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*1911*









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Bulky or heavy goods can be sent C. O. D. by freight, in care of the nearest bank, or by arrangement with Wells Fargo & Co's Express.

Prices in this edition have all been carefully revised and in many cases lowered. On orders of twenty dollars and upwards, on most articles, a discount will be allowed.

# OUR SPECIALTIES

Battersea (London) Crucibles, Muffles, Scorifiers, Furnaces, Etc.

Denver Fire Clay Company, Denver, Colorado.

Baker & Adamson's C. P. Acids and Ammonia.

Ziegler Electric Company, Boston, Mass.

Denniston's Silver-Plated Amalgam Plates.

Oertling's, Becker's, Troemner's, Ainsworth's and Smith & Thompson's Assay and Bullion Balances and Weights.

**Bone Ash.**—Prepared expressly for Assayer's use. We have three grades, viz.: No. 1 Extra, No. 1 and No. 2, all from carefully selected bones, well burnt and ground, such as we have sold for years, and well known as J. T. & Co's Bone Ash.

Blowpipe Balances and Utensils.

Hoskins' Hydro-Carbon Blowpipes and Furnaces.

Fletcher's Blowpipes, Burners and Furnaces.

**Litharge.**—Chemically pure, put up in 25-lb. bags.

**Pure Assay Lead.**—Guaranteed, granulated, rolled in thin sheets, also in small bars.

**Chemical Apparatus** in all its variety. We are always prepared to make, at short notice, new apparatus for any special purpose.

**Our Gold and Silver Tables**, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free on application.



House 1613  
1886

ESTABLISHED 1852

INCORPORATED OCT. 1895

# JOHN TAYLOR & CO.

*Illustrated catalogue*

Importers, Dealers  
and Manufacturers of

## ASSAYERS' MATERIALS

MINE AND MILL SUPPLIES

## SCHOOL, PHYSICAL AND CHEMICAL APPARATUS

CHEMICALS, ETC.



Books on Assaying, Mining and Chemistry



UNION FOUNDRY BLOCK, COR. FIRST AND MISSION STS.

SAN FRANCISCO, CALIF.

1899

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SEVENTH EDITION.

# TO OUR PATRONS

WE again take pleasure in handing you our new and carefully revised CATALOGUE AND PRICE LIST, being our seventh edition. This catalogue is not alphabetically arranged, but articles are classified and put together as nearly as possible with a view for the convenience of buyers making selections.

We have taken great pains in preparing this edition; prices have all been thoroughly revised and made lower on many articles. We bespeak a careful comparison in this respect. Quite a list of new articles has been added, many of our own manufacture and modeled from our own designs and molds. We think all will be found fully up to the growing wants of the miner, assayer, chemist, and schools.

*Acids, Bone Ash, Bluestone, Cyanide of Potash, Borax, Manganese,* and many supplies and materials are manufactured here; and all articles, taking into consideration the quality and adaptation to the wants of the mining interests (which we can assure from our long experience in the line), can, we think, be supplied here as advantageously as elsewhere.

We keep a full stock of *Mercks Pure Chemicals*.

All our *Boiling Flasks* and *Beakers* are carefully selected from the best Bohemian manufacturers, and are of uniform thickness and full size as per factory numbers.

All articles will be furnished as low as the same quality can be had in the market. Staple chemicals in quantity will be quoted at net prices; our customers will have the benefit of the lowest prices as the market fluctuates.

Our Crucibles, Glass, Porcelain Ware, etc., we import direct by sail vessel, at lowest freights, from the largest and best known manufacturers, and can sell on most favorable terms.

We are agents for the Pacific Coast for the *Morgan Crucible Company* (*Battersea, London*), whose goods are illustrated throughout the Catalogue. Also other agencies, see list elsewhere.

We aim to keep in stock all books used by chemists, assayers, and miners, and procure new books as published. We also import foreign publications.

Orders from strangers must be accompanied with the cash or a satisfactory reference.

On all orders to be sent C. O. D. a remittance will be required as a guarantee for expressage both ways. Boxing and cartage at cost. All goods packed with the utmost care by experienced hands. Our responsibility ceases upon delivery of goods to the carrier and obtaining a shipping receipt. We will not guarantee against breakage of goods in transit unless they are insured.

Having enjoyed the confidence of the mining community for over forty years, we may confidently promise that any orders intrusted to us will be filled with fidelity and dispatch, with the best quality of goods in our line.

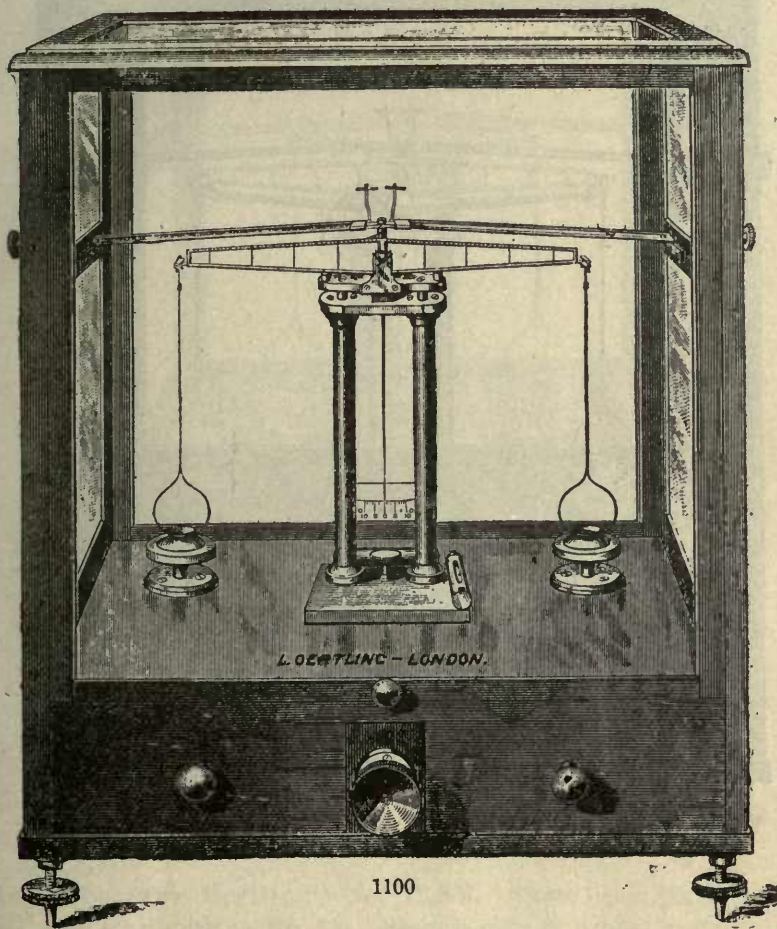
Hoping to be favored with your continued orders,

We are, yours truly,

JOHN TAYLOR & CO.

SAN FRANCISCO, JUNE, 1899.

## ASSAY BALANCES.

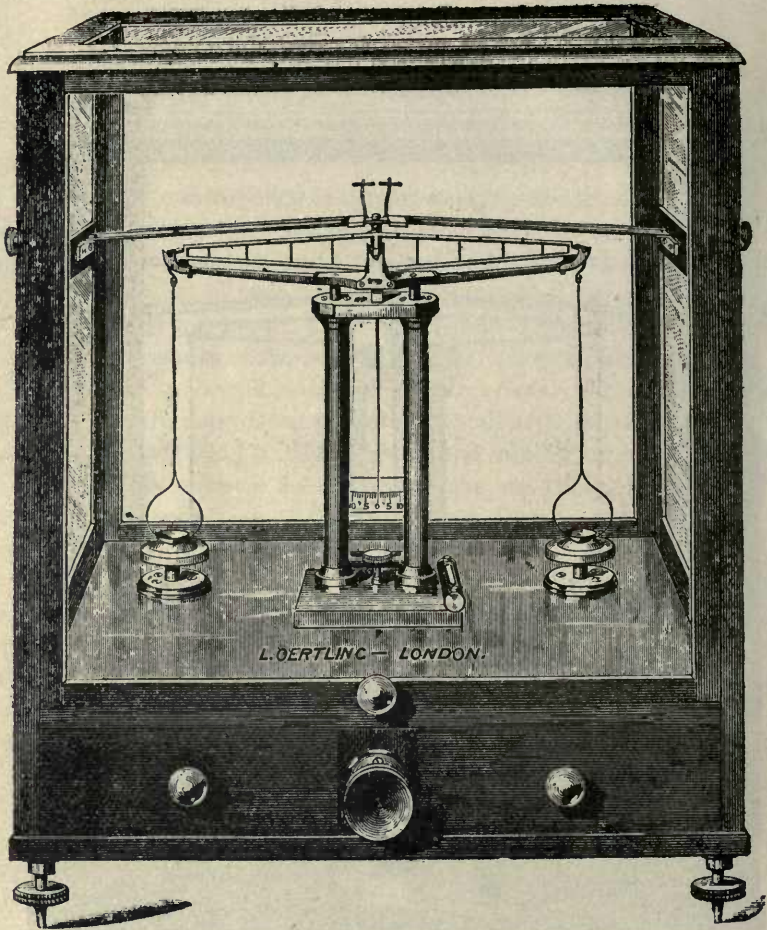


1100

No.  
1100 Assay Balance, Oertling's No. 12, with a beam 10 inches long, of an improved construction, on a stand with double columns; to carry 2 grammes in each pan, and turn with riders. Beam divided into 50 parts. Takes a 5 milligramme rider which reads  $\frac{1}{10}$  milligramme, or takes a 1 milligramme rider which reads  $\frac{1}{100}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{200}$  milligramme. Rider arrangement on both arms of the beam; has agate knife edges working on agate planes; plate glass for the bottom of the case.

Price, without weights ..... \$175.00

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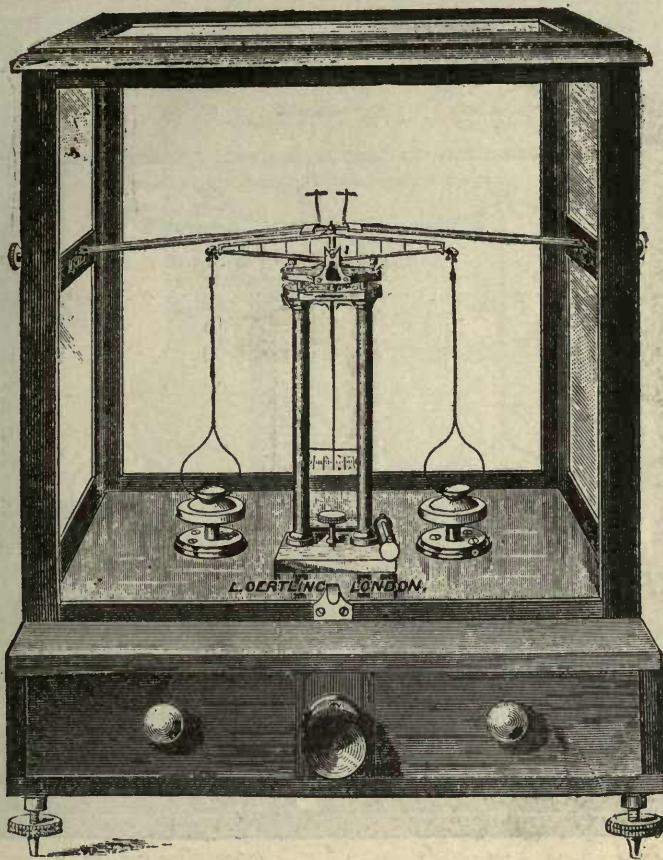


1101

No.

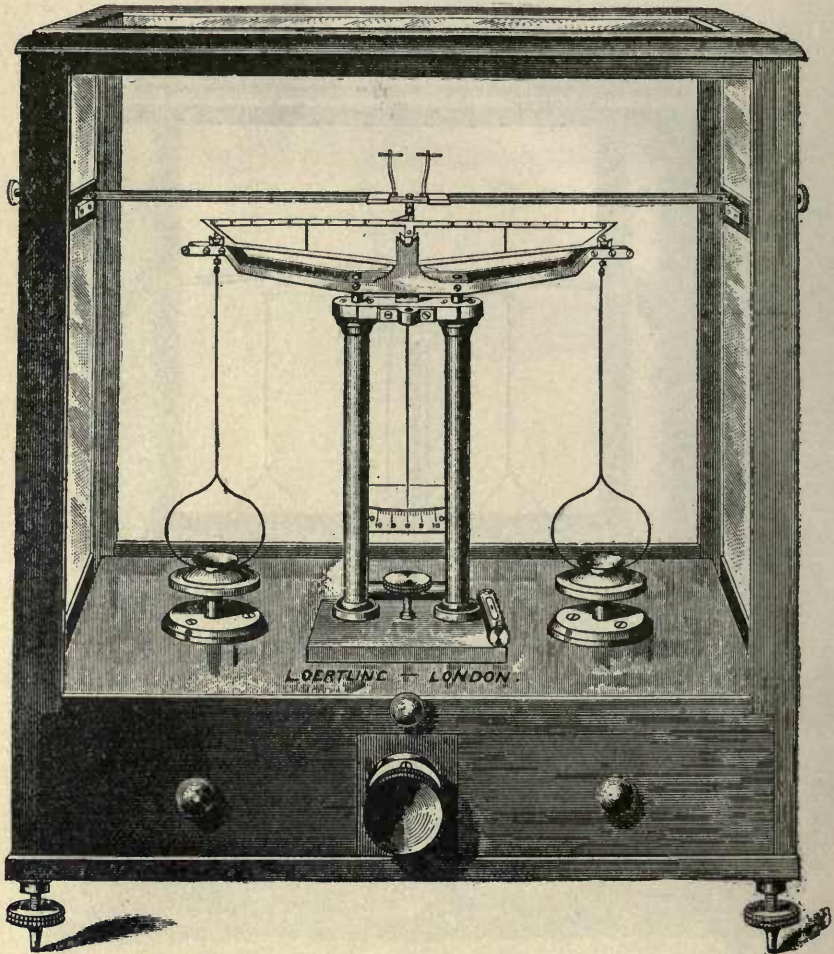
1101 **Assay Balance, Oertling's No. 12 A**, with a beam 10 inches long, of an improved construction, with arms to support the beam and lift it and the pan hangers from the knife edges; to carry 2 grammes in each pan, and turn with 0.1 milligramme. Rider arrangement on both arms of the beam. Beam is divided into 50 parts. Takes a 5 milligramme rider which reads  $\frac{1}{10}$  milligramme, or takes a 1 milligramme rider which reads  $\frac{1}{50}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{100}$  milligramme. Has agate knife edges working on agate planes; plate glass for the bottom of the case.

Price, without weights. . . . . \$225.00



1102

- No.  
 1102 **Assay Balance, Oertling's No. 12 SB.** Short beam, [same style and sensibility as No. 12. Beam is only 6 inches long; index pointer reaches down 5 inches below center of knife edge, which is made of agate and rests upon agate planes, so that a very slight movement of end of beam is multiplied, and easily read on graduated ivory scale. Beam divided into 50 parts. Takes a 5 milligramme rider which reads  $\frac{1}{10}$  milligramme, or takes a 1 milligramme rider which reads  $\frac{1}{50}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{100}$  milligramme. Rider arrangement on both arms of the beam; has agate knife edges working on agate planes; plate glass for the bottom of the case.
- Price, without weights..... \$175.00



1103

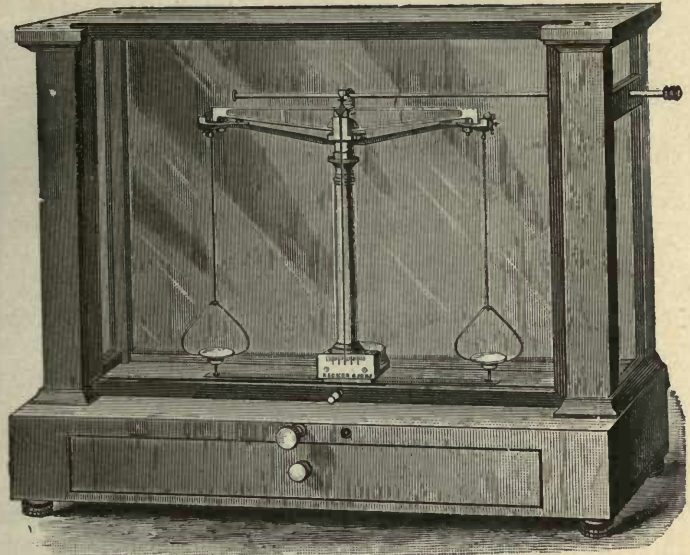
No.

1103 **Assay Balance, Oertling's No. 12 C**, with 8-inch beam, of an improved construction, to carry 5 grammes in each pan, and turn with  $\frac{1}{10}$  milligramme. Rider arrangement on both arms of the beam. The beam is fitted with agate knife edges, working on agate planes, and is divided into 100 divisions; 50 divisions on each arm, the last division at each end coinciding with the end knife edge; double rider-slide; plate glass to bottom of case; reflector for illuminating the divisions on the beam; polished mahogany glass case, with counterpoise weights to front slide. This instrument is richly gilt. Takes a 5 milligramme rider which reads  $\frac{1}{10}$  milligramme, or takes a 1 milligramme rider which reads  $\frac{1}{50}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{100}$  milligramme.

Price, without weights..... \$250.00

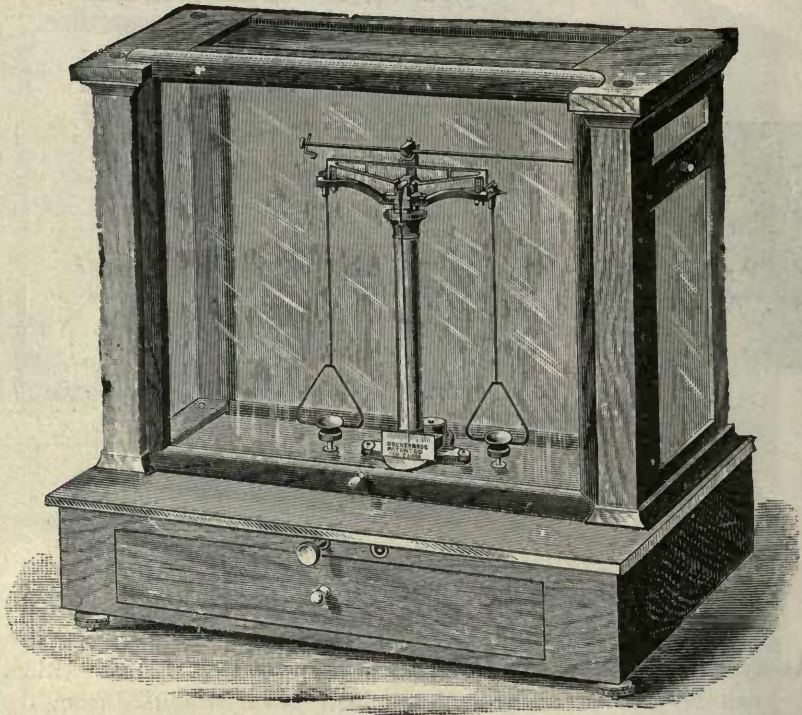


1112



1113

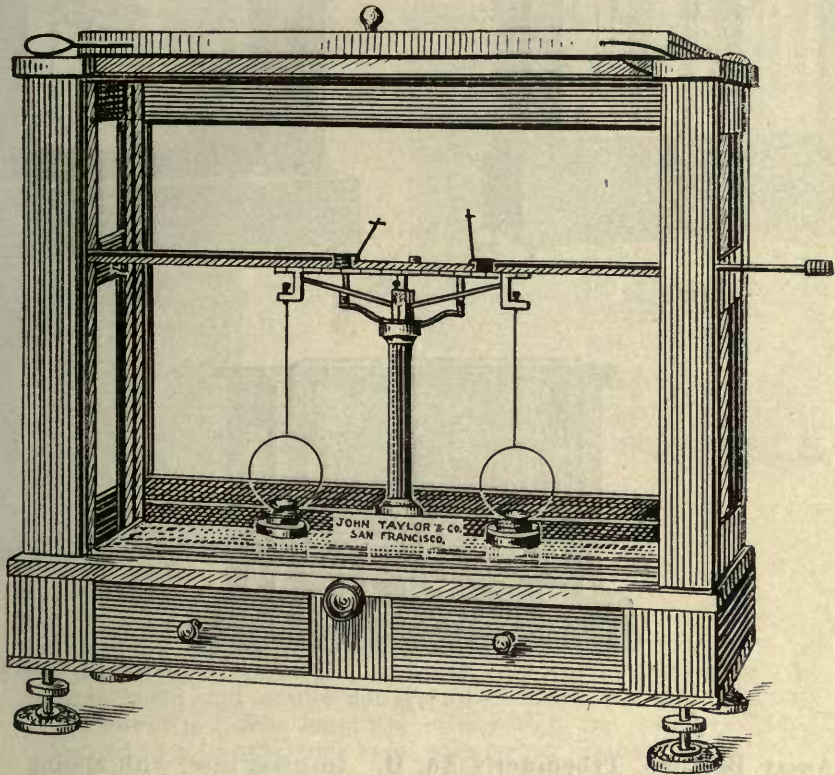
- No.  
 1111 **Assay Balance, Becker's No. 1 A, with apparatus for rider.** Rider can be placed on the center of the beam and used from the O point. Needle deviates 20 divisions on scale for one milligramme. Takes a 2 milligramme rider which reads  $\frac{1}{10}$  milligramme. Can be charged up to 25 grammes. Steel knife edges resting upon agate planes.  
 Price, without weights..... \$ 65.00
- 1112 **Assay Balance, Becker's No. 2, portable, in French polished glass case, 9 inches long,  $9\frac{3}{4}$  inches high and 3 inches deep, sliding frame counterpoised; packed in a light box, with strap for carrying, weighing, all boxed,  $4\frac{1}{2}$  lbs.** Needle deviates 20 divisions on the scale for 1 milligramme. Takes a 2 milligramme rider which reads  $\frac{1}{10}$  milligramme. With apparatus for rider, set of weights, 1 platinum gramme to  $\frac{1}{10}$  milligramme.  
 Price, with weights..... \$ 75.00
- 1113 **Assay Balance, Becker's No. 5.** Of improved construction, for a charge in each pan of 10 grammes, with apparatus to move riders upon beam; knife edges of steel resting upon agate planes. The beam is divided into 20 equal parts. The needle deviates 20 divisions on scale for 1 milligramme. Balance is provided with set of riders, 2 milligrammes, which reads to  $\frac{1}{10}$  milligramme. Glass case with sliding door.  
 Price, without weights..... \$ 95.00



1116

- No.  
 1114 **Assay Balance, Becker's No. 5 A.** Assay Balance improved, on plate glass base, with agate knife edges and agate planes. Both arms of beam are divided into 100 parts. Takes a 2 milligramme rider which reads  $\frac{1}{50}$  milligramme. Needle deviates 20 divisions on the scale for 1 milligramme.  
 Price, without weights ..... \$125.00
- 1116 **Assay Balance, Becker's No. 4.** Short beam; in French polished mahogany, glass case, front sliding frame counterpoised, with glass top to admit light on beam. All parts of the balance are mounted and fastened on plate glass  $\frac{5}{16}$  inch thick, so that nothing can get out of order through warping of the wood. All bearings are agate planes with agate knife edges; the beam is graduated into  $\frac{1}{50}$  milligramme, and in such a manner that the rider can be placed on the center of the beam and used from the O point to either end of the beam. Needle deviates 50 divisions on the scale for 1 milligramme. Beam is divided into 60 equal parts. Takes a rider  $1\frac{1}{10}$  milligrammes which reads  $\frac{1}{50}$  milligramme.  
 Price, without weights ..... \$135.00



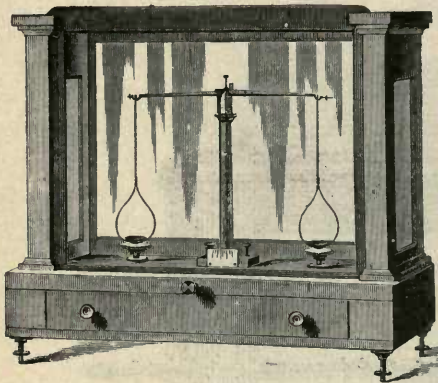


1118

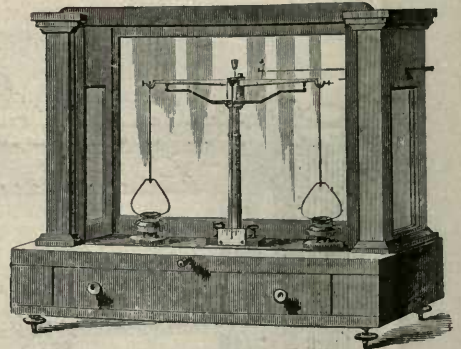
No.

1118 Assay Balance, John Taylor & Co.'s. Sensible to  $\frac{1}{100}$  of one milligramme, in polished mahogany glass case, plate glass base, glass top to admit light, sliding door counterpoised. The beam is made of aluminum, six inches in length and is divided into 50 divisions on each side of center. Takes a 1 milligramme rider which reads  $\frac{1}{50}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{100}$  milligramme. The beam is open top, that is, the rider can be placed anywhere from the center division to the last divisions which are over the knife edges. This balance has agate knife edges, and agate bearings, fall-away pan rests, double rider attachment level and leveling screws. A most excellent balance in every respect.

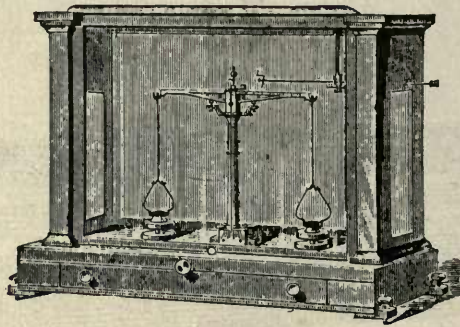
Price, without weights..... \$100.00



1121

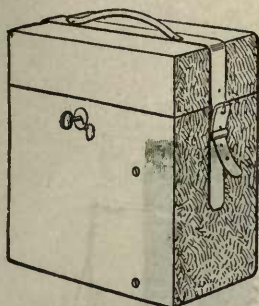


1122

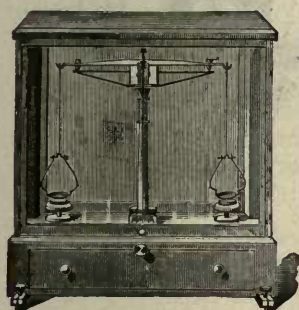


1123

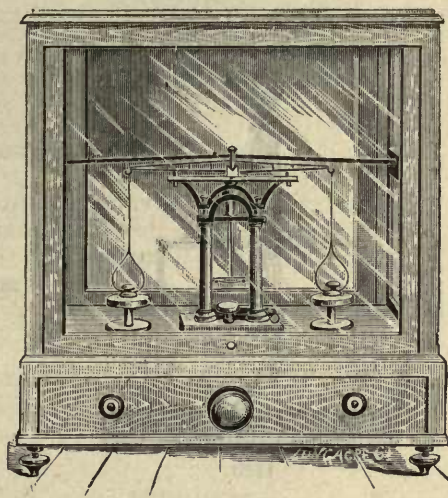
- No.  
 1120 **Assay Balance, Troemner's No. 0.** In glass case, with sliding door.  
 Price, including set of weights, either 10 grains to  $\frac{1}{100}$  grain or 1 gramme to 1 milligramme ..... \$ 35.00
- 1121 **Assay Balance, Troemner's No. 1.** French polished mahogany case, and sliding door counterpoised. All bearings of agate with steel knife edges. Needle deviates 10 divisions on scale for 1 milligramme.  
 Price, without weights ..... \$ 55.00
- 1122 **Assay Balance, Troemner's No. 2.** Aluminum beam, arranged with rider apparatus. Beam is divided into 60 equal parts. Takes a rider, 6 milligrammes, which reads  $\frac{1}{10}$  milligramme. All bearings of agate with steel knife edges. Needle deviates 20 divisions on scale for 1 milligramme.  
 Price, without weights ..... \$ 80.00
- 1123 **Assay Balance, Troemner's No. 3.** Of great sensibility; the needle indicating 40 full divisions for 1 milligramme. Beam is divided into 60 parts. Takes a rider, 6 milligrammes, which reads  $\frac{1}{10}$  milligramme. All bearings of agate. Open beam of pure aluminum; has new improved rest for riders; mahogany case with glass top, and bottom of heavy plate glass. Balance is sensible to  $\frac{1}{100}$  milligramme.  
 Price, without weights ..... \$ 95.00



1124



1124

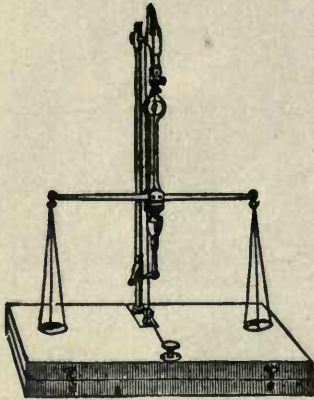


1125

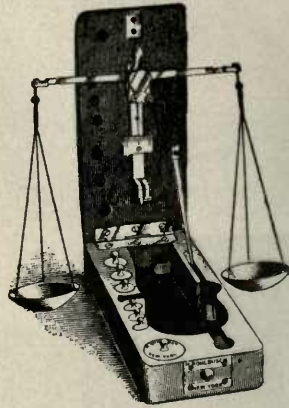
- No.  
**1124 Assay Balance, Troemner's, portable.** In a fine French polished case; beam and needle not disturbed when packed up; case measures  $9\frac{1}{2}$  inches long,  $9\frac{3}{4}$  inches high and 4 inches deep. Packed in a light outside case, with strong leather hand-strap. Needle deviates 20 full divisions for 1 milligramme. A full set of weights, from 1 platinum gramme to  $\frac{1}{100}$  milligramme, included.  
 Price, with weights..... \$ 70.00
- 1125 Assay Balance, Troemner's Extra Fine, No. 5 (new).** Of the very finest and most delicate construction. Beam is of pure aluminum, with agate knife edges and all bearings of agate. Has a double column, with improved new eccentric lift that works perfectly smooth and regular. Beam divided on both arms. Beam divided into 50 parts, and takes a rider, 5 milligrammes, which reads  $\frac{1}{10}$  milligramme, or takes a 1 milligramme rider which reads  $\frac{1}{50}$  milligramme, or takes a  $\frac{1}{2}$  milligramme rider which reads  $\frac{1}{100}$  milligramme. Glass case is large and roomy, with heavy plate glass bottom. The balance has recently been improved and will indicate  $\frac{1}{1000}$  of a milligramme. The sensibility has been vastly increased, and it is the equal of any balance made. This balance is intended for the skilful and careful assayer, and is too delicate for rough work or rough handling. Needle indicates 40 full divisions for 1 milligramme.  
 Price, without weights..... \$175.00

NOTE.—This balance is used as an Umpire Balance at the U. S. Assay Office, New York, at the State School of Mines, Golden, Colorado, and at the San Francisco Mint.

Special attention is called to the superior quality of Agate Bearings. The small additional cost of agate bearings is merely nominal when compared with the manifold advantages attained. In damp or moist climates agate is invaluable, as it will not rust or corrode, and is indestructible.



1130



1131

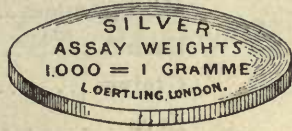
No.  
 1130 **Assay Balance, Plattner's Blowpipe.** Packs in box  $10\frac{1}{2}$  inches long,  $6\frac{1}{4}$  inches wide,  $1\frac{3}{8}$  inches deep. Power 10 grains to  $\frac{1}{100}$ ; beam  $7\frac{1}{2}$  inches long, with 2 pairs movable pans, and ivory spoon. With weights, 10 grains to  $\frac{1}{100}$  grain, or 1 gramme to 1 milligramme.

Price..... \$ 25.00

1131 **Assay Balance, Pocket.** For traveling; when closed, measures 6 inches long,  $2\frac{3}{4}$  inches wide, and  $1\frac{1}{4}$  inch high. Is raised and lowered by means of drop-lever. Including weights, 10 grammes down to 1 milligramme, neatly fitted in box, as shown in cut. Shows 4 divisions for 1 milligramme. This balance can be supplied with a  $\frac{1}{2}$  assay ton weight (if desired) in place of the 10 gramme weight, making it complete for a pulp scale or for assaying where  $\frac{1}{4}$  milligramme is sufficient.

Price ..... \$ 18.00

# ASSAY WEIGHTS.



1150-1-2

No.									
1150	Assay Weights, Oertling's.	In ivory boxes, screw lid, marked 1000=1 gramme. Sheet platinum weights, 1 gramme to 1 milligramme, and 6 riders, each 10 milligrammes.							\$ 13.00
1151	—	Same style as 1150, marked 1000=½ gramme. Sheet platinum weights, ½ gramme to ½ milligramme, and 6 riders, each weighing 5 milligrammes.							13.00
1152	—	Same style as 1150, marked 1000=10 grains. Platinum wire weights, 10 grains to 1/100, and 6 riders, each 1/10 grain.							13.00
1160	—	<b>Becker's, No. 1.</b> Ebony box; 1 platinum gramme and down to 1/10 milligramme.							10.60
1161	—	No. 9. Same style, 10 grains to 1/1000 grain.....							10.60
1170	—	<b>Troemner's.</b> In ebony box; largest weights made of platinum; 1 platinum gramme to 1/10 milligramme.....							8.50
1171	—	Same style, 10 grains to 1/1000 grain.....							9.50
1172	—	In mahogany box; aluminum; 1 aluminum gramme to 1 milligramme.....							5.00
1173	—	Same style, 10 grains to 1/100 grain.....							5.00
1180	—	<b>Becker's.</b> Single, separate from full sets, without boxes. Made of sheet platinum.							
		Milligrammes..	500	200	100	50			
		Each .....	\$1.10	1.00	.85	.75			
		Grains.....	10	5	2	1			
		Each .....	\$1.10	1.00	.85	.75			
1181	—	Made of platinum wire.							
		Milligrammes..	1	2	5	10	20	50	100
		Each .....	\$ .40	.40	.45	.50	.60	.75	.90
		Grains.....	10	5	2	1			
		Each .....	\$1.00	.85	.75	.75			
1182	—	Made of sheet aluminum.							
		Milligrammes..	20	10	5	2	1		
		Each .....	\$ .50	.45	.40	.35	.35		
		Grains.....	5/10	2/10	1/10	5/100	2/100	1/100	
		Each .....	\$ .50	.40	.35	.40	.35	.35	

No.

1183	<b>Assay Weights.</b>	Made of aluminum wire.								
	Milligrammes..	10	5	2	1	$\frac{5}{10}$	$\frac{2}{10}$	$\frac{1}{10}$		
	Each .....	\$ .50	.50	.35	.25	.30	.25	.25		
	Grains.....	$\frac{5}{10}$	$\frac{2}{10}$	$\frac{1}{10}$	$\frac{5}{100}$	$\frac{2}{100}$	$\frac{1}{100}$	$\frac{5}{1000}$	$\frac{2}{1000}$	$\frac{1}{1000}$
	Each .....	\$ .35	.30	.25	.25	.25	.25	.35	.30	.25

**SECOND QUALITY**—Made of German Silver Sheet.

1184	—	Milligrammes..	500	200	100	50	20	10
		Each .....	\$ .80	.75	.60	.50	.40	.30
		Grains.....	10	5	2	1		
		Each .....	\$ .65	.55	.50	.40		

1190 — **Single, Oertling's,** as in set No. 1152, marked 1000=10 grains.

Made of platinum wire.

Grains.....	10	5	3	2	1
Each.....	\$1.00	.90	.80	.75	.70

Made of aluminum wire.

Grains.....	$\frac{5}{10}$	$\frac{3}{10}$	$\frac{2}{10}$	$\frac{1}{10}$	$\frac{5}{100}$	$\frac{3}{100}$	$\frac{2}{100}$	$\frac{1}{100}$
Each .....	\$ .65	.60	.55	.50	.45	.40	.35	.30

1191 — as in set No. 1150, marked 1000=1 gramme.

Made of platinum sheet.

Milligrammes, 1000	500	200	100	50	
Each.....	\$1.30	1.10	1.00	.90	.80

Made of aluminum sheet.

Milligrammes, 20	10	5	2	1	
Each.....	\$ .70	.60	.40	.35	.35

1192 — as in set No. 1151, marked 1000= $\frac{1}{2}$  grammes.

Made of platinum sheet, gold plated.

Milligrammes, 1000- $\frac{1}{2}$	500- $\frac{1}{2}$	200- $\frac{1}{2}$	100- $\frac{1}{2}$	50- $\frac{1}{2}$	
Each.....	\$1.30	1.10	1.00	.90	.80

Made of aluminum sheet, gold plated.

Milligrammes, 20- $\frac{1}{2}$	20- $\frac{1}{2}$	5- $\frac{1}{2}$	2- $\frac{1}{2}$	1- $\frac{1}{2}$	
Each.....	\$ .70	.60	.50	.40	.35

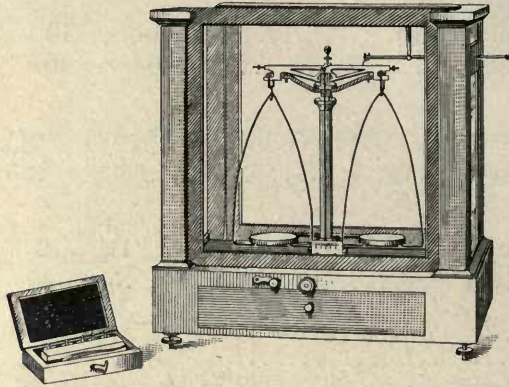
## RIDERS FOR ASSAY AND ANALYTICAL BALANCES, MADE OF ALUMINUM.

No.							
1195	<b>Oertling's</b> , gold-plated .....	$\frac{1}{10}$ grain,	10	5		milligrammes.	
	Each .....	\$ .40	.40	.40			
1197	<b>Becker's</b> , .....	$\frac{2}{100}$	$\frac{12}{100}$		$\frac{12}{1000}$	grains.	
	Each .....	\$ .35	.35	.50			
1198	— .....	1	$1\frac{1}{10}$	2	12	milligrammes.	
	Each .....	\$ .50	.50	.35	.35		
1199	<b>Troemner's</b> .....	$\frac{5}{100}$	$\frac{6}{100}$		$\frac{12}{100}$	grains.	
	Each .....	\$ .35	.35	.35			
1200	— .....	$\frac{1}{2}$	1	5	6	12	milligrammes.
	Each .....	\$ .50	.50	.35	.35	.35	

## EXTRA PANS FOR ASSAY BALANCES, IN PAIRS, BALANCED.

No.						
1201	<b>Oertling's</b> of silver.					
	Diameter, $\frac{3}{4}$ inch; per pair .....					\$2.50
1202	<b>Troemner's</b> , brass, nickel-plated.					
	Diameter, $\frac{3}{4}$ inch; per pair .....					\$1.00
1203	<b>German</b> , deep form, brass, nickel-plated.					
	Diameter .....	$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{7}{8}$	$1\frac{1}{16}$	inches.
	Per pair .....	\$1.00	1.00	1.00	1.00	
1204	— fine horn.					
	Diameter .....	$\frac{5}{8}$	$1\frac{1}{16}$			inches.
	Per pair .....	\$1.00	1.00			

## ANALYTICAL BALANCES.



1205

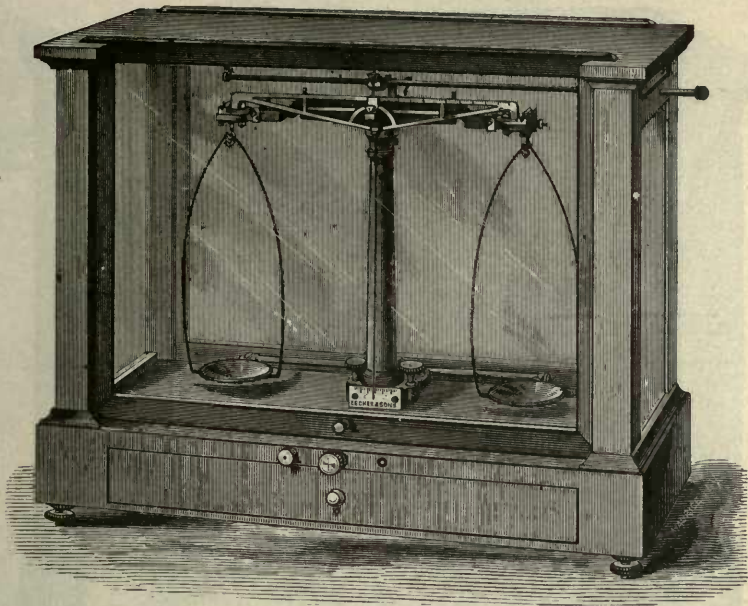
No.  
**1205 Analytical Balance, with Non-Corrosive Weights.** This balance combines features which are not to be had in any other balance for the same price. Short beam of aluminum, graduated for rider, with adjusting screws on both ends. Sensibility  $\frac{1}{10}$  of a milligramme with a load of 100 grammes. Knife edges and planes of agate. Arrests for pans of most approved kind, with automatic stop. Bows and pans extra wide, admitting 4 inch dish. Mahogany case, with glass top; best American workmanship. The weights range from 1 milligramme to 50 grammes. The weights from 1 milligramme to 0.5, and riders are of solid platinum; the large weights are platinum plated, making them non-corrosive. This set will be furnished in a fine mahogany box.

Price, balance and weights..... \$ 60.00

**1206 Analytical Balance, Troemner's No. 2,** capacity 100 grammes in each pan. Sensible to  $\frac{1}{20}$  milligramme. Beam 10 inch, divided into  $\frac{1}{10}$  milligramme; pans  $2\frac{1}{2}$  inches. Improved arrest for pans; apparatus for specific gravity. In a fine French polished glass case, with counterpoised sliding door; all of the finest finish and best construction.

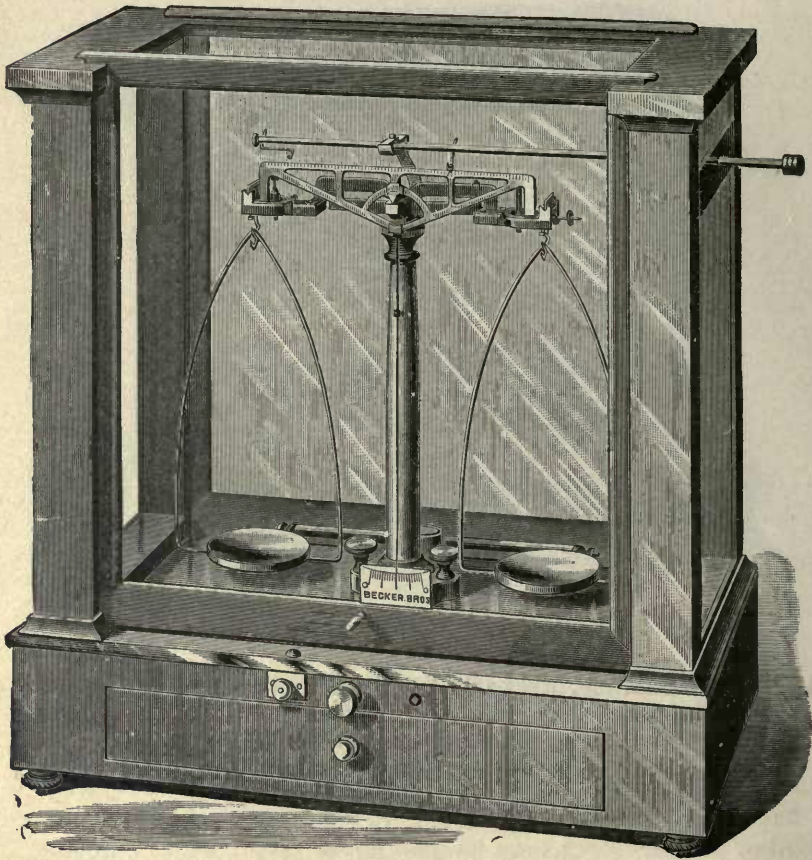
Price, without weights..... \$ 85.00





1213

- No.  
 1210 **Analytical Balance, Becker's No. 6.** Improved. For charge up to 100 grammes in each pan, in French polished glass case, front sliding frame counterpoised, steel knife edges resting upon agate planes. Sensible to  $\frac{1}{4}$  milligramme with its full charge, with arrest for pans.  
 Price, without weights..... \$ 45.00
- 1211 **Analytical Balance, Becker's No. 6, Improved.** For charge up to 100 grammes in each pan, with apparatus for rider. Beam divided into 12 parts, and takes a rider, 12 milligrammes, which reads to 1 milligramme; there are half divisions, and  $\frac{1}{4}$  milligramme can easily be read. Steel knife edges resting upon agate planes.  
 Price, without weights..... \$ 50.00
- 1212 **Analytical Balance, No. 6 A, Short Beam.** In mahogany, French polished glass case, glass top for light on rider, front frame counterpoised, for a charge up to 100 grammes in each pan. Sensible to  $\frac{1}{10}$  milligramme. Beam graduated in  $\frac{1}{2}$  milligramme; provided with improved pan arrest, riders, agate bearings, etc.  
 Price, without weights..... \$ 60.00
- 1213 **Analytical Balance, Becker's No. 7.** For a charge up to 100 grammes in each pan, in fine French polished glass case, front sliding frame counterpoised. Agate knife edges resting upon agate planes, with new improved arrangement for arrest of pans and beam. Sensible to  $\frac{1}{20}$  milligramme with its full charge; provided with apparatus for specific gravity, rider and weighing tubes. Beam divided into 120 equal parts, and takes a rider, 12 milligrammes, which reads to  $\frac{1}{10}$  milligramme; pans  $2\frac{3}{4}$  inches in diameter, with a pair of  $2\frac{3}{4}$  inch glass pans balanced.  
 Price, without weights..... \$ 95.00



1214

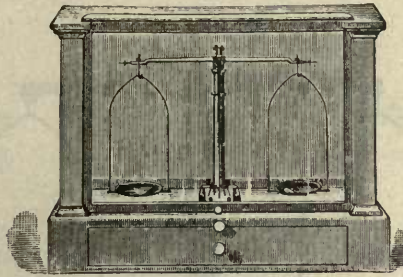
No.

**1214 Analytical Balance, Becker's No. 8 A.** Short beam balance for a charge up to 200 grammes in each pan and sensible to  $\frac{1}{20}$  milligramme. In French polished mahogany and glass case, front sliding frame counterpoised, with glass top to admit light on rider. All parts of the balance are mounted and fastened on plate glass  $\frac{5}{16}$  inch thick, so that nothing can get out of order through the warping of the wood. All bearings are agate planes, with agate knife edges. The beam is graduated, and in such a manner that the rider can be placed on the center of the beam and used from the O point to either end of the beam. Beam divided into 60 parts. Takes a rider, 6 milligrammes, which reads to  $\frac{1}{10}$  milligramme. This balance is provided with new improved arrangements for arrest of pans and beam, riders, apparatus for specific gravity and for weighing tubes. Pans  $2\frac{3}{8}$  inches in diameter. Width of pan support 4 inches; can be made wider if desired.

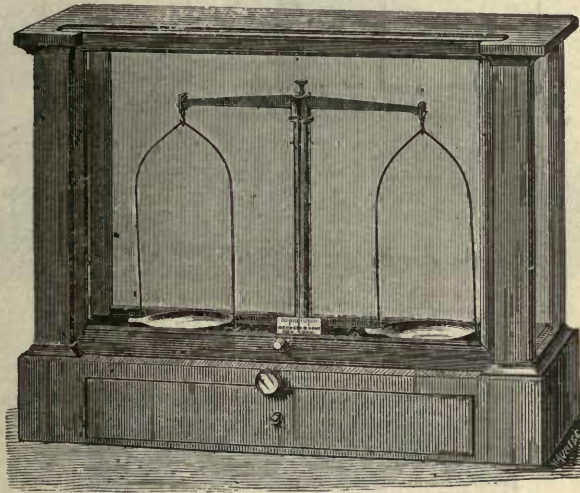
Price, without weights ..... \$125.00

**NOTE.**—All our Assay and Analytical Balances are provided free with a set of glass supports, which lie upon the table, and upon the top is a conical depression into which the leveling screws of the balance rest, giving solidity to the scale case. Also, one-half dozen Watch Glasses, two Camel's-Hair Pencil Brushes, one flat Camel's-Hair Brush, one pair Pincets and Riders.

With all scales we can furnish grain weights and riders in place of gramme weights, if desired.

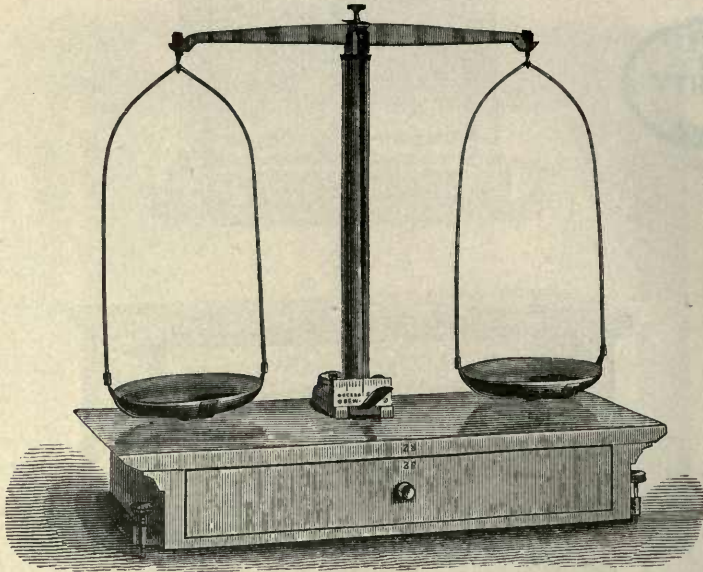


1218



1215

- |      |   |   |
|------|---|---|
| No.  |   |   |
| 1215 | — | <b>Pulp Balance, Becker's No. 16.</b> In French polished glass case; with counterpoised front, sliding scale, provided with eccentric for lifting, bows, and movable pans for a charge up to 2 ounces in each pan. Sensible to $\frac{1}{50}$ grain with its full charge.<br>Price, without weights..... \$ 22.00   |
| 1216 | — | <b>No. 18.</b> Same as No. 1215, but for a charge up to 5 ounces in each pan. Sensible to $\frac{1}{50}$ grain.<br>Price, without weights..... \$ 26.00   |
| 1217 | — | <b>No. 20.</b> Same as No. 1215, but for a charge of 10 ounces in each pan. Sensible to $\frac{1}{50}$ grain.<br>Price, without weights..... \$ 35.00   |
| 1218 | — | <b>Troemner's.</b> This balance is one of the best and most reliable that can be used. For stability and endurance it has no superior. Mahogany case, counterpoised door, sliding upward; has solid nickel pans; has adjusting screw on beam to balance scale. Capacity 2 ounces in each pan. It is sensible to $\frac{1}{50}$ grain.<br>Price, without weights..... \$ 22.00 |
| 1219 | — | <b>Taylor's.</b> Same as No. 1215, but with adjusting screws at each end of the beam.<br>Price, without weights..... \$ 22.00   |



1220



1223

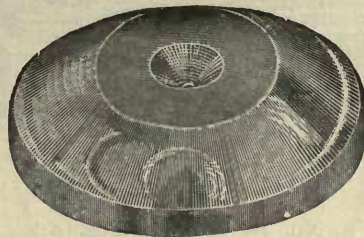
- |      |                                       |  |     |       |
|------|---------------------------------------|--|-----|-------|
| No.  |                                       |  |     |       |
| 1220 | <b>Pulp Balance, Becker's No. 14,</b> | on French polished box with drawer; eccentric for lifting, bows, and movable pans. Can be charged up to 2 ounces in each pan. Sensible to $\frac{1}{50}$ grain.  |     |       |
|      |                                       | Price, without weights .....   | \$  | 11.00 |
| 1221 | —                                     | <b>Becker's No. 17,</b> same as above. For 5 ounces in each pan, on French polished box with drawer, provided with eccentric for lifting, bows, and movable pans. Sensible to $\frac{1}{30}$ grain.                    |     |       |
|      |                                       | Price, without weights.....  | \$  | 15.00 |
| 1222 | —                                     | <b>Becker's No. 19,</b> same as above. For 10 ounces in each pan, on French polished box with drawer, provided with eccentric for lifting, bows, movable pans, set screws and level. Sensible to $\frac{1}{10}$ grain. |     |       |
|      |                                       | Price, without weights.....  | \$  | 22.00 |
| 1223 | <b>Levels, Spirit,</b>                | for balances. Brass mounted.   |     |       |
|      | Size .....                            | 3  | 4   | 5 in. |
|      | Each .....                            | \$ .50   | .60 | .70   |



1230



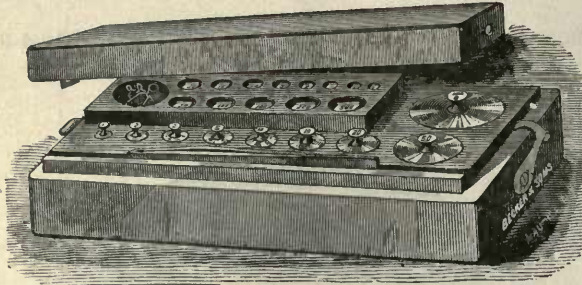
1232-3



1238

No.					
1224	<b>Brushes, flat, camel's-hair.</b>	For cleaning scale pans.			
		Inches .....	1	1½	2
		Each .....	\$ .30	.35	.40
1225	—	<b>pencils, camel's-hair.</b>	⅓ <sub>16</sub> inch quills, per dozen.....		\$ .35
1230	<b>Pulp Spoons, brass.</b>	Double end, ¾ and 1 inch bowls, each.....			\$ .50
1232	—	<b>japanned tin.</b>	Double ends, with two size cups, each		\$ .25
1233	—	<b>japanned tin.</b>	With one spatula end, convenient for measuring and mixing fluxes, each.....		\$ .25
1235	<b>Scale Pans, glass.</b>	Accurately balanced.			
		Diameter .....	2½	2¾	3 inches.
		Per pair.....	\$ .60	.60	.60
1236	—	<b>polished brass.</b>	Deep form, flattened at the bottom, balanced.		
		Diameter, 2¾ inches; per pair.....			\$1.00
1238	<b>Glass Feet, or circular discs, solid,</b>	for placing under the leveling screws of assay balances to give solidity. They have a conical recess to receive the point of screw; per dozen.....			\$ .75

# WEIGHTS OF PRECISION FOR ANALYTICAL ASSAYING AND SCIENTIFIC USE.



1242-4

No.

**Grain Weights.**

1242	—	Becker's, No. 10..1000 grains to $\frac{1}{100}$ , with riders	.....\$18.00
1243	—	“ 18..1000 “ “ $\frac{1}{100}$ , “ class 2	10.00
1244	—	“ 22..1000 “ “ $\frac{1}{10}$ , “ class 2	7.75
1250	—	Troemner's .....1000 grains to $\frac{1}{1000}$ , with riders	..... 14.00
1251	—	.....1000 “ “ $\frac{1}{100}$ , “	..... 13.00
1252	—	.....1000 “ “ $\frac{1}{10}$ , “	..... 12.00

**Gramme Weights.**

1265	—	Becker's, No. 6..200 grammes to 1 M G, with riders	....\$24.00
1266	—	“ 5..100 “ “ 1 M G, “	.... 18.00
1267	—	“ 4.. 50 “ “ 1 M G, “	.... 16.00
1269	—	“ 13.. 100 “ “ 1 M G,.....class 2.	10.00
1270	—	“ 12.. 100 “ “ 1 C G,.....class 2.	5.50
1271	—	“ 11.. 50 “ “ 1 M G,.....class 2.	9.00
1280	—	Troemner's, 50 grammes to 1 M G, with riders	..... 14.00

Extra weights of aluminum and platinum, in parts of grains or grammes, in stock. See Catalogue, numbers 1180-1184.

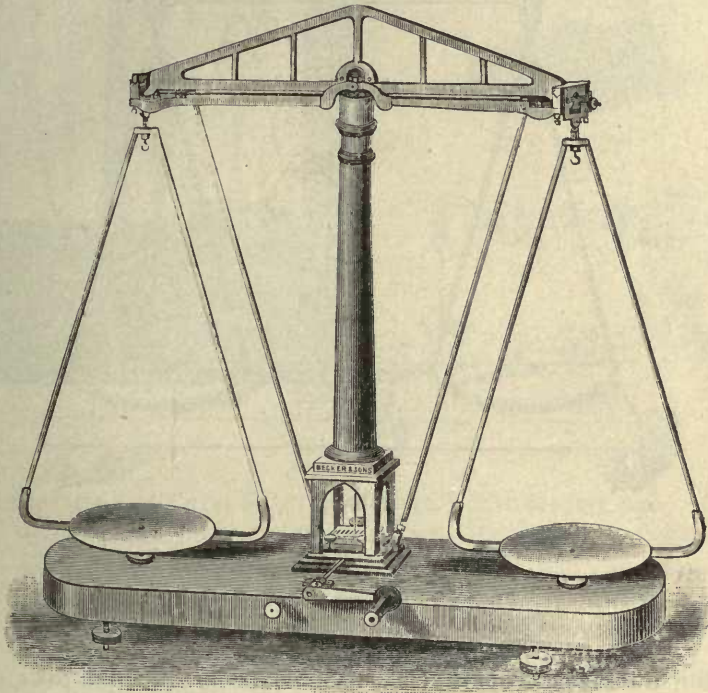
No.

1290*	—	Assay Ton Weights, Troemner's or Becker's.	
		4 A. T. down to $\frac{1}{20}$ A. T.....	\$ 6.00
1292*	—	1 A. T. to $\frac{1}{20}$ A. T.....	3 75
1293*	—	single, separate from full sets.	
		Size... 4 2 1 $\frac{1}{2}$ $\frac{1}{5}$ $\frac{1}{10}$ $\frac{1}{20}$	
		Price...\$ 1.25 1.00 1.00 .90 .75 .60 .50	

\*(The weight denominated by Dr. Chandler "One A. T." equals 29,1666 grammes, and contains, consequently, as many milligrammes as there are troy ounces in a ton avoirdupois of 2000 pounds. The assay ton weights is a system made up from a comparison of the avoirdupois, troy and gramme weights, and will be found extremely simple and useful, saving a vast amount of calculation and labor. The unit of the system is the assay ton = 29,1666 grammes. Its derivation will be seen at a glance. 1 lb. avoirdupois = 7000 troy grains; 2000 lbs. = 1 ton; 2000 x 7000 = 14,000,000 troy grains, in 1 ton avoirdupois; 480 troy grains = 1 ounce troy; 14,000,000 ÷ 480 = 29,1666 troy ounces in 2000 lbs. avoirdupois. There are 29,1666 milligrammes in one assay ton (A. T.); hence 2000 lbs. is to 1 A. T. as 1 ounce troy is to 1 milligramme. Therefore, if 1 A. T. of ore assays 1 milligramme of gold or silver, the ton contains 1 ounce troy.)

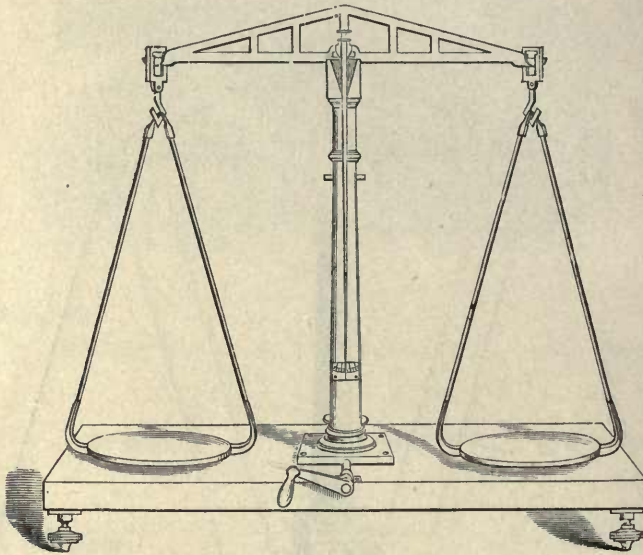
1295 Normal Sugar Weights, 26.048 or 13.024; each ..... \$ 1.00

BULLION BALANCES.



1300-1

- No.  
 1300 **Bullion Balance, Becker's No. 29.** Bullion and specie scale, carrying 500 ounces in each pan. Sensible to 1 grain with that charge. All bearings planes, with new improved construction for the arrestation of the beam and pans, provided with set screws and level.  
 Price, without weights..... \$165.00
- 1301 ————— **Becker's No. 31.** Bullion and specie scale. For 2000 ounces in each pan. Sensible to 2 grains with that charge.  
 Price, without weights ..... \$220.00



1310-12

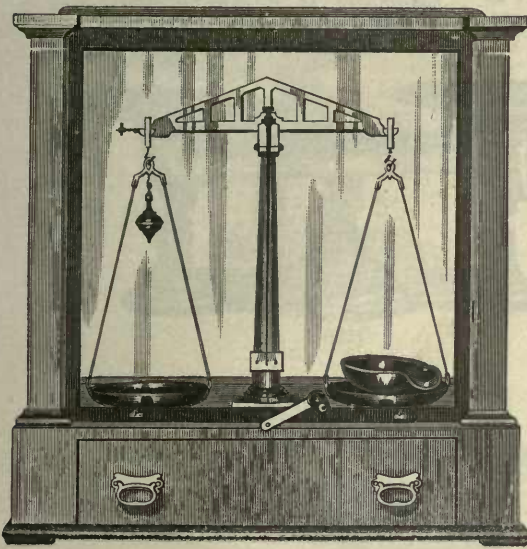
No.  
 1310 **Bullion Balance, Troemner's.** Balance has brass beam, pans, and bows ; improved raising apparatus, provided with glass level and leveling feet ; adjusting screws on beam, etc. A full set of weights included ; large weights are of iron, bronzed ; those from 50 ounces and down are of brass, in a walnut block.

Capacity .....	500	1000	1500 ounces.
Price .....	\$ 95.00	120.00	150.00

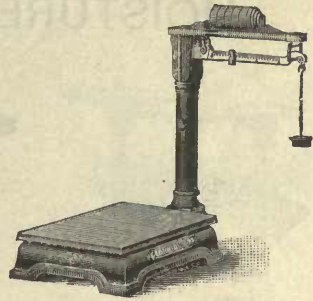
1315 } — **Troemner's.** Balance has an iron beam and eccentric lift ; adjusting screws on beam ; brass pans ; price includes a full set of weights.

Capacity, 500 ounces ; price.....	\$ 75.00
“ 1500 “ “ .....	100.00

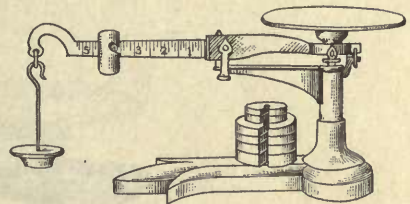




1317



1320



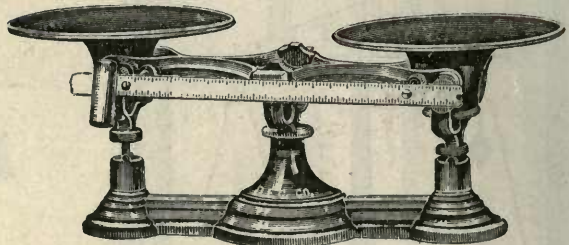
1322-3

- No.
- 1317 **Balance** of the very finest finish ; in French polished glass case, with counterpoised door, sliding upward. Has open beam; 8-inch nickel pans that are movable. Capacity 200 ounces, and sensible to  $\frac{1}{2}$  grain. Has extra pan for loose matter. Inside measure of case is 35 inches high, 30 inches wide. Price includes a full set of weights, 50 ounces to 1 grain. These are neatly fitted in the drawer of case.  
 Price ..... \$ 95.00
- 1318 — With weights, 100 ounces down (225 ounces in all)..... 105.00
- 1319 **Platform Bullion Scales, Howe's.** Brass beam, graduated into  $\frac{1}{4}$  ounce; capacity, 2880 ounces troy; brass weights, poise and counterpoise; the platform  $13\frac{1}{2} \times 19$  inches. All packs in box  $28\frac{1}{2} \times 18 \times 5\frac{1}{2}$  inches. Weight boxed, 90 pounds.  
 Price, boxed,..... 50.00
- **Scales, Fairbank's.** Adjusted  $\frac{1}{4}$  troy ounce, with set screw in poise; brass weights, poise and counterpoise. Weights marked in Troy ounces.  
 Capacity, 3200 to  $\frac{1}{4}$  ounces, price ..... 50.00  
 1321 " 2400 to  $\frac{1}{4}$  ounces, price ..... 30.00  
 1322 **Scales, Fairbank's.** " 120 ounces to 30 grains, price..... 20.00  
 1323 — " 7000 grains to 10 grains, price..... 15.00

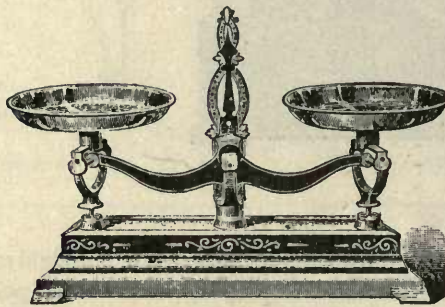
MOISTURE AND TRIP SCALES.



