Interior of a Shoe Shop in the Civil War Period

A Modern Interior

The Shoe Industry

By

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PREFACE

THIS book is the story of a great and highly organized industry. It is the result of two years' careful investigation and extensive supplementary study. Representative factories, manufacturing all varieties of boots and shoes, have been studied in every department and operation, through periods varying from one to six weeks in each. Information has been secured from manufacturers, officials, department heads, and operatives, in every grade of service. The work of the factory and the processes of shoemaking are described as actually observed by the investigator.

Thus the book has been built up out of the industry itself. All available published material, both domestic and foreign, has been examined, but this volume is unique as an original study. Moreover the manuscript has been read critically and approved by many authorities in the industry, both by those who have given information and by others, and by economists and labor union officials.

The conditions and methods presented are those that are general and prevailing in this country.

The great natural divisions of the industry are treated in their logical order, from its historical setting and the development of shoe machinery to the distribution of the finished product of the factory. Employment conditions are treated at length and valuable supplementary material is added. Important statistical material is given throughout the chapters. An explanation of the terms used in shoemaking is made the final chapter, for consultation by the reader as may be found necessary. Numerous charts, diagrams, and illustrations are included.

The book graphically presents extensive inside information gathered for permanent use.

It is the purpose of this study to give the nature, history, magnitude, operations and processes, employment opportunities and demands, and the future of the industry, both for those already in it and for other persons, and their advisers and teachers, who may be considering employment in this field of manufacture.

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Historical Sketch

Ancient and Mediæval Shoes. The sandal was the first known form of footwear. It was the universal type among all early peoples, as it is now in all warm countries. Pictures of ancient Egyptian sandal makers of 1495 B. C. have been found in Thebes, showing methods something like those of the modern hand shoemaker who sat upon a low bench or form and held his work upon his knees. The earliest known form of footwear varied from a strip of leather fastened underneath as a protection from the ground to coverings ornamented with gems and gold. Sandals of papyrus and of leather were in quite general use in ancient times. The Teutonic tribes of the north of Europe wore a leather protection upon the leg below the knee. The Romans adapted this custom by attaching the leg covering to the sandal, at first leaving the toe open and later closing it, thus making a complete boot. Such a boot or shoe was worn throughout the Middle Ages. In this period the shoe became one of the most important and conspicuous articles of dress, and its length varied with the social or political standing of the wearer. Thus a prince wore a shoe thirty inches long; a baron, one of twenty-four inches; a knight, one of eighteen, and so on.

A Recent Discovery of Ancient Shoes. "The two-thousand-year-old footwear exhibit in the museum of the United Shoe Machinery Company, which was recently taken from excavations made on the site of the ancient city of Antinoe, established A. D. 130, impresses the observer with the fact that ancient shoemakers were by no means lacking in skill. In looking at the exhibit, one is amazed to see the modern effects of many of the samples. The shoes are splendidly preserved, and some of the knitted sandals have the appearance of having been given only a few weeks' hard wear. Attempts at ornamentations show rosettes made of leather, and made up in a variety of designs."*

The London Cordwainers' Company. In the year 1272 King Henry III granted an ordinance which established the Cordwainers' and Cobelers' Company of London, as it was first known, and gave it power to supervise the trade generally "for the relief and advancement of the whole business, and to the end that all frauds and deceits may hereafter be avoided." While "cordewaner," a word originating from the use of leather coming from Cordova in Spain, was the name used generally for the shoemaker of the time, the term included also workers in the associated trades, such as leather curriers, tanners, purse and pouch makers, and

*From *American Shoemaking*, for November 7, 1914.

girdlers. The "cobeler" became later the worker in old leather, or merely the shoe repairer.

The Cordwainers' Company has become simply a guild, but one of the oldest and most honored in the city of London.

> Marry, because you have drank with the King,
> And the King hath so graciously pledged you,
> You shall no more be called shoemakers;
> But you and yours, to the world's end,
> Shall be called the trade of the gentle craft.
>
> —*George-a-Greene, Old Play, 1500.*

The Moccasin of the American Indian. The American Indian made rawhide leather by simple processes, and sewed pieces of it into a foot covering called a "moccasin." The white men who first came brought shoes from the mother countries and for many years continued to import them; but the pioneers also wore the moccasins of the native, sometimes making them, as well as hunting shirts and leggings, from leather tanned by the Indian.

The First American Shoemakers. The first shoemakers in this country settled in Massachusetts, Thomas Beard and Isaac Rickerman coming to Salem in 1629, and Philip Kertland to Lynn in 1635. The advent of each of these men was heralded as an important event and special favors were granted to them. They brought the methods of a trade still primitive though ancient in Europe. They used the leather apron, lap stone, hammer, wooden pegs, hand-made thread, boot-tree last, such as thousands of cobblers use even in this day of machinery. John Adam Dagyr, a Welshman, came to Lynn in 1750. He was a master-craftsman, and Lynn, which had already become the leading shoe town in the Colonies, advanced still more rapidly in the industry. Dagyr was the first organizer of the industry in this country. The more ingenious colonists learned to make shoes by hand, often serving an apprenticeship of seven years, and the trade gradually passed far beyond its European stages. From these simple beginnings sprang the great industry of American shoemaking.

An Indenture Paper. Following is a copy of the original agreement by which boys were apprenticed to the shoemaking trade in the early part of the last century. The original is now in the possession of Mr. Charles Wellesley Allen, Brooklyn, N. Y.

"THIS INDENTURE, WITNESSETH,

"That John Goedersoon, now aged fourteen years, eight months and twenty-seven days, by and with the consent of his step-father, John Wright, and his mother, Mary Wright, hath put himself and, by these presents, doth voluntarily and of his own free will and accord, put himself Apprentice to Frederick Seely of the City of New York, Cordwainer, and after the manner of an Apprentice to serve from the day of the date hereof for and during, and until the full end and term of six years, three months

An Old Time Shoemaker

and three days next ensuing during all which time the said Apprentice shall his master faithfully serve, his secrets keep, his commands everywhere readily obey.

"He shall do no damage to his said Master nor see it done by others, without letting or giving notice thereof to his said Master. He shall not waste his said Master's goods nor lend unlawfully to any. He shall not contract matrimony within the said term; at Cards, Dice, or any unlawful game he shall not play, whereby his Master may have damages. With his own goods nor the goods of others, without license from his said Master. . . . He shall neither buy nor sell. He shall not absent himself, day or night, from his said Master's service without leave, nor haunt ale-houses, taverns or play-houses; but in all things behave as a faithful Apprentice ought to do, during the said term.

"And the said Master shall use the utmost of his endeavors to teach, or cause to be taught or instructed, the said Apprentice in the trade, or mystery, of a Cordwainer, and procure and provide for him sufficient meat, drink, washing, lodging and clothing fit for an Apprentice, during the said term of service and four quarters of night schooling during the said term.

"And for the true performance of all and singular the Covenants and Agreements aforesaid, the said parties bind themselves each unto the other firmly by these presents. IN WITNESS WHEREOF the said parties have interchangeably set their hands and seals hereunto. Dated the sixth day of August, in the thirty-fifth year of the Independence of the United

States of America, and in the year of our Lord eighteen hundred and eleven.

"Sealed and delivered in the
presence of L. Cowdrey.

"FREDERICK SEELY,
"JOHN GOEDERSOON,
"MARIA WRIGHT,
"JAHAN WRIGHT."

The Value of Shoes in Colonial Times. In spite of the abundance of wild and domestic animals whose skins might serve as leather in Colonial times, the prices of leather and of rough hand-made footwear were comparatively high. Leather of the finer sort was still imported from England. Shoes were the product of quite laborious processes and of considerable skill and ingenuity. They might be purchased by labor on the land or in the forest, by the barter of other goods or by hard English shillings. In the law of 1720-21 Pennsylvania fixed the maximum price at which shoes should be sold at retail in the colony, as "six shillings and six pence for a pair of good, well-made men's shoes," five shillings for women's shoes, and proportionately less for children's shoes. This law fixed the price of leather also.

With many persons, especially children and youth, shoes were little or seldom worn, appearing only on special occasions. Often the Colonial family walked bare-foot to church on Sunday morning, each member carrying his shoes in his hand until near the church door when they were put on the feet.

Ancient Shoe Laws. The law makers of the Colonies from the beginning set regulations over the activities and employments of the people. The Province of Pennsylvania in 1720-21 made it a crime for a tanner of leather to become a currier or a shoemaker. Section 7 of the law reads as follows:

> "And be it further enacted by the authority aforesaid that no person occupying or using the mystery of the shoemaker, shall make or cause to be made any boots, shoes, or slippers for sale but of leather well and sufficiently sewed with good thread well twisted and made and well waxed. Nor shall mingle the overleather, that is to say part of the overleather being of neats leather and part of calves leather. Nor shall put into any boots, shoes, or slippers for sale, any leather made of sheepskin, bulls hide, or horses hide; or into the upper leather of any shoes or slippers, or into the inner part of any boots (inner part of the shoe excepted) any part of any hide from which the sole leather is cut, called the neck, shank, flange, powle, or cheek, upon paying a forfeiture of all such shoes, boots, and slippers, to be divided and applied in the manner directed by this act."

The same Act provided that shoes sold above the prices fixed by Provincial law or above the rates set from time to time by the mayor, aldermen, and justices of the courts, should be subject to forfeiture.

The Itinerant Shoemaker. The Colonial shoemaker often traveled from house to house or village to village, as a journeyman, doing repair work and making new shoes for all the members of a family. The market for home-made shoes was limited in those days, and many of the shoemakers practiced other arts, such as sharpening knives, saws, and axes, mending furniture, repairing clocks, cutting hair, and pulling teeth. The traveling cobbler, with his kit of simple tools and with the rough and heavy leather of the period, was a welcome dispenser of service and of news and gossip among the colonists.

The First Shoe Shops. No change of importance from either home work or itinerant employment occurred in shoemaking in the colonies until about the middle of the eighteenth century, when the more enterprising cobblers began to employ others and work became more and more confined to local shops. Hand processes continued, with some subdivision of labor, one man cutting, another sewing, another fastening on the bottom of the boot with pegs, and so on. Often in the home or little shop the hand sewing was done by girls and women whose hands were more deft for such a process.

> Poor lone Hannah,
> Sitting at the window, binding shoes!
> Faded, wrinkled,
> Sitting, stitching, in a mournful muse!
> Brighte-eyed beauty once was she,
> When the bloom was on the tree.
> Spring and winter
> Hannah's at the window, binding shoes.
> —"*Hannah Binding Shoes,*" *Lucy Larcom.*

The New England shoemakers led in the industry. There were a few Dutch shoemakers in New York, but scarcely any in agricultural communities of the South. The market of the New England maker, therefore, included all the colonies scattered along the Atlantic coast. In many cases the proprietor of the shop made weekly or monthly trips on foot or with an ox-cart to a village or larger community to dispose of his shop-made goods, and shoe traffic gradually arose.

