	incl			
OXGALL, neutral, freshly precipitated for bacteriological use.....							½ lb.	2.25 incl
**"OXONE," for generating Oxygen.....							2 lb.	1.50 incl
° OXYGEN, gas, 99% pure, as used in calorimetry, carbon combustions in steel, etc. Guaranteed to be free from the Oxides of Carbon, Hydrocarbons, Chlorine and other deleterious substances. Furnished in seamless steel cylinders. Made in accordance with the requirements of the Interstate Commerce Commission. The price includes one cylinder, containing 70 cu. ft. at 1800 lbs. pressure at 68° F. These cylinders are returnable for refilling only.....							17.80	incl
° OXYGEN, gas, 97% ₆ , at 1000 lbs. pressure.....							40 gal.	2.25 cyl. 6.00
" " gas, 97% ₆ , at 1000 lbs. pressure gas cylinder connections.....							100 gal.	5.00 cyl. 12.00
" " These cylinders returnable for credit or refilling.....								1.75
OZOKERITE, black.....				.25	incl			
PALLADIUM, sheets or wire.....	Merck Blue Label						1 gr.	.30 incl
" Copper and Iron.....none								
PALLADIUM, black.....	Merck Blue Label						5 gr.	1.10 incl
" " Copper and Iron.....none	Merck Blue Label						15 gr.	4.25 incl
PALLADIUM Chloride, tested reagent.....	Merck Blue Label						5 gr.	1.10 incl
° " Chloride, tested reagent.....	Merck Blue Label						15 gr.	3.00 incl
° " Nitrate, tested reagent.....	Merck Blue Label						5 gr.	.85 incl
° " Nitrate, tested reagent.....	Merck Blue Label						15 gr.	2.25 incl
" Sodium Chloride, tested reagent.....	Merck Blue Label						5 gr.	.65 incl
" Sodium Chloride, tested reagent.....	Merck Blue Label						15 gr.	1.75 incl
PALM Oil Soap.....							cake	.10 incl
PANCREATIN, active.....				.60	incl			
PAPER, (See Test Paper).....								
PARAFFINE, domestic, melting point about 43°C.....				.15	incl			
" domestic, melting point about 52°C.....				.15	incl			
" (For imported Paraffine melting at other temperatures, see Imbedding Media.)								
PARA-AMIDO-ACETOPHENON.....				4.50	cb.	.03		
PARA-DIMETHYL-AMIDO-BENZALDEHYDE for Ehrlich's test.....							10 grm.	1.00 incl
PARA-PHENYLENEDIAMINE, pure crvst. Hydrochloride..				.80	gb.	.04		
" " Hydrochloride..				1.00	gb.	.05		
° PARALDEHYDE.....				.75	cb.	.09		
PARCHMENT Paper, thin.....				.40	incl			
" Paper, medium.....				.40	incl			
" Paper, heavy.....				.40	incl			

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
PARCHMENT Paper , for dialyzing, No. 0, sheet 26 x 39 in., as used in the manufacture of biological products such as Antitoxin, etc., and not to be confused with the parchment paper of commerce.						sheet	.30	incl
PEPSIN , powder or scales, U. S. P.		.35	cb .04					
PEPTONE , for preparation of culture media.	Witte	.30	cb .03	3.25	cb .09			
“ for preparation of culture media, in original tins of 10 kilos.	Witte						67.50	incl
“ from meat, dry.		.25	cb .04					
“ Silk (Seiden peptone), for Abderhalden Test.						1 grm.	.50	incl
“ Silk (Seiden peptone), for Abderhalden Test.						5 grm.	2.00	incl
“ Silk (Seiden peptone), for Abderhalden Test.						10 grm.	3.75	incl
“ Placenta, for Abderhalden Test.						1 grm.	5.50	incl
PETROLATUM , white.				.25	incl	5 lb.	1.10	incl
“ yellow.				.15	incl	5 lb.	.50	incl
PETROLEUM , Ether (See Ether).								
PHENACETOLIN , Indicator.	Merck Blue Label					½ oz.	.25	incl
“ Indicator.	Merck Blue Label					½ oz.	.75	incl
“ Tested for... Sensitiveness								
PHENOL (See Acid Carbolie).				.25	cb incl	2.00	cb incl	
PHENOLPHTHALEIN , pure.		.35	incl			¼ lb.	1.25	incl
PHENOLPHTHALEIN , Tested for... Proper solubility in Alcohol	Merck Blue Label							
“ Tested for... Sensitiveness	Guaranteed Analysis							
“ Nonvolatile matter... less than 0.1%								
“ Fluorane... none								
PHENYLHYDRAZINE		.25	gb .07	2.75	gb .14			
PHENYLHYDRAZINE , Tested for... Proper solubility	Merck Blue Label	.55	incl			¼ oz.	.25	incl
PHENYLHYDRAZINE HYDROCHLORIDE		.35	gb .07					
PHENOLSULPHONEPHTHALEIN , in original box of 10 ampoules.							1.00	incl
PHLOROGLUCIN , for Günsburg's reagent		4.00	incl			15 gr.	.25	incl
PHLOROGLUCIN , Tested for... none	Merck Blue Label					¼ oz.	1.25	incl
“ Tested for... none	Merck Blue Label					15 gr.	.25	incl
“ Dioxosarin... none								
PHOSPHORUS , red, amorphous.		.15	cb .04	1.20	cb .09			
* “ yellow, sticks.		.15	cn .04	.90	incl	¼ lb.	.30	incl
* “ yellow, sticks, ¼” for gas analysis.		.20	incl	2.00	incl	¼ lb.	.65	incl
* “ Oxochloride.		.20	incl	2.00	gb .15	¼ lb.	.75	incl
* “ Pentachloride.		.15	incl	1.50	gb .15	¼ lb.	.45	incl
* “ Trichloride.		.15	incl	1.50	gb .15	¼ lb.	.45	incl
PITH , for imbedding.						pkge	.10	incl
PLASTER PARIS (See Calcium Sulphate)								
PLATINUM , metal, foil or wire (Prices on application).						.10 cc	.04	
PLATINUM , metal, sheets or wire.	Merck Blue Label					1 gr.	.28	incl
“ Foreign metals... at most a trace	Guaranteed Analysis							
“ Silver... none								
PLATINUM , black.	Merck Blue Label					5 gr.	1.50	incl
“ Foreign metals... at most a trace	Guaranteed Analysis							
“ Silver... none								
PLATINUM , Sponges, set in rings.						each	.80	incl
“ Asbestos, 5%.		4.50	incl					
“ Chloride (ic).		22.50	cb .04					
“ Chloride, c. p., solution 5%.		2.00	incl					
“ Chloride, c. p., solution 10%.		3.25	incl					
PLATINUM Chloride.	Merck Blue Label					½ oz.	5.00	incl
“ Chloride.	Merck Blue Label					15 gr.	1.75	incl
“ Tested for... Solubility in Absolute Alcohol								
“ Metals soluble in Nitric Acid... not more than 0.25%								
“ Sulphates... less than 0.0075% as SO ₂								
“ Nitrates... less than 0.008% as NO ₂								
“ Barium Salts... less than 0.002% as Ba	Guaranteed Analysis							
PLATINUM Crucibles, Dishes (See Apparatus catalogue).								

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
PLATINUM Potassium Chloride (ic) (Potassium Chloroplatinate).....						15 gr.	1.40	incl
“ Potassium Chloride (ous) (Potassium Chloroplatinite).....		28.50				15 gr.	1.45	incl
It is recommended that quotations on Platinum and Platinum salts be secured in advance on account of market fluctuations in price.								
POIRRIER'S BLUE, C.B. indicator.....	Merek Blue Label	1.25	incl			1/4 oz.	.40	incl
Tested for Sensitiveness.....								
*POTASSIUM, metal, balls.....		1.25	gb	.10	15.00	gb	.18	1/4 oz. .35 gb .08
“ Acetate, purified, granular, grade recommended for preparation of Kaisersling solution.....						.35	cb	.08
POTASSIUM Acetate, c. p.....	Baker Analyzed					.65	cb	.09
Fe.....	0.004%	Typical Analysis						
Cl.....	0.0003%							
Na.....	trace							
CaO.....	none							
SO ₂	0.001%							
POTASSIUM Acetate, c. p., anhydrous.....	Baker Special	.15	incl	.90	gb	.09		1/4 lb. .35
POTASSIUM Acetate Solution, about 33% Chlorides.....	Merek Blue Label			.50	incl			1/4 lb. .20
Sulphates.....	less than 0.01% as SO ₄	Guaranteed Analysis						
Heavy metals.....	none							
Iron.....	less than 0.00015%							
Calcium.....	less than 0.0002%							
POTASSIUM Ammonium Sulphate, c. p.....	Baker Analyzed			.45	cb	.08		1/4 lb. .20
“ Antimonate, c. p.....				1.30	cb	.07		1/4 lb. .40
Tested for Sublimity as a reagent for Sodium.....	Merek Blue Label	.20	incl					1/2 lb. 1.10
POTASSIUM Arsenate, c. p.....	Baker Analyzed			.80	cb	.07		1/4 lb. .30
Fe.....	0.001%	Typical Analysis						
SO ₂	0.001%							
Cl.....	0.001%							
CaO.....	0.010%							
POTASSIUM Arsenite, c. p.....	Baker Analyzed			.80	cb	.07		1/4 lb. .30
Fe.....	0.0015%	Typical Analysis						
Cl.....	0.001%							
SO ₂	0.002%							
CaO.....	0.001%							
POTASSIUM Bicarbonate, c. p.....	Baker Analyzed			.35	cb	.07		1/4 lb. .18
Fe.....	0.005%	Typical Analysis						
SiO ₂	0.001%							
CaO.....	0.005%							
Cl.....	0.002%							
SO ₂	0.001%							
POTASSIUM Bicarbonate.....	Merek Blue Label			.40	incl			1/4 lb. .20
Sulphates.....	less than 0.004% as SO ₄	Guaranteed Analysis						
Chlorides.....	less than 0.00075% as Cl							
Nitrates.....	less than 0.0011% as NaO ₃							
Silica.....	none							
Calcium.....	less than 0.004%							
Aluminum.....	less than 0.04%							
Heavy metals.....	none							
Phosphates.....	less than 0.004% as PO ₄							
Iron.....	less than 0.0008%							
Residue on ignition.....	69%							
POTASSIUM Bicarbonate.....	Kahlbaum "C.F.A."					100 grm.	.45	incl
“ Bicarbonate.....	Kahlbaum "C.F.A."					500 grm.	.80	incl
Chloride.....	none	In 10 grams } Certified Analysis						
Sulphate.....	none							
Nitrate.....	none							
Phosphate.....	none							
Lime.....	none							
Alumina.....	none							
Heavy metals (Iron, etc.).....	none							
Silica.....	none							
Residue on ignition.....	69.04%							
Content.....	99.84%							
Moisture.....	remainder							
POTASSIUM Bichromate, crystals.....				.15	cc	.04		
“ Bichromate, powder.....				.20	cc	.04		
“ Bichromate, c. p., crystals.....	Baker Analyzed			.45	cb	.07		1/4 lb. .20
“ Bichromate, c. p., powder.....	Baker Analyzed			.50	cb	.07		1/4 lb. .20
Cl.....	0.001%	Typical Analysis						
SO ₂	0.001%							
CaO.....	none							
POTASSIUM Bichromate.....	Merek Blue Label			.60	incl			1/4 lb. .25
Sulphates.....	less than 0.029% as SO ₂	Guaranteed Analysis						
Chlorides.....	less than 0.0025% as Cl							
Alumina.....	less than 0.1% as Al ₂ O ₃							
Alkaline earths.....	less than 0.005% as Ca							
POTASSIUM Bichromate.....	Kahlbaum "C.F.A."					100 grm.	.55	incl

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
POTASSIUM Bichromate	Kahlbaum "C.f.a.".....					500 grm.	1.00	incl
Content, found 99.97%.....	In 10 grams } Certified Analysis							
Sulphates..... none								
Chlorides..... trace								
Alkaline earths..... none								
Alumina..... none								
POTASSIUM Bichromate, c. p., fused.....				.75 cb	.07	¼ lb.	.25	incl
" Biniodate	Merck Blue Label	.85	incl			¼ oz.	.30	incl
Chlorates, less than 0.15% as ClO ₄								
POTASSIUM Binoxalate, c. p.	Baker Analyzed			.50 cb	.08	¼ lb.	.20	incl
" Bisulphate, pure, crystals.....				.35 cb	.09			
" Bisulphate, c. p., crystals	Baker Analyzed			.40 cb	.08	¼ lb.	.20	incl
Fe..... 0.0007%.....	Typical Analysis							
SiO ₂ 0.005%.....								
Cl..... 0.001%.....								
Al ₂ O ₃ 0.001%.....								
Acidity (H ₂ SO ₄)..... 36.5%.....								
POTASSIUM Bisulphate	Merck Blue Label			.60	incl	¼ lb.	.25	incl
Heavy metals..... none	Guaranteed Analysis							
Chlorides, less than 0.002% as Cl.....								
Arsenic, less than 0.0015%.....								
POTASSIUM Bisulphate, crystals	Kahlbaum "C.f.a.".....					200 grm.	.65	incl
Content, found 100.01%.....	In 10 grams } Certified Analysis							
Arsenic..... none								
Heavy metals..... none								
Chlorides, slight trace.....								
POTASSIUM Bisulphate, c. p., fused (Pyro)	Baker Analyzed			.60 cb	.07	¼ lb.	.22	incl
Fe..... 0.004%.....	Typical Analysis							
SiO ₂ 0.001%.....								
Cl..... 0.001%.....								
Acidity (H ₂ SO ₄)..... 35.2%.....								
CaO..... none								
POTASSIUM Bisulphite, granular.....				.40 cb	.09			
" Bisulphite, c. p.	Baker Analyzed			.75 cb	.08	¼ lb.	.25	incl
Fe..... 0.0003%.....	Typical Analysis							
Al ₂ O ₃ 0.0002%.....								
CaO..... 0.001%.....								
MgO..... 0.001%.....								
Cl..... 0.001%.....								
SO ₂ (available)..... 48.4%.....								
POTASSIUM Bisulphite, meta	Merck Blue Label			.80	incl	¼ lb.	.30	incl
Chlorides, less than 0.002% as Cl.....	Guaranteed Analysis							
Heavy metals..... none								
Arsenic, less than 0.0002%.....								
POTASSIUM Bitartrate, crude (Argols).....				.10 cc	.04			
" Bitartrate, pure, powder (Cream Tartar).....				.35 cc	.04			
POTASSIUM Bitartrate, c. p., crystals	Baker Analyzed			.75 cb	.09	¼ lb.	.25	incl
" Bitartrate, c. p., powder	Baker Analyzed			.80 cb	.09	¼ lb.	.25	incl
POTASSIUM Bitartrate	Merck Blue Label	.20	incl			½ lb.	1.00	incl
Moisture..... none	Guaranteed Analysis							
Chlorides, less than 0.002% as Cl.....								
Sulphates, less than 0.035% as SO ₃								
Ammonium compounds, less than 0.00175% as NH ₃								
Calcium..... less than 0.025%.....								
Heavy metals..... none								
POTASSIUM Borate, c. p.	Baker Analyzed			1.00 eb	.05	¼ lb.	.35	incl
" Bromate.....				.75 cb	.09			
" Bromate, c. p.	Baker Analyzed	.25	incl	2.25 cb	.07	¼ lb.	.75	incl
Bromide..... none	Typical Analysis							
CO ₂ none								
Cl..... 0.001%.....								
SO ₃ none								
POTASSIUM Bromate	Merck Blue Label	.30	incl			¼ lb.	1.00	incl
Potassium Bromide, less than 0.04%.....								
" Bromide, crystals or powder.....				.51 cc	.04			
" Bromide, c. p.	Baker Analyzed			.85 cb	.07	¼ lb.	.25	incl
Cl..... trace	Typical Analysis							
SO ₃ 0.001%.....								
Na..... trace								
Fe..... 0.0002%.....								
Bromate..... none								
POTASSIUM Bromide	Merck Blue Label			1.00	incl	¼ lb.	.35	incl
Potassium Carbonate, less than 0.04%.....	Guaranteed Analysis							
Potassium Bromate, less than 0.004%.....								
Heavy metals..... none								
Sulphates, less than 0.0015% as SO ₃								
Barium salts, less than 0.002% as Ba.....								
Iodides, less than 0.1%.....								
Excess of Potassium Chloride, not more than 1.3%.....								
POTASSIUM Carbonate (Pearl Ash) 90%.....				.12 cb	.08			
" Carbonate, pure, powder.....				.18 cb	.08			