1324



1326



1327

No. 1324 **Quicksilver or Amalgam Scale Scoop.** Russia iron; 14 inches long, 8½ inches wide, 5½ inches deep, with counterpoise weight. Price..... \$ 4.00

1325 **Brass Scoop**; 9 inches long, 7 inches wide, 3 inches deep, with counterpoise weight, for Bullion Balances Nos. 1300-1315. Price ..... 3.00

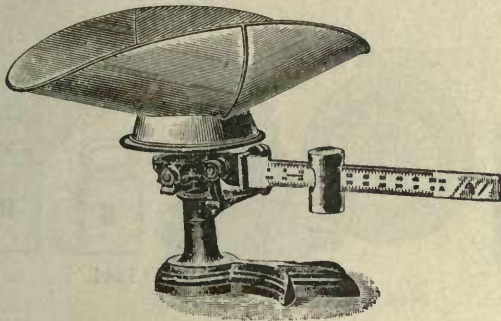
1326 **Moisture Scales.** This scale is so constructed that on using a moisture charge of 2 pounds the sliding weight on the beam indicates the exact per cent of loss or moisture. Price, including set of weights, 2 pounds to ½ ounce..... 10.00

*Example:* Place a two-pound weight on left hand platform, counterpoise with ore to be tested for moisture on the right; then dry the sample so weighed and place on same platform as before; and counterpoise by sliding weight on beam, when you read off the ounces lost and per cent of loss. For absolute accuracy and simplicity it has no equal.

Any other weight or charge may be used, when a simple calculation gives correct per cent of moisture.

1327 **Moisture Scales.** For weighing mineral specimens, etc.

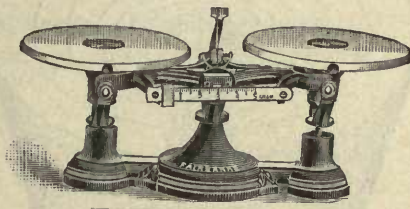
Power	1	lb.	with two	4½	in.	circular	removable	pan	.....	\$ 2.50
"	2	lbs.	"	5¼	"	"	"	"	.....	3.00
"	4½	"	"	6	"	"	"	"	.....	3.50
"	11	"	"	8	"	"	"	"	.....	4.75
"	22	"	"	8¾	"	"	"	"	.....	5.50



1328-9



1335-6



1337

No.  
1328

**Moisture Scales.** These scales are used at smelting and similar plants for determining the percentage of moisture in ores, etc. The ordinary capacity scale is made to weigh a sample of 50 ounces, but special scales are manufactured to order of other capacities as described below. The scale beam has two rows of graduations, the upper row giving the weight in ounces, or pounds, and fractions thereof; the lower row giving the percentages. The percentage row on all scales is figured from 100 to 0 per cent by 1 per cent, and thus the reading gives the direct percentage of loss. The given amount of ore is first weighed, then dried or roasted and re-weighed to note the loss of moisture or sulphur.

50 to 1/2 ounce capacity ..... \$ 10.00

1329

Same as No. 1328 from 50 to 1/2 ounce capacity, but has fractional graduation of 1x1/10 per cent on tip end of the main beam, and both the main and fractional beams are fitted with patent latch poises .....

25.00

**Trip Scales.** For manufacturing chemists. Has very large, shallow or saucer-shaped movable pan, made of hammered copper. All bearings are of steel.

1335

No. 0, Diameter of pan 19 in., capacity 40 lbs.....

14.00

1336

" 1, " " 16 in., " 25 lbs.....

10.00

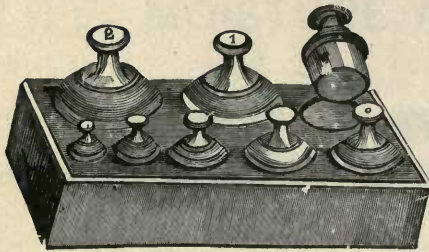
For weights for these scales in avoirdupois, troy or grammes, see catalogue numbers 1340-1375.

1337

**Harvard Trip Scales.** For laboratory work; with 2 six-inch porcelain plates and side beam; 2 kilogrammes to 1/10 gramme..

7.50

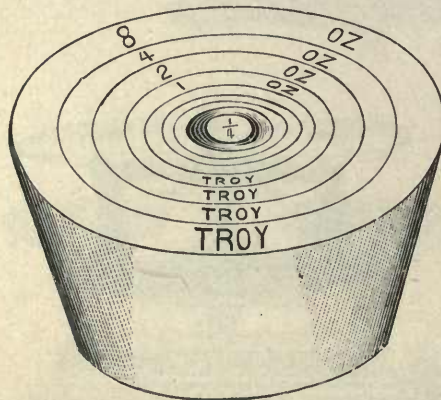
# WEIGHTS.



1340

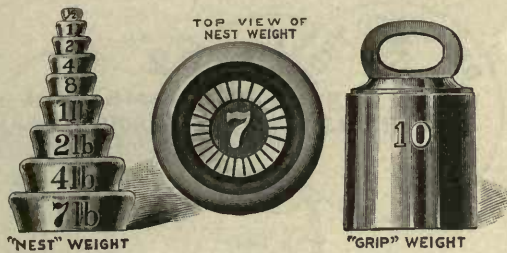


1344



1342

No.				
1340	Weights, Bullion, Troemner's.	Brass, in oiled walnut blocks.		
		20 ounce troy to 1/2 grain, per set.		\$ 7.00
		30 " " 1/2 " "		9.00
		50 " " 1/2 " "		12.50
		100 " " 1/2 " "		18.00
		200 " " 1/2 " "		27.00
1341	—	Bullion, Troemner's.	Iron; single, from sets; adjusted.	
		100 ounce troy, each		1.50
		200 " " "		2.50
		300 " " "		3.50
		500 " " "		5.00
1342	—	Troy Cup.		
		4 ounces down to 1/4 ounce		1.50
		8 " " 1/4 "		3.00
		16 " " 1/4 "		4.00
		32 " " 1/4 "		5.50
		64 " " 1/4 "		9.00
1343	—	Troy Decimal.	For bullion scales. Set of 4/10, 3/10, 2/10, 1/10, 5/100, 4/100, 3/100, 2/100, 1/100 ounces, per set.	2.50
1344	—	Metric, of japped iron.	Nested.	
		1 kilogramme down to 5 grammes		1.25
		2 " " 5 "		2.00
		5 " " 5 "		4.00
		10 " " 5 "		5.50



1346

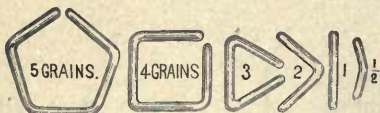
No.	Weights, Gramme, brass. In polished block.				
1345	20 grammes down to 1 centigramme.....				\$ .70
	50 " " 1 " .....				1.10
	100 " " 1 " .....				1.60
	500 " " 1 gramme .....				2.50
	1000 " " 1 " .....				3.50

1346	—	<b>Iron, nickel-plated.</b> Weights are of iron, polished and nickel-plated, making a very handsome and substantial weight, at much cheaper price than those of brass, and vastly cleaner and nicer to handle than the ordinary painted iron weights. In sets, complete :	
		1 pound and down to 1/2 ounce ; total weight, 2 pounds	\$ 2.80
		2 " " 1/2 " " " 4 " "	4.00
		4 " " 1/2 " " " 8 " "	5.50
		5 " " 1/2 " " " 13 " "	7.50
		10 " " 1/2 " " " 23 " "	10.75

1347	—	Price of single weights, separate from full sets:	
		1/2 ounce, each .....	\$ .30
		1 " " .....	.35
		2 " " .....	.40
		4 " " .....	.45
		8 " " .....	.50
		1 pound, " .....	.80
		2 " " .....	1.10
		4 " " .....	1.60
		5 " " .....	2.00
		10 " " .....	3.20
		20 " " .....	6.50



1365



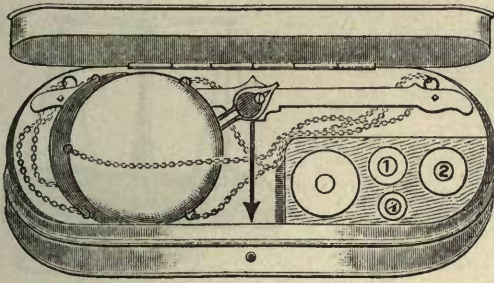
1370



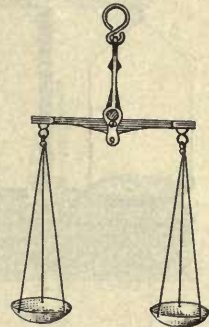
1371

No.					
1365	—	<b>Troy</b> , coin shape.	Brass, marked ounces, pennyweights and grains.		
		1/2 ounce to 1/2 grain, per set.....		\$	.75
		1 " 1/2 " " " .....			1.00
		2 " 1/2 " " " .....			1.25
		4 " 1/2 " " " .....			1.50
		8 " 1/2 " " " .....			2.50
1367	—	<b>Apothecary</b> , coin shape.	Brass, marked ounces, drams, scruples and grains.		
		1 ounce down to 1/2 grain, per set.....		\$	1.00
		2 " " 1/2 " " " .....			1.25
		4 " " 1/2 " " " .....			1.50
1368	—	<b>Metric</b> , coin shape.			
		1 gramme to 1 centigramme, per set.....		\$	.40
		10 " 1 " " " .....			.75
		20 " 1 " " " .....			1.00
1370	—	<b>Grain</b> , Aluminum Wire, 5 to 1/2 grain.....		\$	.50
1371	—	Sheet Aluminum, 10 to 1/2 grain .....			.40
1375	—	<b>Decimal Grain</b> , of German Silver Wire, one weight each 50, 40, 30, 20, and two of 10 grains, per set.....		\$	.50

## HAND SCALES.



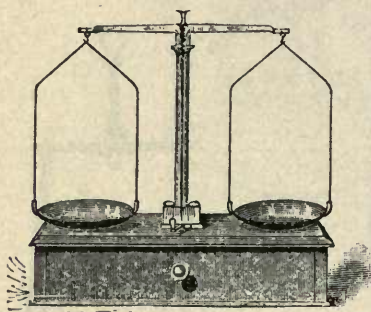
1376



1385

No.					
1376	—	<b>Hand Scales, Troemner's.</b>	In lacquered tin box, with set of troy weights down to $\frac{1}{2}$ grain.		
		Size.....	1	2	4 oz.
		Each.....	\$2.50	3.00	3.50
1380	—	<b>German,</b>	in leather covered boxes, with troy weights down to $\frac{1}{2}$ grain.		
		Size.....	4	8 oz.	
		Each.....	\$2.00	2.50	
1381	—	<b>In wood boxes.</b>			
		Size.....	4	8 oz.	
		Each.....	\$2.00	2.25	
1382	—	<b>In oval tin boxes.</b>			
		Size.....	2	4	8 oz.
		Each.....	\$1.00	1.25	2.00
1383	—	<b>In morocco boxes, velvet lined;</b>	apothecary weights, brass pans, silk suspending threads.		
		Size.....	5	6 oz.	
		Each.....	\$1.00	1.25	
1384	—	<b>In polished cherry wood boxes;</b>	apothecary weights, brass pans, silk suspending threads.		
		Size.....	5	6 oz.	
		Each.....	\$ .75	1.00	
1385	—	<b>Brass beams, horn pans, silk suspending threads;</b>	fine steel bearings very sensitive.		
		Beam.....	3½	4	5
		Pans.....	1½	2	2½
		Each.....	\$1.25	1.50	1.75
					2.00

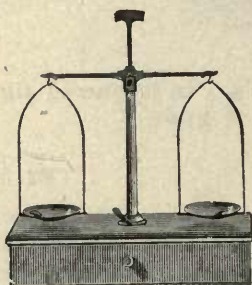
## GOLD SCALES.



1386



1387



1388

No. 1386 **Gold Scales, Troemner's**, indicator pointing downward; on a polished walnut box, with drawer; very accurately adjusted; a set of troy cup weights included.

No. ....	3	2	1	0
Weight ....	8	16	32	64 ozs.
Beam .....	7	9	10	13 in.
Diam. of pans	3½	4	5	6 in.
Each .....	\$10.00	12.00	15.00	24.00

1387 — **German**, with steel beam, pans suspended with chains.

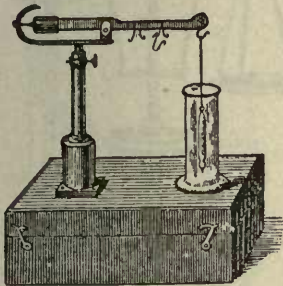
No. ....	1	2	3	4	5	6
Weight ....	8	16	32	64	96	128 ozs.
Beam .....	8½	9½	11	12½	15	16½ in.
Diam. of pans	4¼	4¾	5½	6½	7	8 in.
Each .....	\$8.00	10.00	15.00	20.00	25.00	30.00

1388 **Union Scales**, brass beams, indicator points upward, movable pans; on polished walnut box; scale can be taken apart and packed in drawer of box. These scales are very accurate and useful for weighing small quantities of gold dust. With troy, apothecary, or gramme weights, coin shape.

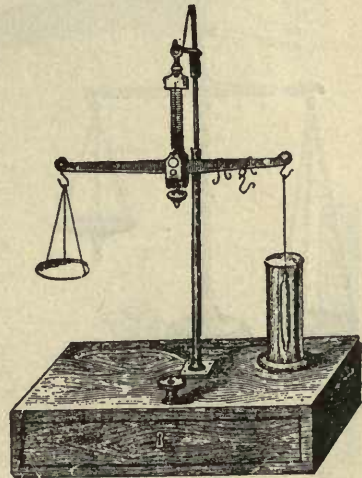
No. ....	2	1	0
Beam .....	5¾	7	8 in.
Diameter of pans .....	2	2½	3 in.
Each .....	\$3.50	5.00	6.00



## SPECIFIC GRAVITY BALANCES.



1390



1391

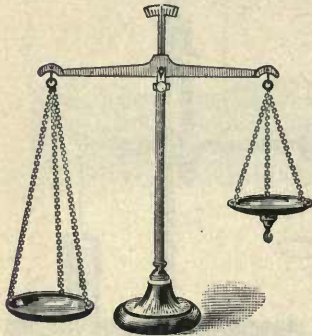
No.  
1390 **Specific Gravity Balance, Westphal's.** Very exact and quick; beam and axis gilded; for liquids only; movable support; Reimann's patent thermometers; all packed in box.

Complete with rider weights . . . . . \$ 15.00

1391

**Mohr's.** Very fine construction. Mounted upon mahogany box, 13x 7x3½ in., with lock drawer, which contains all the parts. This scale is designed for both liquids and solids. Beside the four sets of rider weights which indicate the specific gravity in 1,  $\frac{1}{10}$ ,  $\frac{1}{100}$ , and  $\frac{1}{1000}$ , it has provided two pans, upon which ordinary weighing can be done.

Price . . . . . \$ 20.00



1392



1393

No.  
 1392 **Specific Gravity Balance.**

Beam 10 inches long. Mounted upon brass stand; 11 inches high. Capable of being elevated to 18 inches. Hook under one pan from which to suspend solids.

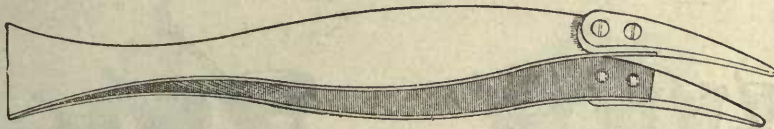
Price, without weights..... \$ 7.00

1393

With beam 13 inches long, and a rest for it. All adjustable to 20 inches high.

Price, without weights..... \$ 15.00

## FORCEPS.



1395



1398



1399



1400-1



1402



1404

No.	Forceps.					
	For lifting assay and pulp weights, blowpipe beads, cupel buttons, etc.					
1395	—	brass, ivory tipped, 4 inches long.....				\$ 1.75
1396	—	bone tipped.....				.80
1397	—	nickel-plated, with fine points.....				.50
1398	—	French style, double, one end with platinum points, 5½ inches long.....				2 25
1399	—	English, of steel, platinum pointed, 4 inches long.....				1.50
1400	—	brass, ends bent, 4 inches long.....				.25
1401	—	nickel-plated.....				.35
1402	—	common steel....	4	5	6	8 in.
		Each.....	\$ .15	.20	.25	.50
1403	—	Gooseneck's, nickel plated, 6 inches long.....				\$ .50
1404	—	nickel-plated, with fine points, non-magnetic.....				.35

# MORTARS.



1410



1411



1412



1413

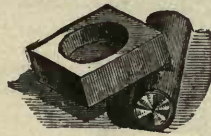


1414

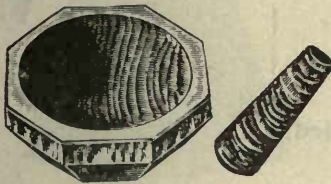
No.							
1410	<b>Mortars, iron; urn shape; light; with pestles; turned inside.</b>						
	Capacity, 1/2	1	2 pints	1/2	1	2 gal.	
	Weight.. 3 1/2	5 1/2	7 1/2	11	23	45 lbs.	
	Each ... \$ .50	.60	.75	1.25	2.25	3.50	
1411	<b>— Bell Shape; heavy, solid bottom, for grinding quartz.</b>						
	Capacity, 1/2	1	2 pt.	1/2	1	1 1/2	2 3 4 gal.
	Weight.. 4	4 1/2	9 1/2	17	22	37	45 82 90 lbs.
	Each ... \$.75	1.00	1.25	1.75	2.50	3.00	4.75 7.50 9.00
1412	<b>— Wedgewood. Best quality, pestles with wood handle.</b>						
	No. ....	1	2	3	4	5	6 7 8
	Diam., inside	3 3/4	4 1/2	5 1/4	6	6 3/4	7 1/2 8 3/8 9 1/4 in.
	Each .....	\$ .75	.90	1.00	1.25	1.50	1.75 2.50 3.00
1413	<b>— porcelain. With pestles, for grinding fluxes, and for liquids. Unglazed inside, glazed outside.</b>						
	No. ....	0	1	2	3	4	5 6
	Diam., inside	6 5/8	5 3/4	4 5/8	4	3 1/4	2 3/4 2 1/4 in.
	Each .....	\$1.50	1.25	1.00	.85	.75	.60 .50
1414	<b>— glass. With pestles.</b>						
	Capacity....	1	2	4	8	16	32 oz.
	Each .....	\$ .25	.30	.40	.60	.75	1.00



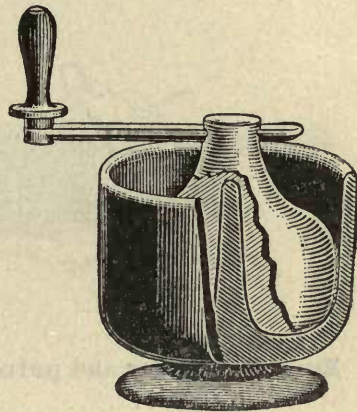
1415



1416

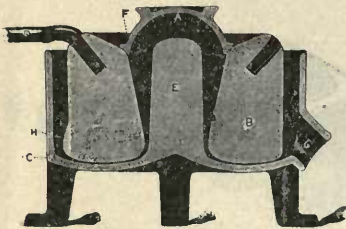


1417

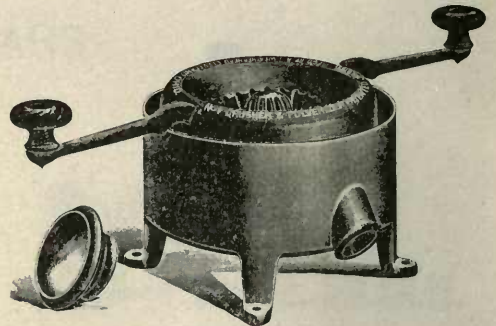


1418

No.									
1415	—	<b>Mortars, Diamond.</b>	Plattner's form, for crushing small quantities of ore or for flattening silver buttons; made of the best tool-steel, hardened.						
		Small	.....	\$	4.00				
		Large	.....		6.00				
1416	—	Leed's form, without ring	.....	\$	2.00				
1417	—	Agate, with pestles, for grinding small specimens of ore.							
		Diameter.	1½    2    2½    3    3½    4    4½    5 in.						
		Each....	\$1.50    2.00    2.75    4.00    5.50    7.50    9.00    12.00						
1418	—	<b>amalgam.</b>	Buck's patent of cast iron. By the rotation of the muller a large sample of quartz can be ground, in contact with quicksilver.						
		Diam.....	6½    8½    8½    10½ in.						
		Weight.....	30    40    72    120 lbs.						
		Wt. of muller	16    28    42    72 lbs.						
		Each.....	\$ 6.50    7.50    9.00    12.00						



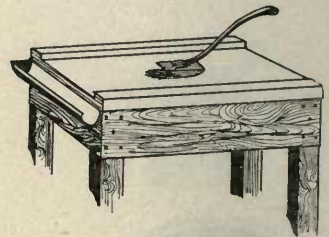
1420—Cut No. 1



1420—Cut No. 2



1421



1425

No.  
1420 **Mortars, crusher and pulverizer combined.**

Diam.....10½ in.  
Height..... 8½ in.  
Weight complete...100 lbs.  
" muller only. 65 lbs.  
Each.....\$ 25.00

Cut No. 1 illustrates the Crusher and Pulverizer with both handles in position, making it very easy to lift out the pestle to clean the mortar. Another use for the handles in this position is when crushing very hard or large pieces of material, take hold of both handles and work backward and forward (or seesaw), which will crush large pieces much easier than with one handle, and as soon as the material is crushed sufficiently take out extra handle and go on with the rotary motion.

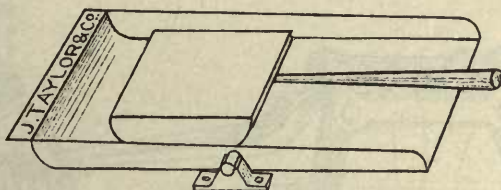
A—Cover. B—Rotating pestle. C—Casing or shell. D—Handle, of which there are two. E—Crushing post, which is corrugated and slightly oval, producing great crushing power. F—Conical corrugated opening in center of rotating pestle, where material is introduced. G—Spout where material is discharged as fast as pulverized. H—Is one of four lugs on the side of rotating pestle, which carry the pulverized material to spout.

The operation is as follows: The cover being removed, the coarse material is fed in at *f*, and pieces as large as will go in the opening can be crushed (unless of an exceptionally hard character). As the material is gradually crushed, it works down to bottom of conical opening, passing under the pestle, where it is pulverized. The centrifugal force carries the product to the sides, where it is caught by the lugs, *h*, which carry it to spout, *g*, and discharge it.

No.  
1421 **Bucking Board**, circular 21 inches in diameter, 1 inch deep, planed for grinding fine. Weight, with 9½ pound muller, 95 pounds.  
Price..... \$ 9.00

1425 — and muller, upper surface planed, flanges at the side, curved muller.

Size .....	18x20	20x24	24x36 in.
Each.....	\$10.50	13.00	17.50



1426



1430



1432

No.				
1426	<b>Bucking Board</b>	and muller, unplanned, on trunnions for tipping.		
	Size . . . . .	7x28	15x28 in.	
	Each . . . . .	\$6.50	9.00	
1430	<b>Brushes,</b>	for dusting mortars; round.		
	Diameter . . . . .	1½	2½ in.	
	Each . . . . .	\$ .90	.75	
1431	—	Flat, for cleaning bucking boards.		
	Width . . . . .	3	4 in.	
	Each . . . . .	\$ .50	.75	
1432	—	<b>bench duster.</b> 8 inches long; bristles, 3 inches.		
	Each . . . . .		\$ .75	

# TAYLOR'S PATENT ROCK FINE CRUSHER.

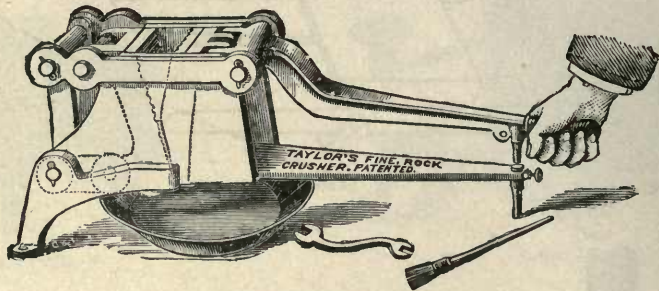


FIG. 1.  
1433

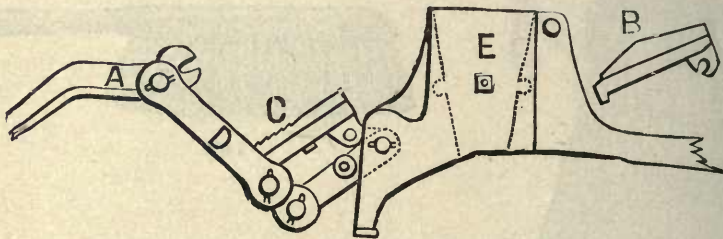



FIG. 2.  
1433

No. 1433 **Rock Fine Crusher. Taylor's Patent.** For assayers, prospectors and samplers, for working specimen ores, crushing old crucibles, etc. The design of this small machine is to enable a person quickly and easily to bring by hand power to fine powder the hardest ores, to be assayed or sampled, and readily crush a larger sample than can be done in a mortar. Each machine has a cover (not shown) to prevent pieces of ore from flying out, and is furnished with a wrench and dust brush. Extra jaws and other parts can be had. Weight, complete, 100 pounds.

Price, complete..... \$ 25.00

Extra parts: B and C, set of hard jaws, \$1.25; D, set of hard side straps, drilled, \$1.50; E, set of hard side plates, 50 cts. per pair; A, lever, drilled, \$1.50.

NOTE.—The hard jaw C is sometimes called the *Shoe*. The hard jaw B is sometimes called the *Die*.

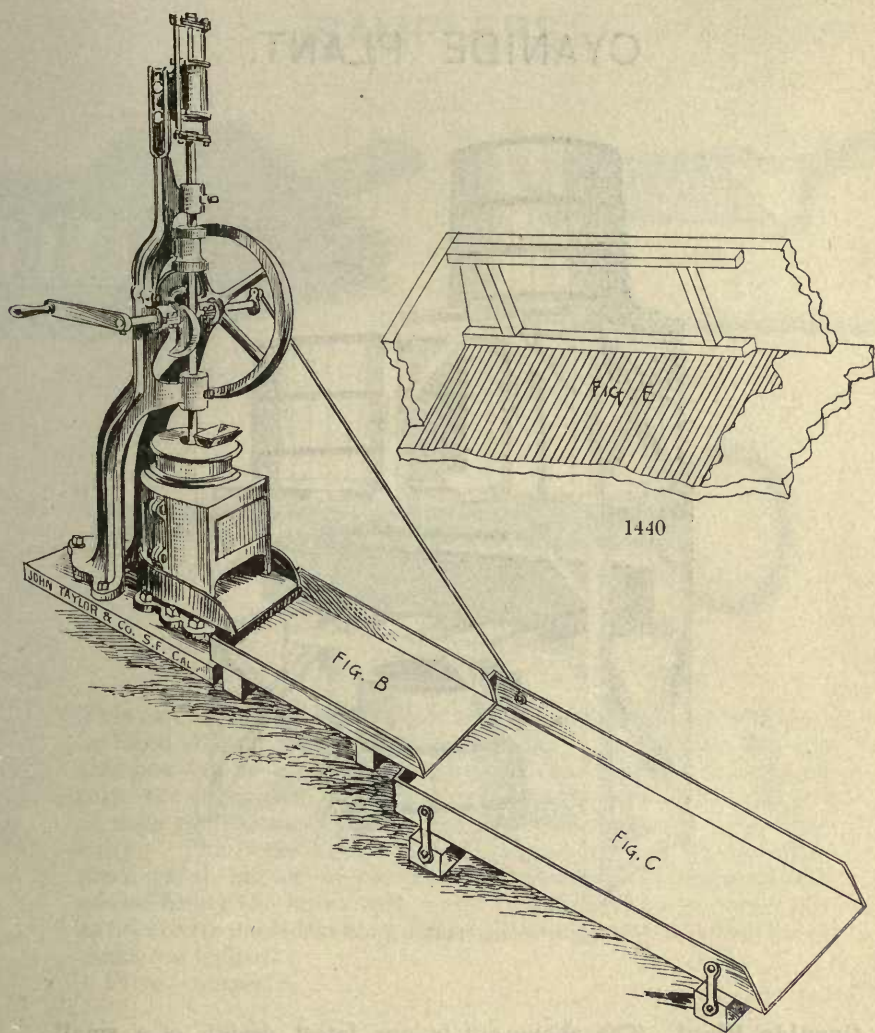
 Send for special circular describing this crusher.

1434 **Crusher. Bosworth.** For laboratory and assayers' use.

Hand Crusher..... \$ 30.00

1435 " " with pulley attachment..... \$ 32.00

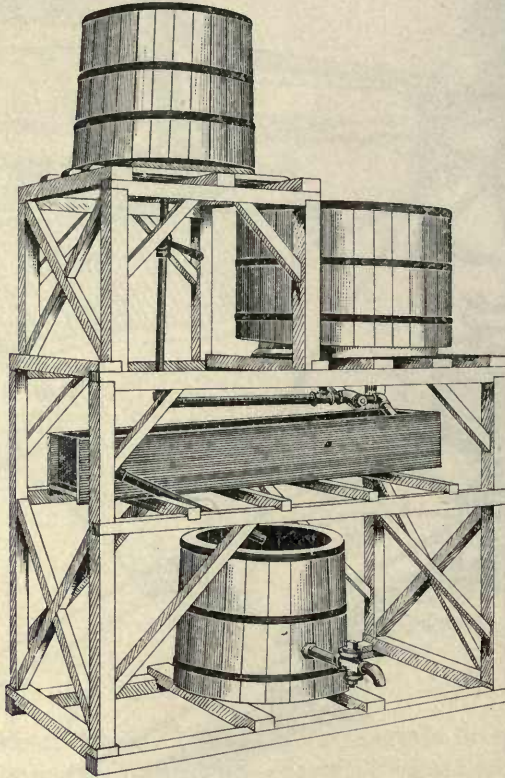




1436-40

- No.
- 1436 **Quartz Mill, one-stamp.** With Day's Vacuum attachment. The stamp is 4 inches in diameter and drops with a force of 125 pounds. The stamp is raised 3 inches by the cam. The total weight of the mill is 335 pounds, and the whole height from the floor is 5 feet. Send for special circular describing this quartz mill.
- Price ..... \$ 75.00
- 1437 **Copper Plates, silver-plated, for above, 12x60 inches.** ..... \$ 10.00
- 1438 **Screens, Russia iron, for above, per set.** ..... \$ 1.50
- 1439 **Sluice Box, for above mill, with copper plate four feet long by one foot wide, silver-plated.**
- Price ..... \$ 8.00
- 1440 **Concentrator.** For stamp mill, fourteen inches wide and eighteen feet long, including sluice blanket ..... \$ 15.00

## CYANIDE PLANT.

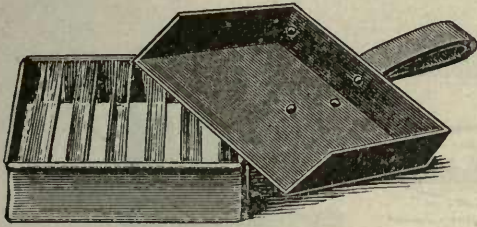


1441

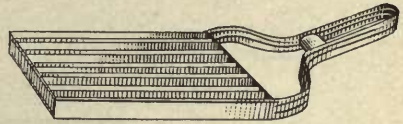
No.

**1441 Cyanide Plant.** The above cut is our latest design of a small Cyanide Plant, having a capacity of 100 pounds of ore. The small tank shown at the highest elevation is to be used as solution tank, while the tank just below it is intended for leaching tank and is fitted complete with false bottom and duck filters. The zinc box shown below the leaching tank has six compartments and is fitted with wire screens ready for use. The lower tank is the sump tank, which is provided with an outlet which facilitates the drawing off of the weakened solution to be transferred to the solution tank again where it is made up to full strength. The pipe connection between the different tanks has been carefully studied out and has been arranged with the greatest convenience. A stop cock will be noticed just below the solution tank, a similar stop cock between the outlet from the leaching tank and the zinc precipitating box. The solution enters the leaching tank through the bottom and is drawn off through the same pipe; but to facilitate the discharging of the leached tailings a union connection will be found just below the leaching tank.

SAMPLERS.



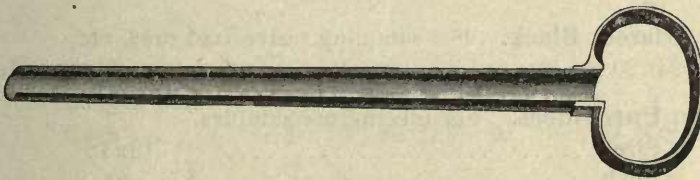
1443



1442



1445



1446

This can be easily disconnected and the leaching tank may then be lifted off and the contents dumped out. In a similar way the zinc box can be easily removed by giving the elbow a quarter turn; the entire zinc box can then be taken out and the contents of each compartment can be removed without any further difficulty. The tanks have all been painted with a special acid-proof paint, but before putting the same to actual use we would advise filling the tanks with water to enable them to swell up, as otherwise considerable gold solution might be lost before the tanks are tight.

Price, complete..... \$ 50.00

No.				
1442	Samplers, Tin, with handle.			
	6x 8 in., 6 trays 1/2 in. wide			\$ .75
	9x12 " 5 " 1/2 " "			1.00
1443	— and Scoop.			
	Size	6x8	9x12	10x10 in.
	Each	\$ .75	1.00	1.00
1445	— or Tryer. Of sheet iron, 19 inches long, with wood handle.			
	Each			\$ .75
1446	— Cast Steel, polished handle.			
	Length	18	21	24 in.
	Each	\$ .90	1.00	1.25

# SAMPLING PAPER, SHEET RUBBER, BAGS, BOTTLES.



1455-6



1475

No.							
1450	<b>Paper, Glazed, Black.</b>	For sampling pulverized ores, etc.					
	24x20 in., per quire					\$ .50	
1455	<b>Rubber, Pure Sheet.</b>	For mixing ore samples.					
	Size.....	18x18	36x36 in.				
	Each.....	\$ .85	2.50				
1456	— with cloth insertion.						
	Size.....	18x18	36x36 in.				
	Each.....	\$ .30	1.00				
1460	— <b>Black Enameled Duck.</b>						
	50 in. wide, per roll of 12 running yards					\$ 6.00	
	One sheet, 50x50 in.					.75	
1465	<b>Bags, Ore Sample.</b>	Manila paper, strong.					
	Width, inches	4	5	6	7	7¾	8
	Length, inches.....	6¾	7½	8½	9¼	11	12
	Per 1000	\$ 2.50	3.00	3.50	4.00	4.50	6.50
1470	<b>Bags, rope manila.</b>	Extra heavy, for ground ores, with improved metal fastenings.					
	4¾x3 inches, 1 ounce, per 100					\$ .65	
	5¼x3½ " 2 " "					.80	
	6 x4 " 4 " "					.95	
	7 x4½ " 6 " "					1.05	
	8 x5 " 8 " "					1.20	
	9 x5½ " 10 " "					1.35	
	10 x6 " 12 " "					1.60	
1471	— <b>duck.</b>						
	No. 1, 5 x 8½ inches, per 100					\$ 5.00	
	" 2, 6 x10 " "					6.00	
	" 3, 7½x12 " "					8.50	
	" 4, 8 x14 " "					10.00	
	" 5, 9 x17 " "					12.50	
	" 6, 10 x20 " "					16.00	
1475	<b>Bottles.</b>	Wide mouth, with flat corks, for sampling ground ores, etc.					
	Ounces	2	4	6	8	12	16
	Per dozen.....	\$ .35	.40	.45	.50	.75	1.00

# SPATULAS, SCOOPS.



1490



1491



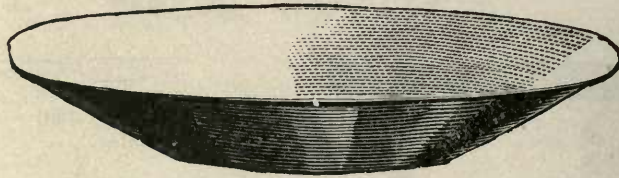
1497



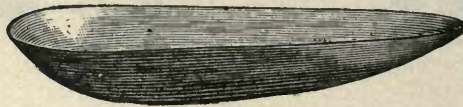
1498

No.										
1490	—	<b>Spatulas, steel, with wood handle.</b>								
		Length blade....	3	4	5	6	7	8	9	10 12 in.
		Each.....	\$ .25	.30	.35	.40	.50	.60	.75	1.00 1.25
1491	—	<b>porcelain, double end.</b>								
		Length.....	7½	8¼	11¼	12¼				14 in.
		Each.....	\$.40	.50	.60	.75				1.00
1492	—	<b>Single end.</b>								
		Length.....	5½	8¼	11¼					14 in.
		Each.....	\$.40	.50	.60					1.00
1493	—	<b>bone.</b>								
		Length.....	5	6	7	8½				10½ in.
		Each.....	\$.10	.15	.20	.25				.30
1494	—	<b>hard rubber.</b>								
		Length.....		6						7 in.
		Each.....		\$.25						.35
1495	—	<b>horn.</b>								
		Length.....		7						8 in.
		Each.....		\$.15						.20
1497		<b>Scoops, horn.</b>								
		No.....	1	2	3	4				
		Bowl.....	3¼x2½	3½x3	4¼x3¼	4½x3½				in
		Each.....	\$.10	.10	.10	.15				
1498		<b>Spoons, horn.</b>								
		No.....	1	2	3	4				
		Bowl.....	1½x1	2x1¼	2¼x1½	3¼x2				in.
		Each.....	\$.10	.10	.15	.20				

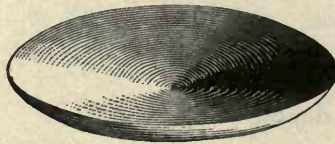
# WASHING PANS AND HORNS, BATEA.



1500



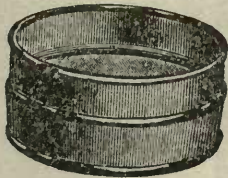
1507



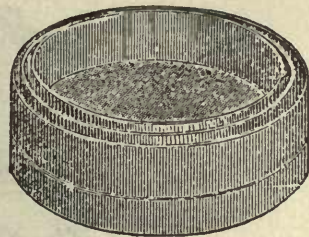
1510

No.			
1500	<b>Gold Pans, Miners', Russia iron.</b>	Seamless, 16½ inches diameter, extra heavy, per dozen.....	\$ 10.50
1501	—	<b>Polished iron,</b> per dozen .....	6.00
1502	—	<b>Iron,</b> with bottom and half up the sides of heavy copper, each.....	3.50
1503	—	<b>Silver-plated inside</b> .....	5.00
1504	—	<b>All copper,</b> each.....	4.50
1505	—	<b>Silver-plated,</b> each.....	6.50
1506	<b>Horns, Miners'.</b>	1849 style, made of horn, finely finished, smooth inside, selected, each.....	\$ 1.00
1507	—	<b>Rubber.</b> Made of black rubber, hard and flexible, 9½ inches long. The black color enables one to quickly detect the smallest particle of gold.	.75
1508	—	<b>Copper.</b> Same size and shape as above, for washing with quicksilver.....	1.25
1509	—	<b>Of Russia Iron,</b> 9½ inches long.....	.50
1510	<b>Batea, wood.</b>	Of Spanish cedar, well-turned, the center burnt to show colors.	
	Diameter .....	12	17 in.
	Each.....	\$1.50	2.00

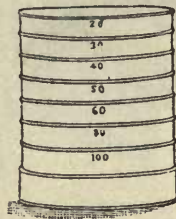
## SIEVES.



1515



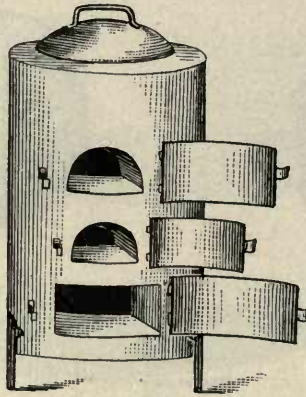
1519



1517

No.														
1515	<b>Sieves. Brass wire, tin frame.</b>													
	No.....	10	20	30	35	40	50	60	70	80	100	120	150	
	Diameter, 5 in..	\$ .50	.50	.60	.60	.60	.60	.60	.75	.75	1.00	1.25	1.50	
	“ 6 “	.65	.70	.75	.75	.80	.85	.90	1.00	1.10	1.25	1.50	1.75	
	“ 8 “	.75	.80	.90	1.00	1.00	1.10	1.20	1.30	1.40	1.50	1.75	2.00	
1516	<b>Sieves. Tin frame, with cover and pan bottom to collect dust.</b>													
	No.....	10	20	30	40	50	60	70	80	100	120	150		
	Diameter, 5 in..	\$ .65	.65	.75	.75	.85	1.00	1.15	1.25	1.40	1.60	1.80		
	“ 8 “	1.25	1.25	1.25	1.25	1.35	1.50	1.75	2.00	2.25	2.50	2.75		
		Larger sizes made to order.												
1517	<b>Sieves. Tin Frame, 5 inches diameter, in sets of 8, with one cover and pan bottom, interchangeable. Convenient for separating powdered ore into different grades of fineness. Nos. 10, 20, 30, 40, 50, 60, 80, 100; height, when together, 10 inches.</b>													
	Price, per set.....												\$ 5.00	
1518	— 3 inches diameter; price, per set of 3 sieves from 10 to 100 mesh.....												\$ 1.50	
1519	— <b>Wooden rim.</b>													
	Per dozen.....	All Nos. to 70	No. 80	No. 90	No. 100									
	5 inch.....	\$6.50	7.00	9.00	10.00									
	6 “.....	7.00	8.00	9.00	11.00									
	7 “.....	8.00	9.50	10.50	13.00									
	8 “.....	9.00	11.00	12.50	16.00									
	9 “.....	10.50	13.00	15.00	20.00									
	10 “.....	12.00	16.00	19.00	23.00									
	11 “.....	14.00	19.00	23.00	27.00									
	12 “.....	17.00	24.00	27.00	33.00									
		Larger sizes made to order.												

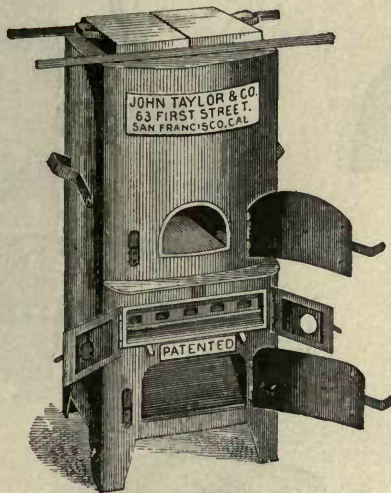
# FURNACES.



1525

No.						
1525	<b>Furnaces, Assay.</b> California pattern; for muffle and crucible work. Iron, brick, lined, furnished with cast iron cover and sand bath.					
	Number.....	1	2	3	4	
	Internal diam.	9	10	10	12 in.	
	Height.....	20	23	25	28 "	
	Weight.....	52	75	125	205 lbs.	
	Uses muffle...	8x4¼ x3	11x4¼ x3⅞	10½x5¼ x3⅞	12x6x4	
	Each.....	\$ 9.00	12.00	15.00	20.00	
1526	—	15½ inch interior diameter. Made to order; price..... \$ 50.00				
		12 in. furnace takes 12 x 6 x4 or 12x5¼ x3⅞ in. muffle				
		10 " " " " 10½x 5¼ x3⅞ " 11x4¼ x3⅞ " "				
		9 " " " " 8 x 4¼ x3 muffle				
		15½ " " " " 9 x15 x6 high side muffle.				
1528	—	<b>Melting, without muffle hole.</b>				
		12 in. interior diameter..... \$ 19.00				
		14 " " " " ..... 30.00				
		The 12 in. furnace takes a No. 16 black lead crucible.				
		" 14 " " " " 25 " " "				
1531	—	Extra parts for	No. 4	3	2	1
			12 in.	10 in.	10 in.	9 in.
			heavy.	heavy.	light.	light.
		Grate bars, wrought iron ..	\$ .75	.60	....	....
		Tripod to support grate bars	1.50	1.25	....	....
		Cast iron grate and tripod..	....	....	1.50	1.25
		Cast iron cover .....	1.75	1.50	1.50	....
		Sand bath .....	1.25	1.00	1.00	.75
1532	—	<b>Sheet Iron Pipe, 24-inch lengths; each.....</b> 25 to 35 cents				
1533	—	<b>Cast Iron Elbows for 12-inch round furnace; each....</b> \$ 1.50				
1534	—	<b>Sheet " " " 12- " " " " 25 to 35 cents</b>				





1535

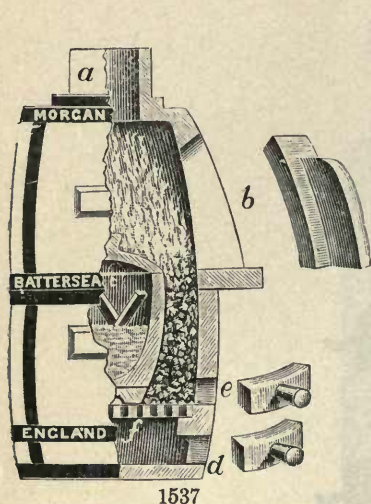
No.

**1535 Furnaces, John Taylor & Co.'s.** Improved combined crucible and muffle furnace. Patented. Made of thick sheet iron, 12 inches square inside measurement, lined with heavy brick 2 inches thick. Complete weight, 250 pounds. It takes a 6x12x4 muffle, allowing the use of 6 No. 9 Battersea or equivalent size crucibles while the muffle remains in place. Can also be used as a melting furnace and will hold a No. 16 black lead crucible. The front of this furnace is fitted with wrought iron doors for the muffle and ash pit, double cast iron feed doors and patented cast iron grate bars, which can be removed by inserting a square poker into openings at the end of the grate bars to lift them out. The top of the furnace is fitted with a cast iron frame with two flat cast iron covers (asbestos lined) sliding right and left from the center on a rail. If so ordered the furnace can be made with body in four separate sections for easy transportation, and fastened together with bolts.

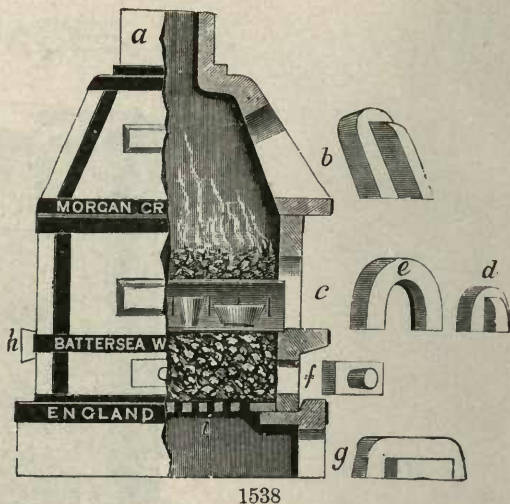
Price ..... \$ 30.00

**1536** — **Extras for above.**

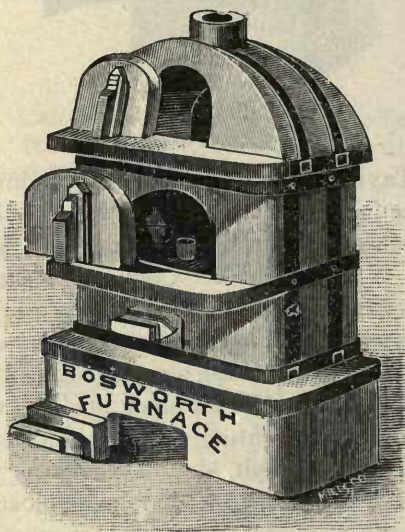
Grate bars, per set.....	3.00
Covers .....	2.50
Oval elbow, heavy iron, 6 inches... ..	1.25



1537



1538



1540

No. 1537 **Furnace, Battersea Portable.** For melting gold, silver, copper, etc. Made of fire clay bound with iron. For assayers' use.

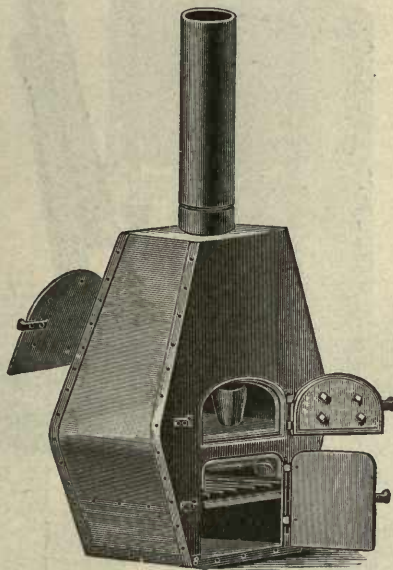
Size	Diam., Inches.	Height, Inches.	Weight, Pounds.	Each.
B. ....	10	20	67	\$ 10.50
C. ....	11½	22	90	12.50
D. ....	13½	26	—	15.00

1538 — **Cupelling, Battersea.** Of fire clay, iron bound. Without base.

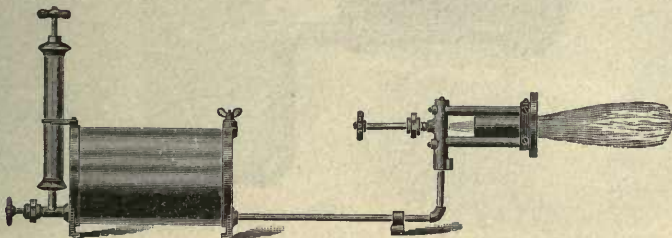
No.	Height.	Diameter.	Size Muffle.	Price.
C. ....	27	14½	9x5½x3½ in.	\$ 22.00
E. ....	29½	16¼	12x6 x4	24.00
F. ....	30	17½	14x8 x5	31.00

1540 — **Bosworth.** Of clay, in three sections, securely bound with heavy iron bands. Takes a 9x15 or 10x16 high side muffle.  
 Price, with 1 muffle ..... \$ 40.00

## FURNACES, BLOWPIPES.

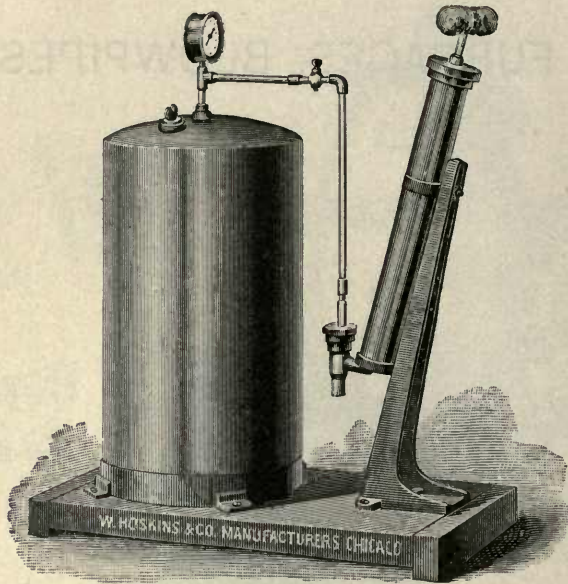


1542

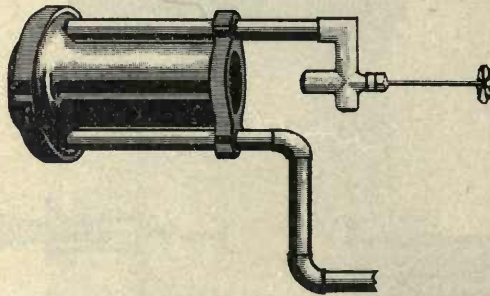


1550-1

- |      |   |  |
|------|---|--|
| No.  |   |  |
| 1542 | — | <p><b>Furnace, "Jackass."</b> A very complete and satisfactory portable furnace, weighing 100 pounds. It is made of clay, in one piece and securely bound with steel, doors asbestos lined. Will take muffle 6x12x4 inches.</p> <p>With 1 muffle..... \$ 20.00</p> <p>Extra muffle... .. 1.00</p> <p>Extra grate..... 1.00</p> |
| 1550 | — | <p><b>Hoskins',</b> Blowpipe No. 2, for gasoline, with half-gallon tank, made entirely of brass, very strong..... \$ 23.00</p>   |
| 1551 | — | <p>Blowpipe No. 3, with 1-gallon tank, otherwise same as No. 2 ..... \$ 26.00</p>  |



1552-3

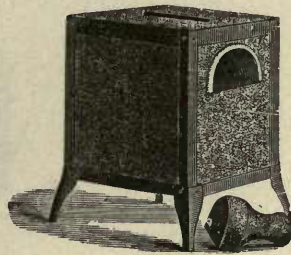


1555

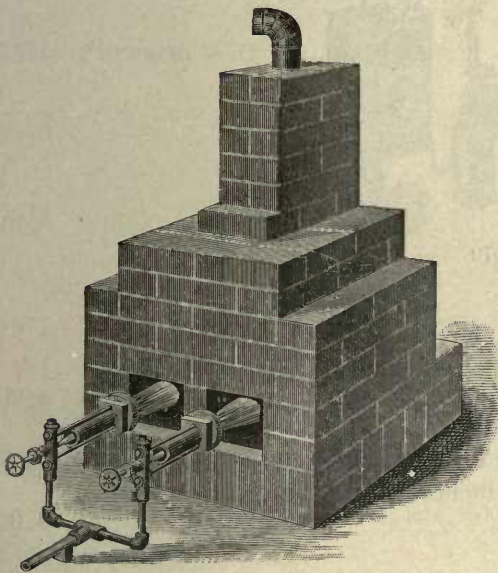
- |      |  |          |
|------|--|----------|
| No.  |  |          |
| 1552 | <b>Furnace, Blowpipe No. 4, with 6-gallon tank, made of heavy copper, suitable pump, pressure gauge, 10 feet of pipe, elbows, etc., and two burners, complete.....</b>   | \$ 50.00 |
| 1553 | <b>Taylor's Special Blowpipe.</b> Eight-gallon tank, made of heavy galvanized iron, guaranteed to stand 100 pounds pressure. Complete, with one coal-oil or gasoline burner .....  | \$ 25.00 |
| 1554 | <b>Burners, extra for above, each .....</b>  | \$ 6.00  |
| 1555 | <b>Coal-Oil or Gasoline Burner.</b> (Patented.) Our new heating burner for assayers and chemists, or for brazing, in which coal-oil at 33° to 45° Beaume, and 150° fire test can be used as fuel. This burner will melt an assay in a crucible or scorifier and will cupel in a muffle. One great advantage of this burner over others is that it can be used with either coal-oil or gasoline and is intended to take the place of the gasoline burner now in use. It has been thoroughly tested. We own the patent and are ready to furnish this burner singly or in quantities. |          |
|      | Each.....  | \$ 6.00  |

NOTE.—Use 74° gasoline in above burners.

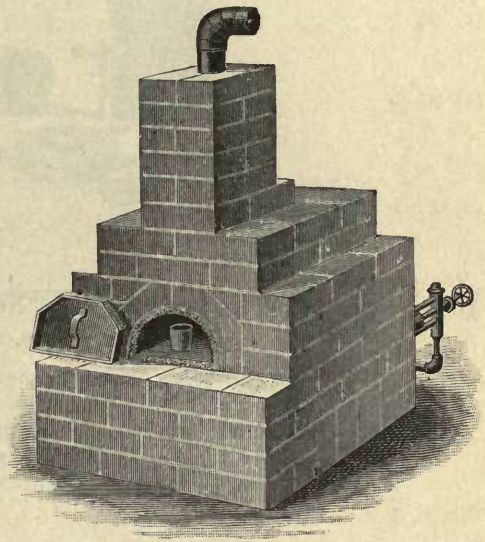
# FURNACES.



1556-7

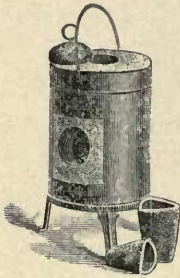


1560—Back View

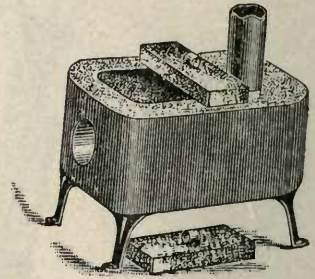


1560—Front View

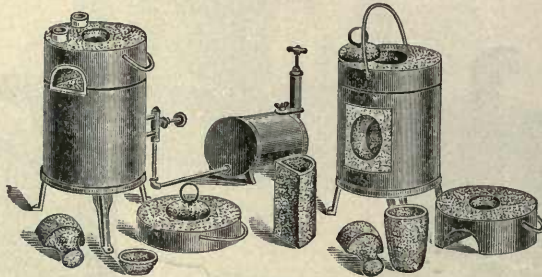
No.			
1556	Furnace, Hoskins' Muffle, No. 2,	taking a muffle 8x4 $\frac{3}{4}$ x3 inches.	
	Price	.....	\$ 10.00
	Extra muffles, each	.....	.65
1557	—	—	
	Muffle, No. 3,	taking a muffle 10x6x4 inches.	
	Price	.....	\$ 15.00
	Extra muffles	.....	1.00
1560	—	—	
	Muffle, No. 4.	Takes a high side muffle 9x15x6 inches, which requires a blowpipe, (Catalogue numbers 1552-3), including all special interior fire bricks, with full directions for setting and bricking up with common brick.	
	Price, including muffle	.....	\$ 25.00
	Extra muffles	.....	1.65



1565-6

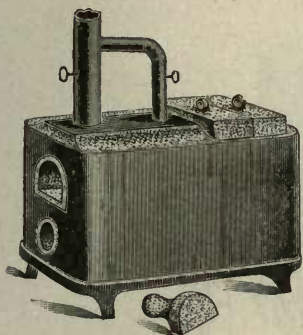


1567-8

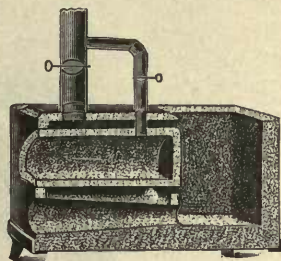


1570

- No.  
**1565** **Furnace, Hoskins' Crucible, No. 1, taking 20 gramme crucibles, or equivalent sizes, 4 inches diameter, 5½ inches deep inside . . . . . \$ 4.00**
- 1566** — **Crucible No. 2, taking Battersea "K" round crucibles, or equivalent sizes, 5 inches diameter, 6½ inches deep inside . . . . . \$ 5.00**
- 1567** — **Crucible No. 3, long form, taking two 20 gramme crucibles, or equivalent sizes. A very effective furnace. . . . \$ 7.00**
- 1568** — **Crucible No. 4, taking four No. 9 crucibles, or equivalent sizes. This is a very efficient furnace for large quantities of work. This furnace can also be used for melting, and will take a No. 6 black lead crucible. . . . \$ 12.00**
- 1570** — **Combination No. 1. On the right in the above cut is shown the furnace prepared for crucible work. By lifting off the cover and substituting the part with the muffle opening and sliding in the muffle, the furnace is prepared as shown on the left. A scorification or two cupellations may be made in this furnace with perfect satisfaction. Weight, complete, is 24 pounds. The muffle is 6x3½x2½ and the crucible furnace is the same as cut No. 1565, No. 1.**
- Price . . . . . \$ 7.00



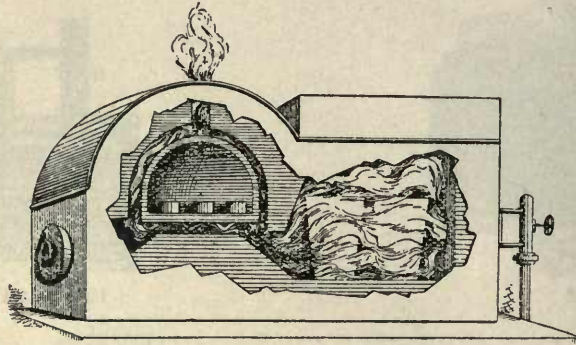
1578



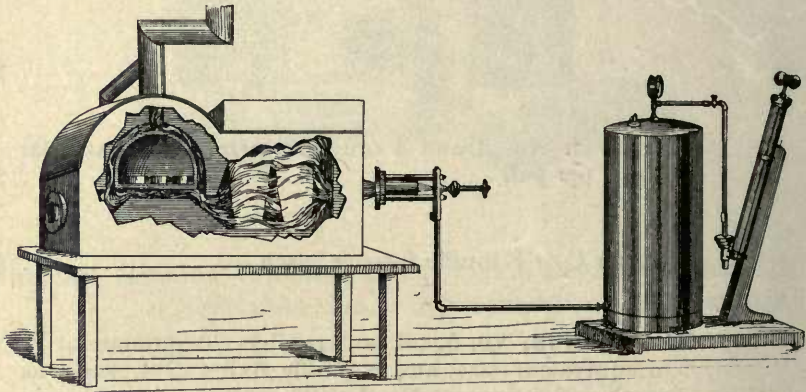
1578—Sectional View.

No.			
1571	Furnace, With No. 2 blowpipe .....		\$ 30.00
1572	— " " 3 " " .....		\$ 33.00
1576	— Covers for No. 3 and 4 crucible furnaces, rectangular form; per pair .....		\$ 1.00
1577	— Plug for C or F muffle furnace, each .....		\$ .50
1578	— <b>Combination, No. 5</b> , takes 1 crucible, 20 grammes or F, or equivalent size, and a muffle 6x3½x2½, same as combination furnace No. 1, and measures 12 inches in length, 8½ inches in width and 16 inches in height. Weight, complete, 30 pounds; packed, 40 pounds.		
	Price .....		\$ 10.00
1579	— <b>Combination, No. 6</b> , takes 4 crucibles, 20 gramme or F, or equivalent size (same as Crucible Furnace No. 4), and muffle 10x6x4 (same as No. 3 Muffle Furnace), and measures 20½ inches in length, 12 inches in width and 19 inches in height. Weight, complete, 95 pounds; packed, 125 pounds.		
	Price .....		\$ 20.00

For assayers or prospectors who desire a portable, self-contained furnace, a Combination Furnace can be recommended. The combination furnaces, Nos. 5 and 6, have the advantage of any other form of combination furnaces heretofore suggested, inasmuch as the introduction of a cold crucible into the crucible chamber interferes in no way with operations being carried on in the muffle. It is economical because all of the heat is utilized. The crucible chamber is always hot and ready for use, independent of what may be going on in the muffle. The muffle is provided with a small chimney to create a current of air through the muffle and needs no further provision for draft, though the furnace may be connected with a chimney, if desired, in which a damper will probably be necessary. Both furnaces are provided with a shelf (not shown in the cuts) to protect the muffle entrance from the heat of the burner and serve as a resting place for cupels, etc., after and before use in the muffle. This will be found to be a great convenience; but no extra charge is made when purchased with a furnace. These furnaces require but one burner.