Often the shop was closed altogether in the summer, when work upon the land was necessary or fishing for those situated along the sea coast.

Frequently the home served as a shop, the family receiving shoe materials from the manufacturer or from the village storekeeper who acted for the manufacturer or tanner.

A Shop of a Century Ago. "Probably the oldest shoe factory now standing in this country is the Putnam shop, near the Newburyport turnpike, in the town of Danvers, Mass. It was built before the Revolution. It was one of the buildings on the old Putnam farm, the birthplace of General Putnam ('Old Put') of Revolutionary fame. It was mentioned in the first United States census of manufacturing, taken in 1786, and it was then evidently a factory of importance. It is still in excellent state of preservation. Some of the tools that were used by its occupants are still preserved.

"The early tools are of wrought iron. The patterns are of board. Cutters who are used to handling thin patterns of today would think these board patterns very coarse. Lasts saved in the old shop are clumsy. The books show that they cost from twenty-five cents to one dollar a pair, the price being determined by the style. Apparently, the last-makers of old well knew how to capitalize style.

"All the shoes made in this old shop were made by hand. The shoemakers were paid from fifteen to twenty-five cents a pair for their labor, and they earned from five dollars to ten dollars a week, the rise and fall of their wages being determined chiefly by the way that orders came in. At first shoes made in this shop were sent in ox-wagons to Boston. Later they were sent in horse wagons. They were packed in barrels."*

Ebenezer Breed and the Shoe Tariff. Following the Revolution the break between the Colonies and the Mother Country encouraged American industries in many lines. American shoemaking, however, still suffered from the competition of imported shoes. The habit of wearing English-made shoes was hard to break and many of the well-to-do people continued to demand them.

At this crisis, in which an industry of great possibilities seemed likely to be restricted and confined mainly to the cheaper lines of product, appeared the first great leader of American shoe manufacture, Ebenezer Breed. Breed was born in Lynn, of

*From *Boot and Shoe Recorder*, Boston.

An Old Time Shoe Shop Placed Beside a Modern Factory

"During three-quarters of the nineteenth century there were many shoe shops in New England which were called 'ten-footers' beeause they were about ten feet square. In these small shanties experienced shoemakers and apprentices made shoes by hand—and well. The building pictured above was used by Freeman Winslow, Jr., in 1861. It stood for years at 52 Collins Street, Lynn."—*The Boston Budget.*

Quaker parentage, and here learned the shoe trade. While still a young man he removed to Philadelphia, then the Nation's capital. Here he gained the friendship of prominent people, including members of the National Congress. He proposed a protective tariff on boots and shoes, and on this suggestion Congress passed a shoe tariff act in 1789.

Breed was a wholesale boot and shoe merchant, and prospered greatly after the passage of the act. He was recognized as a leading American and was feted at home and abroad, visiting France and England.

Through misfortune in personal affairs, Ebenezer Breed lost his business and property and his eyesight. He died in the almshouse of his native town of Lynn.

The following has been said of him:

> "The man who was so powerful as to build up a great wall of protection about the entire American shoe trade spent his declining days quietly and peacefully in an almshouse, forgotten by nearly everyone but the Quakers."

The First Shoe Factories. Soon after the Revolution shoemakers who wished to increase their output or had ambition to became manufacturers or employers, engaged other shoemakers to work for them on a larger scale than formerly, thus establishing the factory system and introducing a distinction between capital and labor in the industry.

The early manufacturers devoted themselves more and more to buying materials in quantities and to selling the products of their factories. Larger and larger factories were erected. In many cases shoemakers took materials from the factory and made shoes at home, each in his little shop.

A Division of Labor in the Factory: "Teams" and "Gangs." It was known that workmen were usually expert in particular operations, for instance, in cutting and fitting uppers, or in preparing soles, or in sewing the sole to the upper. This fact produced a division of labor. Shoemaking in factories during this period, until the introduction of machinery, was marked, also, by the custom of having what were called "teams" of workers. A team consisted of a number of workers, each performing a particular process, the whole team producing an entire shoe. On the other hand, a team might consist of a group of men all experts upon a single process. Such a team was known usually as a "gang." A gang of bottomers, for instance, often went from factory to factory, or from employer to employer, having a contract with each to bottom all the shoes in process of making.

The team or gang system gradually passed largely out of use after the introduction of shoe machinery. The term is still used in some factories, especially in the making or bottoming room. In one factory only, however, among the many investigated in obtaining material for this book, was there found a gang working as in earlier times. This was a team of six men making an entire shoe of high quality for a fine class of trade.

A Quotation on the "Contract System." The following quotation gives an interesting picture of the contract system and team work:*

> "With the advent of the McKay machine came new methods, new systems, and new styles.
>
> . . . .
>
> "The contract system was the popular way of making shoes. The manufacturer had a room in the shoe district, where he cut the uppers and kept his stock; he would then enter into a contract with some man to fit them. When uppers were fitted he would again make another contract with some firm to bottom them. Thus it will be seen that very little equipment was needed to manufacture shoes. All the room required was for cutting and packing. Our large and modern factories of today, with their splendid equipment of almost humanly intelligent machinery and skilled operators, giving employment to thousands of men and women, and turning out annually 3,000,000 pairs of shoes, was never the dream of the old-time shoemaker.
>
> "Many evils grew from the contract system. It was a common thing for those men who had charge of the contract fitting and bottoming rooms to underbid each other, and he whose bid was the lowest got the work. He saw to it, however, that his margin of profit remained

*C. P. Lawrence, in *American Shoemaking*, Boston, January 16, 1915.

the same, for he would cut the piece price of his employees enough to make up the difference, and thus his margin of profit remained the same.

"Labor organizations did much to correct this evil.

"Prices for bottoming ranged from twenty-seven and one-half to forty-five cents a pair. Contractors wanted the lion's share for their profit, and got it.

"The McKay sewing machine and a few stock fitting machines were all the machines used at the time of the five-handed team, and they were operated by foot power.

"Stock fitting was a simple operation, consisting of rounding and channeling and counter skiving (no moulding). Five men were required to build a shoe. A bench six feet long and four feet wide, with two shelves in the center, two men on each side and one at the end, a laster, beater-out, trimmer, edge setter and bottom finisher, constituted the team, and twelve pairs of lasts were given to each team."

The Attitude of Early Shoemakers towards the Shoe Factory. The typical shoemaker had long been his own master. He worked in his little shop at home as he pleased, doing perhaps farm work or engaging in some other occupation a part of the year. He objected to serving any other master than himself, and believed that obedience to a foreman was a surrender of his personal rights and liberties. He was reluctant to submit to factory hours, from seven o'clock in the morning until six at night, and to exacting factory regulations. He opposed in like manner the introduction of labor-saving machinery.

The general industrial growth of communities was, however, an irresistible though a slowly coming tide. Progressive methods of employment and the introduction of machinery gradually broke down all opposition. The individual shoemaker or cobbler has survived to the present day, but will probably disappear with this generation.

Organization in the Factory System. Factories were divided into the natural divisions or departments of shoemaking. Men were set apart to organize and train employees. Superintendents and foremen or overseers of departments appeared. Systems were worked out for the procuring and care of raw materials, for making shoes in quantity, for moving them in the processes of making from one factory room to an other, for having each lot handled and finished as a unit, and for disposing of factory product through agencies established in market centers, and through traveling salesmen. Thus factory organization produced also business organization.

Specialists. Modern factory and business organization calls for specialists in each department. The large shoe manufacturing firm of today has a specialist in leather buying, another in procuring lasts and patterns, another in charge of miscellaneous supplies, another as manager of sales, another as factory manager or in charge of a factory department, another as financier, another for advertising, and so on through all the great divisions of the firm's activities.

The Magnitude of the Industry Today. The growth of the shoe industry in this country has been marvelous. The greatest gain has taken place within the last twenty years, since the invention and wide-spread use of the more important shoe machines. Although full statistical information is given in the census tables included in this volume, a few illustrative figures and facts may be presented here. According to the Census of 1909 there were in thirty-one states of the Union 1,918 factories making shoes and allied products. The capital invested in the industry was $222,324,000, and the number of employees was 215,000. Eight hundred and sixty of the factories were in Massachusetts. There has been a constant increase in the industry since that time, especially in invested capital and employees. The persons connected with shoe manufacture probably now number nearly 250,000. The leading states in their order are, Massachusetts, Missouri, New York, New Hampshire, Ohio, Pennsylvania, and Illinois.

Boston is the leading center of the world in the shoe and leather trade; Chicago, in trade in untanned hides.

Lynn, the first home of the industry in this country, has long been the leading city in the manufacture of shoes and shoe material. Sixty-five per cent. of the manufactures of the city are in these lines. It has over two hundred shoe factories, employing 18,000 people and $18,000,000 in capital, and producing goods to the value of $47,000,000 annually.

Brockton, Mass., ranks second in the industry, with eighty-six per cent. of its manufactures in shoes. It has seventy-five factories, employing about 14,000 people and a capital of over $14,000,000, and producing shoes worth $40,000,000 annually.

Other cities in the order of magnitude of shoe manufacture are, St. Louis, Mo., Haverhill, Mass., Boston, New York, Manchester, N. H., Cincinnati, Rochester, N. Y., and Chicago.

The exportation of shoes has come mostly within twelve or fifteen years, and has grown very rapidly within this time. The Massachusetts North Shore district, for example, now sends abroad more than ten million dollars' worth of shoes each year.

The United States is not only leading the world in making shoes, but is finding markets increasingly in all countries.

The New England Shoe and Leather Association has recently issued a circular from which the following statements are drawn:

> New England produces fifty-seven per cent. of the boots, shoes, slippers and cut-stock and findings, and a large percentage of all the leather made in this country.
>
> It has 1,000 shoe factories and cut-stock and findings establishments, principally in Massachusetts, New Hampshire, and Maine.

In these industries $111,000,000 capital is invested, 100,000 wage-earners are employed, and the annual value of product is approximately $300,000,000.

It has about 175 establishments for the production of leather, representing $45,000,000 of invested capital and $45,000,000 annual value of product.

It also leads in the manufacture of rubber goods, Massachusetts alone annually producing $50,000,000 worth of rubber boots and shoes and miscellaneous articles.

Massachusetts is virtually the birthplace of the tanning and boot and shoe industries of the United States, and has possessed these allied industries for nearly three hundred years.

In the boot and shoe and cut-stock and findings industries, it has about 875 establishments, with more than $90,000,000 invested capital, 83,000 wage-earners and annual value of product of $236,000,000.

It has sixty-three cities and towns in which the shoe manufacturing industry is carried on.

It has one county, Essex, which produces one-seventh of the combined boot and shoe and leather product of the United States.