A R T H U R I L T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
POTASSIUM Carbonate, c. p., crystals	Baker Analyzed	.25	cb .08	¼ lb.	.15 incl
Fe.....	0.0004%	} Typical Analysis			
Al ₂ O ₃	0.0002%				
SiO ₂	0.003%				
CaO.....	-0.0017%				
Cl.....	0.002%				
SO ₄	-0.001%				
POTASSIUM Carbonate	Merek Blue Label	.80	incl	¼ lb.	.30 incl
Heavy metals.....	none	} Guaranteed Analysis			
Chlorides.....	less than 0.002% as Cl				
Sulphates.....	less than 0.003% as SO ₂				
Nitrates.....	less than 0.08% as N ₂ O				
Potassium Cyanide.....	less than 0.04% as CN				
Sulphides.....	less than 0.02%				
Sulphates.....	less than 0.008% as SO ₂				
Phosphates.....	less than 0.03% as K ₂ SO ₄				
Phosphates.....	less than 0.001% as P ₂ O ₅				
Silicates.....	none				
Alumina.....	less than 0.04%				
Calcium.....	less than 0.001%				
POTASSIUM Carbonate	Kahlbaum "C.f.A."			100 grm.	.60 incl
" Carbonate	Kahlbaum "C.f.A."			500 grm.	1.30 incl
Content K ₂ CO ₃	97.15%	} Certified Analysis			
H ₂ O.....	2.88%				
Chloride.....	0.003%				
Sulphate.....	slight trace				
Phosphate.....	none				
Silicate.....	none				
Nitrate.....	none				
Alkaline earths.....	none				
Cyanide.....	none				
Alumina.....	none				
Sulphite, Sulphate and Thiosulphate.....	none				
Heavy metals.....	none				
POTASSIUM Carbonate, c. p., anhydrous	Baker Analyzed	.40	cb .08	¼ lb.	.18 incl
Fe.....	0.0003%	} Typical Analysis			
Al ₂ O ₃	0.0001%				
SiO ₂	0.003%				
CaO.....	0.003%				
Cl.....	0.002%				
SO ₂	0.023%				
POTASSIUM Carbonate, c. p., anhydrous	Baker Special	.60	cb .08	¼ lb.	.22 incl
POTASSIUM Carbonate, solution, about 53%	Merek Blue Label	.65	incl	¼ lb.	.25 incl
Tested for the same substances as Potassium Carbonate (using 3 cc. solution instead of 1 gram Potassium Carbonate)					
POTASSIUM Chlorate, crystals		.15	cc .04		
" Chlorate, powder		.15	cc .04		
" Chlorate, c. p., small crystals	Baker Analyzed	.35	cb .08	¼ lb.	.20 incl
" Chlorate, c. p., large crystals	Baker Analyzed	.40	cb .08	¼ lb.	.20 incl
" Chlorate, c. p., powder	Baker Analyzed	.40	cb .08	¼ lb.	.20 incl
Fe.....	0.0002%	} Typical Analysis			
CaO.....	none				
Cl.....	0.001%				
SO ₂	0.001%				
POTASSIUM Chlorate	Merek Blue Label	.50	incl	¼ lb.	.20 incl
Chlorides.....	less than 0.001% as Cl	} Guaranteed Analysis			
Heavy metals.....	none				
Calcium.....	less than 0.005%				
Bromates.....	less than 0.05% as Br ₂				
Nitrates.....	less than 0.0016% as N ₂ O				
Sulphates.....	less than 0.001% as SO ₂				
Arsenic.....	less than 0.0003%				
POTASSIUM Chlorate	Kahlbaum "C.f.A."			500 grm.	.85 incl
" Chlorate	Kahlbaum "C.f.A."			1000 grm.	1.35 incl
Arsenic.....	none	} Certified Analysis			
Sulphate.....	none				
Nitrate.....	none				
Chloride.....	none				
Heavy metals.....	none				
Alkaline earths.....	none				
POTASSIUM Chloride, pure		.18	cc .04		
" Chloride, c. p.	Baker Analyzed	.25	cb .08	¼ lb.	.15 incl
Fe.....	0.0002%	} Typical Analysis			
CaO.....	0.001%				
Na.....	trace				
SO ₂	-0.001%				
MgO.....	trace				
POTASSIUM Chloride	Merek Blue Label	.60	incl	¼ lb.	.25 incl
Heavy metals.....	none	} Guaranteed Analysis			
Alkaline earths.....	less than 0.01% as Ca				
Sulphates.....	less than 0.001% as SO ₂				
Nitrates.....	less than 0.0002% as N ₂ O				
Chlorate.....	less than 0.01% as ClO ₄				
Magnesium.....	less than 0.002%				

A R T H U R H. F I N O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages				
		Maker or Brand		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
POTASSIUM	Chloride.....	Kahlbaum "C.f.a."						500 grm.	.90	incl
	Heavy metals..... none									
	Alkaline earths..... none in 10									
	Sulphate..... none / grams									
	Content..... 100.00%									
POTASSIUM	Chloride, c. p. (Sodium free).....	Baker Special		.50	cb	.08		¼ lb.	.20	incl
"	Chromate, yellow.....			.30	cc	.04				
"	Chromate, neutral, pure.....			.35	cb	.07				
POTASSIUM	Chromate, c. p. #.....	Baker Analyzed		.50	cb	.07		¼ lb.	.20	incl
	Ca..... none									
	Cl..... -0.001%									
	SO ₄ -0.002%									
	Fe..... 0.0012%									
POTASSIUM	Chromate.....	Merck Blue Label		1.00				¼ lb.	.35	incl
	Free alkali..... less than 0.2% as KOH									
	Sulphates..... less than 0.025% as SO ₄									
	Chlorides..... less than 0.0025% as Cl									
	Alumina..... less than 0.1% as Al									
	Alkaline earths..... less than 0.095% as Ca									
POTASSIUM	Chromate.....	Kahlbaum "C.f.a."						100 grm.	.75	incl
"	Chromate.....	Kahlbaum "C.f.a."						500 grm.	1.95	incl
	Free alkali..... none									
	Sulphate..... none									
	Chloride..... none in 10									
	Alkaline earths..... none / grams									
	Alumina..... none									
	Content..... 98.88%									
	Moisture..... 1.09%									
POTASSIUM	Citrate, granular.....			.65	cc	.04				
"	Citrate, c. p.....	Baker Analyzed		1.00	cb	.08		¼ lb.	.35	incl
	Pb..... none									
	SO ₄ 0.002%									
	CO ₂ 0.050%									
POTASSIUM	Cyanide, c. p.....		.60	incl	6.00	cb	.08	¼ lb.	1.85	incl
"	Cyanide Mixture, fused, technical (98-99%).....			.40	incl			10 lb.	3.50	incl
"	Cyanide Mixture, powder (98-99%).....			.55	cb	.08				
POTASSIUM	Cyanide Mixture, lump (98-100%).....	Baker Analyzed		.45	cb	.08		¼ lb.	.20	incl
"	Cyanide Mixture, powder (98-100%).....	Baker Analyzed		.60	cb	.08		¼ lb.	.20	incl
	CN..... 39.6%									
	Fe..... 0.003%									
	Al ₂ O ₃ 0.015%									
	Na..... presence									
POTASSIUM	Cyanide.....	Merck Blue Label	.35	incl				¼ lb.	1.00	incl
	Sulphides..... less than 0.003% as S									
	Carbonates..... less than 4% CO ₂									
	Sulphocyanates..... less than 0.015% as SCN									
	Ferrocyanides..... less than 0.095% as Fe(CN) ₆									
	Sulphates..... less than 0.575% as SO ₄									
	Chlorides..... less than 0.004% as Cl									
POTASSIUM	Cyanide.....	Kahlbaum "C.f.a."						50 grm.	.90	incl
"	Cyanide.....	Kahlbaum "C.f.a."						100 grm.	1.45	incl
	Sulphate..... none									
	Ferrocyanide and Sulphocyanide..... none in 10									
	Sulphide..... none / grams									
	Carbonate..... none									
	Content..... 99.74%									
POTASSIUM	Dichromate (See Bichromate).....			.45	cc	.04				
"	Ferriyanide, coml., cryst.....			.65	cb	.08				
"	Ferriyanide, pure.....			1.00	cb	.08		¼ lb.	.35	incl
POTASSIUM	Ferriyanide, c. p.....	Baker Analyzed		1.00	cb	.08		¼ lb.	.35	incl
	Cl..... trace									
	SO ₄ 0.050%									
	Na..... trace									
POTASSIUM	Ferriyanide.....	Merck Blue Label		1.60				¼ lb.	.50	incl
	Ferrous salts..... not more than 0.055% Fe									
	Sulphates..... less than 0.005% as SO ₄									
	Chlorides..... less than 0.01% as Cl									
POTASSIUM	Ferriyanide.....	Kahlbaum "C.f.a."						100 grm.	.95	incl
	Sulphate..... none									
	Ferrous salts..... none in 10									
	Chloride..... faint trace / grams									
	Content..... 99.69%									
POTASSIUM	Ferrocyanide, yellow, cryst.....			.28	cc	.04				
"	Ferrocyanide, pure, powder, anhydrous.....			.60	cb	.08		¼ lb.	.22	incl
	Cl..... 0.001%									
	SO ₄ 0.002%									
	Na..... trace									
POTASSIUM	Ferrocyanide, c. p.....	Baker Analyzed		.60	cb	.08		¼ lb.	.22	incl
	Cl..... 0.001%									
	SO ₄ 0.002%									
	Na..... trace									

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices				Price in other size packages			
		per oz.		per lb.		size pkg.	per pkg.	cont.	
						¼ lb.			
POTASSIUM	Ferrocyanide	Merck Blue Label							
	Carbonates less than 0.75% as CO ₂	Guaranteed		.80 incl					
	Sulphates less than 0.0075% as SO ₂	Analysis							
	Chlorides less than 0.04% as Cl								
POTASSIUM	Ferrocyanide	Kahlbaum "C.f.A."				100 grm.	.65	incl	
	Ferrocyanide	Kahlbaum "C.f.A."				500 grm.	1.50	incl	
	Sulphate..... none								
	Chloride..... none								
POTASSIUM	Carbonates..... none	in 10		Certified					
	Content, calculated to 3 molecules water of crystallization..... 100.43%	grams		Analysis					
	Fluoride, c. p.	Baker Analyzed		1.25 cb .09		¼ lb.	.40	incl	
	Formate, c. p.	Baker Analyzed		2.00 cb .08		¼ lb.	.65	incl	
POTASSIUM	Hydroxide, coml. powder (Caustic Potash).....			.15 incl		10 lb.	1.90	incl	
	Hydroxide, electrolytic sticks.....			.35 cb .08		¼ lb.	.18	incl
	Hydroxide, purified	Merck Blue Label		.45 incl		¼ lb.	.20	incl	
	Nitrates less than 0.0016% as N ₂ O ₅								
POTASSIUM	Aluminum..... less than 0.1%	Guaranteed							
	Calcium..... less than 0.1%	Analysis							
	Heavy metals..... at most a trace								
	Potassium Carbonate..... not more than 5%	Merck Blue Label		.20 incl		½ lb. .80 incl			
	Sulphate..... less than 0.004% as SO ₂								
	Chlorides..... less than 0.0025% as Cl								
	Nitrates..... less than 0.0016% as N ₂ O ₅								
	Nitrogen as nitrates; nitrites and Ammonia..... less than 0.00112% N								
	Nitrates..... less than 0.0011% N ₂ O ₅								
	Phosphates..... less than 0.004% as P ₂ O ₅	Guaranteed							
	Silicates..... not more than 0.02% SiO ₂	Analysis							
	Alumina..... not over 0.006% as Al								
Calcium..... less than 0.012%									
Heavy metals..... none									
Substances insoluble in Alcohol..... none									
Potassium Carbonate..... not more than 2.76%									
POTASSIUM	Hydroxide, c. p., by alcohol.....			.60 cb .08		¼ lb.	.22	incl
	Hydroxide, purified by alcohol	Merck Blue Label		.70 incl		¼ lb.	.25	incl	
POTASSIUM	Sulphates..... less than 0.004% as SO ₂								
	Nitrates..... less than 0.0016% as N ₂ O ₅								
	Nitrogen as nitrates, nitrites and Ammonia, etc.,..... less than 0.00112% N								
	Chlorides..... less than 0.005% as Cl								
	Silicates..... not more than 0.06% as SiO ₂								
	Alumina..... not more than 0.032%								
	Calcium..... less than 0.04%								
	Heavy metals..... at most a trace								
	Potassium Carbonate..... not more than 4.15%								
	POTASSIUM	Hydroxide, solution, all strengths	Merck Blue Label		.50 incl				
		Tested for the same substances as under Potassium Hydroxide Pure, but using 2 cc. of solution sp. gr. 1.3, or 5 cc. of solution sp. gr. 1.138 instead of 1 gram Potassium Hydroxide pure.							
	POTASSIUM	Hydroxide, pure (by Baryta)			2.50 incl				
Iodate, c. p.		Merck Blue Label		.55 incl					
POTASSIUM	Iodate	Merck Blue Label		.65 incl		¼ oz.	.25	incl	
	Free acids..... less than 0.05% as H ⁺								
	Iodides..... less than 0.0015% I								
	Chlorates..... less than 0.15% as ClO ₂	Guaranteed							
POTASSIUM	Iodide, crystals	Baker Analyzed		3.75 cb .08					
	Iodide, c. p.	Baker Analyzed		.40 incl		4.00 cb .06	¼ lb.	1.25 incl	
	Iodate..... trace								
	Br..... trace								
POTASSIUM	Cl..... 0.001%	Typical							
	SO ₂ 0.001%	Analysis							
	CO ₂ trace								
	POTASSIUM	Iodide	Merck Blue Label		.40 incl		5.00 incl	¼ lb.	1.35 incl
		Potassium Carbonate..... less than 0.98%							
		Heavy metals..... none							
		Sulphates..... less than 0.01% as SO ₂							
		Cyanides..... less than 0.03% CN							
		Iodates..... less than 0.001% as I ₂ O ₅							
		Ferrie salts..... less than 0.005% Fe ⁺⁺⁺							
		Nitrates..... less than 0.0016% as N ₂ O ₅							
		Excess of Potassium Chloride..... at most 0.5%							
POTASSIUM		Iodide, neutral	Merck Blue Label		.45 incl		5.50 incl	¼ lb.	1.50 incl
		Neutrality..... less than 0.001% alkali as KOH							
		Potassium Carbonate..... less than 0.08%							
	Heavy metals..... none								
	Sulphates..... less than 0.01% as SO ₂								
	Cyanides..... less than 0.03% CN								
	Iodates..... less than 0.001% as I ₂ O ₅								
	Ferrie salts..... less than 0.001% as Fe ⁺⁺⁺								
	Nitrates..... less than 0.0016% as N ₂ O ₅								
	Excess of Potassium Chloride..... at most 0.5%								

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages					
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
POTASSIUM Iodide, c. p.	Baker Special	.50	incl	5.00	cb	.06	1 1/4 lb.	1.55	incl
" Molybdate, c. p.		.45	incl						
" Nitrate, granular				.20	cc	.04			
" Nitrate, pure, crystals				.20	cc	.04			
POTASSIUM Nitrate c. p., crystals	Baker Analyzed			.30	cb	.05	1 1/4 lb.	.18	incl
" Nitrate c. p., powdered	Baker Analyzed			.35	cb	.08	1 1/4 lb.	.18	incl
Cl	0.001%								
SO ₂	none								
CaO	none								
Na	trace								
Perchlorate	trace								
POTASSIUM Nitrate	Merck Blue Label			.80	incl		1 1/4 lb.	.30	incl
Sulphates	less than 0.025% as SO ₂								
Chlorides	less than 0.0005% as Cl								
Chlorates and Perchlorates	less than 0.0005% as ClO ₂								
Calcium	less than 0.01%								
Heavy metals	none								
Iron	less than 0.0008%								
Nitrites	less than 0.00055% as N ₂ O ₄								
POTASSIUM Nitrate	Kahlbaum "C.f.A."						100 grm.	.60	incl
" Nitrate	Kahlbaum "C.f.A."						500 grm.	1.50	incl
Alkaline earths	none								
Heavy metals	none								
Sulphate	none								
Chloride	none								
Chlorate	none								
Nitrite	none								
POTASSIUM Nitrate, c. p., fused				.55	cb	.08	1 1/4 lb.	.20	incl
POTASSIUM Nitrite, c. p., crystals	Baker Analyzed	.15	incl	.80	cb	.08	1 1/4 lb.	.40	incl
" Nitrite, c. p., sticks	Baker Analyzed	.15	incl	1.15	cb	.08	1 1/4 lb.	.40	incl
KNO ₃	none								
Cl	0.010%								
SO ₂	0.001%								
CaO	0.001%								
Fe	0.0001%								
I	none								
POTASSIUM Nitrite, sticks	Merck Blue Label			1.50	incl		1 1/4 lb.	.50	incl
Heavy metals	none								
Chlorides	less than 0.002% as Cl								
Sulphates	less than 0.175% as SO ₂								
POTASSIUM Oxalate, neutral, crystals				.25	cc	.04			
" Oxalate, c. p.	Baker Analyzed			.45	cb	.07	1 1/4 lb.	.20	incl
Fe	0.001%								
CaO	0.001%								
Na	trace								
Cl	0.0005%								
SO ₂	none								
POTASSIUM Oxalate, neutral	Merck Blue Label			1.25	incl		1 1/4 lb.	.40	incl
Neutrality	less than 0.0045% acid as H ₂ C ₂ O ₄								
Sulphates	less than 0.008% as SO ₂								
Chlorides	less than 0.0025% as Cl								
Heavy metals	none								
POTASSIUM Oxalate, neutral	Kahlbaum "C.f.A."						100 grm.	.80	incl
" Oxalate, neutral	Kahlbaum "C.f.A."						500 grm.	2.25	incl
Chloride	faint trace								
Iron	none								
Heavy metals	none								
Sulphate	none								
Content	100.00%								
POTASSIUM Perchlorate		.15	incl	1.40	cb	.07	1 1/4 lb.	.45	incl
" Perchlorate	Merck Blue Label	.30	incl						
Calcium	less than 0.02%								
Chlorides	less than 0.002% as Cl								
Heavy metals	none								
Nitrites	less than 0.0016% as N ₂ O ₄								
Sulphates	less than 0.003% as SO ₂								
POTASSIUM Permanganate, pure, crystals				.25	cc	.04			
" Permanganate, c. p., small crystals	Baker Analyzed	.10	incl	.55	cb	.07	1 1/4 lb.	.20	incl
Cl	0.0002%								
SO ₂	0.002%								
CaO	none								
Fe	0.0002%								
POTASSIUM Permanganate	Merck Blue Label			.60	incl		1 1/4 lb.	.25	incl
Sulphates	less than 0.03% as SO ₂								
Chlorides	less than 0.004% as Cl								
Nitrites	less than 0.08% as N ₂ O ₄								
Chlorates	less than 0.0016% as ClO ₂								
POTASSIUM Permanganate, free from sulphates	Merck Blue Label			1.25	incl		1 1/4 lb.	.40	incl
Sulphates	less than 0.005% as SO ₂								
Chlorides	less than 0.004% as Cl								
Nitrites	less than 0.08% as N ₂ O ₄								
Chlorates	less than 0.0016% as ClO ₂								
POTASSIUM Permanganate	Kahlbaum "C.f.A."						100 grm.	.80	incl

