

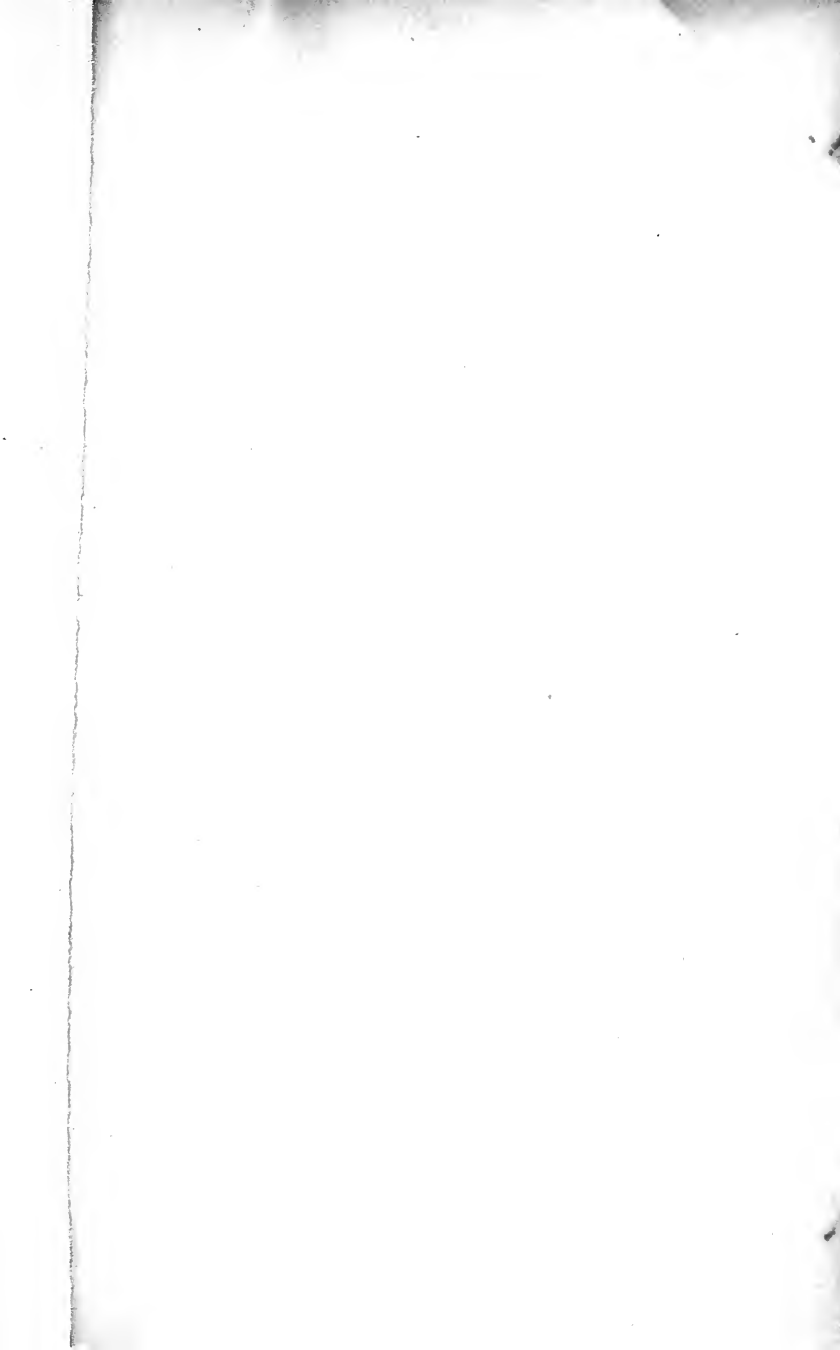
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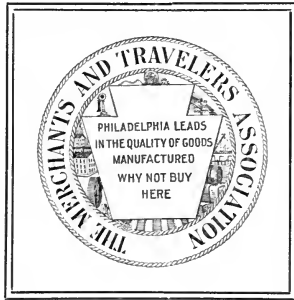






Tales of the Trades

A Presentation of Facts Concerning the
Making of Articles in Everyday Use



PUBLISHED BY

The Merchants and Travelers Association

PHILADELPHIA

1906

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THE MERCHANTS AND TRAVELERS ASSOCIATION
PHILADELPHIA

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PHILADELPHIA, PA.

Foreword



IN sending out this publication, which is intended to show something of the vastness and diversity of Philadelphia's manufacturing interests, and also the strength of the tactical position occupied by her wholesale houses, the MERCHANTS AND TRAVELERS ASSOCIATION of Philadelphia desires to say a few words concerning its work.

Formed for the purpose of exploiting the manufacturing and distributing advantages of the city, it has also endeavored to obtain such concessions from the railroads as would more readily induce the merchants throughout the country to visit Philadelphia when on their buying trips—one result of these efforts being the stop-over privilege. All tickets on any road *via* Philadelphia now carry a stop-over privilege.

The Association has constantly and effectively advanced the City's trade interests by a publicity campaign which has been broad in its scope and which has been an important factor in the growth of the City's wholesale trade.

This book is one of a series of documents which have called the attention of the trade of the country at large to the paramount advantages of Philadelphia as a buying centre and the high quality of product that comes from its vast and complex manufacturing system. It is intended to present information as to general processes rather than to furnish a great array of confusing figures. It is not the purpose even to endeavor to cover the entire field of manufactures, but rather to give an interesting variety of subjects, with the hope that Philadelphia and its enterprises may become even better known and appreciated.

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Representative Business
Houses of Philadelphia

MEMBERS OF MERCHANTS AND
TRAVELERS ASSOCIATION

List of Members

BABY CARRIAGES.

L. Rieber & Co.16 North Fourth Street

BEDDING, BRASS AND ENAMELED BEDS.

Wm. H. McMahan244-48 South Second Street

BELTING, LEATHER.

Graton & Knight Manufacturing Co.132 North Third Street

J. E. Rhoads & Sons239 Market Street

Shultz Belting Co.116 North Third Street

BELTING, LEVIATHAN.

Main Belting Co.1219-1241 Carpenter Street

BONNET AND HAT FRAMES.

J. W. Calver & Co.704 Arch Street

J. Thompson Riday707 Arch Street

BOOTS AND SHOES.

DeCou Bros. & Co.613 Market Street

J. G. Grieb & Sons531 Market Street

Kern, Lauderbach & Co.53 North Third Street

Geo. S. Lott & Co.313 Market Street

Jos. I. Meany & Co.523 Market Street

Masters & Hoffman1-3 N. Fifth Street

Monroe Bros. & Co.438 Market Street

Morrison, McIlvaine & Co.11 North Fourth Street

J. R. Newton & Co.507 Arch Street

Paul Brothers333 Market Street

Philadelphia Shoe Co., Inc.12 North Third Street

Smaltz-Goodwin Co.Eleventh and Race Streets

Stevenson Bros.13 North Fourth Street

Weimer, Wright & Watkin1210-1212 Arch Street

The Geo. H. West Shoe Co.18 North Third Street

BOXES, SHOOKS AND LUMBER.

T. B. Rice & Sons Co.Mifflin Street Wharf

BRAIDS, WORSTED AND WOOL YARNS.

S. B. & B. W. Fleisher28 South Sixth Street

BRONZE STATUARY.

Bureau Bros.S. W. cor. 21st and Allegheny Avenue

BUILDERS' MATERIALS AND CEMENT.

Chas. Warner Co.Land Title Building

List of Members

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BUILDING MATERIAL AND COLD STORAGE SUPPLIES.

Frank S. De Ronde Co.221 North Fourth Street

BUTTER, CHEESE AND EGGS.

J. R. Snyder & Co.4 South Water Street

CARRIAGE AND SADDLERY HARDWARE.

Kennedy, Willing & Co.526 Arch Street

CARPETS.

Artman-Treichler Co.714 Market Street
Jas. & Geo. D. BromleyAdams and Jasper Streets
Dickey & McMasterS. W. cor. 2d & Huntingdon Streets
Dornan Bros.Howard, Oxford & Mascher Streets
H. G. FetterolfWayne Junction, Phila.
Fry, Glanz & Hall1025 Market Street
Peterson Carpet Co.1919 Market Street
F. G. Rogers1011 Filbert Street
Schofield, Mason & Co.Fairhill & Cumberland Streets
Ivins, Deitz & Metzger Co.1220 Market Street

CIGARS.

Otto Eisenlohr & Bro.940 Market Street
Gumpert Bros.114 North Seventh Street
B. Lipschutz44 North Twelfth Street
Oblinger Bros. & Co.615 Market Street
Schoenfeld & Batzofin434 Market Street
Vetterlein Bros.144-146 North Fifth Street

CIGARETTES.

Stephano Bros.904 Walnut Street

CLOAKS AND SUITS.

Blum BrothersTenth and Market Streets
Philadelphia Cloak & Suit Co.135 North 12th Street
Sacks Bros.1220-1228 Cherry Street
Strawbridge & Clothier813 Filbert Street

CLOTHING.

W. & T. Allen & Co.718 Market Street
Arnold, Louchheim & Co.N. E. cor. 11th & Wood Streets
Fleisher Bros.513 Market Street
Frank Bros. & Co.51 North Third Street
A. B. Kirschbaum & Co.Broad and Carpenter Streets
David Lees & Co.40 North Third Street
Liveright, Greenewald & Co.S. W. cor. 13th and Arch Streets
Netter, Oppenheimer & Co.38 North Third Street
Schoeneman & Salsburg57 North Third Street

CLOTHING, SUMMER AND FANCY VESTS.

A. Guggenheim & Co.1210 Race Street

CORNED TIP SHOE LACE MANUFACTORY.

Diamond Tip Shoe Lace Co.2526½ Diamond Street

COTTON YARNS.

Richard A. Blythe114 Chestnut Street

List of Members

CROCKERY, LAMPS AND GLASSWARE.

Fisher, Bruce & Co.221 Market Street

CUT GLASS MANUFACTURERS.

Quaker City Cut Glass Co.Sixtieth Street and Baltimore Avenue

DESIGNERS, ILLUSTRATORS AND ENGRAVERS.

Gatchel & Manning Co.27 to 41 South Sixth Street

DRESS GOODS.

Wm. F. Read & Sons Co.209 Chestnut Street

DRY GOODS.

Folwell Bro. & Co.625 Chestnut Street

Howett-Warner Co.429 Market Street

Miller, Bain, Beyer & Co.N. W. cor. Tenth and Filbert Streets

Strawbridge & Clothier813 Filbert Street

Wm. H. Thomas & Co.622 Market Street

Thompson, Cramp & Co.1011 Filbert Street

Watson & Co.21 South Sixth Street

W. P. West & Son11 Bank Street

DRUGS.

Smith, Kline & French Co.429-435 Arch Street

Valentine H. Smith & Co.....Second and Green Streets

DRUGGISTS' GLASSWARE AND SUNDRIES.

John M. Maris & Co.312 Market Street

DYERS AND FINISHERS.

Firth & Foster Co.York, Emerald and Adams Streets

ELECTRICAL SUPPLIES.

Frank H. Stewart Electric Co.35 North Seventh Street

ELEVATORS.

United States Elevator Co.212-14-16 Dock Street

FERTILIZERS.

Baugh & Sons Co.20 South Delaware Avenue

FLORISTS' SUPPLIES.

H. Bayersdorfer & Co.56 North Fourth Street

FLOWERS, FANCY FEATHERS AND OSTRICH FEATHERS.

J. & L. Baxter731-733 Arch Street..

J. T. Thorn Co.214 South Fifth Street

FOUNDRY EQUIPMENT.

J. W. Paxson Co.Pier 45, North Delaware Avenue

FURNITURE.

Burt Bros.2000-2014 South Ninth Street

GAS FIXTURES.

Lawrence Gas Fixture Mfg. Co.N. E. cor. Twelfth and Cherry Streets

GLASS AND CHINA.

Downs & Bean1035 Market Street

List of Members

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LEADED GLASS, GLASS DECORATORS, MIRROR MANUFACTURERS AND DEALERS IN GLASS.

Henry E. Sealey & Co., Inc.230-232 North Twelfth Street

GLAZED KID.

S. Behal & Sons124 North Fourth Street

Keystone Leather Co.325 Arch Street

GLUE, CURLED HAIR AND SAND PAPER.

Baeder, Adamson & Co.730 Market Street

GROCERS.

Finley Acker Co.121 North Eighth Street

Thos. Martindale & Co.941 Market Street

HARDWARE.

T. James Fernley505 Commerce Street

Supplee Hardware Co.503 Market Street

Wm. P. Walter's Sons1233 Market Street

Jas. M. Vance & Co.211 Market Street

HATS AND CAPS.

Frank P. Heid & Co.Thirteenth and Wood Streets

Eli Keen's Sons62 North Second Street

John McCardle331 Market Street

Thos. Rickert & Co.61 North Third Street

Frank Schoble & Co.Ninth and Oxford Streets

John B. Stetson Co.Fourth Street and Montgomery Avenue

Geo. B. WellsThirteenth and Market Streets

J. H. Welsh & Co.826 Arch Street

HATS, LADIES', MANUFACTURERS.

H. A. Eames.....1133-1135 Arch Street

HATS, TRIMMED.

Apt & Co.721 Arch Street

J. P. Strehle & Co.639 Arch Street

HEATING BOILERS AND RADIATORS.

The H. B. Smith Co.728 Arch Street

HOOKS AND EYES, ETC.

The DeLong Hook & Eye Co.Broad and Wallace Streets

HOSIERY.

Brown-Aberle Co.Palethorp and Huntingdon Streets

Brown & Hunt Co.Mascher Street and Allegheny Avenue

S. B. Ferguson & Co.Mutter Street and Lehigh Avenue

Stokes, Cromie & Co.235 Chestnut Street

Young, Smyth, Field Co.1216-18-20 Arch Street

HOTELS.

Bingham HotelEleventh and Market Streets

Hotel HanoverTwelfth and Arch Streets

Windsor HotelFilbert Street, above Twelfth

HOUSE FURNISHING GOODS.

Wm. Hodges & Co.9-11 South Second Street

IMPORTERS OF FOREIGN FRUITS.

United Fruit Co.Pier 5, North Wharves

List of Members

IMPORTERS OF TOYS, ETC.

Winters & Reinecke822 Arch Street

INJECTORS.

James A. Griffiths500 North Twelfth Street

IRON MANUFACTURERS.

R. D. Wood & Co.400 Chestnut Street

JEWELRY AND WATCHES, WHOLESALE.

S. Kind & Sons1110 Chestnut Street

Koshland & Italie Co.702 Chestnut Street

Wm. C. Penfold Co.818-820 Chestnut Street

Ritter, Kahn & Co.1315 Market Street

H. O. Hurlburt & Sons14 South Tenth Street

B. F. Williams Co.726 Chestnut Street

M. Sickles & Sons726 Chestnut Street

KNIT GOODS.

The Leicester and Continental Mills Co.,
Lippincott Bldg., N. W. cor. Twelfth and Filbert Streets

LACES AND FANCY GOODS.

Jonas Bros. & Co.1007 Market Street

McKinley, Horn & Co.1024 Filbert Street

LACE CURTAINS.

T. I. Birkin & Co.Chester, Pa.

John Bromley & SonsLehigh Avenue, below Front

Joseph H. BromleyLehigh Avenue and Lawrence Street

Pollitz, Kaufman & Co.1720 North Fifth Street

LEATHER.

Burk Bros.409 Arch Street

Cadwallader, Dougherty & Co.327 Arch Street

England, Walton & Co., Inc.258 North Third Street

Laing, Sons & Harrar30-32 North Third Street

LEATHER GOODS.

C. F. Rump & SonsFifth and Cherry Streets

LINENS, IMPORTER.

Jules Wellens2137 Howard Street

LIQUORS.

H. & H. W. Catherwood114 South Front Street

Gallagher & Burton1204 Arch Street

Huey & Christ1209 Market Street

Moore & Sinnott232-234 South Front Street

Angelo Myers311-313 North Third Street

LITHOGRAPHING.

Craig, Finley & Co.147 North Twelfth Street

Ketterlinus Lithographic Mfg. Co.N. W. cor. Fourth and Arch Streets

LUMBER.

Watson Malone & SonsLaurel Street Wharf

MANUFACTURERS OF MINCEMEAT AND PLUM PUDDING.

Atmore & Son110 Tasker Street

MERCANTILE AGENCY.

R. G. Dun & Co.1300 Betz Building

List of Members

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MILLINERY.

Bowen, Dungan & Co.	717	Arch	Street
A. H. Butler & Co.	706	Arch	Street
L. Dannenbaum's Son & Co.	806-08-10	Arch	Street
Kohn, Adler & Co.	722-24	Market	Street

MILITARY GOODS, REGALIA, ETC.

Wm. H. Horstmann Co., Inc.	Fifth and Cherry Streets.		
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NECKWEAR, MEN'S.

The Konzelmann & Oliver Co.	1024	Market	Street
Levy & Co. (Colonial Cravats)	122-24	South	Eighth Street
Thos. P. McCutcheon Bro., Inc.	621	Market	Street

NOTIONS.

W. Bodek Co.	527	Market	Street
William H. Horstmann Co., Inc.	Fifth and Cherry Streets		
H. A. Lang & Co.	512	Market	Street
Sheibley, Hettrich & Tyler	625	Market	Street
Sullivan & Bro.	629	Market	Street
Sullivan & Co.	421	Market	Street
T. H. Vannemann, Son & Co.	525	Market	Street
Young, Smyth, Field Co.	1216-18-20	Arch	Street

OIL-CLOTH.

The Geo. W. Blabon Co.	34	North	Fifth Street
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OILED CLOTHING.

A. R. Underdown	202	Market	Street
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OPTICIAN, WHOLESALE.

D. V. Brown	738-40	Sansom	Street
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PACKING BOXES AND LUMBER.

Jos. T. Pearson	1825	East	Boston Avenue
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PAINTS, ETC.

The Barrett-Lindeman Co.	1400	Frankford	Avenue
Felton, Sibley & Co.	136	North	Fourth Street
John Lucas & Co.	322	Race	Street
Eugene E. Nice	272-74	South	Second Street

PANTALOONS.

Lisberger & Wise	335	Market	Street
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PAPER.

Dill & Collins Co.	829	Filbert	Street
Garrett-Buchanan Co.	18-20	South	Sixth Street
C. S. Garrett & Son Co.	20-22	South	Marshall Street
Holten & Collins Co.	509	Ludlow	Street
Thos. M. Royal & Co.	108	South	Sixth Street
Philip Rudolph & Son	14-16-18	South	Marshall Street
John Simmons' Sons	28-30	South	Marshall Street

PAPER BAGS.

E. J. Spangler Co.	507	Ludlow	Street
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PAPER BOXES, FOLDING.

Brown & Bailey Co.	410	Franklin	Street
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List of Members

PATENT MEDICINES.

Dr. D. Jayne & Son242 Chestnut Street

PENCILS, CRUCIBLES, GRAPHITES, GREASES, ETC.

Joseph Dixon Crucible Co.1020 Arch Street

PEARL NOVELTIES.

Philadelphia Pearl Novelty Co.Twenty-third and Arch Streets

PHARMACISTS AND CHEMISTS, MANUFACTURING.

H. K. Mulford Co.412-28 South Thirteenth Street

Henry K. Wampole & Co.426 Fairmount Avenue

PHYSICIANS' SAMPLE CASES.

C. A. Dickson.....N. E. cor. Seventh and Market Street

PIANO MAKERS.

C. J. Heppe & Son1117 Chestnut Street

PLATE GLASS.

Pittsburgh Plate Glass Co.....N. E. cor. Eleventh and Arch Streets

PLUMBING, STEAM AND GAS SUPPLIES.

Ronalds & Johnson Co.139 North Seventh Street

Walls & PearsallEleventh Street and Ridge Avenue

POWER TRANSMITTING MACHINERY, ETC.

Geo. V. Cresson Co. Eighteenth Street and Allegheny Avenue

PRINTING AND ENGRAVING.

S. H. Burbank & Co.147 North Tenth Street

Geo. W. Gibbons & Sons, Inc.147-149-151 North Tenth Street

Haag & Parris406 Race Street

Ware Bros. Co.1010 Arch Street

PUBLISHING.

The Curtis Publishing Co.425 Arch Street

The John C. Winston Co.1006-1016 Arch Street

PULLEYS, WROUGHT STEEL AND PRESSED STEEL SHAPES.

American Pulley Co.Twenty-ninth and Bristol Streets

QUILTS, FANCY GOODS, ETC.

R. Blankenburg & Co.617 Chestnut Street

REMNANTS AND SECONDS OF DRY GOODS.

W. C. Brown311 Market Street

RUBBER GOODS.

Montgomery Bros.48 North Front Street

Quaker City Rubber Co.409 Market Street

RUGS.

John Bromley & SonsLehigh Avenue below Front Street

W. T. Smith & SonThird Street and Lehigh Avenue

SHIRTS.

L. Needles & Co.24 and 26 Bank Street

W. M. Steppacher & Bro.....146 North Thirteenth Street

Samuel Sternberger & Bro.....Tenth and Filbert Streets

Tutelman Bros. & Faggen60 North Second Street

List of Members

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SHIRT WAISTS.

I. Brod & Co.	1020-24	Filbert Street
M. Haber & Co.	240	Market Street
The Hagedorn-Merz Co.	Third and	Brown Streets
M. Schoenfeld & Co.	718	Arch Street
David Stern & Co.	Twelfth and	Cherry Streets

SHOE MANUFACTURERS' GOODS.

W. A. Lippincott & Co.	411	Arch Street
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SILKS AND RIBBONS.

L. Dannenbaum's Son & Co.	806-10	Arch Street
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SILK THREADS.

The Brainerd & Armstrong Co.	715	Arch Street
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SKEIN SILK DYERS.

The Peerless Co.	1845	East Willard Street
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SOAP.

J. Eavenson & Sons, Inc.	Delaware Avenue and	Penn Street, Camden
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SPORTING GOODS.

A. J. Reach Co.	Tulip and	Palmer Streets
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STATIONERS, PRINTERS AND BLANK BOOK MAKERS.

Wm. H. Hoskins Co.	904	Chestnut Street
William Mann Co.	529	Market Street
R. C. Strafford & Co.	58	North Thirteenth Street

STEAMFITTERS' SUPPLIES.

John Maneely	309	Arch Street
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STORE DISPLAY FIXTURES.