Brockton, the leading city in which men's shoes are manufactured; Haverhill, the foremost slipper manufacturing city, and Lynn, the world's greatest women's footwear center, are notable examples of Massachusetts' shoemaking activity.

More than 3,000,000,000 pairs of shoes have been shipped from Boston in the past forty-five years.

BOOTS AND SHOES, INCLUDING CUT STOCK AND FINDINGS—VALUE OF PRODUCTS FOR LEADING STATES*: 1909 AND 1899

*From Manufactures: 1909. Thirteenth Census of the United States.

Table I—General Statistics. Summary for the Three Branches of the Shoe Industry for the United States. Census of 1909.*

	Total for the industry	Establishments Manufacturing Principally		
		Boots and shoes	Boot and shoe cut stock	Boot and shoe findings
Number of establishments	1,918	1,343	232	343
Persons engaged in the industry	215,923	200,847	7,535	7,541
Proprietors and firm members	1,838	1,218	255	365
Salaried employees	15,788	14,513	587	688
Wage earners (average number)	198,297	185,116	6,693	6,488
Primary horsepower	96,302	85,896	4,769	5,637
Capital	$222,324,248	$197,090,344	$15,735,034	$ 9,498,870
Expenses	477,843,146	412,813,602	41,823,014	23,206,530
Services	117,092,116	109,646,165	3,799,752	3,646,199
Salaries	18,629,421	17,287,013	643,292	699,116
Wages	98,462,695	92,359,152	3,156,460	2,947,083
Materials	332,738,213	277,467,743	36,919,919	18,350,551
Miscellaneous	28,012,817	25,699,694	1,103,343	1,209,780
Value of Products	512,797,642	442,630,726	44,661,497	25,505,419
Value added by manufacture (value of products less cost of materials)	180,059,429	165,162,983	7,741,578	7,154,868

* The latest available statistics. The table does not include allied leather products or rubber boots and shoes.

Table II*—Boot and Shoe Cut Stock.

	Number of establishments	Wage earners (average number)	Wages	Cost of materials	Value of products	Value added by manufacturer
1909	232	6,693	$3,156,460	$36,919,919	$44,661,497	$7,741,578
1904	290	5,936	2,364,209	21,586,872	27,675,815	6,088,943
1899	342	6,155	2,230,691	17,800,282	23,242,892	5,442,610
1889	344	4,992	1,891,031	13,744,655	17,903,846	4,159,191
1879	172	2,885	735,482	5,939,249	7,531,635	1,592,386

The establishments included in this subclass are engaged primarily in the manufacture of soles, tops, lifts, leather and rubber heels, tips, and similar articles. Some products of the same character are manufactured by establishments in the boot and shoe industry proper.

*Table 196, Manufactures: 1909. Thirteenth Census of the United States.

Table III*—Findings.

	Number of establishments	Wage earners (average number)	Wages	Cost of materials	Value of products	Value added by manufacturer
1909	343	6,488	$2,947,083	$18,350,551	$25,505,419	$7,154,868
1904	289	4,434	1,647,877	6,337,810	9,904,887	3,567,077
1899	312	3,246	1,252,491	5,022,591	7,834,615	2,812,024
1889	455	3,434	1,205,397	3,868,099	6,805,330	2,937,231
1879	216	1,935	621,500	1,636,921	2,935,787	1,298,866
1869	297	3,052	871,008	1,880,764	3,653,938	1,773,174

The establishments included in this subclass manufacture supplies, such as trimmings, pipings, cotton and paper specialties, dressing, blacking and fillers, shoe wax, burnishing ink, bindings, steel and wooden shanks, fiberboard and counters, wooden and cork heels, foot-arch supporters, linings, metal protectors, vamp stays, rands, straps, beading, leather bows, eyelets, back stays, shoe tacks, and shoe pegs.

*Table 197, Manufactures: 1909. Thirteenth Census of the United States.

Table IV—Exports of Boots and Shoes from the United States during the Fiscal Years ending June 30, 1912, 1913, and 1914, as Reported by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

	Twelve Months ending June—					
	1912		1913		1914	
	Quantity	Value	Quantity	Value	Quantity	Value
France ....pairs	145,631	$ 501,764	135,523	$ 454,913	104,234	$ 340,645
Germany ....pairs	348,594	920,861	435,747	1,227,513	511,248	1,376,328
United Kingdom........pairs	841,866	1,791,445	588,377	1,333,605	576,420	1,309,206
Other Europe ....pairs	484,064	1,351,238	501,302	1,406,114	533,872	1,530,007
Canada ....pairs	1,231,731	2,457,007	1,560,830	3,107,749	1,679,270	3,104,412
Central Amer. States and British Honduras .....pairs	556,169	1,042,684	526,685	981,971	633,623	1,249,638
Mexico ....pairs	822,605	1,741,282	919,608	1,919,209	566,688	1,143,455
Cuba ....pairs	2,792,561	2,967,722	3,799,406	4,039,467	3,032,710	3,349,927
Other West Indies and Bermuda ....pairs	709,758	746,116	553,566	619,702	757,505	884,088
Argentina ....pairs	115,866	377,407	194,399	651,432	295,146	881,887
Brazil ....pairs	85,342	234,817	160,267	485,608	143,497	451,628
Other So. America ......pairs	270,889	580,014	259,827	629,639	265,940	600,779
British Oceania ....pairs	92,640	212,239	118,468	293,500	115,218	293,876
Philippine Islands.......pairs	327,478	657,718	342,906	612,021	397,265	773,696
Other countries ....pairs	215,149	426,688	207,883	433,692	289,698	577,662
Total.............pairs	9,040,343	$16,009,002	10,304,794	$18,196,135	9,902,334	$17,867,234

Chapter II

SHOE MACHINERY

CHAPTER II

Shoe Machinery

The Invention of Shoe Machinery. The invention of shoe machinery, from about the middle of the last century, has revolutionized shoe manufacture. The story of the patient development of one machine after another, until the dexterity of the human fingers has been equalled, reads like a romance. Most of these machines have been invented by shoeworkers themselves, often after long toil and study of particular processes. Inventive genius and mechanical skill have been granted about 7,000 patents on shoe machinery since the establishment of the United States Patent Office in 1836. Sometimes there have been a score or more on a single machine, to protect it as it has been built up part by part. New patents are constantly being granted, nineteen being announced in one week in November, 1914, during the preparation of this chapter.

In making an ordinary shoe today there are one hundred and seventy-four machine operations, performed upon one hundred and fifty-four different machines, and thirty-six hand operations, or altogether two hundred and ten processes. About three hundred different machines are used in the manufacture of all kinds of footwear, and the number of processes is considerably increased.

Three Stages of Development. There are three conspicuous stages of development in the invention and use of shoe machinery.

The first stage is that of the *upper-stitching machine*, by which the top parts of the shoe are machine-sewed instead of being sewed by hand.

The second is that of the *sole-sewing machine*, by which the soles are attached to the uppers with a machine instead of by hand.

The third stage is that of *machine-welting*, in its modern form. This is an improved method of sewing on the sole, so that the shoe is flexible, as was the old hand-sewed shoe.

Other machines are subordinate to these in general importance, and mark steps of advancement in minor processes and features of shoe manufacture.

An account of the more important machines used in shoe manufacture is given herewith, in the order of their invention. As we shall meet these in operation in our study of factory departments, some knowledge of each machine will help our understanding of a process and of the running of the machine as an occupation.

The Wooden Peg: 1815. Heels were fastened to shoes by hand-made wooden pegs as early as the sixteenth century. Preceding the use of shoe machines came the machine-made peg in 1815. Up to that time the bottom of the shoe had been fastened to the upper by sewing with heavy thread or "waxed ends," and in the case of some heavy boots by copper nails. This sewing was a slow, hard process and was necessarily done by men. The invention of the shoe peg was a great gain. The first pegs were whittled out by hand in imitation of the nail. When pegs were properly driven, piercing both the outer and inner sole, with the upper leather well drawn in between the two, the result was a great improvement in strength and durability over the old method. But the pegged shoes were less flexible than the sewed shoe, and many persons still asked for shoes made by the old method.

A pegging machine was invented in 1833, but none came into general or successful use until about 1857. The pegging machine and the McKay machine revolutionized the industry, but did not put an end to hand shoemaking, which has continued to the present day, yet with a constantly diminishing importance. The great gain, of course, was the large increase in the number of shoes made, with a lowering of the retail price and a widening shoe market.

The Rolling Machine: 1845. The first machine to be widely used in shoemaking was the rolling machine for solidifying sole leather, which was introduced about 1845. Formerly the shoemaker was obliged to pound sole leather upon a lapstone with a flat-faced hammer, to make it firm and durable for the shoe bottom. This was a laborious process, and sometimes took a half hour for what can be done between the strong rollers of the machine in one minute.

The Howe Sewing Machine: 1852. About the year 1851 John Brooks Nichols, a Lynn shoemaker, adapted the Howe sewing machine to sew the uppers of shoes. John Wooldredge, also of Lynn, was the first to use the machine, in 1852. This adaptation really introduced the era of machine shoemaking, doing away with the slow process of hand sewing. The process had been called "binding," and the handsewers were called "binders." Much of this work had been done in the home, and the introduction of this machine made the industry more distinctly a factory industry, marking the first period of development.

The McKay Sewing Machine: 1858. In 1858 Lyman R. Blake, a shoemaker of South Abington, now the town of Whitman, Massachusetts, invented a machine which sewed the soles of shoes to the uppers. This was improved by Robert Mathies and manufactured by Gordon McKay, a capitalist and manufacturer. It became known as the McKay sewing machine.

These machines were first used in the factory of William Porter and Sons of Lynn in 1861 or 1862, and were run by foot power. The McKay machine ushered in the second period of development in shoe machinery, and has done more than any other to modernize shoe manufacture.

The Goodyear Welt Machine: 1862-1875. In 1862 Auguste Destouy, a New York mechanic, invented a machine with a curved needle for sewing turn shoes. This was later improved by as many as eight different mechanical experts employed by Charles Goodyear.

The machine was afterwards adapted to the sewing of the welt in the bottom of the shoe, with patents in 1871 and 1875, and became the famous Goodyear welt machine. This marks the third great period of development in shoe machinery.

McKay and Goodyear were not themselves originators; they adapted and promoted the inventions of shoe worker and mechanic. Other inventions no doubt lacked such promoters and were lost to the industry.

Edge-Trimming and Heel-Trimming Machines: 1877. Edge-trimming and heel-trimming machines were introduced about the year 1877, and soon played a very important part in shoe manufacture. Previous to the introduction of these machines hand trimmers, or "whittlers," as they were called, received very high wages, sometimes double those of lasters who were also highly paid. Considerable opposition was offered to the trimming machines, but their speed, uniformity of work, and saving to the manufacturer made their adoption and universal use inevitable.