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices		Price in other size packages					
Maker or Brand		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.	
POTASSIUM	Permanganate.....	Kahlbaum "C.F.A."				500 grm.	1.95	incl	
	Sulphate..... none								
	Chloride..... none								
	Chlorate..... none								
POTASSIUM	Permanganate, c. p., large crystals.....	Baker Special	.10	incl	.75	cb .07	1/4 lb.	.25	
	Persulphate, c. p.....		Baker Analyzed			2.00	cb .08	1/4 lb.	.65
	Fe..... -0.001%								
	Ph..... none								
Cl..... -0.001%									
POTASSIUM	Persulphate.....	Merek Blue Label	1.25	incl			1/4 lb.	.40	
	Chlorides..... less than 0.002% as Cl		Guaranteed Analysis						
	Heavy metals..... none, or at most a trace								
	SO ₄ 0.005%								
Na..... trace									
POTASSIUM	Phosphate, c. p., monobasic (KH ₂ PO ₄).....	Baker Analyzed			.75	cb .07	1/4 lb.	.25	
	Fe..... 0.001%								
	Na..... trace								
	Cl..... 0.002%								
POTASSIUM	Phosphate, c. p., dibasic (K ₂ HPO ₄).....	Baker Analyzed			.75	cb .08	1/4 lb.	.25	
	Fe..... 0.003%								
	Al ₂ O ₃ 0.002%								
	SiO ₂ 0.002%								
POTASSIUM	Phosphate, c. p., tribasic (K ₃ PO ₄).....	Baker Analyzed			.90	cb .08	1/4 lb.	.35	
	CaO..... 0.001%								
	Fe..... 0.001%								
	Cl..... 0.001%								
POTASSIUM	Pyroantimonate (acid).....	Merek Blue Label	.20	incl			1/2 lb.	1.10	
	Tested for stability as a reagent for Sodium.								
POTASSIUM	Pyrophosphate, c. p.....			1.25	cb .08	1/4 lb.	.40	incl	
"	Silicate, coml. lump.....			.20	cc .04				
"	Silicofluoride, c. p.....			2.00	cb .08	1/4 lb.	.65	incl	
POTASSIUM	Stannosulphate, tested reagent.....	Merek Blue Label	.35	incl					
"	Sulphate, pure, crystals.....			.15	cc .04				
"	Sulphate, pure, powder.....			.18	cc .04				
POTASSIUM	Sulphate, c. p., crystals.....	Baker Analyzed			.30	cb .07	1/4 lb.	.17	
"	Sulphate, c. p., powder.....	Baker Analyzed			.35	cb .07	1/4 lb.	.17	
POTASSIUM	Sulphate.....	Merek Blue Label	.45	incl			1/4 lb.	.20	
	Chlorides..... less than 0.001% as Cl								
	Heavy metals (Cu, Fe)..... none								
	Calcium..... less than 0.02%								
POTASSIUM	Sulphate.....	Kahlbaum "C.F.A."					500 grm.	.75	
	Sulphate.....		Kahlbaum "C.F.A."					1000 grm.	1.20
	Heavy metals..... none								
	Alkaline earths..... none								
Chloride..... slight trace									
POTASSIUM	Sulphate.....	Baker Special					1/4 lb.	.20	
	Fe..... -0.001%								
	CaO..... -0.001%								
	MgO..... 0.001%								
POTASSIUM	Sulphide, pure, lumps, (Liver of Sulphur).....	Merek Blue Label	.20	cb .08			1/4 lb.	.30	
	Sulphide.....		Merek Blue Label	.80	incl			1/4 lb.	.30
	Nitrogen..... not more than 0.012%								
	Nitrogen..... not more than 0.0005%								
Nitrogen..... not more than 0.0005%									
POTASSIUM	Sulphite Solution, 5%.....	Merek Blue Label	.50	incl					
POTASSIUM	Sulphide, c. p., crystals.....	Baker Analyzed	.10	incl	.60	gb .15	1/4 lb.	.22	
POTASSIUM	Sulphide, c. p., crystals.....	Baker Analyzed							
	Fe..... 0.001%								
	Al ₂ O ₃ -0.001%								
	Cl..... 0.030%								
SO ₄ present									

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages			
		per oz.	cont.	per lb.	cont.		
POTASSIUM Sulphide, c. p., crystals	Baker Special	.10	incl	1.00	gb .15	¼ lb. .35	incl
Fe.....	0.003%						
Al ₂ O ₃	-0.001%						
Cl.....	0.020%						
SO ₂	present						
POTASSIUM Sulphite, c. p., crystals	Baker Analyzed			.60	cb .08	¼ lb. .22	incl
Sulphocyanate (Thiocyanate) pure, crystals.....				.50	incl		
POTASSIUM Sulphocyanate, c. p.	Baker Analyzed	.10	incl	1.00	cb .09	¼ lb. .35	incl
SO ₂	0.001%						
Fe.....	0.0001%						
NH ₃	trace						
Cl.....	0.020%						
POTASSIUM Sulphocyanate	Merck Blue Label	.25	incl			½ lb. 1.00	incl
Substances insoluble in Alcohol.....	none						
Chlorides.....	less than 0.0025% as Cl						
Sulphates.....	less than 0.01% as SO ₄						
Heavy metals.....	none						
Iron.....	less than 0.0004%						
Ammonium compounds.....	less than 0.0011% as NH ₃						
POTASSIUM Sulphocyanate	Kahlbaum "C.f.a."					100 grms. 1.15	incl
Sulphocyanate	Kahlbaum "C.f.a."					500 grms. 3.75	incl
Heavy metals.....	none						
Sulphate.....	not present						
Chloride.....	not present						
Iron.....	undeterminable trace						
Solubility in Alcohol.....	complete						
POTASSIUM Sulphydrate (Potassium Hydrosulphide).....	Merck Blue Label	.25	incl			½ lb. 1.25	incl
Polysulphides.....	none						
POTASSIUM Tartrate, granular.....				.55	cb .09		
Tartrate, c. p., crystals	Baker Analyzed			.80	cb .08	¼ lb. .30	incl
Tetroxalate, c. p.	Baker Analyzed	.10	incl	1.10	cb .08	¼ lb. .35	incl
Fe.....	0.002%						
SO ₂	-0.001%						
CaO.....	0.007%						
Cl.....	none						
POTASSIUM Tetroxalate	Merck Blue Label			1.50	incl	¼ lb. .50	incl
Chlorides.....	less than 0.0025% as Cl						
Sulphates.....	less than 0.0083% as SO ₄						
Heavy metals.....	none						
POTASSIUM Thiocyanate (See Potassium Sulphocyanate)							
" Sulphate, c. p.	Baker Analyzed	.20	incl	2.00	cb .08	¼ lb. .65	incl
POTASSIUM Zinc Sulphate, c. p.	Baker Analyzed			.30	cb .08	¼ lb. .30	incl
PUMICE Stone, lumps.....				.10	cc .04		
" Stone, powder.....				.10	cc .04		
PYRIDINE, technical.....				.75	incl		
" medicinal				3.00	gb .14		
PYRIDINE, c. p.	Baker Analyzed	.30	incl	3.00	cb .08	¼ lb. 1.00	incl
Sp. gr.....	0.97						
B. P.....	116°-118°C						
PYROGALLOL (See Acid Pyrogallic)							
QUERCIT						1 grm. .50	incl
RADIUM . Information concerning Radium and Radium Salts on application							
RAFFINOSE (Meletose).....						10 grms. .90	incl
REALGAR, red (See Arsenic Sulphide)							
ROSIN, white.....				.12	cc .04		
" yellow.....				.10	cc .04		
RESORCIN, white, crystals.....				.15	cb .03	1.15	cb .08
RESORCIN	Merck Blue Label	.60	incl			¼ oz. .25	incl
Nonvolatile matter.....	less than 0.005%						
D-resorcin and Phenol.....	none						
Free acids (e.g. Salicylic Acid).....	none						
RHAMNOSE (Isodulcitol).....						10 grms. 1.80	incl
ROCHELLE Salts (See Sodium and Potassium Tartrate)							
ROUGE, for polishing, Ferric Oxide.....				.35	cb .08		
RUBIDIUM Chloride						10 grms. 1.50	incl
SACCHARIN, c. p......		.20	incl	2.00	cb .08	¼ lb. .70	incl
SACCHAROSE, c. p. (Cane Sugar).....				1.00	cb .08	¼ lb. .35	incl
SACCHAROSE	Kahlbaum			1.60	incl		
SAL AMMONIAC (See Ammonium Chloride)							
SALICIN						10 grms. .40	incl
SAL SODA (See Sodium Carbonate)							
SAND, Quartz	Merck Blue Label			1.00	incl	¼ lb. .35	incl
Substances soluble in Hydrochloric Acid.....	not more than 0.05%						
Chlorides.....	less than 0.0025% as Cl						
Volatile substances.....	not more than 0.02%						

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Dance and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
SAND, Sea								
" " washed and ignited.				.10	incl			
" " washed and ignited.	Merck Blue Label			.20	incl			
Substances soluble in Hydrochloric Acid	not more than 0.3%			.40	incl	1/4 lb.	.20	incl
Chlorides	less than 0.002% as Cl							
Valuable substances	not more than 0.02%							
SAND, standard for briquettes				.10	incl	125 lb.	5.50	incl
SHELLAC, Orange, flakes				.45	cc .04			
" bleached				.50	cc .04			
SILICA, powdered (Silicic Acid)				.10	incl			
" precipitated, technical				.40	incl			
SILICON, metal, c. p., crystals						1 grm.	.25	incl
SILVER, metal, pure, granulated				1.40	incl			
" metal, foil				1.30	incl			
SILVER, metal, sheets	Merck Blue Label					1/4 oz.	1.00	incl
Foreign metals	less than 0.025%							
SILVER, leaf, pure, in books						book	.15	incl
SILVER, Arsenite, c. p.				1.50	incl			
SILVER, Asbestos	Merck Blue Label					1/2 oz.	1.50	incl
" Asbestos	Merck Blue Label					1/8 oz.	.50	incl
" Chloride				.75	incl			
" Chloride, c. p.				1.00	incl			
" Cyanide, c. p.				1.00	incl			
" Nitrate, c. p., crystals				.60	incl	8.75 cb	.07	
*SILVER Nitrate, c. p., crystals	Baker Analyzed			.65	incl			
Fe	0.01%							
CaO	0.01%							
Na	trace	Typical						
Cl	none	Analysis						
SO ₄	none							
*SILVER Nitrate, crystals	Merck Blue Label	.90	incl	13.50	incl	1/4 lb.	3.50	incl
Chlorides	less than 0.002%							
Potassium Nitrate	less than 2%							
Salts of Copper	less than 0.002% Cu							
Salts of Bismuth	less than 0.02% Bi							
Salts of Lead	less than 0.3% Pb							
Substances not precipitated by Hydrochloric Acid	less than 0.025%							
*SILVER Nitrate, pure, sticks				.50	cb .04			
*SILVER Nitrate, sticks	Merck Blue Label	1.00	incl					
Chlorides	less than 0.002%							
Potassium Nitrate	less than 2%							
Salts of Copper	less than 0.002% Cu							
Salts of Bismuth	less than 0.02% Bi							
Salts of Lead	less than 0.3% Pb							
Impurities not precipitated by Hydrochloric Acid	less than 0.025%							
SILVER Nitrite, c. p.				1.35	incl			
SILVER Nitrite	Merck Blue Label	2.50	incl			1/4 oz.	.40	incl
Substances not precipitated by Hydrochloric Acid	less than 0.025%							
SILVER Sulphate, c. p.				1.10	incl			
SOAP, Castile, bars								
" Palm Oil								
SODA ASH (See Sodium Carbonate)						cake	.10	incl
SODA LIME (See Sodium Calcium Hydroxide)								
*SODIUM, metal, sticks				.25	incl	.90	incl	
" metal	Merck Blue Label	.30	incl			1/4 lb.	.60	incl
Nitrogen compounds	less than 0.07% N							
Foreign metals	none	Guaranteed Analysis						
SODIUM Acetate, crystals				.15	cb .09			
" Acetate, crystals, pure, fused				.20	cb .08			
" Acetate, c. p., crystals	Baker Analyzed			.30	cb .08	1/4 lb.	.15	incl
Fe	0.0005%							
P ₂ O ₅	none	Typical						
SO ₃	0.005%	Analysis						
Cl	0.002%							
SODIUM Acetate, crystals	Merck Blue Label	.40	incl			1/4 lb.	.20	incl
Chlorides	less than 0.0005% as Cl							
Sulphates	less than 0.01% as SO ₄							
Heavy metals	less than 0.02%							
Calcium	less than 0.02%							
Iron	less than 0.0005%							
SODIUM Acetate, crystals	Kahlbaum "C.F.A."					500 grm.	.70	incl
" Acetate, crystals	Kahlbaum "C.F.A."					1000 grm.	1.10	incl
Iron	none							
Other heavy metals	none							
Lime	none							
Chloride	none	In 10 grains						
Sulphate	none	Certified						
Carbonate	none	Analysis						
Solubility in Alcohol	complete							

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont. per lb.	cont. size pkg.	per pkg.
SODIUM Acetate, c. p., fused.	Baker Analyzed		.50 cb .08	1 1/4 lb.	.20 incl
Fe.	0.003%	} Typical Analysis			
Pb.	none				
Cl.	-0.001%				
SODIUM Acetate, c. p., anhydrous.			.50 cb .08	1 1/4 lb.	.20 incl
" Aluminate, c. p., anhydrous.			1.50 cb .08	1 1/4 lb.	.50 incl
" Amalgam, 5%, 10%, or 15%.			.25 incl		
" Amalgam, 2%, tested reagent.	Merck Blue Label	.30 incl		1 1/4 lb.	.75 incl
SODIUM Ammonium Phosphate, (Micro-cosmic Salt) c. p.	Baker Analyzed		.50 cb .08	1 1/4 lb.	.20 incl
Fe.	0.001%	} Typical Analysis			
CaO.	0.010%				
Cl.	0.001%				
SO ₃	0.002%				
SODIUM Ammonium Phosphate.	Merck Blue Label		.90 incl	1 1/4 lb.	.30 incl
Carbonates.	less than 2% as CO ₂	} Guaranteed Analysis			
Sulphates.	less than 0.0075% as SO ₃				
Chlorides.	less than 0.0015% as Cl				
Nitrates.	less than 0.0016% as N ₂ O ₅				
Heavy metals.	none				
Arsenic.	less than 0.0006% as As				
Potassium.	less than 0.4% as K				
SODIUM Ammonium Phosphate	Kahlbaum "C.f.a."			100 grm.	.60 incl
" Ammonium Phosphate	Kahlbaum "C.f.a."			500 grm.	1.30 incl
Chloride.	trace	} Certified Analysis			
Nitrate.	none				
Sulphate.	none				
Carbonate.	none				
Heavy metals.	none				
Arsenic.	none				
Potassium (flame reaction) trace					
SODIUM Arsenate, technical.			.20 cb .08		
" Arsenate, c. p.	Baker Analyzed		.50 cb .08	1 1/4 lb.	.20 incl
" Arsenate, c. p., anhydrous.			1.00 cb .08	1 1/4 lb.	.35 incl
" Arsenite, technical, 90%.			.20 cb .07		
SODIUM Arsenite, c. p.	Baker Analyzed		.70 cb .03	1 1/4 lb.	.24 incl
" Asparaginate.				10 grm.	.90 incl
" Benzoate, pure.			.55 cb .05	1 1/4 lb.	.20 incl
" Bicarbonate, pure, powder.			1.00 cb .04		
SODIUM Bicarbonate, c. p., powder.	Baker Analyzed		.25 cb .08	1 1/4 lb.	.15 incl
Fe.	0.001%	} Typical Analysis			
CaO.	0.010%				
Al ₂ O ₃	0.002%				
SiO ₂	0.001%				
Cl.	0.0005%				
SO ₃	-0.001%				
Na ₂ CO ₃	trace				
SODIUM Bicarbonate, crystals or powder	Merck Blue Label		.45 incl		
Sulphates.	less than 0.0125% as SO ₃	} Guaranteed Analysis			
Silicates.	none				
Chlorides.	less than 0.001% as Cl				
Thioamphates.	less than 0.0005% as Na ₂ S ₂ O ₃				
Phosphates.	less than 0.03% as P ₂ O ₅				
Heavy metals.	none				
Iron.	less than 0.0015%				
Potassium.	less than 0.4% K				
Monocarbonate of Sodium (Neutral Sodium Carbonate).	at most a trace				
Ammonium compounds.	less than 0.002% as NH ₃				
Sulphocyanates.	less than 0.1% SCN				
SODIUM Bicarbonate.	Kahlbaum "C.f.a."			500 grm.	.75 incl
" Bicarbonate.	Kahlbaum "C.f.a."			1000 grm.	1.20 incl
Monocarbonate.	none	} Certified Analysis			
Residue on ignition.	60.13%				
Content.	100.00%				
Potassium Salts.	slight trace				
Ammonia.	none				
Heavy metals.	none				
Sulphocyanate.	none				
Sulphate.	none				
Chloride.	none				
Silica.	none				
Phosphate and Arsenate.	none				
Theosulphate.	none				
SODIUM Bichromate, technical.			.15 cc .04		
" Bichromate, c. p., crystals.	Baker Analyzed		.45 cb .07	1 1/4 lb.	.20 incl
CaO.	0.001%	} Typical Analysis			
Cl.	0.001%				
SO ₃	0.002%				
Fe.	0.008%				
SODIUM Bichromate	Kahlbaum "C.f.a."			100 grm.	.90 incl
" Bichromate.	Kahlbaum "C.f.a."			500 grm.	2.25 incl
Content.	90.47%	} Certified Analysis			
Chloride.	faint trace				
Sulphate.	none				
Alumina.	none				
Alkaline earths.	none				
SODIUM Binoxalate, c. p.	Baker Analyzed		.60 cb .07	1 1/4 lb.	.22 incl