William Strauss	416	Arch Street
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STOVES, RANGES, FURNACES.

Isaac A. Sheppard & Co.	1801	North Fourth Street
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STRAW GOODS.

Jos. Potter & Son	701	Arch Street
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SUSPENDERS.

The Lockhart-MacBean Co.	1217	Market Street
Lewis Oppenheimer's Sons.	627	Market Street
Pioneer Suspender Co.	718	Market Street

TAILORS' TRIMMINGS.

Roehm Bros.	1013	Filbert Street
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TAPES AND BINDINGS.

Geo. W. Chapin	220-231	Church Street
Krout & Fite Mfg. Co.	Allegheny Avenue and	Emerald Street

TEAS AND COFFEES, WHOLESALE.

C. F. Bonsor & Co., Inc.	15 and 17	South Front Street
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TIN PLATES AND METALS.

Merchant & Evans Co.	517	Arch Street
Riter Bros. & Co.	1022	Race Street

List of Members

TOYS.

John A. Bradley244 Market Street

TRUNKS, BAGS AND SUIT CASES.

The Ward-Pepper Trunk and Bag Co.2100 Fairmount Avenue

TURKISH TOWELS.

W. H. & A. E. Margerison & Co.Emerald and Sergeant Street

UMBRELLAS AND PARASOLS.

S. S. Fretz Mfg Co.1015 Diamond Street

Hirsh & Bro.1307-11 Market Street

Suplee, Reeve, Whiting Co.823-25 Filbert Street

UNDERSKIRTS.

Paul, Enochs & Co.1220-28 Cherry Street

UNDERWEAR, LADIES'.

Kauffman & Rubin715-19 Arch Street

UNDERWEAR, RIBBED.

Querns Bros.1914-30 North Fourth Street

Stratford Knitting Mills (Wm. S. Lloyd).....Wayne Junction, Phila.

Young, Smyth, Field Co.1216-18-20 Arch Street

UNIFORMS.

S. Abrahams & Co.Thirteenth and Hamilton Streets

UPHOLSTERY GOODS AND CURTAINS.

The Cross-Eldridge Co.1215-17 Arch Street

Philadelphia Tapestry Mills,Allegheny Avenue and Front Street

Stead, Miller & Co.Fourth and Cambria Streets

Strawbridge & Clothier813 Filbert Street

VARNISH AND JAPAN.

Cincinnati Varnish Co.142 North Fourth Street

N. Z. Graves Co.S. E. cor. Third and Arch Streets

WAISTS AND SUITS, LADIES'.

I. L. Marks1015-17 Filbert Street

WHITE METAL GOODS.

A. H. Wirz917 Cherry Street

WOOD FINISHING SUPPLIES.

Lawrence, McFadden & Elliott324 North American Street

WOOD AND WILLOW WARE.

Chas. W. Neeld & Co.509 Commerce Street

WOOLEN AND WORSTED MANUFACTURING.

The Southwark Mills Co.Eighth and Tasker Streets

WOOLENS.

Henry C. Biddle & Co.41 North Tenth Street

John B. Ellison & Sons22-24 South Sixth Street

E. R. Hawkins & Co.N. E. cor. Eleventh and Arch Streets

J. R. Keim & Co.515-17 Market Street

Lippincott, Johnson & Co.1021 Walnut Street

Introduction



HILADELPHIA—the Nation's finest workshop.

Vast as is the volume of manufacture, it is not to this alone that the city owes its claim to industrial preëminence. Today, as in the past, Philadelphia stands as the foremost exponent of high quality in production. The city's position in the manufacture of what may be termed the greater products is widely known. Few are unaware of the fact that the Delaware River is the most important ship-building stream in the country; though it may not be so generally known, that, next to the River Clyde in Scotland, it is the greatest in the world. Fifteen thousand men are employed in these shipyards, and here have been turned out more than one-half the nation's navy. Both of the opposing navies in the Russian-Japanese war included Philadelphia-built ships.

Again it is known that Philadelphia's locomotives are and always have been the finest in their class of production; though the fact is not generally comprehended that eight complete locomotives are turned out from these workshops every working day in the year, and that 17,500 men are here employed in this important branch of industry. Bridges of the greatest span known are made in the Philadelphia shops. In war material, both offensive and defensive, the product of the city's mills excels; its armor plate having stood the highest tests, its guns meeting the most exacting requirements, and its armor-piercing projectiles being known throughout the world. Many processes that have borne an important part in the revolutionizing of naval methods have been perfected here. It is known too, that the foundry and machine products of this city are vast in volume and unexcelled in character, and that the refining interests in oil and sugar are equally important.

But the diversity of the manufactures of the city, and the high grade of its products, are not so generally known. In all lines Philadelphia produces the finest, its manufactures standing inflexibly for quality. Just as its battleships and locomotives have stood the test and proved their worth, so its more delicate fabrications in scores of lines have justly earned a reputation of high character.

Introduction

It is natural that this should be so, for today, Philadelphia possesses the best of the country's labor markets. Here are to be found in many lines of industry, the highest artificing skill. It is a fact well known to the manufacturer, that skill at the bench, the lathe or the loom, is passed down from father to son, every great industrial centre becoming, through a process of evolution, a storehouse of skill.

There are in Philadelphia many concerns whose business was started by the fathers and even the grandfathers of the present members. This has increased the pride of the manufacturers in their industries, and in the character of their products. Philadelphia manufacturers are constantly striving to advance the standard, and as a result, the city is preëminent in all branches of the textile industries, such as yarns, carpets, and cloth of all kinds; in glazed kid, in linoleums, in chemicals, drugs, and pharmaceutical preparations, in cordage and twine, and in a wide array of other industries.

There are upwards of three hundred lines of manufacture which include 16,000 separate establishments. The total capital invested is \$500,000,000, the number of wage earners 275,000 and the value of products \$650,000,000 annually.

Situated so close to these vast and diversified industries, the Philadelphia wholesale merchant is in a peculiarly favorable position. Many especially desirable goods may be secured by the merchant who is near the mill, that rarely reach his competitor at a distance; and he is also constantly where he can watch for opportunity to buy to the best advantage. Proximity to the mill means fresh, thoroughly up-to-date wares. A very important consideration, too, is that the jobber who is at the door of the mill knows to a certainty that he can fill orders at a moment's notice.

Nowhere, to so great an extent, is the knowledge gained in trade utilized in manufacture.

The wholesale merchant, in close touch with the buying public, is here, as in no other city, in position to have his ideas incorporated in especially desirable lines, and virtually to oversee the making of them.

It is doubtful if there is a jobbing centre which has so few transient buyers, who come to purchase once and then go elsewhere. It is the established axiom of Philadelphia houses: "Once a customer, always a customer."

Fashioning the Hat



FROM earliest ages, man has held his head covering in high regard. Styles have changed thousands of times since the primitive days when the savage hunter, after killing his prey, drew its skin over his head for protection in the next encounter. Yet through all the mutations of time, with all the changes, man has revered the hat.

There is plenty of evidence that the hat has always been an object of veneration. Pope Innocent IV made it the symbol of the cardinalate. Witness, too, the custom of raising the hat in salute, and the military form of bringing the hand to the cap in the presence of a superior officer. It is indicative of the time-honored regard for the hat that the ancient Romans, when they freed their slaves, gave to them caps as a sign of freedom. Through all the stages of evolution, from the reeking skin to the finished style of to-day, the hat has been regarded as one of the chiefest features of man's attire.

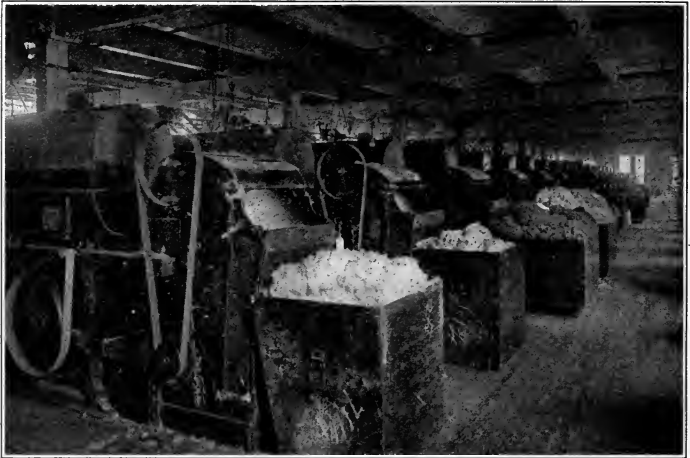
The hat of fashion is a composite of the products of many climes. The plainsman of the west or of the South African veldt, the fashionable promenader of the city, little thinks how many corners of the earth have been searched to meet his fastidious taste. Yet of all the materials that enter into the perfect headwear that has given to Philadelphia so commanding a position in the hat-making industry, no two are the product of one country.

Take, for instance, the basic element of the hat—the fur of which the felt is made. Several varieties are used in fine hat-making, and all are imported from different countries. The fuzzy beaver of our grandfather is no more; indeed the fur of the beaver has ceased, because of its scarcity and its high price, to be even a considerable factor in the making of men's hats. Clear beaver hats are made, but only in limited numbers, there being few who, such as Buffalo Bill, care to afford the luxury of such headwear.

To take the place of the beaver, has come the nutria, a little animal of the Argentine Republic whose fur is in many respects equal to that of the beaver for hatting purposes. It is indicative of the position

Fashioning the Hat

which Philadelphia has attained in the making of the finest hats, that to-day, its industry virtually monopolizes the nutria output of Argentina—a single mammoth establishment cutting fully 80 per cent. of the total export from that country. But nutria is not the only hatting fur



FUR BLOWING

Through these machines, the fur is blown until all guard hairs are removed.

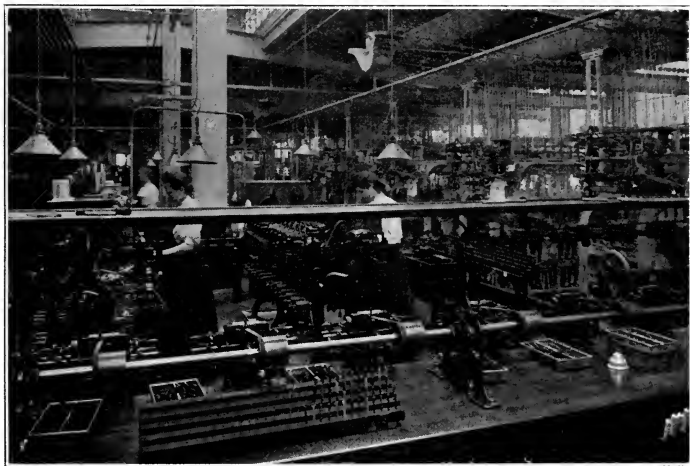
that comes from abroad to Philadelphia. Scotland furnishes 4,000,000 coney skins annually, and Germany 4,000,000 hare skins. Beaver, in limited quantities, comes from Northwestern United States, but the fur is so rare, that were it not that many of the skins are so torn or cut that they are not useful for women's garments, it would be an impossible material for hats. As with the fur, so with the other materials that enter into the production. The shellac that stiffens the felt is from India, raw silk for the bands and braid from Italy, China and Japan, the rubber for the rubber cement, used on the sweat-leather, from Brazil, and the goatskins for the sweat bands, from France and other countries.

Nowhere, except in Philadelphia, is to be seen in one establishment every part of the hat-making industry. The initial process, the prepa-

ration of the fur, for instance, is rarely seen in a factory devoted to the making of hats. Fur-cutting is in itself an important business, many concerns applying themselves to it exclusively. Here it is but one branch of a many-sided industry.

As the millions of pelts are received annually from Europe and South America, they are placed in storage, for a double reason; first, to give the protection that a large reserve stock always affords; second, because age improves the fur. There are, stored in these vast stock rooms, pelts that have remained there for a decade, improving, as old wine, with age.

As the pelt is to be used, it is first washed to rid it of foreign matter. The second process is what is known as carroting. This is the treatment of the fur with nitrate of mercury. It is this that gives to the fur its



WEAVING DEPARTMENT

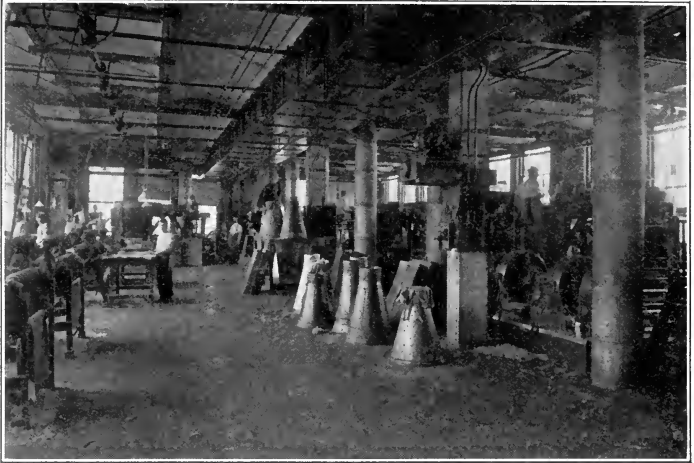
Here the bands and the braids for the hats are woven.

felted property; that quality which, in the subsequent stages, makes it knit together into a homogeneous whole, that makes the fine texture, so pleasing to the touch, found in the high-grade soft hat.

After carroting, the furs are brushed by machinery to rid them of

Fashioning the Hat

the dust and other foreign substances. All such matter is carried away by blowers attached to the machines, so that the fur comes away as fluffy and clean as the fuzz of a newly hatched chick. There is, however, one interesting intermediate process. This is the removal of the



FELTING DEPARTMENT

Over these yard high cones the hat first takes its shape.

guard-hairs—the long, coarse hairs that cover the short, fine, soft coat of so many fur-bearers, such as the seal and the beaver and the nutria. The removal of the greater part of this is done by a machine, one element of which is electrical apparatus that raises the guard hairs as straight up from the skin as the quills of a porcupine. Then the machine clutches the raised hairs, and tears them away from the softer, shorter fur beneath. Subsequent to this comes a long and intricate blowing process that removes the last of these coarse, undesirable hairs.

When the pelts are thus prepared, they go to the cutting department. Here by rapidly revolving shears, the fur is stripped away as cleanly as a barber removes a beard. As the fur comes away from this machine it retains the shape of the pelt; indeed as it lies on the endless moving apron it would be taken for the pelt itself. But the denuded

skin lies beneath the cutting machine, shredded so that it is of no value except for use in the making of glue. After cutting, the fur is sorted according to color and quality. It passes through a number of hands, each selecting the fur from a particular part of the skin, whether belly, side or back fur. As many of the finer soft hats are natural color, it is upon this sorting that the final result largely depends. Following this process of selection, the fur is weighed, and the amount to be used in a hat of a given weight is placed in a box by itself, when it is ready to go to the forming department. It is here that the hat first takes shape—a crude shape to be sure, but nevertheless foretelling the finished product that is to come.

A copper cone, fully a yard high, and almost as large in diameter at the base, and looking like a sieve with its hundreds of tiny perfora-



FINISHING ROOM

Skilled workmen are employed in this process as the hat nears completion.

tions, is placed on a revolving table, within the felting machine. Then the fur, previously weighed out to go into a single hat, is fed into the machine. Before it reaches the revolving cone, it is caught up in a powerful current of air and projected as individual and separate hairs,

Fashioning the Hat

into the felting chamber. This current is drawn by an exhaust fan through the perforations of the hollow cone, but the hundreds of thousands of hairs that it carries are caught upon the damp outer side of the cone, and in a minute's time form a complete covering of thin felt. When the cone is removed from the machine, and immersed in water with its coating of fur, this can be stripped away and the hat has taken its first shape—three feet high, and nearly as great in diameter at the base. This, technically, is the hat cone. An automatic drier expels the water from the soft mass of felt, which is then ready for the "sizing-room." Here the hat is shrunk to approximately the size of a man's head. This is done by repeated plunging in hot water, and by manipulation, and can only be done by skilled workmen.

It must now be blocked—a skilled hand process. The curling of the edge of the brim of the finer grades of soft hats was one of the features that first stamped Philadelphia-made hats with the hall-mark of quality. A brim may be turned by iron, mechanically, but it will not hold its shape as well as when skillfully manipulated by hand.

The shellac which sustains the stiff hat is applied by machinery, the application being so regulated that a greater quantity is in the brim than in the crown. Shellacing is done after the dyeing process, and when the hat has passed through these two stages, and has been dried, it is again the clown-shaped cone, except that it is black and stiff. For the subsequent process of forming the hat over blocks—of blocking—it must be repeatedly immersed in hot water, and with each immersion it softens and becomes pliable. Yet the shellac and the dye remain constant throughout this trying process. The hat is now ready for finishing. It must be put through the process that imparts its smoothness and its glossiness. Placed upon a revolving table, it is polished with a very fine quality of emery paper.

Outside of Philadelphia there is no establishment that is complete within itself—that makes every part of the hat. Here is a complete weaving establishment, where the bands and the braids and the binding in all the various shades, and in the finest qualities, are made.

A high standard, especially in the earlier stages, and persistent culling in every department, means the turning out of finished product that represents the acme of hat-making skill.

There are no cheap hats made in Philadelphia factories; there are not such fine hats made elsewhere. The Philadelphia jobber is compelled to go to other manufacturing centres for his low grades, while all the world that wants the finest, comes to Philadelphia to be supplied.

Raising an Umbrella



If you will raise and lower a high-grade umbrella, and note the perfect freedom of movement, the staunchness of the frame, the snugness with which all the parts fold together; and if you will then follow the process of umbrella-making, you will perhaps marvel at the lightning rapidity with which this smooth-running cloth-covered piece of mechanism is turned out. A coil of steel wire is rolled from a freight car into the stock room at one end of a modern umbrella factory, while at the other end enters raw silk—an unshaped mass of fibre. Through intricate processes, these two approach each other until at the last stage they come together and in a twinkling become a finished umbrella.

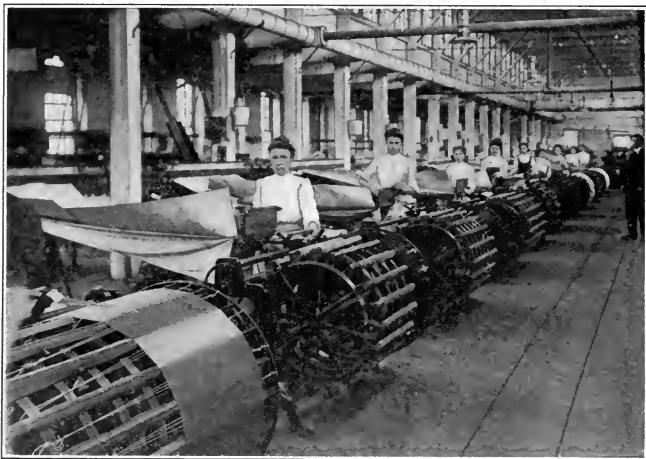
Manifold as are the courses through which the raw stock must pass before it becomes the fabricated product, yet the process is very simple. Take first the cover. As the raw silk enters it is tested for quality. Then it must be dyed, the sombre black for umbrellas, and the multitude of shades for parasols. The making of the warp, and the weaving is the same as in any silk-making process, except that the material for umbrellas is woven a special width. But the woven silk must now go through a number of special processes to make it suitable for umbrella purposes—that is to make it impervious to rain. As it passes through machines specially made for the preparation of umbrella covering, it is brushed by rotary steel brushes which spread the fibre in order to make it more dense. In the first machine these brushes spread the fibre from the middle of the silk outward, in the next from the edges inward, and in the last from end to end. This somewhat resembles the felting process, to which woolen fabrics are more or less subjected, the tiny holes in the silk being closed up by this spreading of the fibre.

After this process the silk must be gone over by hand, as there will still be little holes in the material through which rain might percolate. So an operator, sitting with the silk hung between herself and a strong light, so that she may detect any openings, closes them by scratching them with a steel needle. Now the silk is ready to be cut into umbrella covers and goes to the cutting department. The seven sections of the

Raising an Umbrella

cover are of course alike, and are rapidly cut by hand, the cutter using a triangular shaped pattern. The edges must now be hemmed and the covers sewed. Then the little eyelets which are used in the fastening of the umbrella are stamped in.

While the covering has been going through this process, the frame has been shaped in another department. The round wire is first drawn



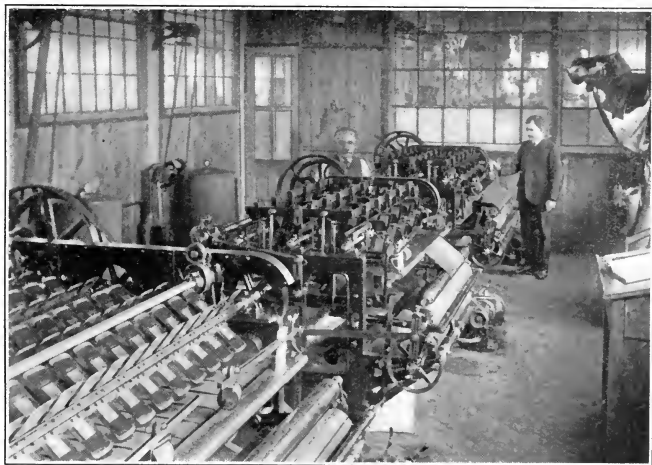
WEAVING THE UMBRELLA SILK

Umbrella and parasol silk must be woven of special width.

between rolls until it is flat. Then it passes between finishing rolls which bring it to the required width and thickness without the deviation of the thousandth part of an inch. It is necessary that there should be this accuracy or in the subsequent rapid process the high grade of frames and the smooth running of the parts could not be attained. This ribbon of steel must now be tempered and must pass through an annealing and tempering process, after which it is impossible to break it by bending it in the hands. It may be crushed under great strain, but will not break. The metal now passes into a machine which curves it into the trough shape of the umbrella rib, fashions the ends and cuts off the required length for a rib all at one operation. Another machine makes the tiny balls that go on the ends of the ribs.

If the frame of an umbrella, commonly termed "the ribs" is examined carefully, it will be noted that there are five parts. There is first the long rib which extends from the top to the outer edge of the umbrella cover; there are the stretchers which extend from these ribs inward to the handle connecting with what is known as the "runner;" and there are the connection joints, technically termed "the lap connection" which hold the stretcher to the rib. Now in the best frame the stretcher, when the umbrella is closed, should lie completely within the trough of the rib, thus making a closer fold. To manufacture a frame in which this is achieved, and in which there are also the elements of strength and freedom of movement, has been the effort of the umbrella maker.