The Lasting Machine: 1883. Though several attempts had been made to invent and operate lasting machines, yet long after it was possible and profitable to sew shoes by machinery, it was still necessary to last them by hand. Shoe operatives in all lines opposed the introduction of machinery, feeling that it would reduce their numbers, shorten the period of employment each year, and make them more dependent upon the manufacturer.

Foremost in this opposition to machinery were the hand lasters. They were strongly organized, and secured a very high wage, ranging from twenty to thirty dollars a week or more at a time when earnings on most processes were low as compared with present day wages in the shoe factory. The lasters boasted that their trade could never be taken away from them.

Jan Ernest Matzeliger, a young man destined to accomplish what seemed impossible, came to Lynn from Dutch Guiana. He was the son of an engineer and himself an expert machinist. In a Lynn shoe factory he learned to operate a McKay machine and heard the boast of the hand lasters.

Matzeliger began to work secretly on a model for a lasting machine. The first model was a failure, as was also a second. A third, however, was so satisfactory that money was advanced to the inventor for a fourth, in 1883. Matzeliger died while working upon this, but it was completed by other men, and became the foundation of the modern consolidated lasting machine.

The old lasters said that this machine sung to them as it worked, "I've got your job! I've got your job!"

Some of the motions of the machine are like those of the hand and fingers, drawing the parts of the leather into place and fastening them by tacks. The hand worker lasted perhaps fifty pairs of shoes a day; the machine operator lasts from 300 to 700 pairs in a day of ten hours.

The Pulling-Over Machine. This improvement was introduced early in the present century. The pulling-over machine prepares the shoe for the lasting machine. It centers the upper upon the last, draws the sides and toe into place with pincers which work like fingers, and temporarily fastens these parts with tacks for lasting. "It is the acme of shoe machinery intricacy and accuracy, and years of study, and over $1,000,000 were spent in its development."*

While his amount seems large it probably means a saving to the shoe manufacturers of the United States of four times the amount each year.

Joseph L. Joyce. Joseph L. Joyce was a shoe manufacturer of New Haven, Conn., and a friend of Goodyear and McKay. From 1860 to 1890 he obtained many patents which greatly improved shoe machinery and the art of manufacturing.

Power in Shoe Manufacture. Hand and foot power were first used for shoe making. In 1855 William F. Trowbridge, at Feltonville, Mass., now

*From *A Primer of Boots and Shoes*. The United Shoe Machinery Company.

a part of Marlboro, first applied horse power to shoe manufacture. Soon after this steam or waterpower was in use in all factories. In 1890 the electric motor was introduced, and has gradually taken the place of the steam engine.

The Development of the Shoe Shank. As an indication of the development of a minor part of a shoe and of the simple machinery necessary for its manufacture, and as an example of a subsidiary industry, the main facts in the growth of the shank industry are here presented.

Primarily the shank is that part of the sole between the heel and the ball of a shoe. In shoemaking the shank is a reinforcement placed between the outer and inner soles of a shoe in that part extending from the heel to the ball of the foot. Its purpose is to give shape or style and elasticity to the shoe.

Fifty years ago the hand shoemaker used hard scraps of leather for shoe shanks, trimmed to the desired shape. Thin pieces of wood, molded to shape on primitive machines, soon came into use, and later strips of leather board. From 1877 to 1885 a single firm in this country had a monopoly of molded shanks. About 1885 numerous patents were granted on shanks and on machinery for producing them. One form was a strip of flexible steel with leatherboard cover or casing. All the kinds of shanks described are in use at the present time, according to the kind and grade of shoes to be manufactured. There is, however, a constant tendency to use shanks of the better quality, for shoes sell better and keep their shape better with the more durable shank reinforcement.

The use of prepared shanks is universal, and the world's supply is produced mainly in this country.

There are machines large and small, simple and complicated, for making the various lesser parts of a shoe and its accessories, such as heels, counters, tips, eyelets, buckles, nails, thread, laces, polishing brushes, and so on, as well as machines for manufacturing the various items of factory equipment.

Operating a Complicated Machine. In some factories it is necessary, and in all factories advisable, that the operator of a modern, complicated shoe machine should understand its parts thoroughly, and be able to make the adjustments and simple repairs that may be needed at any time. The worker who has mechanical ability may learn to adjust and repair his machine by actual experience in running it.

The mechanically expert operative is able to keep the machine running to its full capacity and to lengthen its period of efficient wear. He is thus worth more to the factory, and has increased earning power under the prevailing method of piece work.

The Leasing System. The leasing system of shoe machinery was introduced in 1861 by Gordon McKay, when it was found difficult to sell to manufacturers the Blake machine for sewing uppers and soles together. Such machines were costly and the capital of most shoe manufacturers was small at that time. The leasing system, on a royalty basis, enabled the manufacturers to have the advantage both of the machine and of unreduced capital for manufacture.

The Care of Machinery. Owing to the unusual conditions just described in the shoe industry and through the leasing of machinery, there was early developed by the machine manufacturing company a force of men who were trained in the care of machinery, and located at convenient centers, so as to go wherever machinery trouble existed. With the evolution of the shoe machinery business, and the various machines used in the bottoming of shoes under centralized control, relatively few factories maintain a force of special mechanics, and these are generally for the purpose of millwrighting and construction. At the present time a large force of expert "roadmen," as they are called, is located in all the large shoe manufacturing centers, and in these agencies or branch offices from which they travel there is constantly maintained an immediately available supply of the many machine parts which are liable to wear or breakage. These parts are all numbered and catalogued, so that as soon as a part breaks or a machine goes out of adjustment, a telephone message brings to the factory the required machine part. This service has been expanded to cover the instruction of operators upon the machines when set up in the factory.

The Standardization of Machinery. Because of standardization of machinery and processes and through co-operation between the manufacturer of shoe machinery and the shoe manufacturer, the growth of the industry during the last twenty years has surpassed all former periods. Today, manufacturers, large and small, can secure machinery by leasing it, and nearly all factories are conducted entirely on this basis.

This fact will make our study of the industry easier. We shall be studying operations on standard machines, used quite generally in this country and in many factories in other countries. We must remember, however, that improvements are constantly being made, that a process may be entirely changed on any day, and that the most skillful operatives of machines are in constant demand throughout the country.

Facsimiles of Early Royalty Stamps

Chapter III

LAST-MAKING

CHAPTER III

LAST-MAKING

Definition. The last is the wooden form which determines the size and shape of the shoe. Last-making is not a part of shoemaking, but is a necessary preliminary process or set of processes, as is also pattern-making. The last-maker is a wood worker. In early times the hand shoemaker fashioned his own last, a single form for both right and left feet, with rough proportions. Only within about thirty years have separate forms been used for right and left lasts. With advance in methods of shoemaking last-making has become a definite separate industry, and last factories have been established in most of the great shoe centers of the country. The last item in the cost of shoe manufacture varies greatly, according to changes in the style of foot wear.

The Shaping of the Last. The last is modeled from the human foot. The shape of the last is determined by careful measurements of the foot modified by the use or kind of wear expected, by the prevailing demands of style, the peculiar processes of manufacture, and the special materials used. The last must have a "mean" form, adaptable to the varying shapes of the foot upon which the shoe is to be worn. In the case of shoes meant for special purposes, such as walking or dancing, special forms are used. There are, also, sectional and national differences of form; for instance, the prevailing English styles are somewhat broader and flatter than the American; while in American lasts the waist line, or measure over the instep, is less than in English styles, giving a closer fit in that part of the shoe and preventing the foot from sliding forward in it.

Last Material. Lasts are made of wood or iron. Iron, however, is used less and less in this country except in repair shops. It is still used extensively in England. The wooden last has a plate of iron upon the heel, as a base for nailing on the heel of the shoe, and lasts used in making the McKay shoe, whose entire sole is nailed on, have a plate of iron over the bottom of the last. In England the wood used for lasts is mostly beech, whose close and strong fibre allows a smooth, firm surface, however the grain may be cut. In this country the wood generally used is maple, which cuts easily and presents a smooth, hard surface when kiln-dried, as all woods must be for last-making. The hollow forms used by traveling salesmen, in the store window for display, and in the home for keeping shoes in shape when not being worn, are made of light bass wood.

Hand Last-making. It is interesting to review the processes used in earlier hand last-making, as they show not only the older features of a skilled trade but also the work that is still necessary in a modern industry. The tree trunks brought from the forests were sawed into suitable lengths for lasts. The lengths were "blocked" or split into triangular pieces large enough to afford each a last when cut down. The pieces were then cut down with the bench knife into shapes approaching that of the finished last, and were cut to the desired length. The roughly formed last was then rasped and scraped until all surplus wood was removed. Holes were drilled or bored for the insertion of hooks to draw the last from the completed shoe. The last was finished by sandpapering and rubbing down.

Modern Last-Making. Because of the increase in the numbers of shoes manufactured and the multiplication of styles, it long ago became necessary to produce lasts faster than could be done by hand. Early in the last century, about the year 1820, we find the last-making machine, or last-lathe, long antedating the use of shoe machinery. The last-lathe is a modification of the wood-turning lathe. Instead of producing symmetrical forms the lathe is made to yield forms of irregular shape, like that of the human foot. The lathe has been but little changed in later years. Its chief features are what are known as the model end and the cutter end.

The blocks from which the lasts are to be turned are brought from the forests in the rough, sometimes cut by hand and sometimes by a lathe into shape approaching that necessary for the last. Before being utilized they are kiln-dried for six or seven weeks, to prevent the finished last from shrinking.

The Model Last. The making of the model from which other lasts are to be made is the most difficult process connected with the industry. An old last is sometimes built over by adding thicknesses of leather in places, or a paste of glue and sawdust, and by cutting down the wood in other places to produce the measurements necessary for a desired style. Sometimes the model is entirely new, made by hand to meet the required measurements. A standard size is used, a number seven or eight in men's shoes and a four in women's shoes. From these, by adjustments of the lathe, sizes and widths are graded up and down, usually five sizes each way. Three models are generally made use of for children's lasts.

The Use of the Last-Lathe. The standard model last is clamped in the model end of the lathe, and the rough block of kiln-dried wood from which the last is to be turned is set in the cutter end of the machine. When the machine is put in motion the model swings against a model wheel, at the same time that the last block is forced solidly against the cutter wheel. As both the model and the block revolve, the model wheel guides and regulates the knife which cuts the block, from toe to heel, into an exact duplicate of the model, except for projections at either end which are cut down on the heeler or shaving machine. The last is then placed upon a polishing wheel for the processes of finishing. The bottoms are tested by a sole pattern of the desired size, and the size and width are stamped on them. Metal heels or entire metal soles are also attached. The lathe machine works so accurately that the slightest imperfection or variation in the model is reproduced in the finished last. A machine turns out about fifteen pairs of lasts an hour.