A R T H U R H. T H O M A S C O M P A N Y

		Maker or Brand	Ounce and pound prices			Price in other size packages			
			per oz.	cont.	per lb.	cont.	size pkgs.	per pkg.	cont.
SODIUM	Bismuthate, c. p.	Baker Analyzed	.50	incl	4.50	cb .07	¼ lb.	1.50	incl
	Cl.	none							
SODIUM	Bismuthate, tested reagent.	Merck Blue Label	.40	incl			¼ lb.	1.25	incl
	Bisulphate, c. p., crystals.	Baker Analyzed			.25	cb .08	¼ lb.	.15	incl
SODIUM	CaO.	0.0001%							
	Al ₂ O ₃	0.0001%							
SODIUM	Heavy metals.	309%							
	Chlorides.	less than 0.002% as Cl							
SODIUM	Arsenic.	less than 0.0045% K							
	Potassium.	less than 0.4%							
SODIUM	Bisulphate, c. p., fused (P. ro).	Baker Analyzed			.45	cb .07	¼ lb.	.20	incl
	Fe.	0.0005%							
SODIUM	MgO.	none							
	SiO ₂	0.002%							
SODIUM	Cl.	0.003%							
	Acidity (H ₂ SO ₄).	33.4%							
SODIUM	Bisulphide, c. p. ....				.50	cb .08	¼ lb.	.20	incl
	Bisulphite, pure, powder. ....				.18	cb .09			
SODIUM	Bisulphite, c. p.	Baker Analyzed			.30	cb .08	¼ lb.	.15	incl
	Fe.	0.001%							
SODIUM	CaO.	0.001%							
	MgO.	0.002%							
SODIUM	Cl.	0.002%							
	Reducing power (SO ₂).	39.7%							
SODIUM	Bisulphite.	Merck Blue Label			1.25	incl	¼ lb.	.40	incl
	Chlorides.	less than 0.002% as Cl							
SODIUM	Heavy metals.	none							
	Arsenic.	less than 0.0002%							
SODIUM	Bitartrate, c. p.	Baker Analyzed			1.00	cb .09	¼ lb.	.35	incl
	Borate (Borax), pure, crystals.	Baker Analyzed			.15	cc .04			
SODIUM	Borate (Borax), c. p., crystals.	Baker Analyzed			.35	cb .08	¼ lb.	.17	incl
	Fe.	0.0001%							
SODIUM	CaO.	trace							
	CO ₂	0.001%							
SODIUM	Cl.	0.001%							
	SO ₂	0.001%							
SODIUM	Borate (Borax) purest, crystals.	Merck Blue Label			.45	incl	¼ lb.	.20	incl
	Proper Water content.	47.1%							
SODIUM	Carbonate.	less than 2% as CO ₂							
	Sulphates.	less than 0.0875% as SO ₂							
SODIUM	Chlorides.	less than 0.0005% as Cl							
	Calcium.	less than 0.02%							
SODIUM	Iron.	less than 0.0008%							
	Other metals.	none							
SODIUM	Borate, crystals.	Kahlbaum "C.f.a."					100 grm.	.55	incl
	Borate, crystals.	Kahlbaum "C.f.a."					500 grm.	1.00	incl
SODIUM	Residue on ignition.	52.87%							
	Chlorides.	none							
SODIUM	Sulphate.	In 10							
	Carbonate.	grams							
SODIUM	Heavy metals.	none							
	Content found.	100.98%							
SODIUM	Borate (Borax), pure, powder. ....				.15	cc .04			
	Borate, c. p., powder.	Baker Analyzed			.40	cb .08	¼ lb.	.17	incl
SODIUM	Fe.	0.0001%							
	CaO.	none							
SODIUM	CO ₂	trace							
	Cl.	0.001%							
SODIUM	SO ₂	0.001%							
	Borate (Borax), calcined, purest	Merck Blue Label			1.00	incl	¼ lb.	.35	incl
SODIUM	Proper Water content.	not more than 2%							
	Carbonates.	less than 2% as CO ₂							
SODIUM	Sulphates.	less than 0.0875% as SO ₂							
	Chlorides.	less than 0.0005% as Cl							
SODIUM	Calcium.	less than 0.02%							
	Iron.	less than 0.0008%							
SODIUM	Other metals.	none							
	Borate, c. p., anhydrous, powder				.60	cb .08	¼ lb.	.22	incl
SODIUM	Borate, fused (Borax Glass). ....				.25	cc .04	5 lb.	1.00	incl
	Borate, fused, purest.	Merck Blue Label			1.50	incl	¼ lb.	.50	incl
SODIUM	Carbonates.	less than 2% CO ₂							
	Sulphates.	less than 0.0875% as SO ₂							
SODIUM	Chlorides.	less than 0.0005% as Cl							
	Calcium.	less than 0.02%							
SODIUM	Iron.	less than 0.0008%							
	Other metals.	none							
SODIUM	Bromate, c. p. ....		.45	incl	4.30	cb .08	¼ lb.	1.45	incl
	Bromate.	Merck Blue Label	.40	incl					
SODIUM	Bromides.	less than 0.03% as Br.							
	Bromide, c. p.	Baker Analyzed			.80	cb .08	¼ lb.	.35	incl

		Dance and pound prices		Price in other size packages						
Maker or Brand		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.		
SODIUM	Calcium Hydrate (Soda Lime), dry, for Nitrogen determinations, granulated 4, 8 and 12 mesh.....									
	Baker Analyzed	.40	cb .08	1 1/4	lb.	.15	incl			
	NaOH..... 40% Ca(OH)2..... 57% H2O..... 2% Typical Analysis									
"	Calcium Hydrate (Soda Lime), moist, for Carbon Dioxide determinations, granulated 4, 8 and 12 mesh.....									
	Baker Analyzed	.40	cb .08	1 1/4	lb.	.15	incl			
	NaOH..... 37% Ca(OH)2..... 48% H2O..... 15% Typical Analysis									
SODIUM	Carbonate, crystals (Sal Soda).....			.10	incl	10 lb.	.30	incl		
	Baker Analyzed	.25	cb .08	1 1/4	lb.	.15	incl			
	Carbonate, c. p., crystals..... Fe..... 0.002% CaO..... 0.010% SiO2..... 0.001% Cl..... 0.003% SO2..... -0.001% Typical Analysis									
SODIUM	Carbonate, crystals.....	Merck	Blue Label	.40	incl					
	Substances insoluble in water..... none									
	Sodium Hydroxide..... less than 0.1%									
	Sulphates..... less than 0.00125% as SO2									
	Chlorides..... less than 0.0001% as Cl									
	Silicates..... none									
	Nitrates..... less than 0.007% as N2O5									
	Phosphates..... less than 0.001% as P2O5	Guaranteed								
	Potassium..... less than 0.4% K	Analysis								
	Ammonium compounds..... less than 0.001% as NH3									
	Calcium..... less than 0.002%									
	Magnesium..... less than 0.0002%									
	Heavy metals..... none									
	Iron..... less than 0.00005%									
	Arsenic..... less than 0.00003%									
SODIUM	Carbonate, crystals.....	Kahlbaum	"C.f.A."			1000 grm.	.90	incl		
	Content..... 99.73%									
	Chloride..... none									
	Sulphate..... none									
	Nitrate..... none									
	Phosphate..... none									
	Sodium Hydrate..... none									
	Potassium (flame reaction)..... none									
	Arsenic..... none									
	Heavy metals..... none									
Alkaline earths..... none										
SODIUM	Carbonate, monohydrated, granular.....			.10	cc .04	10 lb.	.60	incl		
	" Carbonate, pure, dried powder.....			.15	cb .09					
	SODIUM Carbonate, c. p., anhydrous.....	Baker Analyzed		.30	cb .08	1 1/4	lb.	.15	incl	
SODIUM	Fe..... 0.0015%									
	Al2O3..... 0.0003%									
	CaO..... 0.010%									
	SiO2..... 0.001%	Typical								
	Cl..... 0.002%	Analysis								
	SO2..... 0.020%									
	P..... trace									
	Loss on Ignition..... 0.210%									
	SODIUM	Carbonate (anhydrous).....	Merck	Blue Label	.65	incl	1 1/4	lb.	.25	incl
		Substances insoluble in water..... none								
Sodium Hydroxide..... less than 0.1%										
Sulphates..... less than 0.00125% as SO2										
Chlorides..... less than 0.0001% as Cl										
Silicates..... none										
Nitrates..... less than 0.007% as N2O5										
Phosphates..... less than 0.001% as P2O5		Guaranteed								
Potassium..... less than 0.4% K		Analysis								
Ammonium compounds..... less than 0.001% as NH3										
Calcium..... less than 0.002%										
Magnesium..... less than 0.0002%										
Heavy metals..... none										
Iron..... less than 0.00005%										
Arsenic..... less than 0.00003%										
SODIUM	Carbonate, anhydrous.....	Kahlbaum	"C.f.A."			500 grm.	1.00	incl		
	" Carbonate, anhydrous.....	Kahlbaum	"C.f.A."			1000 grm.	1.75	incl		
	Content..... 99.47%									
	Mixture..... remainder									
	Chloride..... faint trace									
	Sulphate..... none									
	Nitrate..... none									
	Phosphate..... none									
	Silica..... none									
	Sodium Hydrate..... none									
Potassium (flame reaction)..... faint trace										
Arsenic..... none										
Heavy metals..... none										
Ammonium Salts..... faint trace										
Alkaline earths..... none										
Solubility in Water..... complete										

A R T H U R H. T H O M A S C O M P A N Y

		Ounce and pound prices		Price in other size packages				
		per oz.	cost.	per lb.	cost.	size pkg.	per pkg.	cont.
SODIUM	Carbonate, c. p., anhydrous	Baker Special		.50 cb	.08	1 1/4 lb.	.20	incl
	Fe.....	0.002%	Typical Analysis					
	Al ₂ O ₃	—0.001%						
	CaO.....	0.003%						
	SiO ₂	0.001%						
	Cl.....	0.001%						
SO ₂	—0.001%							
“	Chlorate, c. p.	Baker Analyzed		.50 cb	.07	1 1/4 lb.	.15	incl
“	Chloride, pure	Baker Analyzed		.10	incl			
SODIUM	Chloride, c. p., crystals	Baker Analyzed		.25 cb	.08	1 1/4 lb.	.15	incl
	Fe.....	none	Typical Analysis					
	CaO.....	—0.001%						
	MgO.....	—0.001%						
	I.....	none						
	SO ₂	0.001%						
“	Chloride	Merek Blue Label			.40	incl	1 1/4 lb.	.20	incl
	Sulphates..... less than 0.0066% as SO ₄							
	Alkaline earths..... less than 0.01% as Ca							
	Heavy metals..... none	Guaranteed Analysis						
	Magnesium..... less than 0.0007%							
	Iodides..... less than 0.15% as I							
	Potassium..... less than 0.18% as K							
	Iron..... less than 0.0003%							
	Ammonium..... less than 0.0003% as NH ₃							
SODIUM	Chloride, c. p., crystals	Baker Special		.40 cb	.08	1 1/4 lb.	.15	incl
	CaO.....	none	Typical Analysis					
	Na ₂	none						
	K.....	trace						
“	Chloride, crystals	Kahlbaum “C.f.a.”					100 grm.	.50	incl
“	Chloride, crystals	Kahlbaum “C.f.a.”				500 grm.	.90	incl
	Content..... 99.96%	Certified Analysis						
	Line and Magnesia..... none							
	Ammonium salts..... none							
	Potassium..... none in 10							
	Iron..... none grams							
	Heavy metals..... none							
SODIUM	Chloride, c. p., fused	Baker Analyzed		.45 cb	.08	1 1/4 lb.	.15	incl
	Fe.....	0.0002%	Typical Analysis					
	CaO.....	—0.001%						
	MgO.....	—0.001%						
	I.....	none						
	SO ₂	0.001%						
“	Chloride, fused	Merek Blue Label			.60	incl	1 1/4 lb.	.25	incl
	Sulphates..... less than 0.0066% as SO ₄							
	Alkaline earths..... less than 0.01% as Ca							
	Heavy metals..... none	Guaranteed Analysis						
	Magnesium..... less than 0.0007%							
	Iodides..... less than 0.15% as I							
	Potassium..... less than 0.18% as K							
	Iron..... less than 0.0003%							
	Ammonium..... less than 0.0003% as NH ₃							
SODIUM	Chloride, fused	Kahlbaum “C.f.a.”				100 grm.	.60	incl
	Chloride, fused	Kahlbaum “C.f.a.”				500 grm.	1.40	incl
	Content..... 99.96%	Certified Analysis						
	Line and Magnesia..... none							
	Ammonium salts..... none							
	Potassium..... none in 10							
	Iron..... none grams							
	Heavy metals..... none							
SODIUM	Chromate, c. p.	Baker Analyzed		.90 cb	.08	1 1/4 lb.	.35	incl
	Chlorate, c. p.	Baker Analyzed		1.00 cb	.08	1 1/4 lb.	.35	incl
	Fe.....	0.001%	Typical Analysis					
	CaO.....	0.002%						
	Cl.....	—0.001%						
	SO ₂	—0.001%						
SODIUM	Cobaltic Nitrite, c. p. (for Potassium Determinations)			.50	incl			
“	Fluoride, technical			.18 cb	.01			
“	Fluoride, c. p.	Baker Analyzed		.70 cb	.08	1 1/4 lb.	.30	incl
“	Formate, c. p.	Baker Analyzed		1.00 cb	.08	1 1/4 lb.	.35	incl
“	Hydroxide, crude, powder, 98%			.10	incl	10 lb.	.75	incl
“	Hydroxide, crude, powder, 98%	Greenbank				10 lb.	1.00	incl
“	Hydroxide, pure, granulated (Ammonia free)			.20 cb	.08	10 lb.	1.50	cn .15
“	Hydroxide, electrolytic			.30 cb	.08	1 1/4 lb.	.17	incl
SODIUM	Hydroxide, purified	Merek Blue Label		.45	incl	1 1/4 lb.	.20	incl
	Nitrogen as nitrates and nitrites..... less than 0.002% as N ₂ O ₅	Guaranteed Analysis						
Aluminium..... less than 0.16%								
Calcium..... less than 0.01%								
Heavy metals..... at most a trace								
SODIUM	Hydroxide, c. p., by Alcohol			.60 cb	.08	1 1/4 lb.	.20	incl
	Sodium Carbonate content..... not over 5.3%							

		Ounce and pound prices		Price in other size package.				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
SODIUM	Hydroxide, by Alcohol.....	Merck Blue Label	.65	incl		¼ lb.	.25	incl
	Sulphates.....							
	Chlorides.....							
	Nitrogen.....							
	Nitrogen as nitrates							
	nitrites, Ammonia, etc.....	less than 0.00112% N						
	Silicates.....	not more than 0.05% as SiO ₂						
	Aluminium.....	not over 0.032%						
	Calcium.....	less than 0.005%						
	Heavy metals.....	at most a trace						
Sodium Carbonate content.....	not over 4%							
SODIUM	Hydroxide, with Lime.....	Merck Blue Label	.60	incl		¼ lb.	.25	incl
	Excess of Carbonates, less than 5% as CO ₂							
SODIUM	Hydroxide, with Lime from Ice-land Spar.....	Merck Blue Label	.80	incl		¼ oz.	.30	incl
	Chlorides.....	less than 0.001% as Cl						
SODIUM	Hydroxide, c. p., from Sodium.....	Merck Blue Label	.30	incl	2.50	incl	¼ lb.	.80
	Sulphates.....	less than 0.004% as SO ₂						
SODIUM	Chlorides.....	less than 0.0025% as Cl						
	Nitrogen as nitrates							
	nitrites, Ammonia, etc.....	less than 0.00112% N						
	Nitrogen.....	less than 0.002% N ₂ O ₅						
	Nitrites.....	less than 0.00011% as N ₂ O ₅						
	Phosphates.....	less than 0.035% as P ₂ O ₅						
	Silicates.....	not more than 0.02% as SiO ₂						
	Aluminium.....	not more than 0.0106%						
	Calcium.....	less than 0.012%						
	Heavy metals.....	at most a trace						
Sodium Carbonate content.....	not more than 3.18%							
SODIUM	Hydroxide Solution I, 27%—Free from Nitrogen.....	Merck Blue Label	.55	incl				
	Nitrogen as nitrates, nitrites, Ammonia, etc.....	not more than 0.0002%						
SODIUM	Hydroxide Solution II, 27%—Free from Nitrogen.....	Merck Blue Label	.55	incl				
	Sulphates.....	less than 0.025% as SO ₂						
	Chlorides.....	less than 0.005% as Cl						
	Silicates.....	not more than 0.06% as SiO ₂						
	Aluminium.....	not over 0.032%						
	Calcium.....	0.005%						
	Heavy metals.....	at most a trace						
	Sodium Carbonate content.....	not over 4%						
	Nitrogen as nitrates, nitrites, Ammonia, etc.....	less than 0.0002%						
	SODIUM	Hydroxide Solution III, 15%.....	Merck Blue Label	.55	incl			
Sulphates.....		less than 0.025% as SO ₂						
Chlorides.....		less than 0.008% as Cl						
Nitrogen as nitrates, nitrites, Ammonia, etc.....		less than 0.00112% N						
Silicates.....		not more than 0.06% as SiO ₂						
Aluminium.....		not over 0.032%						
Calcium.....		less than 0.05%						
Heavy metals.....		at most a trace						
Sodium Carbonate content.....		not over 4%						
SODIUM		Hyposulphite (See Thiosulphate)	Merck Blue Label				½ oz.	1.00	incl
	Indigosulphonate.....	Merck Blue Label				½ oz.	.35	incl
SODIUM	Water content.....	not over 10%						
	Tested for Indigo Content							
	Iodate, c. p.....		.60	incl				
	Iodide, c. p.....		.50	incl				
	Molybdate, c. p.....		.35	incl	3.50	cb .08	¼ lb.	1.20
	Monosulphonate (Alizarine).....		.55	cb .04				
	Nitrate, crystals.....		.15	cc .04				
	Nitrate, c. p., crystals.....	Baker Analyzed	.25	cb .08			¼ lb.	.15
	CaO.....	none						
	MgO.....	0.001%						
Cl.....	0.002%							
SO ₂	0.001%							
I.....	none							
SODIUM	Nitrate, crystals.....	Merck Blue Label	.60	incl		¼ lb.	.25	incl
	Sulphates.....	less than 0.0025% as SO ₂						
	Chlorides.....	less than 0.0013% as Cl						
	Chlorates and Perchlorates.....	less than 0.005% as ClO ₃ O						
	Calcium.....	less than 0.01%						
	Heavy metals.....	none						
	Iron.....	less than 0.0005%						
	Nitrites.....	less than 0.00055% as N ₂ O ₅						
	Iodates.....	less than 0.004% as I ₂ O ₅						
	Potassium.....	less than 0.33%						
SODIUM	Nitrate, crystals.....	Kahlbaum "C.f.a."				100 grm.	.55	incl