Perhaps no point in the making of the umbrella has called for greater ingenuity than the connection of the rib to the stretcher. In the best process no metal at all is cut out of the lap to give place to the little pivot which must hold the stretcher; but instead a machine has been devised



RAIN-PROOFING THE MATERIAL

These machines, with their rotary steel brushes, spread the fibre.

by which the metal is merely pushed outward. Then the pivot is inserted and finally the ragged metal that has been pushed outward is hammered back in place. This means, therefore, no appreciable weakening of the rib.

Raising an Umbrella

Yet while all these improvements have been going forward, the number of processes has been reduced. The old style rib required twelve different processes; the new rib but three. One of these machines operates with such rapidity that it can do its special branch of work on twelve umbrellas a minute. As there are seven ribs to the umbrella this is faster than one rib a second.

Next the ribs and stretchers are taken to the japanning room. Here they receive their coat of black, and here also, after being dipped in oil, are placed in ovens, remaining there for two hours. From here they travel to the frame-making room where they are bound together at the top of the rod with aluminum coated wire. The headings and runners for the rods are now gathered together, and the frame is completed. Now it goes to the assembling room where it is to be covered. Here in a twinkling the covers are sewed on the frames by hand. A corps of inspectors are in waiting to examine the umbrella for any defect in the making.

Finally the umbrellas are taken to an adjoining room, where the handles are attached. In no department is greater care shown than in this. These handles do not come to the large factories completed, but in parts. For instance, there will be a wooden section and a silver top, or there will be filigree work in which the silver must be attached to the wood. These parts are assembled by expert workmen, being glued together with jewelers' cement. Hundreds upon hundreds of styles of handles are shown by the large umbrella factories and it is in range of designs as well as in the quality of workmanship throughout that the production of the Philadelphia establishments excels.

Philadelphia was the birth-place of the umbrella industry in the United States, and here to-day is the only factory where every part of the process of umbrella making may be seen. From the city's factories in this line are turned out the very finest in umbrella and parasol production. Many of these various processes require special machinery and it is indicative of the position of Philadelphia in this branch of manufacture that a number of the best of these machines have been invented here and indeed have been made in the factory machine shops. The umbrella requirements of the United States are 40,000 a day, or nearly 15,000,000 a year. The capacity of the Philadelphia factories is one-third that number, and more umbrellas are turned out here than from the shops of any other city. The high skill of the Philadelphia workman and efficient organization mean the utmost economy of production.

The Manufacture of Worsted Yarns



HAVE you ever examined closely a strand of worsted yarn? Have you observed how soft it is, its even thread, and its great strength compared to its airy lightness? Then see if you can trace the evolution of this magical condition, from the crude wool you've seen shorn from a sheep's back.

Yarn spinning has been one of the employments of mankind since primeval times, and the simple devices which were used by the ancients continued to be the spinning implements of civilized communities until times that are astonishingly recent. It was not until the middle of the eighteenth century that human ingenuity turned its attention to improving the methods of spinning, but since then efforts have been put forth incessantly. As a result, there has not been developed in the whole range of mechanical industries, more complex or delicate machinery than is used in the making of worsted yarns.

From its early history, Philadelphia has held a commanding position in the manufacture of worsted yarns; indeed it is natural that so important a centre for all kinds of textiles should excel in this basic process. To-day, remarkable as the statement may seem, Philadelphia has overtaken even Bradford, England, in the race for supremacy in this industry, and has been justly termed the "Worstedopolis" of the world. All classes of yarns are manufactured here—those for cloth, carpets, underwear, etc., and also the different styles of yarns used in hand-knitting and crocheting, such as Knitting Worsted, Saxony, Shetland Floss, Spanish Worsted, Germantown Zephyr, Ice Wool, etc.

Yarns for manufacturing purposes are classed together as "bulk" yarns; those for hand-knitting and crocheting are styled "bundle" yarns. Hand knit and crocheted garments have been in high fashion for some time past and the art of knitting and crocheting, therefore, continues its great popularity. It is generally recognized that only the best yarns should be used for this purpose, and it is in "bundle" yarns, as well as in "manufacturing" yarns that Philadelphia has always excelled. There is in Philadelphia a single mill making a specialty of "bundle" yarns, which turns out more of this class of product than all

other American mills combined. It is in such a mill that the modern processes of yarn manufacture, with its intricate operations, may best be studied—from the time the raw wool enters, until it leaves in the form of beautifully colored yarns.

To the sorter, into whose hands the fleece first passes when it reaches

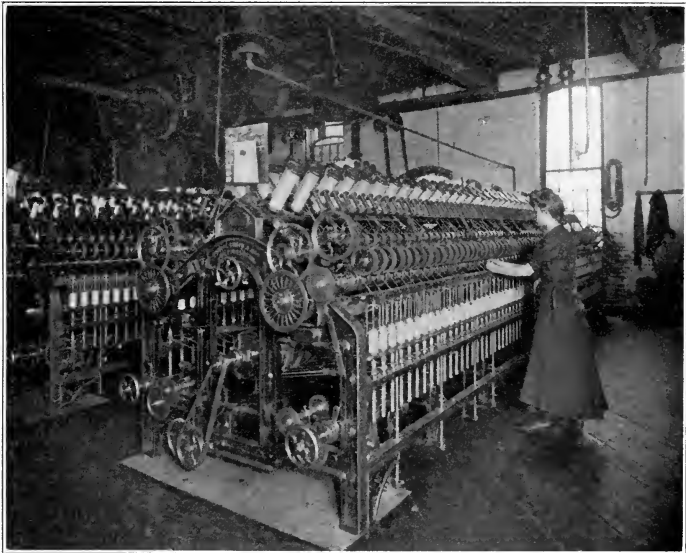


THE COMBING DEPARTMENT

The combs remove the short fibres so that the yarn may be strong and uniform.

the mill, falls one of the most delicate and responsible tasks in the manufacture of worsted yarns. Keeness of eye, precision of touch, judgment as to the relative values of wools imported from various countries, or procured from our own states and territories—all this is part of the equipment of an experienced sorter. He reckons with the forces of nature, knowing that the steady glare of the Australian sun, or the damp raw winds and rains of the American plains, produce changes in the wool while it is still on the back of the sheep. The average fleece is divided into about ten different sorts, or grades. These are placed in separate baskets and are not permitted to mix.

From the sorting room the wool is sent through a chute to the scouring department, each grade being scoured separately. First, however, it goes into a feeder which contains apparatus to open it out before it goes directly into the scouring liquor. The scouring machine consists of three long troughs where steel fingers seize the greasy material and draw it along, repeatedly immersing it in the scouring solution. The first bowl contains a solution of soap, caustic soda and water, the second a milder mixture, and the third only lukewarm water, where the wool is thoroughly rinsed.

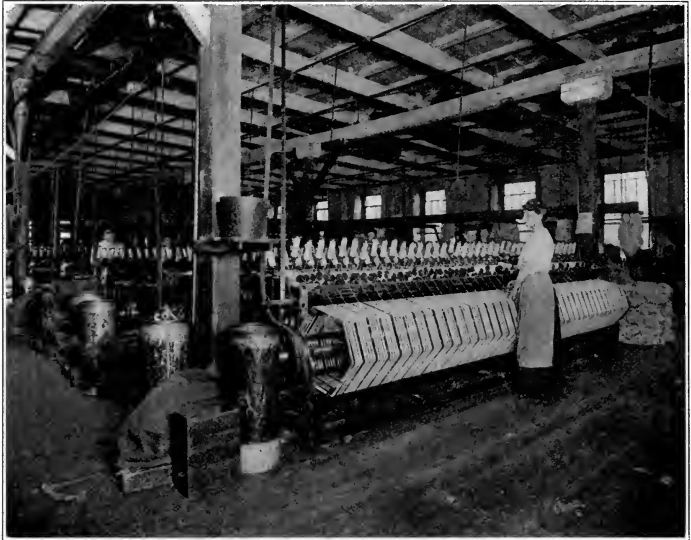


SPINNING FRAMES

These machines transform the product into yarn—some soft and lofty, others flat and wiry—according to the purpose for which they are to be used.

The wool is then taken up and carried on an automatic apron through another opener and passes into the drying machine, through which it travels on a slowly moving wire apron. Various blasts of air meet the wet material; the first hot, the second somewhat milder, the

last cold. By the time the wool has passed through this machine it has become free of all moisture. A very important factor in this process is the soap, which must be absolutely pure, as, should impure grades be used, the wool is liable to become harsh and brittle. So great is the care



THE REELING ROOM

The reel in the foreground is making small regular skeins, some yarn for hand knitting or crocheting.

that must be taken, that many manufacturers have their own soap-making plants so as to be sure to obtain the quality desired.

From the drying machine the wool drops into a pan, whence it is conveyed through pneumatic tubes directly to the carding machines. In the carding process it is properly opened. These machines consist of series of cylinders bound with wire clothing made of needles set closely together. As the wool passes through the cards, it is licked from one cylinder to the other, the needles picking the fibres apart and at the same time throwing off any waste material such as burrs. It emerges

from the last of the needle-covered rollers in a smooth, fine stream with all the fibres nicely drawn out lengthwise.

The wool then goes through the combing machine, which consists of double circles of steel pins. It is drawn through these pins as through a comb, whence the name of the process is derived. In this process the noil, or short fibre, is removed, while the long fibres are drawn out smooth and even into a strand about two inches thick, technically termed "top." The short fibre which this machine discards is not suitable for worsted yarns, but is sold to be used for other purposes.



THE DYEING DEPARTMENT.

Here the raw yarn is dyed into all colors—from the deep rich shades, to the most delicate of tints.

In the drawing process, the wool is gradually drawn out finer and finer until the strand is from one-eighth to one-half inch thick. It is made into different thicknesses according to the purpose for which the yarn is to be used. Thus drawn it is termed "roving."

Now it is ready to be spun into yarn. The spinning frames are long machines, upon which are set hundreds of spindles which revolve to extremely high speed. As the spindles revolve the yarn is drawn out to the desired fineness and is given the required twist. The purpose for which the yarn is to be used determines the exact amount of twist to be put into it—certain uses demand tight, highly twisted yarns, while others require soft, lofty yarns. Watchful eyes are constantly engaged in seeing that the yarn is running perfectly smooth and uniform.

From the spinning room the yarn is taken to the twisting department, where it is made into two, three, four, or whatever fold may be desired.

The yarn is then reeled into skeins according to requirements—those for manufacturing purposes into large hanks, and those for hand knitting and crocheting into small uniform skeins. After the yarn is reeled it is taken into the examining department, where girls look over the product carefully in order to cull any that may show the slightest defect.

The dyeing is one of the most interesting processes. After the yarn is thoroughly scoured, it is put on sticks, and on these goes into the dye vats. At each side of the vats stand men who keep the poles moving to and fro constantly, in order that the yarn may be thoroughly permeated with the dye. After it has attained the desired shade, it is carefully rinsed and taken to the drying-room. Here it is put on long poles and left until thoroughly dry.

Crocheters and knitters demand yarns of many delicate shades and tints, and to satisfy these tastes is one of the exactions placed upon the manufacturer of "bundle" yarns. The greatest care must be taken with the colors to see that they are always uniform. The formulas for this kind of work must be exact, and no deviation from them can be permitted. Temperature and weather play an important part in the working out of results, as do also the kind and quality of the chemicals—and the dyer must consider every circumstance or condition that would tend to alter the result for which he is striving.

After the yarn is dyed, scoured and thoroughly dried, it is taken to the putting-up department. The yarns for manufacturing purposes are put into large bundles or bales, while the knitting and crocheting yarns are put up in small boxes so that they may be kept clean in shipping and while lying on the dealers' shelves awaiting the pleasure of the consumer.



How Piece Goods Are Made



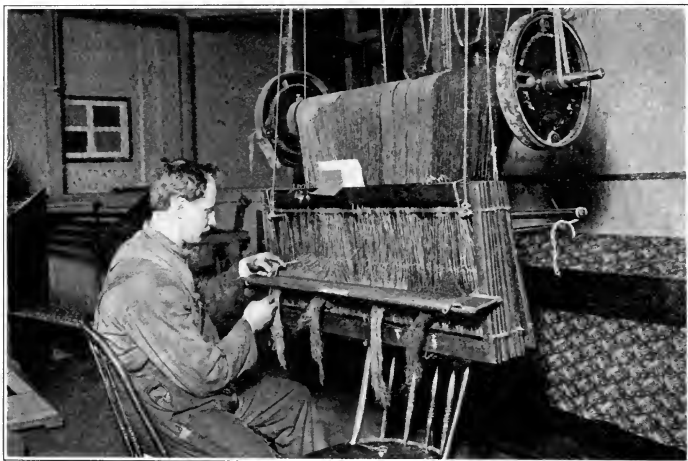
TEXTILES are the foundation of the Philadelphia industrial structure. Important as are the shipyards of the city, its locomotive shops and its various mills which turn out the greater iron and steel products, yet its looms and the various processes in the manufacture of textile fabrics give employment to by far the greater number of workmen and operatives. Virtually all classes and grades of worsted and woolen fabrics are made in the multitude of mills. Carpets constitute the great volume of manufacture, yet the finest in women's wear and in men's suitings, and the greatest range of specialities, are covered by the Philadelphia mills in this field. Ninety-three mills turn out woolen goods of the value of \$19,000,000 annually, and thirty-six that are devoted to worsted piece goods turn out product of the value of \$16,500,000 annually. There are here the largest mills, outside of the trust, devoted to the manufacture of high grade worsted and woolens. There are mills which run exclusively on women's dress goods, whose product is unequalled in this country. Many specialities that have taken their permanent place in favor originated in Philadelphia. Mills devoted to men's wear make product which is not excelled in that line.

Each class of goods has its own individual treatment, and this begins with the selection of the wool and is carried through to the finishing. For this reason we see in the sorting room of one of these vast mills wools from all corners of the globe. There are the fleeces of sheep ranging the plains of the states and territories of our own country as well as those of South America; there is the long staple Irish wool, Australian and Icelandic.

While each grade of goods has its own biography, yet the general process of spinning and weaving is common to all. Through the scouring and the carding they take the same course. There are two processes of spinning worsted yarns, the English or Bradford system and the French, each being best suited to the manufacture of certain classes of goods. The softness that is found in much of the material made, for instance, for women's wear, is attained by the use of yarn spun by the French system.

How Piece Goods Are Made

In the Bradford system the yarn is of longer fibre, while in the French it is drawn straight, although of shorter wool, which gives it a softer "feel." In this latter process it would be absolutely impossible to work the wool in a clear, dry atmosphere, as it would pull apart. A



DRAWING IN THE WARP

Before the weaving the threads must be drawn through the eyes in the harness frame.

device known as the humidifier is employed to overcome this difficulty. This throws out water in atomized form, keeping the air constantly moist.

Two kinds of yarn are used in weaving cloth. One, the warp, extends from end to end of the fabric; the other, the filling, interlaces at right angles with the warp. Being put to more strain and friction than the filling, the warp is twisted more.

After the yarn is taken from the spinning machines on spindles, it is first spooled, and then comes the warping process. In this the yarn is run upon great beams, so that, when placed upon the loom, it unwinds in the form of a wide continuous sheet, which needs only the interlocking filling to make a fabric.

Before the weaving process the warp threads are drawn through a harness. It is this harness which governs the number of threads which

are to be up, and the number which are to be down, when the shuttle, which carries the filling, passes between them. Variations in patterns are obtained by regulating the number of warp threads that shall be up or down, and adjusting the various harness so that they will be up or down, at the right moment. This automatic raising and lowering of the harness is one of the most interesting features of the modern loom.

When the material is woven it must still pass through many processes before it is ready for the market. There is the crabbing process to take out the wrinkles and bring the material smooth and straight. It must be washed, must go through the napping and fulling machines, must be dyed, dried and pressed, and finally steamed to give it lustre. One of the interesting processes which follows the weaving is the felting process to which all woolen fabrics are more or less subjected. If a fibre of wool



SHEARING AND SINGEING MACHINES

As the piece goods pass through these machines, the loose fibre is removed.

is examined under the microscope, it is seen that it is covered with fine teeth like those of a saw. These act like small barbs, interlocking with each other, and it is this which gives to the wool its felting property. The derby hat is an illustration of pure felt, the wool not being woven at

all, but the fibres being compressed until they form a fabric. Fine worsteds are woven and slightly felted, while broadcloth is both woven and felted. A piece of muslin is woven only. You can see through the cotton—you cannot see through the hat or broadcloth, In the felting machine, the fabric is pounded until it is felted to the desired extent.

There is a striking process which is used in the making of some worsted and woolen fabrics to remove any vegetable matter that may still be in the piece. This is known as the carbonizing process. The piece first passes at a rapid rate through a solution of vitriol. If there were in the fabric any cotton threads these would be eaten out in this bath. From this plunge in vitriol the piece passes through a high degree of heat which chars all vegetable matter.

Last comes the dyeing and the finishing. It would seem to the uninitiated to be an impossibility to place a piece of goods in a dyeing tub and to have it come out with part of the fabric dyed and the other part undyed. Yet this is exactly what the manufacturer attains by a very simple process. If he desires a thread of red to run through goods which are to be dyed in the piece, he merely introduces into the piece, in the weaving process, a thread of red cotton. Now, wool will rob cotton of dye. When this piece of goods is placed in the dyeing vat the wool takes the dye, the cotton does not. Cotton is vegetable and hard to penetrate. Wool is animal, porous, and will absorb dye.

No two kinds of material are treated alike in the finishing process. Serges, for instance, must go through machines to remove all the loose wool that raises above the surface. There are two methods of making this smooth finish. In one, the serge is sheared by passing over knives somewhat like those of a lawn-mower, which revolve at extremely high speed. In the other it is passed at lightning speed through a flame which singes the loose wool but which leaves the fabric uninjured.

The process of finishing broadcloths is very long and involves much hand labor. The nap must be sheared to bring it to the required length; it must be brushed so that the nap may all lie in one direction, and it must go slowly over rollers under steam in order to obtain the desired lustre. This means, in the finest of the broadcloths, a process that extends through weeks. It is first of all the fineness of material selected, and then the care with which this finishing process is conducted, which make broadcloth quality; and it is the high standard in these two matters set by the Philadelphia manufacturers of broadcloth which has made the product of this city the acme of quality in this branch of the textile industry.

Building a Suit of Clothes



WHY is Philadelphia clothing better, more satisfactory to dealer and wearer than that made in other manufacturing centres? For three simple and obvious reasons, which do not all three apply to the product of any other city.

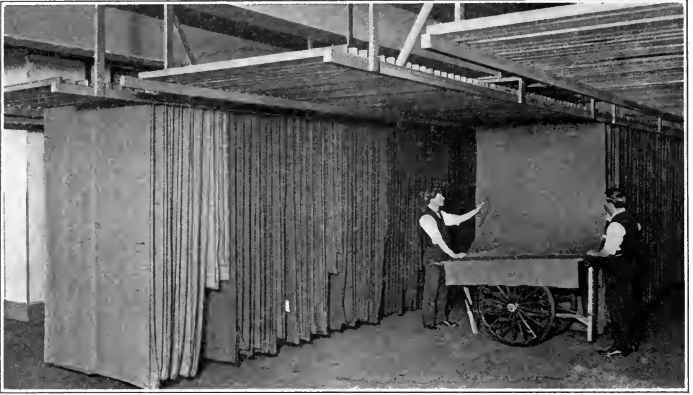
First and foremost is the fact that here, clothing is made under the most sanitary surroundings. The work is done in healthful workshops by operatives who, being well paid, are as a class more healthy and cleanly than they would be were they illy-paid. Second, Philadelphia makes the finest fabrics for the manufacture of men's clothing. The clothing manufacturer has a strong position in his proximity to the mills that turn out piece goods. Third, and perhaps most important in its bearing upon clothes-quality, is the fact that the Philadelphia manufacturer is in the atmosphere of the best style. Indeed, it has become so well-known as not to need argument, that Philadelphia is a well-dressed city—a city of right styles.

The Philadelphia maker of clothing, then, has a strong and unique position in his branch of the city's many-sided industry. Here it is not a branch that is of recent growth. Shortly after 1820, when the clothing factory industry began in the United States, Philadelphia had several establishments in operation. In 1860 Philadelphia production in this line was approximately equal to that of all New England. To-day the factory output of men's clothing reaches an annual value of upwards of \$20,000,000. Not content with keeping abreast with competitors, the Philadelphia manufacturer in this line has led the way in the introduction of new devices that mean economy of production, and has, therefore, been able to place his goods on the market at the very lowest cost consistent with quality.

In a modern, up-to-date clothing factory, expense in production is, first of all, saved by a systematic laying out of departments so that the goods may take a natural progress through the establishment, from the time they enter as piece goods until they leave in cases as finished product. But more than this, economy comes in the lightning-like rapidity

of process, a rapidity that is all the more remarkable when the finished garment is seen, perfect in all its details.

Piece goods, as they are received, first pass under the scrutiny of the inspector. Then comes the first process in clothing manufacture,



DRYING WOOLENS AFTER SHRINKING

Thousands of yards are hung up in this chamber before going to the cutting tables.

and one upon which largely depends the finished result. This is the shrinking process. There are two places that the garment can shrink, first, when it is under the iron, and second, when it is on the back of the wearer. It is to overcome shrinkage at either time that care must be taken in this early process. It is obvious that if the best results are to be attained, the garment should come out, in its finished state, precisely the size of the pattern made by the designer. That this may be achieved, it is necessary, first of all, and before the goods are cut, that they be shrunk as much as it is possible to shrink them. Then the piece will keep its place when the tailor takes it in hand, and will not shrink still more to become, in size, smaller than the designed pattern. The ordinary fulling process of the textile mill is not sufficient for the clothing manufacturer who seeks to produce satisfactory product. It is, therefore, supplemented. There is, first, steam shrinking, and there has now been introduced into this country the cold-water method, which leaves the goods shrunk as much as it is possible for the wool to shrink.

It is now necessary to refinish the goods, and in this process, they are placed between sheets of hard finished cardboard and subjected to a pressure of many tons. The fabric now has a permanent finish, and is ready to be made into clothing. It is also necessary to shrink to the same degree the haircloth and the canvas that are to enter into the garment. It is readily understood that if the cloth is shrunk and the inner fabric unshrunk, or vice versa, there will be a pulling that will mean ill-fitting clothing. Both canvas and haircloth are shrunk fully 15 per cent. in length before they are ready to be cut for the garment.