Devices for Reducing Last in Use. There are various methods of making a part of the last removable or reducing its length, so that it may be more easily drawn from the finished shoe or inserted in a shoe. The earlier and a still common method is to saw out a portion of the instep of the last, leaving what is called the block last. Formerly by having variously shaped substitutes for the part sawed out modifications of styles were effected. Another form is the Arnold hinged last, the last being cut entirely in two, a v-shaped portion cut out of the instep, and the two parts joined by a hinge, so that the heel swings up freely. Some firms make a business of remodeling or building over lasts for shoe manufacturers to meet changes in style. And old lasts are sometimes steamed to restore their shape and fulness.

The Storage of Lasts. The lasts when made, or when returned from factory use, are usually stored in bins, by styles and sizes, in a room convenient to the lasting or making room. They are also sometimes stained different colors to indicate different styles or different widths of the same style. When required for use they are taken from the bins, in sets according to lots of shoes to be made, placed upon the shoe racks, and started on their way through the factory.

One person, very frequently a boy, usually has charge of the storage room. He must be thoroughly familiar with the lasts in his care, and able to select quickly such as may be called for each day.

To become a last maker one must have mechanical ability to learn any or all of the few processes involved. The work is interesting but requires the constant attention of the operator, as the slightest error or inaccuracy would result in an imperfect last. The operator has a fairly constant occupation, as the last factory runs more steadily through the year than does the shoe factory, and experience and skill are an asset to the last worker. His earnings run higher than those of the average shoe worker.

Chapter IV

PATTERN-MAKING

CHAPTER IV

Pattern-Making

Definition. Patterns are the forms or shapes used in cutting the various parts of the upper portion of the shoe. While a sole pattern is sometimes used, the sole is generally blocked or died out in the rough, being trimmed to shape in a later process. Pattern-making had advanced from a very rude beginning to processes requiring the highest skill and adaptation to modern styles. In early days patterns were made of paper. Sometimes tissue paper was wet and placed upon the last, marked in lines where the joints of the upper should be made, and cut in these lines when dried and removed from the last. There was no allowance for grading in sizes, and separate lasts were used for the various sizes.

The Pattern Designer. In a modern shoe factory there is a person called the designer, who makes a constant study of styles. He receives the suggestions of the traveling salesmen, who are always on the watch for novelties in style and fashion. He seeks information from every source as to the permanency of old styles, the popularity of the new, and of changes in dress and custom that are likely to demand still other styles in foot wear. The designer is in close touch with salesmen, manufacturers and department heads in his own factory. He sometimes acts as superintendent of the pattern-making department. Upon his skill and judgment depend in large measure the volume and permanency of trade secured by his company. He should have high artistic skill and knowledge of shoemaking. The ordinary designer must be familiar with about 25,000 different designs.

Frequently after a study of styles, the designer, the sales manager, and the factory manager confer on the most economical styles to be made.

There have already been established a few factories for the designing and making of shoe patterns, to sell to the manufacturer.

The Pattern Model. In making a model for patterns the last is taken as a basis. With due consideration of the shape and style of the shoe, the material to be used, and the use to which the shoe is to be put, the pattern is made to conform to the proportions of the last. The last-maker and the pattern-maker work together to a definite end of utility and style.

Sample patterns are submitted to the manufacturer for approval, after which the pattern-maker draws plans for his model. The sets of model patterns are cut in sheet iron by hand. Patterns are reproduced from them in sheet iron or in cardboard by the pattern machine. The standard size of the model is seven in men's shoes, and four in women's, and by gradations above and below these numbers, as in last-making, other sizes are obtained.

From the model the pattern-maker produces such quantities in each size as may be desired in a factory.

The Trial Shoe. Sometimes a shoe is made as a trial or sample of a new style. This is taken out by the salesman and shown to the trade. If sufficient orders are placed on this particular shoe, patterns are made and the shoe is manufactured in quantities.

The Number of Patterns to a Shoe. The number of patterns necessary for the ordinary shoe varies according to the kind or style of shoe. The button boot, for example, has the following parts, each requiring a separate pattern: Two quarters, two linings, button-piece, button-piece lining, top stay, vamp, foxing, tip, back-stay, vamp-lining, button-stay, backer for button holes, and marker for button holes. Other kinds of shoes have a larger or smaller number of parts.

Pattern Material. Sheet iron has long been used for patterns, and is still largely used for those of linings and the cloth parts of shoes. "Junk-board" or heavy card-board, made by grinding up old newspapers, is gradually taking the place of sheet iron, some factories using it altogether. Zinc, also, is used. Wooden patterns are sometimes used for the soles of shoes, by which the soles are shaped upon a sole-rounding machine.

Making Patterns. The iron model is clamped to the bed of the grading or pattern-making machine. This machine operates by a system of levers, so that the model is reproduced in junk-board or iron, just as in last-making the last is determined by the model. By lengthening or shortening the levers sizes above and below the model are produced. Junk-board patterns are then bound with strips of metal which are smoothed at the corners and soldered at the joints. The patterns are then stamped with size numbers, widths, and styles. Sometimes various colors of the junk-board are used to indicate different widths.

The Standardization of Lasts and Patterns. There has been considerable effort in recent years to standardize patterns for those parts of the shoe which change least in shape from season to season. This is accomplished largely, of course, through permanent forms in corresponding parts of the last, especially the parts back of the ball of the foot. A reduction in the number of patterns used by the cutter or of the dies required for a full run of sizes, when dies are used, is a great gain in shoe manufacture.

The constant increase in the cost of shoe material makes it all the more necessary to reduce cost in some other line. This reduction can be accomplished in part by reducing varieties in form, or by a standardization of patterns.

The Storage of Patterns. The patterns when made in quantities are stored in racks or pigeon holes, according to sizes and kinds, in a pattern room which is convenient to the cutting room of the shoe factory.

Positions in the Pattern-Making Department. The positions in this department are: the Designer, or superintendent of pattern-making; an assistant designer, in very large establishments; the model grader, who does hand work; the power grader, who runs the pattern-making machine; the truer-up, who levels the metal pattern; the binder, who puts the steel border on the card board pattern; the finisher, who solders and smooths the binding; and the stamper, who places the necessary numbers upon the pattern.

The pattern boys have charge of the patterns in storage, taking them to the cutting room and bringing them back and placing them in their proper spaces after use.

The Pattern Maker. The pattern maker may be a person skilled in some of the operations of shoemaking. He should at least be familiar with its general processes, and should have good mechanical ability. The occupation, like that of the last-maker, is less crowded than most of the divisions of the work in the shoe factory.

The Price of Patterns. "It is figured in a general way that a manufacturer of women's shoes should spend at least one-half of one per cent.

of the gross volume of his business for patterns. That is, if he is doing a business of $1,000,000 annually, he should spend at least $5,000 for new patterns. It is quite likely that some manufacturers are spending a larger percentage than this. In the last few seasons, a number of manufacturers have had to increase their expenditures for patterns, because patterns have become much more important in the making of shoe styles than they ever were before. While complaints are common that too much money is spent for patterns, yet the pattern bills are among the smallest that a manufacturer has to pay. They are nowhere nearly as expensive as lasts, nor as costly as the trimmings that are used to put style into shoes.

"Sometimes it pays a manufacturer to buy a new set of patterns just for the purpose of getting out a new style in footwear. For instance, supposing a manufacturer buys a new set of patterns, at twenty dollars, and livens up his line during the dull spell of between seasons, and gets orders for one hundred cases of shoes made according to the new patterns. His profit is five cents a pair, and his total profit is $180. Surely it is worth while to spend twenty dollars to make $180. Of course, the real cost of the patterns depends upon the number of times they are used. They may be thrown aside at the end of the month to make way for new patterns. In that case their cost will figure high. But if they are used through a season, and are carried over to the next season, then their real cost figures down pretty low. But the main point, in dealing with the pattern department, is not to consider chiefly what they cost, but chiefly what they bring in the way of new and additional orders."*

**American Shoemaking*. Boston, March 6, 1915.

CHAPTER V

LEATHER

CHAPTER V

Leather

Its Nature. Leather is the skin of an animal, tanned or otherwise preserved, shrunk, and toughened. The skins of beast, bird, fish, or reptile may be made into leather. Leather in some form has been used from time immemorial for clothing, footwear, harness material, and other articles for human use.

Tanning. Tanning consists in converting animal skins or hides into leather by the use of astringent acids. In earlier times these acids were derived from vegetable products, such as the bark of the hemlock tree, oak tree, willow, and chestnut. The bark was finely ground and steeped in water, forming a strong solution or liquor in which the skins were placed in vats, after the removal of hair and surplus flesh. The action of the acid toughens the skin, condenses it and hardens the albuminous matter in it, thus preserving it from decay. The most common kinds of bark used have been the hemlock and the oak. Some months are required in the process, and the longer the time taken usually the better is the quality of the leather produced. In later years mineral substances, of which chrome alum is a characteristic example, have come into quite general use for tanning. This mode is called chrome tanning. The acid processes require a short time for tanning in comparison with the bark processes, but demand careful attention to prevent injury to the leather. They afford various effects in the coloring of leather. Such leathers are usually finished dry or with only a light application of oil. The bark-tanned leathers go through various lengthy oiling processes, according to thickness and the purposes for which the leathers are designed.

Chrome tanning has transformed the shoe and leather industries.

American Leather Manufacturing. The American leather industry has grown from small beginnings along with shoe manufacturing. The first leather used was imported from England. The colonists also used Indian tanned deer skins.

The first tanner to settle in this country was Francis Ingalls of Lincolnshire, England, who came to Lynn in 1629. Philemon Dickerson, an English tanner, came to Salem in 1637. The tanning of leather was carried on at the same time probably in New York, Pennsylvania, and the Southern Colonies. In 1800 William Rose, another English tanner, was induced to come to Lynn by Ebenezer Breed, who had done so much to promote American shoe manufacture by means of the protective tariff on shoes. Rose became "the father of the American morocco manufacturing industry."

Shortly before the War of the Rebellion, machinery was introduced into the tanning industry, and today machinery is used in the place of hand labor in all its branches. Machinery and the chrome process have given American tanners leadership in the leather producing industry.

American tanneries treat annually about 20,000,000 hides or heavy varieties of leather, and about 100,000,000 skins or lighter varieties. They import annually more than $50,000,000 worth of untanned skins from Europe, Africa, India, China, Siberia, Australia, and South American countries. American tanners produce about $300,000,000 worth of leather. Of this the greater part is used in the manufacture of boots and shoes. A much smaller part is used for upholstering, automobiles and furniture, harnesses, bookbinding, machinery belting, trunks and bags, card cases, pocketbooks, gloves, and novelties.