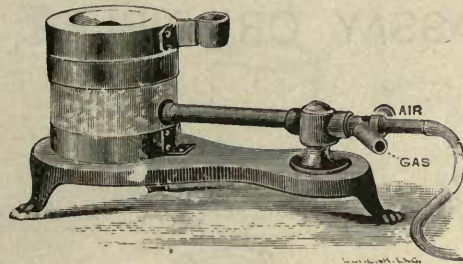
1580-1



1582-3

- |      |   |  |  |
|------|---|--|--|
| No.  |   |  |  |
| 1580 | — | <b>Furnace, Combination Crucible and Muffle Furnace.</b> | Takes 4 Battersea crucibles No. 9, or equivalent sizes, and one muffle 10x6x4 . . . . . \$ 20.00                               |
| 1581 | — | <b>Same.</b>   | With Taylor's blowpipe, including gasoline or coal-oil burner, pipe connections, etc., (No. 1553), complete . . . . . \$ 45.00 |
| 1582 | — | For 2 Battersea crucibles No. 9, and one muffle 8x4¼x3,  | \$ 16.00   |
| 1583 | — | <b>Same.</b>   | With Taylor's blowpipe, including gasoline or coal-oil burner, pipe connections, etc. (No. 1553), complete . . . . . \$ 41.00  |





1588—No. 40 A

No. 1585	<b>Furnace, Fletcher's Crucible, No. 40.</b> This furnace consists of a simple pot—for holding the crucible—with a lid, and a blowpipe, all mounted on a suitable cast iron base. Gas from a $\frac{3}{8}$ -inch supply pipe will work it efficiently. This furnace uses about ten cubic feet of gas per hour, and will take a black lead crucible No. 00.	\$ 3.00
1586	— <b>Extra Parts for above:</b> Furnace body ..... Furnace body and cover..... Burner only ..... Stand, without burner..... Black lead crucible No. 00 .....	\$ .75 1.10 1.00 .90 .25
1588	— <b>No. 40 A, with improved gas burner.</b> This burner is made of the same pattern as that used with the "Perfected" Injector Furnace. It is almost noiseless in its action and works with a very small gas supply; $\frac{3}{8}$ -inch gas supply pipe required.	\$ 3.50
1589	— <b>Extra Parts for above:</b> Furnace body ..... Furnace body and cover..... Burner only ..... Stand, without burner ..... Black lead crucible No. 00.....	\$ .75 1.10 1.50 .90 .25
1590	— <b>No. 40 B, with improved burner, for refined petroleum;</b> gives almost as good results as the gas furnace. Price.....	\$ 4.50
1591	— <b>Extra Parts for above:</b> Furnace body ..... Furnace body and cover..... Burner only ..... Stand, without burner ..... Black lead crucible No. 00 .....	\$ .75 1.50 2.50 .90 .25

NOTE.—For foot blowers for Fletcher's furnace see Nos. 1585-1590.

## ASSAY CRUCIBLES.



1600



1602



1604

Attention is drawn to the description of the crucibles below (Exterior Dimensions), and in ordering these, particulars should be given, to prevent errors.

No.

**1600 Crucibles, Battersea, round form.**

No.....	D	E	F	G	H	J	K	L	N	P	R
Height.....	4	4½	5	5⅝	5⅞	6⅞	7¼	8¼	9¾	11	13 in.
Diameter....	2⅜	2⅞	3	3⅜	3⅝	4½	4¾	5⅞	6¾	7¾	9⅜ "
Price, per doz \$	.50	.75	.85	1.15	1.25	2.00	2.60	3.00	4.50	7.50	13.00

1601 — Covers, "	.40	.50	.50	.60	.65	.75	1.00	1.10	1.25	1.75	2.50
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**1602 Crucibles, triangular form.** Same form as the Hessian crucibles, more uniformly made, and much superior in quality.

T corresponds in size to large 5s.

U " " " " small 5s.

No.....	T	U	V
Height.....	4	3½	3¼
Width.....	3¾	3¼	2⅞
Price, per dozen..... \$	.90	.60	.50

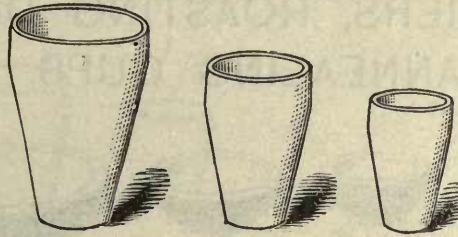
1603 — Covers, " .....	.50	.50	.40
------------------------	-----	-----	-----

**1604 — Battersea Fluxing.**

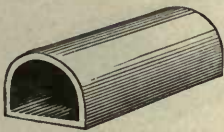
No....	7	8	9	10	12	15	18
Per doz. \$	.85	1.00	1.25	1.75	2.75	4.50	6.50

**1605 — Covers.**

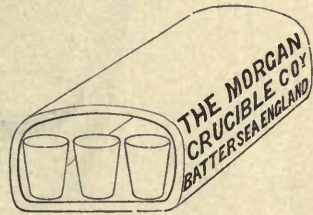
Per doz. \$	.60	.75	.75	.85	1.00	1.25	1.50
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1606



1609



1610

No. 1606 **Crucibles, Colorado Pattern.** Soft burnt; so called soft; low form, straight sides, to fit inside of muffles, as per cut No. 1610.

No.	A2	A1	B
Capacity	5	10	20 grammes.
Height	2 $\frac{5}{8}$	3 $\frac{7}{8}$	3 $\frac{5}{8}$ in.
Width	2 $\frac{3}{8}$	2 $\frac{5}{8}$	3 "
Per dozen	\$ .40	.50	.60

1607 — **Hard Burnt,** so called hard. Prices same as No. 1606.

No.	A2	A1	B
1608 — <b>Covers</b>			
Per dozen	\$ .30	.40	.50

1609 **Muffles, Battersea.**

	In. Long.	In. Wide.	In. High.	Per Doz.
.....	6	4	3	\$ 8.00
C—Hoskins', small....	8	4 $\frac{1}{4}$	3	8.00
E .....	9	5 $\frac{1}{2}$	3 $\frac{5}{8}$	11.00
F—Hoskins', large....	10	6	4	13.50
.....	9 $\frac{1}{4}$	4 $\frac{5}{8}$	3 $\frac{1}{2}$	10.00
H, or 10 $\frac{1}{2}$ -in. Mint ...	10 $\frac{1}{2}$	5 $\frac{1}{4}$	3 $\frac{3}{8}$	12.00
G .....	11	4 $\frac{1}{4}$	3 $\frac{1}{8}$	10.50
12-inch mint .....	12	5 $\frac{1}{4}$	3 $\frac{3}{8}$	13.50
J .....	12	6	4	15.00
K .....	14	8	5	18.00
L .....	15 $\frac{1}{2}$	8 $\frac{3}{8}$	5 $\frac{3}{4}$	20.00

No.		Per Doz.
1610 —	<b>High Sides.</b>	
L. L.	9x15x6 in	\$ 20 00
N. N.	10x16x6 $\frac{1}{2}$ "	25 00
P. P.	11x18x7 $\frac{3}{4}$ "	30 00
R. R.	12x18x7 $\frac{3}{4}$ "	33 00
S. S.	12x19x7 $\frac{3}{4}$ "	33 00

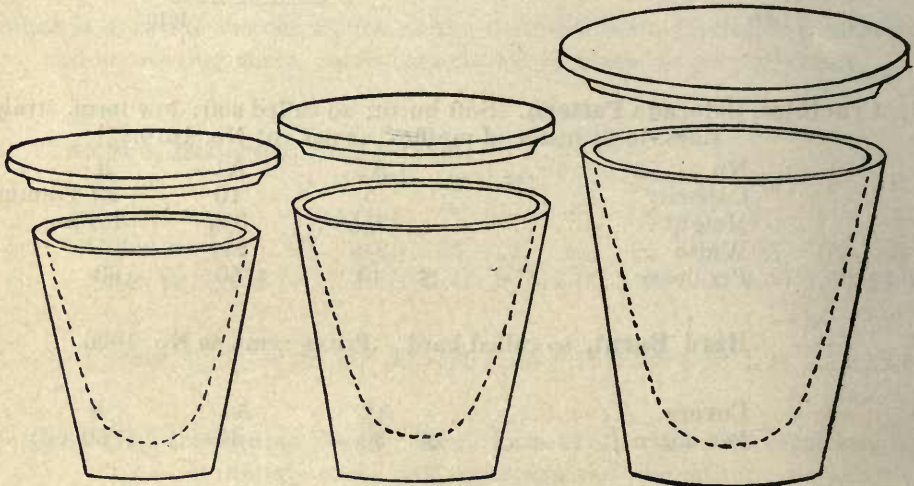
## SCORIFIERS, ROASTING DISHES, ANNEALING CUPS.



1615



1616



1617

No.

<b>1615 Scorifiers, Battersea.</b>						
Outside diameter.....	1¼	2	2¼	2½	2¾	3 in.
Per 1000 .....	\$12.00	12.00	12.00	13.00	16.00	20.00
Barrel contains about.....		3500	3800	2400	2200	1600
Barrel weighs, each about, pounds.		300	425	475	500	525

Special price in barrel lots.

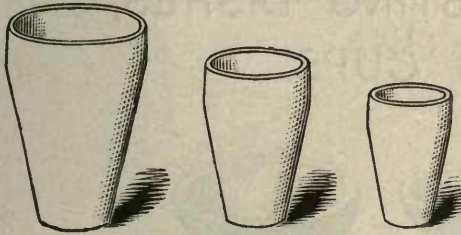
<b>1616 Roasting Dishes, Clay, Battersea.</b>						
Diameter ....	2½	3	4	5	6	8 in.
Per dozen....	\$ .75	1.00	1.25	1.50	2.50	6.00

**1617 Annealing Cups, Battersea.** These are perfectly smooth and of correct porosity.

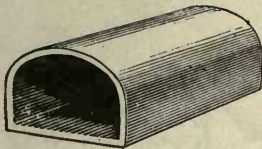
	A	B	C
Height .....	1¼	1¾	1½
Diameter at top .....	1⅝	1¾	1½
Per dozen.....	\$1.00	1.00	1.00

<b>1618</b>	—	<b>Covers, per dozen .....</b>	\$ .25	.25	.25
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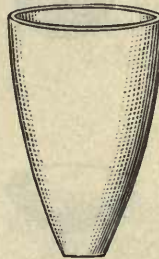
## CRUCIBLES, MUFFLES.



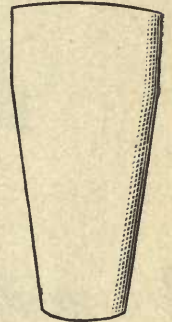
1619



1625



1623



1621

No.								
1619	<b>Crucibles, Clay, Denver.</b>							
	Capacity.....	5	10	12	20	30	40	grammes
	Height.....	2 $\frac{5}{8}$	3	3 $\frac{1}{4}$	3 $\frac{3}{4}$	4 $\frac{3}{4}$	5 $\frac{5}{8}$	inches
	Diameter.....	2 $\frac{3}{8}$	2 $\frac{5}{8}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{3}{8}$	"
	Per 100.....	\$2.50	3.00	3.00	4.00	6.00	8.00	
1620	—	<b>Covers, per 100.</b>						
		2.25	2.25	2.25	3.50	4.00	5.00	
1621	—	<b>Clay, Denver. French pattern.</b>						
	No.....		6		8		9	
	Height.....		4		5		5 $\frac{3}{4}$	in.
	Diameter.....		2 $\frac{1}{4}$		2 $\frac{1}{2}$		3	"
	Per 100.....		\$3.50		7.00		8.00	
1622	—	<b>Covers, per 100.</b>						
			2.25		2.25		3.50	
1623	—	<b>Clay, Denver, for open furnace.</b>						
	No.....	D	E	F	G	J	K	L
	Height.....	4	4 $\frac{1}{2}$	5	5 $\frac{5}{8}$	6 $\frac{5}{8}$	7 $\frac{1}{4}$	8 in.
	Diameter.....	2 $\frac{1}{4}$	3	3 $\frac{1}{8}$	3 $\frac{3}{8}$	4 $\frac{3}{8}$	4 $\frac{5}{8}$	5 $\frac{1}{4}$ "
	Per 100.....	\$3.50	5.50	6.00	8.00	12.00	13.50	24.00
1624	—	<b>Covers, per 100.</b>						
		2.25	3.50	4.00	5.00	6.00	8.75	8.75
1625	<b>Muffles, Clay, Denver.</b>							
	Width	Long		High		Each		
	3 $\frac{1}{2}$ .....	6		2 $\frac{1}{2}$	in.			\$ .50
	4 $\frac{3}{4}$ .....	8		3	Hoskins'.			.60
	5 $\frac{1}{4}$ .....	10 $\frac{1}{2}$		3 $\frac{7}{8}$	U. S. Mint.			.75
	6.....	10		4	Hoskins'.			.75
	6.....	12		4				.90
	8.....	12		5	high sides, very roomy.			1.15
	8.....	14		5 $\frac{1}{4}$	"		"	1.25
	9.....	15		5 $\frac{3}{4}$	"		"	1.50
	10.....	16		6 $\frac{3}{4}$	"		"	1.75
	11.....	18		7 $\frac{3}{4}$				2.25
	12.....	18		7 $\frac{3}{4}$				2.50
	12.....	19		7 $\frac{3}{4}$				2.50
	12 $\frac{3}{4}$ .....	21		8 $\frac{3}{4}$				2.75
	14.....	18		7				2.75

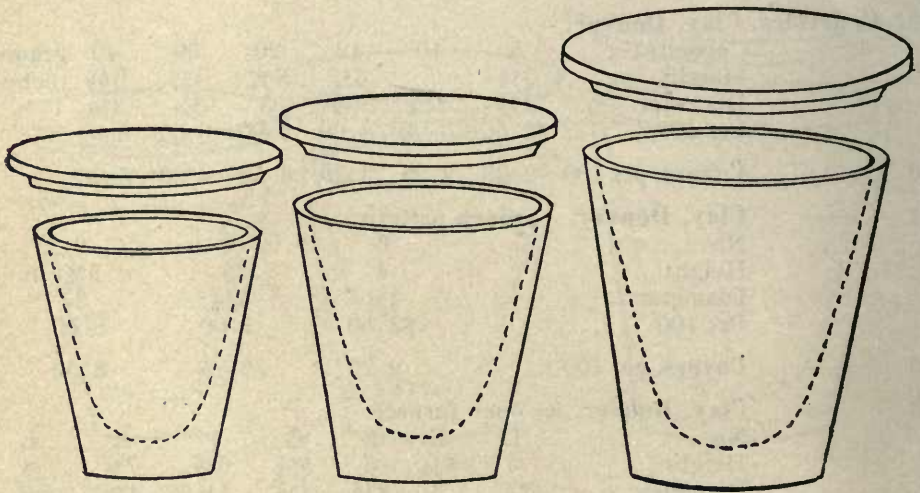
## SCORIFIERS, ROASTING DISHES, ANNEALING CUPS.



1626



1627



1623

**No. 1626 Scorifiers, Clay, Denver.**

Diameter.....	2¼	2½	2¾	3	3½	4 in.
Price, per 100.. \$	1.20	1.30	1.60	2.00	2.50	3.00

Special prices in barrel lots.

**1627 Roasting Dishes, Clay, Denver.**

Diameter.....	3	4	5	6 in.
Price, per dozen \$	.80	.90	1.10	1.75

**1628 Annealing Cups, Clay, Denver.**

No.....	0	1	2
Size.....	1½ x 1½	1¾ x 1¾	1½ x 1½ in.
Per dozen..... \$	1.00	1.00	1.00

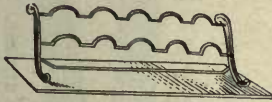
## CRUCIBLES, CRUCIBLE RACKS AND FILLERS.



1635



1640



1641



1642

No.  
1635 **Crucibles, Hessian, triangular.**

	Small 5s	Large 5s	6s	8s
No. in nest .....	4	5	6	7
Height of largest .....	4	4½	5½	7 in.
Width at top .....	3	3½	4¾	5¾ "
Price, per doz.nests....	\$ .65	1.40	2.75	4.50

1636 — Small 5s, outside piece only, per dozen..... \$ .55

1637 — Small 5s, round, per dozen..... .55

1638 **Covers, Triangular, Hessian.**

	Small 5s	Large 5s	6s	8s
Diameter .....	3	3½	4¾	5¾ in.
Price, per dozen.....	\$ .60	.90	1.25	2.25

1640 **Racks, Crucible.** Made of heavy sheet iron, black japanned, for holding 10 assay crucibles while mixing the assay, each hole numbered. Will hold Nos. 7 to 10 Battersea or Denver crucibles.

Each ..... \$ 2.50

1641 — **Iron.** To support 4 assay crucibles in an inverted position after pouring.

Each ..... 2.00

1642 **Filler, Crucible,** of Russia sheet iron, 16½ inches long, for pouring ore or fluxes into the crucible while in the furnace.

Each ..... .75

# BLACK LEAD CRUCIBLES, ETC.



1645

No. 1645 Crucibles, Black Lead or Plumbago. Dixon's or Taylor's make.

Nos.	Height Outside. Inches.	Diameter at the Top, Outside. Inches.	Diameter at the Bilge, Outside. Inches.	Capacity in Liquid Measure. Pints.	Prices. Each.
1.....	3 1/4	2 5/8	2 5/8	1/3	
2.....	4	2 7/8	2 7/8	1/2	\$ .30
3.....	4 1/2	3 1/2	3 1/2	1	.35
4.....	5	4	4	1 1/4	.40
5.....	5 1/2	4 7/8	4 1/8	1 3/4	.45
6.....	5 3/4	4 1/2	4 1/2	2 1/4	.55
8.....	6 3/4	5 1/4	5 1/4	3	.60
10.....	7 5/8	6	6 1/8	4 1/2	.70
12.....	8	6 1/2	7 1/8	5 3/4	.80
14.....	8 1/4	6 3/4	7 1/4	6 1/2	.90
16.....	8 3/4	7	7 3/8	8	} No. 14 and upwards 5 1/2 c per No.
18.....	9 3/4	7 1/2	8	9 1/4	
20.....	10 1/4	7 3/4	8 3/8	10	
25.....	10 1/2	8 1/4	9	12 1/2	
30.....	11 1/4	8 5/8	9 1/2	14	
35.....	11 5/8	9	9 3/4	16 1/2	
40.....	12 1/4	9 1/2	10 1/2	18	
45.....	12 3/4	10	10 3/4	20 1/2	
50.....	13 1/2	10 1/4	11 1/4	24	
60.....	14	10 1/2	11 3/4	26 1/2	
70.....	14 1/2	10 3/4	12	29	
80.....	15 1/2	11 1/8	12 3/8	31	
100.....	16 1/4	11 3/4	12 3/4	35 1/2	
125.....	16 1/2	12 1/4	13 1/2	38	
150.....	18 1/4	13	14 3/4	50	
200.....	20	14 1/4	16	.....	
300.....	21	15 1/4	17	.....	

Holding Capacity Three Pounds of Molten Metal per Number.

1646 — Covers, Black Lead.  
 No ..... 1 2 3 4 5 6 8 10 12  
 Per dozen, \$ 2.00 2.25 2.25 2.50 2.50 2.75 3.00 3.25 3.60  
 Prices of all covers above No. 12, 2 1/2 cents per number.

1647 Dippers, Black Lead.  
 Size..... Small. Medium. Large.  
 Per dozen..... \$ 7.50 8.00 9.00

1648 Stirrers, Black Lead.  
 Size..... Small. Medium. Large.  
 Per dozen..... \$ 8.00 9.00 10.00

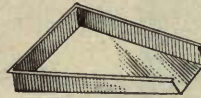
NOTE.—The price of Black Lead Crucibles, Covers, etc., fluctuates according to the price of Ceylon Plumbago, and will be subject to change without notice. All black lead crucibles should be well annealed and kept in a dry, warm place before using.



# SAMPLING PANS, GOLD DUST BLOWERS, MAGNETS, TONGS.



1649



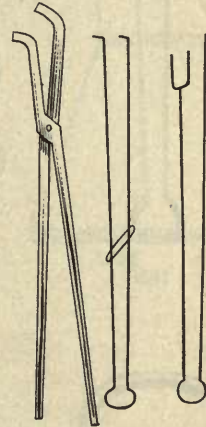
1651



1652



1653



1654-5-6

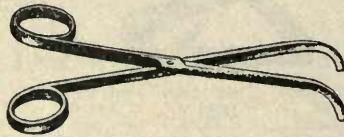
No.										
1649	Sampling Pans, for ore samples, seamless tin.	Diameter . . . . .	5	6	7	8½ in.				
		Per dozen . . . . .	\$ .50	.60	.75	.90				
1650	— Agateware.	Diameter . . . . .	5	6	7	8½ in.				
		Per dozen . . . . .	\$1.25	1.50	1.75	2.00				
1651	Blowers, Gold Dust. Polished sheet brass.									
			4½x6	6½x9	9x10	10½x11	11x13 in.			
		Each . . . . \$	.60	.90	1.00	1.25	1.75			
1652	Magnets, Horse Shoe. Best English.	Length . . . . .	3	4	5	6	7	8	9	10 in.
		Each . . . . . \$	.25	.35	.50	.75	1.00	1.25	2.00	2.25
1653	— Bar. In pairs, with 2 armatures.	Length . . . . .	4	6	8	10 in.				
		Per pair . . . . . \$	.50	.75	1.50	2.00				
1654	Tongs, Crucible, steel.	Length . . . . .	12	17	32	36	45 in.			
		Each . . . . . \$	.50	.60	1.00	1.25	1.75			
1655	— Cupel, steel.	Length . . . . .	26	36 in.						
		Each . . . . . \$	.90	1.10						
1656	— Scorifiers, steel.	Length . . . . .	30	36 in.						
		Each . . . . . \$	.90	1.10						



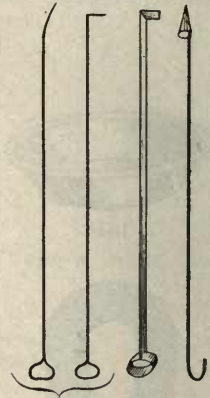
1658



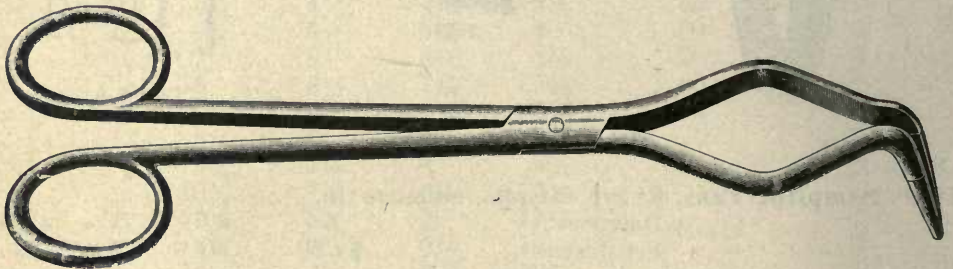
1660-1662



1659-1661

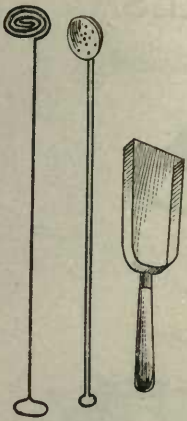


1664-5-6

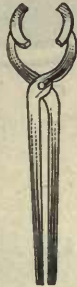


1663

No.				
1657	<b>Tongs</b> , For clasp- ing crucibles in the muffle, same style as 1656.			
	Length.....	19	36	45 in.
	Each.....	\$1.00	1.50	2.00
1658	— <b>Crucible, Scorifier and Cupel combined</b> , steel, 18 inches.			\$ .75
1659	— <b>Crucible</b> , iron, japanned, scissors form, single bent, 9 inches.			.60
1660	— <b>Double bent</b> , 9 inches.....			.75
1661	— <b>Steel</b> , nickel-plated, single bent, 9 inches.....			1.00
1662	— <b>Double bent</b> , 9 inches.....			1.25
1663	— <b>Steel</b> , polished, double bent, solid platinum tips, 8 inches, Price varies with weight of platinum tips.			
	Approximate price.....			6.00



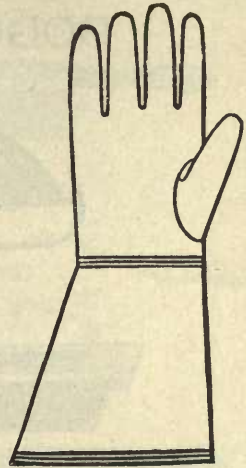
1667-8-9



1670



1677



1675

No.			
1664	<b>Pokers, Iron, 1/2 inch, round</b> .....		\$ .50
1665	<b>Scrapers, Hearth, flat iron, 36 inches</b> .....		.35
1666	<b>Spoons, Granulating, for sampling melted bullion, 4 feet long, bowl 1 inch</b> .....		1.50
1667	<b>Skimmer, Crucible, round iron, 1/4 inch, 36 inches long</b> ....		.75
1668	— <b>Perforated bowl, 36-inch</b> .....		1.50
1669	<b>Shovel, Coal, iron, wooden handle.</b> .....		.25

NOTE.— 32-inch Crucible, 29-inch Scorifier and 28-inch Cupel Tongs are the sizes commonly used with our assay furnaces.

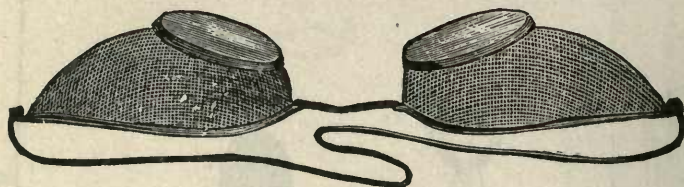
1670 **Tongs, Clasp, for lifting black lead crucibles.** The numbers refer to size of crucible they are made to fit:

Nos. ....	8	10	12	14	16	18	20	25
Each .....	\$2.00	2.50	2.75	2.75	3.00	3.00	3.25	4.25
Nos. ....	30	35	40	45	50	60	70	80
Each .....	\$4.50	5.00	6.00	6.50	7.00	7.50	8.00	9.00

Larger sizes made to order.

1671	— With two side straps and rivet, with eye to hook in, for lifting large crucibles by pulley. Made to order.		
1672	<b>Gloves. Buckskin, heavy gauntlet, Nos. 9 or 10; per pair</b> .....		\$ 1.75
1673	— <b>Horsehide, fire and waterproof; per pair</b> .....		1.75
1674	— <b>Acid, rubber, long gauntlet, best quality; per pair</b> .....		2.50
1675	<b>Mittens, Melters'. Duck, padded, with gauntlet; per pair</b> .....		1.25
1676	<b>Finger Cots, Acid, rubber; per dozen</b> .....		.60
1677	<b>Mittens, Asbestos, with thumb; per pair</b> .....		3.50

## GOGGLES, MOULDS, CHISELS.



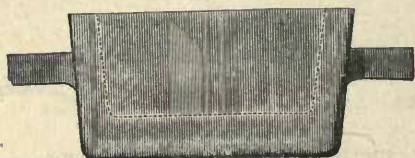
1679



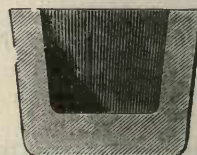
1682



1683



1681



1681

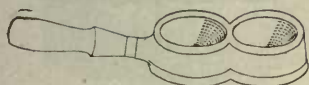
- No.  
 1678 **Asbestos Cloth** for aprons for melters, cut in lengths of 1 yard and 1 yard 6 inches; per yard ..... \$ 2.75
- 1679 **Goggles**, for protecting the eyes at the fire. Each pair in tin box, assorted colored glasses—green, blue, smoke and white.  
 Per pair ..... \$ .25
- 1681 **Moulds, Bullion or Ingot**, round corners.  
 Dimensions, inside measure.
- |             |                                |                                 |                                |      |                               |                               |                                |      |                                |                               |
|-------------|--------------------------------|---------------------------------|--------------------------------|------|-------------------------------|-------------------------------|--------------------------------|------|--------------------------------|-------------------------------|
| Oz. silver  | 15                             | 27                              | 52                             | 107  | 160                           | 265                           | 428                            | 683  | 810                            | 1200                          |
| “ gold.     | 28                             | 50                              | 107                            | 200  | 300                           | 495                           | 800                            | 1000 | 1500                           | 2208                          |
| In. long.   | 2½                             | 3 <sup>3</sup> / <sub>16</sub>  | 4 <sup>1</sup> / <sub>16</sub> | 5    | 5¾                            | 7 <sup>1</sup> / <sub>8</sub> | 8¾                             | ...  | 11 <sup>1</sup> / <sub>8</sub> | 12½                           |
| “ wide.     | 1 <sup>7</sup> / <sub>16</sub> | 1 <sup>11</sup> / <sub>16</sub> | 2 <sup>3</sup> / <sub>16</sub> | 2¾   | 3 <sup>1</sup> / <sub>8</sub> | 3½                            | 4 <sup>7</sup> / <sub>16</sub> | ...  | 4 <sup>7</sup> / <sub>8</sub>  | 5¼                            |
| “ deep.     | 1 <sup>7</sup> / <sub>16</sub> | 1 <sup>3</sup> / <sub>8</sub>   | 1½                             | 2    | 2¼                            | 2 <sup>7</sup> / <sub>8</sub> | 3                              | ...  | 4 <sup>1</sup> / <sub>8</sub>  | 5 <sup>3</sup> / <sub>8</sub> |
| Each ... \$ | .35                            | .50                             | .75                            | 1.25 | 2.25                          | 3.00                          | 3.50                           | 4.50 | 5.50                           | 7.50                          |
- 1682 — **Bullion or Ingot**, with sliding bar; 1½x1½x8 inches inside, with sliding bar to cast any length desired, capacity 150 ounces gold, 75 ounces silver..... \$ 1.00
- 1683 — **Quadruple**, for sample bars ..... .60
- 1684 **Chisels, Bullion.**
- |                          |        |       |
|--------------------------|--------|-------|
| Length.....              | 5½     | 7 in. |
| Width, cutting edge..... | ½      | 5/8 “ |
| Each .....               | \$ .25 | .35   |



1685



1689



1687-8



1694-5



1693



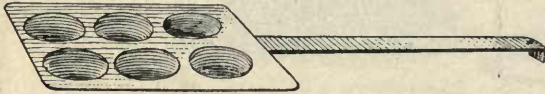
1691



1696

No.				
1685	Brushes, Wire, for scouring bullion; double end.	Steel or brass.....	\$	.50
1686	— Bristle, in leather tube, 1¼ inches diameter .....			.90
1687	Moulds, Assay Pouring. Deep, drilled, smooth, 2 holes.....			1.00
1688	— “ “ Shallow, drilled, smooth, 2 holes.....			.75
1689	— Pouring, heavy solid iron, with 2 conical holes, 2⅞ inches diameter, 1⅝ inches deep; for crucible and scorification assays .....			1.25
1690	— Assay Pouring. Single mould, Comstock Lode pattern, conical, 2⅝ inches diameter, 2⅝ inches deep .....			1.00
1691	— “ “ Drilled, smooth, light cast iron, 3 conical holes .....			1.00
1692	— “ “ Drilled, smooth, light cast iron, 4 conical holes .....			1.25
1693	— “ “ with 3 conical holes, smooth, casting not drilled .....			.50
1694	— “ “ Single, with handle, to be lifted with tongs, deep.....			.40
1695	— “ “ Same, shallow .....			.30
1696	— Pouring, iron, with 6 conical holes and handle, bottom running down to a fine point; for scorification .....			.75

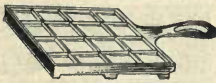
# TRAYS.



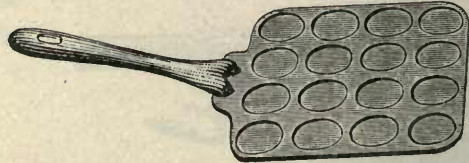
1697



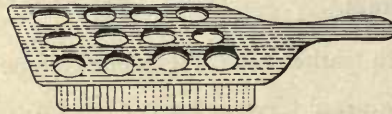
1698



1700



1701



1702

No.	<b>Trays, Cupel or Scorifier. Heavy sheet copper.</b>		
1697	Size.....	6½x9 in., 6 holes.	9x9 in., 9 holes.
	Each.....	\$1.50	2.00
1698	—	Cast iron.	
	Size.....	8x8 in., 9 holes.	8x10 in., 12 holes.
	Each.....	\$1.00	1.25
1699	—	30 conical holes, without handles, 12½x14 in .....	\$ 2.00
1700	—	Cast iron, 8x8 in., 16 shallow square holes.....	1.25
1701	—	With detachable handle.....	1.25
1702	—	Iron, japanned, for carrying annealing cups, 12 holes,....	.75

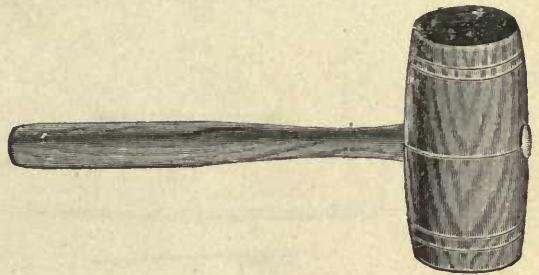
STEEL ALPHABETS AND FIGURES,  
MALLETS.



1715



1718



1720

No.	Figures, Steel, for stamping bullion, in sets, best American make.	Size.....	1/8	3/16	1/4	3/8	1/2 in.
1715	Figures...	Figures...	\$1.00	1.50	1.75	2.50	4.50
1716	Letters, Steel, in sets. ....		\$3.00	4.50	5.50	7.50	12.00
1717	Stamps, Steel, in one piece.						
	Gold .....		\$1.50	2.00	2.75	3.50	4.00
	Silver .....		2.25	2.50	3.00	4.00	4.50
	Fine .....		1.50	2.00	2.75	3.50	4.00
	Value .....		2.25	2.50	3.00	3.00	4.50
	Total .....		2.25	2.50	3.00	4.00	4.50
	No. ....		1.00	1.00	1.50	2.00	2.50
	Oz. ....		1.00	1.00	1.50	2.00	2.50
	\$ .....		.75	.75	1.25	1.75	2.00

1718 — with name of mine or assayer in one piece, made to order of any size or style.  
 Size..... 1/8 3/32 3/16 1/4 3/8 1/2 in.  
 Prices on application.

NOTE.—The above stamps are made of fine steel, well-tempered and durable, and can be used upon iron as well as upon soft bullion.

1720	Mallets, Hickory Wood.					
	Diameter, face.....		2	2 1/2	3 in.	
	Each .....		\$ .25	.25	.35	

1721 — Iron Bound, 3-inch face..... \$ .75

MOULDS, CUPELS, BRUSHES.



1721



1722



1731



1732-3



1724-5

No.							
1722	<b>Moulds, Scorifier, iron.</b>						
	Diameter .....	2	2¼	2½	2¾	3 in.	
	Each .....	\$3.00	3.50	4.25	5.00	5.50	
1723	<b>Scorifier, brass.</b>						
	Each .....	\$5.00	5.50	6.00	6.75	7.50	
1724	<b>Cupel, iron.</b>						
	Diameter .....	½	1	1¼	1½	1¾	2 in.
	Each .....	\$ .75	1.25	1.50	1.65	1.75	2.25
		Larger sizes to order.					
1725	<b>Brass.</b>						
	Diameter .....	½	1	1¼	1½	1¾	2 in.
	Each .....	\$1.75	2.00	2.25	2.50	2.75	3.00
		Larger sizes to order.					
1726	<b>Cupels, Made of best Bone Ash.</b>						
	Diameter ...	½	1	1¼	1½	1¾	2 in.
	Dozen .....	\$ .15	.25	.25	.35	.40	.50
1727	<b>Pencils, Red Chalk, for marking cupels, crucibles, etc.</b>						
	Per dozen .....						\$ .15
1728	<b>Red Chalk, or Reddle, in sticks, per pound .....</b>						.25
1731	<b>Brushes, Button, Lingke's form, brass tube, with bristles at each end.</b>						
	Diameter .....		½		⅝	¾	in.
	Each .....		\$ .40		.50	.60	
1732	<b>With handle.</b>						
	Size .....			3 Rows		4 Rows	
	Each .....			\$ .25		.35	



# ANVILS, HAMMERS.



1735-6



1737



1741



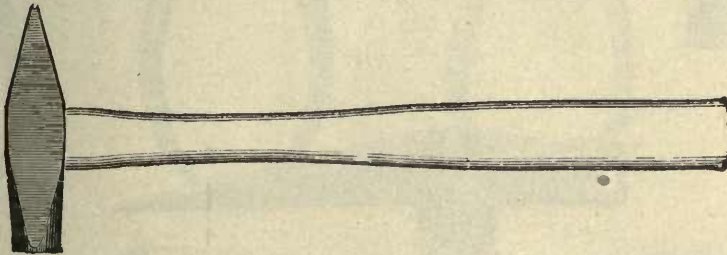
1740



1743

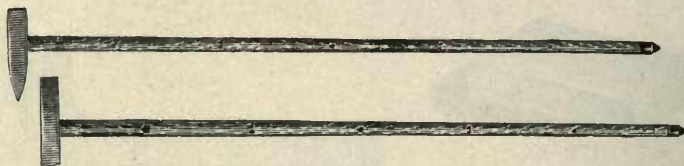


1744

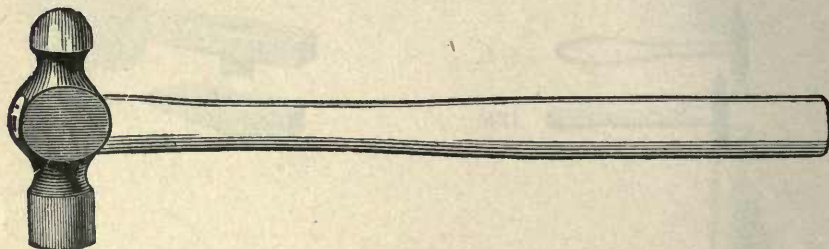


1742

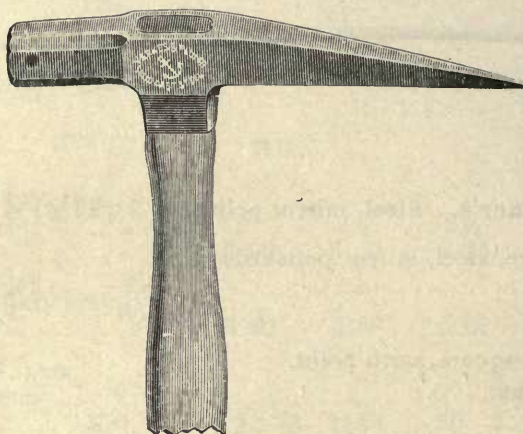
No.								
1735	<b>Anvils, Plattner's.</b>	Steel, mirror polished, $2\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$ in.....				\$ .50		
1736	—	Square, steel, mirror polished.						
		Size .....	2x2	$2\frac{1}{2} \times 2\frac{1}{2}$	3x3 in.			
		Each .....	\$1.30	1.75	2.50			
1737	—	Steel, square, with point.						
		Weight .....	3		6 lbs.			
		Face .....	$2\frac{1}{4}$		3 in. square.			
		Each .....	\$1.75		3.50			
1740	<b>Hammers, Blowpipe, Plattner's,</b>	with wood handle .....				\$ .60		
1741	—	“ “ “ wire “ .....				.75		
1742	—	<b>Button or Slag.</b> One end wedge-shaped. for breaking ores.						
		Weight.....	4	7	12	15	18	22 oz
		Per Doz.....	\$5.50	5.75	6.25	6.50	7.00	7.50
			Weights do not include handles.					
1743	—	<b>Geological, Dana's.</b> Square face; cutting edge parallel with handle.						
		Face .....	$\frac{3}{4}$	1		$1\frac{1}{4}$ in. square.		
		Weight.....	10	21		32 oz.		
		Each .....	\$1.25	1.50		2.25		
1744	—	<b>Geological, Dana's.</b> Cutting edge at right angle with handle						
		Face .....	$\frac{3}{4}$	1		$1\frac{1}{4}$ in. square.		
		Weight.....	10	21		32 oz.		
		Each .....	\$1.25	1.50		2.25		



1746



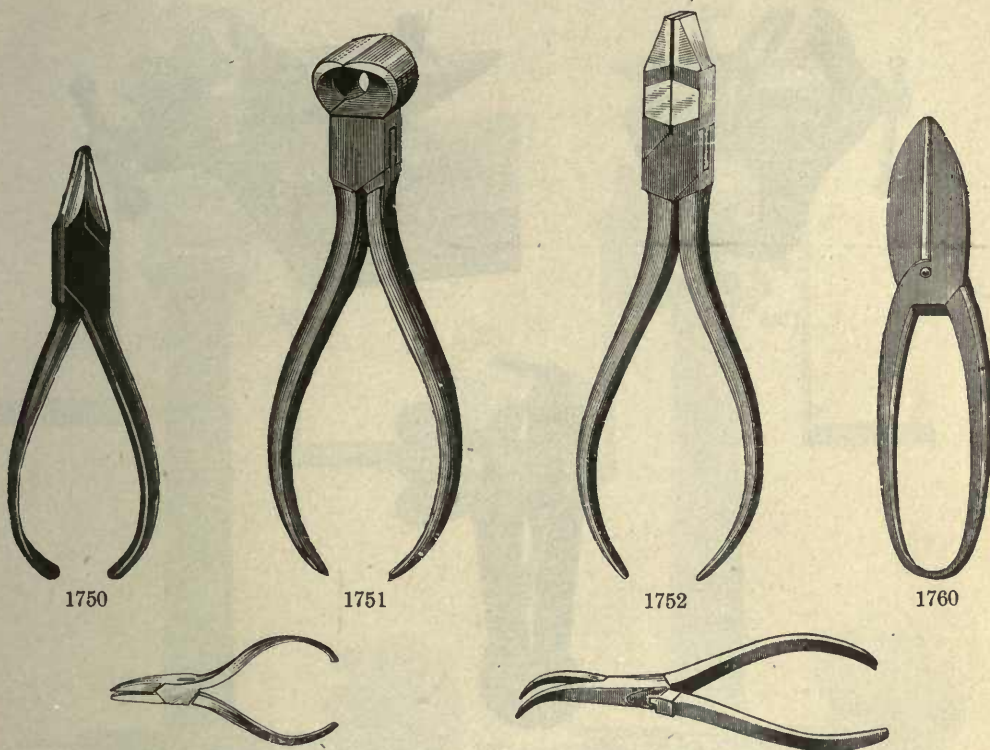
1747



1748

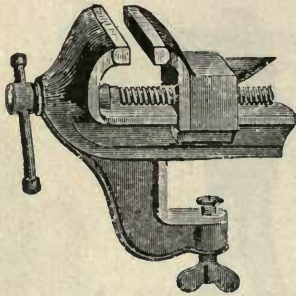
No.							
1746	<b>Hammers, Geological,</b>	for prospecting. Combined hammer, with chisel edge and walking cane, with spike at lower end to assist in climbing. Weight, 2 lbs. Capable of giving heavy blows, fine tempered steel, handle graduated for measuring.					
	Each	.....					\$ 2.50
1747	—	<b>Ball Peen, solid cast steel.</b>					
	Nos.	000	00	0	1	1½	5
	Weight	¾	1	1¼	1½	1¾	3 lbs.
	Each	\$.90	1.00	1.00	1.15	1.25	2.00
1748	<b>Pick, Prospector's,</b>	solid cast steel, adze edge.					
	Nos.	.....		1	2		
	Face	.....		⅞ x ⅞	1x1 in.		
	Weight	.....		1½	2½ lbs.		
	Each	.....		\$1.25	1.50		

PLIERS.

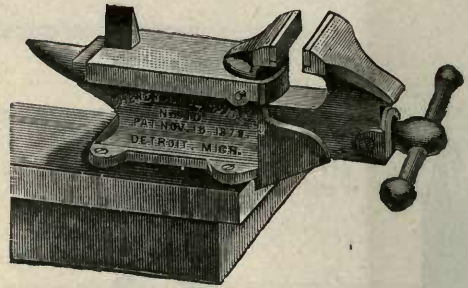


No.	Description	Length	Price
1750	<b>Pliers.</b> Flat or round nose.		
	Length.....	3 4 5 6 7 8 in.	
	Each .....	\$ .30 .35 .40 .50 .60 .70	
1751	— End cutting.		
	Length.....	4 5 6 7 8 in.	
	Each .....	\$ .60 .75 .85 1.00 1.12	
1752	— Side cutting.		
	Length.....	4 5 6 in.	
	Each .....	\$ .60 .75 .85	
1753	— Flat tapering nose; for holding buttons while brushing.		
	Polished steel, 5 inches.....		\$ .60
1754	— Turned down nose; for holding buttons while brushing.		
	Polished steel, 5 inches.....		.60
1755	— With finer point; for gold bead.....		.60
1760	<b>Shears, Snip.</b> Cast steel, bright, polished.		
	Length.....	5 6 7 8 in.	
	Each .....	\$ .75 1.00 1.25 1.50	
1761	<b>Scissors.</b> Steel; 6½ inches.....		\$ .40
1762	— <b>Blowpipe.</b> Polished; for cutting thin metal, with two file edges; cutting edge, 1½ inches; each.....		.40

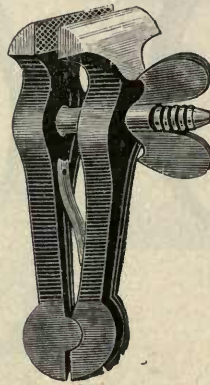
VICES.



1765



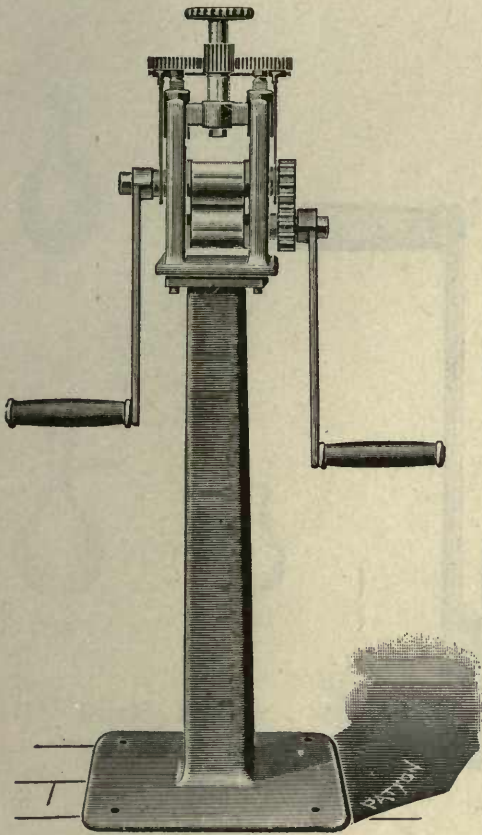
1766



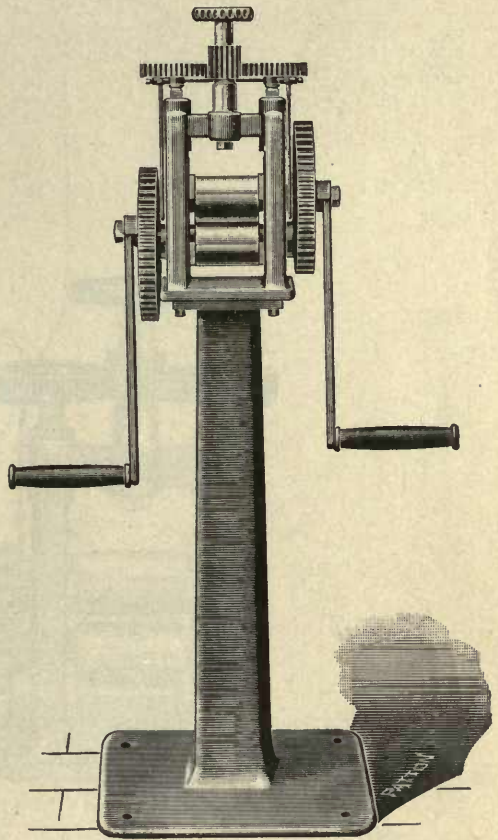
1767

No.						
1765	Vise, Bonney.	Cast iron, to fasten to the bench with one screw.				
	No. 2,	jaw 2 inches wide, opens 2½ inches, each			\$ .75	
	“ 3,	“ 2 “ “ “ 2 “ with attach-				
		ment to take a taper piece, each			1.00	
1766	—	and Anvil combined, improved, with adjustable jaw to grasp taper form.				
	No. 10,	face of anvil 4½x2 inches, jaws 2½ inches wide, open 3 inches, weight, 8½ pounds, each			3.50	
	No. 20,	face of anvil 6½x3 inches, jaws 3½ inches wide, to open 4 inches, weight, 28 pounds, each			4.50	
	No. 30,	face of anvil 8x3½ inches, jaws 4 inches wide, open 5 inches, weight, 37 pounds, each			5.50	
	No. 40,	face of anvil 8½x4 inches, jaws 4½ inches wide, open 6 inches, weight, 51 pounds, each			6.50	
1767	—	Hand.				
	Width of jaw	.....	1½	1¾	1¾	2 in.
	Each	.....	\$ .80	1.00	1.15	1.25

## ROLLING MILLS.



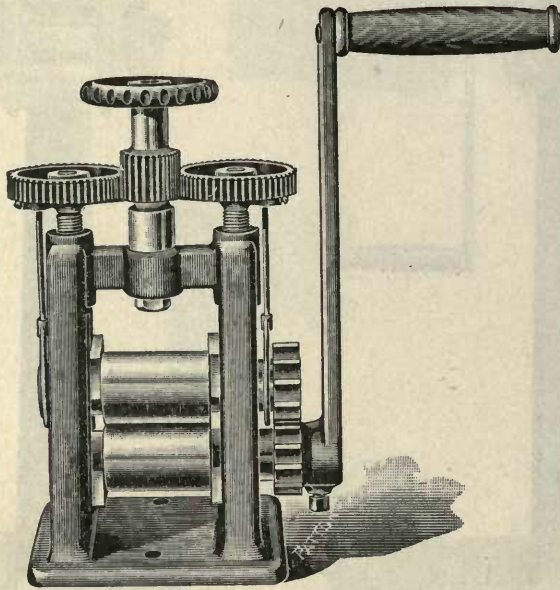
1770



1772

No.				
1770	<b>Rolling Mills, Hand.</b>	Improved single-gear'd, with flat rolls.		
	Nos.....	2	3	4
	Size.....	1½x2	2¼x3	2¾x4 in. long.
	Weight.....	80	145	190 lbs.
	Each.....	\$30.00	50.00	75.00
1772	—	<b>Hand.</b>	Improved. Double-gear'd, with flat rolls.	
	Nos.....		3	4
	Size.....		2¼x3	2¾x4 in. long.
	Weight.....		180	225 lbs.
	Each.....		\$75.00	100.00

These mills are made from newly designed patterns, very heavy, and with improvements that are very desirable. These improvements include the geared pressure screws, in connection with our patent lifting device, which will dispense with all springs and allow the rolls to be raised and lowered by turning the center pinion. The rolls also can be quickly removed from the frame without removing the boxes.



1773

No  
 1773 **Rolling Mill, The Crown.** The illustration shows a newly designed mill. The rolls are 2 inches in diameter by 3 inches long, perfectly hardened, ground and polished. Cut pinions of steel. Geared pressure screws, with an improved lifting device without springs. The rolls can be quickly removed from the frame. Weight, 45 pounds.

Price..... \$ 30.00

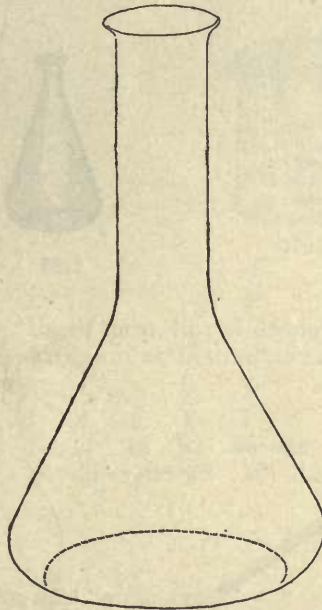
FLASKS.



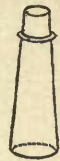
1775



1776



1781  
Full Size.



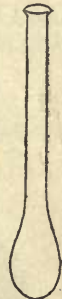
1779



1778



1777



1780

No.											
1775	<b>Flasks, Boiling.</b>	Flat bottom; vial mouth, best Bohemian glass, well annealed.									
	Capacity .	$\frac{1}{2}$	1	2	4	6	8	12	16	24	32 oz.
	Dozen ...	\$1.10	1.25	1.50	1.80	2.25	2.60	3.25	3.60	4.00	5.00
	Capacity .	$\frac{1}{2}$	$\frac{3}{4}$	1	2	3	5	gals.			
	Each ....	\$ .60	.75	.85	1.25	2.00	3.50				
1776	—	<b>Round bottom.</b>									
	Capacity .	$\frac{1}{2}$	1	2	4	6	8	12	16	24	32 oz.
	Dozen ...	\$1.10	1.25	1.50	1.80	2.25	2.60	3.25	3.60	4.00	5.00
1777	—	<b>Wide neck.</b>									
	Capacity .	1	2	4	6	8	16	32 oz.			
	Dozen ...	\$1.50	1.75	2.25	2.50	3.00	4.50	7.50			
1778	—	<b>Side tube.</b>									
	Capacity .....		4	8	16 oz.						
	Dozen .....		\$3.00	4.00	6.00						
1779	—	<b>Parting, or assay, conical form, with ring, flat ground top.</b>									
	Capacity .....		2	3 oz.							
	Per dozen.....		\$2.00	2.25							
1780	—	<b>Parting.</b>									
	Capacity .....		1	2	4 oz.						
	Per dozen.....		\$2.00	2.25	2.75						
1781	—	<b>Parting, Kennedy.</b>									
	Capacity 1 ounce, dozen .....	\$1.25									



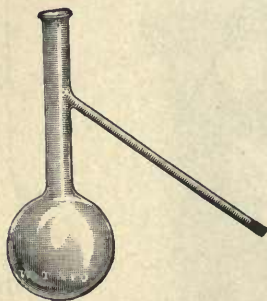
1790



1785



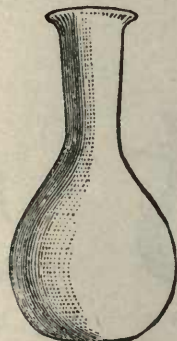
1788



1782



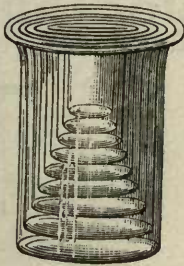
1789



1783

No.									
1782	Flasks, Fractional Distillation, with side tube.	Capacity .....	4	8	16 oz.				
		Per dozen.....	\$3.00	4.50	6.00				
1783	— Copper determination. Pear shaped, wide mouth and broad flange.	Capacity .....	4	6	8	16 oz.			
		Dozen.....	\$1.60	1.80	2.00	3.00			
1784	— Bohemian, hard glass, for Kjeldahl's nitrogen determination.	Capacity.....		200		500%			
		Each.....		\$ .40		.60			
1785	— Erlenmeyer.	Capacity .....	1	2	4	6	8	16	32 oz.
		Per dozen .....	\$1.25	1.50	2.00	2.50	3.00	4.00	5.00
1788	— For gas evolutions, heavy glass, bulb shape, well formed lip, wide neck, flat bottom.	Capacity.....	8	16	32	64 oz.			
		Each.....	\$ .30	.40	.60	.90			
1789	— Wide mouth.	Capacity.....	8	16	32	64 oz.			
		Each.....	\$ .25	.30	.45	.70			
1790	— Fitted with rubber stopper; glass funnel and delivery tube for generating gases.	Capacity.....	4	8	16	32 oz.			
		Each.....	\$ .50	.65	.90	1.15			





1792



1794

No.  
1791 **Beakers, Bohemian Glass.** Usual form, lipped or plain, made of best hard Bohemian glass, equally thin at bottom and sides, thoroughly annealed.

Nos.....	1	2	3	4	5	6	7	8	9	10	11	12
Capacity,	3	4½	7	11	16	22	36	46	64	90	120	150 oz.
Each....\$	.10	.15	.20	.25	.30	.35	.40	.45	.55	.65	.75	.90

1792 — **In nests.**

Nest Nos.	1 to 3,	in nests of 3,	capacity 3 to 7 oz.	Per Nest
"	1 "	4,	" 4, " 3 " 11 "	\$ .45
"	1 "	5,	" 5, " 3 " 16 "	.70
"	1 "	6,	" 6, " 3 " 22 "	1.00
"	1 "	7,	" 7, " 3 " 36 "	1.35
X "	1 "	8,	" 8, " 3 " 46 "	1.75
"	1 "	9,	" 9, " 3 " 64 "	2.25
"	1 "	10,	" 10, " 3 " 90 "	2.75
				3.50

1793 — **Griffin's.** Low, wide form, lipped.

Nos....	00	0	1	2	3	4
Capacity .....	1½	2½	5	8	12	20 oz.
Each.....	\$ .09	.11	.12	.18	.25	.30
Nos.....	5	6	7	8	9	10
Capacity .....	.25	.40	.55	.70	.80	120 oz.
Each.....	\$ .40	.50	.60	.70	.80	.90

1794 — **Griffin's, in nests.**

Nest Nos.	00 to 1,	in nests of 3,	capacity 1½ to 5 oz.	Per Nest
"	0 "	2,	" 2½ " 8 "	\$ .30
"	0 "	3,	" 4, " 2½ " 12 "	.40
"	1 "	4,	" 4, " 5 " 20 "	.65
"	1 "	5,	" 5, " 5 " 25 "	.85
"	1 "	6,	" 6, " 5 " 40 "	1.25
"	1 "	8,	" 8, " 5 " 70 "	1.75
"	1 "	10,	" 10, " 5 " 120 "	2.50
				3.50

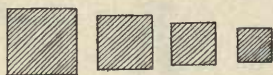
1795 — **Copper lipped, thin, Griffin's form.**

Capacity.....	125	250	500	1000%
Each.....	\$ .75	.90	1.00	1.35

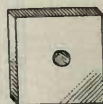
## ASBESTOS BOARDS, SAND BATHS, GLASS PLATES.



1799



1802



1803

No.										
1796	Wire Gauze, steel.	To use under flasks, beakers, etc.								
	Size.....		4	5	6		8 in. sq.			
	Each.....		\$ .10	.10	.15		.20			
1797	—	Brass.								
	Size.....		4	5	6		8 in. sq.			
	Each.....		\$ .10	.15	.20		.25			
1798	Asbestos Boards.	In sheets 42x44 in.								
	Thickness.....		$\frac{1}{32}$	$\frac{1}{16}$	$\frac{3}{32}$		$\frac{1}{8}$			
	Each.....		\$ .50	1.00	1.50		2.00			
1798	—	Pads. To support hot beakers, boiling flasks, etc.					$\frac{1}{16}$ in. thick.			
	Size.....		4	6			12 in. sq.			
	Each.....		\$ .05	.10			.20			
1799	Sand Baths, shallow,	Russia sheet iron.								
	Diam....		3	4	5	6	8	10	12	14 in.
	Each....		\$ .12	.15	.20	.25	.35	.50	.60	.70
1801	Glass Plates.	Light ground on one side for beaker covers.								Air pumps, receivers, etc.
	Size.....		3	4	5		6 in. square.			
	Each.....		\$ .10	.10	.15		.15			
1802	—	French, heavy, ground on one side.								
	Size.....		3	4	5	6	8	10	12 in. square.	
	Each.....		\$ .20	.25	.30	.35	.50	.80	1.20	
1803	—	Ground upon one side and at the edges, with $\frac{3}{8}$ -in hole through the center, to cover chemical vessels and insert stirring rod.								
	Size.....		3½	4	5½	6¼	7	8¼	10½	12½ in. sq.
	Each.....		\$ .20	.25	.30	.40	.50	.60	.70	1.25

# BEAKER COVERS, BOTTLES, TUBES.



1810



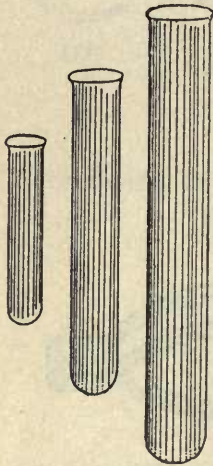
1805



1807

No.							
1805	<b>Glasses, Watch, or Beaker Covers,</b>	best imported well annealed glass, ground edges.					
	Diameter	.....	1	1¼	1½	2	2½ 3 in.
	Per dozen	.....	\$ .20	.25	.25	.30	.75 1.25
	Diameter	.....	3½	4	4½	5	5½ 6 in.
	Per dozen	.....	\$1.50	1.75	2.00	2.50	3.00 3.00
1806	—	<b>Beaker Cover, concave,</b>					
		with hole at side to insert stirring rod.					
	Diameter	.....	3	3½	4	4½	in.
	Dozen	.....	\$2.50	3.00	3.50	4.00	
1807	<b>Watch Glass Clamps,</b>	for holding in pairs two glasses either 2 or 2½ inches					\$ .25
1810	<b>Bottles, Wash, Fresenius.</b>	Fitted with rubber stoppers.					
	Capacity	.....	8	16			32 oz.
	Each	.....	\$ .50	.65			.90
1811	—	Same as No. 1810; of heavier glass.					
	Capacity	.....	8	16			32 oz.
	Each	.....	\$ .75	1.00			1.25
1812	—	With versatile movement.					
	Capacity	.....	8	16			32 oz.
	Each	.....	\$ .75	1.00			1.25
1813	<b>Tubes, Wash Bottle.</b>	Separate from the bottles.					
	Size	.....	8	16			32 oz.
	Per set	.....	\$ .25	.30			.35

## TEST TUBES, BRUSHES.



1816



1817



1818



1823

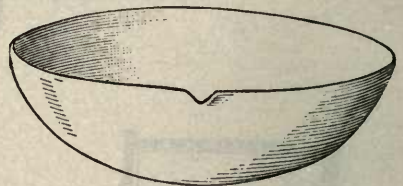
No.									
1816	<b>Test Tubes.</b>	Best imported glass; well annealed; free from lead. Each tube wrapped separately in paper.							
		Size..	3x3/8	4x1/2	5x1/2	5x5/8	5x3/4	6x1/2 in.	
		Doz..\$	.20	.25	.30	.30	.35	.35	
		Gross	1.75	2.50	2.75	3.00	3.50	3.75	
		Size..	6x5/8	6x3/4	7x3/4	7x1	8x1	10x1 in.	
		Doz..\$	.35	.35	.50	.60	.60	1.25	
		Gross	3.75	4.00	5.00	5.00	6.50	12.00	
1817	—	On foot.							
		Size.....			5	6	7	8 in.	
		Doz.....			\$ .75	1.00	1.25	1.50	
1818	—	With side tube.							
		Size.....			6	7	8	9 in.	
		Doz.....			\$ .85	1.00	1.30	1.75	
1820	<b>Ignition Tubes.</b>	Hard glass.							
		Size....	4	5	6	7	8	9	10 in.
		Doz.... \$	.60	.65	.75	.85	1.00	1.50	2.50
1823	<b>Brushes.</b>	Test tube, sponge end, doz.....							\$ 1.20



DISHES.



1835



1838



1841



1843

No. 1835 Dishes, Evaporating, Royal Meissen, porcelain, glazed inside and upper half outside, with lip.

Nos	11	10	9	8	7	6	5
Diam	2½	3½	4½	5	5½	6½	8 in.
Capacity	1	2	4	6 ozs.	½	1	1½ pts.
Each	\$.15	.20	.30	.40	.50	.75	1.00
Nos	4	3	2	1	0	00	000
Diam	9	10	11	12	13½	15	18 in.
Capacity	2	3 pts.	½	1	1½	1¼	2 gals.
Each	\$1.40	1.75	2.00	2.65	3.65	5.50	6.50

1838 — Evaporating, German porcelain, with lip, glazed inside.

Nos	000	00	0	1	2	3
Diam	3	3½	4¼	5¼	6½	7½ in.
Capacity	2	3	4	6	8	16 oz.
Each	\$.20	.25	.30	.40	.50	.65
Nos	4	5	6	7	8	9
Diam	9¼	10½	11½	12	12½	13½ in.
Capacity	32	48	64	80	96	128 oz.
Each	\$.75	1.00	1.25	1.50	1.75	2.00
Nos	10			11		12
Diam	14½			15½		17 in.
Capacity	1½			2		3 gals.
Each	\$2.50			3.25		4.50

1841 — Deep form.

Nos	9	8	7	6	5	4	3	2	1
Diam	2⅝	3	3¼	3⅝	4⅜	4¾	5⅛	5⅝	6 in.
Capacity	1	1½	2	3	4½	5	8	10	15 oz.
Each	\$.12	.15	.20	.25	.30	.35	.40	.45	.50

1842 — Same, in sets of 6, Nos. 4 to 9, per set.....\$ 1.35  
 " " " 9, " 1 to 9, " ..... 2.70

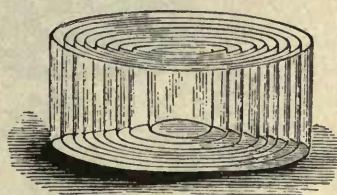
1843 — With lip, flat form.

Nos	7	6	5	4	3	2	1
Capacity	1	2	4	4½	5½	7½	8½ oz.
Each	\$.20	.25	.30	.35	.40	.45	.50

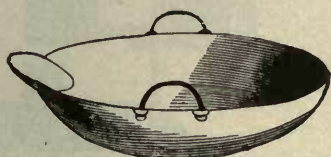
## CASSEROLES, CAPSULES.