The shrinking process ended, the cloth is ready for the cutter. For each style and for each size of every style there are separate patterns. These are made of pasteboard, drawn by a skilled designer, each corresponding with a certain part of the suit. There are sixteen separate parts of a coat, ten for a vest and seven for a pair of trousers.



SECTION OF TRIMMING ROOM

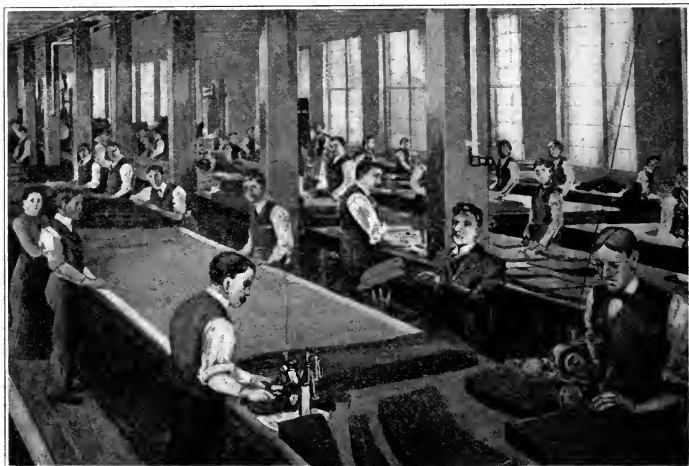
The various parts for the garment are here arranged and laid out.

Now, the cloth having been laid on the tables in from twelve to twenty-four thicknesses, the patterns are laid upon them and a skilled workman marks the outlines on the cloth with wax chalk. This, of

Building a Suit of Clothes

course, is an important step; as any error, even the slightest, is likely to result in an ill-fitting garment. To prevent errors an expert passes upon each lot before and after cutting.

This process of cutting is not the laborious one with which all are



CUTTING THE GARMENTS

Circular knives, revolved at high speed by electricity cut through many thicknesses of material.

familiar from seeing the tailor at work with his shears. As many as a dozen coats are cut at one time. An instrument, one element of which is a circular knife that revolves with the rapidity of a circular saw, is guided along the lines drawn upon the top of two dozen thicknesses of cloth, laid one above the other. The knife, driven by an electric motor, is speeded to 2,400 revolutions a minute, and with an ease that the great tailor's shears never knew, it slices through the many thicknesses of material. For small lots of clothing the shears are still used.

The thirty-three different pieces that compose the garment are then turned over to a workman whose duty it is to separate the coat, vest and the trousers pieces into separate bundles. The size tickets are also put on at this time, one on the fore part, one on the back part and one on the

undersleeve of the coat, one on the neck of the vest, and one on the forepart of the trousers. There is an entirely separate force of employees who are doing their work while the cloth is being marked and cut; these are the trimmers. It is their province to prepare all linings and all accessories that make up a coat. A very important part in the manufacture of clothing is the matching of the linings, buttons and similar details. An expert is employed to do this work, whose duty it is to see that the exact shade of lining is put in the coat to match the outside material. The buttons must also match, and even in the detail of sleeve lining, the pattern is in harmony with the outside cloth.

The garments are now ready for the tailoring floor. Here are machines whose processes amaze by their rapidity. There is a button-holing machine that makes seven buttonholes a minute. First, a knife lowers and cuts through the cloth, a slit the length of the buttonhole. Then it lifts to give place to a needle which automatically travels around the opening, stitching in the buttonhole almost with the rapidity of thought. Another machine trims up the pocket, and at the same operation, binds it.

Then the garment is passed on to the expert tailor. There is no substitute for hand-work in the setting up of a coat, if the coat is to retain its shape. Collars and fronts must pass through the careful hands of the expert, if the exactions of a critical taste are to be met. When the coat is shaped and made, the fronts are subjected to a pressure of 6,000 pounds. Then the entire garment is pressed by hand.

All of these garments are fitted upon a human figure before leaving the factory, forms not being used in any case. In order to carry out this method of fitting, it is necessary to have men of all the many sizes that are being turned out. Throughout the process of manufacture there are numerous and rigid inspections, so that the slightest imperfection may be noted, and if possible, corrected. The product finally goes to the "lay-out" floor, where the orders of thousands of customers are assembled for shipment.

This department is one of the most interesting of all such great establishments. The system here must be of the most perfect kind, owing to the multitude of accounts and the great number of orders that must be handled simultaneously. The shipments are assembled on low tables, reaching but a foot above the floor, and as each is complete it is cased. Each one of the multitude of customers has his own number throughout the year, and the assembling is by number throughout.

A quiet revolution has been going forward in the clothing business—

Building a Suit of Clothes

a revolution which, in each of its stages, has made for better production, and better satisfaction to the consumer, both in fit and quality.

In former years the manufacturers had all the operations incidental to the manufacture of clothing, except the cutting, done outside of their own places of business. The unmade garments were distributed among many operators who returned them when completed. The result was that almost every garment had faults, due to errors in judgment or unskilled workmanship, and there was a deplorable lack of uniformity in tailoring and fit. Formerly, too, before processes were perfected so that the high grade product of the present day might be achieved, very little of the finest of woolen fabrics was used in the factory production of men's clothing. But as processes were gradually improved, and as, consequently, garments which came more and more to meet the approval of the discerning buyer were turned out, a better class of fabrics came to be used. To-day, the best factories cut the highest grade of worsteds and woolens.

The Creation of Women's Garments



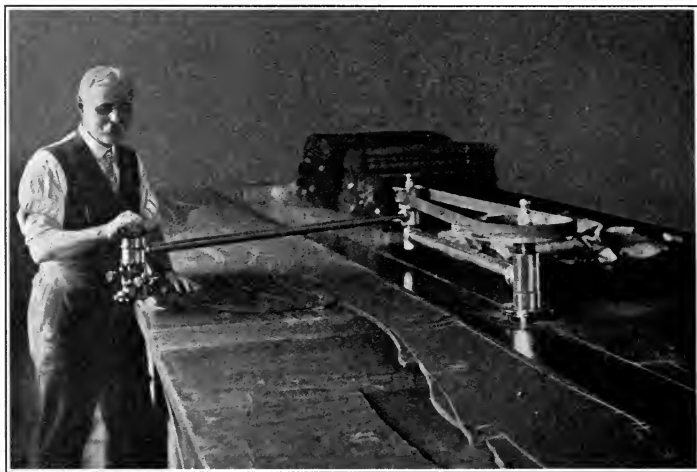
It is a recognized fact that American women are among the best-dressed in the world. They seem to know intuitively what is right, they wear their clothes well, and they have that indefinable something known as good taste. This being so, it follows naturally that the manufacturer of women's garments who can successfully cater to the fastidious taste of American woman-kind, who can follow the mad turning of the wheel of fashion, must carry into the conduct of his business ability of a high order.

In the manufacture of women's cloaks and suits, skirts and waists, Philadelphia holds a leading position, volume and character of production considered. Side by side with the great textile mills which have formed the corner-stone on which rests the city's fame as a manufacturing centre, has grown up this closely-allied industry. Taking the product of the loom, the many establishments devoted to this branch of manufacture fashion it into garments which have a distinctive reputation throughout the retail trade of the country.

In the manufacture of cloaks and suits Philadelphia has advanced by rapid bounds. In the year 1876, when the industry was in its infancy, there were in Philadelphia but two concerns, employing approximately 100 hands. Little more than a quarter of a century has elapsed, yet the industry has expanded to 150 times the dimensions it had attained in the Centennial Year. There are to-day in Philadelphia 150 manufacturers, giving employment to upward of 15,000 hands. There is evidence of the steady advance of this industry in the fact that the limit of price which American women are willing to pay for a ready-made garment has steadily increased. Ten years ago few cloaks or suits turned out from a large establishment would retail for much more than \$40. Nowadays it is not unusual to make garments that retail for \$100 and more. With the improvement of processes, and the raising of the standard of quality and style, there has been a steady encroachment of the ready-made garment upon the domain of the custom-made.

The general process of the making of a cloak or a suit follows closely

that of the manufacture of men's clothing. Man, however, is not a creature of brilliant plumage, and in one of these establishments, we see a much greater range of fabrics and colorings. Then, too, in the matter of designing, elements enter that are not involved in the manufacture



CUTTING THE MATERIAL

This is one of the devices favored by cutter on certain classes of goods.

of men's clothing. It is not the designer who has ideas that alone makes for the success of the establishment; but it is in a far greater degree the one who can see the commercial possibilities of an idea, and who can select from the multitude of designs those which will please the fastidious woman. None the less, the designer is the basis of it all. In making the original pattern from which the garment is to arise, the designer makes but a single size, that is, 36. Then this cardboard pattern is passed on to the pattern-makers, who draft upon it a regular line of sizes.

The material to be cut is "laid up," fold above fold, as in the making of men's clothes, and the pattern is marked out on the upper layer. It is the anomaly of the industry, that in the heat of summer the cutter and the tailor are handling the heaviest kerseys, meltons, heavy chevits,

and broadcloths, that are to keep off December chill, while in winter, the delicate fabrics for summer wear are passing through the process of manufacture—mohairs, flannels, linens and serges.

Now that the pattern is marked upon the cloth, the electrically driven circular knife is passed along the lines, and in a twinkling the material is reduced to the many pieces that enter into the garment. One of each part must now be tied into a bundle, and the cut garment is passed along to the tailor, who puts them all together. Then comes the pressing, the fitting upon living models, and finally, the most rigid inspection for the slightest flaw. If a mistake is detected, it must be righted before the garment goes to the purchaser.

The eminence of the city in this department of manufacture is not entirely owing to the distinctively Philadelphia houses, though these have shown marvelous expansive powers, and have steadily advanced



THE TAILORING ROOM

Hundreds of skilled workers here receive the parts and fashion the garment.

both in quality and character of output. But in this line the industrial life of Philadelphia has been strengthened by many incomers from other centres. In this, as forcibly as in any branch, is demonstrated the superior advantages which Philadelphia possesses as an industrial

centre. Realizing the position enjoyed by Philadelphia, cloak and suit manufacturers have come here, and have established factories that have thrived alongside of those that were distinctively Philadelphian.

It is because they employ a skilful and contented class of workers



THE FINAL INSPECTION

Placed upon forms, the finished garments are scanned for defects, the least of which must be corrected.

that the cloak and suit houses of this city have gained their high reputation. Philadelphia is known as a city of homes; its working people are thrifty, and it has seldom to contend in this line with the labor difficulties encountered elsewhere.

As the taste of the public has become steadily more exacting, the Philadelphia establishments have as steadily improved and diversified the character of their production. The great variety and the elaborate styles that have come in require the most painstaking and accurate designing and work to produce styles sufficiently fine for the exclusive dress of the United States trade.

The Story of An Eiderdown Sack



FROM the raw greasy wool as it comes from the sheep, to the brightly colored eiderdown sack, is a far reach; yet in the knit goods industry as it is in Philadelphia, every one of the many intervening steps is to be seen under a single immense roof.

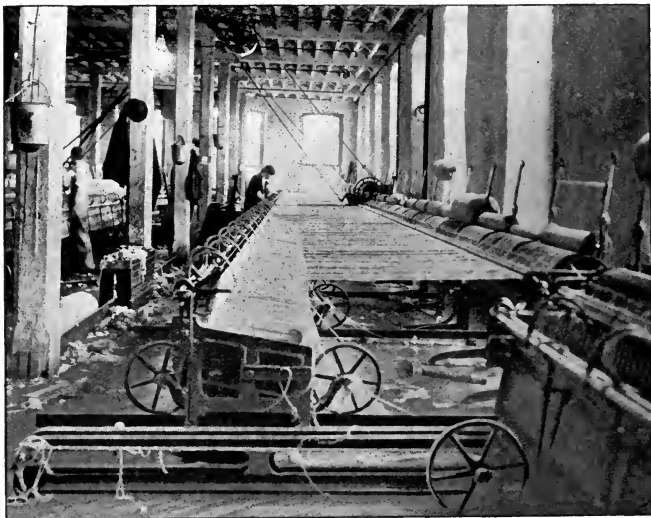
The knitting of such goods as eiderdown and sweaters is a distinct and important industry, and one in which the most intricate machines have been devised to take the place of the old, laborious hand stitch of our grandmothers' day. The busy housewife of half a century ago would have regarded as one of the seven wonders a machine that should take not hundreds but thousands of stitches a minute, and that would turn out the knitted fabric at the astonishing rate that it is delivered from one of these marvels of inventive genius.

Passing the early steps of wool sorting, blending and scouring, and beginning at the point where the industry separates from other departments of textiles, we find at the very threshold this delicate machinery. Take first the knitting of sweaters. The sweater is not turned out as a single garment from the ordinary knitting machine by which the greater part of this work is done. One machine knits the arms, and not a single arm alone but a great row of arms are turned out one after another, and each a continuation of the one before. This one continuous arm is afterward cut apart into many. If a blue arm with a red wristband is desired the machine automatically shifts its operations to the red bobbin and back again to the blue. There is a different machine for the neck, and still another for the body, and each of these parts again comes out in a continuous string, to be cut later into many necks or bodies. The finest of the jerseys, however, such as the Shaker knits, are knit flat. In each of these machines the principle is the same. Precisely as the hand crocheting hook slips through a loop, catches the worsted and pulls it through to form a new loop, so this machine with its myriad of needles operates.

After the knitting, the pieces for each sweater are assembled and then taken in hand by expert operatives who, on special machines, sew, or, in fact, knit up the seams. This is the plain sweater, that pulls on over the

head. There are, of course, many varieties of design, some open down the front and these must be faced by a special machine.

While in the making of the eiderdown fabric a machine of totally different design is used, the knitting principle does not vary. The material



THE SPINNING ROOM

Not so peaceful as the process of a generation ago, but several hundred times as effective.

is knit in bag-shape; that is, it is in a continuous round shape that must afterward be slit. As the fabric is knitted it moves around the circles of needles, each of which does its work of passing through the loop and making its stitch. These circular machines have from 940 to 1820 needles. As the fabric is knit it is rolled automatically upon a roll set above the machine.

Eiderdown, of course, is not eiderdown at all; it is simply a fabric with a delicate, fluffy surface, which, having the softness of the down of the eider duck, has borrowed the name. This softness is obtained by the napping process. The fabric, in this process, is passed between drums

covered with fine steel points that loosen and lift the surface. After this operation the material is three to four times as thick as when it came from the knitting machines.

This gives the ordinary eiderdown surface. There is another machine, however, which imparts a rippled effect. In this, the eiderdown passes over a steel bed covered with ordinary carpeting. Above the eiderdown is a table upon the under side of which is heavily ribbed corduroy. When the machine is in operation this table has a rapid backward and forward,



KNITTING THE FABRIC

Here are seen the circular eiderdown machines with the rolls above which take the fabric as it is knit.

vibratory motion, which give to the material the wavy or rippled effect. By differently adjusting the machine the table is given a rapid circular motion, when, instead of the ripple, there is obtained a chinchilla effect, the soft nap being wound into little nubs covering the surface.

Now that the eiderdown cloth is made and finished it is ready for the expert garment fashioners, and goes through much the same process as would a woman's suit in the making. It is first to be examined for imperfections and then cut according to pattern. The cloth is laid "up," layer above layer, twenty-four garments being cut at once.

After leaving the cutting table the sack passes through nearly a score of hands before it is completed. There are the seamstresses who sew the body of the garment together; then there are others who put on the satin binding; a force of women who do the edging; others that are kept busy with the seaming, and still others whose work is restricted to the over-seaming.

There is an interesting little machine that does applique work. The material that is to be laid over the cloth is lightly fastened on and the design is marked upon it. Then the operative guides the garment through the machine, which at one operation stitches on the material and cuts out the design. Another machine which crochets edging, whips around the edges of a garment with the rapidity of thought. The garment is finally completed only to reach the hands of a second force of examiners.

These examiners work amid a room filled with wooden models, which are built according to the various sizes. The examiners place the garments on the corresponding models as they come from the sewing room. If there is the slightest discrepancy it is carefully noted and the garment is sent back to the person at fault for alteration. The finished product is then given the stamp of final approval, pressed and packed ready for the salesmen's efforts.

Shoes in the Making



HERE are few lines of wares in which shoddy may be concealed from the eye so thoroughly as in footwear. A shoe may be a mere veneer of leather, and beneath the surface may be made of material that gives virtually no wearing qualities.

Leather-board, for instance, is extensively used in the manufacture of shoes that present to the eye of the wearer for a short time a very pleasing front. Leather-board is ground leather made into pulp and then pressed into sheets. There is almost no limit to the extent it may be used in the inner soles of shoes. Whited sepulchres of the shoe trade, containing this material, come from scores of cities and towns throughout the country.

It is a surprising fact, too, that while shoes with leather-board inner soles sell for but a few cents less a pair than genuinely made shoes, that element in their making has not fifty per cent. of the wearing qualities of leather. Stitches will hold very well in leather-board until it becomes wet, but then something is apt to give. It is the boast of Philadelphia's shoe trade that the use of leather-board is an unknown art in the shops of this city.

It is an acknowledged fact that for equal price Philadelphia makers can and do constantly give better value than their competitors. In women's, misses' and children's footwear the city's factories have always led.

Shoemaking is one of the industries toward which the inventor first began to draw his attention, and in many of the machines used,



CUTTING THE UPPERS FROM PATTERNS

ingenuity of the highest order is shown, the progress of a shoe through a modern factory being astonishingly rapid. When the various sorts of leather arrive, they first go through the hands of an inspector, ever alert for flaws. They are then sent to the cutting room. Here a large force



THE SEWING ROOM

Linings and uppers are stitched together by the operatives at these machines.

of skilled workmen cut the leather into the many pieces that compose the upper of a shoe. There is the vamp, the backstay, the tongue, the tip, the top facing, the two quarters, the two eyestays and the two linings. These are cut out by means of small pasteboard patterns.

After the various pieces are cut, deft-fingered sorters arrange them, all the parts that go to make a single pair of shoes being tied in one bundle. These are carried to the fitting room, with its batteries of sewing machines, at which are skilled women workers, who assemble the various parts of the shoe. The vamp, backstays, tongues, etc., are speedily stitched together. The linings are trimmed and the shoe uppers are here almost completed. In this fitting room there are machines

that sew buttons on the shoes and others that stamp in the eyelets for the laces. These are marvelous workers and in less than a second place six buttons on a shoe. It takes no longer to put in, stamp and space the eyelets.

In another department the soles are cut. The block cowhide soles come into the factory and are placed in cutting machines, where sharp knives trim them to the desired shape and size. Then they are subjected to great pressure to give them the curved-in shape.

Now another set of operatives take the parts for finishing. The soles are carefully sewed to the uppers, passing through many hands before the work is completed. A machine of remarkable ingenuity nails on the heel of a shoe in the fraction of a second. At one stroke fifteen to twenty-five nails, according to the size of the shoe, are driven



THE FINISHING MACHINES

Here the shoe takes on the final touches prior to going to the shipping room.

into the heel. Long wire tubes are attached above the machine and through these the nails filter to a small steel frame which holds them erect and in their proper places. The shoe is placed in a niche, and at one stroke all the nails are driven into place.

Shoes in the Making

The shoe must yet pass through many hands before it becomes the finished product. It is first taken to a turning machine, where a skilled workman turns the heel so that it will have a smooth, round surface. The work is done by a steel knife, rapidly revolved by electric power.

After the heel has been turned it is taken to a similar machine equipped with a burnisher instead of a steel knife. This gives the heel its polish. Finally the sole is stained and given a glossy appearance. Wax black is also used to give a finished appearance. The laces are then put in and the shoes packed and made ready for shipment.

Always an important leather centre, Philadelphia has, in the past few years, revolutionized an industry which is daily becoming a more important factor in the vast shoe manufacturing business of the country. This is the manufacture of glazed kid.

Fortunes were sunk by Philadelphia manufacturers in an endeavor to obtain the ideal process for the tanning of goat skin. They solved the secret of what is more and more coming to be recognized as a very close approach to the perfect shoe leather—glazed kid. Formerly a vegetable tannage was used. The chrome tannage, which was here perfected, is a chemical process and produces leather that is impervious to water. The superior qualities of glazed kid have become so well known that while a few years ago only women's and a few children's shoes were made of it, it is now used extensively in men's shoes, which was then an unthought-of possibility.

There are many who still remember the time when all fine shoes were what was known as French kid. Now the conditions are reversed. Not only have Americans taken their home market away from the French but are actually sending to France large quantities of glazed kid.

A few figures are sufficient to show the importance of this vast industry. There are about 150,000 goat skins manufactured each day into glazed kid in America. Of this great number about 120,000 skins are used in Philadelphia. This means employment for about 8,000 to 10,000 hands. The fact that goat skin importation increased \$3,000,000 in 1905 over 1904 indicates the amazing growth of this business. While proximity to this and its allied industries has doubtless tended to strengthen the manufacture of boots and shoes in Philadelphia, the city's factories in this line have always enjoyed an unrivalled reputation for style and quality of production, to maintain which no such alliance is needed.

Pleasing the Fancy in Leather Goods



HERE is no article upon which quality is so plainly imprinted nor any in which shoddy, whether in material or workmanship, may so readily be detected as in manufactured leather. It is very natural that there should be an unmistakable character in a piece of leather upon which the high grade manufacturer is willing to place his trade mark, and which he is willing to stand by. For in very few of the various parts of the field of industry, has hand labor so successfully resisted the advance of machinery; and upon such goods is the stamp of the artisan. There are machine processes, it is true, but essentially these are hand-made goods, every part of which has passed beneath the eye of the skilled workman.

Some conception of the range of styles and forms of leather goods, is to be gained in the leather stock rooms of an establishment devoted to the manufacture of the highest in this line of production. An almost inconceivable range of leathers, and shades of finishing is to be seen. Everybody is familiar with seal, such as is seen in fine pocket books. This, of course, is the skin of the hair seal, as that of the fur seal would be too costly for such purposes. Walrus is merely the hair seal with a different finish. Alligator, lizard, pigskin which men fancy, but which is not so desirable for woman, calfskin, goat and even snake, the generality of people are familiar with. Not so many know that in the past year or two frog skins have come to be made up into fine pocket books. These are imported from Japan; though in America the experiment of tanning the skin of the ordinary bullfrog has been made with some success. The skins of the Java buffalo as well as monkey skins are used as a novelty in limited varieties. Even less familiar, in fine leather goods, is the skin of the elephant—yet it is used. Occasionally an elephant skin comes upon the market; and it is eagerly snapped up by the manufacturer who seeks for the greatest range of styles. It will cost him, however, from \$300 to \$500—\$10 a square foot—and a very small card case made of it will cost \$15, while a lady's bag will cost \$100.