The Increasing Shortage of Leather. In recent years the leather-producing animals the world over have been either actually decreasing in numbers, as in the great West of this country, or have not increased as rapidly as has the demand for leather. The population of the various countries of the world increases steadily and the wearing of shoes becomes more widely a custom in the less civilized countries, as in the case of the countries concerned in the Spanish War, and new uses are steadily found for leather. Such a generally increasing demand tends to raise the price of leather and of leather products. Any lessening of freedom in the commerce of the world, as in the case of the European war, tends also to bring about higher prices in leather products as in other imported articles.

Leather Substitutes. As a result of the growing shortage of leather, the use of leather substitutes is becoming more and more common in the shoe industry. First and chief among substitutes for upper leather are the fabrics, white canvas being most used. The fabric top does not stretch, affords a good-looking shoe, and would find an increased demand even if there were no shortage of leather. It has become a fashion in some localities to have the top of the woman's shoe match the dress. This can be done easily by the use of fabrics, as well as by fancy leathers. Among substitutes for sole leather, leatherboard has been widely used. This consists of fibers of hard leather, waste paper, rags and wood pulp, rolled into hard sheets by machinery. It is cut and handled in the same way as sole leather, and is used in particular in making the bottoms of the cheaper grades of shoes. Wooden heels cut in block are widely used in the making of slippers and the lighter kinds of shoes. Waterproof felt is also coming into use more and more for the sole of the shoe. Celluloid and even oilcloth products are sometimes used for toe boxes. It has long been the custom in shoe manufacture to make heels of pieced leather. One of the latest substitutes is "hideite leather." This is a leather fiber product consisting of soft leather skivings or remnants pressed into sheets. Rubber is used more and more extensively for the bottoms of shoes, and is in increasing demand on the part of the public.

The Tannery Divisions of Hides and Skins. According to the size, the general divisions made in the tanneries are three, as follows:

First, "hides." This is the term used for skins of full-grown or large animals, such as cows, oxen, horses, the buffalo and the walrus. These animals yield thick, heavy leather for shoe soles, machinery belting, or other uses demanding strength and durability. An untanned upper leather hide usually weighs from twenty-five to sixty pounds; a sole leather hide, from forty to seventy pounds; hides weighing from seventy or seventy-five pounds up are used for the heavier kinds of belting.

Second, "kips," skins of the smaller beeves, weighing from fifteen to twenty-five pounds.

Third, "skins" of such small animals as calves, sheep, goats, and dogs.

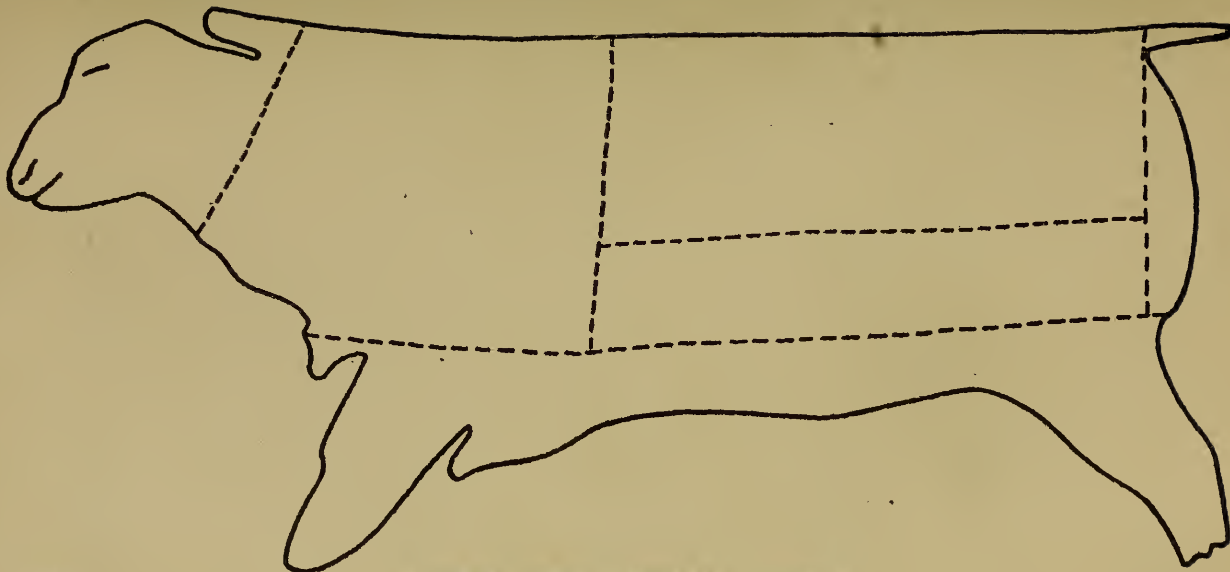
The skins of other animals are used for leather. The kangaroo, for instance, provides one of the best leathers used in shoemaking. Upper leather is made mainly from cow hides, kips, and large calfskins.

Because of the greater demand for thin leathers, thick hides are often split into thin layers by machinery. This is done by passing the hide through a set of rollers between which is a keen knife, which divides the parts into any desired thickness. The outer parts of the leather, on the hair side, are the most valued, and are called "grain" leather. The inner parts are made into a variety of different kinds of leather by special treatment. Various kinds of finishes are given, such as seal grain, glove grain, oil grain, buff, satin, russet, or plain.

A Side of Leather. The larger skins are generally cut along the back into two halves or sides. The usual names for the parts of each side are, head, shoulder, bend, and belly. The "bend" is the best portion of the back, behind the shoulders, the firmest leather of the entire skin. This part is devoted to the best uses and the higher grades of shoes, other parts to lower grades.

Divisions of Leather in Shoe Manufacture. In shoe manufacture leather is divided into two general classes, upper leather, and sole leather. The upper leather includes the outer parts of the shoe above the sole and leather when used for linings. Sole leather includes that used for the outer and inner soles, heels, counters, and rands. Upper leather is usually measured by the square foot; sole leather, by the pound.

The Varieties of Upper Leather. There are five chief kinds of upper leather, as follows: Kid or goat, calfskin, side leather, sheepskin, and coltskin or horsehide. There are also other kinds, such as



A Side of Leather Divided as to Quality

kangaroo, chamois, buckskin, pigskin, and a few special and fancy leathers.

Kid. Kid is the name for leather made from the skins of full-grown goats, coming mainly from the mountains of India, Europe, and South America. There are over sixty recognized varieties of goatskins. According to its tanning and finishing, kid is classed as glazed, mat, royal, cadet, patent, suede, bronze, pebbled or morocco, etc.

"Glazed kid," from the French "glacé kid," is polished after tanning, and its glossy surface is obtained by burnishing on the grain side. It is produced in various colors. Glazed kid is used for the uppers of shoes.

"Mat kid" has a dull, soft, black finish, from treatment with beeswax or olive oil.

"Patent" leather is produced by applying a coat of varnish to the finished surface of the skin.

"Enamel" leather has a hard, glossy finish on the grain side, being boarded and varnished.

"Suede" leather, a French term, means "Swedish" finished. It is finished on the flesh side with a dry, napped surface. It is produced in a great variety of colors and used extensively in making slippers, and to some extent in light shoes.

"Bronze kid," or calfskin, is leather finished with a form of cochineal dye. This is a method long known and used especially for women's fancy shoes.

"Vici kid" is a name first used by Robert Foederer of Philadelphia, about 1885, and in common use now for chrome tanned kid dressed with a mixture of soap and oil. This term became a trade-mark, and refers generally to the better grades of kid leather.

Other kinds of kid are in less general use. They are finished in particular ways, according to effects desired. "Kangaroo kid," for instance, is kid finished in imitation of the genuine kangaroo.

"Chamois" is oil-tanned leather made from the skins of chamois and other small animals. It is a very pliable and washable leather when genuine.

Calfskin. Calfskin is the leather used most extensively in shoemaking. It is the lightest, most pliable, serviceable, and satisfactory of all the skins of the neat animals. Its main sources are the farms of the United States, Canada, South America, and European countries. It is finished in many forms, of which it is necessary to mention only a few, as box, gun metal, patent, wax, willow, boarded, velvet, ooze, and Russia. Kips, the middle weight skins already spoken of, and calfskins overlap in qualities and uses. The calfskin is never split, but is generally shaved to a uniform thickness. The different names applied to calfskin, as in the case of kid, refer to particular kinds of treatment in tanning and finishing the leather, and the terms correspond in the main with those already given for kid. A few special terms for calfskin are the following:

"Box calf" is a proprietary name. It is a chrome tanned calfskin "boarded," that is, treated by rubbing with a board to raise the grain, giving a peculiar rough surface. Box calf is a waterproof leather of black or tan color, and is regarded as the best material for rough out-of-door wear.

"Buckskin" is primarily deer skin tanned in oil. In recent usage it means any soft leather, especially cowhide, finished in a white, grayish, or yellowish color.

"Gun metal" is chrome tanned leather, either calf, veal, or side, with gun metal black finish, or with a bright finish. Gun metal leather is used very extensively in shoe manufacture.

"Wax calf" is finished on the flesh side with a waxlike surface. French calf, also, is finished on the flesh side.

"Willow calf" is a fine, soft, colored, chrome tanned skin.

"Ooze" is a proprietary term applied to the velvet of soft finish skin.

"Russia" is a colored calfskin finished and perfumed with birch oil, which gives it a characteristic appearance and odor.

Side leather. Side leather is cow hide, either bark or chrome tanned, with the skin cut down the back into two halves. The sides are split to reduce to thickness appropriate for shoe tops and finished in various forms with dry, oiled, smooth, or boarded surfaces, in imitation of the various finishes of calfskin. It is used largely in the cheaper grades of men's and boys' shoes.

Sheepskin. Sheepskin is used chiefly for shoe linings and outer parts where the wear is light.

Coltskin. Coltskin and the better part of the horsehide have firmness of texture and susceptibility to high polish. They are used in the form of patent leather and in dull finish, mainly for men's high-grade shoes.

Sole Leather. Sole leather includes the heavier and thicker kinds of leather from the skins of mature, neat animals, such as are suitable for use in the bottoms and heels of shoes. It is tanned and finished so as to produce a firm, solid texture rather than great pliability.

Sole leather is tanned from

Green hides generally ranging between forty and seventy pounds, with an average of about fifty-five pounds.

Dry hides generally ranging between sixteen and thirty pounds, with an average of about twenty to twenty-two pounds.

Previous to ten years ago sole leather hides were tanned in liquors extracted from hemlock or oak bark, or a combination of the two, and the tanned leather received its name according to the tanning material used; namely, oak leather was tanned in oak bark liquors; hemlock in hemlock bark and leather tanned in the combination of the two was called union. As the supply of bark diminished in the various sections where tanneries were located tanners were obliged to substitute other tanning materials, such as barks, nuts, and extract made from various foreign and domestic woods, so today leather is tanned in the combination of several materials and the finished product is designated according to the color of the leather which it resembles. Leather having a light color, resembling the color of old oak is called oak. That which has a more reddish shade is called union and that which has a very dark red shade is called hemlock. Oak leather is used largely in high grade men's and women's shoes and for the finding trade. A large percentage of the union leather is bought by concerns which make a business of cutting soles, and these are sold to be used in the manufacture of women's shoes. Hemlock is used in the manufacture of medium and lower priced men's shoes. There is also a very large export business in this class of leather.