1845



1846



1850



1851



1852



1855

No.										
1845	Dishes, Glass, with lip, round bottom.									
	Diam . . . . .	2½	3	3½	4	4½	5	6	7	8¼ in.
	Each . . . . .	\$.15	.15	.25	.30	.35	.40	.60	.80	1.00
1846	— Dishes, crystalizing, glass. Fine Bohemian, flat bottom, straight sides.									
	Diam . . . . .		4	5	6	7		8 in.		
	Each . . . . .		\$.35	.45	.70	.90		1.00		
1850	— Evaporating, agate ware.									
	Capacity . . . . .	⅙	¼	½	1	2	3	4	5	6 gal.
	Each . . . . .	\$.50	.75	1.00	1.65	3.00	4.00	5.75	8.50	11.00
1851	Casseroles, Royal Berlin porcelain. With porcelain handle.									
	Nos. . . . .	1	2	3	3a	4	5		6	
	Dia . . . . .	2	3	3½	4	4½	5½		6 in.	
	Capacity . . . . .	1	3	5	8	13	24		44 oz.	
	Each . . . . .	\$.35	.40	.50	.70	.85	1.40		1.75	
1852	— With cover and wooden handle.									
	Capacity . . . . .		⅓	⅔	1	1½	2	3		1 liter.
	Diam . . . . .		3	3½	4	4½	5	6		6¾ in.
	Each . . . . .		\$.50	.65	.75	1.00	1.50		1.75	
1855	Capsules, Royal Meissen porcelain, with covers.									
	Nos. . . . .	1	2	3	4	5	6	7	8	9
	Diam . . . . .	3¼	2¾	2½	2¼	1¾	1⅝	1⅜	1¼	1 in.
	Capacity . . . . .	6	4½	3½	2	1½	1¼	1	½	¼ oz.
	Each . . . . .	\$.60	.50	.40	.35	.30	.25	.20	.15	.15

## CRUCIBLES, TRAYS.



1857



1858



1859

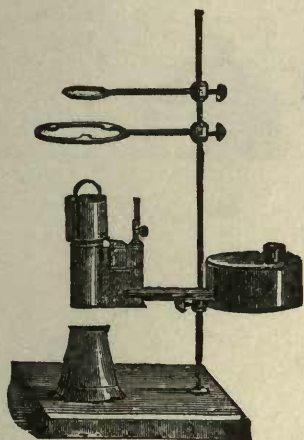


1862

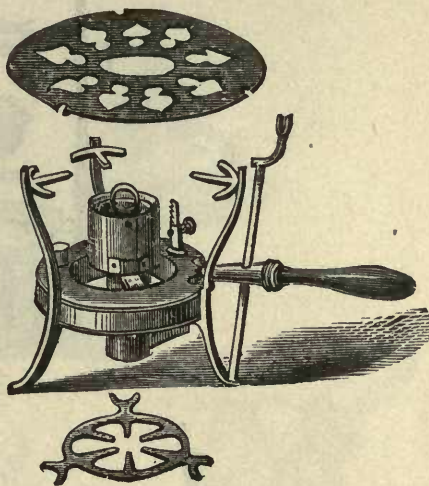
No.						
1856	<b>Capsules, Royal Berlin porcelain, with covers.</b>					
	Nos.....	000	00	0	1	2
	Diam.....	1	1¼	1½	1¾	2
	Capacity...	¼	½	⅝	1	1¾
	Each.....	\$ .15	.20	.25	.30	.40
						3
						2½ in.
						3½ oz.
						.50
1857	<b>Crucibles, Rose or Reduction. Unglazed porcelain, perforated covers with tube.</b>					
	Capacity.....				½	1
	Each.....				\$ .75	1.00
						2 oz.
						1.50
1858	<b>Light Spun Iron, with cover.</b>					
	Capacity.....			½	1	2
	Height.....			1	1½	2
	Diam.....			1½	2½	2½
	Each.....			\$ .25	.30	.40
						.50
1859	<b>Normal School, Skidmore's. For making oxygen from Mn. O<sub>2</sub>. Calcination of chalk with recovery of the expelled CO<sub>2</sub>. Manufacture of soda from Cryolite, preparation of Ammonia, destructive distillation of coal, wood or other organic substances.</b>					
	Capacity.....					1½ oz.
	Each.....					\$ 1.00
1860	<b>Same, single tube.....</b>					\$ .75
1861	<b>Trays, Acid of Lead, square, for etching on glass with hydrofluoric acid.</b>					
	Diam.....		3		4	5 in.
	Each.....		\$ .40		.50	.60
1862	<b>Rectangular.</b>					
	Size.....		1x2x4		1x4x4	1x5x6 in.
	Each.....		\$ .50		.60	.75



LAMPS.



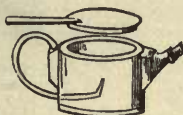
1865



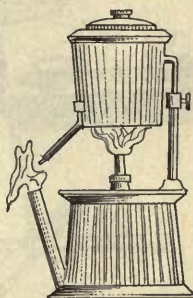
1868



1870

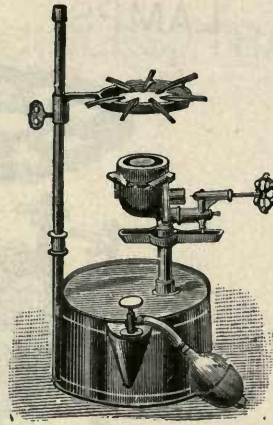


1781

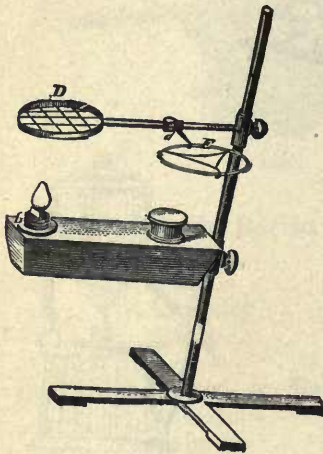


1872

No.				
1865	—	<b>Lamps, Rose's.</b> For alcohol or coal-oil, with sliding rod, chimney, triangle, and two brass rings on mahogany base; Mueller's modification.		
		Price.....		\$ 7.50
1868	—	<b>Luhmes', Brass.</b> For general laboratory work.		
		Price.....		\$ 7.50
1870	—	<b>Russian.</b> Self-acting, for high heating. Steam or alcohol vapor from upper boiler blows through flame of lamp, making a strong, horizontal blast.		
		Nos.....	1	2
		Height.....	5¼	5¾
		Each.....	\$2.00	2.50
				3
				6¼ inch.
				3.00
1871	—	<b>Heavy Copper, vertical blast, self-acting, for alcohol.</b>		
		Height.....	3	4 in.
		Each.....	\$1.75	3.50
1872	—	<b>White's, Copper.</b> Downward blast through separate flame, adjustable.		
		Each.....		\$ 5.50

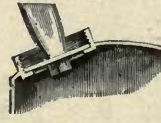


1875

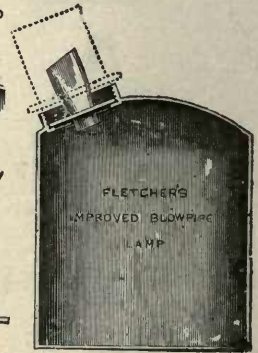
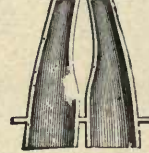


1877

WICK HOLDER TURNED HALF A REVOLUTION.

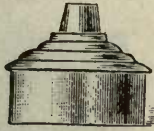


WICK HOLDER END VIEW FULL SIZE SECTION.



1880-82

No.			
1875	—	<b>Lamps, Dangler's Gasoline Laboratory.</b> The most intense heat can be obtained by this burner, which can be easily and instantly regulated at will. The sliding grate allows the article to be placed as near the flame as desired. Pressure regulated by rubber bulb.	
		Each .....	\$ 5.00
1876	—	Extra rubber bulbs, each .....	.35
1877	—	<b>Blowpipe, Plattner's form, mounted on support, can be taken apart to carry in pocket. Screw cap to prevent leakage of oil, with swivel to incline for downward flame. Price without support, D and E, nickel-plated .....</b>	4.00
1878	—	Supports D and E for platinum crucible, porcelain evaporating dish, etc. Price .....	1.25
1880	—	<b>Blowpipe, Fletcher's, improved, polished brass .....</b>	.75
1881	—	“ “ “ nickel-plated .....	1.00
1882	—	Tin, for tallow .....	.30



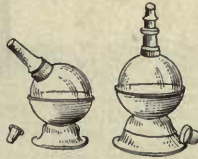
1885



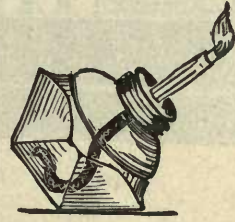
1887-8



1890



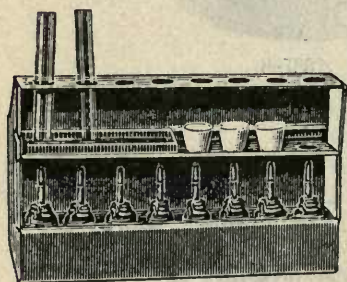
1892



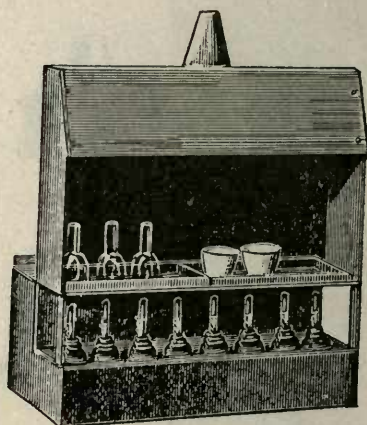
1895

No.				
1885	Lamps, Spirit, brass, with pull-off cap.			
	Capacity .....	2	4	8 oz.
	Each .....	\$ .30	.50	.60
1887	— Brass, with winch to raise and lower wick.			
	Capacity .....		4	7 oz.
	Each .....		\$ .50	.75
1888	— Nickel-plated.			
	Capacity .....		4	7 oz.
	Each .....		\$ .60	.85
1890	— Spirit, glass, globe shape, ground caps fitted with tube and wick.			
	Capacity .....	2	4	8 oz.
	Each .....	\$ .30	.35	.50
1892	— Spherical, mounted, nickel-plated, metal cup, universal movement for downward flame when using a blowpipe.			
	Capacity .....		2	8 oz.
	Each .....		\$1.00	1.50
1895	— <b>Simplicity</b> , with 9 facets on the fount; may be readily adjusted to any required position. Useful for assayers and chemists.			
	Capacity .....	2	4	4 oz.
	Burner, diam. of wick.	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{2}$ in.
	Each .....	\$ .60	.75	.85

## LAMPS, WATER BATHS.



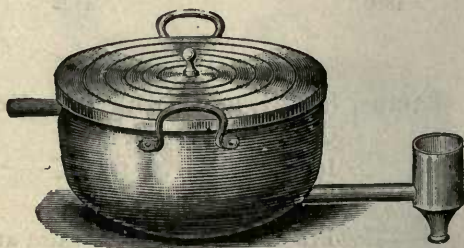
1896



1897



1900



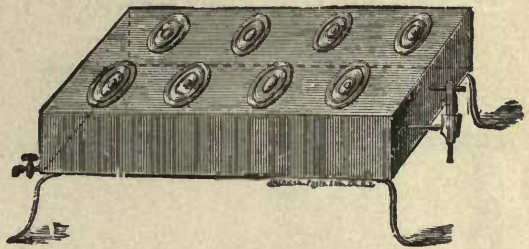
1902

No.							
1896	<b>Lamps, Parting.</b>	By W. H. Leavens; for alcohol; galvanized iron, very strong; shelves for sand bath and annealing cups; upper shelf perforated for holding test tubes.					
	Burners	.....	6	8	12 in.		
	Each	.....	\$3.00	3.50	4.50		
1897	—	<b>Parting.</b> Same as preceding, except upper shelf is left out so as to use flasks instead of test tubes. Hood and pipe attached for carrying off fumes.					
	Burners	.....	6	8	12 in.		
	Each	.....	\$3.50	4.00	5.00		
1900	<b>Water Baths.</b>	Heavy polished copper, tin lined, with concentric rings, cover and steam escape.					
	Diam.	.....	4	5	6	8	10 in.
	No. of rings	.....	3	4	5	6	7
	Each	.....	\$ .90	1.15	1.60	2.50	5.00
1902	—	With constant water level.					
	Diam.	.....	5	6	8 in.		
	Each	.....	\$2.00	2.25	3.00		

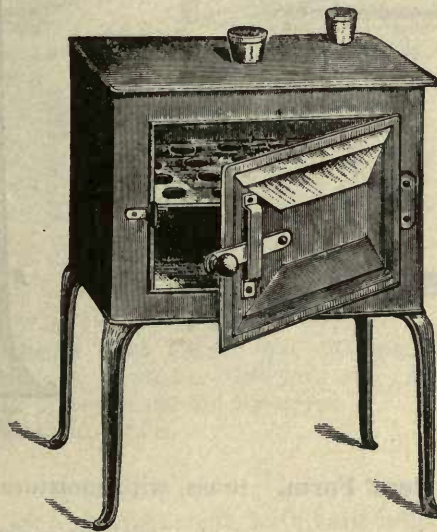
## DRYING BATHS.



1905



1908



1910

- No.  
 1905 **Water Baths** with test tube rack as used by Dr. Blair in iron analysis, made of polished copper.  
 7 inches in diameter ..... \$ 4.50
- 1908 — Heavy copper, arranged to be heated by steam; stove or burners with eight openings, all provided with concentric rings and cover, pipe and stop-cock; also has Kekule's constant regulator.  
 Size, 26x14 in. .... \$20 00
- 1910 **Drying Baths or Ovens.** Double walls with inlet for water, made of polished copper, with openings for thermometer and gas regulator, movable shelf, extra sheet iron bottom to prevent burning out, and four detachable iron legs.
- |                              |        |      |           |
|------------------------------|--------|------|-----------|
| Outside dimensions . . . . . | 6x8    | 8x10 | 10x12 in. |
| Each . . . . .               | \$6.50 | 9.00 | 12.00     |
- 1915 — Same, of tin, with double walls, with inlet for water, two openings for thermometer, etc.  
 Size, 6x8 in., each . . . . . \$ 3.00

BLOWPIPES.



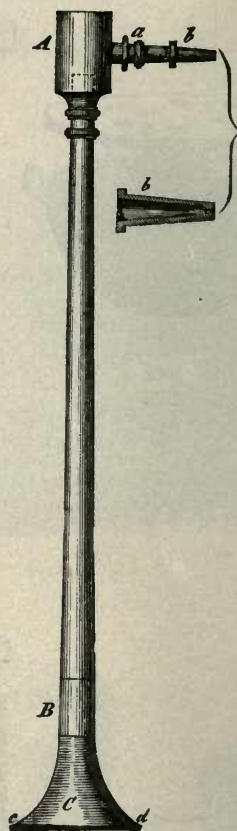
1920



1924



1928



1926

No.					
1920	Blowpipes, Jewelers' Form.	Brass, with moisture bulb.....			\$ .30
1921	—	" " "	without moisture bulb.....		.20
1922	—	" " "	nickel-plated, with moisture bulb .....		.40
1923	—	" " "	nickel-plated, without moisture bulb .....		.30
1924	—	John Taylor & Co's, with wooden mouth-piece and threaded tip to screw on .....			.50
1926	—	Plattner's, brass trumpet mouth-piece, moisture bulb and movable platinum tip; takes apart for cleaning..			2.00
1927	—	Same, nickel-plated.....			2.25
1928	Tips, Blowpipe, made of platinum.	Apertures $\frac{1}{10}$ , $\frac{5}{10}$ , $\frac{9}{10}$ millimeters,			.75
1929	—	Hard rubber mouth-pieces, trumpet shape, each .....			.30

NOTE.—Our platinum tips are swaged from one piece of metal and are not soldered; are durable. We true the holes in line with the axis, and polish the end, so a correct stream of air and best results are obtained. We make them with different size apertures, as laid down by Plattner:  $\frac{1}{10}$  millimeter wide for qualitative assays, and  $\frac{5}{10}$  millimeter for such qualitative assays as require a strong flame, and for all quantitative assays; also  $\frac{9}{10}$  millimeter for Harding's Furnace 279.



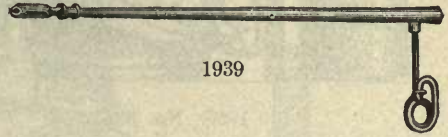
1935



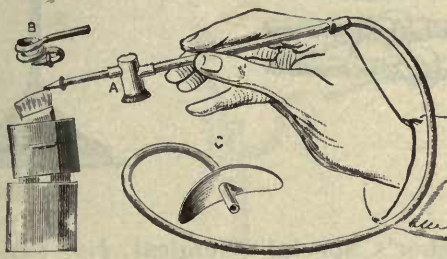
1936



1938

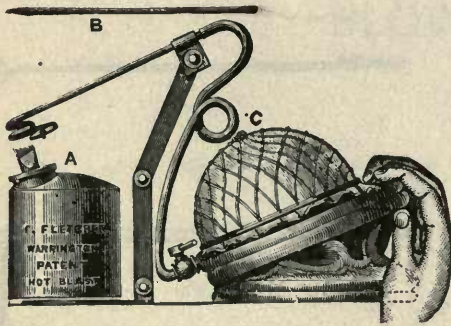


1939

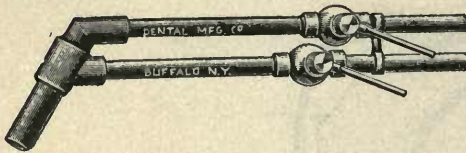


1945

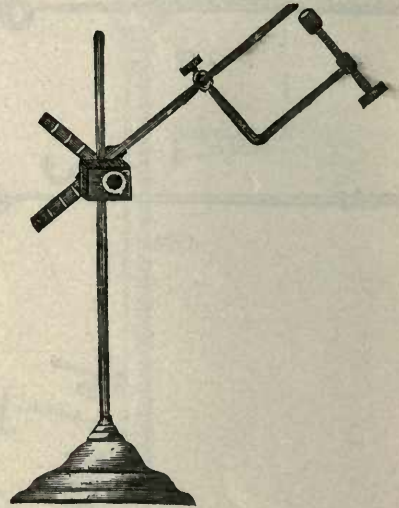
No. 1935	—	<b>Blowpipes, Fletcher's Hot Blast, No. 30</b> specially designed for jewelers, dentists, chemists, etc. Has nearly double the power of the old blowpipe. Taper shaft, brass .....	\$ .65
1936	—	No. 30 <i>b</i> , straight shaft, with hard rubber mouth-piece..	.75
1938	—	No. 30 <i>c</i> ; jointed with both hot and cold blast jets, folded in case .....	1.00
1939	—	No. 31. Hot blast chemical. A pattern of the ordinary chemical blowpipe, with the patent hot blast arrangement, with hard rubber mouth-piece .....	1.25
1940	—	Hard rubber mouth-piece, separately.....	25
1945	—	No. 42, with both cold blast and patent hot blast, two jets, nickel-plated mouth-piece. In case.....	1.50
1946	—	<b>Ross'</b> . Mouth-piece C, separately, for use with other blowpipes.....	.60



1950—No. 32a



1960

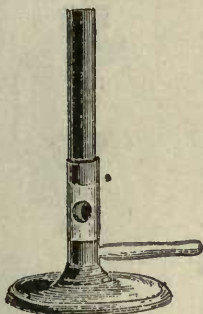


1954

No.			
1950	Blowpipes, Fletcher's Special Chemical, No. 32a, with folding stand, adjustable at any height or angle. It can be used either with the mouth, or the small hand-blower can be attached and the blowing done by the fingers. With this blow-pipe is supplied one jet with and one without the patent coil, to enable a larger variety of flame to be obtained. The lamp or a weight should be placed on the stand when in use.		
	Complete, as illustrated.....		\$ 4.75
	No. 32, blowpipe only .....		1.00
1951	— Hand blower only, as illustrated, catalogue No. 1950, No. 32a, in case, with extra rubber dish.....		3.25
1952	— <b>Oxyhydric.</b> Mounted on stand; universal movement, to direct flame in any direction. Plain.....		5.50
1953	— With stop-cock.....		6.50
1954	— With stop-cock and lime-holder.....		8.00
1955	<b>Prepared Limes, for oxyhydric blowpipes.</b>		
	Per dozen, in tin box .....		2.50
1960	<b>Blowpipes, Brazing, with 2 stop-cocks, one for gas, the other for air blast.</b>		
	1/4 inch tube .....		2.50
	1/2 " " .....		4.50



## GAS BURNERS.



1965



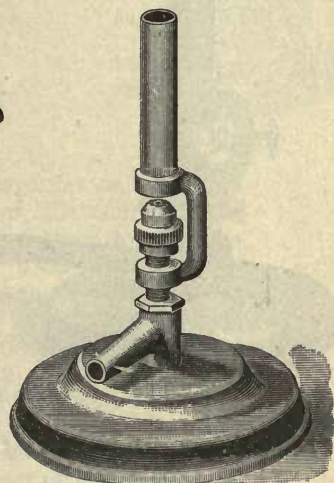
1965



1969

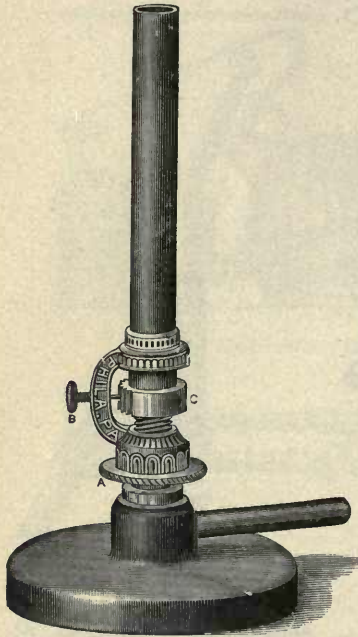


1968



1970

No.						
1965	<b>Burners, Bunsen's. With air regulators.</b>					
	Tubes .....	1	2	3	4	6
	Each .....	\$ .50	1.25	1.75	2.00	3.00
1968	—	With tripod, to support dish.....				\$ 1.00
1969	—	<b>Chaddock's.</b> Of porcelain, incorrodible; for use in hoods where metal, on account of the smoky flame, soon corrodes. Complete, with support for dishes, chimney and 3 asbestos pads .....				1.75
1970	—	<b>Adjustable Bunsen, No. 5 G.</b> For burning gas of variable quality. In this burner the size of the orifice through which the gas escapes, is adjusted by turning the milled cap-nut seen inside the arm which supports the upright tube. The air supply is adjusted by screwing the arm up or down, it being threaded and moving upon the stem which passes through its lower end. It follows that any desired quality of flame can be produced with it, and that it will burn any kind or quality of gas, rich or poor. Its adjustability renders it a favorite burner for those using gasoline gas, or the mixture of gasoline vapor and air made by gas machines. This burner is furnished, when required, with an adjustable support for holding small flasks or evaporating dishes. It is well made and strong, and is mounted upon a cast iron base. Total height, 6½ inches.				
		Each .....				\$ 1.00



1975



1980



1981



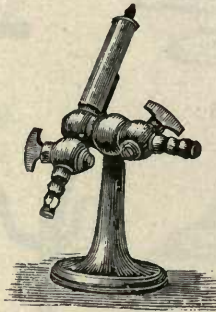
1982



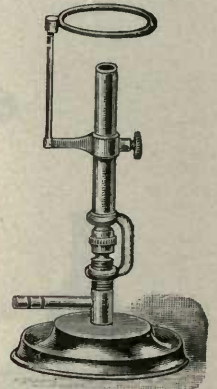
1983



1984



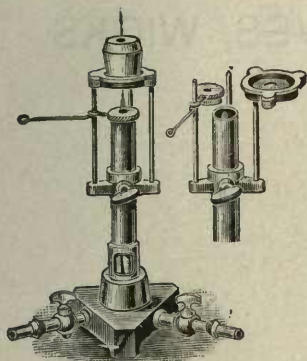
1985



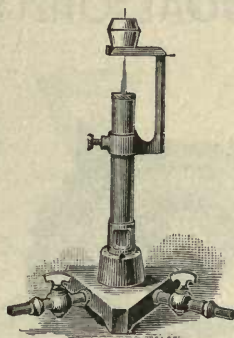
1972

No.			
1971	<b>Burners, No. 5 H.</b>	On brass base, turned and polished.....	\$ 2.00
1972	—	<b>No. 5 K.</b> Adjustable Bunsen; iron base, with support..	1.75
1973	—	Support only .....	.75
1975	—	<b>Bunsen's.</b> New self-adjusting burner for burning gases of various qualities. The special features of this burner are as follows :	
		By turning the knurled part A the flame can be increased or lowered, the flow of gas and air being regulated automatically, the burner will therefore always retain a blue flame. B is the set screw by which to regulate the burner tip C, supplying more or less air according to quality of gas. The supply of gas is regulated by inserting the screw into the next slot, either to the right or left. Care must be taken that the screw is not inserted into the slot too tightly, as this will interfere with the turning of the burner. If a yellow flame should be desired, separate the set screw B from the burner tip C, allowing the gas and air to be regulated separately .....	1.25
1980	<b>Burner Attachment.</b>	To set into the Bunsen burner.....	.25
1981	—	To set over the burner ; with rest for the blowpipe.....	.25
1982	—	<b>Crowns.</b> Giving a round flame for heating small dishes..	.50
1983	—	<b>Tripods.</b> For supporting dishes.....	.25
1984	—	<b>Wing Top.</b> For bending tubing, etc.....	.25
1985	—	<b>Bunsen's Blast.</b> With two stop-cocks, movable in all directions.	
		Each.....	4.50

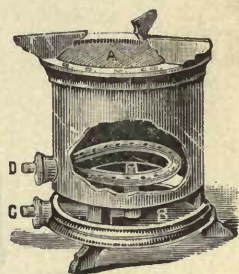
## BLOWPIPE FURNACES.



1991



1990



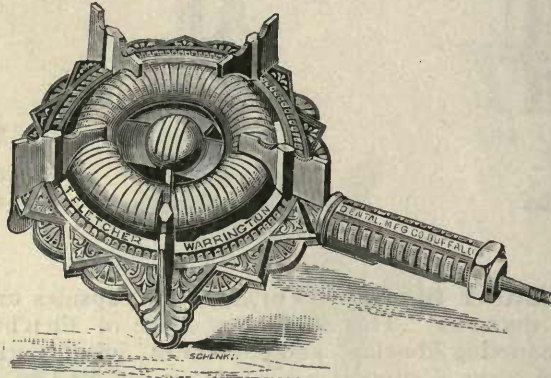
1999

**Fletcher-Plattner Blowpipe Furnace**, for capsules or crucibles  $\frac{3}{4}$  inch diameter. This furnace is made of Fletcher's patent non-conducting fire-clay, and is almost indestructible. Two forms of furnace support are made, to be used in connection with the No. 5 Blast Bunsen. The Fletcher support is made of one casting, with a thin metal plate for the furnace to rest upon. The Lewis support is placed on a substantial tripod, and so arranged that the furnace is self-centering. The top plate on which the furnace rests can be turned aside without detaching it from the burner, when it is desired to use the burner for other purposes. The cap of the burner is also secured to the frame by a wire hinge, which prevents its being lost or misplaced.

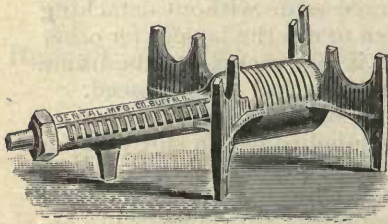
When used in connection with the Blast Bunsen, the furnace has a hole in the bottom; it is also supplied with a side hole for use with a mouth blowpipe. With the Blast Bunsen No. 5, as shown in the cut, and a Fletcher foot blower, 100 grains of cast iron can be perfectly fused in two minutes; the temperature being, at the same time, under the most perfect control. In ordering, specify "bottom" or "side" hole.

No.			
1990	<b>Blowpipe Furnace, No. 5c,</b>	blowpipe furnace, with Blast Bunsen and Fletcher Furnace Support .....	\$ 4.25
1991	—	<b>No. 5c,</b> blowpipe furnace, with Blast Bunsen and Lewis Furnace Support .....	4.75
1992	—	<b>No. 5,</b> Blast Bunsen, alone .....	3.50
1993	—	<b>No. 5d,</b> blowpipe furnace, alone, with bottom or side hole, and one crucible .....	.25
1994	—	Fletcher Furnace Support, alone .....	.60
1995	—	Lewis Furnace Support, alone, including cap.	1.00
1996	—	Clay Crucibles, per dozen .....	.25
1997	—	Clay Capsules, " .....	.25
1999	—	<b>No. 7,</b> low temperature burner, with blast pipe C .....	2.00
2000	—	<b>No. 7,</b> low temperature furnace, without blast pipe C .....	1.75

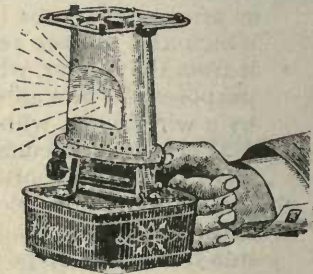
BURNERS, COAL-OIL STOVES, WICKS.



2001-2



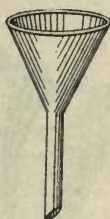
2003



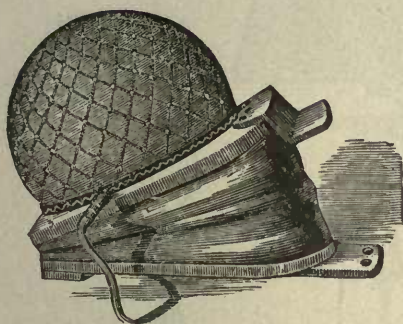
2004

No.					
2001	<b>Burners, Fletcher's Radial, No. 1, ring, 3¾ in. diam.....</b>				<b>\$ 1.50</b>
2002	—	"	"	" 2, " 5 in. " .....	2.00
2003	—	"	"	" 3R, " .....	1.00
2004	<b>Coal-oil Stoves, with 1 flat wick, 4 in.</b>				
	<b>Model, iron cistern.....</b>				<b>.75</b>
	<b>Defiance, " " .....</b>				<b>1.00</b>
	<b>Florence, " " .....</b>				<b>1.25</b>
	<b>Fairy, glass " .....</b>				<b>1.50</b>
2005	<b>Flat Wicks, for coal-oil stoves.</b>				
	Width.....		3		4 in.
	Per dozen.....		\$ .40		.50

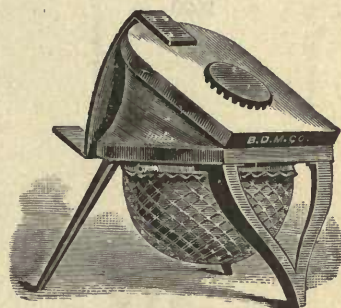
## BLOWERS, FUNNELS.



2015



2006



2007

No.			
2006	<b>Blowers, Fletcher's Foot Bellows.</b>	Giving a continuous blast of air.	
	Nos. ....	9, small	9A, med. 9B, large
	Diameter.....	7¼	9 11 in.
	Each . . . . .	\$4.00	5.00 7.00

2007	—	<b>Foot Bellows, mounted on legs.</b>	
	Nos. ....	10, small	10A, med. 10B, large
	Diameter.....	7¼	9 11 in.
	Each . . . . .	\$5.00	6.00 8.00

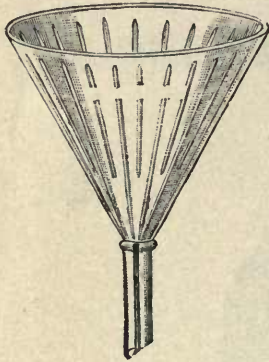
NOTE.—The Nos. 9 and 10 Bellows have a single disc; the Nos. 9A and 10A double, and the Nos. 9B and 10 B treble discs.

2008	<b>Blowers, Extra Rubber Discs</b> for Nos. 9 or 10,	each.....	\$ .50
	“ “ “ “ “ 9A or 10A “	.....	.75
	“ “ “ “ “ 9B or 10B “	.....	1.00

2009	—	<b>Extra Nets</b> for above.....	.35
------	---	----------------------------------	-----

2015	<b>Funnels, Best German Glass.</b>	Angle, 60°; long stems, ground to a point.					
	Diameter.....	2	2½	3	3½	4	4½ in.
	Each . . . . .	\$ .10	.12	.15	.15	.20	.20
	Diameter.....	5	5½	7	9	10½	12 in.
	Each . . . . .	\$ .25	.30	.40	.60	.85	1.15

2016	—	<b>Bunsen's, with edges ground even; angle, 60°; long stems, ground to a point.</b>	
	Diameter.....	1½	2 2½ 3 3½ 4 4½ in.
	Each.....	\$ .10	.15 .18 .20 .25 .30 .35



2020



2022



2024



2025



2030



2032

No.

2020

**Funnels, Ribbed.**

Diameter.....	3½	5	6	7	8½ in.
Capacity.....	4	8	16	32	64 ozs.
Each.....	\$ .15	.20	.25	.35	.50

2022



In sets of 3, assorted, per set ..... \$ .20

2024



**Hard rubber.**

Capacity.....	4	8	16	32 oz.
Each.....	\$ .25	.35	.50	.60

2025



**Separatory, open top, usual form, angle 60°, with stop-cock.**

Diam.....	4	5	6	7	9 in.
Each.....	\$1.25	1.50	2.00	2.50	3.00

2030



**Separatory, globe shape, heavy glass, stoppered.**

Capacity.....	8	16	32	64 oz.
Each.....	\$1.50	2.25	2.75	3.25

2032



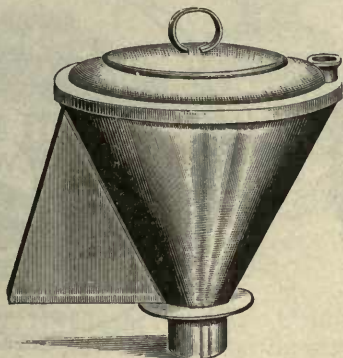
**Separatory, globe shape, light glass, stoppered.**

Capacity.....	1	2	4	8 oz.
Each.....	\$ .90	1.00	1.25	1.50

## FUNNELS, THISTLE TUBES.



2035



2036



2040



2041



2042



2043



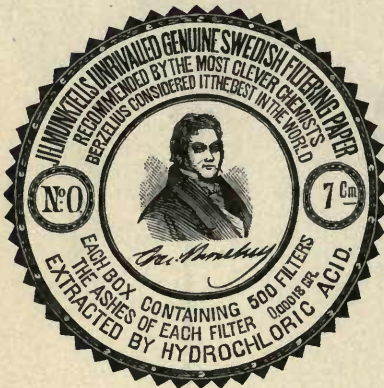
2044



2050

No.					
2035	Funnel, Separatory, cylinder shape, open top.				
	Capacity.....	1	2	4	8 oz.
	Each.....	\$ .80	1.00	1.25	1.75
2036	— Tin, Plantamour's, for hot filtrations, 5¼ in. on top side..				\$ 1.75
2040	— Tubes, conical top.				
	Length.....		10		12 in.
	Each.....		\$ .15		.20
2041	— Tubes, spiral stem, conical top, length 12 in, each.....				\$ .40
2042	— “ conical top, safety bend.....				.25
2043	— “ thistle top, plain.....				.20
2044	— With.....		1	2	4 bulbs.
	Each.....		\$ .20	.25	.40
2050	Filtering Rings, porcelain; 2 or 3 arms.....				\$ .35

FILTER PAPER.



2059



2059

- No.
- 2055 **Filter Paper, Prat-Dumas & Co. (French), round cut, white.**  
 Nos . . . . . 7 10 13 15 19 25 33 40 45 50  
 Diam . . . . . 3 4 5 6 8 10 13 15 18 20 in.  
 Per 100 . . \$ .10 .18 .20 .25 .30 .40 .60 .70 .90 1.10  
 In sheets, size 21x17 in. . . . . ream, \$4.75; quire, \$ .35
- 2056 **Prat-Dumas & Co. (French), round cut, gray.**  
 Nos . . . . . 15 19 25 33 40 45 50  
 Diam . . . . . 6 8 10 13 15 18 20 in.  
 Per 100 . . \$ .25 .30 .35 .50 .60 .80 .90  
 In sheets, size 21x17 in; . . . . . ream, \$4.00; quire, \$ .30
- 2057 **Baker & Adamson's, washed in hydrochloric and hydrofluoric acid, giving the lowest ash of any filter paper on the market. Put up in boxes holding 100 round filters.**  
 Diam . . . . . 5½ 7 9 11 12½ 15 ctm.  
 Ashes, 1 filter: .00001 .00002 .00003 .00005 .000065 .00009 gm.  
 Per 100 . . . . . \$ .40 .50 .65 .80 1.00 1.20
- 2058 **Baker & Adamson's, washed in hydrochloric acid only.**  
 Diam . . . . . 7 9 11 12½ ctm.  
 Ashes, 1 filter: .00002 .00003 .00005 .000065 gm.  
 Per 100 . . . . . \$ .25 .35 .45 .50
- Munktell's Swedish.** Is of the best quality manufactured, and has been recommended by the most prominent chemists throughout the world. The several grades are adapted to the various kinds of laboratory work.
- 2059 **No. 0.** Washed filters, 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 round; 100 sheets in package, 5 packages in a box.  
 Diam . . . . . 5½ 7 9 11 12½ 15 18½ ctm.  
 Ashes, 1 filter: .00011 .00015 .00029 .00044 .00056 .00081 .00124 gm.  
 Per 100 . . . . . \$ .20 .27 .41 .55 .63 .85 1.25





2065

No. 2060 **Filter Paper, Swedish, No. 1F.** Uniform in thickness; best linen material; most perfect filtering paper made; leaves the smallest amount of ash of any unwashed paper. Very strong, adapted to the highest grade of chemical work. The finest precipitates are retained. Cut round; 100 sheets in a package, 5 packages in a box.

Diam.....	5½	7	9	11	12½	15	18½ ctm.
Ashes, 1 filter:	.00025	.00040	.00066	.00098	.00127	.00183	.00278 grm.
Per 100 .....	\$ .11	.16	.25	.30	.40	.50	.72
In sheets 48x48 ctm.....	ream, \$19.00;						quire, \$ 1.10

2061 — **Swedish, No. 2.** A pure white linen paper, heavier than No. 1F, and not as closely woven, therefore more rapid in filtration. A superior paper for all kinds of laboratory work. Cut round; 100 sheets in a package, 5 packages in a box.

Diam.....	5½	7	9	11	12½	15	18½ ctm.
Per 100 .....	\$ .10	.13	.20	.26	.31	.40	.53
In sheets 48x48 ctm.....	ream, \$16.00;						quire, \$ .95

2062 — **Swedish, No. 3.** A pure white paper, heavier than No. 2; filters rapidly; fully equal to the high grade German papers, but at less cost than other paper of same quality and weight; cut round; 100 sheets in a package, 5 packages in a box.

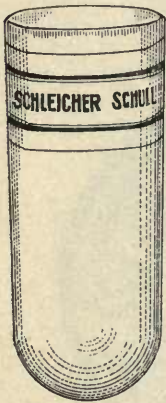
Diameter.	5½	7	9	11	12½	15	18½ ctm.
Per 100.. \$	.08	.10	.15	.19	.24	.32	.41
In sheets 48x48 ctm .....	ream, \$13.00;						quire, \$ .75

2065 — **Schleicher & Schull's.** Pure, No. 595.

Diameter.	5½	7	9	11	12½	15	18½	24	32	38½ ctm.
Per 100.. \$	.12	.15	.20	.23	.25	.30	.40	.60	1.00	1.25
In sheets 47x54 ctm .....	ream, \$10.00; quire, \$ .60									

2066 — Same. No. 597 is much heavier than No. 595; for rapid and clear filtration.

Diameter.....	5½	7	9	11	12½	15	18½ ctm.
Per package of 100 sheets. \$	.15	.20	.25	.30	.35	.40	.55
In sheets 58x58 ctm .....	ream, \$18.00;						quire, \$ 1.00



2069



2070



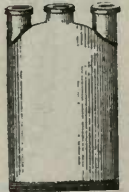
2071



2072



2074



2075

No  
2067 **Filter Paper. Schleicher & Schull's No. 589.**

Diameter.....	5½	7	9	11	12½	15 cm.
Ashes, 1 filter, 0,00004	0,00007	0,00011	0,00017	0,00021	0,00025	
Per 100.....	\$ .60	.70	.90	1.10	1.35	1.60

2068 — Same. **No. 590.**

Ashes, 1 filter, 0,00004	0,00005	0,00008	0,00013	0,00016	0,00019	
Per 100.....	\$ .75	.80	1.25	1.45	1.65	2.00

Nos. 589 and 590, S. & S. filter papers, are washed in hydrochloric acid and hydrofluoric acid, for quantitative analysis and for rapid filtering, and leave only the slightest trace of ashes

2069 **Extraction Thimbles, Fat Free, Schleicher & Schull's, for Soxhlet, Mohr & Knofler's extraction apparatus for milk and other fat determinations, in boxes of 25 thimbles in each box.**

Sizes.....	33x80	19x90	33x94	43x123 mm.
Per box of 25.....	\$2.25	2.00	3.00	4.00

2070 **Bottles, for weighing filters. Very light glass; wide mouths; ground, hollow stoppers.**

Height.....	40	50	60	70	80 mm.
Diameter.....	25	30	30	35	40 "
Each.....	\$ .30	.40	.50	.60	.70

2071 **Precipitating Jars, with lip.**

Capacity.....	¼	½	1	2	4 pt.
Each.....	\$ .20	.25	.35	.50	.75

2072 **Precipitating Glasses, on foot.**

Capacity.....	½	1	2	3	4	6 oz.
Each.....	\$ .15	.20	.25	.30	.35	.40

2073 **Spoons, deflagrating or combustion.**

Bowl, 1 in., each.....						\$ .25
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**Bottles, Woulf, of heavy German glass.**

2074 — 2 necks.....	4	8	16	32 oz.	½	1	2 gal.
Each.....	\$ .40	.50	.60	.85	1.10	2.00	3.50
2075 — 3 Necks.....	.50	.60	.75	1.00	1.25	2.25	4.00

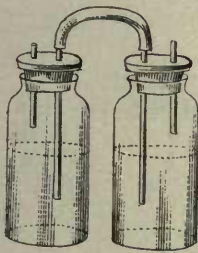
BOTTLES, BELL GLASSES.



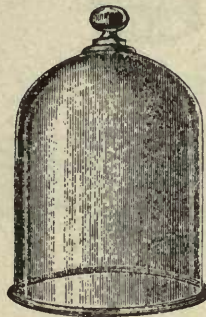
2085



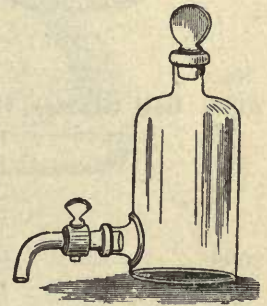
2081



2080



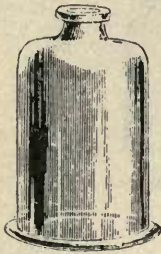
2086



2082

No.						
2076	<b>Bent Tubes, for Wouff bottles.</b>					
	16	32 $\frac{1}{2}$ oz.	$\frac{1}{2}$	1	2 gal.	
	Price, per set . . . \$ .30	.40	.50	.60	.80	
2080	<b>Bottles, Wash, wide neck, with varnished wood stoppers, packed with rubber; holes for the tubes lined with rubber; straight glass tubes to be connected by rubber tube.</b>					
	Capacity . . . . .	1	2	4	8 pints.	
	Each . . . . .	\$1.00	1.50	2.00	2.50	
	NOTE—These can be made in any style, with any number or size of tubes.					
2081	<b>Bottles, Aspirator, with outlet near bottom.</b>					
	Capacity . . . . .	$\frac{1}{2}$	1	2	2 pints.	
	Each . . . . .	\$ .50	.75	.90	.90	
	Capacity . . . . .	$\frac{1}{2}$	1	2	3 gals.	
	Each . . . . .	\$1.10	2.00	2.75	4.00	
2082	— Same as No. 2081, with glass stopper and ground glass stop-cock.					
	Capacity . . . . .	1	2 pints.	$\frac{1}{2}$	1 gal.	
	Each . . . . .	\$2.75	3.50	4.00	5.00	
2085	<b>Bell Glasses, low form, with knob, strong rim at the bottom, ground for use with the air pump.</b>					
	Height . . . . .	4	5	7 in.		
	Diameter . . . . .	6	8	10 in.		
	Each . . . . .	\$1.00	1.30	1.75		
2086	— <b>Tall form, with knob.</b>					
	Height . . . . .	6	8	10	12	15 in.
	Diameter . . . . .	3	4	5	6	7 $\frac{1}{2}$ in.
	Capacity . . . . .	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2 gal.
	Each . . . . .	\$ .50	.65	.85	1.25	2.00

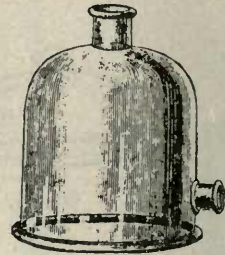
## BELL GLASSES, GLASS TUBING, GAUGE GLASSES.



2037



2088



2089

No.

2087 **Bell Glasses, Open top, wide opening.**

Height.....	6	8	10	12	15 in.
Diameter.....	3	4	5	6	7½ in.
Capacity.....	⅛	¼	½	1	2 gal.
Each.....	\$ .50	.75	1.25	1.50	2.50

2088 — **Swelled form, with knob.**

Base diameter.....	4½	6	7¾	9 in.
Capacity.....	¼	½	1	2 gal.
Each.....	\$ .75	1.00	1.50	2.75

2089 — **Tubulated, with opening on top and tubelature on side near bottom, for use with filtering pump.**

Height.....	8 in.
Diameter.....	6 "
Each.....	\$3.00

2100 **Glass Tubing.** Illustration page 108. Best German, lead free, made expressly for chemical use, for glass blowing and fitting up chemical apparatus, being strong and elastic. In lengths of 5 feet.

Size.....	⅛ to ¾ inch.	¾ to 2 inches outside diameter.
Per pound..	\$ .60	.75

2101 — **Bohemian Hard Glass** for combustion, assorted diameters, per pound..... \$ 1.00

2102 — **Capillary**, assorted sizes, per pound..... 1.00

2103 — **Barometer Tubes**, sealed at one end, ⅛ inch to ¼ inch bore, 30 inches long, each..... .50

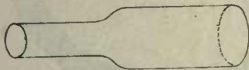
2104 **Stirring Rods, Glass.** Solid and hollow, fused ends, for beakers, evaporating dishes, etc.

Length.....	7	8	9	10	11	12	15	18 in.
Diameter.....	⅜	¼	¼	⅜	⅜	⅜	⅜	½ in.
Solid, per doz..	\$ .45	.50	.60	.65	.70	.75	1.00	2.00
Hollow, per doz..	\$ .50	.55						

2105 **Tubes, Scotch Glass Gauge** for boilers, stills, etc., per dozen.

Length.....	10	11	12	13	14	16	18	24 in.
Diam., ½ to ⅝..	\$3.00	3.25	3.60	3.85	4.25	4.85	5.50	7.25
" ⅜ to ¾..	3.50	4.00	4.50	5.00	5.25	6.00	6.75	9.00

## GLASS CUTTERS, RUBBER TUBING, REDUCERS.



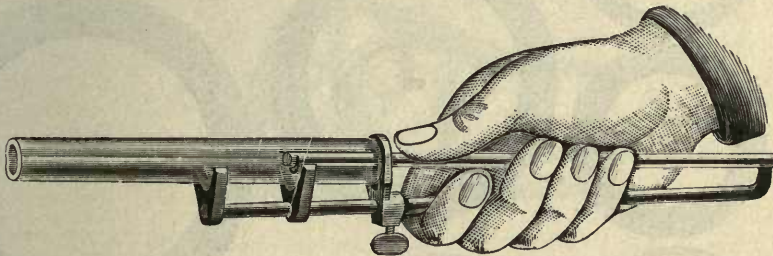
2120



2109



2108



2107

No  
2106 **Washers, Gauge Glass.** For packing the ends of gauge tubes water tight.  
Per dozen ..... \$ .25

2107 **Glass Cutter, for tubing;** will cut any length up to 10 inches ..... 1.50

**Tubing, Rubber.** Vulcanized, best quality, white.

2108	—	Internal diam. . .	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$ in.
		Light, per foot. . . \$	.04	.05	.06	.08	.09	.12		
2109	—	Heavy, " ..	.05	.06	.08	.10	.12	.15	.18	.20
2110	—	Extra heavy ..					.25	.35	.40	.50

2111 — **Black Rubber, pure gum.**

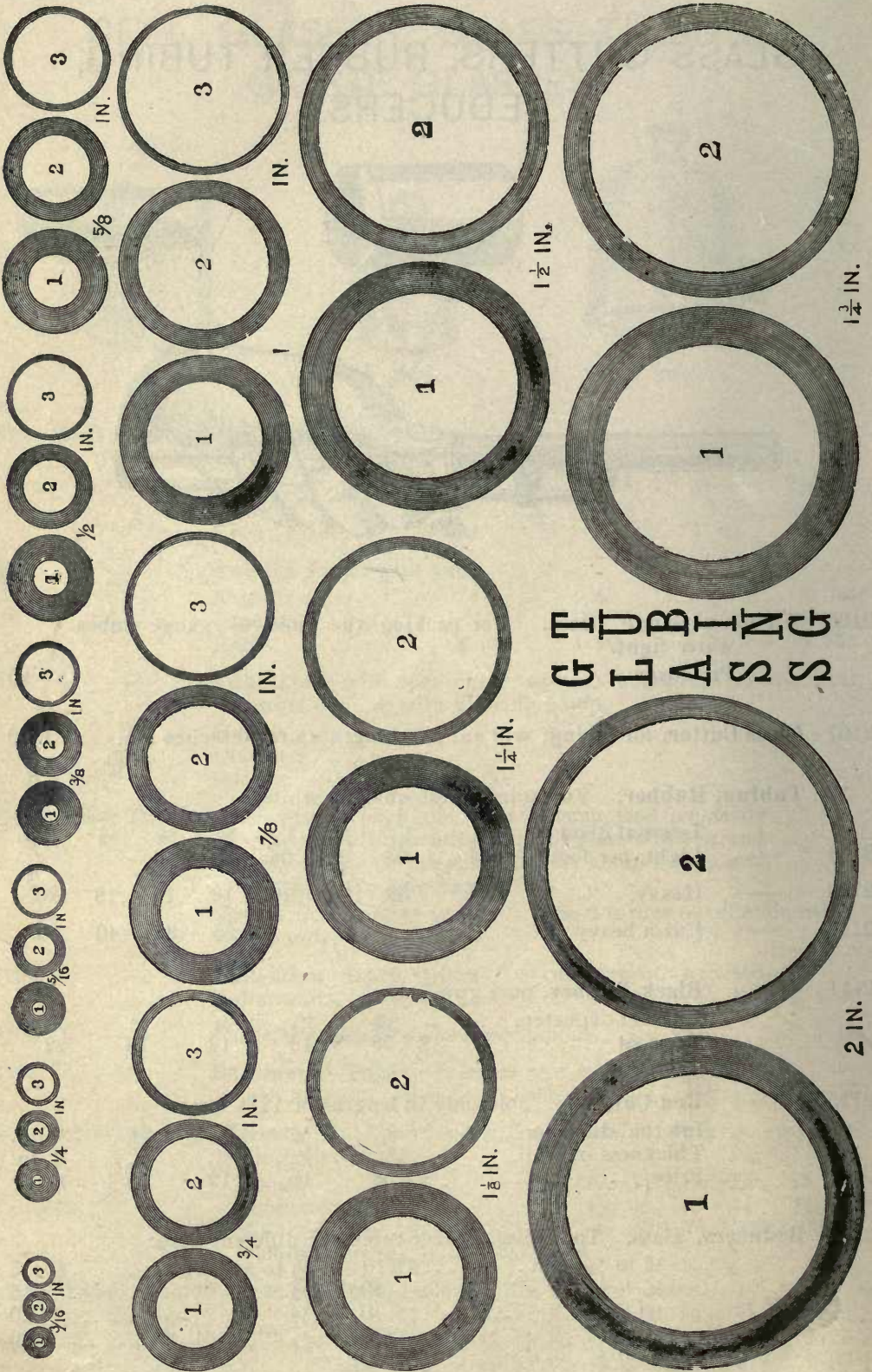
	Internal diameter. . . . .	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$ in.
	Per foot. . . . . \$	.08	.10	.12	.18	.22

2115 — **Red Covered.** Sold only in lengths of 12½ feet.

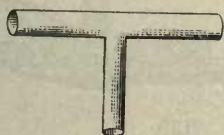
	Internal diameter. . . . .	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$ in.
	Thickness of wall. . . . .	$\frac{5}{64}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$ in.
	Price. . . . . \$	.08	.10	.12	.15	.18

2120 **Reducers, glass.** To connect rubber tubing of different sizes.

$\frac{1}{8}$ to $\frac{1}{4}$ inch	..... \$	.10	$\frac{3}{8}$ to $\frac{5}{8}$ inch	..... \$	.15
$\frac{1}{4}$ " $\frac{3}{8}$ "	.....	.10	$\frac{3}{8}$ " $\frac{3}{4}$ "	.....	.15
$\frac{1}{4}$ " $\frac{1}{2}$ "	.....	.10	$\frac{1}{2}$ " $\frac{3}{4}$ "	.....	.20
$\frac{1}{4}$ " $\frac{5}{8}$ "	.....	.10	$\frac{1}{2}$ " 1 "	.....	.20
$\frac{3}{8}$ " $\frac{1}{2}$ "	.....	.10			



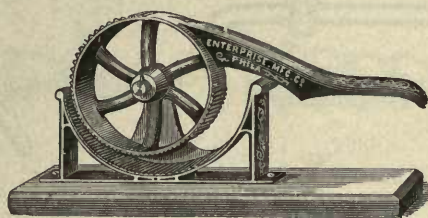
## GLASS TUBES, FILES, CORKS.



2122



2123



2134

No.													
2122	<b>Tubes, Three-way, T form.</b>												
	Diam.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$ in.									
	Each.....	\$ .20	.25	.30									
2123	— Y form.												
	Diam.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$ in.								
	Each.....	\$ .25	.30	.35	.40								
2125	<b>Files, taper saw or three-cornered: flat, and round.</b>												
	Length.....	3	4	5	6	8 in.							
	Each.....	\$ .15	.20	.25	.30	.35							
2126	<b>File Handles, per dozen</b> .....					\$ .50							
2130	<b>Corks, taper shape, of best selected wood, regular length.</b>												
	Numbers.....	1	2	3	4	5	6	7	8	9	10		
	Diam. small end..	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{3}{4}$ in.		
	Per gross.....	\$ .60	.60	.70	.80	1.00	1.10	1.40	1.70	2.00	2.60		
	Numbers.....	11	12	13	14	15	16	17					
	Diam. small end..	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{15}{16}$	1	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$ in.		
	Per gross.....	\$2.70	2.95	3.30	3.65	4.00	5.20	5.80					
	Numbers.....	18	19	20	22	24	26						
	Diam. small end..	1 $\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{5}{16}$	1 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3 in.	
	Per gross.....	\$6.40	7.00	8.00	10.00	12.50	15.00						
2132	— Flat, for wide-mouth flasks, bottles, etc.*												
	Dia. lg. end 1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 in.	
	Gross ... \$	.45	.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.50	5.50
2134	<b>Press, Cork, Rotary, for small and large corks, each</b> .....											\$ 1.25	

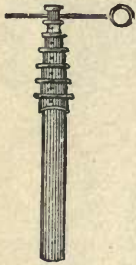
# RUBBER STOPPERS, CORK BORERS, GLASS STOP-COCKS.



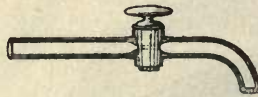
2135



2137



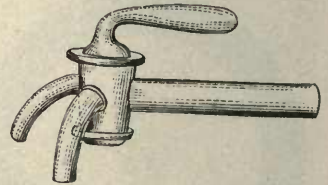
2126



2140



2145



2141

No. 2135 **Stoppers, Rubber,** best and softest pure rubber. Solid, one or two holes, tapering, for various chemical apparatus.

Our rubber stoppers are made in our own moulds. We do not, as formerly, give the diameter of the large end of these stoppers, the sizes being so graded that the size of the small end of each stopper is the same as the diameter midway between the top and bottom of the next smallest number.

Nos.....	00	0	1	2	3	
Diameter at bottom.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{13}{16}$ in.	
Dozen.....	\$ .50	.60	.75	.85	.90	
Nos.....	4	5	6	7	8	9
Diameter at bottom.....	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{15}{16}$ in.
Dozen.....	\$1.00	1.25	1.75	2.35	2.75	3.75
Nos.....	10	11	12	13	14	15
Diameter at bottom.....	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{15}{16}$	$2\frac{1}{8}$	$2\frac{5}{16}$	$2\frac{1}{2}$ in.
Dozen.....	\$5.00	6.00	7.00	9.00	10.50	12.00

2136 **Cork Borers, in sets.**

Set of.....	3	6	8	12	15
Sizes.....	$\frac{1}{8}-\frac{1}{4}$	$\frac{1}{8}-\frac{3}{8}$	$\frac{1}{8}-\frac{1}{2}$	$\frac{1}{8}-\frac{3}{4}$	$\frac{1}{8}-\frac{7}{8}$
Per set.....	\$ .75	1.25	1.75	2.00	2.75

2137 — **Sharpener, each** ..... \$1.00

2140 **Stop-cocks, Geissler's, glass.** Hollow stopper; ground air tight; larger size for chlorine generators, tanks, etc.

Bore.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$ in.
Each.....	\$1.75	3.50	5.00

2141 — **Two deliveries.**

Bore.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$ in.
Each.....	\$3.25	4.50	6.00

2145 —

Bore $\frac{1}{8}$ in.....		
Length.....	3	11 in.
Each.....	\$ .75	1.00





2151



2154



2155



2156



2158



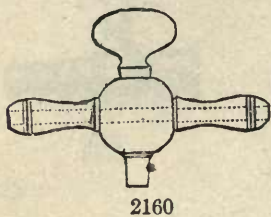
2159



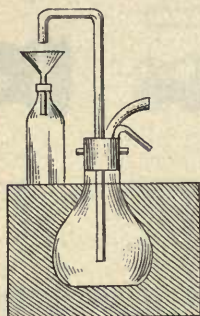
2159

No.				
2151	Stop-cocks,	Brass, double ends, for tubing connection.		
		Bore.....	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .65	1.00
2153	—	Unpolished.....		\$ .25
2154	—	Brass, one end for tubing, the other with male screw.		
		Bore.....	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .75	1.00
2155	—	Brass, one end for tubing, the other with female screw.		
		Bore.....	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .75	1.00
2156	—	Brass, with double male screws.		
		Bore.....	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .75	1.00
2157	—	Brass, with double female screws.		
		Bore... ..	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .75	1.00
2158	—	Brass, with male and female screws.		
		Bore.....	$\frac{1}{8}$	$\frac{1}{4}$ in.
		Each .....	\$ .75	1.00
2159	—	Nipples, with either male or female end.....		\$ .25

# FAUCETS, SYPHONS, ACID PUMPS.



2160

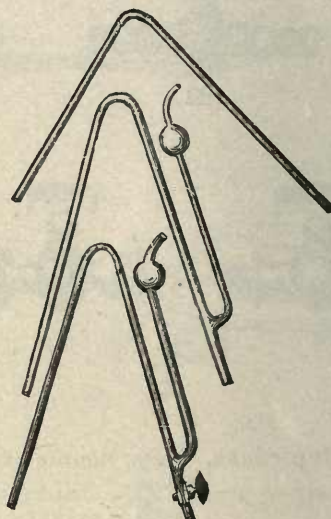


2165

2162

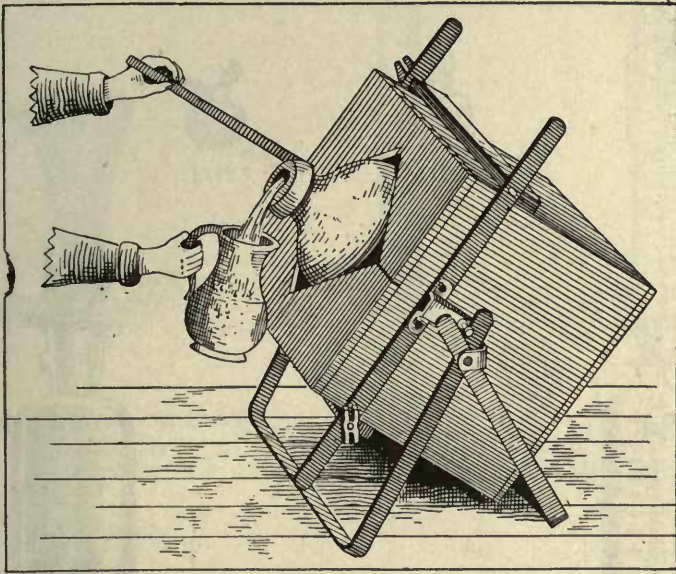
2163

2164

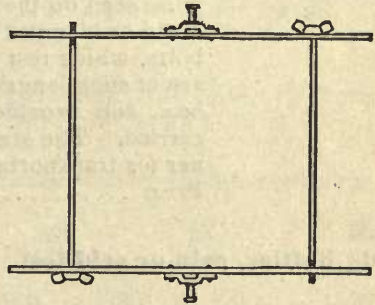
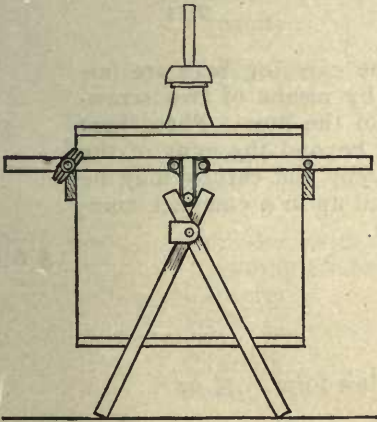


No.				
2160	<b>Faucets</b> , hard rubber, both ends for rubber tubing connections.			
	Bore.....	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$ in.
	Each .....	\$ .30	.40	1.25
2161	— $\frac{3}{8}$ inch bore, with screw and nut, for tanks or jars.			
	Each .....			\$ 1.00
2162	<b>Syphons</b> , glass, plain.....			
	Length, short arm....	15	17	19 in.
	Each .....	\$ .25	.30	.40
2163	— With exhaust tube.			
	Length, short arm....		16	19 in.
	Each .....		\$ .40	.50
2164	— With exhaust tube and glass stop-cock.			
	Length, short arm....		15	19 in.
	Each .....		\$1.25	1.50
2165	<b>Acid Pump</b> , glass; for emptying carboys. Glass, no rubber to be injured; the flow under perfect control; can fill large or small bottles with equal ease; durable and cheap.			
	Each .....			\$ 3.75
2167	— With foot blower .....			7.75

## SUPPORTS.



2168



No.

2168 **Supports, carboy, carrying and tilting device.** To overcome the difficult and dangerous operation of carrying and tilting heavy carboys, we herewith introduce a simple device, whereby the carrying of carboys becomes easy and the pouring out of its contents can be done with safety. The illustration shows a stand with a carboy placed thereon, partly swung over, as in the act of pouring. It will be seen that while the carboy can be tilted or turned over with ease, and any quantity drawn from it without the danger of spilling, a considerable amount of labor and material can be saved.

# BOTTLES.



2170



2171



2173



2172



2175



2174

As seen on the illustration, the carrying bars are fastened or clamped to the carboy by means of two screwbolts, which rest on the cleats of the box. These bars are of such lengths as to project beyond the ends of the box, and provide handles whereby the carboy may be carried. The stand can be folded up in a compact manner for transportation or storage.

Price ..... \$ 5.00

No.						
2170	Bottles, coin or acid test.	2 oz	.....			.50
2171	— Cobalt.	With ground glass cap, low form.	1/2 oz	.....		.35
2172	—	With ground cap, tall form	1/2	1	2	4 oz.
	Each	.....	\$ .35	.45	.55	.65
2173	— Schuster's.	With stopper.	2 oz	.....		\$ .25
2174	—	With stopper to turn half around to admit air.	White or amber colored glass.			
	Size	.....		1		2 oz.
	Each	.....		.20		.25
2175	— Mixing.	Graduated and glass stoppered.				
	Capacity	.....	250	500	1000	2000%
	Each	.....	\$ 1.50	2.00	3.00	4.50

GRADUATES.