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
SODIUM Nitrate, crystals	Kahlbaum "C.F.A."					500 grm.	1.10	incl
Chloride none								
Chlorate, Perchlorate none								
Sulphate none								
Iodate none								
Nitrite none								
Potassium (flame reaction) slight trace								
Iron none								
Alkaline earths none								
Heavy metals none								
SODIUM Nitrite, coml., granular	Baker Analyzed . . . . .			.22 cb	.08			
" Nitrite, c. p., crystals	Baker Analyzed . . . . .			.45 cb	.09	1/4 lb.	.15	incl
NaNO ₂ 95.9%								
Fe -0.003%								
Pb none								
Cl 0.002%								
SO ₂ -0.001%								
Ir none								
SODIUM Nitrite, c. p., sticks	Baker Analyzed . . . . .			.50 cb	.08	1/4 lb.	.15	incl
(Analysis as above)								
SODIUM Nitrite, sticks	Merck Blue Label			1.20	incl	1/4 lb.	.40	incl
Chlorides less than 0.002% as Cl								
Sulphates less than 0.175% as SO ₂								
Heavy metals none								
SODIUM Nitrite, Potassium free	Merck Blue Label . . . . .			.25	incl	1/2 lb.	.90	incl
Potassium less than 0.03% as K								
Chlorides less than 0.002% as Cl								
Sulphates less than 0.175% as SO ₂								
Heavy metals none								
SODIUM Nitroferriyanide (Nitroprusside) . . . . .				.40 cb	.04			
" Nitroferriyanide	Merck Blue Label . . . . .			.80	incl	1/4 oz.	.30	incl
Sulphate less than 0.01% as SO ₂								
" Oxalate, coml., powder								
SODIUM Oxalate, c. p.	Baker Analyzed . . . . .			.60 cb	.08	1/4 lb.	.20	incl
Fe 0.0003%								
CaO 0.008%								
Cl -0.001%								
SO ₂ -0.001%								
CO ₂ none								
SODIUM Oxalate, c. p., for standardizing	Baker Special					1/4 lb.	.50	incl
SODIUM Oxalate (Sorensens) 10f. p.	Merck Blue Label . . . . .			.20	incl	1/4 lb.	.60	incl
Hygroscopic moisture not more than 0.01%								
Sodium Carbonate less than 0.021%								
Sodium Binoxalate less than 0.0224%								
Chlorides less than 0.0015% as Cl								
Sulphates less than 0.025% as SO ₂								
Iron less than 0.0003%								
Potassium less than 0.006%								
Foreign organic substances at most a trace								
SODIUM Oxalate	Kahlbaum "C.F.A."					100 grm.	1.10	incl
" Oxalate	Kahlbaum "C.F.A."					500 grm.	3.45	incl
Content 99.93%								
Moisture 1.2 mg								
Chloride none								
Sulphate none								
Sodium Carbonate none in 10 grams								
Binoxalate none								
Organic compounds none								
Potassium (flame reaction) none								
Iron faint trace								
SODIUM Peroxide . . . . .				.65	incl	1/4 lb.	.30	incl
" Permanganate . . . . .				.35 cc	.04			
" Peroxide . . . . .				.85	incl	1/4 lb.	.30	incl
* SODIUM Peroxide, c. p.	Baker Analyzed			1.00	incl	1/4 lb.	.35	incl
Na ₂ O 88.5%								
Fe 0.002%								
Al ₂ O ₃ 0.0003%								
Cl 0.0002%								
SO ₂ none								
Insoluble matter 0.001%								
SODIUM Peroxide	Merck Blue Label					100 grm.	.70	incl
Sulphates less than 0.014% as SO ₂								
Chlorides less than 0.0015% as Cl								
Phosphates less than 0.06% as P ₂ O ₅								
Nitrogen less than 0.003%								
Silicates not more than 0.01% as SiO ₂								
Heavy metals none								
* SODIUM Peroxide, Carbon free				1.30	incl			
" Peroxide, c. p., for coal analysis	Baker Special . . . . .			.15	incl	1/4 lb.	.45	incl
" Peroxide, c. p., fusel . . . . .				.20	incl	1/4 lb.	.55	incl
" Phosphate, c. p., monobasic								
(NaH ₂ PO ₄ + 4H ₂ O)	Baker Analyzed . . . . .			.75 cb	.08	1/4 lb.	.25	incl
Fe 0.001%								
Cl -0.001%								
SO ₂ -0.001%								
SODIUM Phosphate, pure, crystals, dibasic . . . . .				.10 cb	.09			

	Maker or Brand	Dune and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
SODIUM Phosphate, anhydrous, powder, dibasic.				.22 cb	.09			
“ Phosphate, c. p., dibasic ($\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$)	Baker Analyzed			.35 cb	.08	1/4 lb.	.15	incl
Fe.....	0.0095%	} Typical Analysis						
As.....	trace							
Cl.....	0.001%							
SO ₂	0.005 %							
SODIUM Phosphate, dibasic ($\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$)	Merck Blue Label			1.00	incl	1/4 lb.	.35	incl
Carbonates.....	less than 2% as CO ₂	} Guaranteed Analysis						
Sulphates.....	less than 0.0075% as SO ₂							
Chlorides.....	less than 0.0015% as Cl							
Nitrates.....	less than 0.0010% as N ₂ O ₅							
Heavy metals.....	none							
Arsenic.....	less than 0.0005%							
Potassium.....	less than 0.4% as K							
SODIUM Phosphate	Kahlbaum “C.f.A.”					100 grm.	.75	incl
“ Phosphate	Kahlbaum “C.f.A.”					500 grm.	1.65	incl
Carbonate.....	none	} Certified Analysis						
Sulphate.....	none							
Chloride.....	none							
Nitrate.....	none in 10							
Arsenic.....	none (gram)							
Heavy metals.....	none							
Potassium (flame reaction).....	faint trace							
SODIUM Phosphate, c. p., anhyd., dibasic.				.60 cb	.08	1/4 lb.	.20	incl
“ Phosphate, c. p., dibasic, (Arsenic free)	Baker Special			.50 cb	.08	1/4 lb.	.20	incl
“ Phosphate, coml., granular, tribasic.				.10 cc	.04			
“ Phosphate, c. p., tribasic ($\text{Na}_2\text{PO}_4 + 12\text{H}_2\text{O}$)	Baker Analyzed			.90 cb	.08	1/4 lb.	.30	incl
Cl.....	0.003%	} Typical Analysis						
SO ₂	0.003%							
As.....	trace							
Nitrate.....	trace							
SODIUM Phosphate, c. p., meta, (NaPO₃)				1.20 cb	.08	1/4 lb.	.40	incl
“ Picrocarminate Solution, tested reagent	Merck Blue Label	.30	incl					
SODIUM Potassium Carbonate, c. p.	Baker Analyzed			.50 cb	.08	1/4 lb.	.20	incl
Na ₂ CO ₃	35%	} Typical Analysis						
K ₂ CO ₃	54%							
Fe.....	0.001%							
SiO ₂	0.002%							
Cl.....	0.001%							
SO ₂	0.002%							
P.....	trace							
SODIUM Potassium Carbonate	Kahlbaum “C.f.A.”					100 grm.	.50	incl
“ Potassium Carbonate	Kahlbaum “C.f.A.”					500 grm.	1.10	incl
Free alkali.....	none	} Certified Analysis						
Chloride.....	slight trace							
Sulphate.....	none							
Nitrate.....	none							
Phosphate.....	none							
Silica.....	none							
Cyanide.....	none in 10							
Sulphate.....	none (gram)							
Thiosulphate.....	none							
Alkaline earths.....	none							
Ammonia.....	none							
Heavy metals.....	none							
Arsenic.....	none							
SODIUM Potassium Carbonate, fused, anhydrous, tested reagent	Merck Blue Label			1.25	incl	1/4 lb.	.50	incl
“ Potassium Phosphate, c. p.				.50 cb	.07	1/4 lb.	.20	incl
“ Potassium Tartrate, crystals (Rochelle Salts)				.32 cc	.04			
“ Potassium Tartrate, powder (Rochelle Salts)				.32 cc	.04			
“ Potassium Tartrate, c. p. cryst.	Baker Analyzed			.70 cb	.08	1/4 lb.	.24	incl
“ Potassium Tartrate, c. p., powder	Baker Analyzed			.75 cb	.08	1/4 lb.	.24	incl
Fe.....	0.001%	} Typical Analysis						
CaO.....	none							
Cl.....	0.000%							
SO ₂	0.001%							
SODIUM Potassium Tartrate, crystals	Merck Blue Label			.80	incl	1/4 lb.	.30	incl
Calcium.....	less than 0.03%	} Guaranteed Analysis						
Heavy metals.....	none							
Chlorides.....	less than 0.0005% as Cl							
Sulphates.....	less than 0.15% as SO ₂							
Ammonium compounds.....	less than 0.0045% as NH ₃							

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
SODIUM Pyrophosphate, c. p., crystals	Baker Analyzed				
Fe..... 0.0003%	Typical Analysis				
MgO..... none					
SODIUM Pyrophosphate	Merek Blue Label		.80 incl	¼ lb.	.30 incl
Phosphates..... less than 2% as P ₂ O ₅	Guaranteed Analysis				
Sulphates..... less than 0.0075% as SO ₃					
Carbonates..... less than 2% as CO ₂					
Chlorides..... less than 0.0015% as Cl					
Nitrates..... less than 0.0016% as N ₂ O ₅					
Heavy metals..... none					
Arsenic..... less than 0.0005%					
Potassium..... less than 0.4% as K					
SODIUM Pyrophosphate, c. p., dry		1.00 cb	.08	¼ lb.	.35 incl
" Silicate, coml., solution.....		.10 cb	.03	1 gal.	.50 incl
" Silicate, coml., dry lump.....		.16 cc	.08		
" Silicate, coml., powder.....		.20 cc	.04		
" Silicate, c. p., crystals.....		.80 cb	.08	¼ lb.	.25 incl
" Silicofluoride, c. p.....		1.00 cb	.08	¼ lb.	.35 incl
" Stannate, c. p.....		1.00 cb	.08	¼ lb.	.35 incl
" Sulphate, pure, cryst. or powder.....		.10 cb	.09		
" Sulphate, c. p., crystals.....	Baker Analyzed	.25 cb	.08	¼ lb.	.15 incl
Fe..... 0.0001%	Typical Analysis				
Cl..... 0.0015%					
CaO..... none	Guaranteed Analysis				
MgO..... none					
SODIUM Sulphate	Merek Blue Label		.15 incl		
Substances insoluble in water..... none	Guaranteed Analysis				
Chlorides..... less than 0.001% as Cl					
Heavy metals..... none					
Iron..... less than 0.00085%					
Calcium..... less than 0.002%					
Magnesium..... less than 0.003%					
Arsenic..... less than 0.0005%					
SODIUM Sulphate	Kahlbaum "C.f.A."			1000 grm.	.90 incl
Chloride..... none	Certified Analysis				
Alkaline earths..... none					
Iron..... none in 10					
Arsenic..... none in 10					
Heavy metals..... none in 10					
Solution..... neutral					
SODIUM Sulphate, c. p., anhyd. powder	Baker Analyzed	.35 cb	.07	¼ lb.	.15 incl
Fe..... 0.0003%	Typical Analysis				
CaO..... none					
MgO..... none	Guaranteed Analysis				
Cl..... 0.0001%					
SODIUM Sulphide, fused.....		.50 cb	.08		
" Sulphide, brown, crystals.....		.10 cb	.08		
" Sulphide, c. p., crystals.....	Baker Analyzed	.40 gb	.15	¼ lb.	.15 incl
Fe..... 0.0003%	Typical Analysis				
Cl..... 0.010%					
SO ₂ 0.95%	Guaranteed Analysis				
Polysulphide..... trace					
SODIUM Sulphide	Merek Blue Label	.65	incl	¼ lb.	.30 incl
Nitrogen..... not more than 0.0056%					
SODIUM Sulphide	Kahlbaum "C.f.A."			100 grm.	.55 incl
" Sulphide	Kahlbaum "C.f.A."			500 grm.	.95 incl
Solubility..... complete	Certified Analysis				
Ammonium salts..... none					
Content, calculated on crystallized sulphide..... 98.7% remainder					
SODIUM Sulphide, Solution, 5%	Merek Blue Label	.60	incl	¼ lb.	.30 incl
Nitrogen..... not more than 0.00056%					
" Sulphite, pure, crystals.....		.10 cc	.04		
SODIUM Sulphite, c. p., crystals	Baker Analyzed	.25 cb	.08	¼ lb.	.15 incl
Fe..... 0.0003%	Typical Analysis				
CaO..... 0.001%					
SO ₂ 0.001%	Guaranteed Analysis				
Cl..... 0.001%					
SO ₃ present					
SODIUM Sulphite, crystals	Merek Blue Label	.50	incl	¼ lb.	.20 incl
Chlorides..... less than 0.002% as Cl	Guaranteed Analysis				
Heavy metals..... none					
Arsenic..... less than 0.0002%					
SODIUM Sulphite, anhydrous, powder.....		.15 cc	.04		
" Sulphite, c. p., anhydrous.....	Baker Analyzed	.30 cb	.07	¼ lb.	.15 incl
Fe..... 0.0003%	Typical Analysis				
CuO..... 0.003%					
SO ₂ 0.001%	Guaranteed Analysis				
Cl..... 0.010%					
SO ₃ present					
SODIUM Sulphite, dried	Merek Blue Label	.85	incl	¼ lb.	.30 incl
Chlorides..... less than 0.002% as Cl	Guaranteed Analysis				
Heavy metals..... none					
Arsenic..... less than 0.0002%					
SODIUM Tartrate, c. p.	Baker Analyzed	.75 cb	.08	¼ lb.	.25 incl