Nor are these the only skins that pass into the hands of the skilled workman on leather goods. A huntsman kills a rare animal or even a

bird, and he may fancy a pocket book or a novelty made of the skin. So in the making of these dainty creations of leather, there pass beneath the eye and iron of the workman the skins of specimens of almost the whole animal kingdom. These are only the kinds of leather, but they by no



CUTTING THE LEATHER

The highest grades in many varieties pass under the knives of these workmen.

means cover the range of styles that are to be seen in such a stock-room. There are various finishes that may be given to leather to produce varieties of grains, and then, too, there is a limitless number of tints and shades that may be given to each leather. Morocco, or goatskin, which for wear is unexcelled, may be given a finish in imitation of almost all of these kinds of leather. Seal may have its natural grain, which is pebbled, or variations may be obtained, as for instance in what is known as Falkland seal, which has pronounced lines running through it.

Many of these skins are very costly, and as they are paid for by the square foot, it will not do to take unquestioned the statement of the seller. The skin is first of all passed, therefore, through a machine which automatically measures it and records upon a dial its exact size

in square feet. Not a corner nor a projecting lip of leather is forgotten by this wonderful machine in its calculations.

Before these leathers can be used in the making of fine leather goods, all the oils must be extracted, as they would otherwise soil any delicate article that should touch their surface. Matching all these various leathers and shades and tints of the same leather, is a separate large stock of silks and other materials—velvets, satins, etc.,—ranging from sombre blacks and delicate ecrus, to blues and vivid reds.

Now the leather is to be cut. As it is irregular in shape it could not be cut by machinery without great wastage; and, furthermore, there may be defects which no machine could detect. Therefore each skin must pass beneath the eye of the skilled cutter, who carves out the parts with the aid of pasteboard patterns.



A FINISHING ROOM

Final touches are here placed upon the manufactured article.

It is not a consecutive process by which the goods pass onward to their finished state. It may be necessary to pass a given piece three, four and even five times through the stitching room; as at the various stages a few stitches must be taken here and there. But, first of all, after

the cutting stage, comes the bevelling or paring of the leather. It is plain that if the edges, which must be folded over in the subsequent stages, were left untrimmed, the finished pocket-book or other article would, to a certainty, be a very clumsy piece of work. In bevelling down the edges a high degree of skill is required if the fold is to be nice. While in some of the work a bevelling machine is used in which a sand-paper covered wheel scrapes down the edge, in by far the greater part of the work, this is a hand process. In order to overcome bulkiness much of the leather is split, and this must be backed up with some fibre pasted to the inner surface. The omission of this backing is one of the many ways in which a piece of work may be skimped.

The leather being cut and bevelled, now comes the process of putting the parts together. The delicate silk linings are introduced; gussets, which allow the pockets to expand; and, in the case of shopping bags, for instance, the leather must be attached to the frame. In many of the finer goods the leather is riveted on, though in the greater number it is sewed on by hand. One simple process that adds much to the appearance of the piece of goods, is the running of the fine line which will be seen just inside the edge of any pocket-book. This is done by hand, the workman running in the line with a heated iron.

When it is considered what a wonderful range of articles comes from a large establishment of this kind, it will be seen that there are almost as many processes in which skill in the individual workman is essential to high grade production.

The Philadelphia manufacturer in this line has sought, and sought successfully, to strike the happy mean between the bulky English goods—which are made first of all for wear, and which will unquestionably wear a lifetime—and the finer and dainter creations of the Vienna workshops in which, many times, strength is sacrificed to lightness and fine appearance. The American manufacturer who values the reputation for fine goods will not sacrifice strength, but, in order to obtain fine appearance in the finished wares, he will approach as closely as may be to the danger line.

It is impossible for better leather goods to be made than those that are turned out from the best of the Philadelphia factories. Here are to be found manufacturers who will not allow a piece of goods to leave their workshops without their own mark, even to please the largest customer desiring his own mark solely; who stand behind every article made by them and who, consequently, have the strongest incentive to maintain the standard which they have set for themselves.

Rearing Ribbons



IF the drowsy silkworm, lying within its cocoon, could dream of the beautiful effects that would come of its labor, it would doubtless awake to a very high sense of its own importance in the world. Yet it is not all the silkworm, for between the fine spun raw material and the silk of commerce, are a multitude of intricate and delicate processes. Without the aid of man, the airy fibre as it comes from the industrious little spinner would be of no avail. And in the weaving and fashioning of this fibre, man has vied with man until process has been perfected as in very few other lines of industry.

A brief study of modern methods of silk-making will furnish convincing proof of the steady improvement of recent years, which has reduced to the very finest possible point the cost of production. In the manufacture of ribbons and dress silk, Philadelphia has forged steadily ahead in the past few years. While some of the other manufacturing centres have been content to abide by older methods, Philadelphia makers of silks and ribbons have been satisfied with nothing short of the latest and best equipment. The art of weaving is here seen in its perfection, the highest economy of production compatible with high class production being achieved.

Raw silk, as it comes from Japan, Italy and China, is first taken in hand by the "throwster," whose work it is to make of these delicate fibres that come from the silkworm, thread suitable for the loom. This means a thread of two, three, four, five or six raw fibres, according to the use to which it is to be put.

"Organzine" is the term given to the finest of the thread, which is used for the warp. The filling, which is slightly inferior, is termed "tram."

From the "throwster" the silk goes to the dyer, whose process requires from three days to a week. The dyed silk is now put on the winding frames, which are modern and automatic in action. Each frame consists of seventy-two revolving spindles, which are small wheels run on a horizontal axle, connecting with as many spools. The skein silk is placed on the creels known as "swifts" and is then unwound, running to the spools where it is wound again.

Rearing Ribbons

When the silk is taken from the winding machine on the spools it is ready for the warping machines. These are big wheels of wooden frame-work about ten feet in height. The spools are first placed on a creel. This is a flat wooden board about four feet square and has places



WINDING THE SILK

The spools for the warp are wound by these machines with amazing rapidity.

for several hundred spools which are ranged in rows. The thread from each spool is placed on the warping machine and the many threads are brought into the warp of the material as the big warping machine slowly revolves. The number of threads, of course, varies with the width of the cloth, the ribbons requiring few in comparison with the dress silks. Some of the thirty-six-inch goods have as many as 12,000 ends or threads in the warp.

When goods of a certain length are to be made, the warp threads must be made considerably longer, as there will be an important "take-up" in the weaving process. Each time the filling interlocks there is a

very small gather, which means shortening of about seven per cent. when the fabric is completed.

While the warping mill has been doing its work, the filling is being wound upon the quills that are to be placed in the shuttle. The machine which does this winding is one of the most interesting of the many ingenious devices found in the field of textiles. Long rows of quills are wound upon the machine simultaneously, and at the breaking of a thread that part of the machine that is winding the particular quill suspends operations automatically until the operator adjusts the difficulty.

No machine has been carried farther toward a state of perfection than the ribbon loom, and it is in America that the loom has been brought to its highest development. Upon these high speed side Jacquards as many as thirty-four spaces—that is, separate widths—are woven at a single operation, while of the very narrow ribbon, Number 2, as many as ninety-six spaces may be woven simultaneously.

The German loom is a very ponderous and inefficient affair compared with the modern American double-decked ribbon loom, with its two tiers of flying shuttles. No foreign ribbon looms are brought into this country to-day; they have been superseded by this marvel of American ingenuity.

In another department of the mill, yard silks are woven. Here again



THE WARPING MACHINE

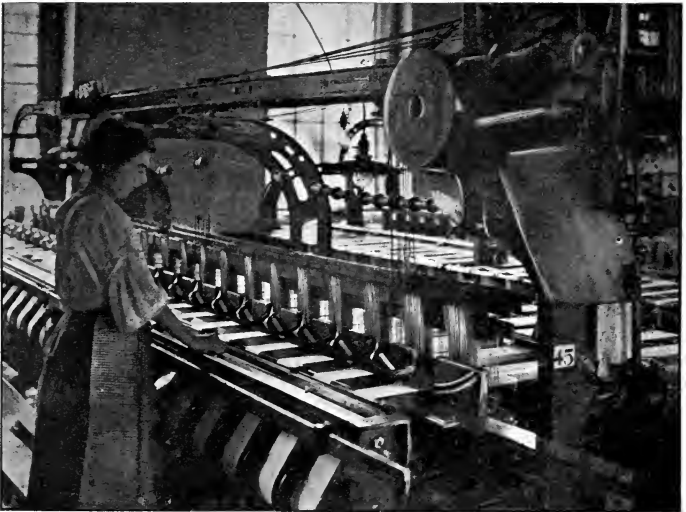
On these big wheels silk from the many spools is gradually gathered into the warp.

Rearing Ribbons

appear the infinite number of beautiful patterns that come from the Jacquard. A changeable silk is obtained by using a warp of one color and a filling of another, as, for instance, a black and a green.

Very few of the silk weaving mills finish their own fabrics. Indeed, the finishing of silks is an art by itself, and one which constantly changes with the changing breath of fashion; and the manufacturer, therefore, is entirely willing to devote himself exclusively to the making of the fabric. Each of the different purposes for which silk is used demands a different finish. The maker of waists demands one finish, the maker of skirts, another, and of underskirts, still another. Fashion, too, is very capricious, One season she demands a rustling silk, another season, a silk that is stiff but which does not rustle, and still another, a natural silk.

As the ribbon is taken from the looms, it is measured off into lengths



A RIBBON LOOM

Many widths of ribbon are woven simultaneously by this modern device.

of ten yards each, the operator slashing with her scissors into the dainty, finely woven fabric to mark the end of each length. These lengths are now taken to a machine where they are speedily rolled into the familiar blocks or "bolts" when they are ready for the market.

The Magic Growth of a Curtain



VIEWED in the light of twentieth century achievement, the genii of Alladin's wonderful lamp seem after all to have been endowed with no very extraordinary powers. Go where you will in the industrial field to-day and on every hand are to be seen evidences of accomplished facts that would make the old time wonder-worker hide his face and own himself vanquished.

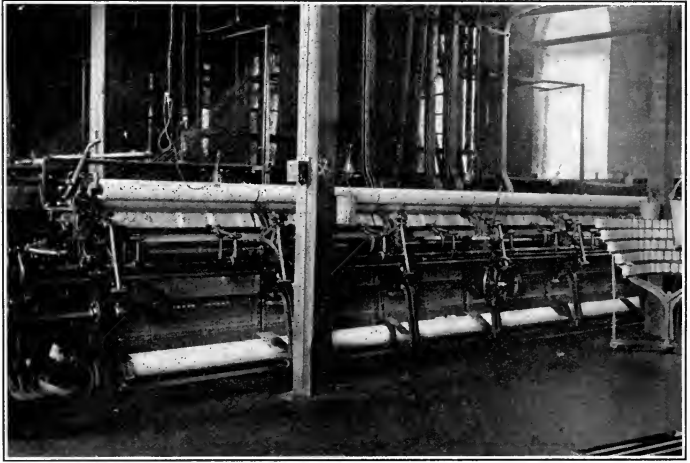
In no branch of mechanical endeavor have greater results been accomplished than in the gradual development of lace making. Ages ago some one first demonstrated the idea by placing two or three fibres side by side and entwining others in and out around them. Nowadays, thousands of delicate hair threads are handled with marvelous ease, rapidity and dexterity by a machine of twenty-six thousand pounds weight—a ponderous spider that weaves seventy-two pairs of curtains, fifty inches wide, in a single day.

Though the lace curtain forms one of the chief decorative features of the modern home, it would be interesting to know how many persons ever give a single thought to its place or method of production. Quite generally, Nottingham, Calais, Plauen and St. Gall have been regarded as the modern centres of lace making; and it may therefore come as a direct surprise that the largest individual manufactory in the world is located, not in any one of these old world cities, but in Philadelphia and that this one great plant has a capacity of from 50,000 to 60,000 pairs of lace curtains every week. It has been Nottingham lace; it should be Philadelphia lace; for not only has the industry here made marvelous strides, growing at a rate that it never grew elsewhere, but in exquisite effects obtained the city to-day outclasses its older rivals.

The first real step in the operation of lace making, subsequent to the designing of the pattern, comes in the winding room. Here great bales of cotton thread weighing between 350 and 400 pounds are opened up just as they are received from the spinning mills in Virginia and North Carolina. The skeins of thread are now wound on spools, which will eventually contribute their quota to form the flower or figure in the cur-

The Magic Growth of a Curtain

tain. There are three separate and distinct operations necessary in order to complete the "winding." First, the spools, second, the bobbins—and lastly, the "warp" thread. These latter run longitudinally through the curtain and constitute the body or ground work upon which



THE LACE CURTAIN LOOM

Many breadths of curtains are turned off simultaneously by the wonderful worker.

the net and design is executed by the loom. Two warps constitute a "winding," the threads being 4,500 yards in length.

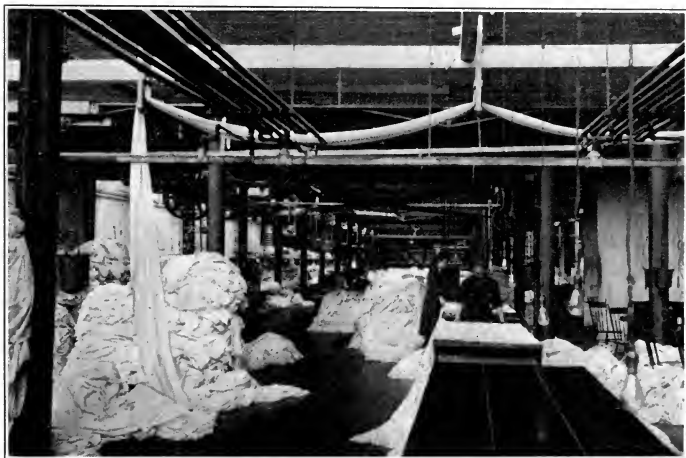
The bobbins are round, slightly larger than a silver dollar though no thicker, and, tightly clamped together, are wound a hundred at a time. When full they contain from ninety to one hundred and eighty yards each, according to the fineness of the thread. There are from 2,000 to 4,000 of these bobbins to each machine, the number varying according to the quality of the goods to be made.

Upon each of these great looms six curtains sixty inches in width are woven simultaneously. The curtains are not delivered from the loom separately but in continuous ropes, in which form they now go to the mending room. They must here be examined for breaks, tears and other imperfections. Formerly all this work was done by hand. Now a

machine that works with lightning rapidity goes over the curtain, mending each of the imperfections. Marvelous as this machine is, it would do but clumsy work if it were not for the skillful manipulation of the curtain by the operator as it passes under the needle. The figure is carried unerringly in the mind of the operative, and wherever there is a flaw that particular part is guided to the needle for correction.

As the long mass of netting comes from these mending machines, it lies in great heaps ready for its trip to the bleaching room; and this journey is one of the striking sights of a lace curtain manufactory.

The piles are not carted into the bleaching department but are whisked at lightning speed through a "hole in the wall" near the ceiling. This aperture in the partition is about eight inches in diameter and is lined with porcelain so that there may be no damage to the fabric.



THE MENDING ROOM

Overhead is shown the curtain rope passing rapidly on its way to be bleached.

Through it passes this seemingly-never-ending rope of curtain to take its dip in the bleach pots. There it is immersed in chemically charged pots large enough to accommodate from 5,000 to 7,000 pairs of curtains at one time. The bleaching process takes about a day.

The Magic Growth of a Curtain

When it is desired to make ecru curtains, these are not subjected to the bleaching process, the natural color of the cotton being ecru. Many of the curtains have this natural shade with a pure white design woven upon them. This is obtained by using the natural cotton for



THE FOLDING ROOM

On the upright T's the curtains are given their first fold in one yard breadths.

the body of the curtain and using for the pure white design cotton thread which has previously been bleached. There is also what is known as a half bleach. In the ordinary full bleaching process, the curtains are placed in the bleach pots, then taken out and washed and then returned to the bleach. In the half bleach, they are given but one immersion. This leaves them with a delicate cream tint which is brought out by a mild stain. The Arabian curtains are given their deep ecru by staining.

After the bleaching and the washing the curtains are transferred to what is commonly known as a "whizzer," that is, a centrifugal drier which, whirling at high speed expels the water until there is just enough moisture left to take up, in the next process, the starching ingredients to the best advantage.

The finishing machine is another of the wonders of a lace curtain

making plant. The curtains, still a long rope, are first immersed in a solution of starch. Then as they move further into the machine they are gradually spread out upon a continuously moving apron until they are at their full width. Now they pass between steam rollers or drums and emerge from the machine perfectly dry and with the familiar crisp finish of the lace curtain.

Through these rooms—the weaving, the winding, the bleaching and the finishing—the curtains have been in one long piece. Now they are to be cut apart and to take their shape for the first time as the curtain of commerce. The edges are yet to be trimmed, the operator again guiding the fabric through a machine which this time makes the familiar wave-like edges.

The curtains next go to the folding room. The main folds are put in by girls who work at a frame shaped like a large "T." At either end of the cross piece is an upright needle and the curtain is caught from one of these to the other until it is in yard folds. Now it is passed along to other operatives who put in the remaining folds, and then to still others who are kept busy feeding the light fabric into huge presses where it is settled or pressed into form for handling.

Next the facing or colored tissue is inserted, and the curtains are ticketed and tied in pairs. They then pass into the hands of a wrapper, who applies the finishing touch in the shape of cream manila paper and sends them to the shipping room. It requires from twelve to twenty days to complete this process from the cotton thread to the shipping room.

The art has advanced to so high a degree towards perfection that it is now virtually limited only by the ingenuity, inspiration and artistic ability of the draftsman and the designer. Laces are being made by machine to-day that will bear expert scrutiny beside those that are hand made; indeed, these monster machines are producing fabrics as filmy and wonderful as ever was spun by spider in his secluded nook.

In view of the great consumption of lace in this country—a consumption which was, in former years, met by foreign makers—and also in view of the great development of this industry in Philadelphia, the position of the city as a lace making centre is secure. With the largest lace manufactory in the world and with another larger and even more modern, in course of construction, with high quality of production as it is achieved nowhere else, Philadelphia lace making rests upon a firm and lasting basis.

The History of a Carpet Roll



CARPET looms in two wards situated in the busiest of the Philadelphia mill districts, have as great carpet-making capacity as the looms of all the rest of the country combined. There are in these two wards 3,300 looms, having a capacity of 45,000,000 yards annually. This equals the output of all carpet mills in America outside of Philadelphia.

While these looms are operated largely in the manufacture of ingrain carpets, there has been a constantly increasing production of body Brussels and tapestries, Wiltons and velvets. In all of these classes of goods, the output of the city's mills is to-day of high quality; its Wiltons, in fact, being unequalled in texture. Sharp as has been the competition of other great industrial centres, excellent as is the quality of goods produced in them, Philadelphia remains the carpet city of the country.

In all branches of the manufacture of carpets—designing, dyeing, weaving and finishing—there has been a constant advance in recent years. To-day the art is near its highest stage, and if the manufacturer would establish a reputation for high production in any one of the qualities of carpets, he must neglect no single step in the process of making.

Familiar as the housewife is with the carpet, it is to be doubted whether one in a hundred knows why one carpet is better than another; knows the difference between a Wilton and a velvet, or, indeed, even the meaning of the term "body Brussels." In the weaving of body Brussels and Wiltons all the various colors of yarn used in the weaving run continuously through the fabric, being merely hidden from sight in those places where the design does not call for their appearance upon the surface. After being dyed in the skein the yarn is wound upon spools, and in the weaving process every color is drawn continuously into the warp, each being merely buried from sight when it is not needed. They are in the body of the carpet, which is, therefore, termed body Brussels.

With tapestry and velvets it is otherwise. The yarn is not dyed in the skein, but is printed in spots, each thread being first red, then blue, then ecru, and so on.

Body Brussels and Wiltons are woven alike, except that the series of loops or corrugations which are seen along the surface of the body Brussels are slit at the top in the case of the Wilton.

The warp of cotton, jute or linen, which forms the backing of the



WEAVING THE CARPET

Thousands of threads are controlled by this marvel of machinery to obtain the beautiful carpet designs.

carpet, is made in a great machine which not only winds the many threads from the spools to the beam, but which gives them a special treatment to prepare them for their specific purpose. They first pass through a starchy mixture to give them the desired stiffness, are at the same time colored, then pass between drums and are dried, and finally are wound upon the beam. The stiffening or sizing preparation varies with each mill, each manufacturer having his own particular formula. The warp thus prepared, and the woolen yarn, make up the carpet fabric.

Though the process by which the infinite number of beautiful designs are obtained seems at first very mysterious, the general principle is in reality not difficult to understand after a little study of the carpet loom. The various colored yarns are drawn slowly from the thousand

The History of a Carpet Roll

spools in the creel frame, as the fabric is woven. By the operation of the Jacquard machine the yarns needed to make the coloring of the design in that particular part of the fabric are drawn up until there is a space between them and the other yarns, which are not to appear in this spot in the surface, and are, therefore, not needed. The shuttle now passes between, so that there appear on the surface—that is, on the pattern—only such colors as were up at that moment.

Next these threads are depressed and others are raised to appear on the surface as the shuttle flies beneath them.

But perhaps the most wonderful part of the loom is the Jacquard attachment. On top of the loom above the weaver's head is a box-like arrangement with innumerable needles, not unlike in appearance to a typewriter with its long shanks of wire operating the keys.



A VIEW OF THE WEAVING ROOM

Here are shown the frames containing the spools from which the thousands of strands are drawn into the loom.

These needles are pushed back and forth by a series of pasteboard cards punctured with holes. Where there are holes the needles slide through, in this way each needle controls certain threads in the warp

which are picked up in the weaving to make the pattern. These cards are strung together by laces in an endless chain and each move of the shuttle brings a new card in front of the machine to be struck by the needles.

Of course a separate series of cards has to be made for each pattern.