2180



2190



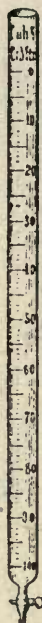
2195

No.									
2180	Graduates, glass, cone shape.								
	Capacity . . . . .	1	2	3	4	6	8	16	32 oz.
	Each . . . . .	\$ .25	.30	.35	.40	.50	.60	1.00	1.50
2181	— Capacity . . . . .	}		1					2 drachms
				60					120 minims
	Each . . . . .			\$ .25					.30
2185	— Glass, double graduation, in grammes and ounces.								
	Capacity . . . . .	1	2	4	8	16			32 oz.
		40	75	150	300	500			1000 grms.
	Each . . . . .	\$ .40	.50	.70	1.10	1.45			2.50
2186	— Cone form.								
	Capacity . . . . .	25	50	100	200	300	500	1000	grms.
	Each . . . . .	\$ .35	.45	.60	.75	1.00	1.25	2.00	
2190	— Cylinder, with lip, double graduations in cubic centimeters, reading either up or down.								
	Capacity . . . . .	5		10		25			50 %
	Each . . . . .	\$ .30		.35		.50			.65
	Capacity . . . . .	100	200	250	500				1000 %
	Each . . . . .	\$ .85	1.00	1.25	1.50				2.50
2191	— Cylinder.								
	Capacity . . . . .	500	1000	2000	3000	4000	5000		grains.
	Each . . . . .	\$ .50	.75	.90	1.00	1.15	1.25		
2192	— Cylinder, glass-stoppered.								
	Each . . . . .			\$1.25		1.75			
2195	— Cylinder, glass-stoppered, with 1 row of figures.								
	Capacity . . . . .		25		50		100 %		
	Each . . . . .		\$ .65		.75		1.00		
	Capacity . . . . .		250		500		1000 %		
	Each . . . . .		\$1.65		2.25		3.50		

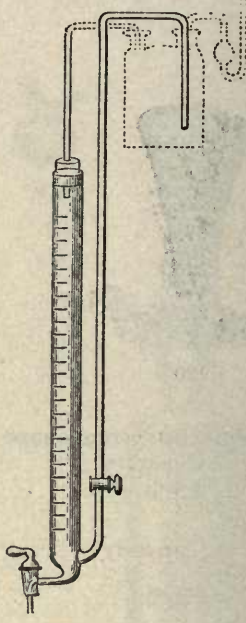
## TEST TUBES, BURETTES.



2210

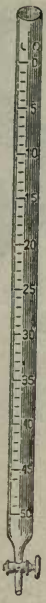


2212



2215

No.					
2200	<b>Test Tubes, graduated, on foot.</b>				
	Capacity.....	5- $\frac{1}{2}$	10- $\frac{1}{2}$	15- $\frac{1}{2}$	25- $\frac{1}{2}$ %
	Each.....	\$ .25	.40	.45	.50
2205	<b>Tubes, Nessler's, for ammonia test.</b> Made of clear glass, with polished bottoms.				
	Graduation.....	50	100	50 and 100	50, 100 and 150 %
	Each.....	\$ .50	.60	.75	1.00
2210	<b>Burettes, Mohr's.</b> Accurately graduated for pinch-cocks; with tip and rubber connections.				
	Capacity.....	10	25	50	50 %
	Graduation.....	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{10}$
	Each.....	\$ .75	.90	1.15	1.30
	Capacity.....	100	100	200	200 %
	Graduation.....	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{1}$
	Each.....	\$1.75	2.00	2.50	2.00
2212	— With Geissler's glass stop-cock.				
	Capacity.....	25	50	50	100
	Graduation.....	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{5}$
	Each.....	\$1.50	1.75	2.00	2.40
2215	— <b>Gawalowsky's,</b> with glass stop-cock and glass side tube with stop-cock, for filling from reservoir.				
	Capacity.....	25	50	100 %	
	Graduation.....	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	
	Each.....	\$3.00	3.50	4.25	



2216



2217



2216-7



2220



2230



2231

No.				
2216	—	<b>Burettes, Schellbach's, with dark enameled stripe on white enameled background, giving a definite meniscus; with Geissler's stop-cock.</b>		
		Capacity.....	25      50      100 %	
		Graduation.....	$\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	
		Each.....	\$1.50      1.75      2.50	
2217	—	With Fresenius' stop-cock. Prices same as No. 2216.		
2220	—	<b>Squibb's, complete, with reservoir. The most convenient form of self-filling automatic burette; filled by pressure; the overflow syphons back into the reservoir, thus avoiding the trouble of reading the zero point.</b>		
		Capacity.....	25      50 %	
		Graduation.....	$\frac{1}{10}$ $\frac{1}{10}$	
		Each.....	\$4.50      5.00	
2225	—	<b>Mohr's, Graduated in grains, with Geissler's stop-cock.</b>		
		Capacity.....	100      500      1000 grains.	
		Graduation.....	1      1      1	
		Each.....	\$1.75      2.25      2.50	
2230	—	<b>Float or Swimmer, each</b> .....		\$ .30
2231	—	“      “      with points to prevent sticking to side, each.....		\$ .50

## BURETTES, CLAMPS.



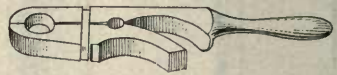
2235



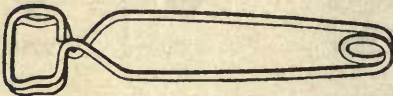
2238



2246



2245



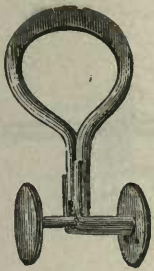
2247



2248-50

No.							
2235	<b>Burettes, Gay Lussac's, mounted on polished wood base.</b>						
	Capacity....	25	25	50	50	75	100 %
	Graduation..	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{2}$
	Each .....	\$1.15	1.25	1.50	1.75	1.75	2.00
	Capacity....	100	120	150	200	250 %	
	Graduation..	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{5}$
	Each .....	\$2.75	2.50	2.75	3.00	3.50	
2238	— <b>Bink's, English form.</b>						
	Capacity....	10	25	50	50	100	100 %
	Graduation..	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{5}$
	Each .....	\$1.00	1.25	1.50	1.75	2.25	2.50
2245	<b>Clamps; wood, for test tubes. With rubber band.</b>						
	Each .....						\$ .15
2246	— <b>Wood. With springs for holding large tubes or flasks.</b>						
	Each .....						.30
2247	— <b>Stoddard's, for test tubes. Of brass spring wire; very commendable.</b>						
	Each .....						.15
2248	— <b>Chaddock's, for test tubes. Of japanned spring wire, rubber covered jaws.</b>						
	Each .....						.35





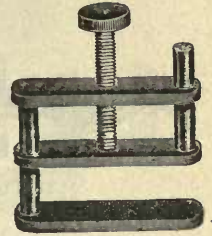
2251



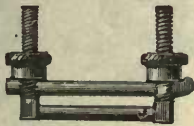
2252



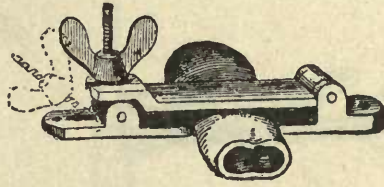
2253



2254

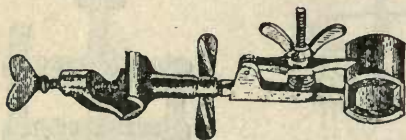


2255

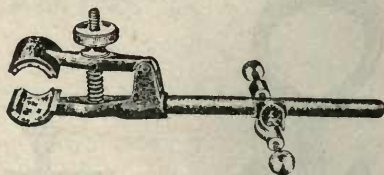


2256

No.							
2249	Clamps, Chaddock's, for beakers.	Of japanned spring wire,					
		rubber covered jaws.					
	Each	.....					\$ .25
2250	—	Chaddock's, for evaporating dishes.	Of japanned spring				
		wire.					
	Each	.....					.25
2251	—	Mohr's, s. c. pinchcocks, Nickel-plated; strong spring.					
	Size	.....	Small.	Medium.			Large.
	Each	.....	\$ .15	.20			.25
2252	—	Hofmann's. Nickel-plated.					
	Size	.....		Small.			Large.
	Each	.....		\$ .25			.30
2253	—	Hofmann's, improved.					
	Width	.....	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
	Each	.....	\$ .25	.30	.40	.60	.75
2254	—	Hofmann's latest design. Nickel-plated; for rubber tubing up to 1 in.					
	Width	.....			$\frac{3}{4}$		1 in.
	Each	.....			\$ .30		.35
2255	—	Bunsen's, for rubber tubing. Of brass; $1\frac{1}{2}$ in. wide.					
	Each	.....					\$ .50
2256	—	Bunsen's, for heavy rubber tubing. Can be screwed on table; to hold tubing up to 2 in.					
	Each	.....					.75



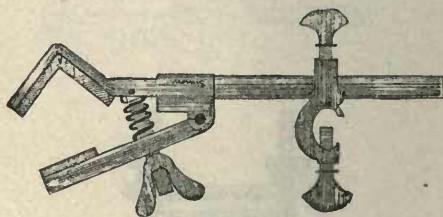
2258



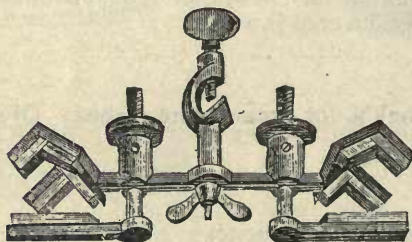
2261



2259



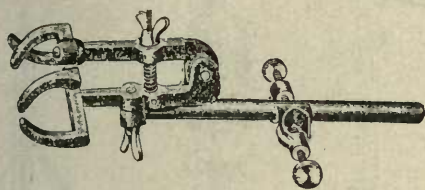
2262



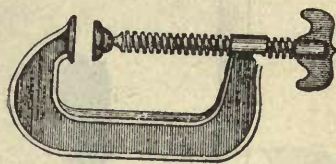
2260

No.			
2258	Clamps, for burettes, etc., with set screws, iron, to attach to a retort stand.....		\$ .50
2259	— for burettes, with strong spring closing the movable jaw.		.75
2260	— Hofman's, improved, for two burettes or tubes. ....		1.00
2261	— Bunsen's, for holding burettes, etc., with fastener, complete .....		1.00
2262	— Bunsen's, for large tubes and condensers, with fastener, complete .....		1.25

## CLAMPS, PIPETTES.



2263



2264



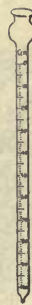
2265



2266



2270



2275

No. 2263 **Clamps, Bunsen's**, for very large apparatus, the jaws adapting themselves to irregular shapes, with fastener, complete, \$ 1.60

2264 — **Iron**, for fastening apparatus to table.  
 Size..... 2½ 3 4 5 6 8 in.  
 Each..... \$ .30 .40 .50 .60 .80 1.30

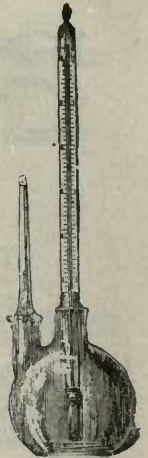
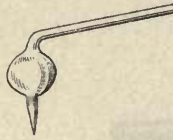
2265 — **Clamp Holders**, for fastening clamps to supports.  
 Size..... Small. Large.  
 Each..... \$ .20 .25

2266 — **Universal**, to set at any angle..... \$ .40

2270 **Pipettes, volumetric.** Accurately graduated.  
 Capacity..... 1 2 3 4 5 10 15 %  
 Each..... \$ .10 .10 .12 .15 .15 .20 .25  
 Capacity..... 20 25 50 100 150 %  
 Each..... \$ .30 .35 .40 .60 .75

2275 — **Graduated.** Thistle top, with sheet rubber top.  
 Capacity..... 10 20 %  
 Graduation..... 1/5 1/5  
 Each..... \$ .60 .75

# PIPETTES, BOTTLES.



2277

2280-4



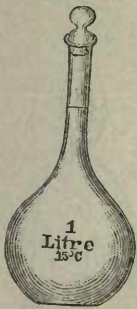
2288

2285

2286-7

No.	2276	2278	2288	2285	2286-7					
<b>2276</b>	<b>Pipettes, Mohr's.</b> Most accurately graduated in centimetres and fractions.									
	Capacity.....	1	5	10	10	20	25	50	50	100 %
	Graduation ...	$\frac{1}{100}$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{5}$
	Each.....	\$ .60	.60	.65	.70	.80	.90	1.25	1.00	2.00
<b>2277</b>	<b>Dropping Tubes.</b> Bent form, $1\frac{1}{4}$ -inch bulb, each.....									
					\$ .15					
<b>2278</b>	— With rubber bulb, dozen.....									
					.50					
<b>2280</b>	<b>Bottles, Specific gravity, with glass stoppers.</b>									
	Capacity.....	100	250	500	1000 grains.					
	Each.....	\$ .60	.75	.90	1.00					
<b>2281</b>	— In box, with counterpoise weight.									
	Capacity.....	100	250	500	1000 grains.					
	Each.....	\$1.75	2.00	2.50	3.00					
<b>2282</b>	— Capacity.....									
		10	20	25	50	100 grammes.				
	Each.....	\$ .60	.70	.80	.90	1.00				
<b>2284</b>	— In box, with counterpoise weight.									
	Capacity.....	10	20	25	50	100 grammes.				
	Each.....	\$1.50	1.75	2.00	2.50	3.00				
<b>2285</b>	— With thermometer ground into neck, Fahr. scale, in box, with counterpoise weight.									
	Capacity.....		50		100 grammes.					
	Each.....		\$2.50		3.00					
<b>2286</b>	— <b>Geissler's form,</b> Fahr. thermometer, porcelain scale, capillary overflow tube, in box with counterpoise weight.									
	Capacity.....	25	50		100 grammes.					
	Each.....	\$4.00	4.50		5.00					
<b>2287</b>	— Same, with Celsius thermometer.									
	Capacity.....	25	50		100 grammes.					
	Each.....	\$4.00	4.50		5.00					
<b>2288</b>	— Bulb shape, with capillary stopper, hollowed out at lower inner end.									
	Capacity.....	10	25	50	100 grammes.					
	Each.....	\$1.00	1.25	1.50	2.00					

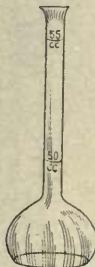
## FLASKS, PYROMETERS.



2290



2291



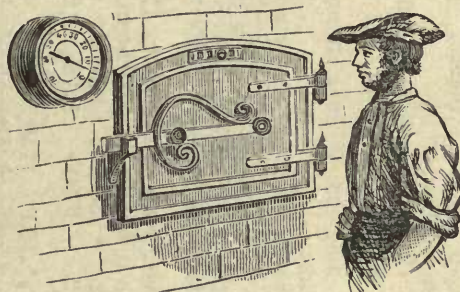
2292



2293



2295



2300

No.									
2290	<b>Flasks, volumetric or liter, with glass stoppers.</b>								
	Capacity .....	50	100	150	200	250	500	1000	2000 %
	Each .....	\$ .30	.40	.50	.55	.60	.75	1.00	1.25
2291	— Without glass stoppers.								
	Capacity .....	50	100	150	200	250	500	1000	2000 %
	Each .....	\$ .25	.30	.35	.40	.45	.60	.75	1.00
2292	— <b>Sugar, with two graduations on neck.</b>								
	Capacity .....	50/55		100/110		150/160		200/220 %	
	Each .....	\$ .35		.40		.60		.75	
2293	— For polarization, Kohlrausch's, one graduation on neck.								
	Capacity .....	50							100 %
	Each .....	\$ .40							.50
2295	<b>Dish, wrought German silver, with spout, polished, for sugar analysis, 3 inches in diameter, with counterpoise weight.</b>								
	Each .....	\$ 3.50							
2296	— Aluminum .....	2.50							
2300	<b>Pyrometers, for noting high temperatures, melting points of metals, in crucibles and furnaces, heat of ovens, etc.; 5½ in. dial, reading to 1200° Fahr. The stem 30 in. long.</b>								
	Price, either horizontal or perpendicular .....	\$25.00							

# THERMOMETERS.



Full size.  
2314

2310 Thermometers, chemical, best European make. Paper scale, enclosed in glass tube, length, 12 to 13 inches,  $\frac{1}{4}$  to  $\frac{5}{16}$  inches diameter, in pasteboard box.

Graduated to..	212	400	600° Fahr.
Each .....	\$1.00	1.25	1.40

2311 Chemical, 8 inches long by  $\frac{1}{4}$  inch diameter. Graduated to 220° Fahr. . . . . \$ .85

2312 Same, 110° Celsius . . . . . .85

Graduated to	100	150	200	360° Cel.
Each .....	\$1.00	1.25	1.50	1.75

2314 Chemical, solid glass, with white back, 12 to 13 inches long,  $\frac{1}{4}$  to  $\frac{5}{16}$  inch diameter, in pasteboard box.  
Graduated to 212 300 400 600° Fahr.  
Each..... \$1.25 1.50 1.75 2.00

Chemical, grad. to	100	150	200	360° Cel.
Each.....	\$1.25	1.50	1.75	2.00

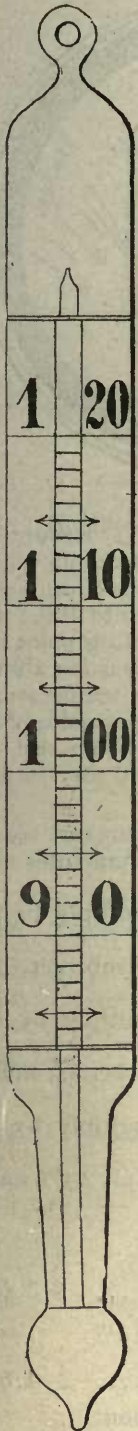
2316° Chemical, with double graduation reading 240° Fahr. and 120° Celsius.  
Each .....

.....	\$ 2.00
-------	---------

2320 see Floating, for sugar manufacturers, paper scale, 7 inches long,  $\frac{5}{8}$  inch diameter, 0-50° Celsius.  
Dozen..... \$ 6.00



Full size.  
2320



Full size.  
2328



2325



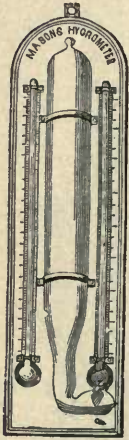
2327



2329

No.				
2325	—	<b>Thermometers, Self-registering, Fahr. scale, upon polished wood, maximum, minus 40 to plus 120.</b>		
		Each.....		\$ 1.50
2326	—	Minimum, minus 40 to plus 120.		1.50
		Each.....		
2327	—	Maximum and minimum, mounted on neat hard-wood frame, with magnet.		3.50
		Each.....		
2328	—	<b>Incubator, paper scale, inside of glass tube, accurately graduated, with red line to show marking 103°.</b> Cut full size.		
		Each.....		1.75
2329	—	Japanned tinned cases.		
		Length.....	7      8      10	12 in.
		Per dozen.....	\$1.50   1.75   2.50	3.00

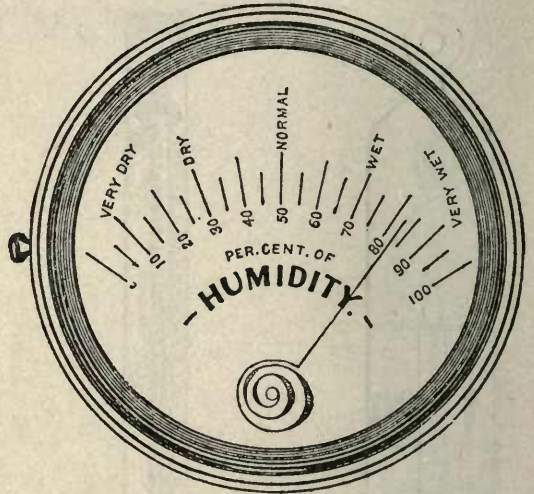
# HYGROMETERS.



2330



2331



2332

**Scales.** Centigrade symbol "C"; Fahrenheit symbol "F"; Reaumur, symbol "R". The zero of the scales of Reaumur and Centigrade is freezing point of water marked, in each case, 0°, while the intervening space up to the boiling point of water is divided, in the former case into 80 parts, and in the latter into 100. In the Fahrenheit scale the freezing point is represented by 32° and the boiling point by 212°, the intervening space being divided into 180°, which admits of extension above and below the points named, a good thermometer being available for temperature up to 620° Fahrenheit. The use of the Reaumur scale is confined exclusively to Germany and Russia, while the Centigrade scale is used throughout the rest of Europe. The Fahrenheit scale is confined to England, her colonies and the United States of America.

A variety of circumstances arise in which it becomes necessary to convert readings from one scale into those of the others, in which case the following rules are to be observed:

1. To convert Centigrade degrees into degrees of Fahrenheit, multiply by 9, divide the product by 5 and add 32.
2. To convert Fahrenheit degrees into degrees of Centigrade, subtract 32, multiply by 5 and divide by 9.
3. To convert Reaumur degrees into degrees of Fahrenheit, multiply by 9, divide by 4 and add 32.
4. To convert Fahrenheit degrees into degrees of Reaumur, subtract 32, multiply by 4 and divide by 9.
5. To convert Reaumur degrees into degrees of Centigrade, multiply by 5 and divide by 4.
6. To convert Centigrade degrees into degrees of Reaumur, multiply by 4 and divide by 5.

No.			
2330	—	<b>Hygrometers, Mason's.</b> Mounted on wood back, plated scale.	
		Each.....	\$ 3.50
2331	—	<b>Daniels'.</b> With burnt-in gold rings, mounted on polished wood stand; fine German made.	
		Each.....	4.50
2332	—	Denoting humidity (percentage of moisture) without reference to tables. The simplest and best form, constructed entirely of metal and glass, finely nickel-plated. Diameter, 3 inches.....	1.00



## SAND GLASSES, HYDROMETERS.



2333



2336

No.						
2333	<b>Sand Glasses</b> .....	5	10	15	45	60 minutes
	Each.....	\$.80	.90	1.00	1.25	1.50
2334	— <b>Double Form</b> , graduated, 1 to 15 minutes, reversible.					\$ 1.25
2336	<b>Hydrometers, Acid</b> , Beaume's, 0 to 70.					
	Each.....					.50
2337	— <b>Pyle's make</b> , graduated					
	20 to 30, 30 to 40, 40 to 50, 50 to 60, 60 to 70					
	Each.....		$\frac{1}{10}$ ths.			1.75
2338	— <b>Alkali</b> , Beaume's, 0 to 50.					
	Each.....					.50
2339	— <b>Alcohol</b> , Tralle's and U. S. C. H. scale, 1 to 100.					
	Each.....					.75
2340	— Same, with thermometer.					
	Each.....					1.50
2341	— <b>Ammonia</b> , Beaume's, 10 to 40.					
	Each.....					.20
2342	— <b>Bark</b> , Beaume's, 0 to 60.					
	Each.....					.50
2343	— <b>Beer</b> , Beaume's, 0 to 50.					
	Each.....					.50
2344	— <b>Cider</b> , Beaume's, 10 to 30.					
	Each.....					.50
2345	— <b>Coal-oil</b> , standard, as adopted by U. S. Petroleum Association, Beaume's scales, 10 to 90, in $\frac{1}{4}$ °.					
	Each.....					.50
2346	— Same, with thermometer, combined, standard, as adopted by U. S. Petroleum Association, Beaume's scale, 10 to 90, in $\frac{1}{4}$ °, 10 inches.					
	Each.....					2.00
2347	— Same as above, 12 inches.					
	Each.....					3.00

NOTE—Nos. 2345-2347 range for all grades. Petroleum, 18° to 32°; Coal-oil, 33° to 45° Naphtha, to 74°; Gasoline, to 85°.

No.			
2348	Hydrometers, Ether, Beaume's, 10 to 80.	Each.....	\$ .50
2349	— Milk, Beaume's, 0 to 120.	Each.....	.50
2350	— Whale-oil, Beaume's, 0 to 80.	Each.....	.50
2351	— Salt, Beaume's, 0 to 100.	Each.....	.50
2352	— Sea water, or Salinometer, Beaume's, three scales on the stem, temperature 190, 200 and 210°, and 0 to $\frac{3}{32}$ .		
2353	— Syrup, Beaume's, 0 to 50.	Each.....	.50
2355	— Saccharometers, Brix', graduated		
	0 to 30, 30 to 60, 30 to 90, 60 to 90		
	$\frac{1}{5}^{\circ}$	0 to 5, 0 to 15, 0 to 25, 5 to 15, 10 to 20, 25 to 35	
	$\frac{1}{10}^{\circ}$	—5 to +5, 0 to 30, 30 to 60, 60 to 90, 60 to 100	
	$\frac{1}{2}^{\circ}$	Graduated for temperature of 17 $\frac{1}{2}$ ° centigrade	
	Each.....		.75
2356	— Specific gravity, for light liquids, 1.700 to 1.000, Beaume and specific gravity scale.	Each.....	.75
2357	— Specific gravity, for heavy liquids, 1.000 to 2.000,	Each.....	.75
2358	— Specific gravity, Universal, 0.7000 to 2.000 with thermometer.	Each.....	3.00
2359	— Twaddell's, No. 1, 0 to 24 into $\frac{1}{2}$ , 9 inches..		.75
	“ “ 2, 24 “ 48 “ $\frac{1}{2}$ , 9 “ ..		.75
	“ “ 3, 48 “ 72 “ $\frac{1}{2}$ , 9 “ ..		.75
	“ “ 4, 72 “ 108 “ $\frac{1}{2}$ , 9 “ ..		.75
	“ “ 5, 108 “ 144 “ $\frac{1}{2}$ , 9 “ ..		.75
	“ “ 6, 144 “ 180 “ $\frac{1}{2}$ , 9 “ ..		.75
2360	— Urinometer, 0 to 60, 5 inch, with glass jar and printed directions.	Each.....	.75
2361	— Same, 0 to 50, 5 $\frac{1}{2}$ inches, milk scale, with graduated jar.	Each.....	1.25
2362	— Vinegar, 0 to 6, in $\frac{1}{10}$ , 0 to 8, in $\frac{1}{2}$ .	Each.....	.50

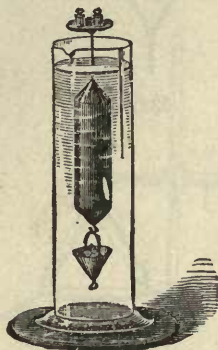
## FIRE TEST, AREOMETERS, JARS.



2365



2371



2370



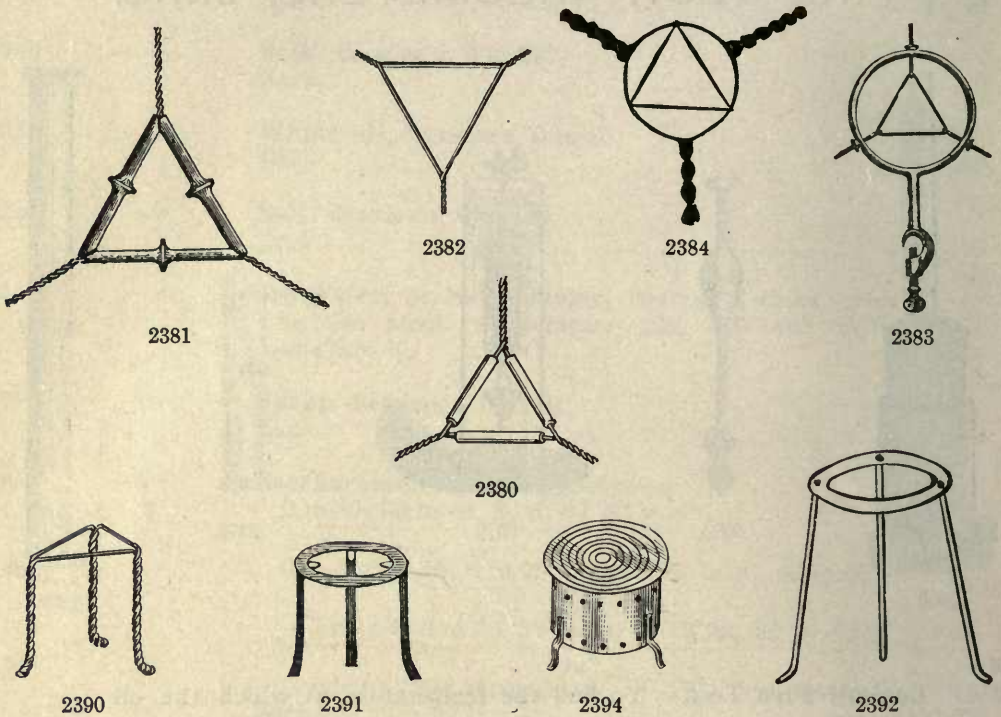
2372



2375

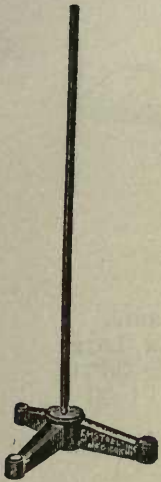
No.								
2365	<b>Coal-oil Fire Test.</b> To find the temperature at which the oil will flash or explode. A thermometer suspended in copper vessel containing the oil, surrounded by copper cup containing water; lamp underneath surrounded by copper hood.							
	Price, complete .....						\$ 5.00	
2366	Extra glass cups for above.....						.30	
2370	<b>Areometer, Nicholson's.</b> For taking (without use of a balance) the specific gravity of specimens of ores, or any solid substance not weighing over 1000 grains.							
	<b>Brass,</b> with glass jar	Price, without weights.....					4.50	
2371	—	<b>Glass.</b>	“	“	“	“	2.75	
2372	<b>Apparatus to Determine Amount of Water in Milk.</b> Showing the percentage of water by volume, according to Fuchs.							
	Each.....						2.00	
2375	<b>Jars, Hydrometer, on foot.</b>							
	Height.....	6	8	10	12	15	18	20 in.
	Diameter....	1	1½	1½	2	2	2	2 “
	Each.....	\$ .25	.35	.40	.55	.60	.85	1.00

# TRIANGLES, TRIPODS.

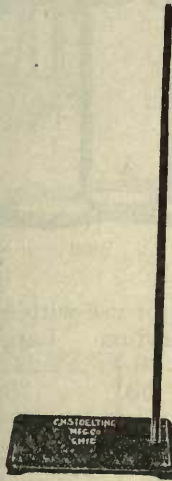


No.								
2380	<b>Triangles.</b>	<b>Wire; pipe-stem covered ; small, medium and large.</b>						
		Each .....						\$ .10
2381	—	<b>With porcelain tubes, flanged, on tin wire.</b>						
		Sizes .....	Small.	Medium.	Large.			
		Each .....	\$ .25	.35	.45			
2382	—	<b>Not clayed.</b>						
		Each .....						\$ .05
2383	—	<b>Adjustable.</b> This holder is nickel-plated and will accommodate any size triangle up to 100 cubic centimeters.						
		Each .....						1.25
2384	—	<b>Solid platinum wire, inside of an iron ring, after Fresenius.</b>						
		Assorted sizes .....						\$1.00 to 2.00
2390	<b>Trip ds.</b>	<b>Hard twisted wire ; japanned ; 5½ inches high.</b>						
		Each .....						\$ .20
2391	—	<b>Brass; dissectable ; for alcohol lamp.</b>						
		Each .....						.75
2392	—	<b>Iron.</b>						
		Number of rings.....	1	2	3	4	5	6
		Each .....	\$ .35	.40	.50	.75	1.00	1.25
2394	—	<b>With 7 rings and jacket complete.</b>						
		Each .....						\$ 2.00

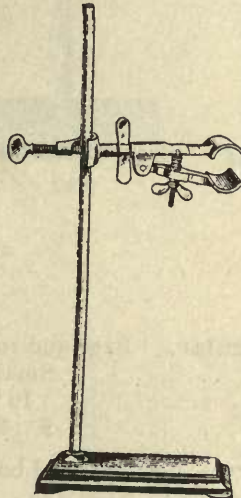
# SUPPORTS FOR BURETTES, FUNNELS, ETC.



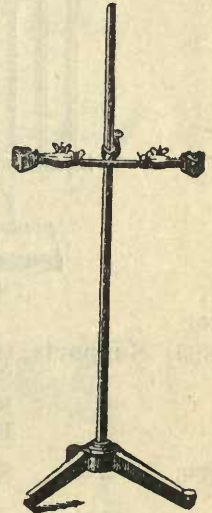
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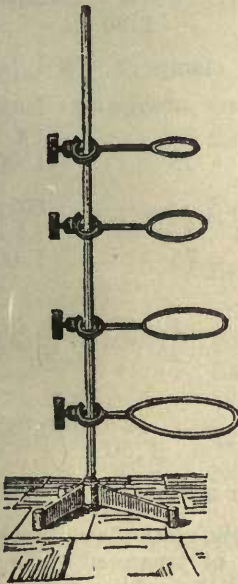
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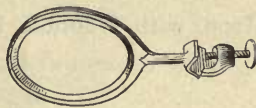
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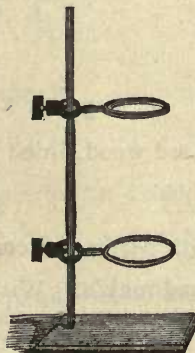
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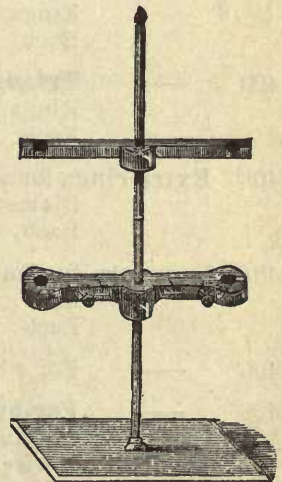
2400



2403

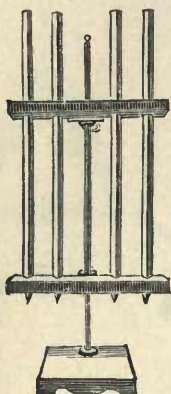


2399

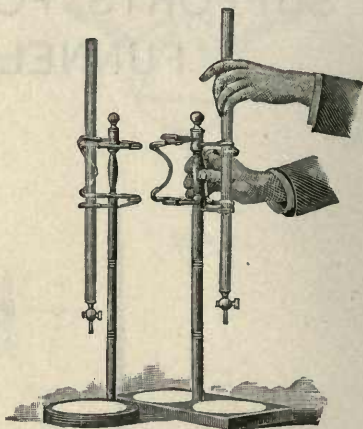


2404

## SUPPORTS.

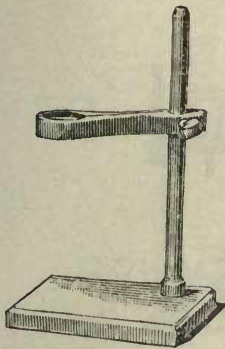


2405

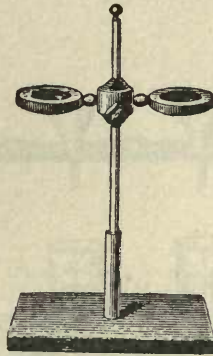


2406

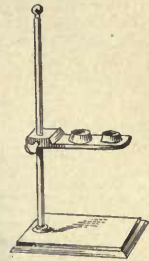
No.					
2395	<b>Supports, triangular.</b>	Base and rod only, for use with any clamp.			
	Size.....	Small	Medium	Large	Ex. Large
	Rod .....	16	20	24	36 in.
	Each.....	\$ .40	.50	.75	1.00
2396	—	<b>Square.</b>	Base and rod only, for use with any clamp. Length of rod same as No. 2495.		
	Size.....	Small	Medium	Large	
	Each.....	\$ .35	.50	.75	
2397	—	<b>For burettes.</b>	Iron base, rod and clamps.		
	With.....	1	2	3	clamps.
	Each.....	\$ .90	1.40	1.90	
2398	—	For burettes.	Iron, with 1 double Hofmann clamp....		\$ 1.50
2399	—	<b>Square base.</b>			
	Rings.....	2	3	4	
	Each.....	\$ .60	.75	1.00	
2400	—	<b>Triangular base.</b>			
	Rings.....	2	3	4	
	Each.....	\$ .60	.75	1.00	
2403	<b>Extra rings for above.</b>				
	Diameter of Ring..	2	3	4	5 in.
	Each.....	\$ .15	.20	.25	.30
2404	<b>Supports, for burettes.</b>	Hard wood, lined with cork.			
	For.....	1		2	burettes
	Each.....	\$1.00		1.50	
2405	—	For 4 burettes, with perforated corks in lower arm.....			\$ 1.25
2406	—	<b>For burettes, Chaddock's.</b>	With round milk glass plate, black walnut base with porcelain plate, clamp of japanned spring wire on turned maple upright; thumb opens the rubber covered V-shaped jaws, which close upon the burette and hold it firm and true.		
	For.....	1		2	burettes
	Each.....	\$1.75		2.75	



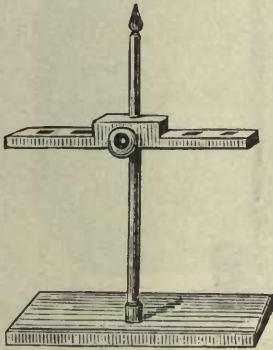
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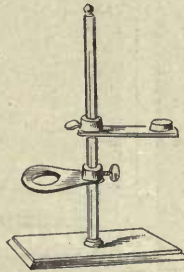
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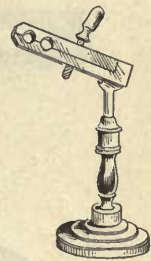
2409



2410



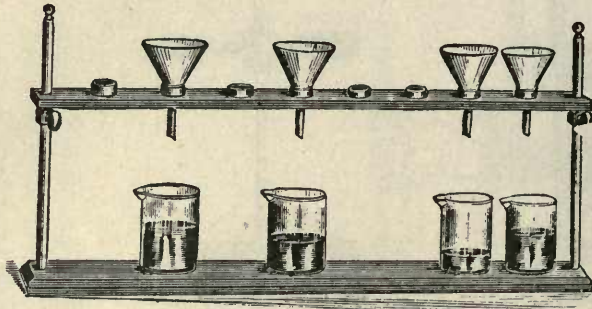
2411



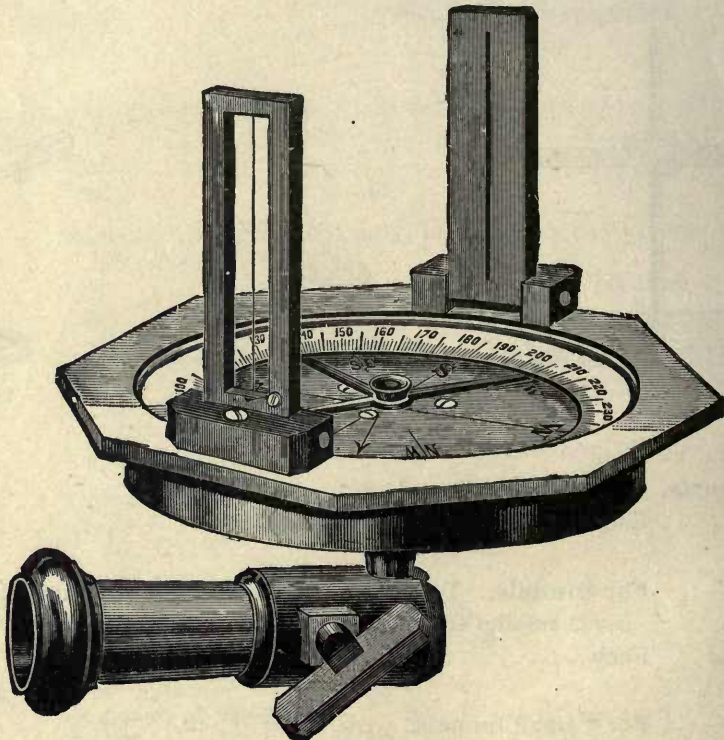
2412

No.			
2407	—	<b>Supports,</b> One arm for 1 funnel.	
		Each.....	\$ 1.00
2408	—	<b>For funnels.</b> Two arms, for 2 funnels, with extra plate for 2 smaller funnels.	
		Each.....	1.50
2409	—	For 2 small funnels.	
		Each .....	1.25
2410	—	With 1 double arm, for 4 small funnels.	
		Each.....	1.25
2411	—	With 2 separate adjustable arms for funnels.	
		Each.....	1.50
2412	—	With movable screw clamps.	
		Each.....	1.50

# SUPPORTS, COMPASSES.



2415

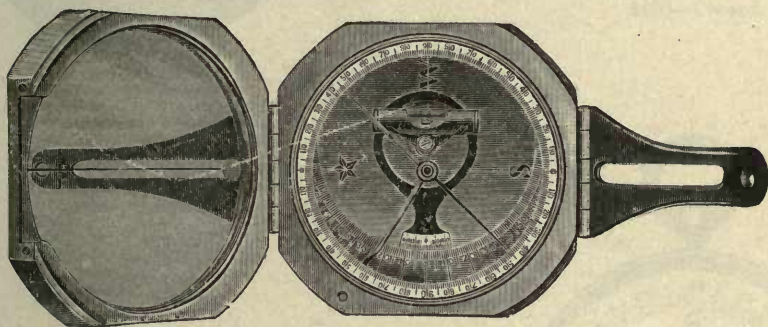


2418

- No.  
 2415 **Supports,** for funnels ; height adjustable, 6 funnels in one line.  
 Each..... \$ 2.00
- 2418 **Compasses.** 4 inches diameter, needle 3 inches. With folding hook,  
 with ball movement and hair sights; socket for staff;  
 each in mahogany box; metal faces, double dial, all  
 graduated to single degrees; jeweled bar needles.  
 Each ..... 15.00



## BRUNTON'S PATENT POCKET MINE TRANSIT.



Cut about one-half size.

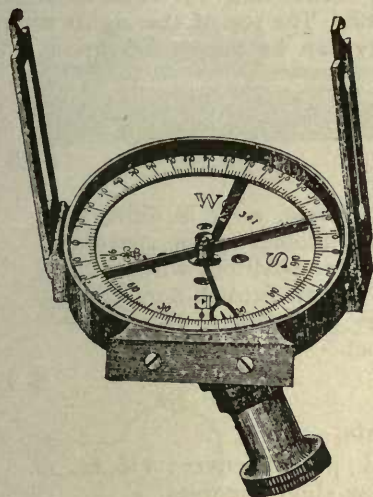
2419.

No.

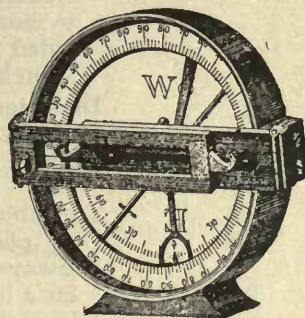
2419. The accompanying illustration shows this valuable instrument as it appears to the operator when taking courses or horizontal angles. A tripod or Jacob's staff is unnecessary, as the sighting and reading are accomplished simultaneously. The lightest and most convenient pocket instrument on the market. Dimensions when folded for the pocket,  $2\frac{3}{4} \times 2\frac{3}{4} \times 1$  inches.

Price ..... \$25.00

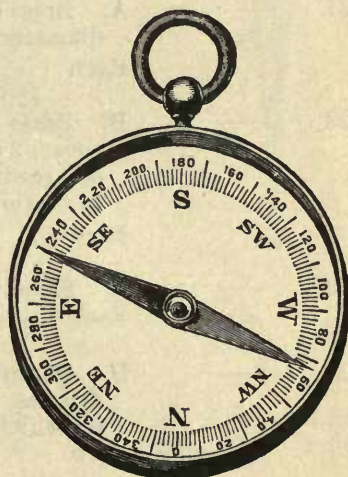




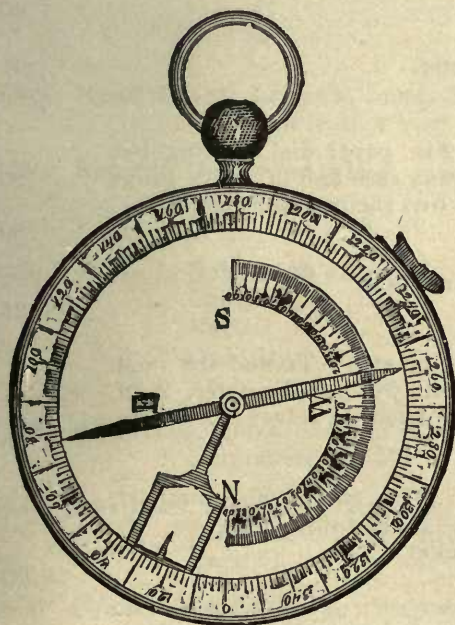
2420—Open.



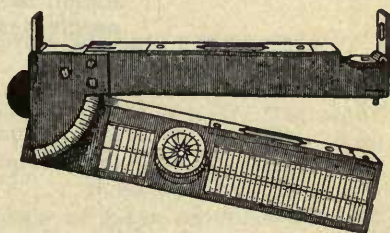
2420—Closed.



2421-5



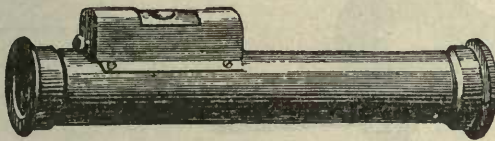
2426



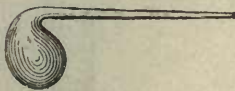
2427

No.				
2420	Compasses.	<b>For Miners.</b> With folding down sights and clinometer for getting dip angle of a quartz ledge. Metal dial, graduated into single degrees; also cardinal points of the compass. Needles jeweled, all with socket and universal movement, to mount upon a Jacob staff. The top of the sights are provided with hooks, so they can be suspended upon a line stretched along the drift.		
		Diameter, case.....	3	4 in.
		Length of needle.....	2	4 "
		Each.....	\$9.00	11.25
		The above compass has no levels, as it is difficult to place them. With a clinometer, the needle always resting in a horizontal position, will serve for a level ordinarily; but we can furnish a circular level, to be placed upon the glass cover, which can be carried in the vest pocket.		
		Each.....		\$ 1.00
		<b>Pocket, with cardinal points.</b>		
2421	—	<b>A.</b> Brass case, nickel-plated; pull-off cover; $1\frac{3}{4}$ in. diameter; paper dial reading single degrees.		
		Each.....		50
2422	—	<b>B.</b> Brass case, nickel-plated; thick, bevelled glass cover; 2 in. diameter; jeweled needle; metal, silvered dial reading two degrees; needle lift to protect point in carrying.		
		Each.....		1.00
2423	—	<b>C.</b> Same; $2\frac{3}{8}$ in. diameter.		
		Each.....		1.25
2424	—	<b>D. Miner's Pocket.</b> 2 in. paper dial, reading two degrees. All in mahogany case 3x3 in., with hinge lid which when closed lifts the needle from point.		
		Each.....		.80
2425	—	<b>E.</b> Same. Metal, silvered dial.		
		Each.....		1.25
2426	—	<b>Miner's Pocket, with clinometer.</b> To find the inclination of quartz ledges. $2\frac{1}{2}$ in. diameter; 2 in. needle; jeweled, nickel-plated, in velvet lined case.		
		Each.....		4.50
2427	—	<b>Clinometer, boxwood.</b> With two levels, compass, inclination scale, and folding-down sights. In leather case for the pocket.		
		Each.....		15.00
2428	—	<b>Atwood's mining clinometer and compass,</b> with a table of fall of angles, with two levels at right angles, with sights, all mounted in a rectangular metal open frame, $6\frac{1}{2}$ x3x $\frac{1}{2}$ in., in leather case.		
		Each.....		15.00

# LEVELS, RETORTS, RECEIVERS, ADAPTERS, CONDENSERS.



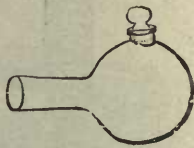
2430



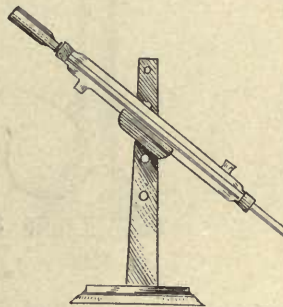
2435



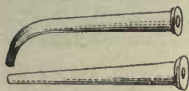
2436



2440



2450



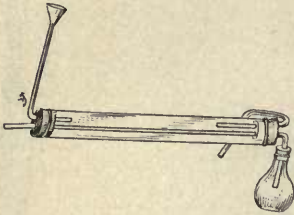
2445



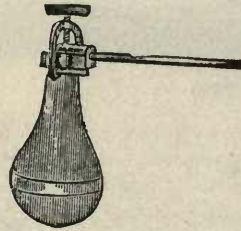
2451

No.									
2430	<b>Hand Level, Locke's, brass, for use in drawing lines in tunnels, in leather case</b>								\$ 7.50
2435	<b>Retorts, Bohemian glass, plain.</b>								
	Capacity...	2	4	8	16	32 oz.	½	1	2 gal.
	Each	\$ .20	.25	.30	.35	.45	.60	.90	1.50
2436	<b>Bohemian glass, with tubulature and glass stopper.</b>								
	Capacity			2	4	8	16		32 oz.
	Each			\$ .25	.30	.35	.55		.70
	Capacity			½	1	2	3	4	5 gals.
	Each			\$ .90	1.30	2.25	3.75	5.00	6.00
2440	<b>Receivers, glass, plain or tubulated, same prices as glass retorts, catalogue numbers, 2435-6.</b>								
2445	<b>Adapters, glass, for connecting retort with receivers, either bent or straight.</b>								
	Diameter at large end..	½	1	1½	2	2¾	3 in.		
	Each	\$ .25	.30	.35	.40	.45	.50		
2450	<b>Condensers, Liebig's, both outer and inner tube of glass, mounted on wood supports, universal movements.</b>								
	Length			12	18	24		30 in.	
	Price			\$1.50	1.75	2.00		3.00	
2451	<b>Unmounted</b>			1.00	1.25	1.50		2.25	

# STILL AND CONDENSER, ALEMBICS, RETORTS.



2453



2457



2455



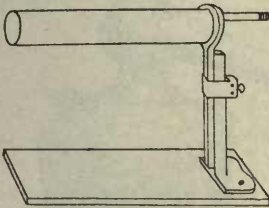
2454



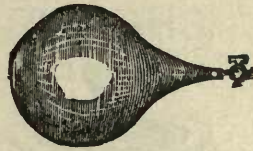
2456

No.						
2452	<b>Condensers, Inner tubes only, can also be used as adapters for glass retorts.</b>					
	Length.....	19	26	33	40	50 in.
	Each.....	\$ .25	.35	.55	.65	.85
2453	<b>Still and Condenser, combined, Liebig's, all glass, 10 inches long.</b>					
	Each.....					\$ 1.25
2454	<b>Alembics, ground stopper.</b>					
	Capacity.....	2	4	8	oz.	
	Each.....	\$ .50	.75	1.00		
2455	<b>Condenser or Rectifier, glass worm inside of glass tube.</b>					
	8 inches long, 1 inch diameter, each .....					\$ .75
	12 " " " 1 " " " .....					2.50
2456	<b>Retorts, German Porcelain, for very high heat, glazed inside, stoppered.</b>					
	Capacity.....	4	8	16	32	oz.
	Each.....	\$ .25	1.50	1.75	2.50	
2457	<b>— Copper, for generating oxygen with iron clamp and brass delivery tube.</b>					
	Capacity.....	½	1	2	4	pints
	Each.....	\$2.00	2.25	2.75	3.50	

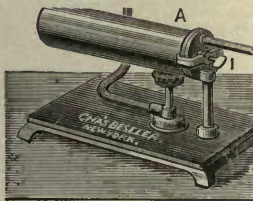
# RETORTS, GAS BAGS, GASOMETERS, PUMPS.



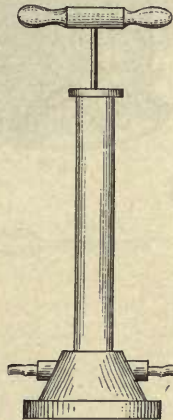
2460



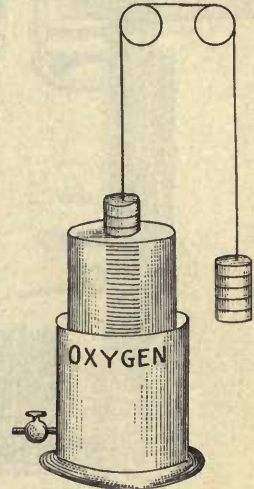
2463



2462



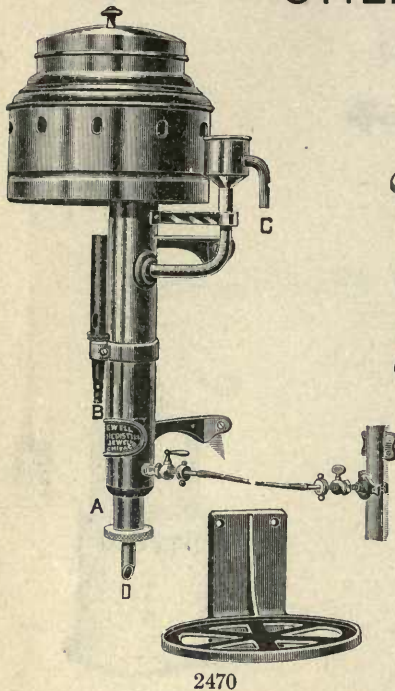
2465



2464

- No. 2460 **Retorts, Brass.** The tube 6 inches long, 1½ inches in diameter. A small portion of the chemicals can be reduced first, then the burner moved under fresh portion without generating too rapidly; mounted on board, with elevating device to suit the flame.  
 Each ..... \$ 1.75
- 2462 — Sheet iron, 12x2 inches, mounted upon iron stand, with Bunsen burner.  
 Each ..... \$ 9.00
- 2463 **Gas Bags,** rubber, bulb shape, for collecting oxygen, fitted with brass stop-cock and rubber stopper.  
 Capacity ..... 1      2      3      4      5 gals.  
 Each ..... \$2 00    2.50    3 00    3.50    3.75  
 Prices will be given for larger sizes.
- 2464 **Gasometers,** of galvanized sheet iron, japanned, a new and cheap form simplified by Taylor. No escaping of gas, a convenient means for measuring quantity of gas contained or used.  
 Capacity.. 5      10      20      25      40      50      80 gals.  
 Each.....\$7.50 10 00 12.50 14.00 16.00 20.00 25.00
- 2465 **Transfer Pump,** brass barrel, 1½ inch bore, 16 inches long, with cup leather packing, forcing both ways, in or out, Taylor's improved balance valve for inward and outward flows, all mounted upon foot-boards.  
 Each ..... \$12.50

## STILLS, CONDENSERS.



2470



2468



2467

2470

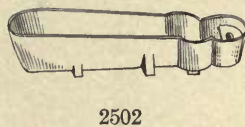
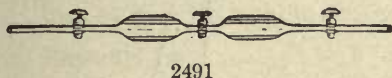
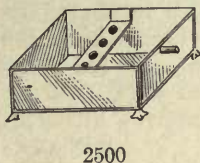
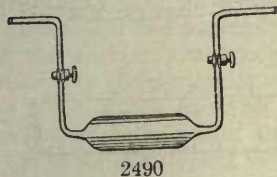
No.						
2466	Stills and Condensers, copper, tin lined, for distilling water, tinctures, etc.	Capacity.....	1/2	1	2	3 gals.
		Each.....	\$9.00	12.00	14.00	16.00
2467	—	Copper Still only.				
		Each.....	\$6.00	8.50	9.00	10.00
2468	—	Condenser only.				
		Each.....	\$3.00	3.50	5.00	6.00
			Larger sizes furnished to order.			

2470. — **Jewell's No. 4.** Capacity, one-half gallon per hour. Especially adapted for domestic use, and owing to its simplicity, ease of operation and durability, is generally preferred over any other form for use in the kitchen or pantry. It certainly cannot be excelled, and is not equalled by anything on the market. The Stills are fitted complete with brass, gas and water cocks, block tin pipe water connections, and adjustable bracket for holding bottle or other receptacle for distilled water. The burner is of the standard Bunsen type, with special gauze tip; does not "pop back" or smoke under any conditions, and burns a beautiful blue flame. The cover on the Still is made of polished copper. The "retort" and "condensing jacket" are in one piece. All parts are interchangeable and readily accessible.

Price..... \$15.00

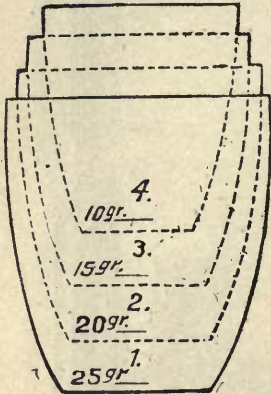


# CONDENSERS, EXTRACTION APPARATUS, TROUGHS.

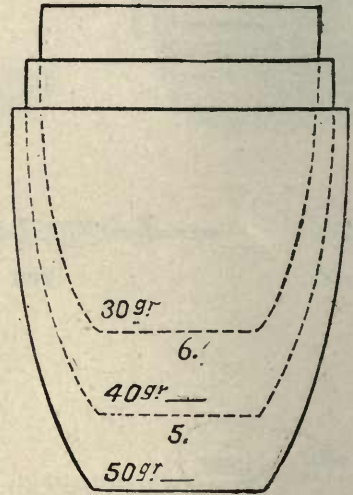
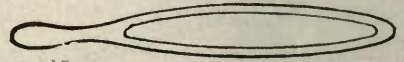


No.					
2490	Condensers.	For sulphuric acid. With one bulb and two stopcocks.			
		Each.....			\$ 2.75
2491	—	Same. With two bulbs and three stopcocks.			
		Each.....			3.00
2495	Extraction Apparatus, Soxhlet's.	Complete with flask and condenser.			
		Capacity.....	2	4	6 oz.
		Each.....	\$2.60	3.00	4.00
2500	Troughs, pneumatic.	Japanned tin, with sliding perforated shelf and overflow pipe.			
		Size.....	5x7x9	7x9x12	8x9x12    8x11x15 in.
		Each.....	\$1.50	2.00	2.50    3.00
2502	—	Mercury; porcelain; cross form; holds 6 lbs. mercury.			
		Each.....			\$ 1.00
2503	—	Same; oblong.			
		Capacity.....		8	16 lbs.
		Each.....	\$1.25		1.50

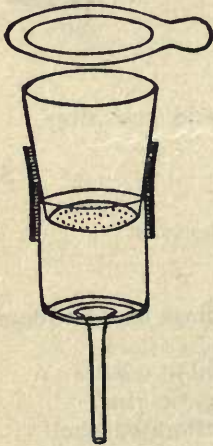
# PLATINUM.



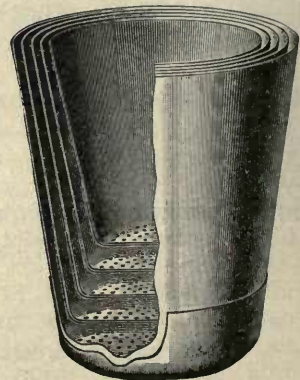
2510



2510



2511



2512

## PLATINUM.

Our stock of platinum is the best. The crucibles and dishes are hammered up, not spun, consequently are solid, durable and will not blister. Our prices are the market rates, which fluctuate. The foil and wire sold by the grain.

Pure platinum being a very soft metal, scarcely harder than gold, it is essential for durability that it be alloyed with a small percentage of iridium. Every chemist will appreciate the superiority of utensils, made of this alloy, over pure platinum, since the former are much harder and more tenacious, besides offering a greater resistance to the action of chemical agents, an alloy of platinum with 10% iridium being but slightly attacked by aqua regia. This result seems to be due to the formation of a thin film of iridium upon the surface of the utensils in use, which renders them indifferent to most chemical action.

Estimates given for all kinds of platinum ware for chemical and laboratory purposes. Old dishes, crucibles, etc., repaired, reshaped, and purchased.

No.

2510 **Crucibles, platinum.** With covers, weighing approximately as many grammes as they hold cubic centimeters, as follows :

Capacity in %	8	Weight in grammes,	8
"	10	"	10
"	12	"	11
"	15	"	14
"	20	"	18
"	25	"	24
"	30	"	27
"	35	"	33
"	40	"	37
"	45	"	44
"	50	"	51
"	55	"	56
"	60	"	62
"	70	"	65
"	80	"	68
"	90	"	70
"	100	"	80
"	110	"	90

Covers are always furnished with crucibles unless otherwise ordered. Crucibles of other weights and capacities made to order. Prices on application.

2511 **Crucibles,** According to Dr. Gooch, with perforated bottom, cover and extra cap.  
Prices on application.

2512 — **Platinum.** Gooch form, with covers and caps, weigh as follows:

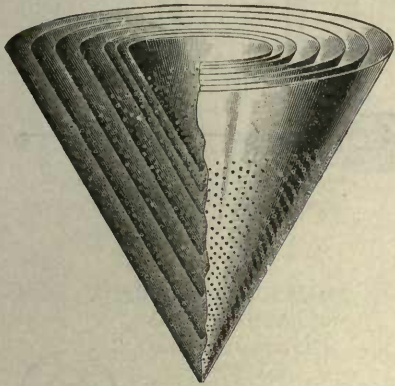
Capacity in %	10	Weight in grammes.	13
"	12	"	16
"	15	"	18
"	20	"	22
"	25	"	29
"	30	"	34

Coarse or fine perforation. Covers are always furnished with crucibles unless otherwise ordered.

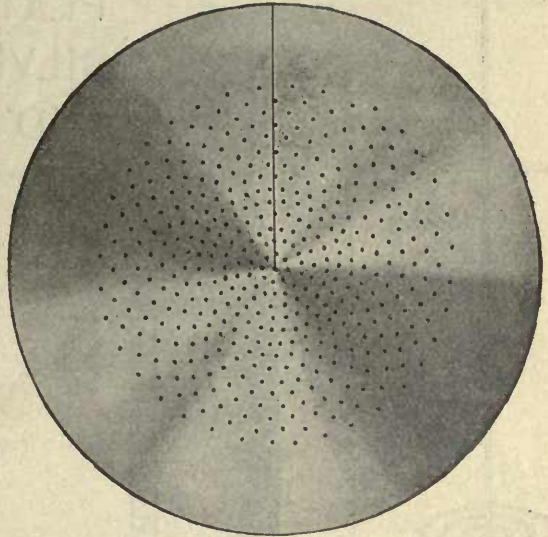
Prices on application.

Illustration No. 2512 full size from 12 % to 30 % inclusive.

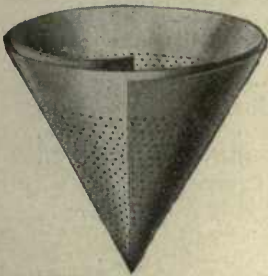
- No.
- 2513 **Cones, platinum.** Seamless Filter, 60°, coarse or fine perforations. Sold by the piece. Stock sizes as follows, others to order:  
 Diameter . . . . .  $\frac{3}{4}$   $\frac{7}{8}$   $1\frac{1}{4}$   $1\frac{1}{2}$   $1\frac{3}{4}$  2 inch.  
 Prices on application.
- 2514-15 — **Flexible filter.** Full or three-quarters circle, coarse or fine perforation, adjustable to any angle. Sold by the piece. Cut No. 2514 shows flexible cone before folding; cut No. 2515 shows cone folded to fit funnel. Stock sizes as follows:  
 Diameter, folded,  $\frac{3}{4}$   $\frac{7}{8}$  1  $1\frac{1}{4}$   $1\frac{1}{2}$   $1\frac{3}{4}$  2 inch.  
 Prices on application.
- 2520 **Dishes, platinum.** With lips, best hammered ware. Platinum dishes weigh, approximately,  $\frac{1}{3}$  as many grammes as their capacity in cubic centimeters.
- |                    |     |     |     |             |            |
|--------------------|-----|-----|-----|-------------|------------|
| Nos. . . . .       | 9   | 8   | 7   | 6           | 5          |
| Weight . . . . .   | 8   | 14  | 22  | 82          | 48 grammes |
| Capacity . . . . . | 20  | 30  | 45  | 85          | 125 %      |
| Nos. . . . .       | 4   | 3   | 2   | 1           |            |
| Weight . . . . .   | 65  | 90  | 125 | 150 grammes |            |
| Capacity . . . . . | 200 | 270 | 370 | 400 %       |            |
- Prices on application.
- 2525 **Boats, platinum.** All sizes, shapes and weights, ranging from 3 % to 10 %, and from 4 grammes to 8 grammes.  
 Prices on application.
- 2530 **Spoons, deflagration,** of platinum, for blowpipe analysis, with or without covers. Sold by the piece.  
 Bowl,  $\frac{1}{2}$  inch diameter,  $\frac{5}{16}$  inch deep.  
 "  $\frac{5}{8}$  " "  $\frac{5}{16}$  "  
 Prices upon application.
- 2532 — For qualitative analysis. This spoon will be found especially handy in fusion work.  
 Prices upon application.
- 2535 **Spatulas, platinum,** all shapes, weights and sizes—to sketch. Shapes and weight, ranging from 3 grammes to 15 and heavier, according to size, shape and thickness. Prices upon application.
- 2536 **Sponge, platinum.**  
 Each . . . . . \$ .35
- 2540 **Platinum Cylinder and Spiral,** for quantitative determination of copper by electrolysis. Standard forms, weights ranging from 10 to 30 grammes; other sizes, shapes or weights to order. Prices upon application.