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices			Price in other size packages	
		per oz.	cont.	per lb. cont.	size pkg.	per pkg. cont.
SODIUM Taurocholate , for use in bacteriological work.....		6.00	cb .04		15 gr. .40	incl
“ Tetraoxalate , c. p.....		.20	incl	2.00 cb .08	¼ lb. .70	incl
“ Thiosulphate , (Hyposulphite), pure, crystals.....				.10 cb .04		
“ Thiosulphate , c. p., crystals.....	Baker Analyzed			.25 cb .08	¼ lb. .15	incl
Fe.....						
CaO.....	0.001%					
SO ₂	none					
Free S.....	0.250%					
	none					
SODIUM Thiosulphate , crystals.....	Merck Blue Label			.40 incl	¼ lb. .20	incl
Carbonates.....						
Sulphates and sulphites.....	less than 0.17% as CO ₂					
Free alkali.....	less than 0.01% as SO ₃					
Sulphides.....	less than 0.01% as NaOH					
Calcium.....	less than 0.02%					
SODIUM Thiosulphate	Kahlbaum “C.F.A.”				500 grm. .75	incl
“ Thiosulphate	Kahlbaum “C.F.A.”				1000 grm. 1.15	incl
Free alkalies.....	none					
Sulphate.....	none					
Sulphite.....	none					
Sulphide.....	none					
Carbousate.....	none					
Lime.....	none					
Content.....	99.2%					
Mechanical moisture.....	0.19%					
SODIUM Thiosulphate , c. p., crystals.....	Baker Special			.40 cb .08		
“ Thiosulphate , c. p., anhydrous.....	Baker Analyzed			.50 cb .07	¼ lb. .15	incl
Fe.....	0.002%					
CaO.....	0.001%					
SO ₂	0.590%					
Free S.....	trace					
SODIUM Tungstate , pure, crystals.....				1.25 cb .08		
“ Tungstate , c. p.....		.20	incl	2.00 cb .08	¼ lb. .70	incl
SODIUM Tungstate	Merck Blue Label	.30	incl		¼ lb. .80	incl
Proper water content.....	12%					
Chlorides.....	less than 0.001% as Cl					
Sulphates.....	less than 0.075% as SO ₃					
SODIUM Tungstate	Kahlbaum “C.F.A.”				50 grm. .90	incl
Sulphate.....	none					
Chloride.....	trace					
Residue on ignition.....	83.45% (grams)					
Tungstic acid.....	69.70%					
SOLUTION, Acid Phosphomolybdic , 10%.....		.15	gb .05	.80 incl		
“ Acid Phosphotungstic , 10%.....		.15	cb .03	1.00 cb .08		
“ Alizarin , (Sodium Monosulphonate) for detection of free HCl in stomach.....				.20 cb .08		
“ Boas , for detection of HCl in gastric juice.....		.15	cb .03	1.25 cb .08		
“ Chloro-iodide of Zinc , after Schultz.....		.50	gb .05			
“ Congo Red , for detection of free HCl in stomach.....				.80 cb .08		
“ Dimethyl-amido-azo-henzol , 0.5% for gastric juice analysis (Loepler).....		.15	incl	.75 cb .08		
“ Doreus , for estimating amount of Urea in Uric Acid Ehrlich's (Diazo Reaction).....				.60 gb .12		
“ Esbach's , for estimating amount of Albumen in urine.....				.30 gb .12		
“ Fehling's , Alkaline.....				.25 cb .08		
“ Fehling's , Copper.....				.50 cb .08		
“ Fehling's , in tablet form, in cartons containing 24 tablets each.....				.50 gb .12		
“ Gas , for analysis with Orsat Apparatus.....	Bur'ghs Welcome				carton .25	incl
I. Potassium Hydroxide solution for absorbing CO ₂.....				.80 incl	1 liter 1.40	incl
II. Ammoniacal solution Cuprous Chloride for absorbing CO.....				.80 incl	1 liter 1.40	incl
III. Potassium Pyrogallate solution for absorbing O.....				.80 incl	1 liter 1.40	incl

A R T H U R H . T H O M A S C O M P A N Y

	Maker or Brand	Dunes and pound prices				Price in other size packages		
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
SOLUTION, Gänzberg's, for detection of								
HCl in gastric juice.....		.60	cb.	.03				
Haines', for detection of								
Sugar in urine.....				1.00	incl			
Hayem's, for diluting blood..				.25	cb.	.08		
Hypobromite, for use in Dore-				.60	gb.	.1		
mus Ureometer								
Iodine, for detection of Starch,				.60	gb.	.12		
Alkaloids, and Alcohol....				.20	incl			
Labarraque's,.....								
Laemoid, indicator.....		.20	incl					
Litmus, indicator.....				1.00	cb.	.08		
Litmus, according to Kubel								
and Tiemann, in original	Kahlbaum				500 grm.	1.80	incl	
packages.....								
Litmus, according to Kubel								
and Tiemann, in original	Kahlbaum				1000 grm.	3.50	incl	
packages.....								
Lugol's.....				.25	gb.	.12		
Methyl Orange, indicator.....		.15	incl					
Millon's, for detection of				.25	incl	2.00	gb.	.12
Proteids.....								
Nessler's, for detection of				.15	incl	1.00	incl	
Ammonia and its salts....				.15	incl	1.25	incl	
Nylander's.....				.25	incl	1.00	incl	
Obermayer's.....								
Phenolphthalein, 1% alcohol-								
ic solution.....				.50	cb.	.08		
Phloroglucin-Vanillin, for de-								
tection of HCl in gastric				.60	cb.	.03		
juice.....				2.00	incl			
Platinic Chloride, c. p., 5%.....				3.25	incl			
Platinic Chloride, c. p., 10%.....								
Resorcin, for detection of HCl				.15	gb.	.05	1.40	gb.
in gastric juice.....								.12
Ruhemann's I, for estimation								.25
of Uric Acid.....								.08
Ruhemann's II, for estima-								.28
tion of Uric Acid.....								.07
Soap, for water analysis.....								1.00
Soda, Chlorinated, (Laba-								.20
raque's).....								incl
Toepfer's, for gastric juice				.15	incl	.75	cb.	.08
analysis.....								.50
Toisson's, for diluting blood..								.08
Tropaeolin OO, for detection								1.00
of HCl in gastric juice....				.15	incl	1.00	cb.	.08
Tumeric, indicator.....								

STANDARD VOLUMETRIC SOLUTIONS are not carried in stock because of their unstable nature. Each order is, therefore, made up specially and cannot be shipped until the day after order is received.

ACID, Hydrochloric, decinormal.....	liter	1.25	cb.	.18
Nitric, decinormal.....	liter	1.25	cb.	.18
Oxalic, decinormal.....	liter	1.25	cb.	.18
Sulphuric, decinormal.....	liter	1.25	cb.	.18
AMMONIUM Sulphocyanide, decinormal..	liter	1.35	cb.	.18
IODINE, decinormal.....	liter	1.35	cb.	.18
POTASSIUM Bichromate, decinormal.....	liter	1.25	cb.	.18
Hydrate, decinormal.....	liter	1.25	rb.	.14
Permanganate.....	liter	1.25	cb.	.18
SILVER NITRATE, decinormal.....	liter	1.35	cb.	.18
SODIUM Carbonate, decinormal.....	liter	1.25	cb.	.18
Chloride, decinormal.....	liter	1.25	cb.	.18
Hydrate, decinormal.....	liter	1.25	rb.	.14
Thiosulphate, decinormal.....	liter	1.25	gb.	.18
SORBIT.....	1 grm.	6.50	incl	
STARCH, corn.....		.10	cc.	.04
iodized.....	.35	cb.	.03	
potato.....		.15	cc.	.04
soluble.....	.15	cb.	.03	.80
wheat.....		.30	incl	
STRONTIUM Acetate, c. p.....	Baker Analyzed	1.25	cb.	.08
Carbonate, pure, pptd.....		.50	cb.	.09

A R T H U R H. T H O M A S C O M P A N Y

	Maker or Brand	Ounces and pound prices		Price in other size packages						
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.		
STRONTIUM Carbonate, c. p.	Baker Analyzed			.50	cb	.08	1 1/4	lb.	.20	incl
Fe.....	0.002%									
BaO.....	-0.001%									
Cl.....	0.0005%									
SO ₂	-0.001%									
STRONTIUM Chloride, pure, crystals	Baker Analyzed			.25	cb	.09	1 1/4	lb.	.20	incl
Fe.....	0.001%									
BaO.....	0.001%									
CaO.....	0.0005%									
SO ₂	0.001%									
STRONTIUM Chloride, c. p.	Baker Special			.75	cb	.08	1 1/4	lb.	.25	incl
Fe.....	0.002%									
BaO.....	none									
CaO.....	none									
SO ₂	none									
STRONTIUM Fluoride, c. p.	Baker Analyzed			1.00	cb	.08	1 1/4	lb.	.35	incl
Hydroxide, c. p.	Baker Analyzed			1.00	cb	.08				
Nitrate, granular	Baker Analyzed			.20	cc	.04				
STRONTIUM Nitrate, c. p.	Baker Analyzed	.10	incl	.50	cb	.07	1 1/4	lb.	.20	incl
Fe.....	0.0005%									
BaO.....	0.001%									
CaO.....	0.001%									
Cl.....	none									
STRONTIUM Nitrate, c. p.	Baker Special			.75	cb	.07				
Fe.....	-0.0001%									
BaO.....	none									
CaO.....	none									
Cl.....	0.002%									
STRONTIUM Oxalate, c. p.	Baker Analyzed			.90	cb	.09	1 1/4	lb.	.35	incl
Oxide, c. p., hydrated	Baker Analyzed			1.00	cb	.07				
STRONTIUM Sulphate, c. p.	Baker Analyzed			.50	cb	.07	1 1/4	lb.	.20	incl
CaO.....	none									
BaO.....	trace									
Fe.....	0.005%									
Cl.....	0.035%									
STYRAX				.50	cb	.08				
SULPHIDE Cubes (See Cubes)										
SULPHITE Cubes (See Cubes)										
SULPHUR, rolls (Brimstone)				.10	cc	.04	5	lb.	.25	incl
“ sublimed (Flowers of Sulphur)				.10	cc	.04	5	lb.	.25	incl
“ washed.....				.15	cc	.04				
“ precipitated.....				.16	cc	.05				
“ crystals.....				.50	incl					
“ Dioxide, gas, in valve top cylinders of 7 lbs. ea.....							per cyl.	6.00	incl	
“ Monochloride.....				.50	gb	.20				
SYNTHOL				.45	cb	.09				
TALCUM, powder				.10	cc	.04				
TANNIN (See Acid Tannic)										
Tartar Emetic (See Antimony Potassium Tartrate)										
TEST PAPER, Congo, sheets 210 x 250 mm							quire	.75	incl	
“ Congo, in books of 25 strips							book	.05	incl	
“ Congo, vials of 100 strips..							vial	.10	incl	
“ Congo, tape form in rolls..							roll	.10	incl	
“ Litmus, blue, red or neutral in sheets, 210 x 250 mm.							quire	.75	incl	
“ Litmus, blue, red or neutral, in books of 25 strips..							book	.05	incl	
“ Litmus, in vials of 100 strips..							vial	.10	incl	
“ Litmus, blue, red or neutral, in tape form.....							roll	.10	incl	
“ Litmus, red and blue combined, tape form.....							roll	.25	incl	
“ Tumeric, sheets, 210 x 250 mm							quire	.75	incl	
“ Tumeric, books of 25 strips							book	.05	incl	
“ Tumeric, vials of 100 strips							vial	.10	incl	
“ Tumeric, tape form.....							roll	.10	incl	
TETRAMETHYL - PARAPHENYLENE - DIAMINE HYDROCHLORIDE	Merck Blue Label						5 grn.	.75	incl	
TETRAMETHYL - PARAPHENYLENE - DIAMINE HYDROCHLORIDE	Merck Blue Label						15 grn.	2.00	incl	
Inorganic matter..... less than 0.05%										
THALLIUM, metal		1.80	incl				1 grm.	.15	incl	
“ Nitrate.....		1.80	incl				1 grm.	.15	incl	

	Maker or Brand	Ounce and pound prices		Price in other size packages	
		per oz.	cont.	per lb.	cont.
TUMERIC, powder.....				.25 cc	.04
" paper (See Test Paper).....					
TUNGSTEN, metal (Wolfram) c. p., powd..		.75 cb	.03		
" Oxide (See Acid Tungstic).....					
°TURPENTINE, ozonized.....				.30 cb	.08
" rectified.....				.40 cb	.09
" Venice.....				.40 cb	.07
" white.....				.15 cb	.08
" 1 gal. .85 cn					.25
URANIUM Acetate, c. p.....		.60	incl		
URANIUM Acetate, free from Sodium.....	Merek Blue Label	.80	incl		1 1/4 lb. 2.50 incl
Sulphates..... less than 0.0035% as SO ₃					
Sodium..... not more than 0.048% as Na					
Earths..... less than 0.005% as Ca	Guaranteed Analysis				
Uranous salts..... not more than 0.2385% UIV					
Foreign metals..... none					
°URANIUM Nitrate, c. p.....		.45	incl		
URANIUM Nitrate.....	Merek Blue Label	.65	incl		1 1/4 lb. 2.00 incl
Sulphates..... less than 0.0025% as SO ₃					
Alkali salts..... less than 0.05%					
Earths..... less than 0.005%	Guaranteed Analysis				
Uranous salts..... not over 0.2385% UIV					
Foreign metals..... none					
UREA, c. p.....		.25	incl		
VANADIUM Chloride c. p.....		1.50	incl		
VANILLIN.....		.45	incl		
VASELINE (See Petrolatum).....					
VERMILION, English.....		.10 cb	.03	1.10 cb	.08
VOLUMETRIC SOLUTIONS (See Solutions).....					
WATER, Distilled, in 5 gal. crated bottle.....					.75 cb 1.00
WATER, glass, (See Sodium Silicate)....					
WAX, (Beeswax) white.....		.55	incl		
" (Beeswax) yellow.....		.50	incl		
" Carnauba.....		.85	incl		
" Japan.....		.25	incl		
" for plastic reconstruction, special prices on application.....					
°XYLENE (Xylo).....		.30 cb	.08	1 gal.	2.00 cn .25
" (Xylo).....				2 gal.	3.75 cn .35
" (Xylo).....				5 gal.	8.00 cn .50
" (Xylo).....	Merek	.30	cb .10		
°XYLENE (Xylo), c. p.....	Baker Analyzed	1.00	cb .08		
Sp. gr..... 0.85	Typical Analysis				
B. P..... 137-140°C					
XYLIDINE.....	Merek Blue Label	2.00	incl		1 1/4 lb. .65 incl
Substances insoluble in Hydrochloric Acid..... none	Guaranteed Analysis				
XYLOSE.....				1 gm.	.80 incl
" 10 gm.				7.00	incl
°YTRITIUM Nitrate, c. p.....		3.00	incl		
ZINC, metal, coml., granulated (mossy zinc), for making Hydrogen.....		.20	cc .04	10 lb.	1.50 incl
ZINC, metal, c. p., mossy, stick or shot.....	Baker Analyzed	.50	incl	1 1/4 lb.	.15 incl
Fe..... .021%	Typical Analysis				
As..... trace					
Pb..... 0.050%					
Cd..... 0.001%					
ZINC, metal (Arsenic free), granulated, thick sticks, thin sticks.....	Merek Blue Label	.60	incl	1 1/4 lb.	.25 incl
Arsenic..... less than 0.000025%					
ZINC, metal, c. p., mossy, free from Carbon and Arsenic, containing traces of Iron.....		.30	incl		
ZINC, metal, c. p., powdered, 20 mesh.....	Baker Analyzed	.45	incl	1 1/4 lb.	.15 incl
ZINC, metal, c. p., powdered, 30 mesh.....	Baker Analyzed	.30	incl	1 1/4 lb.	.15 incl
Fe..... .021%	Typical Analysis				
As..... trace					
Pb..... 0.050%					
Cd..... 0.001%					
ZINC, metal, (Arsenic free) coarse powder.....	Merek Blue Label	.80	incl	1 1/4 lb.	.30 incl
Arsenic..... less than 0.000025%					
ZINC, metal, c. p., special, mossy, stick or shot.....	Baker Analyzed	.35	incl	1 1/4 lb.	.15 incl
Fe..... .041%	Typical Analysis				
As..... none					
Pb..... 0.005%					
Cd..... none					

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
ZINC, metal, free from Arsenic, nearly free from Iron, granulated, thick sticks, thin sticks or plates.....	Merck Blue Label					¼ lb.	.30	incl
Arsenic..... less than 0.00025%	Guaranteed Analysis							
Matter oxidizable by Permanganate..... less than 0.028% as Fe								
ZINC, metal, c. p., powdered, 20 mesh.....	Baker Special					¼ lb.	.15	incl
“ metal, c. p., powdered, 30 mesh.....	Baker Special					¼ lb.	.15	incl
Fe..... 0.00%	Typical Analysis							
As..... none								
Pb..... 0.005%								
Cd..... none								
ZINC, metal, free from Arsenic, Sulphur, Phosphorus and Iron, granulated, thick sticks or thin sticks.....	Merck Blue Label					¼ lb.	.35	incl
Arsenic..... less than 0.00025%	Guaranteed Analysis							
Potassium Permanganate..... less than 0.0056% Fe								
Compounds of Sulphur, Phosphorus, etc..... none								
ZINC, metal, dust.....								
ZINC, metal, c. p., dust.....	Baker Analyzed							
Zn..... 82.3%	Typical Analysis							
Fe..... 0.010%								
Pb..... 0.009%								
Cd..... 0.030%								
ZINC, metal, dust.....	Merck Blue Label					¼ lb.	.25	incl
Tested for value of Zinc Dust.....	Guaranteed Analysis							
Nitrogen..... not more than 0.00112%								
ZINC, metal, filings, free from Arsenic.....	Merck Blue Label					¼ lb.	.35	incl
Arsenic..... less than 0.00025%								
ZINC, metal, filings, free from Arsenic, nearly Iron free.....	Merck Blue Label					¼ lb.	.35	incl
Arsenic..... less than 0.00025%	Guaranteed Analysis							
Matter oxidizable by Permanganate..... less than 0.028% as Fe								
ZINC, sheet (4 x ½ inches), for standardizing.....	Baker Analyzed					¼ lb.	.15	incl
As..... trace	Typical Analysis							
Pb..... 0.104%								
Fe..... 0.016%								
Cd..... none								
ZINC, metal, amalgamated.....						¼ lb.	.25	incl
“ metal, platinized.....						¼ lb.	.25	incl
“ Acetate, pure.....								
ZINC Acetate, c. p.....	Baker Analyzed					¼ lb.	.15	incl
Fe..... 0.002%	Typical Analysis							
Cd..... none								
Cl..... 0.001%								
SO ₄ 0.001%								
ZINC Arsenite, c. p. (ortho).....						¼ lb.	.60	incl
“ Borate, c. p.....						¼ lb.	.50	incl
“ Bromide, c. p.....								
ZINC Carbonate, c. p.....	Baker Analyzed					¼ lb.	.20	incl
“ Chloride, fused, pure.....								
ZINC Chloride, c. p., granular.....	Baker Analyzed							
“ Chloride, c. p., sticks.....	Baker Analyzed							
Fe..... 0.002%	Typical Analysis							
Pb..... 0.001%								
Cd..... trace								
SO ₄ 0.005%								
Mn..... none								
ZINC Chloride, powder.....	Merck Blue Label					¼ lb.	.25	incl
Excess of Zinc Oxychloride less than 2.5% ZnO	Guaranteed Analysis							
Sulphates..... less than 0.002% as SO ₄								
Foreign metals..... none								
Alkalies..... less than 0.05% Alkali Salts								
ZINC Iodide-Starch, solution.....	Merck Blue Label					¼ lb.	.20	incl
Tested for..... Sensitiveness								
ZINC Nitrate, c. p.....	Baker Analyzed					¼ lb.	.15	incl
Fe..... 0.002%	Typical Analysis							
Mn..... 0.001%								
Cl..... 0.001%								
SO ₄ none								
ZINC Nitrate, c. p., sticks.....						¼ lb.	.30	incl
“ Oxide, white.....								
ZINC Oxide, c. p., dry process.....	Baker Analyzed					¼ lb.	.15	incl
Mn..... none	Typical Analysis							
Fe..... 0.003%								
Pb..... 0.006%								
Cd..... trace								
Cl..... 0.020%								
SO ₄ 0.050%								