THE BURLING TABLES

Every yard of the carpet is searched that the smallest flaw may be righted.

This is done on a card cutting machine. The pattern as drawn and painted by the carpet designer is marked into small squares of about one inch, and these are in turn divided into about thirty-six smaller squares. The operator places a piece of cardboard in the cutting machine and following the squares on the design punches a hole by means of keys for every one of the small squares that is found in the color portion of the design.

In carpet weaving, the yarn is bound tightly over a wire which extends crosswise of the fabric. This is then withdrawn by the machine, leaving, in the case of body Brussels and tapestries, the rows of little loops that are seen along the surface of the fabric. In Wiltons and velvets we see, instead of these corrugations, innumerable little tufts

which have come from the slitting of these loops. The device by which this cutting is accomplished, though ingenious, is extremely simple. It has been explained that in the case of tapestry and body Brussels the wire over which rows of loops extending across the fabric have been bound, is automatically withdrawn after it has accomplished its work. Now, in the weaving of Wiltons and velvets, the end of this wire is a very sharp, tiny blade, which, as the wire is drawn speedily through the row of loops, slits them at the top. A Wilton is merely a body Brussels cut in this way; a velvet merely a tapestry similarly treated. Of course, there are minor points of difference, but the general process of weaving is alike in the case of the body Brussels and the Wilton, and, on the other hand, of the tapestry and velvet.

Now that the carpet roll is woven, it goes to the finishing machinery. It must be steamed to raise the warp and sheared to crop it even. Here again the process differs, as the finishing is one of the processes in which superiority of product may be attained.

Burlers now take the carpet in hand and correct any imperfections in the weaving. It is then given a light shearing, rolled by machinery, and finally covered to await the pleasure of the buyer.

There has been in recent years a constantly increasing trend of favor toward rugs, and there has therefore been a decrease in production of carpeting, the looms being more and more applied to the making of rugs. There has been, too, a tendency away from the cheaper kinds and toward the better. In the manufacture of rugs in these various grades Philadelphia easily leads.

Art squares, which are ingrain rugs woven to their full width, are a considerable part of the total product, and with the improvement in designing, dyeing and weaving, many beautiful effects are procured in this class of goods. Constantly trying to improve its product, and with the present-day tendency to specialize in these various lines, Philadelphia leads today, just as it has always led, in carpet production.

Hosiery and Underwear Making



THE average shopper who enters a retail store and purchases a suit of underwear or a pair of stockings has very little conception of the number of intricate processes through which these articles have passed before being placed on the sales counter. To the person uninitiated in the methods of modern manufacture the price at which hosiery and underwear are sold nowadays seems impossible in view of the numerous stages which are necessary in the making. It is only by reason of the scientifically perfected methods by which the goods are now made, that prices can be maintained so remarkably low.

Take, first, the making of hosiery. Ribbed stockings, such as are used for children, are generally made by a different process from that by which many women's stockings are produced. In the making of the child's stocking, the leg is first knit by a machine which has from 120 to 240 needles. The fewer the needles, the coarser the rib. The legs are turned out as one continuous leg, to be afterward cut apart. Now each leg is placed upon another machine, which takes up the knitting where the other left off and shapes the foot.

This, however, leaves the toe part open and another machine closes this over, finishing the work. The stockings are now dyed and are finished by passing them rapidly through a machine in which a flame singes off the upraised fibre. Finally, drawn over flat wooden forms, they are passed into finishing machines which dry and press them. When drawn off these forms they are ready for packing. Many of the finer grades of women's stockings, as, for instance, those of silk, are what is termed "flat-fashioned." That is, they are knit flat, and then seamed up the back. The machine fashions the stocking, changing automatically to make the necessary changes in the knitting.

Many of the ordinary grades of women's stockings, however, come from the machine in the tubular form, a single machine doing all of the work except the closing of the toe. There is a new device, perhaps the most marvelous in the whole range of hosiery manufacture, which knits as a single piece a stocking that is plain at the top and lace, or open,

work below. In the first part of this process, twice the number of needles are needed that are used in the lace work. As the laced part is reached in the process, the needles that are not needed are thrown out of action automatically. An infinite number of lace-work designs can be obtained,

the pattern being controlled by a device that is, in principle, the Jacquard of the loom.

The suit of underwear must go through an even greater number of operations. The cotton comes from the spinners in three forms—on cops, on cones and in skeins. The cotton on the cops and cones is generally in the natural color, whereas the skein cotton has usually been bleached



A LONG ROW OF SEWING MACHINES

to a pure white. Cones, cops and skeins first go to the winding department. Here are frames by which the cotton is unwound and run on bobbins, which are cone-shaped and about twelve inches high. In this shape they are sorted and placed in bins until ready for the knitting frames.

In the knitting process the identical stitches that were applied by our grandmothers' knitting needles are made at a speed that would have seemed beyond the limits of possibility fifty years ago. The large knitting frames revolve rapidly, with the bobbins flying around on top. For some weights of underwear there are eight bobbins from which the cotton is unwound to be knit into the fabric by the hundreds of tiny needles. The machines are so constructed that worsted and cotton may be incorporated in the same fabric. The thread from each bobbin is run through a guide, and this takes it to the needles. The woven cloth emerges from the bottom of the machine in a continuous stream. The large knitting frames produce the bodies for the garments, while on the smaller ones the sleeves are made. These knitting frames are so constructed that they also give shape to the garment, narrowing the weaving

for the waist-line, and also changing the stitching on the sleeves for the cuffs. Furthermore, they make tucking for the bodies and skirts of the garment.

The woven fabric is now taken to another department where it is cut into the required lengths. There are, of course, patterns to guide the cutters, and after the garments and sleeves are cut to length they are given over to the shape cutters. The latter work with shears or huge knives which fit in grooves in the cutting tables.

Next the garments go to the assembling room. Here are wonderful sewing contrivances, known as interlocking machines, which, with a speed of 3,500 stitches a minute, sew the various parts of the garments together. After the sleeves have been sewed to the garment, it is ready to receive the trimming and fancy needlework. One machine makes a bar edging and sews it on the underwear at the same time. Endless



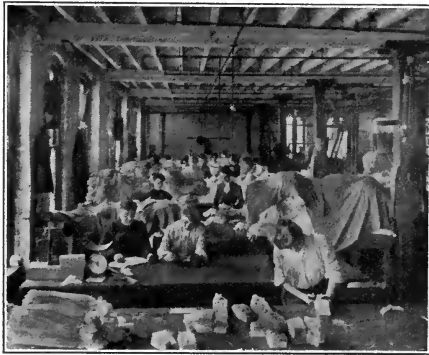
THE KNITTING DEPARTMENT

Here the material which is to be made into underwear rapidly assumes form.

varieties of laces and fancy work are used, many different machines being required for this work. Next the facing is placed on the vests and drawers, after which the garment goes to the finishing room. The bottoms are sewed on and the button holes made, all by machinery. One contrivance cuts and makes the button holes automatically and

shapes any size button-hole from one-eighth of an inch to an inch and a half. Another ingenious steel worker covers the seams. A corps of girls, known as tapers, with lightning speed, next insert the tape through the edging on the garment.

The underwear is now completed and has only to be pressed before



BUSY HANDS IN THE CUTTING DEPARTMENT

being placed in boxes for shipment. Four different kinds of presses are used, according to the nature of the underwear. In one, the garments are placed between heated steel plates, about a yard square. Then there is the mangle system, in which the garment is run on a large heated cylinder. The smaller headed cylinder used by laundries is employed on some kinds of underwear.

Finally, there is the old-fashioned sad-iron for delicate tucks and laces. The garments are now thoroughly examined and placed in boxes ready for shipment.

Philadelphia has 150 factories in this line, their combined product amounting to \$15,000,000 in value annually. All grades of hosiery, in both silk and cotton, are made, the equality being unexcelled, and in some line unequaled.

The New Way in Tapestry-Making



INETY-FIVE per cent. of all American-made tapestries are the product of Philadelphia mills, a thousand looms engaged in this important branch of the textile industry turning out annually goods of the value of \$10,000,000. Not only are Philadelphia manufacturers capable of equaling the finest imported upholstery goods, but they have, by constant improvement in methods of production, placed these fabrics, so beautiful in design and color effects, and combining art with utility, easily within the reach of the average American housekeeper.

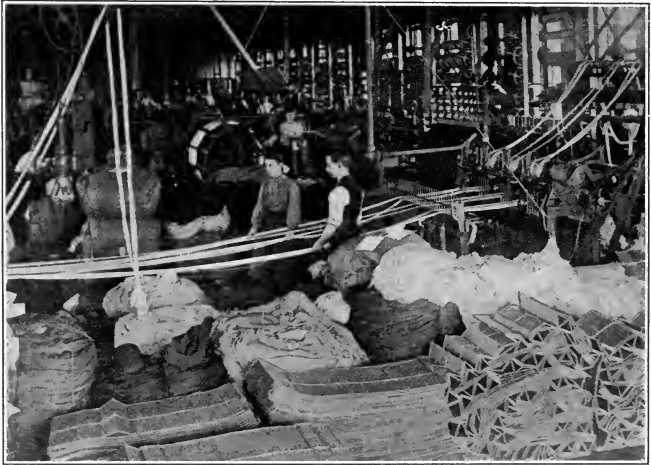


THE DYEING ROOM

Huge power dyers in background contrasted with older methods of hand work used for only small lots.

It was here that the use of cotton in tapestries began in America, and there is no reason to believe that this branch of manufacture will drift to other centres. On the contrary the tendency has been toward

greater centralization, because of the paramount advantages which the city affords. It is of prime importance that the manufacturer of upholstery goods should be near his yarn market. Silk, linen, cotton and jute yarns are all used, from the very coarse grades to the very finest, and this



SPLITTING THE YARN

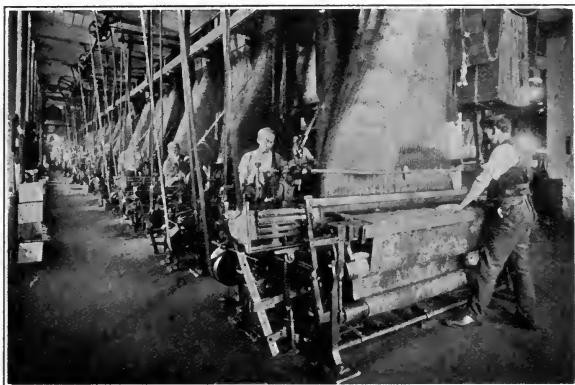
Here is seen one of the early processes in the making of the warp.

supply must be drawn from all parts of the world. Yet the manufacturer who is close to the market where he can procure the greater part of his supply has a decided advantage over the competitor.

There is another reason, equally important, why Philadelphia has enjoyed the monopoly of this branch of manufacture. Weavers of the highest class only may be used in the weaving of upholstery goods, and even these must be specially trained. As Philadelphia is the greatest textile centre, manufacturers have the advantage of being situated where they can make their selection from among weavers of the very highest skill.

As the upholsterer uses no less than 150 different grades of yarn, it would obviously be impossible for him to do his own spinning. This raw material, therefore, comes to the mill as yarn, and first goes to the

dyehouse. There are here huge machines, closed in on all sides, in each of which is a revolving frame-like arrangement with cross pieces. The yarn is hung on these cross bars and the frame slowly turns, dipping the yarn in the dyeing fluid. Each of these frames has a capacity of many



WEAVING THE FABRIC

An unbroken vista of looms that weave thousands of separate threads into the intricate design of the finished pattern.

thousands of pounds, and a ton of yarn can be dyed as quickly as the old-fashioned kettles could give the required color to one-sixth the amount. In no branch of the textile industry is a greater variety of color used; and in these yarns, as they come from the dyehouse, there is seen the greatest range of shade and tint imaginable.

Now the yarn goes to the drying machine—a huge wooden box about fifty feet long and ten feet in height—which takes the wet yarn in at one end and turns it out at the other, clean and dry and ready for the loom. The temperature of the drying room is maintained automatically close to 180 degrees Fahrenheit. The yarn used for the warp is dried on huge heated cylinders, known as cams. These rollers slowly revolve and the yarn is pressed between them and at the same time dried by the heat from within.

After the yarn has been dyed and dried it is taken to the vast storerooms and kept there until required. The storerooms contain row

after row of big bins filled to the brim. The yarn for the warp is wound on spools and placed on the beaming frame in regular rows, similar to a checker-board. Then the threads from the various spools are brought together in a comb-like arrangement called a reed and wound about another large wooden frame. All of the different colors are arranged by the operator as they are to appear in design. Sometimes there are as many as 10,000 ends or threads in a pattern and it takes the operator perhaps two or three days to arrange these before the warp can be wound on the beams. After the warping the beams are taken to the weaving rooms and placed in the looms.



THE BURLING ROOM

Not the tiniest defect escapes the eye of these skilled workers.

The woven fabric is now carried from the looms to a finishing room, where corps of burlers take out the knots and add the finishing touches. It is also run through a finishing machine, which smooths the surface and cleans it thoroughly. Now the tapestry is complete and goes to the shipping room. In a single establishment there pass through this room as many as 300 different designs, and all grades, from cotton to pure silk.

The Art of the Metal Worker



QUALITY is something that is frequently beneath the surface. The proof of the pudding is in the eating; indeed, the pudding might have a very pleasing exterior and a sodden interior. The truth of this is strongly illustrated in the manufacture of hardware in which, as indeed in virtually all lines of metal working, Philadelphia shops excel.

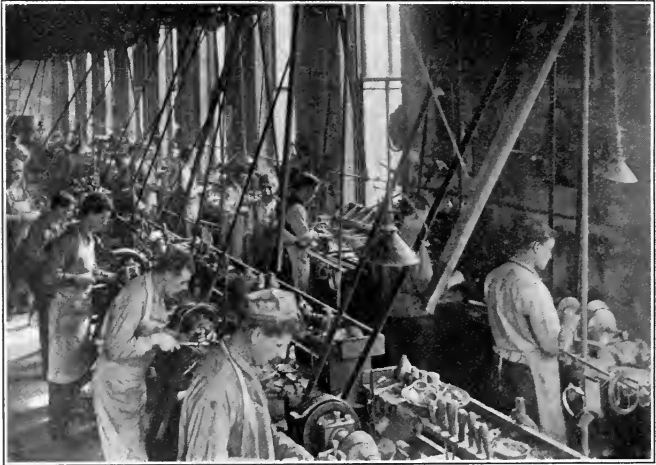
Long experience and great facilities of manufacture mean, first of all, the gathering together of experts in all the various branches of the industry, every step of the way from the digging of the ore down to its final usage. It is this experience, this equipment, which makes it possible for the Philadelphia hardware manufacturer and makers of many other lines of metal goods to turn out a product which is a little better than that of their competitors.

The quality does not always show on the surface; yet it is there. Philadelphia manufacturers of hardware set the standard of production for the manufacturers of the entire country. So far as it relates to many lines, this statement would rest unchallenged. It is true in virtually all Philadelphia hardware productions. In saws, of course, Philadelphia easily leads, and it leads also in hammers and hatchets, lawn mowers, shears, files, hardware specialties such as meat grinders, and in a number of other lines of what is commonly termed "shelf hardware."

In the manufacture of saws, its output is of great variety, from the smallest hand saw to the greatest band saw. Probably very few people have ever thought that a saw may cost as much as \$12,000; but this is actually the case; and in the great saw works which have made Philadelphia unquestionably the leader in this line of production not one alone, but several such, have actually been made. These particular saws, 100 inches in diameter, are used for the cutting of marble. Their edges are set with removable teeth, which are carborundum diamonds, each of which costs several dollars. As these are destroyed they may be removed, and by a very simple dental operation a new tooth may be inserted. There are also to be seen in these great works, band saws 150 feet long,

designed to run at the rate of a mile a minute. In saws for lumbering and all conceivable purposes, Philadelphia production absolutely leads.

And this is true in many other lines of hardware. The hammers and hatchets made here lead in their lines. There are no finer shears



SHAPING THE METAL

At these benches and lathes the various parts of the fixture are made.

than are made in Philadelphia, while in household novelties and shelf hardware the output of the Philadelphia shops is absolutely unexcelled. It is the determination of the manufacturer to make the best article of its kind rather than the cheapest, that has given the city's hardware production this reputation for quality.

A single illustration will give an idea of the care with which every part is made. The Philadelphia make of such specialties as meat grinders has gained a high reputation, and this is because the greatest precaution is taken to test to the utmost every blade that is used. These blades come to the factory as steel castings, and are first put through a case-hardening process; that is, packed in boxes in a mixture of bone dust, leather and salt, they are baked in ovens for three hours, after which they are cooled in oil. This gives the desired hard surface but leaves the interior softer, thus insuring strength.

But not content with care in this hardening process, the Philadelphia maker subjects every individual blade to a crushing strain far beyond any it will ever meet in actual service. Three or four per cent. of the blades crack under the strain; but those which withstand it are certain to meet all requirements that will ever be placed upon them. Of course, this method of hardening is not that used in many lines of hardware as, for instance, saws, which are hardened and tempered in oil.

In many lines of metal specialties the character of product is similarly high. In gas fixtures, for instance, the output is unexcelled by that of any other city; while in ecclesiastical metal work such as crucifixes, candelabra, censers and the like, both design and quality are of very high order. In both these latter lines of manufacture the process is the same.



FITTING THE PARTS

Skilled workmen here do the work which makes the perfectly adjusted fixture.

The metal comes to the factory in the shape of castings, sheet metal, rods and tubing. It first goes to the fitters, who make it of the right length and size for the fixtures. Then it is taken up by the assemblers, who put the parts together. Now comes the dipping process; the metal

being plunged in an acid bath to rid it of grease and foreign matter. Then it is plated and then polished. It is in the polishing department that it takes the finish which must afterward be made permanent and which contributes so much to the appearance of the fixture. The polishing



HOLLOW SPINNING

is done upon wheels of cloth and the metal passes from one to another of these; the first, hard; the next, softer, and the next still softer. Though the first of these wheels is merely circular sheets of soft muslin laid together, the rapid rate at which it revolves—2,700 revolutions a minute, gives to even this soft material a hard surface that polishes down the metal and rubs out the roughness. Next comes the coloring wheel which brings the metal to the right color and finally the soft finishing wheel, of canton flannel, which merely rubs it gently. The metal parts are

brushed with lacquer to fix the color and prevent tarnishing.

In the turning and shaping of the many parts a high degree of skill is required. There is, for instance, the hollow spun work by which a disc of fine metal is made into the shape of a globe or a vase. The disc is placed upon a lathe and revolved at high speed. The skilled workman, at whose hand is a varied assortment of tools, presses upon the revolving disc with first one and then another, gradually molding it to the desired shape.

The Short Cut in Furniture-Making



FORMERLY, and not so many years ago, the cabinetmaker made furniture, and the machine supplemented his work; nowadays the machine's the thing, while man puts on the finishing touches. The price has been cut in two, and the furniture is better. That is, the furniture is better if in none of the various stages there is slighting, and if, throughout, the right material has been used. There is no stage at which a fine piece of furniture may be hurried on its way through the factory. It feels, even in its early stages, the dignity that is in keeping with its finished appearance of quality, and it will permit no infringement upon that dignity. Care in furniture making must begin with the seasoning of the wood, and must be carried through to the shipping room.

All the various kinds of wood that enter into the making of fine furniture—oak, plain and quartered, ash, poplar, chestnut, birch, maple, mahogany, etc. — are “shipped dry” to the factory. This is a term which means that they are shipped about half dry. If they were sent

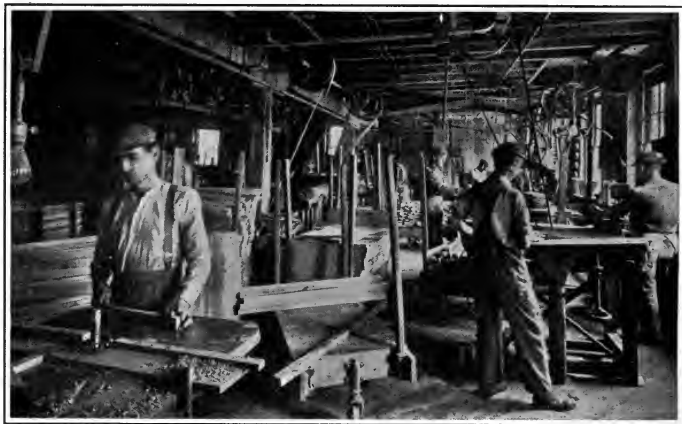


EARLY STEPS IN THE PROCESS

direct from the saw there would be excessive freights, and to avoid this half the sap is dried out before the lumber is passed to the factory.

Here it is first of all seasoned. The loaded cars are run direct into the dry kiln, where, beneath them are steam pipes which heat the room to about 140 degrees, drying out the last of the sap. It would be impos-

sible to season the lumber thus as soon as it comes from the saw. Such a process would mean that the wood would not dry out with the same degree of rapidity on the inner part as on the surface, and "hollow horn-ing," that is, the cracking up or checking of the inner wood, would result. These cracks within would not appear until the wood was cut.



DOVETAILING AND RABBETING

This is some of the machinery which nowadays expedites furniture making.

From the kiln the lumber goes to a room where the furniture is blocked out in the rough—that is, it is cut to length and ripped to width. Here too it is glued, if stock wider than the natural width of the board is desired, as, for instance, for the top of a sideboard. In this room, also, are chiselled by machine the little projections, called tenons, which are to fit into the mortised sections of other parts in order to fasten the piece together. Here, too, is a machine which does away with the old hand planing, scraping and sandpapering process. This machine has as its principal element three sandpaper covered drums. These as they revolve rapidly bring the piece to a smooth surface. This machine takes the place of twenty men. One shortcoming of this device is that, as the sandpaper moves always in the one direction over the surface of the wood, it is apt to raise the fibre in that direction. So it is suppl-

mented by another sandpapering machine which gives the forward and backward stroke of the hand process.

The most interesting of these early processes and one in which the greatest care must be exercised, is the veneering. Very little solid furniture is made today, veneered furniture taking its place for two reasons. One is that if solid furniture were made of, for instance, mahogany, the supply of this not too plentiful wood would shortly become exhausted. The second reason is that veneered furniture is better. If a piece of solid furniture is subjected to extremes of climate it is very likely to crack. For instance, if it were left for a time in a damp room which should afterward be heated, the wood would first swell and then shrink under the heat, and cracking might result. Furniture properly veneered cannot possibly crack.