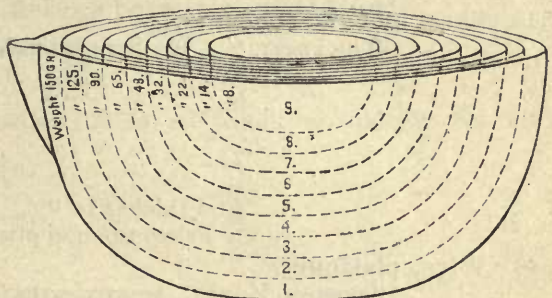
2513



2514



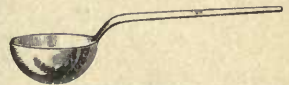
2515



2520



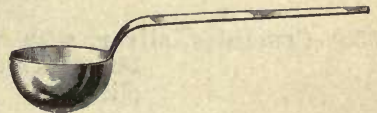
2525



2530—Fig. 1  
Full Size.

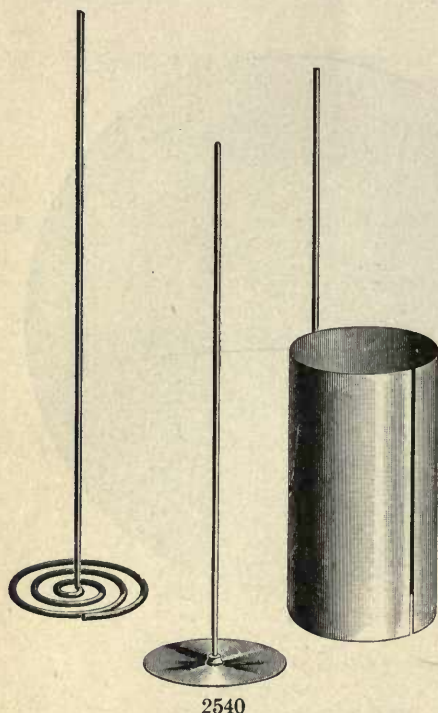


2530—Fig. 3  
Full Size.



2530—Fig. 2  
Full Size.

# PLATINUM WARE, SILVER CRUCIBLES AND DISHES.



2535



2532—Full Size.



2536

No. 2545 **Sheet or Foil, platinum.**

Thickness, $\frac{3}{1000}$ in.,	approximate weight per square in. . .	10 grains
“ $\frac{4}{1000}$ “	“ “ “ “	17 “
“ $\frac{5}{1000}$ “	“ “ “ “	22 “
“ $\frac{10}{1000}$ “	“ “ “ “	30 “
“ $\frac{15}{1000}$ “	“ “ “ “	50 “
“ $\frac{15}{1000}$ “	“ “ “ “	82 “

And thicker to  $\frac{125}{1000}$  in.  
Prices upon application.

No. 2546 **Wire, platinum.**

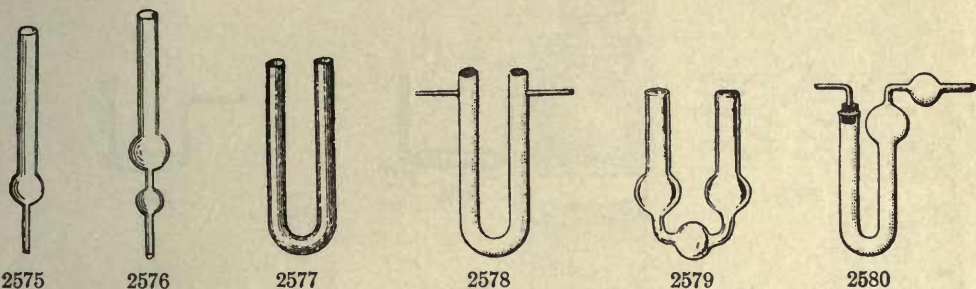
Diameter, $\frac{8}{1000}$ in.,	approximate weight, per foot. . . . .	3 grains
“ $\frac{11}{1000}$ “	“ “ “ “ . . . . .	7 “
“ $\frac{15}{1000}$ “	“ “ “ “ . . . . .	12 “
“ $\frac{20}{1000}$ “	“ “ “ “ . . . . .	19 “
“ $\frac{25}{1000}$ “	“ “ “ “ . . . . .	32 “
“ $\frac{30}{1000}$ “	“ “ “ “ . . . . .	47 “
“ $\frac{35}{1000}$ “	“ “ “ “ . . . . .	61 “
“ $\frac{40}{1000}$ “	“ “ “ “ . . . . .	72 “
“ $\frac{45}{1000}$ “	“ “ “ “ . . . . .	96 “
“ $\frac{50}{1000}$ “	“ “ “ “ . . . . .	110 “
“ $\frac{55}{1000}$ “	“ “ “ “ . . . . .	145 “
“ $\frac{60}{1000}$ “	“ “ “ “ . . . . .	180 “
“ $\frac{65}{1000}$ “	“ “ “ “ . . . . .	220 “

Larger sizes up to  $\frac{1}{8}$  inch or  $\frac{125}{1000}$ .  
Prices upon application.

No. 2550 **Crucibles, silver, with covers, same shapes as platinum crucibles.**  
For sizes see illustrations page 142. Prices upon application.

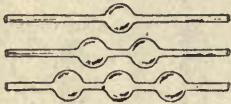
No. 2551 **Dishes, silver, same shapes as platinum dishes.** For sizes see illustrations page 145. Prices upon application.

# CRUCIBLES, CALCIUM CHLORIDE TUBES, COMBUSTION BOATS.



No.					
2560	<b>Dishes, Evaporating, of pure wrought nickel, with lip.</b>				
	Diameter .....	2	2½	3	3¾ in.
	Capacity .....	35	70	125	225 %
	Each .....	\$ .60	.70	1.00	1.40
2562	<b>Crucibles, of pure wrought nickel.</b>				
	Diameter .....	1¾	1½		2 in.
	Capacity .....	20	30		75 %
	Each .....	\$ .75	.90		1.15
2565	<b>Tubes, Combustion, Royal Meissen porcelain, glazed inside.</b>				
	Diameter .....	½	¾	1	1¼
	Length .....	24	24	24	24
	Each .....	\$1.10	1.50	1.75	2.00
					2.50
	For glass combustion tubing, see page 106, catalogue No. 2101.				
2568	<b>Boats, combustion, porcelain.</b>				
	Length .....	2¾	2¾	3¾	5½ in.
	Width .....	7/16	9/16	¾	1¼
	Each .....	\$ .25	.25	.30	.35
2575	<b>Tubes, calcium chloride. With one bulb.</b>				
	Length .....				8 in.
	Each .....				\$ .20
2576	<b>— Same. With two bulbs.</b>				
	Length .....				10 in.
	Each .....				\$ .25
2577	<b>— Same. U shaped, plain.</b>				
	Length .....	4	6	8	10
	Each .....	\$ .15	.25	.30	.40
					.50
2578	<b>— Same. U shaped, with side tubes.</b>				
	Length .....				6 in.
	Each .....				\$ .40
2579	<b>— Same. Woehler's. With three bulbs.</b>				
	Length .....				6 in.
	Each .....				\$ .45
2580	<b>— Same. Marchand's.</b>				
	Length .....				5 in.
	Each .....				\$ .50

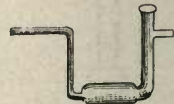
# TUBES, CYLINDERS, PRISMS.



2582



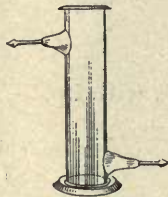
2585



2587



2590



2592



2600

No.						
2582	<b>Tubes, calcium chloride.</b>					
	With.....	1	2	3 bulbs		
	Each.....	\$ .20	.25	.35		
2585	— Same. Liebig's form, one arm, double bend, 3½ in. bulb.					
	Each .....			\$ .40		
2586	— Same. Double bend, 5 in. bulb.					
	Each .....			.50		
2587	— Same. Mitscherlich's form, one arm, double bend; one arm tubulated, 2 in. bulb.					
	Each .....			.50		
2590	— Same, upright, jar form, side opening near the bottom.					
	Height.....	8	12	16 in.		
	Each.....	\$ .60	.80	1.25		
2592	— <b>Elliot's.</b>					
	Height.....			8 in.		
	Each .....			\$ .60		
2600	<b>Prisms, finely polished, angle 60 degrees.</b>					
	Length.....	3	4	5	6	8 in.
	Each .....	\$ .30	.40	.50	.60	.80



## BOTTLES.



2605



2606



2610



2612

No. 2605 **Bottles, Wide mouth, ground glass stoppers.**

Capacity...	½	1	2	3	4	6	8 oz.
Dozen.....	\$ .75	1.00	1.50	1.75	2.00	2.25	2.50

2606 — **Narrow mouth, with ground glass stoppers.**

Capacity...	½	1	2	3	4	6	8	12	16 oz.
Dozen.....	\$ .75	.75	1.00	1.15	1.25	1.50	1.75	2.25	2.50

2610 — **Tincture, mushroom stoppered.**

1 ounce, height	3¼ inches, per dozen	\$ 2.00
2 " "	3⅞ " "	2.00
4 " "	5½ " "	2.50
8 " "	7⅞ " "	3.00
16 " "	8½ " "	3.25
1 quart, "	10⅞ " "	4.00
½ gallon, "	13¼ " "	7.50
1 " "	15 " "	12.00
2 " "	19 " "	30.00

2612 — **Salt Mouth, mushroom stoppered.**

1 ounce, height	3⅞ inches, per dozen	\$ 2.50
2 " "	3⅞ " "	2.50
4 " "	5⅞ " "	2.75
8 " "	6⅞ " "	3.25
16 " "	8¼ " "	3.50
1 quart, "	9¾ " "	4.50
½ gallon, "	12⅞ " "	8.50
1 " "	14½ " "	15.00
2 " "	17½ " "	36.00



2615-20

No.

2615 **Bottles, Reagent**, with chemical names and equivalents in raised letters ground on the surface; made from glass containing no lead, zinc or other metallic flux. All letters ground to make them perfectly visible. Any names not on the list can be engraved on the bottles at small extra charge. Please order by numbers.

In sets of 4, labeled Hydrochloric, Sulphuric, Nitric Acid and Ammonium Hydrate.

Capacity . . .	4	8	16 oz.
Per set . . . .	\$1.35	1.65	2.00

2620 — **Reagent**, capacity,  $\frac{1}{4}$  pint=4 ounces =125 %; height  $5\frac{1}{4}$  inches.

No.

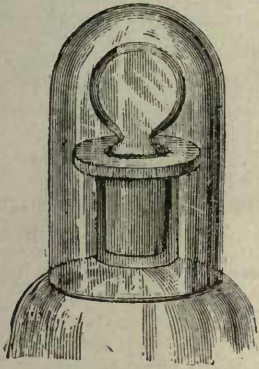
1	Hydrogen Sulphide (amber), $H_2S$
2	Hydrochloric Acid . . . . . $HCl$
3	Acetic Acid . . . . . $HC_2H_3O_2$
4	Sulphuric Acid . . . . . $H_2SO_4$
5	Nitric Acid . . . . . $HNO_3$
6	Potassium Ferrocyanide . . . . . $K_4Fe(CN)_6$
7	Potassium Sulphocyanide . . . . . $KSCN$
8	Potassium Carbonate . . . . . $K_2CO_3$
9	Potassium Sulphate . . . . . $K_2SO_4$
10	Potassium Iodide . . . . . $KI$
11	Potassium Ferricyanide . . . . . $K_3Fe(CN)_6$
12	Potassium Hydroxide . . . . . $KOH$
13	Potassium Dichromate . . . . . $K_2Cr_2O_7$
14	Sodium Phosphate . . . . . $Na_2HPO_4$
15	Ammonium Hydroxide . . . . . $NH_4OH$
16	Ammonium Sulphide (amber) . . . . . $(NH_4)_2S$
17	Ammonium Chloride . . . . . $NH_4Cl$
18	Ammonium Carbonate . . . . . $(NH_4)_2CO_3$
19	Ammonium Oxalate . . . . . $(NH_4)_2C_2O_4$

No.

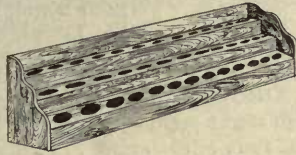
20	Barium Chloride . . . . . $BaCl_2$
21	Calcium Chloride . . . . . $CaCl_2$
22	Calcium Sulphate . . . . . $CaSO_4$
23	Calcium Hydroxide . . . . . $Ca(OH)_2$
24	Magnesium Sulphate . . . . . $MgSO_4$
25	Mercuric Chloride . . . . . $HgCl_2$
26	Silver Nitrate (amber) . . . . . $AgNO_3$
27	Lead Acetate . . . . . $Pb(C_2H_3O_2)_2$
28	Ferrous Sulphate . . . . . $FeSO_4$
29	Ferric Chloride . . . . . $Fe_2Cl_6$
30	Alcohol . . . . . $C_2H_5OH$
31	Ammonium Sulphocyanide . . . . . $NH_4CNS$
32	Barium Hydroxide . . . . . $Ba(OH)_2$
33	Barium Carbonate . . . . . $BaCO_3$
35	Ether . . . . . $(C_2H_5)_2O$
36	Cupric Sulphate . . . . . $CuSO_4$
38, 39, 40	Blank.
59	Sodium Carbonate . . . . . $Na_2CO_3$
61	Sodium Hydroxide . . . . . $NaOH$

Set of above, 40 bottles, packed in shipping order, per set. \$ 7.50

2622 — 1 set of above, 40 bottles, filled with chemically pure reagents, according to Fresenius, per set. . . . . 15.00



2645



2650



2640-1



2655

No.  
2625 Bottles, Same style as No. 2620.

<p>No. 37 Platinc Chloride.....PtCl<sub>4</sub> 58 Fehling's Solution. 59 Sodium Carbo late.....Na<sub>2</sub>CO<sub>3</sub> 60 Sodium Acetate .....NaC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> 61 Sodium Hydroxide.....NaOH 77 Ammonia .....NH<sub>3</sub> 81 Stannous Chloride.....SnCl<sub>2</sub> 82 Ammonium Molybdate ... (NH<sub>4</sub>)<sub>2</sub>MoO<sub>4</sub> 83 Carbon Disulphide ..... CS<sub>2</sub> 86 Mercurous Nitrate.....Hg<sub>2</sub>(NO<sub>2</sub>)<sub>2</sub> 87 Indigo Solution. 88 Nessler's Solution. 90 Magnesia Mixture. 93 Oxalic Acid ..... H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> 94 Picric Acid.....C<sub>6</sub>H<sub>2</sub>OH(NO<sub>2</sub>)<sub>3</sub> 96 Potassium Chromate.....K<sub>2</sub>CrO<sub>4</sub></p>	<p>No. 97 Ammonium Sulphydrate ....NH<sub>4</sub>HS 100 Mercuric Potassium Iodide. 401 Barium Nitrate .....Ba(NO<sub>3</sub>)<sub>2</sub> 404 Silver Sulphate .....Ag<sub>2</sub>SO<sub>4</sub> 406 Bromide Water. 407 Chloroform.....CHCl<sub>3</sub> 408 Cochineal. 409 Coralline. 410 Litmus. 411 Methyl-Orange. 412 Phenolphthalein. 413 Turmeric. 414 Iodine Solution .....I+KI 415 Methyl Alcohol.....CH<sub>3</sub>OH 416 Sodium Cobaltic Nitrite. 417 Sodium Hyposulphite.....Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub></p>
Per dozen .....	2 50

NOTE—The above bottles, Catalogue No. 2625, numbers 37 to 417, are not kept in stock; will be furnished to order.

2630 Bottles Reagent. Capacity, 1/2 pint=8 oz.=250 %; height, 6 1/2 in.

<p>No. 101 Sulphuric Acid, Con .....H<sub>2</sub>SO<sub>4</sub> 102 Sulphuric Acid, dil .....H<sub>2</sub>SO<sub>4</sub> 103 Nitric Acid, Con .....HNO<sub>3</sub> 104 Nitric Acid Dil.....HNO<sub>3</sub> 105 Hydrochloric Acid, Con.....HCl 106 Hydrochloric Acid, Dil .....HCl 107 Hydrogen Sulphide (amber), H<sub>2</sub>S 108 Ammonium Hydroxide.....NH<sub>4</sub>OH 109 Ammonium Chloride.....NH<sub>4</sub>Cl 110 Ammonium Carbonate .....(NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> 111 Sodium Hydroxide .....NaOH 112 Sodium Carbonate.....Na<sub>2</sub>CO</p>	<p>No. 114 Barium Chloride.....BaCl<sub>2</sub> 116 Blank. 122 Ammonium Sulphide (amber)(NH<sub>4</sub>)<sub>2</sub>S 126 Alcohol .....C<sub>2</sub>H<sub>5</sub>OH 129 Sodium Phosphate.....Na<sub>2</sub>HPO<sub>4</sub> 130 Ammonium Oxalate.....(NH<sub>4</sub>)<sub>2</sub>C<sub>2</sub>O<sub>4</sub> 131 Acetic Acid.....HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> 145 Silver Nitrate (amber) .....AgNO<sub>3</sub> 150 Potassium Hydroxide.....KOH 151 Calcium Hydroxide .....Ca(OH)<sub>2</sub> 152 Lead Acetate.....Pb(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub></p>
Per dozen .....	\$ 4.00

2631 One set of above (23 bottles), filled with chemically pure reagents, according to Fresenius..... \$10.00

2635 Bottles Reagent. Capacity, 1 pint=500 %; height, 7 3/4 in.

<p>No. 204 Ammonium Hydroxide.....NH<sub>4</sub>OH 211 Blank. 215 Sulphuric Acid .....H<sub>2</sub>SO<sub>4</sub></p>	<p>No. 216 Nitric Acid .....HNO<sub>3</sub> 217 Hydrochloric Acid.....HCl</p>
Per dozen .....	\$ 6.00

2640 Bottles Reagent. Wide mouth. Capacity, 1 oz.=30 %; height, 3 1/8 in.

<p>No. 350 Sodium Carbonate.....Na<sub>2</sub>CO<sub>3</sub> 351 Borax .....Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> 353 Sodium Acetate.....NaC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> 354 Potassium Nitrate .....KNO<sub>3</sub> 353 Potassium Cyanide.....KCN 361 Am. Sod. Phosphate.... NaNH<sub>4</sub>HPO<sub>4</sub> 364 Copper.....Cu 365 Ferrous Sulphate .....FeSO<sub>4</sub> 366 Ferrous Sulphide .....FeS</p>	<p>No. 367 Potassium Chlorate .....KClO<sub>3</sub> 368 Potassium Ferricyanide.....K<sub>3</sub>Fe(CN)<sub>6</sub> 369 Sodium Bitartrate.....NaHC<sub>4</sub>H<sub>4</sub>O<sub>6</sub> 370 Sodium Nitrate .....NaNO<sub>3</sub> 371 Starch. 372 Test Paper. 373 Zinc. 374 Ammonium Phosphate.....(NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> 375 Blank.</p>
Per dozen .....	\$ 2.70

No. 2641 **Bottles Reagent.** Wide mouth. Capacity, 4 oz.=125 %; height, 4 7/8 in.

No.	
301	Sodium Carbonate ..... Na <sub>2</sub> CO <sub>3</sub>
302	Potassium Nitrate.....KNO <sub>3</sub>
303	Potassium Cyanide.....KCN
304	Borax.....Na <sub>2</sub> B O <sub>7</sub>

No.	
305	Ferrous Sulphate ..... FeSO <sub>4</sub>
307	Blank.
312	Test Paper.

Per dozen ..... \$ 4.00

NOTE—The above bottles catalogue No. 2640-1. Numbers 350 to 375 and 301 to 312 are not kept in stock; will be furnished to order.

2645 **Bottle Caps, Reagent.** Loose glass caps for covering the necks and lips of reagent bottles to protect stoppers and mouths of bottles from dust. Can be furnished as follows:

Size {	..... 1/4	..... 1/2	..... 1 pint
	1 1/2 x 2 1/4	2 1/4 x 3 1/2	2 3/8 x 4 1/4 in.
Per dozen	\$1.00	1.00	1.00

2650 **Racks.** Of polished wood for reagent bottles, with recess for each bottle; to hold a set of 40 1/4-pint bottles.  
Each ..... \$ 7.50

2655 **Bottles Reagent.** Capacity, 1/4 pint=4 ounce=125 %. With acid-proof labels, symbols blown in the bottles and also in the stoppers. The main features of these reagent bottles are the hood stopper, the shape of the lip and the raised acid-proof label.

The object of the hood stopper is to prevent an accumulation of dust and the salts deposited from the atmosphere of chemical laboratories upon the lip of the bottle.

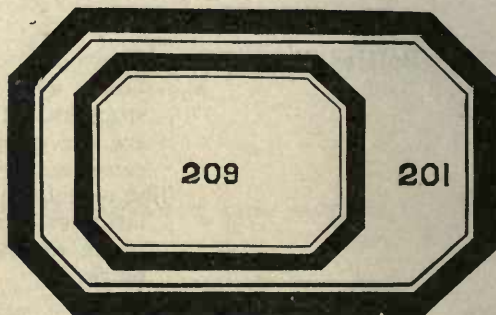
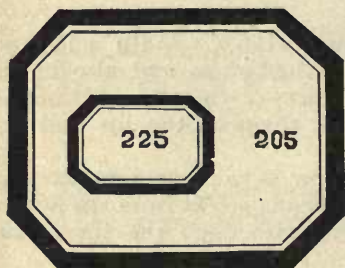
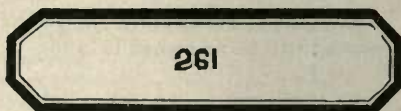
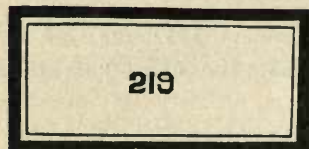
No.	
10	Hydrogen Sulphide (amber).H <sub>2</sub> S
20	Hydrochloric Acid.....HCl
30	Acetic Acid.....HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub>
40	Sulphuric Acid.....H <sub>2</sub> SO <sub>4</sub>
50	Nitric Acid.....HNO <sub>3</sub>
60	Potassium Ferrocyanide....K <sub>4</sub> Fe(CN) <sub>6</sub>
70	Potassium Sulphocyanide...KCNS
80	Potassium Carbonate.....K <sub>2</sub> CO <sub>3</sub>
90	Potassium Sulphate.....K <sub>2</sub> SO <sub>4</sub>
100	Potassium Iodide.....KI
110	Potassium Ferricyanide....K <sub>3</sub> Fe(CN) <sub>6</sub>
120	Potassium Hydrate.....KOH
130	Potassium Dichromate.....K <sub>2</sub> Cr <sub>2</sub> C <sub>7</sub>
140	Sodium Phosphate.....Na <sub>2</sub> HPO <sub>4</sub>
150	Ammonium Hydroxide.....NH <sub>4</sub> OH
160	Ammonium Sulphide(amber)(NH <sub>4</sub> ) <sub>2</sub> S
170	Ammonium Chloride.....NH <sub>4</sub> Cl
180	Ammonium Carbonate.....(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>
190	Ammonium Oxalate.....(NH <sub>4</sub> ) <sub>2</sub> C <sub>2</sub> O <sub>4</sub>

No.	
200	Barium Chloride.....BaCl <sub>2</sub>
210	Calcium Chloride.....CaCl <sub>2</sub>
220	Calcium Sulphate.....CaSO <sub>4</sub>
230	Calcium Hydrate.....Ca(OH) <sub>2</sub>
240	Magnesium Sulphate.....MgSO <sub>4</sub>
250	Mercuric Chloride.....HgCl <sub>2</sub>
260	Silver Nitrate (amber).....AgNO <sub>3</sub>
270	Lead Acetate.....Pb(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>2</sub>
280	Ferrous Sulphate.....FeSO <sub>4</sub>
290	Ferric Chloride.....Fe <sub>2</sub> Cl <sub>6</sub>
300	Alcohol.....C <sub>2</sub> H <sub>5</sub> OH
310	Ammonium Sulphocyanide..NH <sub>4</sub> CNS
320	Barium Hydroxide.....Ba(OH) <sub>2</sub>
330	Barium Carbonate.....BaCO <sub>3</sub>
350	Ether.....(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> O
360	Cupric Sulphate.....CuSO <sub>4</sub>
380,	390, 400.....Blank
590	Sodium Carbonate.....Na <sub>2</sub> CO <sub>3</sub>
610	Sodium Hydroxide.....NaOH

NOTE.—The above bottles are not kept in stock. Will be furnished to order.

Per set..... \$18.50

## BLANK LABELS, CHEMICAL LABELS.



- No.  
 2660 **Labels, Blank.** Heavy, gummed on back, for marking ore samples, bottles, etc., 100 labels in a box.
- |  |        |
|--|--------|
| Nos. 201, 2004, per box, each.....                 | \$ .25 |
| “ 205, 209, 219, 261, 259, 225, per box, each..... | .15    |
- 2665 **Labels, Chemical.** In books. Compiled by Prof. Chandler, including all the most important chemicals and reagents; good paper, gummed on back and perforated; any one can be removed without destroying the book; with name and latest formula, tables of atomic weights, etc.
- |               |        |
|---------------|--------|
| Per book..... | \$ .65 |
|---------------|--------|

# ASSAY CERTIFICATES, HUMID ASSAY OUTFITS.

No. 2666 **Blanks for Assay Certificates.** 8½x5½ inches.

ASSAY OFFICE OF.....

No..... 18

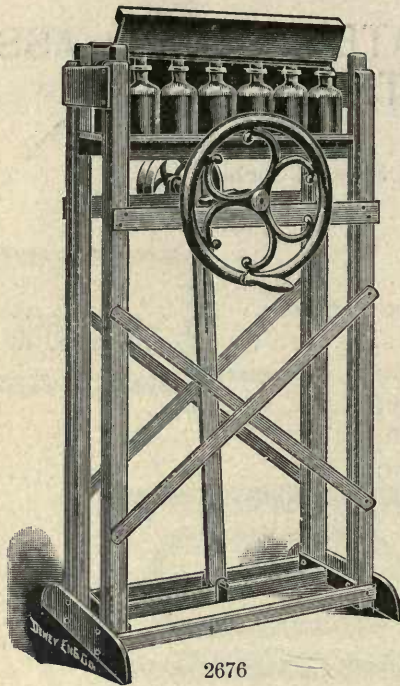
CERTIFICATE OF ASSAY.	I HEREBY CERTIFY, That the ore marked.....		
	assayed for .....		yielded at the rate of .....
	.....ozs. Gold per ton;	}	Remarks .....
	.....ozs. Silver per ton;		
	.....per cent. Lead;		
	.....per cent. Copper;		
	Value Gold at.....per oz.....		
	“ Silver at.....per oz.....		
	“ Lead at.....per cent.....		
	“ Copper at.....per cent.....		
.....			
.....			

Assayer.

Per 100..... \$ .50  
 With name, per 1000..... 3.50

The above form is on a reduced scale, the regular size of the Assay Certificate being 8½x5½ inches.

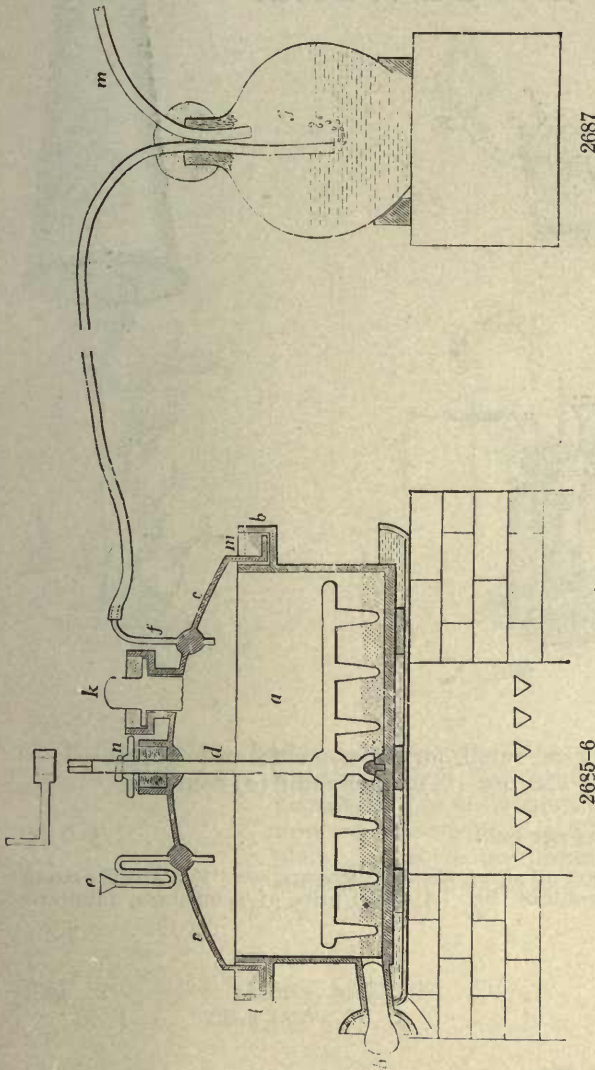
- 2670 **Humid Assay. Copper Tank.** According to Gay Lussac. Complete for normal solution—capacity 70 litres. Provided with silver-lined cock and glass vent tube, arranged to prevent evaporation. The tank is lined inside with tin.  
 Each ..... \$20.00
- 2671 — **Graduated Cylinder.** Capacity, 1000 %.  
 Each ..... 2.75
- 2672 — **Bulb Pipette.** 100 cubic centimeter graduations. Cemented to brass silver-lined cock, with air vent; all mounted upon iron bracket.  
 Each ..... 12 00
- 2673 — **Black Rubber Tubing.** 6 feet—to connect tank with pipette—with brass compressor.  
 Price ..... 1.15
- 2674 — **Twelve Humid Assay Shaking Bottles,** with pure rubber stoppers; each bottle is numbered.  
 Per Doz..... 6.00
- 2675 — **Carrying Tray.** For 12 bottles; of japanned tin, recess for each bottle; numbered to match the bottles.  
 Each, without bottles..... 9.00



No.			
2676	—	<b>Humid Assay. Shaking Table.</b> For 12 bottles; arranged to be driven by hand or power. Six of the bottles can be moved without disturbing the other six. All movable parts complete, and balanced for high speed. Bottom and top of each bottle cushioned.	
		Price, without bottles.....	\$50.00
2677	—	<b>Three Glass-stoppered Bottles.</b> For decimal solution; capacity, 32 oz.	
		Price .....	1.00
2678	—	<b>Six Graduated Pipettes.</b> 5 % into 1/2.	
		Price .....	2.40
2679	—	<b>One Sand Glass.</b> 5 minutes.	
		Price .....	.75
		We also furnish the following different styles of tanks and pipettes:	
2680	—	<b>Glass Tank.</b> Secured in box, with glass syphon and air vent tube; 60 litres.	
		Price .....	15.00
2681	—	<b>Glass Bulb Pipette.</b> 100% to fill from the bottom with spray arrester and draining saucer, mounted upon wooden bracket. This pipette is recommended for rapid work.	
		Price .....	7.00
2682	—	<b>Shaking Table.</b> For 6 bottles to run by hand or power.	
		Price.....	50.00



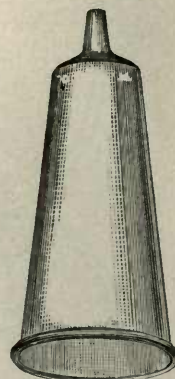
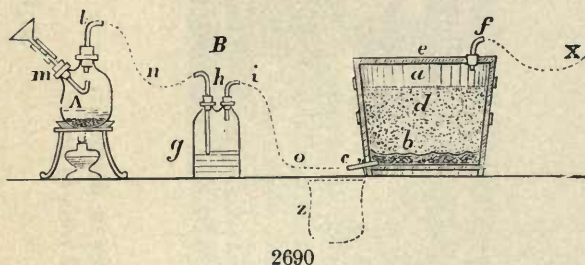
# CHLORINE GENERATORS.



No.	2687	Washing, Apparatus, for chlorine generator. Glass, about 12 gallons, with rubber stopper, bent glass tubes, and 5 feet of rubber tubing to connect with generator.	Price .....	\$ 7 50
No.	2688	Sand Bath, for above, sheet iron, water tight, for 22-inch generator.	Price .....	2.50
No.	2689	— Same, for 25-inch generator.	Price .....	3.00

No.	2685	Generator, Chlorine, of Lead, 25 inches in diameter, 10 inches deep, weighs about 280 lbs., with stirrer (d), suitable for charge of chemicals for 3 tons of pulverized ore, without sand bath at bottom.	Price .....	\$65.00
No.	2686	— Same as above, but smaller size; 22 inches in diameter, 9 inches deep, suitable for charge for 2 tons of ore.	Price .....	50.00

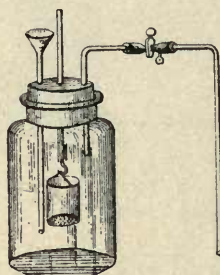
# GENERATORS, PERCOLATORS.



2691



2696



2697



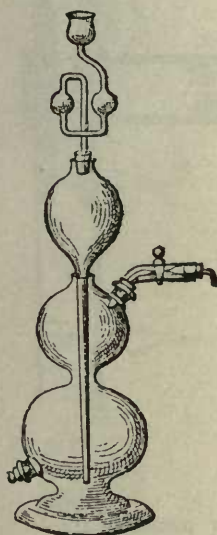
2699

No. 2690 **Generator, Chlorine.** Test size, small, for experimental test of 20 or 30 pounds of the ore. The generator (a) contains 1 quart.  
 Price, complete as per cut..... \$ 6.00

NOTE.—For full description of manner of using above generators, see “Kustell’s Roasting of Gold and Silver Ores,” among our text-book list. Also see price of manganese, sulphuric acid, etc., in our list of chemicals.

2691 <b>Percolators.</b>		Capacity .....	$\frac{1}{2}$	1	2 gal.
	Each .....		\$ .75	1.00	1.50
2696 <b>Generator, Berzelius.</b> For gas.		Capacity .....	$\frac{1}{4}$		$\frac{1}{2}$ gal.
	Each .....		\$6.00		7.50
2697	— <b>Fresenius’,</b> for generating oxygen and sulphuret of hydrogen.	Capacity, 32-ounce .....			\$ 2.50
2698	— <b>Kipp’s Sulphuretted-Hydrogen.</b> Most improved form for a constant supply of $H_2S$ ; generator provided with Geissler’s stop-cocks, safety tubes, etc., complete.	Capacity .....	$\frac{1}{2}$ pt.	1 pt.	1 qt.
	Each .....		\$3.50	4.00	5.00
2699	— <b>Kipp-Wartha.</b>	Capacity, 8-ounce .....			\$ 5.00

## GENERATORS.



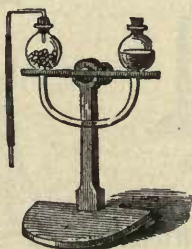
2698



2701



2705



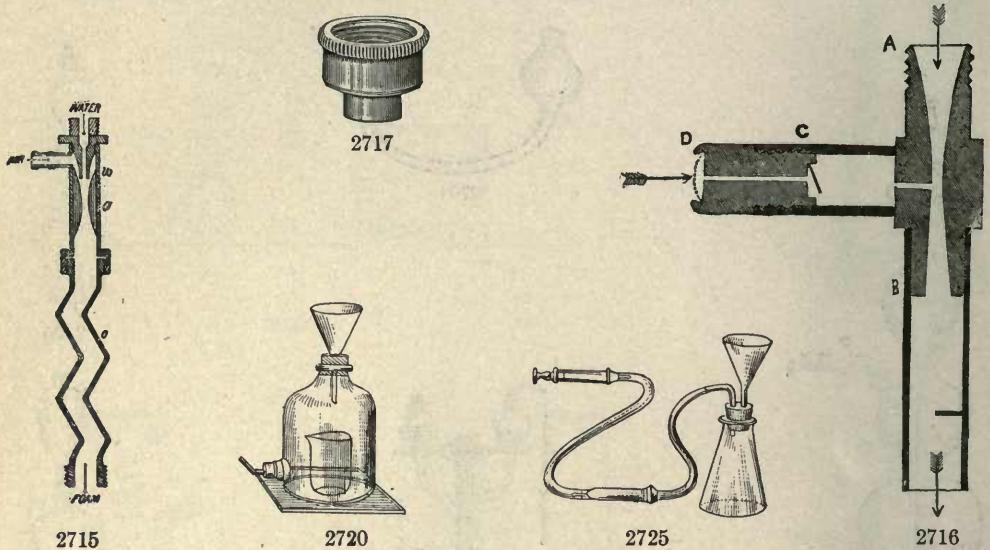
2700



2706

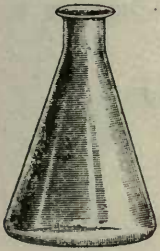
No.				
2700	—	<b>Generator, Babos.</b> Very convenient where frequent and limited quantities of $H_2S$ is required. Made to generate by depressing the bulb containing the sulphuret of iron; upward movement of same stops generation. Complete, mounted on improved stand, with rubber stoppers, pinch-cocks and delivery tube.		
		Price, complete.....		\$ 2.75
2701	—	<b>Glass, part only.</b>		
		Each .....		1.25
2705	—	<b>Displacement, Hahn's,</b> with glass stopper and faucet, 125 %.		
		Each .....		2.50
2706	—	<b>Displacement, Robiquet's.</b>		
		Capacity, lower vessel .....	16	32 oz.
		Each .....	\$1.50	2.00
2707	—	With tube to connect upper and lower vessel, to stop evaporation.		
		Capacity .....	16	32 oz.
		Each .....	\$2.00	2.50

# FILTER PUMPS, RAPID FILTER APPARATUS.



No. 2715	<b>Pump,</b>	<b>Filtering Richard's</b> , for exhausting by water pressure to facilitate filtering.			
		Size.....	Small, $\frac{1}{8}$ inch bore.	Large, $\frac{1}{4}$ inch bore.	
		Each.....	\$1.50	2.00	
2716	—	Same, <b>Chapman's</b> .			
		Size.....	Small.	Medium.	Large.
		Each.....	\$1.50	3.00	5.00
2717	<b>Couplings,</b>	<b>Chapman's</b> .			
		Size.....	Small.	Medium.	Large.
		Each.....	\$.50	.60	.70
2720	<b>Rapid Filtering Apparatus,</b>	<b>Bunsen's</b> , with a 1 gallon bell jar on ground glass plate, beaker, 8 ounce glass funnel, rubber stoppers, and platinum cone to support filter paper.			
		Price, complete.....	\$ 6.00		
2725	—	Same, a heavy cone-shaped bottle, funnel, rubber stopper, exhaust pump, and simple valves.			
		Capacity.....	4	8	16 oz.
		Each.....	\$2.00	2.50	3.00
2726	—	Same, with perforated platinum expanding cone for funnel.			
		Capacity.....	4	8	16 oz.
		Each.....	\$2.65	3.25	4 00

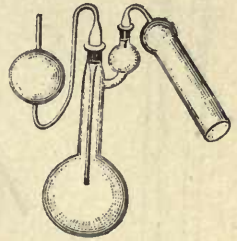
# FILTERING BOTTLES, ALKALIMETERS.



2730



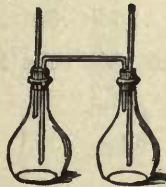
2731



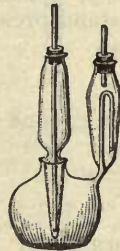
2735



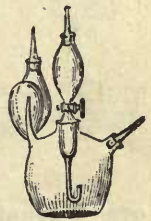
2736



2737



2738



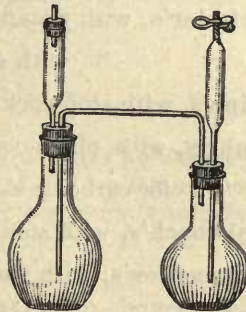
2739



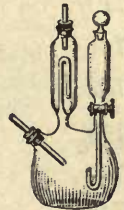
2740



2741



2742



2743



2744



2745

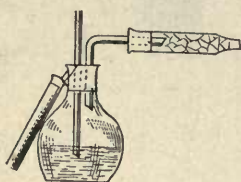


2750

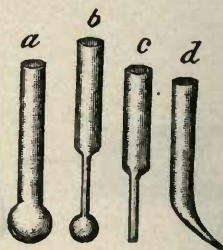


2752

## FILTERING BOTTLES, ALKALIMETERS, REDUCTION TUBES.



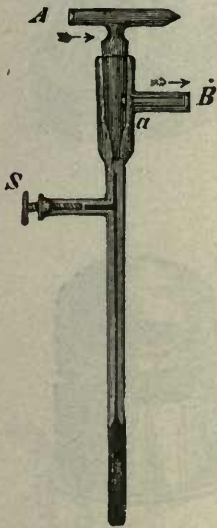
2754



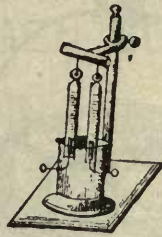
2755

No.						
2730	<b>Bottles, Filtering, Bunsen's, conical, of extra heavy glass to withstand pressure.</b>					
	Capacity .....	4	8	16	32	64 128 oz.
	Each.....	\$ .20	.25	.30	.40	.80 1.25
2731	<b>Filtering, cane shape, with side tube for use with filter pump.</b>					
	Capacity .....		4		8	16 oz.
	Each .....		\$ .30		.40	.50
2735	<b>Alkalimeter, Bunsen's</b> .....					\$ 1.50
2736	— <b>Fresenius'</b> .....					.75
2737	— <b>Fresenius' &amp; Will's</b> .....					.50
2738	— <b>Geissler's, with ground joints</b> .....					1.50
2739	— “ “ with stop-cock .....					2.00
2740	— <b>Kipp's, with stop-cock</b> .....					1.75
2741	— <b>Mohr's, with pinch-cock</b> .....					.75
2742	— “ for carbonic acid determinations .....					1.00
2743	— <b>Rohrbeck's, with stop-cock</b> .....					1.75
2744	— <b>Schroedter's, with stop-cock</b> .....					2.00
2745	— <b>Peffer's,</b> .....					2.50
NOTE.—For full description of 2745 see Peffer's "Beet Sugar Analysis," see paragraph 54.						
2750	— <b>Marsh's, for detecting arsenic. Two bulbs, tubes 5/8 inch opening</b> .....					\$ .50
2751	— Same, with glass faucet and jet .....					1.25
2752	— Same, with brass faucet and jet, all mounted on wooden support.....					2.75
2753	— <b>Condensing Plate, porcelain, for above</b> .....					.30
2754	— <b>To Make Assays of Oxide of Manganese. Capacity of flask 3 ounces.</b>					
	Price.....					1.25
2755	<b>Tubes, reduction, for arsenic test.</b>					
	Form a, b, c, d, Doz. ....					.75

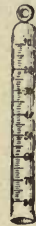
# GAS REGULATORS, EUDIOMETERS.



2760-1



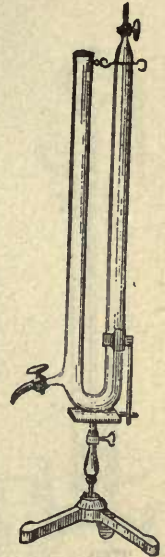
2765



2766



2767

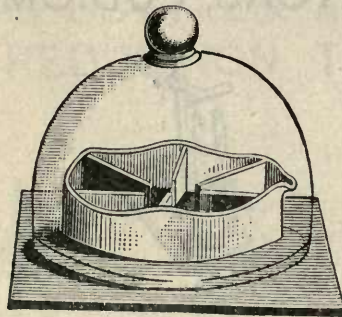


2770

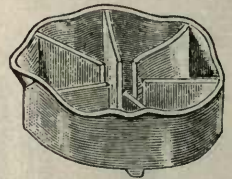
- No. 2760 **Tubes, Gas Regulator.** Temperature Regulator, or Thermostat, according to Reichert, almost entirely of glass. Will regulate to  $\frac{1}{2}$  of 1 degree. Being about the size and shape of a thermometer, it fits  $\frac{1}{2}$ -inch hole.  
 Price..... \$ 3.00
- 2761 — For low temperatures ..... 3.50
- 2765 **Eudiometer.** For decomposition of water by electricity. Separate tubes, graduated for collecting each gas and measuring same; platinum terminals at side of jar.  
 Price, mounted ..... 3.25
- 2766 — **Tubes, Glass, Extra, for above, graduated.**
- |                     |               |                |                |
|---------------------|---------------|----------------|----------------|
| Capacity.....       | 10            | 15             | 25 %           |
| Graduated into..... | $\frac{1}{5}$ | $\frac{1}{10}$ | $\frac{1}{10}$ |
| Each.....           | \$ .50        | .65            | .80            |
- 2767 — **Bunsen's form, with two platinum electrodes.**
- |                     |               |               |      |       |
|---------------------|---------------|---------------|------|-------|
| Capacity.....       | 50            | 100           | 250  | 500 % |
| Graduated into..... | $\frac{1}{5}$ | $\frac{1}{2}$ | 1    | 1     |
| Each.....           | \$2.00        | 2.50          | 3.00 | 3.50  |
- 2770 — with 2 stop-cocks and platinum electrodes at top for determining the quality of hydrogen intermingled with chlorine.  
 Unmounted..... \$ 3.50
- 2775 — Mounted ..... 5.00



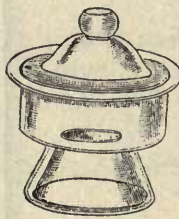
2780



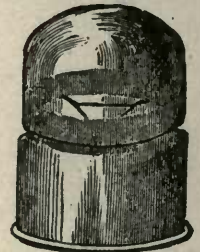
2790



2791



2795



2798

No.							
2780	<b>Eudiometer.</b>	<b>Decomposition of Water.</b>	With carbon electrodes.				
		Unmounted.....			\$ 4.00		
		Mounted.....			5.00		
2781	—	Same.	With platinum electrodes.				
		Unmounted.....			4.00		
		Mounted.....			5.00		
2790	<b>Desiccators.</b>	Consisting of a porcelain acid dish with six partitions and bell glass ground air tight to heavy glass plate.					
		Diameter of bell jar.....	6	8	10 in.		
		“ acid dish.....	4	5	6 “		
		Each, complete.....	\$3.50	3.75	4.50		
2791	<b>Desiccator Dishes,</b>	or acid dishes, of porcelain, with partitions.					
		Diameter.....	4	4½	5	5½	6 in.
		Each.....	\$1.00	1.25	1.25	1.35	1.50
2795	—	Scheibler's. With knob top, ground air tight.					
		Diameter.....	4	5½	6½ in.		
		Each.....	\$1.00	1.40	2.00		
2798	—	Fresenius'. Two jars ground together; with triangle.					
		Diameter.....	4	5 in.			
		Each.....	\$1.50	2.00			



## DIGESTING FLASKS, POTASH BULBS, NITROGEN BULBS.



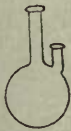
2800



2801



2802



2803



2804



2810



2811



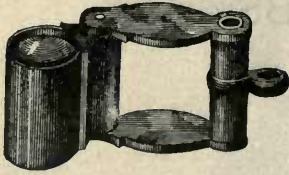
2815



2816

No.			
2800	<b>Digesting Flasks,</b> or flasks for fractional distillation. Flat bottom, confining delivery tube; 2 oz.	Each .....	\$ .30
2801	— Same. Bulb neck.	Each .....	.30
2802	— Same. 2 oz., with 2 necks.	Each .....	.30
2803	— Same. Round bottom, 2 oz., 2 necks.	Each .....	.30
2804	— Same. Round bottom, 2 oz., side neck.	Each .....	.30
2810	<b>Potash Bulbs.</b> Liebig's, with 5 bulbs.	Each .....	.60
2811	— Mitscherlich's.	Each .....	.65
2815	<b>Nitrogen Bulbs.</b> Will & Varrentrapp's, with 3 bulbs, 1½ inch.	Each .....	.40
2816	— Nollner's, 3 bottles, 2 oz. capacity, with funnel and delivery tube.	Each .....	1.25

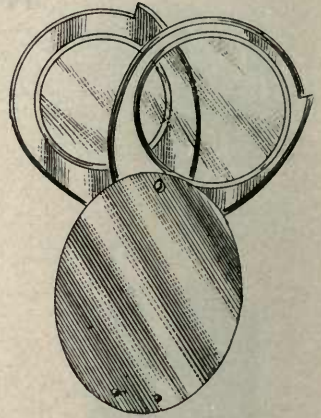
# LENSES, MAGNIFYING GLASSES.



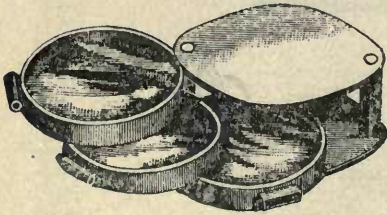
2820



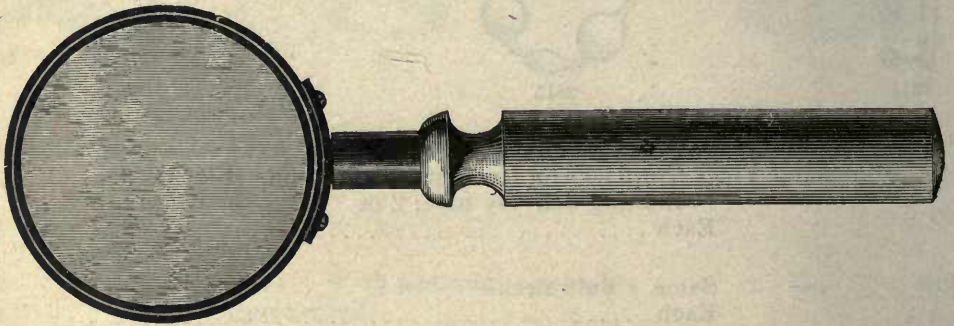
2822



2836



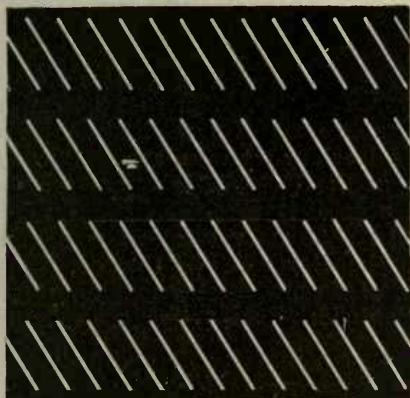
2830



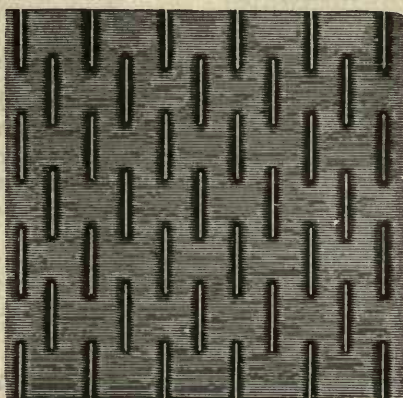
2835

No.								
2820	<b>Lenses, Coddington, very powerful, folding, nickel-plated frame.</b>							
	Diameter . . . . .	$\frac{3}{4}$	1	$1\frac{1}{4}$				$1\frac{1}{2}$ in.
	Each . . . . .	\$ 1.50	1.75	2.00				2.35
2822	— With handle.							
	Diameter . . . . .	$\frac{1}{2}$		1				$1\frac{1}{2}$ in.
	Each . . . . .	\$ 1.00		1.50				2.00
2825	<b>Glasses, Magnifying, in rubber case, folding, best quality.</b>							
	Glasses . . . . .	1	2				3	
	Diameter . . . . .	$1\frac{1}{4}$	$1\frac{1}{8}$ and $1\frac{1}{4}$				$\frac{3}{4}$ , $\frac{7}{8}$ and 1 in.	
	Each . . . . .	\$ .60	1.00				1.25	
2830	— In aluminum case, folding, best quality.							
	Glasses . . . . .	1		2			2	
	Diameter . . . . .	1		$\frac{3}{4}$			1 in.	
	Each . . . . .	\$ .75		1.00			1.25	
2835	— <b>Reading, brass rim, with handle.</b>							
	Diameter . . . . .	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5 in.
	Each . . . . .	\$ .75	1.00	1.35	1.75	2.25	2.75	3.50
2836	— <b>Hard rubber rim, with handle.</b>							
	Diameter . . . . .	$1\frac{1}{2}$	$1\frac{3}{4}$	2			$2\frac{3}{4}$ in.	
	Each . . . . .	\$ .65	.75	1.00			1.25	

## BATTERY SCREENS.



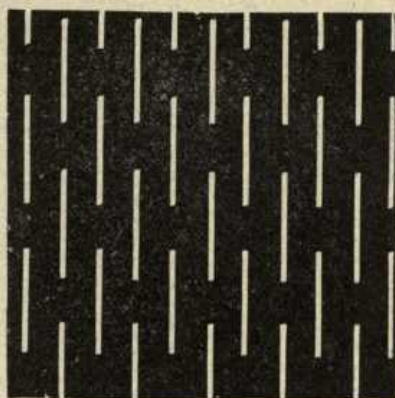
2850—Diagonal slot punched.



2851—Slot cut or burred.

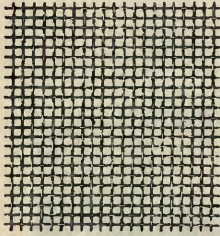


2852—Round punched.



2853—Straight slot punched.

No.	<b>Screens, Battery, Russia Iron, for wet crushing; needle slot screens.</b>											
No. of needle.....	1	2	3	4	5	6	7	8	9	10	11	12
Openings equal to number of wire screen of mesh..	12	14	16	18	20	25	30	35	40	50	55	60
Nos.....	1-8		9		10		11-12					
Price, per square foot....	\$ .60		.70		.75		.80					
Prices apply to all the above styles.												



2855

## HEAVY STEEL TEMPERED WIRE BATTERY CLOTH.

No. 2855 **Cloth, Battery, Heavy Steel Tempered Wire.** Our list is carefully selected, embracing the desirable sizes of wire cloth for mining purposes. Any other sizes of mesh or wire can be made to order; all factory lists of wire cloth in the United States are the same, the price varies in each mesh according to size of the wire. No length less than 100 lineal feet shall be understood to be a roll. The mesh in the wire cloth is the distance from the center to the center of the wire. This grade of cloth is wove and kept in stock 18 and 24 inches wide. Other widths can be made to order if desired.

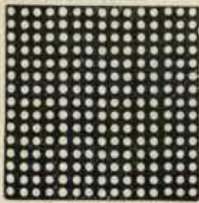
No.	2 Mesh, made from	No.	8 Wire, per square foot	\$
" 2	"	" 10	"	.38
" 2	"	" 12	"	.27
" 4	"	" 12	"	.60
" 4	"	" 14	"	.38
" 4	"	" 16	"	.27
" 5	"	" 13	"	.60
" 5	"	" 15	"	.38
" 6	"	" 14	"	.60
" 6	"	" 16	"	.38
" 6	"	" 18	"	.27
" 8	"	" 16	"	.60
" 8	"	" 18	"	.38
" 8	"	" 20	"	.27
" 10	"	" 18	"	.60
" 10	"	" 20	"	.38
" 10	"	" 22	"	.27
" 12	"	" 19	"	.60
" 12	"	" 21	"	.38
" 12	"	" 23	"	.27
" 14	"	" 20	"	.60
" 14	"	" 22	"	.38
" 14	"	" 24	"	.27
" 16	"	" 22	"	.60
" 16	"	" 24	"	.38
" 16	"	" 26	"	.27
" 16	"	" 28	"	.17
" 18	"	" 23	"	.60
" 18	"	" 24	"	.48
" 18	"	" 26	"	.32
" 20	"	" 24	"	.62
" 20	"	" 26	"	.43
" 20	"	" 27	"	.35
" 20	"	" 28	"	.27
" 24	"	" 26	"	.65
" 24	"	" 27	"	.55
" 24	"	" 29	"	.38
" 30	"	" 28	"	.66
" 30	"	" 29	"	.56
" 40	"	" 31	"	.68
" 40	"	" 32	"	.57
" 50	"	" 34	"	.80
" 50	"	" 35	"	.65
" 60	"	" 36	"	.85
" 70	"	" 38	"	.90
" 80	"	" 40	"	1.20
" 90	"	" 42	"	1.45

No. 2860 **Cloth, Brass or Copper Wire.** For battery screens. No length less than 100 lineal feet shall be understood to be a roll. The mesh, same as in steel, is the distance from the center to the center of the wire.

No.	2 Mesh, made from	No. 14 Wire, per square foot.		\$
" 2	"	" 15	"	.85
" 2	"	" 16	"	.60
" 3	"	" 15	"	.50
" 3	"	" 16	"	.85
" 3	"	" 17	"	.60
" 4	"	" 17	"	.50
" 4	"	" 18	"	.60
" 4	"	" 19	"	.45
" 5	"	" 17	"	.85
" 5	"	" 18	"	.60
" 5	"	" 19	"	.50
" 6	"	" 18	"	.85
" 6	"	" 19	"	.60
" 6	"	" 20	"	.50
" 8	"	" 20	"	.85
" 8	"	" 22	"	.50
" 10	"	" 21	"	.85
" 10	"	" 22	"	.60
" 10	"	" 23	"	.50
" 12	"	" 22	"	.85
" 12	"	" 23	"	.60
" 12	"	" 24	"	.50
" 14	"	" 23	"	.85
" 14	"	" 24	"	.60
" 14	"	" 25	"	.50
" 16	"	" 24	"	.85
" 16	"	" 25	"	.60
" 16	"	" 26	"	.50
" 18	"	" 26	"	.60
" 18	"	" 27	"	.50
" 20	"	" 27	"	.60
" 20	"	" 28	"	.50
" 22	"	" 28	"	.60
" 22	"	" 29	"	.50
" 24	"	" 29	"	.60
" 24	"	" 30	"	.50
" 30	"	" 30	"	.50
" 30	"	" 31	"	.65
" 30	"	" 32	"	.55
" 35	"	" 32	"	.55
" 40	"	" 32	"	.75
" 40	"	" 33	"	.55
" 50	"	" 34	"	.55
" 50	"	" 35	"	.85
" 60	"	" 35	"	.65
" 60	"	" 36	"	.88
" 70	"	" 36	"	.70
" 80	"	" 37	"	.80
" 80	"	" 38	"	1.00
" 90	"	" 39	"	1.25
" 100	"	" 40	"	1.45

Nos. 2 to 20 inclusive, 19, 24, 36 and 48 inches wide.  
 Nos. 22 to 80 inclusive, 36 and 48 inches wide.  
 Other widths can be made to order.

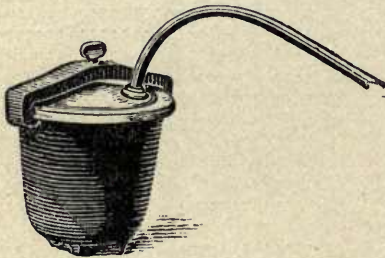
# TIN SCREENS, RESPIRATORS, RUBBER SCRAPERS, RETORTS.



2870



2880



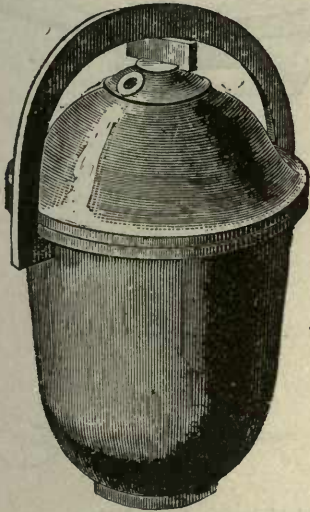
2890



2885

- No. 2870 **Screens, Tin, perforated.**
- |  |            |           |
|--|------------|-----------|
| Size.....  | 10x14      | 14x20 in. |
| Dozen.....   | \$2.00     | 4.00      |
| 1 box, size 10x14 inches, contains 225 sheets.                 |            |           |
| 1 " " 14x20 " " "  | 112 "      |           |
| No. 0 is the equivalent of about No. 35 mesh brass wire cloth. |            |           |
| " 1 " " " "  | " 24 " " " |           |
| " 2 " " " "  | " 14 " " " |           |
- 2880 **Respirators, Hurd's patent.** The most complete device ever offered for protecting the lungs and throat from dust, poisonous gases and all other impurities.
- Each..... \$ 2.50
- 2885 **Scrapers, Rubber,** of pure gum, for cleaning amalgam plates. 4x4x½ inches. Each..... .50
- 2890 **Retorts, Iron,** for mercury distillation, etc.; movable cover fastened by screw clamp and milled smooth, making it absolutely tight-fitting.
- |             |        |      |      |      |      |       |       |      |
|-------------|--------|------|------|------|------|-------|-------|------|
| Capacity... | ½      | 1    | 2    | 4    | 8    | 12    | 16    | pts. |
| Weight....  | 3½     | 6½   | 9    | 17   | 33   | 57    | 74    | lbs. |
| Each.....   | \$2.00 | 3.00 | 4.00 | 5 50 | 8.00 | 15.00 | 18.00 |      |

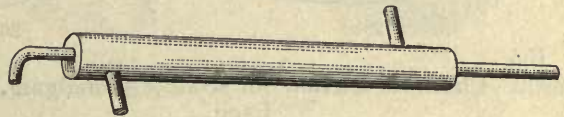
## RETORTS, WATER JACKETS, BLANKETS, AMALGAM STRAINERS.



2895



2900



2896

No. 2895 **Retorts, Iron, Nevada or Oval Top, with pipe.** The advantage of this retort over the old flat top pattern is that it can be filled full of amalgam, thereby holding more than the old style, besides avoiding all danger of explosion, owing to the crown space in the cover, which allows for the expansion. They are made extra heavy, well ground in the joints, and are furnished with a strong Norway clamp, having a wrought iron key, which can be driven in or out of place by a single stroke of a hammer.

Capacity.....	1	2	3	4	5	6	10 pints
Holds quicksilver..	12½	25	38	50	63	75	125 lbs.
Weight.....	10	15	18	25	31	44	65 "
Each.....	\$4.50	5.50	7.00	8.00	9.00	10.50	12.00

2896 **Jackets, Water, or condensers, for Flat Top or Nevada retorts and pipe.**  
Price, from.....\$ 2.00 to 3.00

2898 **Blankets, Sluice.** All-wool, with long nap, made specially for catching gold.  
Per yard, 60 inches wide ..... \$ 3.00  
" 30 " " ..... 1.75

2900 **Strainers, Amalgam or Quicksilver, of heavy duck, fastened to iron ring, with hood outside to prevent loss.**  
Diameter ..... 6 10 12 in.  
Each ..... \$ .90 1.25 1.50

2901 — Same, without ring.  
Diameter ..... 6 10 12 in.  
Each ..... \$ .50 .70 .75

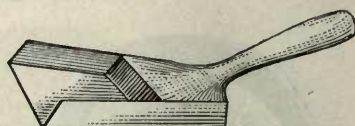
# CHAMOIS SKINS, FUNNELS, SCOOPS, BUCKETS.