A R T H U R H . T H O M A S C O M P A N Y

	Maker or Brand	Ounce and pound prices		Price in other size packages					
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg	cont.	
ZINC Oxide, c. p., wet process	Baker Special								
Mn.	none								
Fe	0.003%								
Pb	0.005%								
Cl	0.001%								
SO ₄	0.005%								
ZINC Oxide	Merck Blue Label			.85	incl	¼ lb.	.30	incl	
Arsenic	less than 0.0015%								
Sulphates	less than 0.0075% as SO ₄								
Chlorides	less than 0.001% as Cl								
Carbonates	less than 1% as CO ₂								
Nitrates	less than 0.0016% as N ₂ O ₄								
Calcium	less than 0.02%								
Magnesium	less than 0.005%								
Foreign Heavy Metals	None								
Foreign bodies which reduce Permanen-									
note when Zinc Oxide is dissolved in									
dilute Sulphuric Acid	none								
*ZINC Peroxide, c. p. . . . . .				.30	incl			
" Phosphate, c. p.	Baker Analyzed			.80	cb	.08	¼ lb.	.30	incl
" Sulphate, pure, crystals.12	cb	.09			
" Sulphate, c. p., crystals.	Baker Analyzed			.25	cb	.08	¼ lb.	.15	incl
Pz	0.001%								
Pb	0.001%								
Cd	trace								
Cl	0.002%								
ZINC Sulphate	Merck Blue Label			.45	incl	¼ lb.	.20	incl	
Chlorides	less than 0.001%								
Foreign metals	none								
Iron	less than 0.0008%								
Nitrates	less than 0.0016% as N ₂ O ₄								
Ammonium compounds	less than 0.0035% as NH ₃								
Free Sulphuric Acid	none								
Arsenic	less than 0.0035%								
ZINC Sulphate	Kahlbaum "C.f.A."					100 grm.	.50	incl	
" Sulphate	Kahlbaum "C.f.A."					500 grm.	.75	incl	
Free Sulphuric Acid	none								
Arsenic	none								
Ammonium salts	none								
Iron	none								
Foreign metals	none								
Chlorine	none								
Nitrate	none								
ZINC Sulphate, c. p., anhydrous50	cb	.08	¼ lb.	.20	incl
" Sulphide, c. p.	Baker Analyzed			1.50	cb	.08	¼ lb.	.50	incl
Fe	0.003%								
Cd	trace								
Pb	0.005%								
SO ₄	0.030%								

SECTION II
STAINS AND CHEMICAL PREPARATIONS FOR USE IN MICROSCOPY,
BACTERIOLOGY, ETC.

Nutrient Media for Bacteriological Cultures

	Maker or Brand	Ounce and pound prices		Price in other size packages				
		per oz.	cont.	per lb.	cont.	size pkg.	per pkg.	cont.
AGAR AGAR, in shreds, prime, white.....	A. H. T. Co. No. 40			.85	incl			
“ “ powder.....	Witte	.25 cb	.03	2.00 cb	.08			
BEEF EXTRACT, in jars	Liebig			2.75	incl	1 1/4 lb.	.90	incl
“ “	Liebig					1 1/2 lb.	1.50	incl
GELATINE, Gold Label.....	A. H. T. Co. No. 33			.60	incl			
“ “ Extra (French).....	Coignet			1.00	incl			
LITMUS MILK (Lakmusmolke künstlich nach Seitz).....	Kahlbaum					100 grm.	.25	incl
“ “ (Lakmusmolke künstlich nach Seitz).....	Kahlbaum					500 grm.	.75	incl
NUTRIENT MEDIA, after Von Heyden (Nährstoff Heyden), in original tins.....						1/4 lb.	1.50	incl
NUTROSE (Casein-Sodium), in original packages						1/4 lb.	1.00	incl
PEPTONE.....	Witte	.30 cb	.03	3.25 cb	.09			
“ “ in original tins of 10 kilos.....	Witte						67.50	incl

Imbedding Media for Section Cutting

CELLOIDIN, shreds	Schering	1.00	incl					
PARAFFINE, domestic, melting point about 43° C.....				.15	incl			
“ “ domestic, melting point about 52° C.....				.15	incl			
“ “ best white, imported, melting point 35-37° C.....				.25	incl			
“ “ best white, imported, melting point 40-45° C.....				.25	incl			
“ “ best white, imported, melting point 45-50° C.....				.30	incl			
“ “ best white, imported, melting point 50-55° C.....				.30	incl			
“ “ best white, imported, melting point 60-62° C.....				.40	incl			
“ “ best white, imported, melting point 74-76° C.....				.60	incl			
“ “ white, filtered, imported, melting point 36° C.....	Gruebler					1 1/2 kilo	1.15	incl
“ “ white, filtered, imported, melting point 40-42° C.....	Gruebler					1 1/2 kilo	.45	incl
“ “ white, filtered, imported, melting point 44-46° C.....	Gruebler					1 1/2 kilo	.50	incl
“ “ white, filtered, imported, melting point 50-52° C.....	Gruebler					1 1/2 kilo	.50	incl
“ “ white, filtered, imported, melting point 56-58° C.....	Gruebler					1 1/2 kilo	.60	incl
“ “ white, filtered, imported, melting point 60-62° C.....	Gruebler					1 1/2 kilo	.65	incl
PITH, for sectioning.....							pkg.	.10

Media for Mounting Microscopic Objects and for Finishing Mounts

		20cc. Collapsible Tubes		Ounce	Pound	Containers
ASPHALTUM.....				.10	.25	incl
BALSAM, Canada, dry .....				.50	5.00	incl
“ “ Canada, natural, paper filtered .....		.25		.30	2.00	incl
“ “ Canada, dissolved in Benzol.....		.30		.45	6.00	incl
“ “ Canada, dissolved in Chloroform .....		.30		.45	6.00	incl
“ “ Canada, dissolved in Xylol .....		.30		.45	6.00	incl
“ “ Damar, in Benzol.....				.45	6.00	incl
BELL'S MICROSCOPIC CEMENT .....				.65		incl
BROWN'S TRANSPARENT RUBBER CEMENT .....				.40		incl
BRUNSWICK BLACK .....				.25		incl
DEANE'S MEDIUM .....				.30		incl
FARRANT'S MEDIUM .....				.30		incl

	20cc. Collapsible Tubes	Ounce	Pound	Con- tainers
GLYCERINE, camphorated		.25		incl
" jelly		.30		incl
GOLD SIZE		.15	.75	incl
HOLLIS' GLUE		.35		incl
MARINE GLUE, colorless		.50		incl
" fluid		.30		incl
" hard		.35		incl
MEYER'S ALBUMEN FIXATIVE		.25		incl
WHITE ZINC CEMENT		.50		incl

Media for Mounting Microscopic Objects and for Finishing Mounts

From the Laboratory of Dr. G. Gruebler & Co., Leipzig, Germany. Furnished in original packages only.

	30 gram	100 gram	Con- tainers
BALSAM, Canada, rectified, neutral	.60	1.50	incl
MASKENLACK, No. III	.25	.60	incl
MONOBROMNAPHTHALIN	1.00	2.50	incl
STYRAXLÖSUNG FÜR DIATOMEEN	.50	1.50	incl

Microscopic Stains, Dry

From the Laboratory of Dr. G. Gruebler & Co., Leipzig, Germany. Furnished in original packages only.

Where stains are sold in the original Gruebler packages, we have used the German name in the price list, as experience shows users of these goods to be quite as familiar with the German, as with the English equivalent.

	Author	1 Gram	10 Grams	25 Grams	100 Grams	Cont.
A.—METHYLENBLAU-EOSIN (Reuter)		.38	3.60			incl
ACETINBLAU			.25			incl
ACID CARMINIC, Ia		.20	1.88			incl
" " Iia		.15	1.25			incl
ACRIDINORANGE			.35			incl
ACRIDINROT			.30			incl
AETHYLVIOLETT			.35			incl
ALAUN-CARMIN sicc (Grenacher's solution of Alumina-carmine is obtained by dissolving this dry stain in from 20 to 25 parts of boiling water)			.53			incl
ALIZARIN KRIST, Spalteholz		.33	3.00			incl
ALIZARINBLAU S	Ehrlich		.30			incl
ALIZARIN I SICC, Rawitz			.40			incl
ALIZARIN SULFACIDE, Metschnikoff			.35			incl
ALIZARIN SICC			.40			incl
ALIZARINCYANIN, Rawitz			.33			incl
ALIZARINCYANIN, Spalteholz		.33	3.00			incl
ALIZARINGRÜN B			.30			incl
ALIZARINSULFOSAURES NATRON			.33			incl
ALKALIBLAU			.33			incl
ALKALIGRÜN			.38			incl
ALKANIN, fettlös, Rot			.30			incl
AMMONIAK-CARMIN	Hoyer	.23	2.00			incl
ANILIN (-SALZE) CHLORHYDRAT			.10			incl
" " SCHWEFELSAURES			.13			incl
ANILINBLAU soluble in alcohol			.35			incl
" " soluble in water			.33			incl
ANILIN-BLUE-BLACK			.35			incl
ANILINGELB			.25			incl
ANILINGRÜN	Strasburger		.30			incl
ANTHRACENBLAU, Kaplan			.30			incl
AURAMIN			.30			incl
AURANTIA			.45			incl
AZOBLAU			.30			incl
AZOCARMIN			.25			incl
AZUR I	Giemsa	2.50				incl
" " II	Giemsa	1.25				incl
" " II, Eosin	Giemsa	1.88				incl
BENZOAZURIN			.33			incl
BENZOPURPURIN	Birch-Hirschfeld		.30			incl
BERLINERBLAU (See Colors for Injecting)						incl
RIEBRICHER SCHARLACH	Griesbach		.30			incl
BIONDI-EHRLICH-HEIDENHAIN three color mixture, dry "Gruebler"			1.45			incl
BISMARCKBRAUN	Weigert		.20	.44	1.75	incl
BITTERMANDELÖLGRÜN			.30			incl

	Author	1 Gram	10 Grams	25 Grams	100 Grams	Cont.
BLACKLEY-BLAU (See Anilin-blue-black).....						
BLAUHOLZEXTRACT (See Campecheholzextract)...						
BLAUSCHWARZ.....			.33			incl
BLEU DE LYON.....	Griesbach		.30			incl
BORAXCARMIN SICC.....			.90			incl
BORDEAUX R.....	Griesbach		.30			incl
BRASILIN.....		.25				incl
BRILLIANTBLAU, EXTRA GRÜNlich.....			.40			incl
BRILLANT-CRESYLEBLAU.....			.35			incl
BRILLANTGRÜN.....			.30			incl
BRILLANTSCHWARZ.....			.35			incl
CAMPECHEHOLZEXTRACT.....	Paneth		.10			incl
CARMALAUN SICC. "Gruebler" (P. Mayer's alum carmine solution is obtained by dissolving this dry stain in hot water).....			.60			incl
CARMIN RUBR. OPT.....			.43			incl
CARMIN II.....			.38			incl
CARMINS, AMMONIAK (See Ammoniak-Carmin)...						
CARMINSÄURE (See Acid Carminic).....						
CARMINS, NATRON (See Natron Carmin).....						
CHINABLAU.....			.35			incl
CHINAGRÜN (for typhoid cultures).....			.25			incl
CHINOLINBLAU (See Cyanin).....						
CHLORHYDRINBLAU.....	Kühne		.25			incl
CHROMOGEN, for neuroglia staining.....	Weigert		.20			incl
CHROMOTROP.....			.25			incl
CHRYSAMIN.....			.25			incl
CHRYSOIDIN.....			.25			incl
COCCININ.....			.30			incl
COCCIONELLA IA, pulv.....				.15	.60	incl
COERULLEIN S.....			.30			incl
CONGOCORINTH G.....			.30			incl
CONGOROT, Nissl.....			.33	.75	3.00	incl
CORALLIN, soluble in alcohol and caustic solution soluble in water.....	Strausburger		.25			incl
CRESYLECHTVIOLETT.....			.30			incl
CRISTALLVIOLETT.....			.30			incl
" (Höchst).....			.30			incl
CROCEIN.....	Griesbach		.30			incl
CROCEINSCHARLACH 7 B.....			.30			incl
CURCUMÉIN N.....			.20			incl
CYANIN.....		.75	7.00			incl
DAHLIA.....			.30			incl
DIAMANTFUCHSIN.....			.33			incl
ECHTGRÜN (DINITROSORESORCIN), Platner.....			.28			incl
ECHTROT.....			.50			incl
EOSIN A. G.....			.35			incl
EOSIN B. A.....			.30			incl
" soluble in water, yellowish.....				.65	2.50	incl
" soluble in water, bluish.....			.25			incl
" soluble in alcohol.....			.30			incl
" pure, French, for blood staining.....			.30			incl
EOSIN-METHYLENBLAU.....	Jenner		.18	1.65		incl
" " ".....	May-Grünwald		.25	2.25		incl
" " ".....	Leishman		.38	3.50		incl
" " ".....	Reuter		.38			incl
ERYTHROSIN, PUR.....			.45			incl
FLUORESCÉIN, Czaplowsky.....	Kühne		.45			incl
FLUORESCÉIN-KALIUM.....			.35			incl
FUCHSIN, for bacilli staining.....			.25	.56	2.25	incl
FUCHSIN S. (Acid Fuchsin).....	Weigert		.30	.63	2.50	incl
FUCHSIN-METHYLENBLAU.....			.68			incl
GALLEIN EN PÂTE.....			.10			incl
" SICC.....			.50			incl
GALLOCYANIN.....			.25			incl
GENTIANA-VIOLETT, Gram u.A.....			.25	.60	2.25	incl
GOLDORANGE.....	Griesbach		.20			incl
HAEMALAUN, SICC. "Gruebler" (P. Mayer's Hæ- malum solution is obtained by dissolving this dry stain in hot water).....				.60		incl

	Author	1 Gram	10 Grams	25 Grams	100 Grams	Cont.
HAEMATEIN, PURISS.....		.33				incl
“ “.....	P. Mayer	.35	3.30			incl
HAEMATEIN-AMMON, PURISS.....	P. Mayer	.33	3.00			incl
HAEMATTOXYLIN, PURISS., KRISTALL.....		.65	1.50	6.00		incl
“ “ (DUNKEL).....		.55	1.25	5.00		incl
HAEMATTOXYLIN-EOSIN.....		.75				incl
HELIANTHIN.....		.20				incl
HESS, BORDEAUX.....		.35				incl
HEXAMETHYLVIOLETT (See Methylviolett 6 B).....						
HOFMANN-S-VIOLETT.....			.35			incl
JANUSGRÜN.....			.30			incl
JENNER'S STAIN.....		.25	2.25			incl
INDIG-CARMIN (Indigo-Sulphonate of Soda).....			.45			incl
INDIG-CARMIN (Indigo-Sulphonate of Soda) Ia opt. for Heidenhain's kidney injection. See Colors for Injecting).....						
INDULIN.....			.35			incl
JODEOSIN SICCO.....			.45			incl
JODGRÜN, Griesbach u.A. (Ersatz).....			.50			incl
KRESOFUCHSIN.....		.25				incl
LACMUS STAIN, Neutral.....	Czuplewsky	1.10				incl
LEISHMAN STAIN.....		.38	3.50			incl
LEUKOANILIN (Leuko-Fuchsin).....			1.25			incl
LEUKOBLAU.....			1.25			incl
LEUKORRILLIANTGRÜN.....			1.25			incl
LEUKOMALACHITGRÜN.....			1.25			incl
LICHTGRÜN F. S., Benda u.A.....			.25			incl
MAGDALAROT, echt.....		.45				incl
“ des Handels.....			.40			incl
MAGENTAROT.....			.35			incl
MALACHITGRÜN.....			.30			incl
“ Ia.....			.35			incl
“ KRIST (Double salt of Zinc Chloride).....				.38		incl
MARTIUSGELB.....			.25			incl
MAUVEIN.....		.25				incl
MAY-GRÜNWARD'S STAIN.....		.25				incl
METANILGELB, Kristall, Ia.....	Griesbach		.30			incl
METHYLBLAU.....			.40			incl
METHYL-EOSIN.....			.38			incl
METHYLGRÜN.....			.38			incl
“ KRIST, OO, yellowish.....			.50			incl
METHYLORANGE.....			.25			incl
METHYLVIOLETT R. N.....			.35			incl
“ 5 B.....			.30			incl
“ 1 B.....			.38			incl
“ 2 B.....			.25			incl
“ 6 B (Hexamethyl-violett).....			.35			incl
METHYLENBLAU, for bacilli staining.....	Koch		.30	.65	2.50	incl
“ (See Colors for Injecting).....	Ehrlich					incl
“ R. X.....	Siegmund Mayer		.45			incl
“ medic, pur.....	Guttmann & Ehrlich			1.25	4.75	incl
“ rein L. F.....			.35		3.25	incl
METHYLENBLAU-EOSIN, Jenner.....	May-Grünwald	.25	2.25			incl
METHYLENBLAU.....	Leishman	.38	3.50			incl
METHYLENGRÜN.....			.38			incl
METHYLEN-VIOLETT.....			.35			incl
MUCICARMIN, SICCO.....	P. Mayer	.28				incl
MUCHÄMATEIN.....	P. Mayer	.43				incl
MSCARIN.....			.50			incl
NACHTBLAU.....			.35			incl
NAPHTALINROT, PUR.....		.50				incl
NAPHTOLGELB S.....			.25			incl
NAPHTOLGRÜN B.....			.25			incl
NAPHTYLAMINBRÄUN.....	O. Kaiser		.25			incl
NAPHTYLAMINGELB (Naphtolgelb).....			.25			incl
NAPHTYLENBLAU R. in Kristall.....			.38			incl
NATRON-CARMIN.....		.23				incl
NEUTRALROT, rein, nach P. Ehrlich, f. Inj. in vital Gew. zu Graunlrgb.-Färbg.....			.75			incl
NIGROSIN.....			.25			incl
NIRLAU-CHLORHYDRAT.....			.45			incl
NIRLAU-SULFAT.....			.40			incl