A very small percentage of sole leather hides is now being tanned by a chrome process, the basis of this tannage being bichromate of soda. It is practically the same process as that used in tanning chrome upper leather. Very heavy hides are generally used for leather tanned in this process because of the fact that the tannage does not swell the hides as does the vegetable process and it is necessary to get a hide averaging from eighty to ninety pounds in order to obtain the required thickness. This process produces a piece of leather which has a pearl gray color in its natural state and when waterproofed is of a dark greenish shade. The leather is used in the natural state for soles on cheap outing shoes and waterproofed for heavy storm shoes.

Oak tanned leather is the best kind of sole leather, as is indicated always by its market price. It has a light, creamy tan color, and is both firm and flexible. Hemlock tanned is of a lower grade than oak or union tanned leather. Chrome tanned sole leather is dense, hard, and durable, but has hardly passed beyond its experimental stage.

Hides, from which sole leather is made, vary according to climatic conditions in various quarters of the world. Animals living in warm climates have a thick and tough skin with thin hair; those living in cold climates have a thick coat of hair with light weight skin.

The cost of sole leather makes a large item in the general costs of shoe manufacture, and leather substitutes are used chiefly for sole leather.

Some other leather terms and varieties of leather not necessarily included in this chapter will be found in Chapter XIV on shoemaking terms.

The Cut-Sole Industry. The great development of the shoe industry in recent years has produced not only dealers in all kinds of leather and shoe supplies, but special manufacturers of the various materials required by the shoe factory. As in the case of the automobile, shoe manufacture may be made almost a matter of assembling prepared parts.

The industry connected with the preparing of sole-leather parts is especially extensive, including cut soles, insoles, counters, heels, top lifts, taps, box toes, and rands. All these parts are now produced in highly specialized factories, and furnished to the shoe manufacturer at the lowest cost, in great numbers in uniform size and quality. Some of the largest manufacturing companies, however, have subsidiary factories in their plants for the production of such parts, but the smaller factories are compelled to buy them from the independent manufacturer.

Most of the lines of industry connected with the cutting of sole leather center in the United States, and there are no factories at all outside this country for cut-soles, heels, top pieces, and rands. There are forty cut-sole factories in this country, which do an annual volume of business of $40,000,000, supplying the home and foreign markets.

LEATHER, TANNED, CURRIED, AND FINISHED—VALUE OF PRODUCTS FOR LEADING STATES: 1909 AND 1899

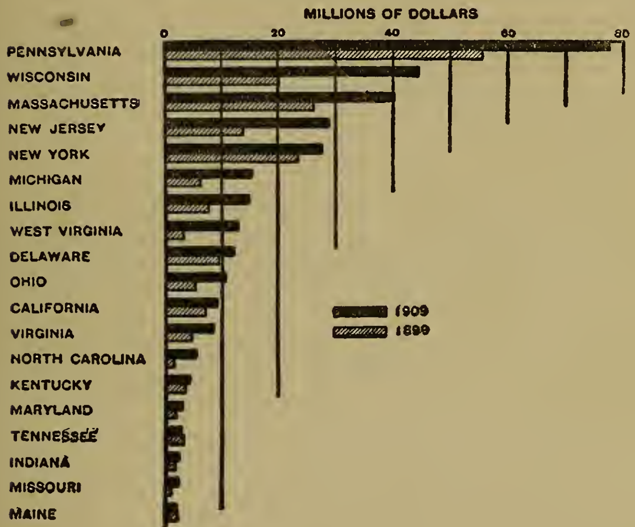


Table V—Imports of Hides and Skins (except Fur Skins) into the United States during the Fiscal Years Ending June 30, 1913 and 1914, by Principal Countries, as Reported by the Bureau of Foreign and Domestic Commerce.

	1913		1914	
	Quantity	Value	Quantity	Value
Calfskins				
Belgium ....lbs.	4,724,643	$1,271,762	5,157,640	$1,373,096
France....lbs.	4,991,299	1,255,031	5,800,673	1,434,335
Germany ....lbs.	16,916,203	5,251,602	16,560,316	5,392,463
Netherlands ....lbs.	8,142,510	1,833,875	12,006,926	2,643,576
Russia in Europe ....lbs.	30,247,647	9,726,608	19,747,462	7,282,870
Other Europe ....lbs.	13,180,207	3,247,620	12,078,561	2,806,602
Canada ....lbs.	5,930,010	1,166,070	5,734,207	1,066,387
South America ....lbs.	2,841,373	656,178	2,036,364	554,313
Other countries ....lbs.	7,585,243	1,886,227	3,281,441	828,311
Total ....lbs.	94,559,135	$26,294,973	82,403,590	$23,381,953
Cattle Hides				
Belgium ....lbs.	7,106,337	$1,401,788	7,313,906	$1,602,241
France....lbs.	20,102,370	3,309,014	19,036,552	3,319,136
Germany ....lbs.	9,787,312	1,646,502	4,989,795	848,989
Italy ....lbs.	2,411,973	418,849	1,967,552	338,907
Netherlands ....lbs.	7,270,864	1,172,630	4,099,899	680,939
Russia in Europe ....lbs.	22,906,231	4,262,798	9,043,103	1,713,179
United Kingdom ....lbs.	8,588,600	1,523,740	11,204,957	2,070,836
Other Europe ....lbs.	3,578,370	590,519	4,272,591	795,933
Canada ....lbs.	41,608,176	5,979,593	46,588,543	7,132,744
Mexico ....lbs.	29,500,427	4,220,572	33,194,289	5,478,901
Cuba ....lbs.	2,840,141	392,667	5,528,502	889,636
Argentina ....lbs.	67,041,938	12,517,587	79,787,332	16,165,676
Brazil ....lbs.	1,743,956	421,122	3,259,873	880,780
Colombia ....lbs.	5,461,505	966,759	5,098,244	1,042,174
Uruguay ....lbs.	7,244,806	1,404,595	13,403,443	2,627,553

Cattle Hides—Continued					
Venezuela	lbs.	4,470,501	1,038,754	5,149,398	1,358,778
East Indies	lbs.	6,929,176	1,376,307	4,474,768	899,045
Other countries	lbs.	19,449,707	3,655,168	21,550,741	4,336,495
Total	lbs.	268,042,390	$46,298,964	279,963,488	$52,181,942
Goatskins					
France	lbs.	2,406,371	$800,951	2,171,224	$728,762
Russia in Europe	lbs.	7,183,542	1,509,091	5,131,075	1,133,242
United Kingdom	lbs.	5,436,922	1,342,029	5,281,468	1,261,925
Other Europe	lbs.	6,306,071	1,861,458	5,068,968	1,383,929
Mexico	lbs.	4,815,304	1,731,234	4,010,150	1,298,039
Argentina	lbs.	4,276,365	1,457,242	3,470,013	1,190,166
Brazil	lbs.	3,357,781	1,688,945	4,191,124	2,177,849
Aden	lbs.	3,129,594	975,894	3,595,909	1,120,170
China	lbs.	9,827,646	2,815,844	7,304,761	2,126,706
East Indies	lbs.	41,594,938	8,429,484	35,831,857	7,550,777
Africa	lbs.	2,625,746	670,314	2,817,948	678,252
Other countries	lbs.	5,290,025	1,507,931	5,884,931	1,541,446
Total	lbs.	96,250,305	$24,790,417	84,759,428	$22,191,263
Sheepskins					
France	lbs.	2,999,829	$666,975	2,221,769	$560,152
Russia in Europe	lbs.	8,484,377	1,572,075	9,158,287	1,782,569
United Kingdom	lbs.	28,885,579	5,206,068	26,384,892	4,783,845
Other Europe	lbs.	3,510,173	634,818	3,872,164	683,449
Canada	lbs.	1,860,948	190,367	3,678,117	403,038
Argentina	lbs.	6,848,065	776,969	3,874,944	522,626
Brazil	lbs.	993,321	309,265	1,582,333	459,772
Asia	lbs.	6,536,764	1,298,880	6,028,206	1,262,050
British Oceania	lbs.	8,179,576	1,058,438	9,848,498	1,499,761
Other countries	lbs.	3,486,087	681,089	3,427,615	635,955
Total	lbs.	71,784,719	$12,394,944	70,076,825	$12,593,217

Chapter VI

THE DEPARTMENTS OF SHOE MANUFACTURE

CHAPTER VI

The Departments of Shoe Manufacture

The Business Departments. The business side of modern shoemaking has definite and numerous divisions. There are the usual officers: President, vice-president, treasurer, superintendent or general manager, employment manager, welfare manager, office manager, and other heads of departments and divisions, with their many assistants. The functions and the duties connected with all these divisions are such as are found in the general business world, and are described in the volume upon *Business Employments.* From fifteen to twenty per cent., or nearly one-fifth of the persons connected with the shoe industry, are employed upon its business side.

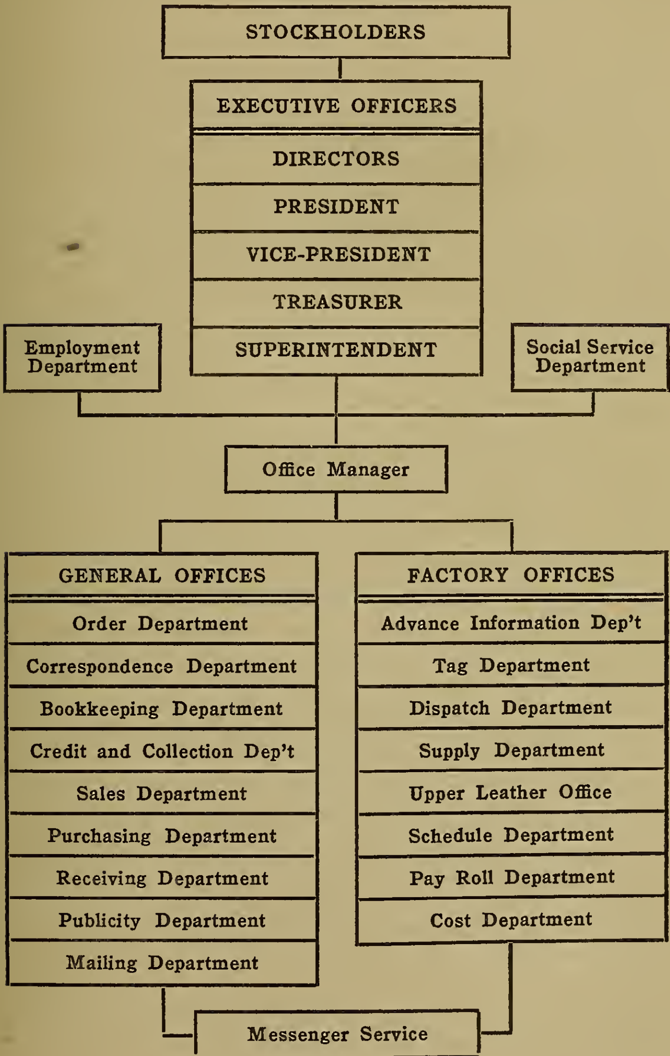
The accompanying chart, on page 111, gives a list of the usual business departments and shows their three-fold nature,—of executive control, maintenance of business, and maintenance of manufacture. The two divisions of employment and social service are in a sense independent of the three major divisions, or supplementary to them. The employment department deals with all questions of the hiring, training, and discharge of employees; the social service department, with all questions of their general welfare.