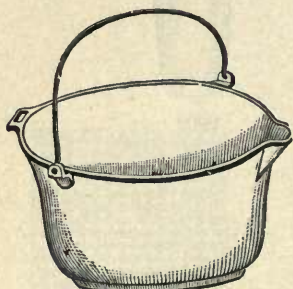
2905



2904



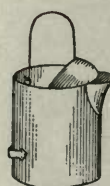
2906



2910



2912

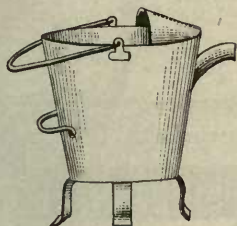


2913

- No.  
**2902 Chamois Skins**, for straining amalgam, assorted sizes and qualities.  
 Each.....\$ .75 to 1.00
- 2903 Funnels, Agate**, for quicksilver.  
 Diameter..... 4½ in.  
 Each.....\$ .40
- 2904 Scoops, Quicksilver or Amalgam**, black iron, wood handle.  
 Size..... 5x4½ in.  
 Per dozen.....\$ 9.00
- 2905** — Same, of Russia iron.  
 Length..... 5  
 Width..... 2½  
 Per dozen..... \$2.50
- 5 3½ 4½ in.  
 5 3.00 3.50
- 2906** — Same. Flaring form, wood handle.  
 Length..... 7½ in.  
 Width..... 5 "  
 Each.....\$ .75
- 2910 Buckets, Quicksilver or Amalgam**, iron, porcelain lined, with bale and spout. These have an Alaska handle, where grasped by the hand, not shown in the cut.  
 Capacity..... 2 3 4 6 8 10 12 qts.  
 Price, per dozen..\$7.20 7.80 9.00 13.50 15.60 16.80 18.00
- 2912** — Russia iron, heavy riveted bottom, strong bolts; 6½ inches wide, 8 inches deep.  
 Each..... \$ 2.00
- 2913** — Same. Spout strainer and guard; 6½ inches wide, 8 inches deep.  
 Each..... 4.00



# QUICKSILVER DIPPERS, LADLES, MILL LAMPS, WICKS.



2914



2915



2920



2922



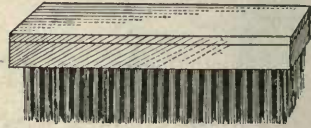
2921

- No.
- 2914 **Buckets, Amalgam.** Flaring pattern, on 3 legs; 8 inches deep, 9½ inches wide at top, 6 inches wide at bottom.  
 Each..... \$ 4.00
- 2915 **Dippers, Quicksilver or Amalgam.** Agate, extra strong, wood handles.  
 Size..... Small Large  
 Per dozen..... 4¼ x 3 5¼ x 3¼ in.  
 \$6.00 9.00
- 2916 — **Black Iron, heavy riveted, seamless, wood handle.**  
 Diameter, 4½ inches.  
 Dozen..... \$15.00
- 2920 **Ladles, Iron.** For melting zinc, antimony, lead, etc.  
 Diameter..... 3 4 5 6 in.  
 Each ..... \$ .30 .40 .50 .60
- 2921 — **Bullion.** Forged from one piece of charcoal iron, 8 inches in diameter, 4 inches deep.  
 Per dozen..... \$36.00
- 2922 **Lamps, Mine or Mill.** Heavy galvanized sheet iron; japanned; cone shaped; neck tube 2 inches high, ½ inch bore; holds ½ pint oil.  
 Each..... .75
- 2923 **Wicks.** Extra wicks for above lamps, round woven.  
 Per dozen ..... .50

# BROOMS, PAILS, SPONGES, BRUSHES.



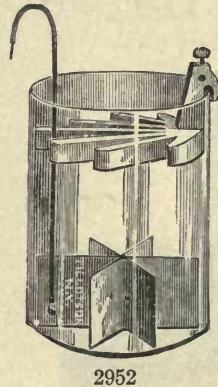
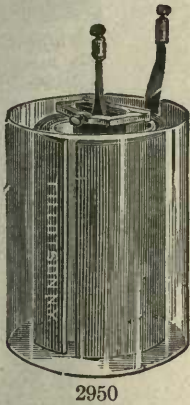
2929



2931

No.				
2925	<b>Brooms, Mill.</b>			
	Nos .....	3	2	1
	Per dozen .....	\$4.50	5.00	5.50
2926	<b>Pails, Mill. Oak, solid bottom.</b>			
	Per dozen .....			\$15.00
2927	<b>Sponges, Mill or Sluice.</b>			
	Per pound, according to size and quality .....			\$ 1.00 to 1.25
2928	<b>Brushes, Sluice or Broom. Strong.</b>			
	Per dozen .....			\$ 3.50
2929	— For cleaning amalgam plates; 12 inches long, with handle.			
	Rows of bristles .....	3	4	5
	Each .....	\$ .45	.50	.60
				.80
2930	— Same. Platers brush made of Mexican fibre.			
	Size .....		3x6	3x8 in.
	Per dozen .....		\$1.50	3.25
2931	— <b>Steel wire. For cleaning battery screens.</b>			
	Size .....		3x6	3x9 in.
	Each .....		\$1.50	2.00
2932	— <b>Steel round.</b>			
	Diameter .....			2½ in.
	Length of wires .....			4¼ "
	Per dozen .....			\$ 9.00

GALVANIC BATTERIES.



No. 2950 Battery, Bunsen's, with rolled zincs, superior to cast ones.

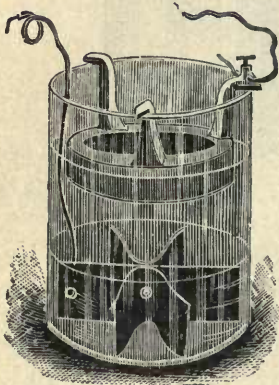
Size .....	1 gal.
Jar .....	6x8 in.
Cell, complete.....	\$ 3.10
Parts: Carbon .....	.40
Carbon connection, Platina and clamp.....	.75
Glass jar.....	.50
Porous cup.....	.25
Zinc and connections.....	1.50

DIRECTIONS—Amalgamate the zinc with mercury, and place in jar. Place the carbon in porous cup, and fill the porous cup with 40 degrees nitric acid to within a half inch of the top; then place porous cell immediately within the zinc, and fill the glass jar with water to the same height as the fluid in the porous cell. If greater energy is required add sulphuric acid to the water in the glass jar, but not to a greater extent than one part acid to twelve parts of water. The acid should be added to the water before setting up the battery, and the acid water allowed to cool before using.

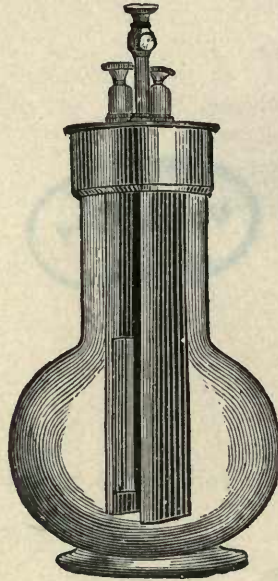
2952 — Crowfoot Gravity.

Cell, complete.....	\$ 1.10
Parts: Copper, 6 inches.....	.20
Zinc, with hanger and connector .....	.50
Jar, 6x8 inches.....	.50

DIRECTIONS—Pour enough water into the jar to cover the zinc, then add 32 ounces copper sulphate in small crystals. To hasten the action dissolve 2 or 3 ounces of zinc sulphate in as many ounces of water, and gently pour it on top of the copper solution. Finally connect the two electrodes of the series and let them so remain for a few hours, until the separation of the two solutions, which will be known by the blue observed in bottom of copper solution; this blue line should be maintained midway between the zinc and copper; when the "blue line" is too low, drop in a few crystals of copper sulphate; if it is too high, connect the battery in short circuit as before described until it goes down, or draw out some of the copper solution and add zinc solution or fresh water. As long as the battery remains in action there is an increase in quantity of zinc sulphate solution in the upper part of the jar.



2954



2956



2958



2958

No. 2954 **Battery, Gravity, with amalgamated zinc.**

Price per cell, complete.....					\$ 1.30
“ Zinc, with screw.....					.75
“ Jar, 6x8 inches.....					.50
“ Copper.....					.15

This Battery, with amalgamated zinc, is the very best gravity battery, and although the first cost is higher, yet it is the most economical. Same directions as No. 2952.

2956 **Battery, Grenet. French imported.**

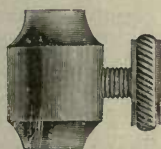
Capacity.....	½ pt.	1 pt.	1 qt.	½ gal.
Cell, complete.....	\$1.00	1.60	2.20	3.00
Parts {				
{ Carbons, each.....	.20	.30	.40	.50
{ Zinc “.....	.15	.20	.25	.30

DIRECTIONS.—To 3 pints of cold water add 5 fluid ounces of sulphuric acid; when this becomes cold add 6 ounces (or as much as the solution will dissolve) of finely pulverized bichromate of potash. Mix it well.

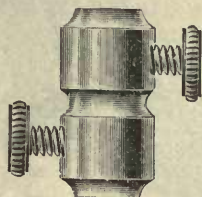
2958 **Battery, Disk Cell, “Gonda.”**

Complete.....					\$ 1.00
Disk, porous only.....					.60
Jar.....					.25
Zinc.....					.15
Sal-Ammoniac.....					.10

# BATTERY JARS, CELLS, BINDING SCREWS AND POSTS. PROSPECTORS' KIT.



2964



2964



2966

No.						
2960	<b>Battery Jars.</b>	Round, of glass, best make.				
		Width.....	4½	5	6 in.	
		Height.....	5	7	8 "	
		Each.....	\$ .35	.40	.50	
2962	—	<b>Cells.</b>	Porous, round cups.			
		Width.....	2½	3	3 in.	
		Height.....	4½	5½	7 "	
		Each.....	\$ .15	.20	.25	
2964	—	<b>Connections, Binding Screws.</b>	Finished.			
		Size.....		Single	Double	
		Each.....		\$ .10	.18	
2966	—	<b>Binding Post.</b>	American pattern.			
		Size.....		Small	Medium	Large
		Each.....		\$ .08	.12	.15

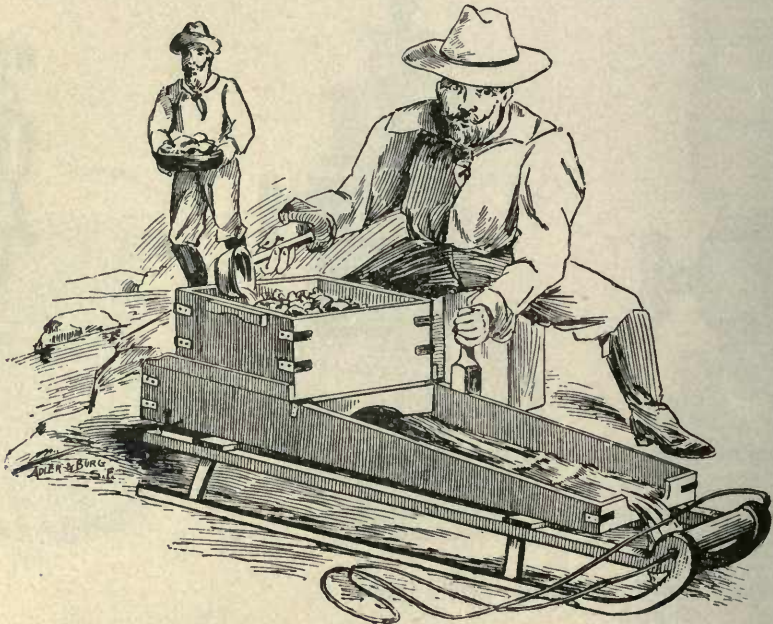
2970 **What Every Prospector Should Have.** The following little apparatus or kit of tools and chemicals, will enable one (without being a chemist) to make a quick and correct test of gold, silver and copper contained in any rock :

- |  |                                 |
|--|---------------------------------|
| Hammer, one face flat, the other wedge-shape for splitting rocks | 12 Test Tubes                   |
| Iron Mortar and Pestle   | Test Tube Holder                |
| Magnifying Glass   | 3 Glass Funnels                 |
| Sieve (No. 100)  | Package Filter Paper            |
| Ore Measure  | 1-lb. Bottle Nitric Acid, C. P. |
| Acid Measure   | 1-lb. Bottle Ammonia            |
| Spirit Lamp  | 1-oz. Bottle Chloride Tin       |
|  | 1-pint Bottle Alcohol           |
|  | Small Box Salt                  |

All the above packed in small box, 16 inches long, 8 inches wide, 9 inches high, with hinged lid, lock, and leather strap for carrying ; weighs only 15 lbs.

Price, complete, with full printed directions ..... \$10.00

# MINERS' GOLD WASHER OR ROCKER.



2972

No.  
 2972 **Miners' Gold Washer or Rocker**, 5 feet long, 21 inches wide, weighs 63 pounds. The rocker rests and rides upon a wood frame not shown in cut. All well made and painted, furnished with dipper and amalgam scraper. There is a canvas (not shown) stretched upon a frame, placed at an angle under the screen of the rocker, upon which the first gold is collected. This is removable for cleaning.

Price ..... \$15.00

Same, made to take apart, packed for shipping for mule transportation.

Price ..... 17.50

2973 **Sluice Box**, with riffles, for above, to extend the washing; 36 inches long, 22 inches wide, 3 inches deep, with No. 16 mesh brass wire sieve placed over upper end, removable to throw out coarse sand; provided, also, with copper plate 22x18 inches, silver plated upon upper side, and with a rubber amalgam scraper.

Price..... \$14.00

## ASSAY OUTFITS.

No.

2975 Assay Outfit for Prospectors. F. O. B. cars or steamer, San Francisco, for \$125.

- |   |                                 |
|---|---------------------------------|
| 1 Portable Button Balance and Weights.                                | 3 Glass Funnels, 4 oz.          |
| 1 Pulp Scale with assay ton Weights 1. A. T.<br>to $\frac{1}{20}$ oz. | 100 sheets Filter Paper to fit. |
| 1 10-in. Iron Furnace, No. 1525-2.                                    | 1 Brass Wire Sieve, No. 60.     |
| $\frac{1}{2}$ doz. Muffles.   | 1 Steel Spatula.                |
| 1 pair Crucible Tongs.  | 1 Tripod.                       |
| 1 " Scorifier "   | 1 Polished Steel Anvil.         |
| 1 " Cupel "   | 1 H. S. Magnet, best English.   |
| 1 Cupel Mould.  | 1 lb. Acid Nitric, C. P.        |
| 4 doz. Crucibles.   | 1 " " Hydrochloric, C. P.       |
| $\frac{1}{2}$ " Crucible Covers.                                      | 5 " pure Assay Litharge.        |
| 100 Scorifiers.   | 10 " Sodium Bi-Carbonate.       |
| 1 Iron Mortar and Pestle, $\frac{1}{4}$ gal.                          | 10 " Bone Ash.                  |
| 1 Graduate, 4 oz.   | 10 " Borax.                     |
| 1 Blowpipe.   | 1 " Argols.                     |
| 1 pair Cutting Pliers.  | $\frac{1}{4}$ oz. Proof Silver. |
| 1 " Button "  | 5 lb. Granulated Lead, C. P.    |
| $\frac{1}{2}$ doz. Annealing Cups.                                    | 1 " Rolled Lead, C. P.          |
| $\frac{1}{2}$ " Parting Flasks Kennedy.                               | 1 Magnifying Glass.             |
| 1 Alcohol Lamp.   | $\frac{1}{4}$ gal. Alcohol.     |
| 1 Nest Beakers (4).   | 1 Button Brush.                 |
| 1 Wash Bottle, 16 oz.   | 2 Hammers.                      |

2976 Assay Outfit for \$300. We are frequently requested by mining companies to prepare a list of apparatus, chemicals and fixtures for the assayers' use.

The following will be found to contain everything necessary and useful, and nothing unnecessary. Larger quantities of crucibles, scorifiers, and chemicals can be added as desired. We have also added a list for the analyst, and for volumetric determination.

We trust these new lists will be found convenient for our patrons. If an Oertling, Troemner or other assay balance is preferred to Becker's, the difference in cost can be ascertained by referring to our general Catalogue:

- |   |  |
|---|--|
| 1. 1 Becker's No. 5 Assay Balance with 3 glass feet,<br>with 2 camel hair pencils,<br>" 6 watch glasses, $1\frac{1}{4}$ in.,<br>" 1 pair pincers,<br>" 3 riders, each 2 milligrammes. | 6. 1 Pulp Spoon, Japan tinned, spatula end.                      |
| 2. 1 set Becker's Assay Weights, No. 1, 1 gramme to $\frac{1}{20}$ milligramme.   | 7. 1 pair Glass Scale Pans, $2\frac{3}{4}$ in., for pulp scales. |
| 3. 1 Becker's Pulp Balance, No. 16, in glass case with sliding door, counterpoised.   | 8. 1 Wedge Wood Mortar and Pestle, No. 4.                        |
| 4. 1 set Assay Ton Weights, 4 to $\frac{1}{20}$ oz. Grain weights and riders instead of grammes, if desired, same price.  | 9. 1 Buck's Pat. Amalgam Mortar, $6\frac{1}{2}$ in.              |
| 5. 1 Pulp Spoon, Japan tinned, double end.  | 10. 1 Mortar Dust Brush, $1\frac{1}{2}$ in.                      |
|   | 11. 1 Flat Camel Hair Brush, $1\frac{1}{2}$ in.                  |
|   | 12. 1 Tin Sampler, 9x12 in., 5 troughs.                          |
|   | 13. 1 Rubber Sample Sheet, 36x36 in.                             |
|   | 14. 1 " " " 18x18 in.  |
|   | 15. 100 Paper Sample Bags, metal clasp, 6x4 in.                  |
|   | 16. 1 Taylor Pat. Hand Sampling Ore Crusher.                     |
|   | 17. 1 10-inch Steel Blade Spatula.                               |

No.

## 2976 Assay Outfit for \$300—continued.

18. 1 Miners' Wash Horn, black rubber.
19. 1 " " Pan, Russia iron, 16½ in.
20. 1 Wood Batea, 12 in.
21. 1 Brass Wire Sieve, No. 40, 8-in., wood rim.
22. 1 Brass Wire Sieve, No. 60, 6-in., wood rim.
23. 1 Brass Wire Sieve, No. 80, 5-in.
24. 1 Gold Dust Blower, 9x10 in.
25. 1 6-in. Horse Shoe Magnet.
26. 1 Muffle Furnace, sheet iron, brick-lined, 12 in. interior diameter. No. 1525.
27. 1 Elbow, for furnace.
28. 5-Joint Pipe, for furnace.
29. ¼ doz. Bat. Muffles, 12x6x4 in.
- NOTE—The following furnaces, Nos. 30, 31, if desired in place of Nos. 26, 27, 28 and 29.
30. 1 Special 8-gallon Tank, with 1 Gasoline or Coal-oil burner, pump, pressure gauge and connecting pipes complete.
31. 1 Combination Muffle and Crucible Furnace, holding four No. 9 Battersea crucibles, and one 10x6x4 Muffle.
32. ¼ doz. Muffles, F. Bat., 10x6x4 in.
33. 1 pair Buckskin Assay Gloves, one-half gauntlet.
34. 1 pair Assay Crucible Tongs, 32 in.
35. 1 " " Cupel Tongs, 26 in.
36. 1 " " Scorifier Tongs, 29 in.
37. 4 doz. " Crucibles, No. 9, Battersea.
38. 1 " No. 2 B. L. Covers.
39. 1 Assay Crucible Rack to hold 10 crucibles while charging.
40. 4 8-oz. Glass Stopped Bottles, engraved "Nitric Acid, Muriatic Acid, Sulphuric Acid, and Ammonia."
41. 3 No. 10 Black Lead Crucibles for bullion.
42. 1 " 10 " " Cover.
43. 1 pair No. 10 Clasp Tongs.
44. 1 " Melters' Duck Mittens.
45. 1 Quadruple Bullion Mould.
46. 1 160-oz. Silver, 300-oz. Gold, Bullion Mould.
47. 1 Assay Pour Mould. 3 holes.
48. 1 Iron Rack for draining assay crucibles.
49. 1 Scorifier Tray, cast iron, 8x8 in., 9 holes.
50. 1 Cupel Tray, sheet iron, 5x7 in.
51. 100 Scorifiers Bat., 2½ in.
52. ½ doz. Clay Roasting Dishes, 4 in.
53. 2 B. L. Roasting Dishes, 5 in.
54. 1 Bullion Chisel, ½x5½ in.
55. 1 Iron Cupel Mould, 1½ in.
56. 1 Wood Mallet for mould, 2½ in.
57. 1 doz. red Chalk Pencils, to number cupels, etc.
58. 1 Lingke Double End Button Brush, ½ in.
59. 1 Polished Steel Anvil, flat, 3x3 in.
60. 1 Button Hammer, 6-oz.
61. 1 Slag Hammer, 22-oz.
62. 1 pair Flat Nose Pliers. 4 in.
63. 1 " End Cutting Pliers, 5 in.
64. 1 " Snip Shears, 6 in.
65. 1 " Flat Taper Nose, Bead Pliers, 5 in.
66. 1 " Scissors, B. P. size.
67. 1 doz. Flat Bottom Flasks, 2-oz.
68. ½ " Cone Ring Flasks, 2-oz.
69. 1 pair Wood Mattrass Tongs.
70. 1 No. 2 Bonney Vise.
71. 1 Hand Vise, 1½ in.
72. 2 pieces, 6x6 in. Iron Wire Gauze, No. 16.
73. ½ doz. Gold Annealing Cups, B.
74. 1 Copper Water Bath, 5 in., 4 ring.
75. 1 Iron Sand Bath, 8x1 in.
76. 1 Nest, No. 1-6 Plain Beakers.
77. 1 Concave Beaker Cover, 3½ in.
78. 1 " " " 3 in.
79. 1 " " " 2½ in.
80. 1 " " " 2 in.
81. 6 assorted 7 to 8 in. Hollow Glass Stirring Rods.
82. 1 16-oz. Washing Bottle, R. S.
83. 1 32-oz. " " "
84. 1 doz. Test Tubes, 5x⅝ in.
85. 1 Test Tube Brush.
86. 1 Test Tube Rack, 8 holes, and drain pins.
87. 1 Wood Test Tube Holder.
88. 1 Nest, 3 Test Tube Funnels.
89. 1 Nest Nos. 1-9 Porcelain Evaporating Dishes.
90. 2 Porcelain Capsules and Covers, No. 7.
91. 1 Dangler's Gasoline Laboratory Lamp.
92. 1 Glass Spirit Lamp, 4-oz.
93. 1 Berzelius' Blowpipe, with platinum tip, bored to ⅝ m. m.
94. 1 Coal-oil Test Stove with two 4-in. wicks.
95. 2 Glass Funnels, plain, 4 oz.
96. 2 " " " 8 oz.
97. 1 package S. & S. Filter Paper, 18½ ctm.
98. 1 " " " " 24 ctm.
99. ½-lb. Assorted Glass Tubing ¼ to ⅜ inch diameter.
100. 2 feet Rubber Tube, ⅛ inch.
101. 2 " " " ⅜ inch.
102. 2 " " " ¼ inch.
103. 1 Combined 8-ounce and 250 C. C. Cone graduate.
104. 1 Chemical Thermometer.
105. 1 Beaume Acid Hydrometer.
106. 1 Iron Stand, 3 rings.



No.

## 2976 Assay Outfit for \$300--continued.

- |  |  |
|--|--|
| 107. 1 Twisted Wire Tripod.  | 125. 25 lbs. Bone Ash, No. 1.                                    |
| 108. 1 Wood Funnel Support.  | 126. 2 " Black Flux.   |
| 109. 1 Patinum Crucible, 12 C. C., with cover.                       | 127. 20 " Borax.   |
| 110. 1 piece Platinum Foil, 1x2 inches, $\frac{1}{1000}$ inch thick. | 128. 5 " Borax Glass.  |
| 111. 6-inch Platinum Wire, $\frac{1}{5000}$ inch.                    | 129. 2 " Charcoal, powdered.                                     |
| 112. 1 Pocket Magnifying Glass, 2 lenses, No. 2825.                  | 130. $\frac{1}{2}$ " Gran. Copper, C. P.                         |
| 113. 1000 Blank Assay Certificates with name of assayer.             | 131. 2 " Sulphate Copper.  |
| 114. 1 Chlorine Generator, Test Size, complete.                      | 132. 1 " Ether Sulphuric.  |
| 115. 1 Glass Desiccator, 4 inches.                                   | 133. 2 " Pulverized Glass.                                       |
| 116. 1 Iron Quicksilver Retort, flat top; 1 pint, with pipe.         | 134. 10 " Pure Assay Lead, gran.                                 |
|  | 135. 10 " " " " sheet.   |
|  | 136. 25 " " " Litharge.  |
|  | 137. $\frac{1}{4}$ -doz. sheets Litmus Paper each, red and blue. |
|  | 138. 1 lb. Quicksilver.  |
|  | 139. 1 " Potassium, Carbonate.                                   |
|  | 140. 2 " " Cyanide.  |
|  | 141. 4 " " Nitrate.  |
|  | 142. 1 oz. Proof Silver Foil.                                    |
|  | 143. 15 lbs. Sodium Bi-Carbonate.                                |
|  | 144. 10 " Sodium Hyposulphite.                                   |
|  | 145. 2 " Brimstone.  |
|  | 146. 1 gal. Distilled Water.                                     |

## CHEMICALS AND FLUXES.

117. 1 lb. Acid, Acetic, No. 8.  
 118. 1 " Muriatic, C. P.  
 119. 1 " Sulphuric, C. P.  
 120. 7 " Nitric, C. P.  
 121. 1 qt. Alcohol, 95°.  
 122. 1 lb. Ammonium Hydrate C. P., 26°.  
 123. 1 " Ammonium Carbonate.  
 124. 5 " Argols, powdered.

Total price of above outfit...\$300.

Weighs about 800 pounds gross.

## 2980 Assay Outfit for \$230. For Analytical and Volumetric Work.

- |   |  |  |  |  |                                    |  |                       |   |   |   |                    |  |  |  |   |  |   |   |   |                                 |   |   |                                       |                  |  |   |  |   |                   |                    |
|---|--|--|--|--|------------------------------------|--|-----------------------|---|---|---|--------------------|--|--|--|---|--|---|---|---|---------------------------------|---|---|---------------------------------------|------------------|--|---|--|---|-------------------|--------------------|
| 147. 1 Becker's No. 7 Analytical Balance, with agate knives and plaues; power, 100 grammes to 1 milligramme, with 3 glass feet,<br>1 pair balanced glass pans, 3 inches diameter,<br>1 specific gravity apparatus,<br>1 flat camel hair brush, 1½ inches wide,<br>1 pair pincets.<br>3 Riders, each, 12 milligrammes. | 148. 1 set Becker's Fine Weights, No. 5, 100 grammes to 1 milligramme, and riders. | 149. 1 Moisture scale, with two balanced brass pans 7 inches diameter; power, 2 kilos. | 150. 1 set Brass Weights, in wood block, 2 kilos down to 1 c. g. | 151. 1 Glass Mortor and pestle, 32-oz. | 152. 1 12-in. Steel Blade Spatula. | 153. 2 16-oz. Boiling Flasks, flat bottom. | 154. 2 32-oz. " " " " | 155. 1 Copper Drying Oven, 8 x 10 in., on legs, double walls. | 156. 1 nest, Nos. 1 to 10, Plain Beakers. | 157. 2 Concave Beaker Covers, 4 in. diameter. | 158. 2 " " " 5 " " | 159. 1 32-oz. Heavy Bulb Shape Washing Bottle. | 160. 1 Porcelain Evaporating Dish, Royal Meissen, 12 in. diameter. | 161. 1 Flat Porcelain Evaporating Dish, 8½ in. diameter. | 162. 1 Glass Evaporating Dish, with spout, 8¼ in. diameter. | 163. 1 Porcelain Casserole with cover and wood handle, 5 in. diameter. | 164. 1 16-oz. 2 Neck Woulf Bottle, fitted with tubes. | 165. 2 Precipitating Glasses on Foot, 250 C. C. | 166. 4 ft. $\frac{1}{4}$ in. Rubber Tube. | 167. 4 " $\frac{3}{16}$ in. " " | 168. 1 Glass Stop-cock, $\frac{1}{8}$ in. bore, double end. | 169. 1 Chemical Mixing Bottle, graduated, 500 C. C. | 170. 1 Graduated Cylinder, 1000 C. C. | 171. 1 " " 250 " | 172. 1 Glass Stopped Burette, 100 C. C. $\frac{1}{10}$ with float. | 173. 1 Glass Stopped Burette, 50 C. C. $\frac{1}{10}$ . | 174. 1 Wood Support, cork lined, for 2 burettes. | 175. 1 Graduated Bulb Pipette. 10 C. C. | 176. 1 " " " 50 " | 177. 1 " " " 100 " |
|---|--|--|--|--|------------------------------------|--|-----------------------|---|---|---|--------------------|--|--|--|---|--|---|---|---|---------------------------------|---|---|---------------------------------------|------------------|--|---|--|---|-------------------|--------------------|

**Assay Outfit for \$230—continued.**

- |   |  |
|---|--|
| 178. 1 Mohr's Pipette, graduated, 5 C.C. into $\frac{1}{2}$ .                     | 196. 1 Mercury Trough; 6 lbs.  |
| 179. 1 " " " 20 C.C. into $\frac{1}{10}$ .  | 197. 1 2-gallon Rubber Gas Bag with stop-cock.   |
| 180. 1 " " " 50 C.C. into $\frac{1}{10}$ .  | 198. 1 Platinum (pure hammered) Dish, $2\frac{3}{4}$ in., 80 C. C.                             |
| 181. 1 Specific Gravity Bottle with thermometer and tare weight in box, 100 C. C. | 199. 1 set 40 (4-oz. reagent bottles). Catalogue No. 2615.                                     |
| 182. 1 Specific Gravity Bottle with thermometer and tare weight in box, 50 C. C.  | 200. 1 Silver Dish, $2\frac{1}{2}$ inches diameter, with spout.                                |
| 183. 1 Volumetric Flask, 1 liter, glass-stoppered.                                | 201. 1 Box Blank Labels, gummed, $1 \times 2\frac{1}{2}$ in.                                   |
| 184. 1 Volumetric " $\frac{1}{2}$ " "   | 202. 1 Dialyser, 1 gallon.   |
| 185. 1 Chemical Thermometer, 120° Cel., 240° Fah.                                 | 203. 1 Carbon Determination Apparatus.   |
| 186. 1 Beaume Hydrometer for light liquids.                                       | 204. 1 Marsh Arsenic Test Apparatus, with mounting and plates.                                 |
| 187. 1 " " " heavy "  | 205. 1 Richard's Filter Pump with connections.   |
| 188. 1 Hydrometer Jar, on foot.   | 206. 1 Hot Filtering Apparatus, 1 pint.  |
| 189. 1 Retort Stand, 3 adjustable rings.  | 207. 1 Rapid Filtering Apparatus, $\frac{1}{2}$ pint, with perforated platinum cone, complete. |
| 190. 1 Wood Support for 3 assorted funnels.                                       | 208. 1 Desiccating Apparatus, glass bell and plate, and porcelain acid dish, 5 in.             |
| 191. 1 Glass Retort, 1 pt., stoppered.  | 209. 1 Digesting Apparatus.  |
| 192. 1 " Receiver, " "  | 210. 1 Potash Bulb, Liebig's.  |
| 193. 1 Liebig's Condenser, 15 in. glass, mounted.                                 | 211. 1 Nitrogen Apparatus.   |
| 194. 1 Evolution Flask, 1 pt., fitted with rubber stopper and delivery tubes.     | 212. 1 Displacement Apparatus, 1 pint.   |
| 195. 2 Gas Bottles, 1 qt.   |  |

No.

**2982 Memoranda of Outfit for Copper Assays by Cyanide Potassium Method.**

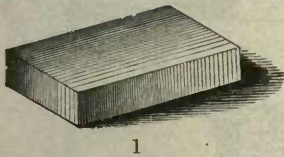
- |  |  |
|--|--|
| 1 Pulp Balance.  | 1 Sampler and Scoop.                           |
| 1 set Gramme Weights, 50-gramme to 1 milligramme.      | 1 Buckboard and Muller.                        |
| 2 pair Pincets.  | 1 Color Plate, porcelain.                      |
| 2 Spatulas.  | 1 H <sub>2</sub> S Apparatus, small.           |
| 1 $\frac{1}{2}$ -gal. Iron Mortar.                     | 2 Empty Bottles.                               |
| 1 80-mesh Sieve.                                       | 6 ft. Rubber Tube, $\frac{1}{4}$ -in.          |
| 1 doz. Copper Flasks.                                  | 3 Pinch Cocks.                                 |
| $\frac{1}{2}$ " $3\frac{1}{2}$ -in. Funnels, Bunsen's. | 1 box Labels, blank.                           |
| $\frac{1}{2}$ " Sand Baths.                            | 1 book Labels, chemical.                       |
| 1 10 c. c. Cylinder.                                   | 2 books Litmus Paper.                          |
| 4 10 c. c. Pipettes.                                   | $\frac{1}{2}$ doz. Capsules, No. 3 and Covers. |
| 1 8-oz. Graduate.                                      | $\frac{1}{2}$ gallon Sulphuric Acid, com'l.    |
| $\frac{1}{2}$ doz. 8-oz. Beakers.                      | $\frac{1}{2}$ " Muriatic Acid, com'l.          |
| $\frac{1}{2}$ doz. packages Gray Filter Paper, 7-in.   | $\frac{1}{2}$ " Nitric Acid, com'l.            |
| $\frac{1}{2}$ " " " S. & S. " " 18 $\frac{1}{2}$ c. m. | 7 " Nitric Acid, C. P.                         |
| $\frac{1}{2}$ doz. 12-oz. Beakers.                     | 5 lbs. Sheet Zinc, cut in strips, com'l.       |
| 1 Dangler Blast Lamp, gasoline.                        | 8 " Ammonium, C. P., 26°.                      |
| 1 8-oz. Alcohol Lamp, glass.                           | 1 " Potassium Cyanide, 98%—99%.                |
| $\frac{1}{2}$ lb. Glass Rods and Tubing.               | 6 sheets Copper Foil, C. P.                    |
| 2 Burettes, 50 c. c., $\frac{1}{10}$ glass stop-cock.  | $\frac{1}{2}$ gallon Alcohol, 95%.             |
| 1 Retort Stand, 3-ring.                                | 1 " Distilled Water.                           |
| 2 Funnel Stands, for 4 funnels.                        | 1 lb. Zinc, granulated, C. P.                  |

Price, complete ..... \$80.00

Battery outfits for copper analysis can be furnished as desired.

## BLOWPIPE APPARATUS.

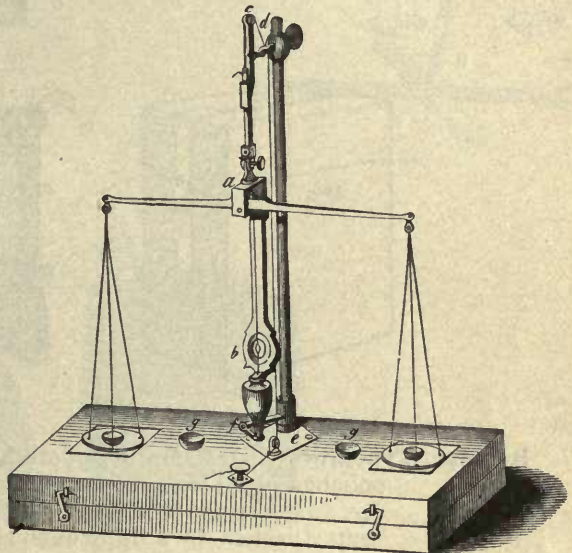
According to Prof. Plattner, for Qualitative and Quantitative Blowpipe Analysis.



1



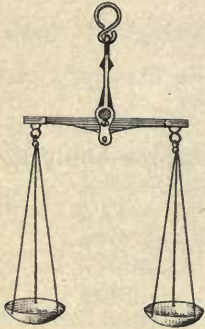
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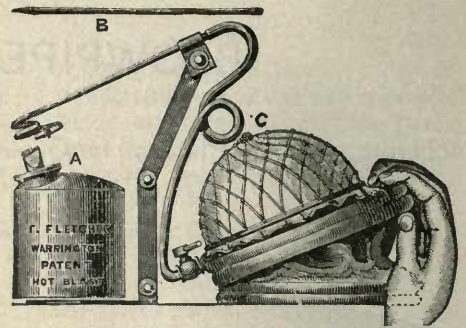
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No.

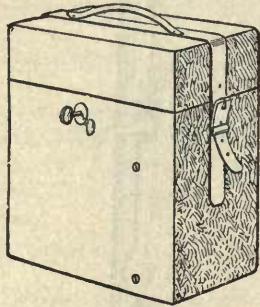
- |   |  |        |
|---|--|--------|
| 1 | Anvil, Small, best polished steel, $2\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$ .....   | \$ .50 |
| 3 | Balance, Plattner's, for blowpipe analysis; especially arranged for traveling, sensible to 1-5 milligramme, portable in polished wooden box, best German make, complete, with set of weights 1 gramme to 1 milligramme .....   | 25.00  |
| 5 | <p>Becker's No. 2. In French polished glass case, 9 in. long <math>9\frac{3}{4}</math> in. high and 3 in. deep, sliding frame counterpoised; packed in a light box, with strap for carrying, weighing, all boxed, <math>4\frac{1}{2}</math> lbs. Needle deviates 20 divisions on the scale for 1 milligramme. Takes a 2 milligramme rider, which reads <math>\frac{1}{10}</math> milligramme. With apparatus for rider, set of weights, 1 platinum gramme to <math>\frac{1}{10}</math> milligramme.</p> <p>Price .....</p> | 75.00  |



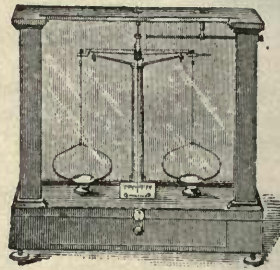
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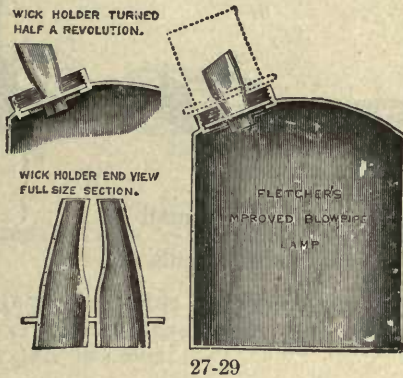
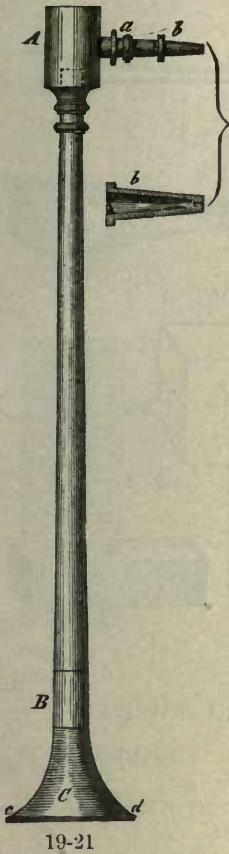


7



No.

- 7 **Balance, Troemner's latest improved portable assay.** In a fine French polished case ; beam and needle not disturbed when packed up ; case measures 9½ in. long, 9¾ in. high and 4 in. deep ; packed in a light outside case, with strong leather hand strap ; needle deviates 20 full divisions for 1 milligramme ; a full set of weights, from 1 platinum gramme to 1/10 milligramme included. Takes a 6 milligramme rider, which reads 1/10 milligramme.  
 Price..... \$65.00
- 9 — **Pulp.** Brass beams, horn pans suspended by silk cord, with weights 10 grammes to 1 centigramme.  
 Price..... 2.00
- 11 **Beakers, lipped, 00 to 1** ..... .30
- 13 **Blowpipe, brass, jeweler's form, plain**..... .15
- 15 — Same, with bulb..... .25
- 17 — **Fletcher's Special Chemical, No. 32.** With folding stand, adjustable at any height or angle. It can be used either with the mouth, or the small hand blower can be attached and the blowing done by the finger. With this blowpipe is supplied one jet with, and one without the patent coil, to enable a larger variety of flame to be obtained. The lamp or a weight should be placed on the stand when in use.  
 Price—Blowpipe, alone..... 1.00  
 Blower alone, with Elastic Chamber enclosed within a net, and stop-cock in box..... 3.00  
 As illustrated..... 4.75



No.			
19	Blowpipe, Plattner's, brass, with movable platinum tip and hard rubber mouth-piece.....		\$ 2.00
21	— Same, brass, nickel-plated .....		2.25
23	Blowpipe Lamp, Plattner's nickel-plated, with patent swivel.....		4.00
25	— Support D. E. for platinum crucible, porcelain evaporating dish, etc., of polished brass to fit lamp, extra.....		1.25
27	— Fletcher's, polished brass .....		.75
29	— Same, brass, nickel-plated.....		1.00
31	— Tin, for tallow.....		.30
33	Burner, Bunsen's, with tip and tube for blowpiping..		.85
35	Button Brush Lingke's 5/8 in.....		.50
37	Capsules, porcelain capacity 8 c/c.....		.15
39	— Same, capacity 15 c/c .....		.20
41	Carbon blocks moulded.....		.30
43	— Cylinders moulded 3x1 1/8 in.....		.20



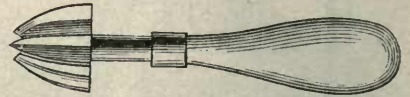
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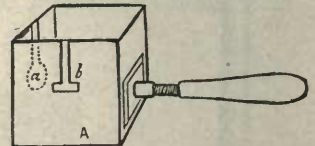
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53



57



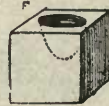
59-61



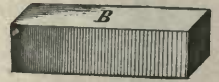
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67

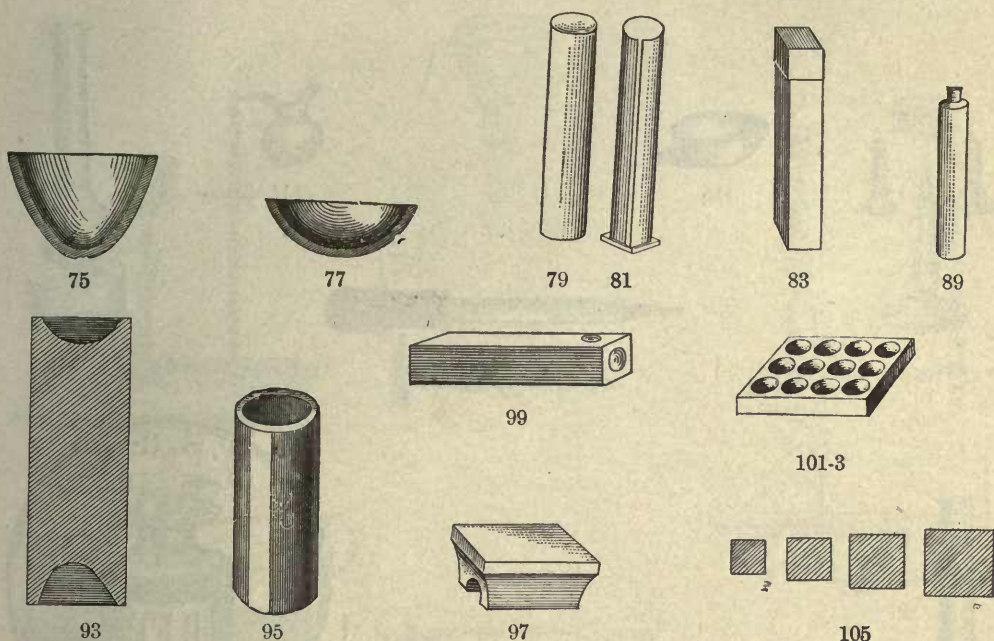


65



69

No.				
45	<b>Borers, Charcoal,</b>	four-cornered, small		\$ .45
47	—	square and spatula end		.50
49	—	square end and chisel end, magnetized		.50
51	—	club shape		.75
53	<b>Capsules, Charcoal.</b>			
		Diameter	$\frac{3}{4}$ $\frac{7}{8}$	1 in.
		Doz	\$ .20      .25	.35
55	—	Same, $\frac{1}{16}$ -in, 3 doz. in box		\$ .20
57	<b>Crucibles, Charcoal.</b>			
		Diameter	$\frac{3}{4}$ $\frac{7}{8}$	1 in
		Doz	\$ .25      .30	.40
59	<b>Charcoal Holder,</b>	for Charcoal Squares, with screw handle to fasten the coals in		\$1.75
61	—	Same, with platinum wire and shield		2.25
63	—	<b>Saw,</b> polished blade		.50
65	—	<b>Squares or Stoves,</b> of prepared powdered charcoal, 30 mm. high, 32 mm. square, top face recessed to receive porcelain clay crucibles No. 75, doz		1.00
67	—	Same, Covers, 14 mm. thick, 32 mm. square, recessed to receive clay capsule No. 77, doz		.60
69	—	<b>Cakes or Sticks,</b> natural, hard wood; willow, fine grain, size about 4x1x1 inches, doz		.50
71	—	Pressed, size 80x20x10, mm., doz		.50
73	—	“ 80x20x20 “ “		.75



No.				
75	Crucibles, Clay, dozen			\$ .30
77	Capsules, " "			.25
79	Carriers, or cases for crucibles, capsules and stoves, made of japanned tin, with pull off cover.			
	For	6	12, charcoal crucibles.	
	Each	\$ .25	.30	
81	For	6	12, charcoal capsules.	
	Each	\$ .25	.30	
83	For charcoal stoves, with covers.			
	For	3	6, coal stoves.	
	Each	\$ .35	.40	
85	For 12, clay crucibles			\$ .25
87	For 12, clay capsules			.25
89	Metal bottle for carrying oils, tight screw cap 5½ inches long, 1½ inches in diameter			1.25
93	Cylinders, Clay, or holders, for charcoal crucibles and capsules, each			.25
95	Charcoal			.25
97	For charcoal capsules, to examine sublimates			.50
99	Prismatic form, with cavity at one end and one side			.35
101	Color Test Plates, porcelain, 3½x4½ inches, 12 depressions			.65
103	" " 5x6 inches, 12 depressions			.85
105	Cobalt Plates, blue glass			.10



109



115



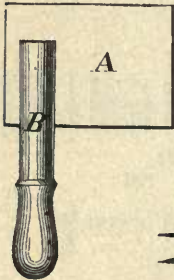
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119



111-13



125



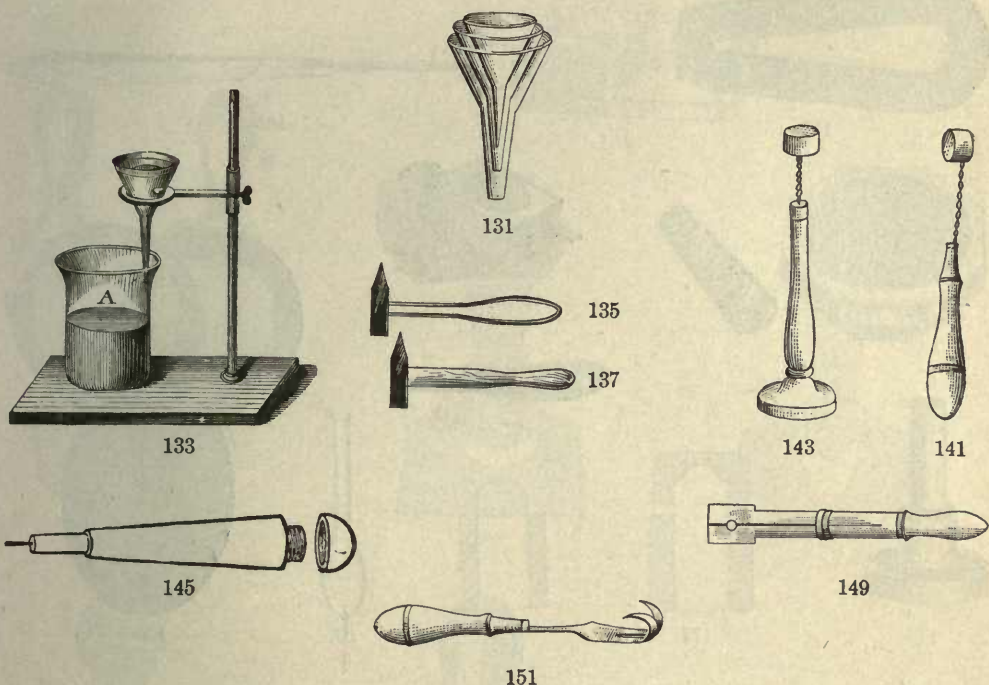
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127

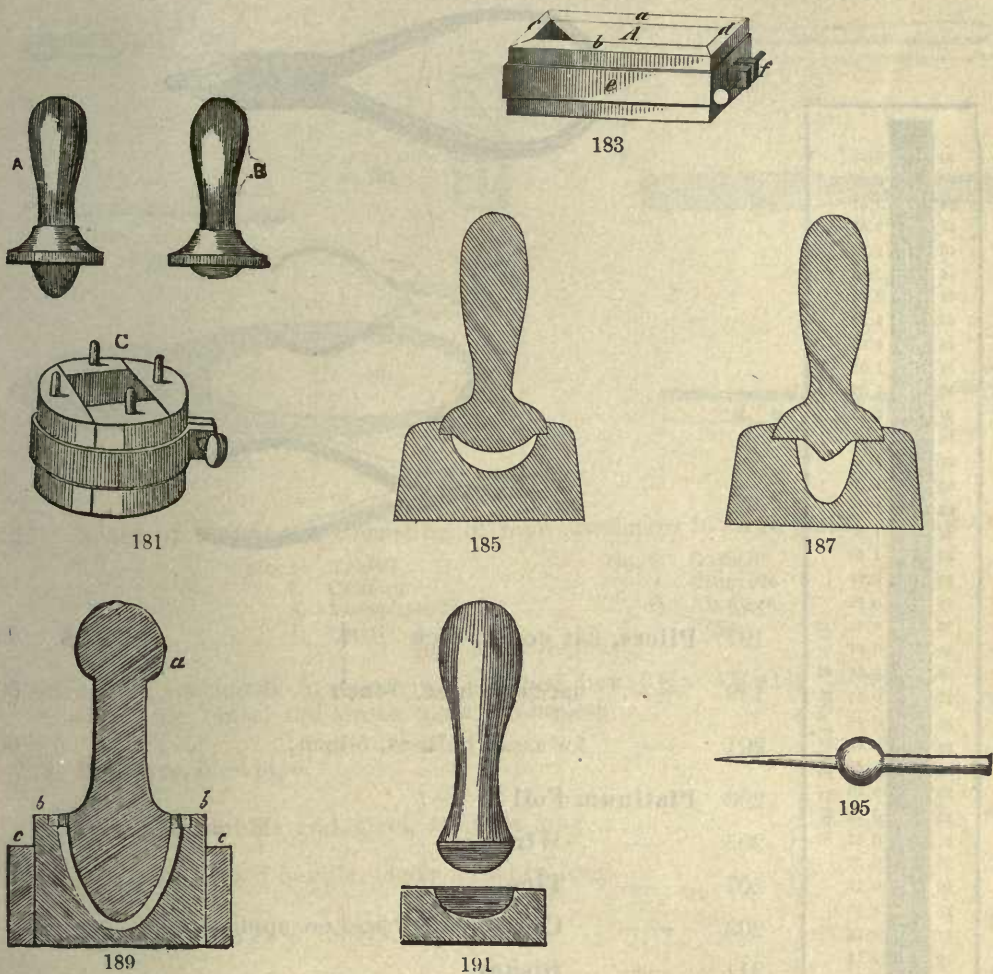
No.		\$
107	Coal Chisels.....	.25
109	Cupel Holder, with two cupels and one mould .....	1.50
111	— Moulds, 1/2-inch brass.....	1.75
113	— “ 1/2-inch iron .....	.75
115	Dishes, porcelain, 3 in a set.....	40
117	Dropping, or Cobalt Bottles, glass stoppered, Schuster's, 2-ounce.....	.25
119	Dropping Tubes .....	.05
121	Files, round and triangular, with handle .....	.20
123	Forceps, polished nickel, Raynor's form, platinum pointed, 5 1/2 inches .....	2.25
125	Cylinder, Wood, upon which to form soda paper cornets.....	.15
127	Filter Paper. See Catalogue, page 102.	
129	Fuel, Alcohol, per pint.....	.50
	— Olive Oil, “ .....	.90
	— Nut Oil, “ .....	.30
	— Paraffine, per lb.....	.25



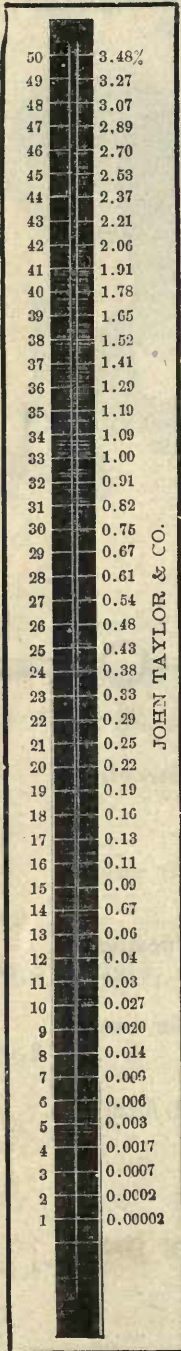


No.			
131	<b>Funnels, glass, per nest of 3.</b>	.....	\$ .20
133	— Supports, 2 brass rings, adjustable vertically and sideways, wood base.		
	Each.....		.90
135	<b>Hammers, Plattner's, wire handle</b>	.....	.75
137	— " wood "	.....	.60
139	<b>Holder, for chimney and funnel.</b>	.....	1.50
141	— Cupels, brass cups, held by twisted wire in handle.....		.30
143	— " upright form	.....	.30
145	— for platinum wire, hollow handle, milled screw, clamping point, etc	.....	.90
147	— with six platinum wires.....		1.75
149	— with sliding ring and flat jaw; will hold wire or sheet....		.35
151	— steel, wood handle, for charcoal cakes.....		.35
153	<b>Knife, for cutting cork.</b>	.....	.25

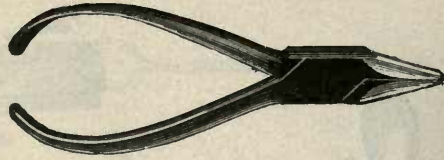




No.			
181	Moulds,	for making pressed coal stoves and covers, with two pestles and extra bottom piece, complete.....	\$ 5.00
183	—	for making charcoal cakes, with extra bottom piece for two sizes, either 80x20x10 or 80x20x20 mm.....	3.00
185	—	hard wood, for making charcoal capsules, improved form, with self-centering pestle .....	.75
187	—	for making charcoal crucibles.....	.85
189	—	polished brass, in sections to take apart for making clay crucibles.....	4.50
191	—	for clay capsules made of boxwood .....	.75
193	—	for clay crucibles, made of boxwood .....	1.25
195	Pipette,	glass bulb, 150 mm long.....	.15



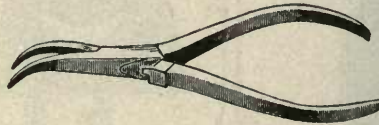
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197



199

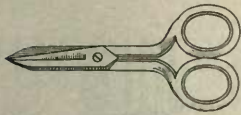


201

No.			
197	Pliers, flat nose, 5-inch	.....	\$ .50
199	— flat taper nose, 5-inch	.....	.60
201	— for assay buttons, 5-inch	.....	.60
203	Platinum Foil	} Prices on application.	
205	— Wire		
207	— Tips		
209	— Crucibles		
211	— Dishes		
213	— Spoons		
215	— Spatulas		
217	Paper, glazed, for mixing and sampling powdered ores; in sheets colored bronze, blue, black or white; size 20x24 inches; per quire	.....	\$ .50
219	Harkort's Ivory Scale, for measuring B. P. buttons to take the place of a balance	.....	3.00

DIRECTIONS—Treat with the B. P. one assay centner (equals 100 M. G.) of the powdered silver ore. If the resulting button measures 50 upon the scale, that is, just fits between the diverging lines at 50, then the silver is  $.0348\frac{48}{100}$  per cent of the 100 M. G. of ore by weight.

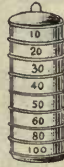
In 1 ton of 2000 lbs. average there are 29.1666 Troy oz. .0348 per cent of 29.1666 oz. equals 1.01499 oz. of pure silver to the ton. At \$1.2929 per oz., equals \$1312.26 per ton, the value of the sample assayed. If a button measures 25 on the scale, the value per ton will be \$162.15.



223



229



233



225



227



231

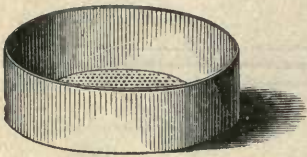


245

- No.  
 221 **Scale of Hardness**, consisting of nine specimens in large pieces, as follows:
- |                     |               |
|---------------------|---------------|
| No. 1. Talc         | No. 2. Gypsum |
| " 3. Calcium        | " 4. Fluoride |
| " 5. Phosphate lime | " 6. Alumina  |
| " 7. Quartz         | " 8. Topaz    |
| No. 9. Corundum.    |               |

Each lot of specimens in recess in a polished box  $6\frac{3}{4} \times 4\frac{1}{4} \times 1\frac{1}{4}$  inches with a file, chisel and streak plate; complete..... \$ 5.00

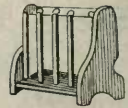
223	Scissors, blowpipe.....	.40
225	Spatulas, double end, steel, 4 inches long.....	.25
227	— wood handle, blade 3 inches long.....	.25
229	Spoon, Ivory, $3\frac{1}{2}$ inches, each.....	.30
231	Shears for cutting metal.....	.75
233	Sieves, nest of three, brass, tin frame, 3 inches in diameter, with cup at bottom. Nos. 30, 50, 100, or any three numbers desired, per set.....	1.50
235	Silver Foil, Proof Silver, per oz.....	1.60
237	Soda Paper, 40 sheets in box.....	.25
239	— sheets 10x5 in.....	.05
241	Stirrers, glass, dozen.....	.50
243	Streak Plates, of porous porcelain, for mineralogists, Royal Berlin..	
	$1\frac{5}{8} \times 2\frac{3}{4}$ in. $2\frac{1}{4} \times 3\frac{3}{8}$ in.    3x4 in. $3\frac{3}{4} \times 5\frac{1}{2}$ in.	
	\$ .25                      .30                      .35                      .45	
245	Test Lead Measure graduated into 5, 10, 15 and 20, blowpipe centners.....	.35



247



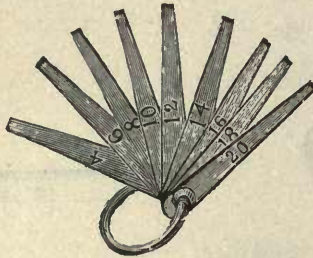
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253-5



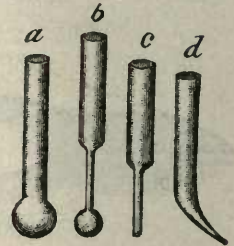
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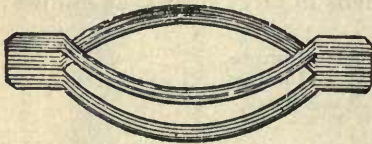
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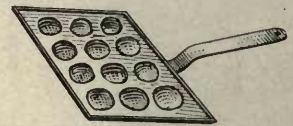
249



263



271



277

No.		\$
247	<b>Test Lead Sieve</b> .....	.30
249	<b>Test Tubes</b> , per dozen.....	.25
251	— holder.....	.15
253	— Support, 4 holes and drain pins.....	.25
255	— Same, 8 holes and drain pins.....	.50
257	<b>Touch-stones</b> , black.....Small, \$ .50; medium, \$ .75; large,	1.00
259	— White.....“ .50 “ .75 “	1.00
261	<b>Tubes</b> , hard glass, open at both ends, per dozen.....	.50
263	— for arsenic reduction.....	.10
265	<b>Wash Bottle</b> , fitted with pure gum stopper and tubes, 4 ounce.....	.35
267	— Same, 8 ounce.....	.55
269	<b>Watch Glasses</b> , 2-inch, dozen.....	.25
271	— Clips.....	.20
273	<b>Wicks</b> , for lamps, each.....	.10
275	<b>Test Needles of Gold</b> , 9 needles fastened to a ring, numbered, and containing gold upon their points of 4, 6, 8, 10, 12, 14, 16, 18 and 20 karats fine.....	3.00
277	<b>Trays</b> , sheet iron, for carrying cupels or capsules, 12 depressions...	.65

# HARDING'S PORTABLE BLOWPIPE OUTFIT.

No.

279 **Portable Blowpipe Outfit, Harding's**, for 50 assays, each 2 grammes, packed in box, 25x9½x7½ inches, hinged lid, with straps for carrying, weighs 38 pounds.

Price, complete, with directions . . . . . \$40.00

The following articles are included in the above blowpipe outfit:

Mortar and Anvil combined.	Pipette.
Hammer and Pestle combined.	Pliers.
Tin Frame Sieve, 100 mesh.	Wood Former for Cupels.
Horseshoe Magnet.	Clay Cover for Scorifier.
Button Balance and Weights, 1 grm. to 1 mm.	Annealing Cups.
Granulated Lead Measure.	Phosphoric Acid.
"    "    Spoon.	Granulated Lead.
Roasting Furnace, Asbestos Lined (Fig. 2).	Borax Glass.
Fifty-five Scorifiers.	C. P. Nitric Acid.
Paraffine Lamp.	Paraffine.
Blowpipe, adjustable mounting, rubber bellows, with platinum tip, ⅜ mm. bore.	Alcohol.
Spirit Lamp.	Bone Ash.
Forceps.	Proof Silver.

**FIRST, FUSION**—Weigh two grammes of pulp or well mixed ore, and mix with it eight grammes of pure granulated lead in the scorifier, then cover the mixture with eight grammes more of the lead, then by means of the pipette add, drop by drop, concentrated phosphoric acid until the mixture is moist. The object of this is to cement the pulp into a compact mass to prevent its being blown away by the blast.

Place the scorifier (*D*) with its charge into the furnace, as shown in Fig. 1, and let it rest quite level upon its asbestos bed with loose asbestos around the sides of the scorifier, even with the top, as at *E*. Now blow a smoky flame upon the surface of the assay so expel moisture, then add to the assay ten or twenty per cent of borax glass as the ore may require.

The cover (*A*) is now placed upon the scorifier as shown, but care must be taken that the openings (*A* and *B*) are just large enough to let the flame in at *A* and the gas escape at the opening *B*.

The most difficulty is experienced by beginners in obtaining a flame which is of sufficient volume and intensity to bring the ore to fusion. The paraffine in the lamp (*G*) must first be melted, and the copper tube, which carries the wick, heated by means of an alcohol flame and mouth blowpipe before the lamp is lit. The wick should be cut to an angle of about thirty degrees. The flame when burning freely should be about five inches high.

Particular care must be taken with the platinum blowpipe tip. It is bored to the width of ⅜ millimeters, and the hole is true and in line with the axis of the cone, and it should be preserved from injury. If this is not the case the flame will scatter and buzz, in which case it is impossible to obtain a fusion. The blowpipe flame must be perfectly smooth and silent, when the furnace, lamp and blowpipe are in the position shown in Fig. 1. The bellows are operated so as to produce a flame which is slightly yellow at *A*, but nearly blue at *C*. This flame is kept up until the fusion is completed, then the tip is moved a little in the direction of the furnace, which will shorten the flame so that the point will barely strike the surface of the molten lead. Care must, however, be taken that the temperature of the furnace does not drop to the extent as to chill the slag. The blast is kept up until the lead is oxidized to such an extent as to be nearly covered with slag. The scorifier is then removed from the furnace and allowed to cool.

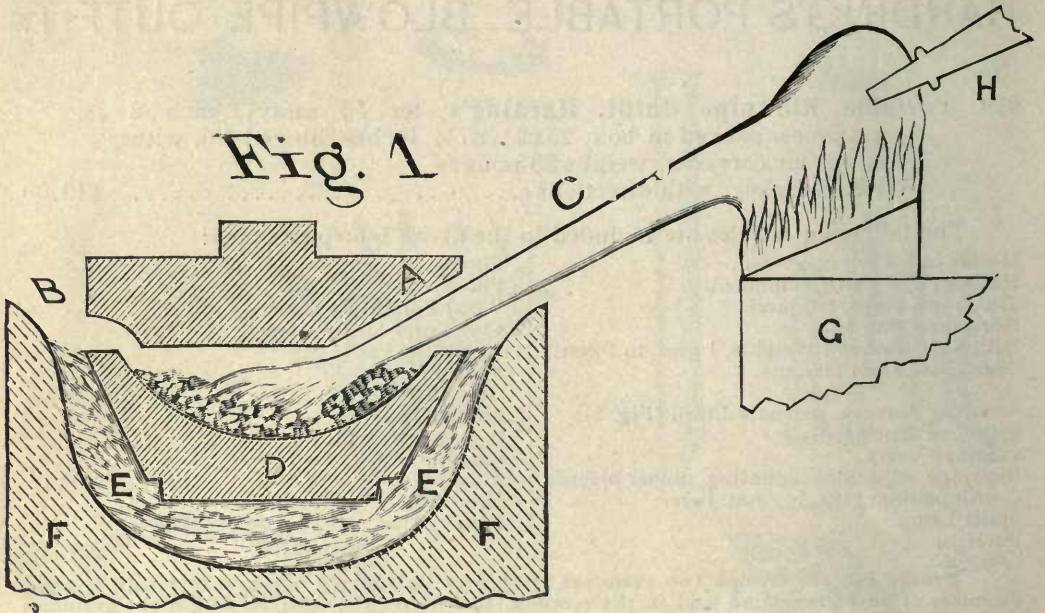
**SECOND, CUPELLING**—The lead button is prepared in the ordinary way for cupellation.