The veneer is simply thin slices of wood, peeled off thirty to the inch. If but one layer were used, or if the work of veneering were slighted



IN THE FINISHING DEPARTMENT

Here the furniture begins to take its high appearance.

anywhere, it would be useless. But upon the top of a core, say of chestnut, two thicknesses of veneer are laid, the grain of one running in one direction, that of the other in the opposite direction. The bottom of the core is similarly treated, so that the solid wood is thus overlaid with four

thicknesses. This, if done properly, absolutely prevents warping and cracking, in either the core or the veneer. Solid furniture possesses one advantage. If it is scarred, as by the dropping of a heavy object upon it, it may be smoothed out and refinished. Veneer, being very thin, cannot be so treated, but its other advantages overweigh this solitary one that the solid piece of furniture possesses. The veneer must be laid on with the utmost care or trouble will follow. The surface is first covered with glue and then it is laid upon the core. The two are finally subjected to great pressure in order to lay the surface smooth and force out the excess of glue.

Supplementing the main process in this early part of the work are machines which do special work upon particular parts. These are moulding machines to fashion the edges, jointers to bring all four sides of a square part to exact right angles with adjoining sides, planers and similar machines. In another department the more highly ornamental parts are carved. Tools that turn at the rate of 9,000 revolutions a minute touch here and there the surface of the wood, held by an expert carver, and the desired pattern is speedily brought out.

All these parts must now be assembled, a process of great rapidity under the new method. Glue is laid over the tenons and over the surfaces of the mortised parts, and the various pieces are fitted together. Then the whole is placed in a large clamp, and, with the throw of a lever, the maker brings sufficient pressure to bring all parts snugly together. Four strokes of the mallet drive down the uprights so that they will set true, and the process is over.

Then comes the finishing. The filler, a combination of oil and pulverized stone, is first rubbed into the grain. This fills the pores and gives a hard surface that will not absorb varnish. The surface is now sandpapered and three, perhaps four, coats of varnish are to be applied. Then the polishing is done with pumice and water, or, in some cases, pumice and oil.

All this means furniture of high character that will stand wear and still keep its fine appearance. Furniture making of the inferior sort has been drifting in recent years toward the cheaper labor markets, while high-grade production still continues to characterize the factories situated in the better labor centres. All the output of the Philadelphia factories is of high grade, while in some lines its merit and artistic beauty are unexcelled.

From Pulp Mill to Book Shelf



It is but natural that a city which saw its first printing press as early as 1686, four years after the first English settlement was made in the colony, and which has always felt profoundly the influence of Franklin, should have carried the art of printing and publishing to a very high degree toward perfection. In 1743 the first bible printed in the United States, except for those which were printed in the Indian language, was



STAMPING DEPARTMENT

In the foreground is shown how book covers are made by machinery. In the stamping department they are then embossed in gold and colored inks.

turned out from the press of Christopher Sauer in Germantown. The first daily paper in the United States was established here in 1784. Franklin attempted a publication of magazines and other periodicals as early

as 1741; and in 1810 it was estimated that there were here printed annually half a million volumes.

Not only does Philadelphia to-day hold a high place in the book publishing trade, but it is also a centre for fine commercial printing, such as



TYPE SETTING MACHINES

Under the manipulation of the operator these machines automatically set the lines and cast them in metal, ready for printing.

printing establishments is known for high character throughout the country.

It is not generally known to the reading public that the largest establishment in America, owned and operated by a private company, for the manufacture and sale of bibles of all kinds is situated in Philadelphia, and that there is no city where as many bibles are printed,

catalogues, announcements, circulars and booklets of all kinds. Besides its hundreds of small printing establishments it has 250 large plants, the aggregate annual payroll of which, in the mechanical department alone, is \$2,500,000. These 250 printing plants do a business approximating \$10,000,000 a year. This requires special varieties of type, special presses and facilities for the selection of high grade papers. As the city has large type foundries its printers are favorably located in this respect, and what is more important, they are constantly in an atmosphere of good taste in the matter of printing. The customer of the Philadelphia printer has been educated to get the right sort of printing, and to insist upon getting it. It is for this reason that the work done by Philadelphia commercial

bound and shipped by one establishment. There are here issued by one house a half-million bibles yearly, and by three Philadelphia houses combined there are nearly a million copies manufactured every year. There is no city in the United States where a purchaser can have an opportunity to make so fine a selection as here, more than 500 styles, differing in type, size of text page and kind of binding, being published.

Books for children, which are known in the trade as juvenile books, are the largest sellers in the book trade, and the publishers of the most extensive line of these are found in Philadelphia. It is estimated that more than a million copies a year of juvenile and other popular books are published and manufactured in Philadelphia alone. Besides these, Philadelphia publishers are noted for the books brought out in beautiful bindings, handsome illustrations and popular styles.

In few lines of industry has there been so great a development of



SEWING DEPARTMENT

After the sheets of a book are assembled they are brought to the machines and sewed with thread and silk.

delicate and intricate machinery to expedite process. At every corner in the making of a book we find machines of the most seemingly involved, yet really simple, character. Take, as an illustration, the type-setting process. The old hand setting process is, of course, out of date so far

as what is termed "straight composition" is concerned. Even the linotype, which is a marvel of ingenuity, is rivalled in this class of work by an even more intricate machine termed the "monotype." The linotype casts a solid line of metal, after the operator has called down



GILDING ROOM

The books are clamped in these great vises and the gold leaf is rubbed into the edges by hand.

his line of matrices by pressing upon the letters of his keyboard. The monotype, a more recent invention, casts each letter separately, setting it up as it is cast. In this process a record, somewhat similar to that which is seen in self-playing piano devices, is first made by an operator who works upon a keyboard resembling an enlarged typewriter keyboard. As he touches the keys the ribbon of paper is punctured. When this record is made it is taken to the monotype machine. Here the little punctures in the ribbon govern the movement of a small plate of matrices into which the type is cast.

Other machines of almost as marvelous intricacy are to be seen. There is, for instance, an ingenious device which makes the covers or cases of the books. The operator feeds in at one end a sheet of cloth. This is gummed by the machine, and as it moves forward, two pieces of cardboard move from the opposite end of the machine to meet it. At one

operation these boards are laid upon the paste-covered cloth, are pressed down upon it, the ends of the cloth are drawn over neatly, and the finished case is delivered at the side of the machine.

For the smaller books as many as seventy-two pages are printed in a single sheet—that is, in a single form. For even the larger, sixteen pages are printed at once. Great presses with a self-feeding device pick up sheet by sheet and carry it speedily forward to receive the impression of the many pages. Some of these presses print both sides at once, and in one of the mechanical operations the paper is fed into the press, printed, and then cut before being delivered.

These sheets, which are termed “signatures,” now go to the folding machine, from which they emerge folded to the size of the book. The delicate India paper used for many of the finer books, however, is not trusted to this rapid process, but is placed upon a hand folder. The



HAND STAMPING

On these machines, raised work, such as monograms on letter paper is done.

signatures, placed in piles by themselves, are now rapidly assorted by an operative who passes from one pile to another, picking up each in turn and placing them together. The book is now assembled. It is then pounded down, a process which corresponds to the shrinking to which

woolen fabrics are subjected. Following this the books are taken to the stitching machine, which sews the signatures together. Indeed, as the printed pages emerge from this machine, a dozen books may be stitched together and must afterwards be cut apart.

The edges of the books are now trimmed, after which they are taken to the gilding room. Here the gold is applied to the edges. The books are placed in great vises, a score or more in each, and are clamped tightly together. Now, the red ink, which underlies the gold on the edges of many of the volumes, is applied with a brush. Then the gold leaf is laid on by hand and rubbed in. The books are now to be rounded. While in the ordinary book this rounding process is done by machinery, in the case of finer grades it is done by hand. Deft workmen hammer the backs into rounded shape with marvelous speed.

The cases or covers of ordinary books are made by machinery. Flexible leather cases, on the contrary, are hand-made by skilled workmen only. The leather must be beveled by hand and the inner sides of the rounded edges carefully gathered and pressed into shape. The gold lettering is now applied. Gold leaf is laid over the part to be lettered and the cover is fed into the press, which stamps the letters. After this stamping process the gold leaf around the letters is easily brushed away, leaving the gold only where the die touched the surface. Glue is now applied to the two outer pages, and the book is made fast to its cover. In the making of ordinary books there is much more machine work than in those of the finer sorts. Those bound in half-calf generally have much hand work on the covers. The tooling, such as the filigree work, which is to be seen on the backs of half-calf bound volumes, is a skilled hand process. With a various assortment of dies or tools the workmen stamp in this design.

From Pigment to Paint Pot



CONCENTRATION of the vast chemical industry in and near Philadelphia has given special advantages to all allied lines, notably the making of drugs and pharmaceutical preparations and the manufacture of paints.

Doubtless the importance of this centre in drug preparations has been, to a very important extent, influenced by the fact that the city has numerous and exceptionally fine medical, pharmaceutical and dental colleges. Products of the Philadelphia general drug and drug manufacturing houses have always been recognized for their purity and the attractive forms in which they are presented. In chemical productions of all kinds the preëminence of the city is well-known.

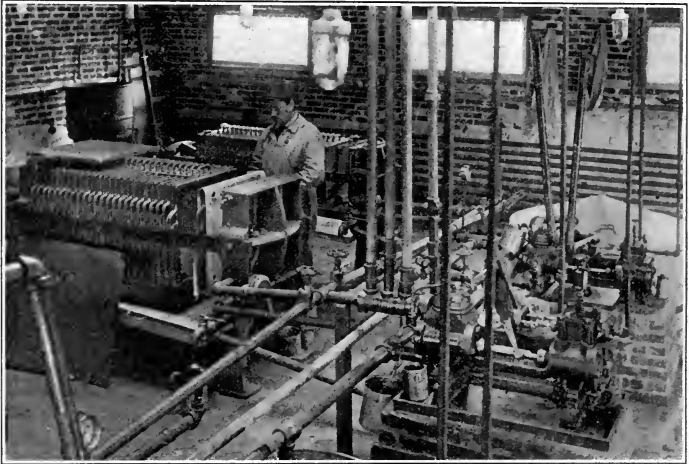
The manufacture of paints early assumed importance in Philadelphia. The representative houses in this line of manufacture are the oldest in the country, and at the same time the most vigorous. Buyers to-day recognize Philadelphia-made colors as the leaders in their line; indeed this is the birthplace, in America, of White Leads, Zincs, Colors, Varnishes and Brushes.

As the country has increased in population and in wealth, art and decorative effects have come more and more to be sought. Philadelphia manufacturers of colors have been fully equal to the possibility of this growth, and have led in the production of all the latest forms of painting and surfacing materials for the most elaborate effects in the fine and industrial arts.

Comparison of present methods with those formerly employed throws some light upon the question as to why prices at present are relatively so much lower than was thought possible in earlier days. In the manufacture of colors, the operations were mostly conducted under the greatest disadvantages. The "batches," as they are called, were small; colors, to-day, being made by the ton instead of by the hundred pounds as in the old days.

In the making of chemical colors, the various ingredients are

first prepared in great vats, the chemicals used being here dissolved; then these are drawn together into another separate vat; and this process, which is technically termed "striking the color," is one of the most interesting in the industry. It may be that none of the ingredients



PRESSING COLOR

Here the water is expelled until the mass becomes a solid cake.

was of the color sought, yet in bringing them together a chemical change has resulted that produces the desired color, which now slowly settles to the bottom of the liquid. In order to remove acids or other chemicals formed in the reactions, the top must first be drawn off by a syphon. Now water is run in, and again syphoned off, and this process, called washing, is repeated sometimes four, five or six times before the color is freed from impurities.

The color is now a soft mush, and in this form goes to the presses. Here the water is pressed out through canvas. Then the cake is taken to a drying room, where the last of the moisture is expelled. The dry cake next goes to the powdering mill where it is reduced to an impalpable powder, when it is ready for grinding in japan, oil or water, as

the case may be. This is done in a buhr-stone or an iron mill, the paint being worked until the color is thoroughly incorporated, and until the whole is a fine, smooth, butter-like paste. Paint so ground is termed in "paste" form to distinguish it from the ready-mixed. There is a difference, however, in the consistency, depending considerably upon the temperature or season of the year in which it is ground or sold. Paint manufactured in the winter time and held over until the summer will, of course, be softer or more mellow than when the temperature is much lower.

The grinding of many of the colors is a very slow process. Coach colors, for instance, must be absolutely flat and perfect. In the making of these the stream, as it comes from the mills, is so fine as scarcely to be



GRINDING COLOR

In these batteries of mills the dry powder is incorporated.

seen. A mill may work throughout a day and grind but five pounds of this paint.

Mineral colors are made from native ores or oxides. The mining and preparation of these is a separate business from the preparation of

the paint. They come to the manufacturer ready to be ground; and in the grinding, follow the course of the chemical colors, being first incorporated with the oil in which they are to be ground. There are to be seen in one of these great establishments from four to six hundred



VARNISH BOILING HOUSE

The gums are here boiled prior to being mixed.

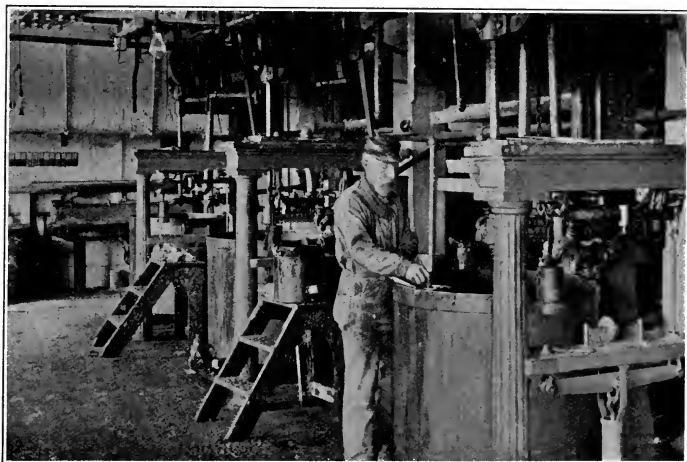
mills grinding material in the various forms in which it may be required, whether water colors, or oil colors, or coach colors in japan, or the various special mixings required by different branches of trade.

The growth of the ready-mixed paint department of the industry has been enormous in the past quarter of a century, mainly as the result of the dissemination of information by art schools and through newspaper household departments and magazines. This, stimulating the spirit of improvement, has made a large demand for paints ready for use. Many of the difficulties formerly experienced by the amateur in the use of paints, was due to inability to mix the material in such a way as to produce the desired results.

This difficulty has now been removed, and we have paints in ready-

mixed form both for house painting and for the various uses on the interior of dwellings, equal to anything that can possibly be produced in the qualities of durability, beauty and permanency. In whatever field the amateur desires to try his hand, he has paints, varnishes and finishes ready to use.

In the manufacture of Ready-Mixed Paint the workman assembles the base. Around him are pipes which supply him with all the necessary ingredients for the paints. The turning of one valve gives him a supply of oil, another, a supply of turpentine, benzine, varnish, dryer, or whatever he may require in making the paint formula which he has before him. The exact amount needed of each is turned into the vat in the mixing process.



FIRST PROCESS IN MIXED PAINT

Here the workman assembles the various ingredients.

Varnishes are simply solutions of gums of hard or soft variety. The vessels containing the gums, and the materials in which they are to be dissolved, are placed upon trucks so that they can be run over a fire, which is covered with a hood of metal or brick. This process, which is

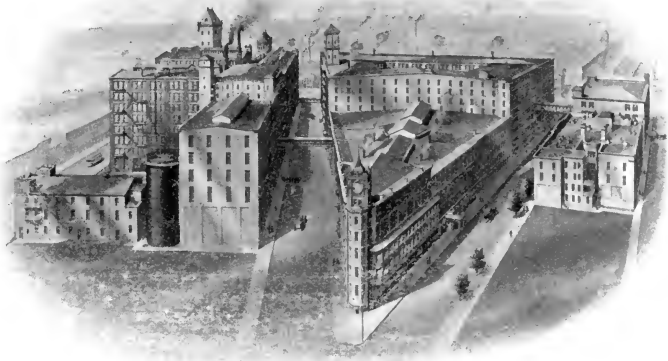
From Pigment to Paint Pot

the first in varnish making, is very difficult, the qualified gum melter being an important factor. When the material is thoroughly "cooked," it is transferred to a mixing house where it is incorporated with turpentine, oil, benzine, etc. On account of the inflammable nature of the mixing material, this process must be conducted at a distance from the boiling furnaces.

Proximity to the great chemical establishments of the city is a very important advantage to the paint manufacturer. To illustrate this fact, it is only necessary to mention a few of the chemicals that are used in the process. Yellow is made of bichromate of potash, with lead salts; blue, with prussiate of potash; green by a combination of these two; reds are mostly products of coal tar, struck on a lead oxide basis; the finer lakes, products of cochineal and dyes on alumina bases. All of the chemicals used in making these various colors are to be obtained at hand by the Philadelphia paint manufacturer. Then, too, he uses very largely sulphuric, acetic and nitric acids, all of which are prepared in Philadelphia in immense quantities.

A visit to any of the works of the Philadelphia manufacturers of such goods is time well spent by any buyer. Through having details explained, he obtains a fuller appreciation of the advantages which the manufacturer possesses, and he can feel assured that the fact that goods originate in this important center, where every facility in the matter of skilled labor, capital and other advantages are so easily obtainable and liberally employed, is a guarantee of superior quality at the lowest possible cost.





THE name of Stetson has always been synonymous with the finest in the production of men's hats. The Stetson "Boss Raw Edge" is the most splendid soft hat manufactured. Made entirely by hand by a process originated in the Stetson factory, it is the only hat that will retain its shape in all climates and under the hardest uses without the support of a binding.

The broad brim Stetson is popular in the cattle regions of the West, Alaska and Mexico, in the mountains and plains of South America, in Australia and South Africa. In the recent Boer War 10,000 British soldiers marched under the protection of the Stetson cow-boy hat of the American ranch. It is indicative of the high quality of production in this factory that these hats are still in service.

For finish, style and quality the

Stetson stiff hat is as famous the world over as is the soft hat. By men of the finest tastes they are demanded in the shops of Paris, Monte Carlo, Berlin, Hamburg and London, as well as in the cities of America. Wherever found the Stetson brands are a guarantee of correctness.

The Stetson factory, complete in all its details, has become one of the points of interest for foreigners visiting this country. Tourist agencies have solicited the favor of putting it upon their list of places to be visited, with the result that parties of tourists are conducted through the establishment at frequent intervals.

Throughout the plant the conditions under which employes work are such that the Stetson factory is known to all people interested in welfare work as a model for comfort, safety, and healthfulness.

JOHN B. STETSON COMPANY

FOURTH ST. AND MONTGOMERY AVE.

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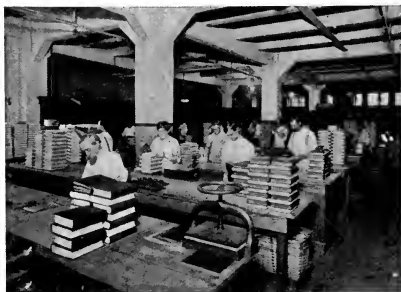
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As Importers of Fine Dress Goods and Silks, we have built up a business second to none of its kind.

The splendid consideration enjoyed by our Linen Department is well deserved. Here, in Table Damask, Napkins, Fancy Linens and Towels is shown the best exclusive line of qualities and patterns on the market; of these goods we are one of the largest importers.

Our Wash Goods and White Goods Departments have a strong hold on the trade because of the extremely large variety shown in exclusive styles and patterns.

We are also dealers in Upholstery Goods, Lace Curtains, etc., in which lines we show the choice of all the best mills.

As manufacturers of Women's Cloaks, Suits and Skirts, we have one of the largest and best equipped factories in the United States, where, with abundance of light and fresh air, our goods are manufactured in the best of hygienic surroundings, thus insuring

honest-made merchandise of the best quality, free from contamination.

Having earned an enviable reputation for placing only dependable merchandise on the market, and also for the most fair and liberal treatment of the trade, it shall be our aim to continue to deserve the liberal patronage of the best dealers who desire "goods that sell."



Strawbridge & Clothier



Home of the "Fretz Foldwell Umbrellas" and Manufactory of Umbrella and Parasol Materials

THE Fretz Manufacturing Company are makers of Fretz "Foldwell" frames, ribs, rods, furniture, handles, silks, unions, etc.

All buyers of umbrellas find it profitable to first consult with the foremost co-operative umbrella company on earth, situated in Philadelphia—the birth-place of American umbrella making. This means the finding of many surprising values.

Nowhere else would it be *possible* to find sufficient expert mechanics to build and operate all the intricate automatic special machinery necessary to make all parts—um-

brella wire and "Foldwell" ribs and rods, brass furniture, handles; and to weave the perfect silks for waterproof umbrella covers.

To-day, our salesmen can only visit the largest cities and there meet by appointment local buyers to mutual advantage. We build all grades and values that prove profitable to all—seller and consumer alike.

We are ready to build 15,000 "Fretz Foldwell" umbrellas daily and to make all parts from the raw materials to finished product!

Write for sample umbrellas! Write for sample cloths! Write for catalogue of supplies.

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Factory and Salesrooms

PHILADELPHIA



THE Art of Knitting and Crocheting continues its universal popularity. It is a pastime which combines profit with pleasure. Machine-made garments do not equal in softness, beauty and distinctive elegance those knitted and crocheted by hand. Bitter experience has taught the expert knitter and crocheter to use only the best yarns. No matter how skilful she may be, the finished work will not be satisfactory, if the yarn is not of the highest grade.



The "Fleisher" Yarns have been on the market for many years, and their excellent qualities have earned for them a national reputation. They are the acknowledged standard of excellence, combining all the qualities required by the most exacting knitter or crocheter—evenness, loftiness, elasticity. They are dyed in a full line of colors, from the deep, rich shades used for afghans to the light, delicate tints for infants' garments. Throughout all the processes of their manufacture, especial care and attention are given, in order to produce perfect yarns.