	Author	1 Gram	10 Grams	25 Grams	100 Grams	Cont.
ORANGE G.			.20			incl
ORCEIN, PUR., Israel, Unna u.A.		.18				incl
ORCEIN, spec. f. Elastin-färbung, Unna		.18				incl
OXYORCEIN	Savini	.25				incl
ORSEILLE, Extract			.15			incl
PATENT-SÄURE-RUBIN	Kultschitzky		.30			incl
PHENOSAFRANIN (See Safranin, pure)						
PHLOXINROT	Birch-Hirschfeld		.35			incl
PIKROCARMIN, SICC.	Cuccati	.25				incl
" " "	Hoyer	.25				incl
" " "	P. Mayer	.25				incl
" " "	Ranvier	.25				incl
PIKROLITHIONCARMIN, SICC., "Gruebler" (Solution made by dissolving in boiling distilled water, allowing to stand and then filtering)		.23				incl
PONCEAU P. R			.25			incl
PURPURIN, SICC. OPT.		.45	4.25			incl
PYRONIN	Pappenheim		.38			incl
RESORCIN-FUCHSIN			2.25			incl
ROMANOWSKY STAIN		.38	3.50			incl
ROSANILIN (-Base)			.45			incl
ROSANILINCHLORHYDRAT			.30			incl
ROSANILIN, saltpetersaures			.35			incl
" schwefelsaures			.35			incl
ROSANILINVIOLETT, Hanstein			.50			incl
ROSAZURIN B.			.50			incl
" G			.50			incl
ROSE BENGAL	Griesbach		.40			incl
ROSOLSÄURE			.25			incl
ROTVIOLETT, 5 R. S	Unna		.30			incl
RUBIN S			.30			incl
RUTHENIUMROT (MANGIN), per 1-10th gram		1.50				incl
SAFRANIN O., soluble in water, Pfitzner, Flemming			.35			incl
SAFRANIN, pure (Phenosafrafin)			.38			incl
" soluble in alcohol			.40			incl
SÄUREALIZARINBLAU			.25			incl
SÄUREALIZARINGRÜN			.25			incl
SÄUREFUCHSIN (See Fuchsin S.)			.25			incl
SÄUREGRÜN			.28			incl
SÄUREVIOLETT, 1897, Ers. f. Hoffmansblau			.25			incl
" Kulnc.			.35			incl
SÄUREBRAUN			.25			incl
SCHARLACH R., Michaelis			.35	.80		incl
SILBERNITRAT-AMMONIAK	Fajertzstajn	.43				incl
SMARAGDGRÜN			.30			incl
SOLIDGRÜN			.30			incl
SPILLER'S PURPLE		.65				incl
SUDAN III, for fat staining after Daddi			.30			incl
THIAZINBRAUN			.25			incl
THIAZINROT			.25			incl
THIONIN PUR. Ehrl., Hoyer, Heidenhain		.20	1.50			incl
TOLUIDINBLAU, Hoyer			.35			incl
TROPÄOLIN 00 and 000			.25		2.25	incl
TRYPANROT			.50			incl
URANIN			.35			incl
VESUVINBRAUN	Koch		.25			incl
VICTORIABLAU 4 R., Lustgarten			.38			incl
VIOLETTSCHWARZ			.30			incl
VITALNEUROT (Dr. Schulemann)			.80		7.50	incl
WASSERBLAU, Unna u.A			.35			incl
WOLLSCHWARZ, Löffler, f. Bact.-Geisseln			.25			incl
WRIGHT'S STAIN		.40				incl

Colors for Injecting

From the Laboratory of G. Gruebler & Co., Leipzig, Germany. Furnished in original packages only.

	Author	1 Gram	10 Grams	100 Grams	1000 Grams	Cont.
BERLINERBLAU, insoluble in water				1.00	8.00	incl
BERLINERBLAU Ia, easily soluble in water			.30	2.65		incl
CARMIN COERULEUM, for Cystoscopy, 1 tube of 20 tablets, per tube		.80				incl
INDIGOCARMIN OPT. Ia pure (Indigosulphonate of Soda), for kidney injection	Heidenhain	.35	3.40			incl

A R T H U R H. T H O M A S C O M P A N Y

	Author	1 Gram	10 Grams	100 Grams	1000 Grams	Cont	
INJECTIONS—ROT. for injection in vital organs.	Ehrlich	.....	.75	.....	.....	incl
LEIM-INJECTIONS—MASSEN—(Gelatin injection mass) blue.....	.....	.....	.....	.40	3.75	incl
“ “ (Gelatin injection mass) red.....	Spalteholz	.....	.....	.50	4.50	incl
“ “ (Gelatin injection mass) yellow.....	Ackerman	.....	.....	.50	4.75	incl
“ “ (Gelatin injection mass) black.....	.....	.....	.....	.50	4.50	incl
“ “ (Gelatin injection mass) red, conc. fast “Gruebler”.....	1.80	17.50	incl
METHYLENBLAU RECTIF., for injection in vital organs.....	Ehrlich	.....	.15	1.25	.....	incl

Staining Solutions

From the Laboratory of Dr. G. Gruebler & Co., Leipzig, Germany. Furnished in original packages only.

	10 Grams	25 Grams	100 Grams	Cont.
EHRlich's TRIPLE MIXTURE.....	.30	1.10	incl	
GIEMSA'S SOLUTION, for the Romanowsky method.....	.40	1.50	incl	
METHYLENE BLUE POLYCHROMATIC, nach Unna.....	.25	.60	incl	
PICROCARMINE, after Weigert.....	.15	.50	incl	

Dry Stains in Tablets, “Soloid” Brand

The tendency of solutions of the aniline dyes to decompose has always been a source of trouble in microscopic work. The “Soloid” Microscopic Stains contain aniline dyes of the highest quality, and make it possible to prepare solutions in small quantities as required. By their use waste is avoided, and correct results are assured. These are supplied in tubes containing six tablets each. Instructions for making solutions are furnished with each tube.

In Loeffler's alkaline methylene blue, aniline gentian violet and Ziehl's carbol fuchsin the solutions obtained are only approximately equivalent to those prepared according to the original formulae. The figures avoid small fractions in measurement, enabling the solution to be prepared more readily, without diminishing the efficiency of the stain.

	Per tube	Per doz. tubes
BISMARCK BROWN, pure 0.1 gram. Dissolve one “Soloid” Bismarck Brown in 7 cc of absolute alcohol and add 7 cc of distilled water.....	\$0.25	\$2.55
BORAX METHYLENE BLUE. Dissolve one “Soloid” Borax Methylene Blue in 10 cc of distilled water.....	.25	2.55
EHRlich's TRIPLE STAIN (Biondi-Ehrlich-Heidenhain Triple Stain). Dissolve one “Soloid” Ehrlich Triple Stain in 25 cc of distilled water, one “Soloid” Acid Fuchsin in 2 cc of distilled water and mix. The mixture is ready for use and keeps well.....	.30	3.15
EOSIN, pure, 0.1 gram. To obtain a solution of eosin suitable for general staining, one “Soloid” product may be dissolved in 20 cc of 50% alcohol. This gives a 0.5% solution.....	.25	2.55
EOSIN-AZUR (for Giemsa staining) 0.038 gram. Dissolve one “Soloid” product in 5 cc of a mixture of equal parts of glycerine and pure methyl alcohol.....	.50	5.70
EOSIN-METHYLENE BLUE (Louis Jenner's Stain) pure 0.05 gram. Dissolve one “Soloid” product in 10 cc of pure methyl alcohol.....	.25	2.55
FUCHSIN (Basic) pure, 0.1 gram. Dissolve one “Soloid” Fuchsin in 2.5 cc of absolute alcohol and add 10 cc of distilled water.....	.25	2.55
GENTIAN VIOLET, pure, 0.1 gram. Dissolve one “Soloid” Gentian Violet in 7 cc of absolute alcohol and add 7 cc of distilled water.....	.25	2.55
GRAM'S IODINE SOLUTION, 15 cc. Dissolve one “Soloid” product of reagent A in 10 cc of distilled water, add one of reagent B, and when solution is complete, dilute to 15 cc with distilled water.....	.25	2.55
HAEMALUM—Each “soloid” product contains Haematein, .0005 gm, and Ammonia Alum, 0.25 gm. To prepare the stain, one product is ground up with 5 cc of distilled water, and boiled a few minutes. A clear solution is thus obtained.....	.25	2.25
HAEMATOTOXYLIN, pure, 0.1 gram. Dissolve one “Soloid” Haematoxylin in 1 cc of absolute alcohol and add 2 cc of distilled water.....	.25	2.55
METHYLENE BLUE, pure, 0.1 gram. Dissolve one “Soloid” Methylene Blue in 7 cc of absolute alcohol and add 7 cc of distilled water.....	.25	2.55
METHYL VIOLET, pure, 0.1 gram. Dissolve one “Soloid” product in 1 cc of absolute alcohol and add 5 cc of distilled water.....	.25	2.55
ROMANOWSKY STAIN (Leishman's Modification). Dissolve one “Soloid” product in 10 cc of pure methyl alcohol.....	.25	2.55
ROMANOWSKY STAIN (Wright's Modification). Dissolve one “Soloid” product in 10 cc of pure methyl alcohol.....	.25	2.55
THIONIN BLUE, pure, 0.1 gram. Dissolve one “Soloid” Thionin Blue in 10 cc of absolute alcohol and add 5 cc of distilled water.....	.25	2.55

Per Tube Per doz. tubes

TOISON BLOOD FLUID. For the preservation of blood corpuscles and the counting of the same. Dissolve one "Soloid" product in 3 cc of glycerine and 16 cc of distilled water. The solution should always be filtered immediately before use. It acts as a simple diluent, prevents clotting and preserves the natural appearance of the red corpuscles. At the same time the nuclei of the white corpuscles are faintly tinted, so as to facilitate their recognition and counting; but no means is afforded for discriminating between the different varieties.	.25	2.55
METHYL ALCOHOL , pure, in hermetically sealed glass phials containing 15 cc.	.25	3.00

Staining Material in Solution

These solutions are made in every case in accordance with the author's latest formula, and from Gruebler's dry stains. Because of the instability of many of these solutions, we cannot guarantee their performance unless they are used promptly after delivery. We recommend the purchase of dry stains and the preparation of solutions in the laboratory, as the most satisfactory and economical method. The solutions listed below are those for which we have most demand and are kept in stock ready for immediate delivery. Others made promptly to order.

	Author	25 Grams	100 Grams
AMMONIA WATER-GENTIAN VIOLET	Weigert	.28	.45
ANILINE WATER-GENTIAN VIOLET	Gram	.25	.45
BIONDI-EHRlich-HEIDENHAIN'S TRIPLE MIXTURE		.30	.60
BISMARCK BROWN, saturated aqueous solution		.20	.35
" BROWN	Weigert	.25	.45
" BROWN, saturated alcoholic solution		.30	.60
BORAX- CARMINE	Grenacher	.20	.30
" CARMINE, alcoholic	Grenacher	.30	.55
CARBOL-FUCHSIN. (Gabbett's Solution I.) For use in staining tuberculi bacilli in connection with Gabbett's Methylene Blue	Ziehl-Nielsen	.25	.40
CARBOL XYLOL, for clearing	Weigert		.20
CONGO RED		.20	.35
CONGO RED SOLUTION in diluted alcohol		.30	.55
EHRlich, TRIACID SOLUTION, for neutrophile granules		.45	.80
" TRIPLE MIXTURE, for eosinophilous cells		.60	1.10
EOSIN, BLUSH		.25	.45
" YELLOWISH, saturated alcoholic solution		.30	.60
" YELLOWISH, saturated aqueous solution		.20	.40
EOSINATE OF METHYLENE BLUE	Jenner	.40	.75
GABBET, Bacillus Stain, Solution II. For use in staining tuberculi bacilli in connection with Carbol Fuchsin		.25	.40
GENTIAN VIOLET, saturated aqueous solution		.25	.45
" VIOLET, saturated alcoholic solution		.25	.45
" VIOLET	Ehrlich	.25	.45
GIEMSA'S STAIN. For use in staining malarial parasites. Equal parts of Azure II and Eosin solution ready for use		.30	.50
GOLDHORN, Polychrome Methylene Blue		.45	1.50
" "One-Solution"		.60	1.65
HAEMATOXYLIN, concentrated	Delafield	.35	.60
" IRON, Solution No. 1	Heidenhain	.20	.35
" IRON, Solution No. 2	Heidenhain	.30	.50
HARRIS' MODIFICATION OF ROMANOWSKY'S STAIN		.40	...
HASTING'S STAIN		.50	1.25
IODINE SOLUTION	Gram	.20	.35
JENNER'S EOSINATE OF METHYLENE BLUE		.40	.75
LEISCHMAN'S BLOOD STAIN		.30	.75
METHYLENE BLUE, for bacillus	Loeffler	.25	.45
" BLUE, Acetic acid, for diphtheria bacillus	Neisser	.25	.40
" BLUE, (Soapymethylene blue)	Nissl	.30	.50
" BLUE, Gabbet's		.25	.40
" BLUE, Polychromatic	Goldhorn	.45	1.50
" BLUE, saturated alcoholic solution		.50	1.00
" BLUE, saturated aqueous solution		.40	.80
NEUSSER'S STAIN		.20	.35
PAPPENHEIM STAIN		.20	.35
TINCTURE FOR STAINING ELASTIC TISSUE	Weigert	.55	1.00
TOISSON SOLUTION		.20	.35
VAN GIESON SOLUTION		.35	.65
WRIGHT'S STAIN, guaranteed		.50	...
ZIEHL-NIELSON CARBOL FUCHSIN		.25	.40

Reagents for Serological Work

These reagents are furnished in original packages only and are manufactured by the H. K. Mulford Company.

	Size pkg.	Per pkg.
AGGLUTINATING SERUM, Cholera.....	1 grm.	2.00
" SERUM, Typhoid.....	1 grm.	2.00
" SERUM, Paratyphoid, "A".....	1 grm.	2.00
" SERUM, Paratyphoid, "B".....	1 grm.	2.00
ANTI HUMAN HEMOLYTIC AMBOCEPTOR PAPER.....	10 tests	3.00
ANTISHEEP HEMOLYTIC AMBOCEPTOR.....	1 cc.	5.00
" HEMOLYTIC AMBOCEPTOR PAPER.....	10 tests	3.00
ANTIGEN-NOGUCHI.....	10 tests	3.00
ANTIGEN, Cholesterin, Fortified.....	10 tests	2.00
BORDEN OUTFIT for Serodiagnosis of Typhoid Fever.....	Outfit	3.50
BASS TEST for Serodiagnosis of Typhoid Fever.....	60-120 tests	2.50
NOGUCHI REAGENTS, Antigen and Amboceptor.....	10 tests	5.00

Kahlbaum Collections

Kahlbaum collection of 200 different Carbon combinations, in stoppered glass specimen vials with foot, each containing from 15 to 150 cc. of material. Imported to order only. Price "duty free".....	\$75.00
Kahlbaum collection of 98 substances in glass vials, arranged according to Knorr & Duden for the introduction to the study of organic chemistry. Imported to order only. Price "duty free".....	9.00
Kahlbaum collection for demonstrations in physical chemistry without loss of material, after Prof. Dr. E. Bosc, experiments 1 to 17, with printed directions, packing included, but without tube No. 8b of Carbonic Acid. Imported to order only.	
Price, "duty free".....	52.75
Carbonic Acid tube, extra, "duty free".....	4.80

Liquified Gases

Liquified Gases, in glass tubes for demonstrations, Kahlbaum. Each tube furnished in a velvet lined case. Imported to order only.

	Duty Free
Ammoniak (Ammonia).....	\$3.20
Chlor (Chlorine).....	3.20
Cyan (Cyanogen).....	5.12
Kohlenoxydsulfid (Carbon Oxy sulphide).....	5.12
Kohlensäure (Carbon Dioxide).....	4.80
Methyläther (Methyl Ether).....	3.84
Methylchlorid (Methyl Chloride).....	2.88
Nitrosylchlorid (Nitrosyl Chloride).....	4.48
Phosgen (Phosgene).....	2.56
Salzsäure (Hydrochloric Acid).....	3.84
Schweflige Säure (Sulphur Dioxide).....	2.56
Schwefelwasserstoff (Hydrogen sulphide).....	5.12
Stickoxydul (Nitrous Oxide).....	5.12
Stickstofftetroxyd (Nitrogen Peroxide).....	4.48