The cupel is made by taking a new scorifier and filling it with dry bone ash and pressing down the surface as hard as you can, and smooth, with a depression in the center about ⅝ of an inch in diameter and ⅙ of an inch deep. A wood former is provided for this operation.

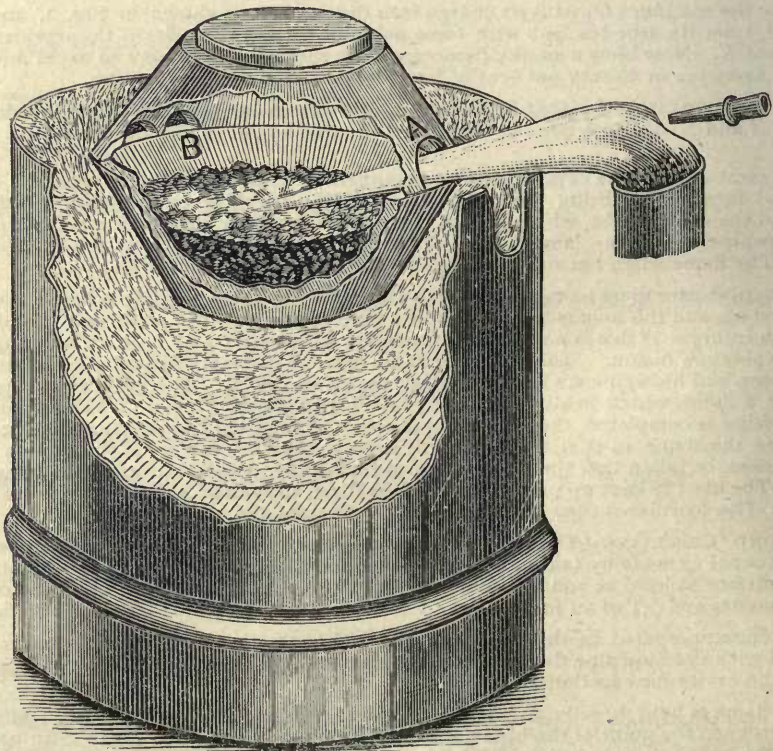
The cupel, prepared in this way, is placed within the furnace (without a cover), as Fig. 2, and heated with the blowpipe flame until all the moisture is expelled. Then the lead button is placed in the cavity for cupellation.

The flame is held directly on the lead until the litharge begins to form. After this it is necessary to keep the point of the blue flame at one side of the molten lead. The object of this is to keep the bone ash at a sufficiently high temperature to absorb the litharge as fast as it is formed. Close attention must be paid to this part of the operation.

The flame should be directed to any point where litharge is inclined to accumulate, otherwise the operation is as the ordinary cupellation in the muffle furnace.

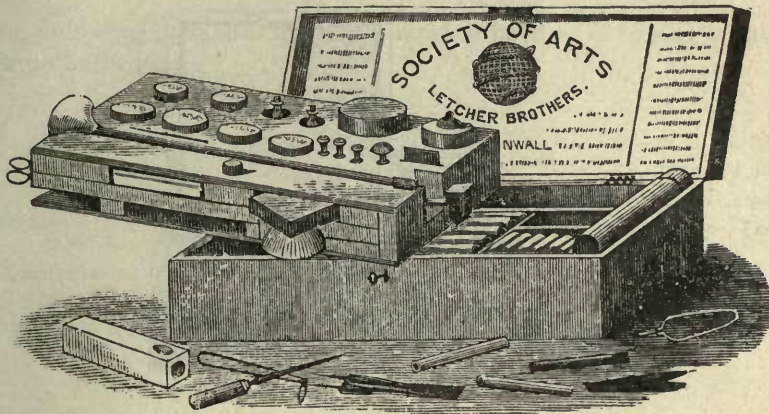


279



279—Figure 2





281-3-5

## BLOWPIPE APPARATUS IN SETS.

No. 281 **Society of Arts Blowpipe Apparatus**—These blowpipe cabinets are unequaled in cheapness and quality, compactness and portability, and in arrangement of apparatus.

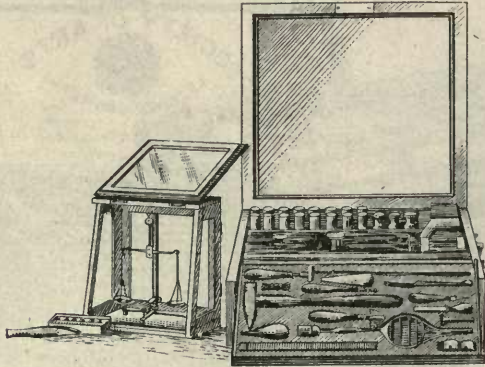
**Set A**, in mahogany box, contains:

- |                   |                            |                    |                        |
|-------------------|----------------------------|--------------------|------------------------|
| Blowpipe.         | Magnet.                    | Boiling Dish.      | Borax.                 |
| Spirit Lamp.      | File.                      | Open Tubes.        | Bone Ash.              |
| Grease Lamp.      | Scissors.                  | Closed Tubes.      | Fluor Spar.            |
| Hammer.           | Cupel Striker.             | Glass Rod.         | Assay Lead.            |
| Anvil.            | Bone Spatula.              | Blue Glass.        | Cobalt.                |
| Pestle and Guard. | Platinum Wire.             | Litmus Paper.      | Nitrate.               |
| Platinum Forceps. | Platinum Foil.             | Tumeric Paper.     | Potassium Bi-sulphate. |
| Brass Forceps.    | Tin Foil.                  | Brazil Wood Paper. | Copper Oxide.          |
| Lamp Tweezers.    | Magnesium.                 | Soda Paper.        | Silver.                |
| Test Tube Holder. | Pastille and Cupel Holder. | Sodium Carbonate.  | Chloride and Potassium |
| Chisel.           | Pastilles.                 | Microcosmic Salt.  | Iodide of Sulphur.     |

Price..... \$14.00

283 **Blowpipe Apparatus, Set B**, in polished mahogany box, with initial plate, contains, in addition to the above, platinum tip to blowpipe, agate mortar and pestle, and gold bead ..... 17.50

285 — **Set C**, contains same apparatus as B, in mahogany box, with the addition of 48 carefully selected test minerals in tubes arranged in a drawer. These minerals afford good examples in practice for both elementary and advanced students ..... 20.00



287

No.  
287 Fine Blowpipe Set for both qualitative and quantitative analysis. Made by C. Osterland, Freiberg, Germany. All contained in polished mahogany box,  $13\frac{1}{2} \times 12\frac{1}{2} \times 4\frac{1}{2}$  in., with brass grip handle at one end. Enclosed in stout leather case with straps; weighs complete, 22lbs. Contains the following implements, all of finest construction, brass and nickel finish, packed in velvet lined recesses, in trays and in tin boxes:

- |   |   |
|---|---|
| 1. Balance— $3\frac{1}{2}$ in. nickel-plated beam. New arrangement to arrest the pans. Beam support always vertical. Sensible to $\frac{1}{10}$ M. G., with two pairs metal removable pans and vial to take the specific gravity of ores. | 26. Coal Crucibles.   |
| 2. Folding Glass Case for No. 1.  | 27. " Capsules or Dishes.   |
| 3. Set Weights of sheet platinum and aluminum, 1000 milligrammes to $\frac{1}{10}$ M. G.  | 28. Porcelain Clay Crucibles.   |
| 4. Pair Horn Pans, balanced.  | 29. " " Capsules.   |
| 5. Harkort's Ivory Scales for measuring cupel beads.  | 30. Square Coal Holder, with platinum wire and guard plate.                                 |
| 6. Pair Ivory Pointed Pincets.  | 31. Clay Holder for Nos. 26 and 27.   |
| 7. " Platinum Pointed Pincets.  | 32. Coal Borer, spatula end.  |
| 8. " Brass Pincets.   | 33. " " for No. 23.   |
| 9. " Steel "  | 34. " " large, for No. 28.  |
| 10. " Flat Nose Pliers.   | 35. Plattner's B. P. Lamp with folding stand.   |
| 11. " Polished Steel Scissors, with file back.  | 36. Metal Lamp for Alcohol.   |
| 12. Magnifying Glass, 2 lenses, black horn frame.   | 37. Support for Crucibles to fit stand No. 35.  |
| 13. Steel Chisel and Magnet combined.   | 38. Blowpipe, Berzelius form, trumpet mouth and platinum tip, bored to $\frac{1}{10}$ M. M. |
| 14. " Hammer, wood handle.  | 38a. Extra Platinum Tip, bored to $\frac{1}{10}$ M. M.                                      |
| 15. Combined Steel Anvil and Diamond Mortar.  | 39. Cupel Mould, with stamp and stand, after Plattner.                                      |
| 16. Agate Mortar, 2 in., and pestle.  | 40. Platinum Sheet.   |
| 17. Ivory Spoon.  | 41. Magnesium Ribbon.   |
| 18. Steel Spatula, double end.  | 42. Silver Strips.  |
| 19. Horn Mixing Capsule.  | 43. Zinc "  |
| 20. Brass "   | 44. Test Papers, blue and red Litmus.   |
| 21. Camel Hair Pencil Brush.  | 45. Platinum Wire Holder, with hollow handle and wires.                                     |
| 22. Box Soda Paper, cut to size.  | 46. Platinum Spoon, short handle, to be held by No. 7.                                      |
| 23. Boxwood Cylinder for No. 22.  | 47. Button Brush, double end.   |
| 24. Granulated Lead Measure, graduated into 5, 10, 15, 20 B. P. centners.   | 48. Open Tubes, hard glass.   |
| 25. Square Coals, with covers.  | 49. Closed Tubes, " "   |
|   | 50. B. P. Mattresses, hard glass.   |
|   | 51. Set 4 Glazed Porcelain Capsules.  |
|   | 52. Two " "   |
|   | 45 M. M. Wide.  |

No. 287 Continued.

Also the following Reagents in glass-stoppered bottles, in turned polished wood boxes, with pull-off cover.

A—Arsenic.	I—Oxide Copper.	P—Bi-Sulphate Potash.
B—Borax.	J—Test Lead.	Q—Nitrate Cobalt.
C—Soda.	K—Starch Flour.	R—Borax Glass.
D—Salt Phosphor.	L—Acid Oxalic.	S—Iodide Potash and Sulphur.
E—Nitre.	M—Sifted Bone Ash.	T—Acid Boracic.
F—Muriate Ammonia.	N—Washed “ “	U—Potassium Cyanide.
G—Plattner's Flux.	O—Iron.	
H—Chloride Soda.		

Price, complete.....\$140.00

No.  
289 **Blowpipe Apparatus**, as described in “Brown's Manual of Assaying.”

1 1 Set (3) Porcelain Dishes.	17 1 Set Moulds and Stamps.
2 1 Diamond Steel Mortar.	18 1 Pair Nippers.
3 1 Pair Platinum Pointed Forceps.	19 1 Double Lense.
4 1 “ Heavy Tip Steel Forceps.	20 1 Knife.
5 1 “ Steel Forceps.	21 1 Dropping Pipette.
6 1 Steel Chisel.	22 1 Camel Hair Brush.
7 1 Charcoal Borer, club shape.	23 6 Mattrasses.
8 1 “ “ with spatula.	24 1 Glass Alcohol Lamp, with metal top.
9 1 Pair Scissors.	25 1 Chamois Skin.
10 1 Platinum Holder, with 6 wires.	26 6 Glass Tubes.
11 1 Plattner's Blowpipe Lamp, with swivel.	27 ½ Dozen Charcoals.
12 1 Charcoal Saw.	28 Coal and Ash Trays.
13 1 Mattrass Holder.	29 2 Books Test Papers.
14 1 Plattner's Blowpipe, nickel plated.	30 Frame, with 18 glass-stoppered and labeled reagent bottles, containing the following reagents:
15 1 Platinum Tip for same.	
16 1 Steel Hammer, with wire handle.	

Test Lead.

Tin.

Phosphorous Salt.

Borax Powder.

Borax Glass.

Boracic Acid, fused.

Boracic Acid, cryst.

Plattner's Flux.

Bismuth Flux.

Carbonate Soda.

Potash Oxalate.

Salt.

Soda Nitrate.

Charcoal.

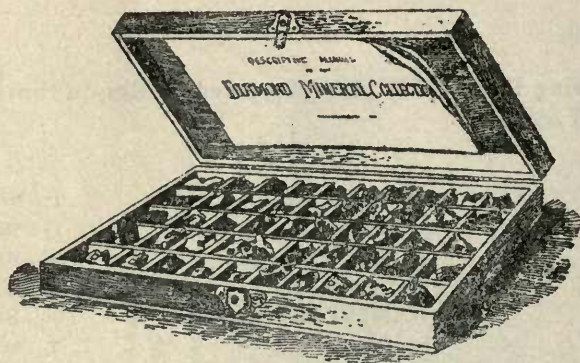
Bone Ash, sieved.

Bone Ash, washed.

Copper Oxide.

Bisulphate Potash.

Price for complete set, securely packed in neat wooden carrying case. . \$30.00



291



293

No.

291 **Diamond Mineral Collection**, in box  $11\frac{1}{2} \times 6 \times 1\frac{1}{2}$  in. A set of 50 numbered specimens, averaging one inch in diameter. Polished hardwood box with automatic spring lock, as follows :

- |                       |                 |                   |
|-----------------------|-----------------|-------------------|
| 1. Native Sulphur.    | 18. Pyrite.     | 35. Rock Crystal. |
| 2. Stibnite.          | 19. Pyrrhotite. | 36. Amethyst.     |
| 3. Graphite.          | 20. Hematite.   | 37. Milky Quartz. |
| 4. Auriferous Quartz. | 21. Magnetite.  | 38. Chalcedony.   |
| 5. Argentite.         | 22. Limonite.   | 39. Agate.        |
| 6. Cinnabar.          | 23. Siderite.   | 40. Jasper.       |
| 7. Chalcopyrite.      | 24. Pyrolusite. | 41. Pyroxene.     |
| 8. Cuprite.           | 25. Corundum.   | 42. Rhodonite.    |
| 9. Malachite.         | 26. Cryolite.   | 43. Amphibole.    |
| 10. Azurite.          | 27. Wavellite.  | 44. Garnet.       |
| 11. Galenite.         | 28. Fluorite.   | 45. Mica.         |
| 12. Cerussite.        | 29. Gypsum.     | 46. Scapolite.    |
| 13. Sphalerite.       | 30. Apatite.    | 47. Orthoclase.   |
| 14. Zincite.          | 31. Calcite.    | 48. Cyanite.      |
| 15. Willemite.        | 32. Dolomite.   | 49. Talc.         |
| 16. Calamine.         | 33. Barite.     | 50. Serpentine.   |
| 17. Cassiterite.      | 34. Celestite.  |                   |

Price ..... \$ 2.50

293 **Students' Complete Mineral Collection.** Three hundred specimens, in six trays or drawers, with recesses for each, all packed in box  $12\frac{3}{4} \times 8 \times 8\frac{1}{2}$  in., illustrating Dana's Manual of Mineralogy and Petrography. Antique oak cabinet, polished and paneled, chiffonier locks. The most complete mineral set ever offered. Any one of the six drawers can be pulled out and laid before the student.

Price, with Dana's Manual of Mineralogy and book of localities. \$50.00

## MINERAL AND CHEMICAL SUBSTANCES

To illustrate the Important Re-action of Bodies before the Blowpipe.

295 The set of 50, each in bottle, labeled and numbered, conveniently packed in box for carrying, in pocket  $7 \times 5 \times 2$  inches. Following is the list :

- |                                 |                               |
|---------------------------------|-------------------------------|
| 1. Alloy of Mercury and Tin.    | 26. Fluor Spar.               |
| 2. " " Lead and Antimony.       | 27. Feldspar.                 |
| 3. " " " " Bismuth.             | 28. Graphite.                 |
| 4. " " " " Zinc.                | 29. Galena.                   |
| 5. " " Copper, Lead and Silver. | 30. Hematite.                 |
| 6. " " Tin and Copper.          | 31. Iodide of Potassium.      |
| 7. " " Lead and Platinum.       | 32. Mica                      |
| 8. " " Gold, Silver and Copper. | 33. Molybdcic Acid.           |
| 9. Alum.                        | 34. Oxide of Cobalt.          |
| 10. Anglesite                   | 35. " " Lead.                 |
| 11. Arsenious Acid.             | 36. Oxalate of Nickel.        |
| 12. Arseniate of Copper.        | 37. Pyrolusite.               |
| 13. Bromide of Cadmium.         | 38. Quartz.                   |
| 14. Bone Ashes.                 | 39. Sulphate of Baryta.       |
| 15. Chloride of Copper.         | 40. " " Copper.               |
| 16. " " Sodium.                 | 41. " " Magnesia.             |
| 17. Carbonate of Ammonium.      | 42. " " Potassium.            |
| 18. " " Lithium.                | 43. Sulphur.                  |
| 19. Cuprite.                    | 44. Sesqui Oxide of Chromium. |
| 20. Cinnabar.                   | 45. Oxide of Uranium.         |
| 21. Calcite.                    | 46. Stibnite.                 |
| 22. Chromic Iron.               | 47. Strontianite.             |
| 23. Chlorate of Potash.         | 48. Steatite.                 |
| 24. Enargite.                   | 49. Serpentine.               |
| 25. Emery.                      | 50. Ulexite.                  |

Price..... \$10.00

By the use of the substances, No. 295, re-action of the following elements and compounds may be obtained :

Antimony.	Cadmium.	Oxygen.
Aluminum.	Chloric Acid.	Phosphoric Acid.
Arsenic.	Carbonic Acid.	Platinum.
Ammonium.	Fluorine.	Potassium.
Bismuth.	Gold.	Silver.
Bromine.	Iodine.	Sulphur.
Baryta.	Iron.	Sulphuric Acid.
Boracic Acid.	Lead.	Strontium.
Copper.	Lithium.	Silica.
Chlorine.	Mercury.	Sodium.
Calcium.	Molybdenum.	Tin
Cobalt.	Manganese.	Tungstic Acid.
Chromium.	Magnesium.	Uranium.
Carbon.	Nickel.	Zinc.

## BOOKS

UPON ASSAYING, MINERALOGY, CHEMISTRY OF METALS, BLOWPIPE, CHEMICAL ANALYSIS, ETC.

NOTE—The apparatus and chemicals described in the following books we keep on hand.

<b>Aaron</b> (C. H.)—Part I, Assaying Gold and Silver Ores. Illustrated . . . .	\$ 1.00
<b>Aaron</b> (C. H.)—Part II and III combined illustrated Gold and Silver Bullion Assaying, Melting Humid Assay Process; also, lead, copper, tin, mercury, zinc, antimony, sulphur, etc., concluding with an appendix to Part I. . . . .	1.75
<b>Abel</b> (Frederick Augustus)—Mining Accidents and their Prevention, with discussion by leading experts . . . . .	4.00
<b>Adams</b> (W. J.)—Hints on Amalgamation and the General Care of Gold Mines . . . . .	1.50
<b>Adriance</b> (John S.)—Laboratory Calculations and Specific Gravity Tables.	1.25
<b>Anderson</b> (J. W.)—The Prospector's Handbook. A guide for the prospector and traveler in search of metal-bearing or other valuable minerals. Illustrated . . . . .	1.50
<b>Armstrong</b> (Henry E.)—Introduction to the study of organic chemistry. The Chemistry of Carbon and its Compounds. Illustrated . . . . .	1.50
<b>Barr</b> (Wm. M.)—Pumping Machinery. A practical hand book relating to the construction and management of steam and power pumping machines. Two hundred and fifty engravings covering every essential detail in pump construction . . . . .	5.00
<b>Barringer</b> (Dan Morcan)—Minerals of Commercial Value . . . . .	2.50
<b>Bauerman</b> (H.)—Text-book of Descriptive Mineralogy; 12mo., cloth . . . .	2.00
<b>Bayley</b> (T.)—Pocket Book for Chemists . . . . .	2.00
<b>Beard</b> (J. T.)—The Ventilation of Mines. A work for practical mining men in their study of the subject . . . . .	2.50
<b>Beringer</b> (C. & J. J.)—Text-book of Assaying. For the use of those connected with mines, with numerous diagrams and tables . . . . .	3.25
<b>Blair</b> (A. A.)—The Chemical Analysis of Iron. A complete account of the best known methods for the analysis of iron, steel, pig iron, iron ore, limestone slag, clay, sand, coal, coke, furnace and producer gases. Illustrated . . . . .	4.00
<b>Blake</b> (Wm. P.)—The Precious Metals, with a chapter upon the unification of gold and silver coinage; the production of the precious metals, or statistical notices of the principal gold and silver producing regions of the world . . . . .	1.50
<b>Blake</b> (Wm. P.)—Report upon the Precious Metals, being statistical notices of the principal gold and silver producing regions of the world . . . . .	1.50

<b>Blount</b> (Bertram) and <b>Bloxam</b> (A. G.)—Chemistry for Engineers and Manufacturers. A practical text-book. Vol. I. Chemistry of Engineering, Building and Metallurgy . . . . .	\$ 3.50
Vol. II. The Chemistry of Manufacturing Processes . . . . .	4.50
<b>Bloxam</b> (Chas. L.) & <b>Huntington</b> (Alfred K.)—Metals; Their Properties and Treatment . . . . .	2.00
<b>Body</b> (R. R.)—The Sugar Factory Manager's Handbook of Notes, Tables, Rules and Data, for managers, engineers, chemists, overseers and others . . . . .	2.50
<b>Bolton</b> (H. C.)—Students' Guide in Quantitative Analysis, intended as an aid to the study of Fresenius system . . . . .	1.50
<b>Borchers</b> (W.)—Electric Smelting. A practical manual of the extraction and treatment of metals by electrical methods . . . . .	6.50
<b>Bosqui</b> (Francis L.)—Practical Notes on the Cyanide Process . . . . .	2.50
<b>Bowie</b> (Aug. J. Jr.)—A practical treatise on hydraulic mining in California, with description of the use and construction of ditches, flumes, wrought-iron pipes and dams, flow of water on heavy grades and its application under high pressure to mining . . . . .	5.00
<b>Brannt</b> (Wm. T.) & <b>Wahl</b> (Wm. H.)—The Techno-Chemical Receipt Book, containing several thousand receipts governing the latest, most important and most useful discoveries in chemical technology and their practical application in the arts and industries . . . . .	2.00
<b>Brannt</b> (Wm. T.)—The Metal Worker's Handy Book of Receipts and Processes. Being a collection of chemical formulas and practical manipulations for the working of all the metals and alloys, including the decoration and beautifying of articles manufactured therefrom as well as their preservation . . . . .	2.50
<b>Brannt</b> (Wm. T.)—A Practical Treatise on Animal and Vegetable Fats and Oils, comprising both fixed and volatile oils, their physical and chemical properties and uses, the manner of extracting and refining them, and practical rules for testing them. Illustrated . . . . .	12.50
<b>Brough</b> (Bennett H.)—A Treatise on Mine Surveying . . . . .	2.50
<b>Brown</b> (Walter Lee)—Manual of Assaying Gold, Silver, Copper and Lead Ores. With illustrations . . . . .	2.50
<b>Brush</b> (George L.)—Manual of Determinative Mineralogy, with an introduction on Blowpipe Analysis. New notation revised and corrected. Illustrated . . . . .	3.50
<b>Cairns</b> (Fred A.)—A Manual of Quantitative Chemical Analysis, for the use of students. New edition revised . . . . .	2.50
<b>Campbell</b> (Harry Wise)—Manufacture and Properties of Structural Steel . . . . .	4.00
<b>Classen's</b> (Herrich Boltwood)—Quantitative Chemical Analysis by Electrolysis . . . . .	3.00
<b>Clowes</b> (Frank)—Treatise on Practical Chemistry and Qualitative Inorganic Analysis . . . . .	2.50
<b>Clowes &amp; Coleman</b> —Elementary Qualitative Analysis . . . . .	1.50

<b>Clowes (Frank) and Coleman (J. B.)</b> —Quantitative Chemical Analysis..	\$ 3.60
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— “ C. P., cryst. ....	.75	.85	1.00	.15
— Phospho Molybdic .....	.....	.....	2.25	.30
— Phosphoric (glacial), in sticks .....	1.25	.....	.....	.30
— “ (diluted) .....	.40	.....	.....	.....
— “ (syrupy), 85% .....	.75	.....	.....	.....
— Picric, C. P. ....	.....	.....	.....	.30
— Pyrogallic, resubl .....	.....	.....	.....	.50
— Sulphuric, com'l, 66° Beaume.				
— In 9-lb. bottles, per bottle ... \$ .75 .....	.....	.....	.....	.....
— “ in carboys, about 180 lbs. ....	.02	.....	.....	.....
— “ in iron tanks, 1600 lbs .....	.01½	.....	.....	.....
Tanks, each \$8.00.				
— Carboys, each, \$2.25				
— Sulphuric, strictly C. P., sp., gr., 1,845, free from arsenic, nitrogen, organic matter and sulphurous acid, in 1-lb. bottle .....	.40	.....	.....	.....
— 9-lb. bottle .....	.30	.....	.....	.....
— in carboys about 180 lbs. ....	.15	.....	.....	.....
Carboys, each, \$2.25				
— Sulphuric, fuming .....	.65	.....	.....	.....
— Sulphurous .....	.40	.....	.....	.....

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
<b>Acid, Tannic, C. P.</b> .....	\$.....	\$.....	\$.....	\$ .30
— Tartaric, C. P., cryst.....	1.00	1.25	1.50	.20
— “ “ powdered.....	1.00	.....	.....	.....
<b>Alcohol, 95%, 1 gal. tin</b> .....	\$3.25	.....	.....	.....
— “ ½ gal. bottle.....	1.65	.....	.....	.....
— “ ¼ “ .....	.90	.....	.....	.....
— “ 1 pt. “ .....	.50	.....	.....	.....
— Wood, per gallon .....	1 50	.....	.....	.....
— Absolute, per lb. ....	4.00	.....	.....	.....
<b>Alum, powered</b> .....	.10	.....	.....	.....
— cryst.....	.10	.....	.....	.....
— Ammoniacal, pure .....	.50	.....	.....	.10
— Chromic, C. P.....	.....	.60	.70	.15
— Ferric, cryst.....	.50	.60	.....	.15
<b>Aluminum, in slabs, ingots, sheet and wire, at lowest market rates.</b>				
— Acetate, pure dry.....	.....	.....	.....	.25
— Chloride, “ .....	1.25	1.50	1.75	.20
— Sulphate, pure.....	.80	.....	.....	.15
— Acetate, pure cryst.....	1.25	1.50	1.75	.25
— Arsenate.....	.....	.....	.....	.35
— Bi-Carbonate, cryst .....	1.50	1.75	2.00	.25
<b>Ammonium, Bi-Chromate, chem. pure, cryst</b> .....	1.25	1.50	1.75	.25
— Bi-Sulphate .....	1.50	1.75	2.00	.30
— Bromide, U. S. P.....	1.00	.....	.....	.20
— Carbonate, com'l, bulk .....	.20	.....	.....	.....
— “ chem. pure .....	.60	.75	.90	.15
— Chloride (sal ammoniac) gran., bulk ..	.16	.....	.....	.....
— “ “ “ lump, “ ..	.16	.....	.....	.....
— “ chem. pure, gran .....	.50	.60	.75	.15
— Chromate, neutral, pure.....	3.25	.....	3.75	.50
— Fluoride, cryst .....	.....	.....	.....	.35
— Hydrate (Aqua Ammonia) 20° Beaume in 4½ lb. bottle, per bottle..\$ .90	.....	.....	.....	.....
— in carboys .....	.12	.....	.....	.....
— in tanks .....	.10	.....	.....	.....
— Carboys, each, \$2.50				
— Tanks, each, \$10.00				
— Concentrated 26° Beaume strictly C. P., sp. gr. 0.90 Baker & Adamson, in 1-lb. bottles.....	.40	.....	.....	.....
— in 4-lb. bottles, per bottle.....\$1.00	.....	.....	.....	.....
— in carboys .....	.15	.....	.....	.....
— Carboys, each, \$2.50				
— Hydrosulphuret (sulphide), sol.....	.75	.90	1.10	.20
— Iodide.....	.....	.....	.....	.50

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
<b>Ammonium</b> , Molybdate, chem. pure.....	\$2.00	\$2.25	\$2.50	\$ .35
— Nitrate, gran.....	.50	.70	.90	.20
— " fused.....	.50	....	....	....
— Oxalate, chem. pure.....	1.00	1.25	1.50	.20
— Phosphate, pure.....	1.00	1.25	1.50	.25
— Succinate, pure, cryst.....	....	....	....	.50
— Sulphate, purified.....	.50	.60	....	.15
— Sulphite, chem. pure.....	....	....	....	.30
— Sulphocyanide, pure.....	1.00	1.25	1.50	.20
— Tartrate.....	....	....	....	.25
<b>Antimony</b> , Metallic, bulk.....	.25	....	....	....
— " chem. pure.....	....	....	....	.25
— Chloride, pure cryst.....	....	....	....	.30
— Oxide, white, true.....	....	....	....	.25
— Tartrate.....	....	....	....	.40
<b>Arsenic</b> , Metallic, pure cryst.....	.60	.75	.90	.20
<b>Argols</b> , in bulk, Red powd.....	.15	....	....	....
— In bbls., quotations given.				
<b>Asbestos</b> , long fiber.....	.50	....	....	....
<b>Barium</b> , Metal, per gramme.....	\$4.00	....	....	....
— Acetate, chem. pure.....	1.75	....	....	.25
— Carbonate, pure, prec.....	.50	.60	.80	.20
— Caustic, see Barium Oxide hydrated.				
— Chlorate, chem. pure.....	.90	1.00	1.25	.15
— " com'l, in bulk.....	.16	....	....	....
— Chloride, chem. pure, cryst.....	.50	.60	.80	.15
<b>Barium</b> , Hydrated, pure, cryst.....	.60	.75	.90	.20
— Nitrate, pure, cryst.....	.50	.60	.80	.15
— Nitrite.....	....	....	....	.25
— Sulphate, pure, precip.....	.75	.85	1.00	.15
— Sulphide, pure.....	1.15	1.30	1.50	.15
<b>Beeswax</b> , bulk.....	.45	....	....	....
<b>Bismuth</b> , Metallic, pure, bulk.....	3.00	....	....	.25
— Bromide.....	....	....	....	1.20
— Nitrate, cryst.....	3.00	....	....	.30
— Nitrite.....	....	....	....	.40
— Oxide Hydrated, pure.....	....	....	....	.50
— Oxychloride.....	....	....	....	.50
<b>Bleaching Powder</b> , Chloride Lime, in lbs.....	.20	....	....	....
— " " in 35-lb. tins.....	.04½	....	....	....
— " " in bbls., quotations given.				
<b>Bone Ash</b> , No. 2, bulk.....	.03½	....	....	....
— " 2, 100-lb. boxes.....	.03	....	....	....

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
<b>Bone Ash, No. 2, in bbls., special rates.</b>				
— " 1, in bulk .....	\$ .04½	\$....	\$....	\$....
— " 1, 100-lb. boxes.....	.04	....	....	....
— " 1, in bbls., special rates.				
— " 1, Extra, in bulk.....	.06	....	....	....
— " 1, " 100-lb. boxes.....	.05½	....	....	....
— " 1, " in bbls., special rates.				
— Washed.....	.15	....	....	....
— " 100-lb. boxes.....	.12	....	....	....
NOTE—The superior quality of our Bone Ash is well known. For many years we have supplied the mining trade West of the Rocky Mountains; also, Mexico and Australia.				
<b>Bone, Black, see Charcoal, animal.</b>				
<b>Borax, conc.....</b>	.10	....	....	....
— " sacks, per lb., special rates.				
— " " per ton, " "				
— Refined cryst., ".....	.12	....	....	....
— " " per bbl., special rates.				
— " " " ton, " "				
— Powd.....	.12	....	....	....
— " " bbl., special rates.				
— " " ton, " "				
— Glass, powd.....	.40	....	....	....
— " " in 25, 50 and 100-lb. boxes...	.35	....	....	....
— " " " bbls., special rates.				
<b>Brazil Wood, Test Papers, per doz.....</b>	\$ .50	....	....	....
<b>Bromine,.....</b>	1.00	1.25	1.50	.25
<b>Brimstone, see Sulphur.</b>				
<b>Cadmium, Metal, in sticks.....</b>	2.25	....	....	.25
— Bromide.....	....	....	....	.30
— Chloride.....	....	....	....	.50
— Nitrate, pure, cryst.....	....	....	....	.40
— Sulphide.....	....	....	....	.30
<b>Calcium, Bromide.....</b>	....	....	....	.30
— Carbonate, bulk.....	.10	....	....	....
— Chloride, fused, lumps.....	.50	.65	.90	....
— " pure gran.....	.50	.65	.90	....
— " dry white.....	.60	....	....	....
— Fluoride (fluorspar), bulk.....	.15	....	....	....
— Oxide, hydrated, from marble.....	.60	....	....	.15
— Phosphuret.....	....	....	....	.60
— Sulphate, pure, precip.....	.85	1.00	1.15	.15
— Sulphide.....	.60	....	....	....
— Sulphite.....	.50	....	....	.20
<b>Carbon, Bi-Sulphide, sol., highly rectified.....</b>	.50	.75	.90	....

	Prices per lb.			Prices
	1 lb.	½ lb.	¼ lb.	per oz.
<b>Cerium, Nitrate</b> .....	\$ . . .	\$ . . .	\$ . . .	\$ .50
— Oxalate.....				.25
<b>Charcoal, Animal (bone black)</b> .....	.10			
— Willow, powdered.....	.15			
— “ Ellis’, powdered, in ¼-lb. bottles, per doz.....	\$2.25			
<b>Chromium, Sulphate</b> .....				.35
<b>Cobalt, Metal, gran</b> .....				.60
— Acetate.....				.75
— Carbonate.....				.50
— Chloride, pure, cryst.....				.40
— “ sol.....				.25
— Chromate.....				.70
— Nitrate, pure, cryst.....				.50
— “ sol.....				.25
— Oxide.....				.75
<b>Copper, Metal turnings</b> .....	.40			
— “ gran., chem. pure.....	.75			
— “ foil, pure.....	.75			
— Acetate, chem. pure.....	1.00			.20
— Carbonate, chem. pure.....	1.00			.20
— Chromate.....				.30
— Chloride (Bi-Chloride).....	.75	.85	1.00	.20
— Cyanide.....				.30
— Iodide.....				.80
— Oxide, black.....	.60	.75	.90	.20
— “ red, pure.....	1.57	2.00	2.25	.30
— Nitrate, chem. pure.....	.80	1.00	1.25	.20
— Sulphate (blue stone).....	.10			
— “ bbls., special rates.....				
— “ Pure.....	.60	.80	1.00	.15
<b>Ether, Sulphuric, conct., 1-lb tins,</b> .....	.90			.20
— “ “ 3 “ “.....	.80			
— Squibbs, 100 c/c, tin, each.....	.40			
— “ 250 c/c, “.....	.75			
— “ 500 c/c, “.....	1.40			
<b>Fire Clay,</b> .....	.05			
— per bbl. special rates.....				
<b>Flux, Black</b> .....	.90			
— White.....	1.00			
— Plattner’s, lead flux.....	1.25			
<b>Glass, fine powdered,</b> .....	.15			
— Wool, ½ oz.....	\$1.20			1.00
<b>Gold, Chloride, dry, 15 grain bottle</b> .....	.60			

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
<b>Graphite</b> , .....	\$ 10	\$.....	\$.....	\$.....
— finest, powdered, pure.....				.20
<b>Iodine</b> , resub .....				.50
<b>Iridium</b> , metal, 15 grain bottle.....	\$2.00			
<b>Iron</b> , metal filings, coarse, .....	.10			
— “ “ fine, .....	.15			
— Wire, pure, for standardizing, 1-oz. spools.....				.20
— Metal scrap sheet .....	.10			
— “ gran., chem., pure, by alcohol.....	.50			
— Acetate, in scales .....				.40
— Arsenate.....				.30
— Arsenite .....				.40
— Chloride, dry ferric .....	.60	.75	.90	.20
— Iodide .....				.50
— Oxide, black .....	.60			.15
— “ red anhydrous .....	.80	1.00	1.20	.15
— Phosphate .....				.30
— Sulphate (copperas) .....	.05			
— “ in bbls, special rates.....				
— “ refined, pure, cryst. ....	.15			
— Sulphide (Sulphuret), bulk.....	.20			
— Tannate .....				.30
— Valerianate .....				.45
— and ammonium sulphate, pure.....	.75		1.00	
<b>Kaolin</b> , powdered .....	.10			
<b>Lead</b> , metal, chem. pure, for assaying, in small bars. ....	.15			
— metal, chem. pure in foil, rolled thin.....	.25			
— “ “ “ gran.....	.15			
— “ “ “ “ 25 lb. bags.....	.12			
NOTE.—We guarantee our granulated test lead to contain not more than .05 troy ounces of silver to the ton of 2000 lbs., consequently if 40 grammes of it are used in assaying ⅓ A. T. of ore, the silver assay is accordingly increased ⅓ troy ounces per ton of ore.				
<b>Lead</b> , Acetate (white), sugar lead, com'l.....	.20			
— “ chem. pure.....	.50	.60	.65	.15
— Carbonate, pure .....				.10
— Chloride, pure.....	1.00			.20
— Chromate, pure, fused.....	1.40			.30
— Nitrate, pure, U. S. P .....	.50	.60	.25	.20
— Phosphate .....				.40
— Protoxide (Litharge), J. T. & Co., bulk.....	.12½			
— “ 25-lb. kegs.....	.10			
— “ chem. pure, bulk.....	.15			
— “ chem. pure, 25-lb. bags.....	.13½			
— Oxide, Red (Pb.3 O4), minimum.....	.15			
— Per Oxide (Pb. O2).....				.15
— Sulphate, chem. pure.....	.60	.80	1.00	.15

	Prices per lb.			Prices
	1 lb.	½ lb.	¼ lb.	per oz.
<b>Litmus, gran</b> .....	\$ .40	\$ ....	\$ ....	\$ ....
— Paper, blue and red, per doz. sheets...	\$ .40	....	....	....
— “ blue, in book.....	.10	....	....	....
— “ red, “.....	.10	....	....	....
— “ blue or red, 12 books in each box, per box.....	.60	....	....	....
<b>Lye, concentrated, “Our Best,” 48 1-lb. tins in case, per case.....</b>	\$3.25	....	....	....
<b>Magnesium, metal, ribbon.....</b>	....	....	....	.75
— Chloride, chem pure, cryst.....	.70	.80	1.00	.15
— Sulphate, “ “.....	.50	.60	.80	.15
<b>Manganese, Metal, per gramme.....</b>	\$ .15	....	....	....
— Chloride.....	....	....	....	.20
— Oxide, black, in bags, fine ground, for chlorination works, per ton. Quota- tions given	....	....	....	....
— Oxide, bulk.....	.05	....	....	....
— Sulphate, pure cryst.....	.90	1.00	1.25	.20
<b>Mercury, (Quicksilver) in iron flasks, 76½ lbs. lowest market rates</b>	....	....	....	....
— less than flasks, in bottles.....	.60	....	....	....
— Bi-Chloride (corrosive sub.), (Mercuric Chloride), (Recrystallized) Merck's....	2.00	2.10	2.25	.30
— Bi-Chloride, Commercial.....	.80	....	....	....
— Bi-Sulphate (see Sulphate).....	....	....	....	....
— Chloride (Calomel), (Mercurous Chloride), (Mono Chloride).....	2.00	2.10	2.30	.25
— Cyanide.....	....	....	....	.50
— Nitrate (Mercurous).....	....	....	2.25	.35
— Oxide, black.....	....	....	2.25	.40
— “ red (Mercuric), levigated.....	....	....	1.75	.25
— Pernitrate (Mercuric).....	....	....	....	.35
— Sulphate (Bi-Sulphate) (Mercuric).....	1.60	....	2.00	.25
<b>Molybdenum, metal, per gramme.....</b>	\$ .60	....	....	....
<b>Nickel, metal, granulated.....</b>	1.50	....	....	.20
— Acetate.....	....	....	....	.50
— Chloride.....	....	....	....	.30
— Nitrate, pure.....	....	....	....	.30
— Oxalate.....	....	....	....	.50
— Oxide, black.....	....	....	....	.30
— Phosphate.....	....	....	....	.50
— Sulphate.....	....	....	....	.20
<b>Nutgalls, powdered, bulk.....</b>	.20	....	....	....
<b>Paraffine, .....</b>	.20	....	....	....

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
Phenol-phtalein, pure.....	\$.....	\$.....	\$.....	\$1.00
— " in ½ oz. bot.....	.....	.....	.....	1.25
Phosphorous .....	1.10	1.20	1.30	.20
— Red (amorph).....	.....	.....	.....	.35
Platinum, metal, see catalogue pages 143-146 .....	.....	.....	.....	.....
— Bi-Chloride, (Chloride) Solution 10%...	.....	.....	.....	1.25
Potassium, metal, 1 oz.....	.....	.....	.....	2.00
— " ½ " .....	.....	.....	.....	2.25
— " ¼ " .....	.....	.....	.....	2.50
— " ⅛ " .....	.....	.....	.....	2.75
— Acetate, chem. pure.....	.....	.....	.....	.20
— Antimonate, pure.....	.....	.....	.....	.35
— Arsenate, chem. pure.....	.....	.....	.....	.25
— Arsenite, pure.....	.....	.....	.....	.25
— Bi-Carbonate, in 1 lb. tins.....	.30	.....	.....	.....
— " " 5 " " .....	.25	.....	.....	.....
— " " 10 " " .....	.20	.....	.....	.....
— " pure, cryst .....	.50	.60	.80	.15
— Bi-Chromate, for batteries, bulk.....	.20	.....	.....	.....
— " chem. pure, cryst.....	.60	.80	1.00	.15
— Bi-Sulphate, " " " .....	.80	1.00	1.25	.20
— Bi-Tartrate, pure.....	1.10	1.25	1.40	.25
— Bromide.....	1.00	1.25	1.50	.20
— Carbonate (Salts Tartar) 1-lb. tin.....	.25	.....	.....	.....
— " 5 lb. tins .....	.20	.....	.....	.....
— " 10 " " .....	.18	.....	.....	.....
— " bbls. special rates	.....	.....	.....	.....
— " chem. pure.....	.75	.90	1.00	.20
— Caustic, white, purified, in sticks.....	.60	.80	1.00	.20
— " pure, purified by alcohol, in sticks .....	1.00	1.25	1.50	.....
— Chlorate, bulk.....	.25	.....	.....	.....
— " cryst. chem. pure .....	.60	.80	1.00	.15
— Chloride, chem. pure .....	.60	.75	.90	.15
— Chromate, " " .....	.85	1.15	1.35	.20
— Cyanide, fused for milling purposes ...	.45	.....	.....	.....
— " " " " " 10 lb. tins	.35	.....	.....	.....
— " " " " " in cases	.....	.....	.....	.....
— 120 lbs. special rates	.....	.....	.....	.....
— Cyanide, chem. pure 98%-99% .....	.60	.....	.....	.....
— " " " " in cases 112	.....	.....	.....	.....
— lbs. special rates	.....	.....	.....	.....
— Cyanide, absolutely chem. pure.....	.....	.....	.....	.50
— Ferricyanide, bulk.....	.50	.....	.....	.....
— " chem. pure.....	1.25	1.40	1.60	.30



	Prices per lb.			Prices
	1 lb.	½ lb.	¼ lb.	per oz.
<b>Potassium, Ferrocyanide, bulk</b> .....	\$ .50	\$.....	\$.....	\$.....
— " chem. pure.....	1.00	1.20	1.40	.20
— Iodide .....	3.25	3.50	3.75	.35
— Nitrate (Nitre), English refined, cryst.	.15	....	....	....
— " " chem. pure.....	.60	.80	1.00	.20
— Nitrite, chem. pure, sticks.....	1.50	1.60	1.70	.30
— Oxalate (Neutral), pure.....	.60	.75	1.00	.20
— Permanganate, pure cryst.....	.50	.60	.70	.15
— Sulphate, pure powdered .....	.45	.60	.80	.20
— Sulphide.....	.40	....	....	.20
— Sulphite.....	1.00	....	....	.20
— Sulphocyanate, pure.....	1.25	1.50	1.75	.25
— Tartrate, chem. pure.....	....	....	....	.25
— and Sodium tartrate, C. P., (Rochelle Salts).....	1.00	....	....	....
<b>Quartz, Sand, (see Acid Silicate)</b>				
<b>Resin, bulk</b> .....	.04	....	....	....
— In bbls. special rates.				
<b>Reddle, in sticks</b> .....	.20	....	....	....
<b>Silex, powdered quartz</b> .....	.15	....	....	....
<b>Silica, fine white sand</b> .....	.02	....	....	....
<b>Silver, metal, foil, proof silver</b> .....	....	....	....	1.60
— " " chem. pure, 1000 fine,.....	....	....	....	2.50
— Amalgam.....	....	....	....	.40
— Chloride.....	....	....	....	1.60
— Cyanide.....	....	....	....	2.25
— Nitrate, cryst.....	7.75	8.00	8.25	.65
— " chem. pure, Merck's guaranteed reagent .....	....	....	....	1.75
NOTE—Silver compounds fluctuate in value.				
<b>Sodium, metal</b> .....	2.00	....	....	.40
— Acetate, chem. pure .....	.75	.85	1.00	.20
— Amalgam.....	1.25	....	....	....
— Arsenate, pure.....	....	....	....	.20
— Arsenite, pure .....	....	....	....	.20
— Bi-Borate (see Borax) chem. pure, cryst..	....	....	....	.20
— Bi-Carbonate, 112 lb. kegs, quotations given				
— Bi-Carbonate, English bulk.....	.06	....	....	....
— " 112 lb. kegs, special rates				
— " chem. pure, powdered.....	.40	....	....	.20
— Bi-Chromate, for batteries, 1-lb. bottle...	.60	....	....	....
— " 5 lb. bottle, per lb .....	.50	....	....	....
— " chem. pure.....	....	....	....	.25
— Bi-Sulphate, pure cryst.....	.80	....	....	.15

	Prices per lb.			Prices per oz.
	1 lb.	½ lb.	¼ lb.	1 oz.
<b>Sodium,</b> Bi-Sulphite, cryst., pure.....	\$ .70	\$ .85	\$1.00	\$ .20
— Bromide.....	.....	.....	.....	.25
— Carbonate (Sal Soda). cryst.....	.05	.....	.....	.....
— “ “ “ bbls. special rates	.....	.....	.....	.....
— “ “ dry for assaying, bulk	.06	.....	.....	.....
— “ “ bbls. special rates	.....	.....	.....	.....
— “ (Soda Ash).....	.05	.....	.....	.....
— “ “ casks, special rates	.....	.....	.....	.....
— “ “ chem. pure, dried	.50	.60	.75	.20
— Caustic, 98% gran. in 10-lb. tins, per lb..	.15	.....	.....	.....
— “ 60% in 40 lb. cans..... “	.10	.....	.....	.....
— “ 60% “ drum, special rates	.....	.....	.....	.....
— “ 70% “ “ “ “	.....	.....	.....	.....
— “ purified sticks.....	.60	.75	.90	.20
— “ “ by alcohol, sticks.....	1.00	.....	.....	.....
— Chlorate, pure cryst.....	.70	.....	.....	.20
— Chloride (Salt) ½ ground, in sacks, per ton, special rates	.....	.....	.....	.....
— Chloride chem. pure cryst.....	.50	.....	.....	.15
— Hyposulphite, bulk, Eng. refined.....	.07	.....	.....	.....
— “ 112 lb. kegs, special rates.	.....	.....	.....	.....
— “ chem. pure.....	.50	.60	.75	.15
— Nitrate, commercial, bulk.....	.06	.....	.....	.....
— “ chem. pure, cryst.....	.50	.....	.....	.15
— Nitrite, chem. pure, in sticks.....	1.50	1.75	1.90	.25
— Nitro, Prusside, chem. pure.....	.....	.....	.....	1.00
— Oxalate, chem. pure.....	1.10	1.25	1.40	.20
— Per oxide, in tins.....	.90	.....	.....	.....
— Phosphate, twice purified, cryst.....	.40	.60	.80	.15
— Phosphite, pure.....	.....	.....	.....	.60
— Silicate, sol. (water glass), 1 pt.....	\$ .30	.....	.....	.....
— “ cryst.....	.30	.....	.....	.....
— Sulphate, chem. pure, cryst.....	.50	.....	.....	.15
— Sulphide, true cryst.....	.75	.90	.....	.20
— Sulphite, pure cryst.....	.30	.....	.....	.15
— Tartrate.....	.....	.....	.....	.20
— Wolframate (Tungstate) pure.....	.....	.....	1.00	.20
— and Ammonium Phosphate (Microcosmic Salt).....	1.25	1.50	1.75	.25
<b>Steel,</b> metal filings.....	.20	.....	.....	.....
— “ wire, piano ¼ lb. pkg.....	2.00	.....	.....	.....
<b>Strontium,</b> Caustic (Oxide).....	.....	.....	.....	.30
— Chloride, cryst.....	1.00	.....	.....	.20
— Nitrate, pure dry.....	1.10	1.25	1.40	.20
— Nitrite, chem. pure.....	.....	.....	.....	1.00
— Sulphate, purified.....	.....	.....	.....	.25

	Prices per lb.			Prices
	1 lb.	½ lb.	¼ lb.	per oz.
<b>Sulphur</b> , ground, bulk.....	\$ .05	\$.....	\$.....	\$.....
— “ bbls. special rates.				
— Sublimed, bulk.....	.06	....	....	....
— “ bbls. special rates.				
— (roll Brimstone)....	.10	....	....	....
— “ bbls., special rates.				
<b>Tin</b> , metal, pure, small bars or pencils, bulk.....	1.00	....	....	....
— pure, gran., bulk.....	1.00	....	....	....
— foil, pure, bulk.....	1.00	....	....	....
— Chloride, Stannous, pure, cryst.....	.80	1.00	1.25	.20
— Oxide, white, powdered, pure cryst. ....	1.25	1.40	1.50	.20
<b>Tumeric</b> , powdered.....	....	....	....	.15
— paper, doz.....	.40	....	....	....
<b>Uranium</b> , metal, per gramme. ....	\$3.00	....	....	....
— Acetate.....	....	....	....	.75
— Chloride.....	....	....	....	.75
— Nitrate, chem. pure.....	....	....	....	.75
<b>Water</b> , dist'd, 10-gal. carboy, per gal.....	.12½	....	....	....
— “ 5 “ dem., “ “.....	.12½	....	....	....
— “ 1 “ “ “.....	.15	....	....	....
— “ 10 “ carboy, each.....	2.25	....	....	....
— “ 5 “ box dem.....	1.75	....	....	....
— “ 1 “ “ “.....	1.00	....	....	....
<b>Zinc</b> , metal, sheet scrap.....	.10	....	....	....
— “ coarse gran.....	.25	....	....	....
— “ chem. pure, small bar.....	.50	....	....	....
— “ “ “ coarse gran.....	.50	....	....	....
— “ pure gran., free from arsenic, Merck's.	.75	....	....	.30
— Amalgam.....	1.25	....	....	....
— Bromide.....	....	....	....	.30
— Carbonate, pure precip.....	....	....	....	.20
— Chloride, dry.....	....	....	....	.20
— Oxide, by dry process.....	.30	.40	.50	....
— “ chem. pure, by wet process.....	.50	....	....	.15
— Phosphate.....	....	....	....	.35
— Shavings.....	.40	....	....	....
— Sulphate, chem. pure.....	.35	.50	.60	.15

# REFERENCE TABLES AND INFORMATION.

## COMPARISONS AND EQUIVALENTS.

The U. S. Standard of weight is the Troy pound, and was copied in 1827 from the imperial Troy pound of England for the use of the U. S. Mint, and there deposited. It is standard in air at 62° Fabr., the barometer at 30 inches.

### Troy Weight.

- 24 grains = 1 dwt.
- 480 " = 20 " = 1 oz.
- 5760 " = 240 " = 12 " = 1 lb. = 22.816 cub. in. of distilled water at 62°.

### Avoirdupois Weight.

- 437.5 grains = 1. oz.
- 7,000. " = 16. " = 1 lb.
- 700,000. " = 1600. " = 100. " = 1 cwt.
- 14,000,000. " = 32,000. " = 2000 " = 20 " = 1 ton.

### Apothecaries' Weight.

- 20 grains = 1 scruple.
- 60 " = 3 " = 1 drachm.
- 480 " = 24 " = 8 " = 1 oz.
- 5760 " = 288 " = 96 " = 12 " = 1 lb.

### Metric, or French Weights.

	Grammes.	Troy Grs.	Troy Ozs.	Troy Lbs.	Avoir. Ozs.	Avoir. Lbs.
1 Milligramme .....	= .001	= .01543				
1 Centigramme .....	= .01	= .15432				
1 Decigramme .....	= .1	= 1.5432				
1 Gramme .....	= 1.	= 15.432	= .032	= .00267	= .03528	= .0022047
1 Decagramme .....	= 10.	= .....	= .321	= .02679	= .3528	= .022046
1 Hectogramme .....	= 100.	= .....	= 3.215	= .26792	= 3.52758	= .22046
1 Kilogramme .....	= 1000.	= .....	= 32.150	= 2.6792	= 35.2758	= 2.2046
1 Myriagramme .....	= 10000.	= .....	= .....	= 26.792	= .....	= 22.046
1 Quintal .....	= 100000.	= .....	= .....	= 267.92	= .....	= 220.46
1 Tonneau .....	= 1000000.	= .....	= .....	= 2679.2	= .....	= 2204.6

### Metric, or French Linear Measure.

	Metre.	U. S. Ins.	Feet.	Yards.	Miles.
1 Millimetre...	= .001	= .03937	= .00328		
1 Centimetre...	= .01	= .3937	= .0328		
1 Decimetre...	= .1	= 3.937	= .32808	= .10936	
1 Metre.....	= 1.	= 39.3704	= 3.2808	= 1.0936	
1 Decametre...	= 10.	= 393.704	= 32.808	= 10.936	
1 Hectometre...	= 100.	= .....	= 328.08	= 109.36	= .0621375
1 Kilometre...	= 1000.	= .....	= 3280.8	= 1093.6	= .621375
1 Myriametre...	= 10000.	= .....	= 32808.	= 10936.	= 6.21375

## Reference Tables and Information.—Continued.

## Metric, or French Cubic or Solid Measure.

	Cu. Metres.	U. S. Cu. Ins.		U. S. Cu. Ft.	U. S. Cu. Yds.
1 Cubic Centimetre .. =	.000001	=	.061025		
1 Cubic Decimetre... =	.001	=	61.025		
1 Centistere..... =	.01	=	610.25	=	.353156
1 Decistere..... =	.1	=	6102.5	=	3.53156
1 Stere..... =	1.	=	.....	=	1.3080
1 Decastere..... =	10.	=	.....	=	13.080
1 Hectostere..... =	100.	=	.....	=	130.80

## Assay Ton Weights.

The Assay Ton Weights is a system made up from a comparison of the Avoirdupois, Troy and Gramme Weights, and will be found extremely simple and useful, saving a vast amount of calculation and labor.

The unit of the system is the assay ton=29.1666 grammes. Its derivation will be seen at a glance.

1 lb. Avoirdupois=7,000 Troy grains.

2,000 lbs.=1 ton.

$2,000 \times 7,000=14,000,000$  Troy grains, in one ton Avoirdupois.

480 Troy Grains=1 oz. Troy.

$14,000,000 \div 480=29.1666$  Troy ozs. in 2,000 lbs. Avoirdupois.

There are 29.1666 milligrammes in one assay ton (A. T); hence 2,000 lbs. is to 1 A. T. as 1 oz. Troy is to 1 milligramme.

Therefore, if 1 A. T. of ore assays 1 milligramme of gold or silver, the ton contains 1 ounce Troy.

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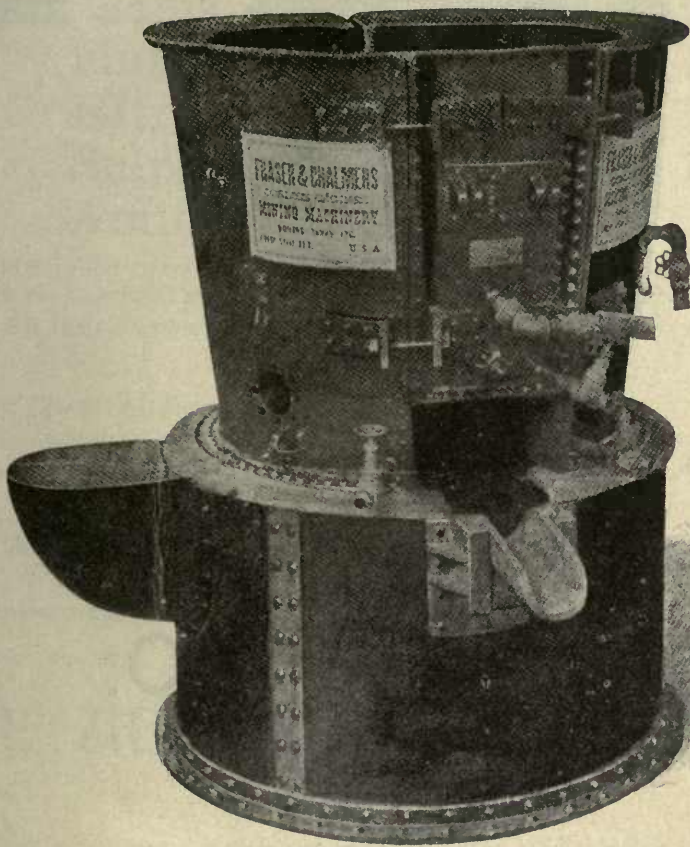
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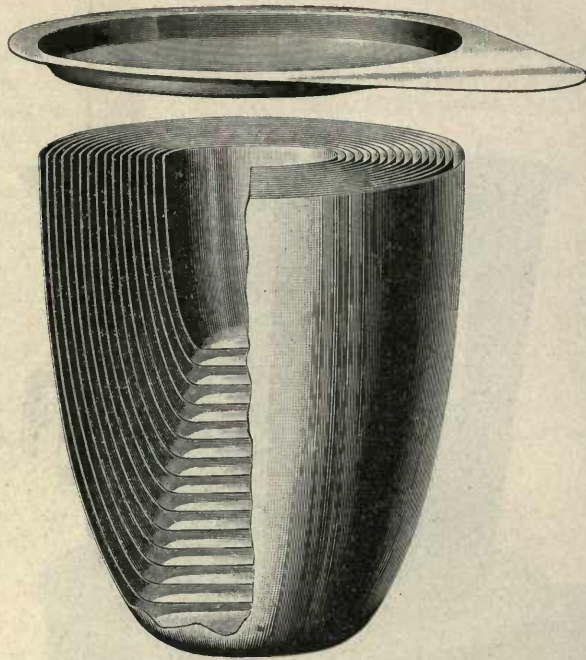
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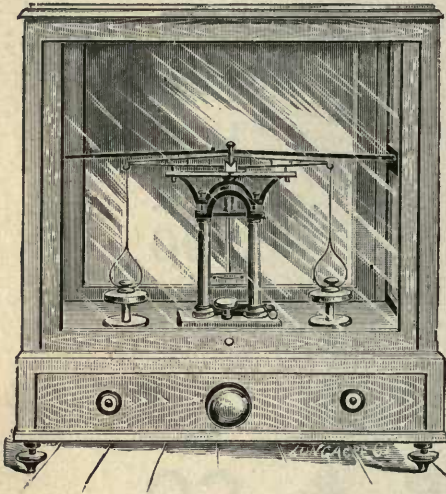
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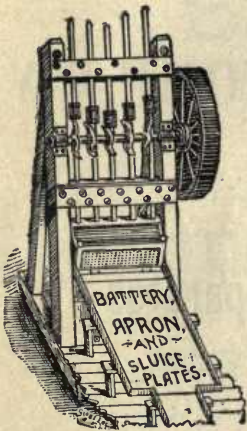
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IT IS A curious fact that there does not exist in the English language a single complete treatise on Metallurgy. There are a number of smaller text-books mainly adapted to the use of students, which cover the entire field, but make no pretense of describing it with any thoroughness of detail; and there are a number of very admirable works dedicated to the metallurgy of individual metals.

"Such being the position of our literature on this subject, I venture to think that I am rendering a distinct service in submitting a translation of the most recent and most exhaustive work on the subject in any language from the pen of that eminent metallurgical authority, Dr. Carl Schnabel, of Clausthal. The object of his work has been to give a complete account of the metallurgical treatment of every one of the metals ordinarily employed, together with all the recent improvements in the art, whilst at the same time pointing out the scientific principles underlying each process, and illustrating each by examples drawn from actual practice in various parts of the world."

—From the Author's Preface.

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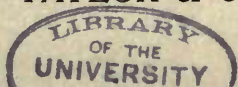
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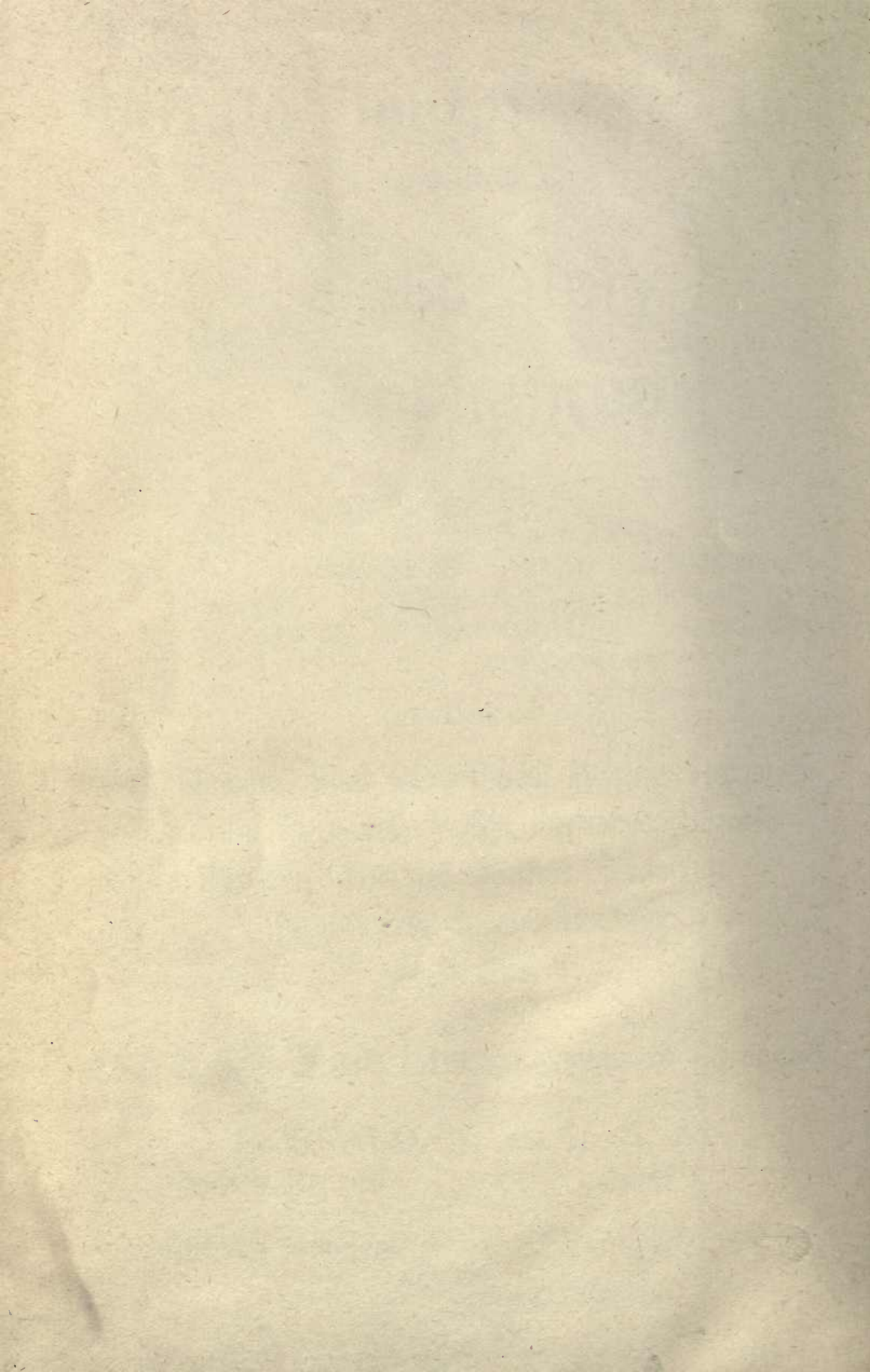
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