- FLEISHER'S KNITTING WORSTED
- FLEISHER'S DRESDEN SAXONY
- FLEISHER'S SPANISH WORSTED
- FLEISHER'S SPIRAL YARN
- FLEISHER'S SHETLAND ZEPHYR
- FLEISHER'S SHETLAND FLOSS
- FLEISHER'S GERMANTOWN ZEPHYR
- FLEISHER'S SUPERIOR ICE WOOL
- FLEISHER'S CASHMERE YARN
- FLEISHER'S PAMELA SHETLAND



The "Fleisher" Yarns will give your trade the best satisfaction and return a good profit to the retailer. They are carried by nearly all of the leading dry goods and notion jobbers in Philadelphia and throughout the country.





LIST OF SPECIALTIES

Diphtheria Antitoxin
 Analgine
 Bismuth Formic-Iodide
 Casca-Laxative

Diasos
 Laxative Salts of Fruit
 Lithos Tablets
 Pine and Somnos Cordial

Pre-Digested Beef
 Salicylos
 Somnos
 Vaccine

Antitoxin and Vaccine Laboratories, Glenolden, Delaware Co., Penna.



SUPLEE, REEVE, WHITING CO.

SUCCESSORS TO
BELKNAP, JOHNSON & POWELL

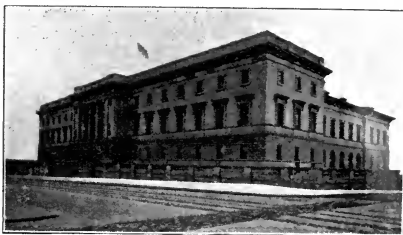
MANUFACTURERS OF
UMBRELLAS AND PARASOLS

823-825 FILBERT STREET, PHILADELPHIA
 434-436-438 BROADWAY, NEW YORK

Important Points of Interest in Philadelphia



*The Hoskins Store
904-906 Chestnut Street*



*United States Mint, 17th and Spring Garden Sts.
15 minutes from The Hoskins Store*



THE HOSKINS STORE began thirty-seven years ago as a stationery shop. To-day it is a Department Store for business men and women, handling Stationery, Engraving, Printing, Office Furniture and Business Systems.

Our buyers are always on the alert for every new creation that interests the busy man and woman—we thereby keep our customers thoroughly up-to-date.

We always try to be a little in advance of the times—to anticipate them; and this is why we are looked upon as an authority on such articles as we handle, so we feel safe in saying,

"IF IT'S IN OUR LINE, WE HAVE IT"



Office Furniture Dept., The Hoskins Store

THE HOSKINS STORE has the largest assortment of Office Furniture and Sectional Cases in Philadelphia—entire second floor is devoted to it. It is easy to find here exactly what you want in design and price.



Business Systems Dept., The Hoskins Store

CARD INDEX AND VERTICAL FILING SYSTEMS are becoming a necessary part of every business. Hoskins Business Systems Department is complete. Suggestions and ideas are yours for the asking.

THE HOSKINS STORE

904-906 CHESTNUT STREET

PHILADELPHIA

Mr. Retailer

THIS is your proposition. The purchase of the best possible line of clothing at the proper prices. Our proposition resolves itself into a definite statement that the **Alco System of Clothing** for Men and Young Men contains all the elements of quality, coupled with modest pricing that is bound to show up when our clothes are sold by you. The customer to whom you sell one of the **Alco System Garments** is a walking advertisement for your store. Our salesmen are booking the largest orders in our history. With our increased facilities we shall take good care of this business. Where we are not represented, exclusive control of the line with helping advertising is offered to live merchants. If we are not showing you the **Alco System Clothes** it's your business to let us know ; mail or wire.



Arnold, Louchheim & Co.

MANUFACTORY AND MAIN OFFICES

Eleventh, Wood and Carlton Sts.

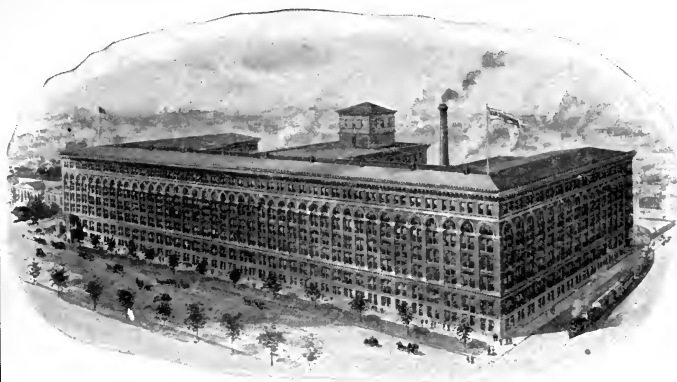
PHILADELPHIA

NEW YORK

CHICAGO

BALTIMORE

ST. LOUIS



Philadelphia a Good-Clothes Centre

SOME of the highest grade garments for men ever produced ready to put on are designed and made in Philadelphia. Nearly everyone is familiar with the trade-mark of A. B. Kirschbaum & Company on men's fine suits, topcoats, raincoats and the like.

The small illustration above shows the plant, built solely for and completely occupied by the Kirschbaum business.

It is the largest clothing establishment in the world, and one of the show places of Philadelphia. Situated at Broad, Carpenter, Washington and Watts Streets, next to the beautiful grounds of the Ridgway Library. Nothing has been spared that money would buy or science provide to make this the cleanest, most wholesome and sanitary clothing establishment in America. Every floor is flooded with sunlight and pure air.

Among other interesting features

this concern has its own electric equipment, its own fire patrol, its own railway line connecting the shipping rooms with the Pennsylvania Railroad, and a restaurant for the employés.

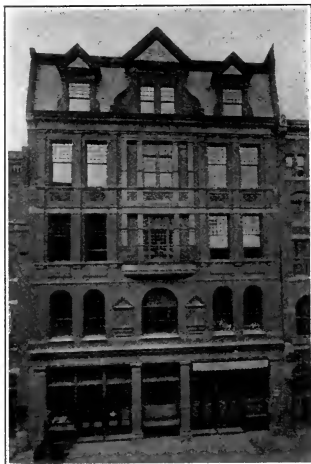
The Kirschbaum business was established in 1850, and, like many another Philadelphia institution, has grown with the industrial development of the city, profiting by the unusual manufacturing advantages, good labor, excellent shipping facilities and unequalled position as a producing community.

It has been said that in Philadelphia the standard of living is higher and the cost of living less than in any other city in America. One can readily see how this fact makes for economy of manufacture as well as quality of product. It is unquestionably true that in most lines buyers obtain here better value for the money than in any other market, especially in articles of every-day use and wear.

Established 1823 by the late John B. Ellison, Sr.

JOHN B. ELLISON & SONS

Wholesale Woolens



PHILADELPHIA BUILDING
22, 24 and 26 South Sixth Street
13, 15 and 17 S. Marshall Street



FOREIGN OFFICES

MONTREAL . . .	Cristine Building, 10 Victoria Square
HUDDERSFIELD . . .	11 Britannia Chambers
PARIS	{ 97 Rue Des Petits Champs, 7 Cite Trevisé, 7
TORONTO	Carlan Building, 54 Bay
VIENNA	AUSTRIA
HAMBURG	GERMANY
SYDNEY	AUSTRALIA
BARCELONA	SPAIN
CAPE TOWN	SOUTH AFRICA

AMERICAN OFFICES

NEW YORK	{ 180 and 1172 Broadway S. E. Cor. Twenty-eighth Street
BALTIMORE	140 W. Fayette Street
BOSTON	233 Tremont Building
BUFFALO	Morgan Building
CHICAGO	1007 and 1008 Hartford Building
ST. LOUIS	Missouri Trust Building
PITTSBURG	McCance Block
CINCINNATI	Neave Building
MINNEAPOLIS	705 Lumber Exchange Building
DETROIT	1032 Majestic Building
CLEVELAND	631 Garfield Building
WASHINGTON	522 Bond Building
LOUISVILLE	Keller Building
NEWARK	830 Broad Street
MILWAUKEE	Wells Building
NEW ORLEANS	508 L. & L. & G. Building



LONDON BUILDING
5, 6 and 7 Golden Square, West
25, 26 and 27 Bridal Lane, West
57, 59 Beak St., Regent St., West

This firm was established in 1823, and is the largest and oldest woolen house in America. They have warehouses in London, Philadelphia and Montreal, and sales offices in all the principal cities in America and Europe, and distribute their goods to almost every part of the world. **C** They carry a full line of goods suitable for Men's and Ladies' Tailoring Trade, Livery, Hunting and Riding Goods, Priestley's Cravenettes, etc.



HERE'S a picture of the Philadelphia Mint—where all the money comes from. The money that's coined here supplies the country with currency.

There's another "mint" in Philadelphia, where the **good** Clothes come from. The Clothes that are "coined" here, supply dealers all over the country with a product whose instant salability makes it as good as "ready money" to them.

It's because—like the product

of that other Philadelphia Mint—**Fleisher Clothing** bears the unmistakable stamp of honest value that it is as easily exchangeable for "coin of the realm."

We're not making empty promises. There are more than thirty-five years of fulfilment back of every promise we make. If you want to find out just why Fleisher Clothes so easily get your customers' money, suppose you ask us to send you sample garments. At our expense, of course.

FLEISHER BROTHERS

Men's and Young Men's Clothing

809-811-813 ARCH STREET

PHILADELPHIA

NEW YORK: 729 AND 731 BROADWAY

The Southwark Mills Company

MILLS

Eighth and Tasker Streets

Fifteenth and Wharton Streets

Third and Moore Streets

Thirty-first and Reed Streets

Twenty-first Street and Washington Avenue

Philadelphia

MAIN OFFICE

Eighth and Tasker Streets



Manufacturers of High-Grade Worsted
and Woollen Fabrics for Men's
and Women's Wear

The product of the mills of this Company has long been known for its high quality. The Southwark Mills broadcloths are the standard of excellence in their line

*Something About
Ribbons and Silks*

Tireless Activity

turns the wheels of commerce. It is not enough to produce the best to-day, we must do better to-morrow, or—drop behind.

The slipping of a cog means secondary place. Striving for the best results has given our ribbons a national reputation, but reputations once made (unless reinforced steadily and constantly by tireless activity) are soon lost.

The result for us to-day is the best general line of ribbons and silks in America manufactured exclusively for the retail trade.

Kohn, Adler & Co.
Philadelphia



THE PENNSYLVANIA LINE represents the highest achievement in Lawn Mower making. Not only are these machines superior in mechanical detail, but both material and workmanship are of the very highest order. Crucible Steel, hardened and tempered in oil, is employed in all the cutting blades, insuring a self-sharpening feature not found in other machines. They have taken the First Prize wherever exhibited in competition with other makes, and remain to-day the Standard Lawn Mowers of the World.

SA

Supplee
Hardware
Company

PHILADELPHIA

3 W's Lenox

For misses, children and little men. 60 styles always on hand. Price, from 40 cents to \$1.50

(Made in the Weimer Building)

3 W's Dorcas

Old ladies' hand turn comfort shoe. A trade bringer. Price, \$1.50

(Made in the Weimer Building)

3 W's Everybody's

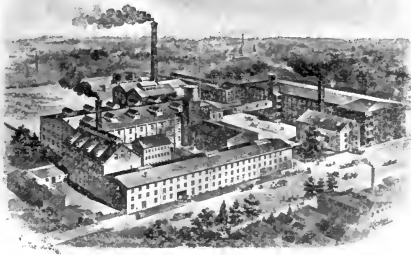
Fine shoes for women in all leathers. Price, \$1.60

(Made in the Weimer Building)

Come and see them made

Weimer, Wright
& Watkin

PHILADELPHIA



WHEN you buy the Leicester and Continental Mills knit goods you obtain not only what cannot be equalled, quality for quality, at the same prices, but goods that show the highest artistic treatment in design and coloring.

It is impossible to make better knit goods than are turned out by these mills, because every department of manufacture is conducted here, and in each there is the

constant aim to produce the best quality that can be produced at a given price. This is the reason why the product of these mills invariably commends itself to the discerning buyer: and this is true in the production of sweaters, athletic goods, bath-robos, smoking-jackets, bathing-suits and eider-down wrappers and sacks. We also sell eiderdown cloth, made in our own mills, and unequalled in price and quality.

The Leicester and Continental Mills Co.
Germantown
Philadelphia

Celebrated Bundhar Wilton Rugs

(CARPET AND SMALL SIZES)

French Wilton Rugs

(CARPET AND SMALL SIZES)

Body Brussels Rugs

(CARPET SIZES ONLY)

Imperial Art Squares

(3 AND 4 YARDS WIDE; ANY LENGTH)



CUT ORDER DEPARTMENT

IN BUNDHAR WILTON CARPETS—
FAMOUS FOR WEARING QUALITIES

THE MOST DURABLE CARPETS FOR CONTRACT WORK

(Samples sent on approval)



Ivins, Dietz & Metzger Company

1220-22 MARKET STREET
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CHICAGO, ILL., 1202 Heyworth Bldg. DETROIT, MICH., 1327 Chamber of Commerce

Send for Price Lists and Colored Plates of Rugs

Established
1850



Incorporated
1904



C. F. RUMPP & SONS

Manufacturers of

FINE LEATHER GOODS

Fifth and Cherry Streets

PHILADELPHIA

New York Salesroom, 683 and 685 Broadway



Lawrence Gas Fixture Manufacturing Co.

Designers and Manufacturers of

GAS, ELECTRIC AND COMBINATION
FIXTURES

129, 131, 133 & 135 North
Twelfth Street (Corner Cherry Street)

Philadelphia, Pa.



The Home of the Paints that will Make You Famous

PHILADELPHIA is known the world over for her hospitality, historic associations and the great excellence of her manufactures. It is truly a manufacturing city, one of the chief industries being Paints, Colors, Varnishes, etc.

As the apparel oft proclaims the man, so does the paint a dealer handles either make or debase his reputation.

If you are a druggist, hardware man, general storekeeper, or handle paint in connection with your other lines, it would pay you to make the acquaintance of the Lucas Products, which by their remarkable protective, beautifying and preservative qualities, speak right to the mind of every intelligent man. They have won almost national fame and held it for many years, their peculiar and individual merits giving them a distinctive place in the paint economy of to-day.

Respect your reputation, Mr. Dealer, and resolve for 1906 to

handle the "LUCAS QUALITY GOODS," which have back of them over half a century's honorable business record. If you come to Philadelphia, we should be glad to make your acquaintance, show you our goods and explain our methods.

The foundation of our business was laid over sixty years ago when we commenced manufacturing, and year by year it has been materially strengthened.

When the Lucas Products were first placed upon the market, we determined, come what may, that they must live up to their name and reputation. They have done this and more, and to-day stand right at the very front as preservers, protectors and beautifiers.

If interested in paints, look into the subject carefully. Then, and then only, will you understand why twelve thousand satisfied customers are handling the Lucas Goods.

Our booklet, "The Voice of Experience," explains more fully. Shall we send it?

JOHN LUCAS & CO.

MANUFACTURERS OF COLORS, PAINTS, VARNISHES, ETC.

NEW YORK

PHILADELPHIA

CHICAGO



40 Years OF Satisfaction

THAT is the length of time our special brands of hats—SEAL and SYLVANIA—have satisfied thousands and thousands of people. These names are guarantees of quality and style—*winning* and *holding* the confidence of the trade. Why don't you handle such hats? We send samples.

J. H. WELSH & CO.
HATS—STRAW GOODS—CAPS
826 ARCH ST. PHILADELPHIA

For
Ribbons, Silks and Velvets

Bowen, Dungan Co.

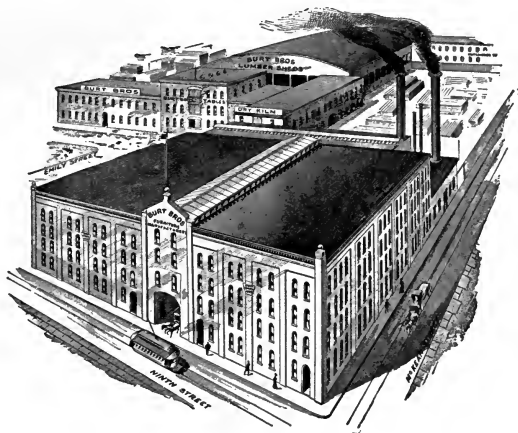
Importers
Manufacturers' Agents

715, 717, 719 Arch Street
Philadelphia

WE ARE READY TO SHOW YOU

FURNITURE

unexcelled by any of its class; goods that are being distributed through all of the markets, from the Atlantic to the Pacific Coast, as well as into many of the foreign countries.



Suites, \$14.00 to \$65.00

Chiffoniers, \$4.25 to \$20.00

Sideboards, \$11.50 to \$30.00

Dressing Tables, \$5.00 to \$18.50

CHAMBER SUITES, SIDEBARDS, CHIFFONIERS,
TOILET TABLES, PRINCESS DRESSERS AND
ODD BUREAUS IN OAK AND MAHOGANY

Catalogue to any Dealer on request

BURT BROTHERS, Manufacturers
NINTH AND EMILY STREETS :: :: PHILADELPHIA



Nepaul Mills

INCLUDED in the product of these mills are Upholstery and Drapery Fabrics, Damasks, Brocatelles, Armures, Gobelins, Silk Warps and Cotton Specialties and Tapestry Curtains and Couch Covers in an extensive variety of styles and weaves, Silk and Cotton Curtains, Bordered Curtains, Novelty Mercerized Curtains, etc., etc.

Fabrics by the yard in Silk and Satin Damask, Brocatelles, Armures, Silk and Cotton Gobelins, Mercerized Damasks, Silk Warps and all grades of Cotton Textures.

Stead, Miller & Co.

PHILADELPHIA

Mills and Salesroom: Fourth and Cambria Streets

NEW YORK
140 Fifth Avenue

CHICAGO
414 Medinah Temple
Fifth Avenue and Jackson Street

SAN FRANCISCO
58 Flood Building

An Old Merchant's Letter to His Son



MY DEAR JOHN :

The spring season will soon be here, and this is about the time you want to be buying. Salesmen are coming along with early lines—shirtwaists, silk waists, shirtwaist suits, wash skirts, cloth skirts, silk coats, covert jackets and raincoats—and it's up to you. Don't twist around the point like a terrier pup after his tail. When you see the line you want, buy it. I've noticed a tendency among some merchants during the last couple of years to put off their buying until the last horn, and when the good merchant has his goods all unpacked on his tables and racks, and is taking in the shekels, these wise ones are writing and telegraphing rush orders. Everything attributed to progress doesn't belong there. The college yell is a development of the Indian war-whoop, but it isn't an improvement. If you play with the spoon, you only make your medicine harder to take; and don't forget that procrastination is the biggest thief out of the penitentiary. Things haven't changed much since my day. The only difference between the old-fashioned stomach-ache and the modern appendicitis is that the latter costs about two hundred dollars more. Business is tacked down mighty tight, and the tack-puller is enterprise. Enterprise means push, and push gets its meals from the brain; and the brain occupies the top floor of the Human Apartment House, with an express elevator running to it.

You've struck some quartz, but you must keep digging. The only time to sleep is when you're in bed. Rip Van Winkle had a good nap, but when he awoke there wasn't even a sandwich for him. And, above all, remember that you get only straight tips from

Your affectionate

FATHER.



ESTABLISHED
1871



TERMS, 60 EXTRA
7-10 DAYS

Philadelphia Cloak and Suit Company

129, 131, 133, 135 N. TWELFTH STREET

JOHN W. GOODWIN, President
JOHN H. SMALTZ, Mgr. and Vice-Pres.
E. N. SIMONS, Secretary and Treasurer

Smaltz- Goodwin Co.

Makers of



ARTISTIC FOOTWEAR

PHILADELPHIA

NEW YORK, 309 BROADWAY CHICAGO, 21 QUINCY ST. SAN FRANCISCO, 819 MARKET ST.
LONDON, E. C., 27 MILTON ST.



For Catalogues, Advertisements, Commercial Work, etc.

We Manufacture Ribbons and Silks



Do You Buy Direct?

MOST manufacturers sell their product through a commission house or between-man—we don't.

No "extra profits" are paid for on the Pine Tree make of ribbons and silks, they come direct from our looms to the dealer.

Every yard of goods is sterling value, backed by over 50 years

of jobbing and manufacturing success.

Each order you place with us means better goods and more profit for you.

Why not write for samples to compare with any similar priced ribbons on the market?

You are the Judge!

We would be pleased to show you through our mill at any time.

The pictures used in illustrating Silk Manufacturing
are from our mills

L. Dannenbaum's Son & Co.

806-808-810 Arch Street
52 and 54 N. Eighth Street

Philadelphia, Pa.

Owners and Operators The Pine Tree Silk Mills

The Merchants and Travelers Association

N. E. COR. 13TH AND MARKET STREETS

(ENTRANCE, NO. 9 N. THIRTEENTH ST.)



☞ The headquarters are centrally located, midway between the principal railway stations, and convenient to both retail and wholesale districts.

☞ Visiting merchants are cordially invited to use the facilities which the association affords—information and telephone service, reading- and writing-rooms, etc.

Trade Mark



Merchant & Evans Co. Successor to Merchant & Co., Inc.

Tinplate and Metals

517 Arch Street, 512 Cherry Street, Philadelphia

WE ARE MANUFACTURERS OF
HIGH-GRADE BRIGHT AND ROOFING PLATES
SOLDER AND BABBITT METALS
STEREOTYPE AND ELECTROTYPE AND ALL
GRADES OF MIXED METALS

We also Manufacture the

"STAR" VENTILATOR AND SKYLIGHT "STAR" VENTILATOR
MERCHANT'S METAL "SPANISH" TILES AND "GOTHIC" SHINGLES

We carry in stock Brass and Copper Tubes, Sheets and
Rods, Galvanized and Black Steel Sheets, Sheet Zinc, etc.

Lowest Prices consistent with Quality

WINDSOR HOTEL

1217-29 FILBERT ST. PHILADELPHIA

*Central for
Shippers and Buyers*

WE'RE REMODELED

WE'RE RENOVATED

WE'RE REASONABLE

FRANK M. SCHEIBLEY, Manager

Young, Smyth, Field Company

ESTABLISHED 1842



WHOLESALE DISTRIBUTORS

of Everything that is Best in Philadelphia Quality

Hosiery, Gloves and Underwear ; White Goods, Small Wares,
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from the European Markets

Dependable life insurance extend- ing to age 75

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An Annuity thereafter through-
out life of \$50 for each \$1000
of insurance carried

All for less than the ordinary
life rate—example, age 35,
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Rates for all ages, specimen
policy, full information upon
request.

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by the policyholders' company.

**Penn Mutual Life
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