The Executive Officers. The executive officers are those who work out and control the general plans and policies of the company. They may or may not be stockholders. They are responsible to the stockholders for the success of the company.

The General Offices. The general offices are concerned in building up the business side of manufacture and reach out into the field of trade. These offices take charge of the orders received from shoe dealers, of correspondence, bookkeeping, and the credits and collections of the company. They have charge of purchasing and caring for materials used in manufacture, and of the large and important functions of advertising and of selling manufactured goods.

The Factory Offices. The factory offices are those concerned closely with manufacture, touching the factory at every department. These offices are often separate from the others and placed as near the factory departments as possible. They take charge of tags made from the orders received by the order department and follow them through the factory. They provide a schedule of the time in which shoes shall be made or passed from room to room. They maintain supplies for all factory purposes, pay employees, and supervise the costs of manufacture.

CHART OF THE BUSINESS DEPARTMENTS OF SHOE MANUFACTURE



Factory Service and Office Service. Factory service does not necessarily lead to office service. In general the two fields of employment are quite separate. Boys and young men, however, are sometimes taken into the business offices of a company, usually as messengers, and given at the same time factory training, such as observation of processes and routine of manufacture. Less frequently the plan is followed of giving six months' training in an office and then the same period in the factory. The purpose in such double training is usually to prepare young men to act as assistants to superintendents or heads of departments. Sometimes, on the other hand, employees in factory departments who show clerical ability also are taken into the factory offices, where there is always need of a practical knowledge of the work of the factory.

The Factory Departments. In the following chapters the present volume treats of actual shoemaking, or of factory departments and processes. There are six general divisions in the modern shoe factory. These are shown by the following chart upon factory departments. They are: the Upper Leather department, the stitching department, the sole leather department, the making department, the finishing department, and the treeing, packing, and shipping department. These are each minutely subdivided into factory rooms, sections, or departments, as will appear in the following pages. The last division, treeing, packing, and shipping, in a large factory, are each separate departments, making eight in the major divisions rather than six. In large factories we find numerous additional departments of which the chief ones are shown in the second division of the diagram, or heel department, box toe department, box factory, and printing department. There may be sub-divisions, also, in this second group, according to the magnitude of manufacture. A large company, indeed, may produce all its materials in the endeavor to lower the cost of every item that enters into shoemaking.

Other names are used for some of these divisions, usually according to locality; for instance, the stitching department is sometimes called the fitting department, the making department, the bottoming department, and the sole leather division is called the stock-fitting division. The word "room" is very generally used for "department" for the sake of brevity in speaking.

The Modern Shoe Factory. The modern shoe factory, in which are found the many offices and the factory departments just enumerated, has become quite typical in general form. The width of the factory is a very important consideration. Buildings are constructed with a width of about fifty feet, as single long buildings, or having wings of the same width, and less often in hollow squares, maintaining the same width throughout. This construction allows plenty of daylight along the middle of each room from the two sides. As good light

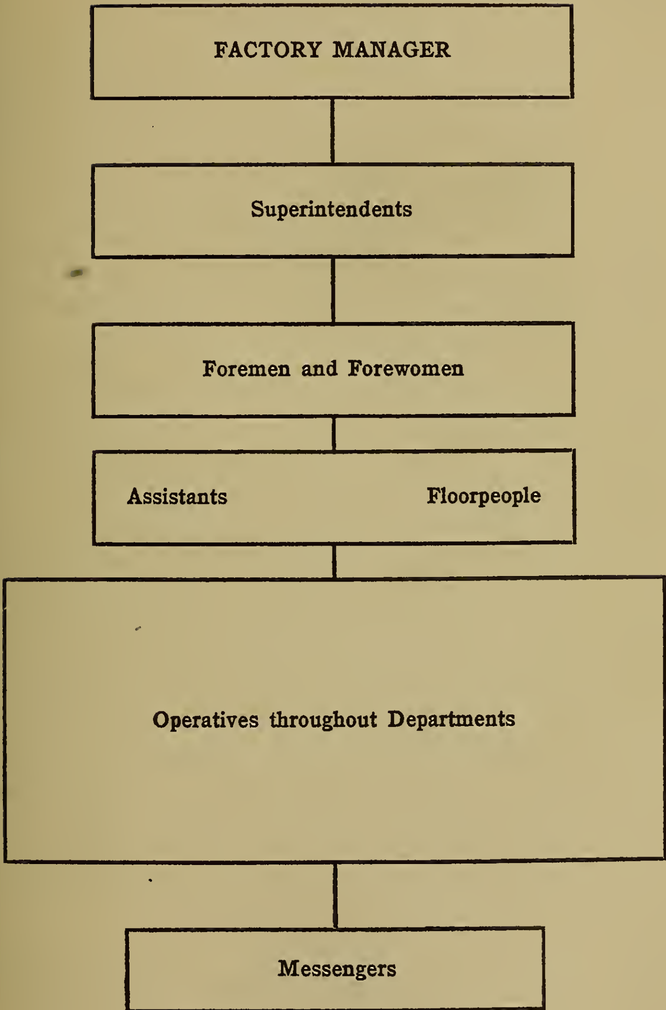
CHART OF THE FACTORY DEPARTMENTS

FACTORY DEPARTMENTS
Upper Leather Department
Stitching Department
Sole Leather Department
Making Department
Finishing Department
Treeing Department*
Packing Department
Shipping Department

ADDITIONAL DEPARTMENTS IN LARGE FACTORIES
Heel Department
Box Toe Department
Box Factory
Printing

*Treeing, Packing, and Shipping may be treated separately or as one department.

CHART OF FACTORY MANAGEMENT



is necessary to accurate work, it is essential that rooms be constructed in this way.

In length, factories vary from about two hundred feet up to several hundred feet. The most common form is the long, single building, with capacity for a few hundred or perhaps a thousand employees. Some factories have small wings or adjacent structures. The plan followed by some very large manufacturing companies of extensive wings or units affords great length of rooms with floor space all well lighted from two sides, sometimes up to a quarter or a half mile in length. Such plants employ four or five or more thousands of people, and turn out from ten to twenty thousand pairs of shoes daily.

The Typical Factory. The typical factory has four floors for its six major departments. The sole leather department occupies the first or basement floor. The upper leather and stitching departments occupy the fourth or upper floor. The making department occupies the third floor. The finishing, packing, and shipping departments are upon the second floor. The business offices are usually divided between the second and third floors. The factory offices are usually placed as near their factory departments as possible.

In the very large factories, or in the case of a plant consisting of several factories, there are usually central administrative offices, while the factory offices are in the various buildings of the plant.

A Typical Modern Shoe Factory, Manchester, N. H.

Some large factories now have as many as seven or eight floors. In such buildings the general plan already given is followed. The sole leather departments are on the basement floor; the upper leather departments occupy the top floor. Shoes in process of making pass downward continually to the packing and shipping rooms on the first floor. Height is sought only when the length of the building is limited for providing needed floor space. Indeed, the long, low building or plan of separate buildings is preferable in many respects, giving less movement of manufacture up and down, less crowding of employees, better light and ventilation, and less intense jar and rumble of machinery, all tending to improve conditions of employment.

On the other hand, from the standpoint of the manufacturer, the closest working arrangement of rooms consistent with free movement and safety, is the better, since it brings smaller overhead charges, less expensive administration and oversight, and a quicker passage of the shoe from its beginning to its completion. Location and available building space, however, are the usual factors that determine the departure of a factory plan from the general and natural four-floor division.

The most modern shoe factories are built of steel and concrete, with the outer walls largely given up to window space, as may be seen in the accompanying illustration.

Chapter VII

METHODS IN SHOE MANUFACTURE

CHAPTER VII

Methods in Shoe Manufacture

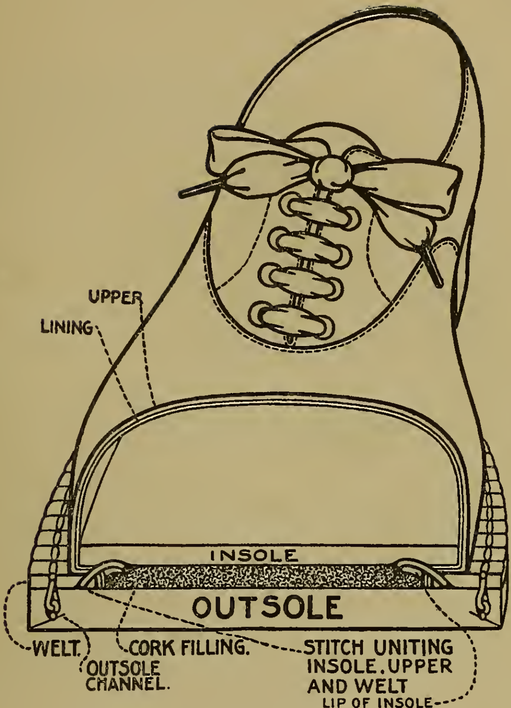
The Chief Methods. The chief methods in manufacturing shoes, developed mostly with the introduction of machinery, are as follows:

The Goodyear Welt,
The McKay,
The Turned,
The Standard Screw,
The Pegged,
The Nailed.

The distinctions indicated in these terms arise from the methods of attaching the sole of the shoe to the upper, which has always been the most important problem of the shoemaker. Prior to the introduction of shoe machinery, all sewing upon shoes, the attaching of the bottom to the upper as well as sewing together the parts of the upper, was done by hand. In the beginning of the factory industry people often took parts from the factory to their homes for hand stitching.

The first improvements consisted of the use of wooden pegs and nails, leading to the use of the "standard screw." In the chapter upon the history of shoemaking we have noted inventions which have dealt with the attaching of the sole to the upper—that of August Destouy in 1862, a machine with a curved needle for sewing turned shoes; that of Lyman R. Blake, adapted by Gordon McKay, introduced in 1862 for the same purpose, and since known as the McKay sewing machine; and that of Charles Goodyear, who adapted the Destouy machine for turned shoes to the sewing of welts in 1871, known as the Goodyear Welt machine.

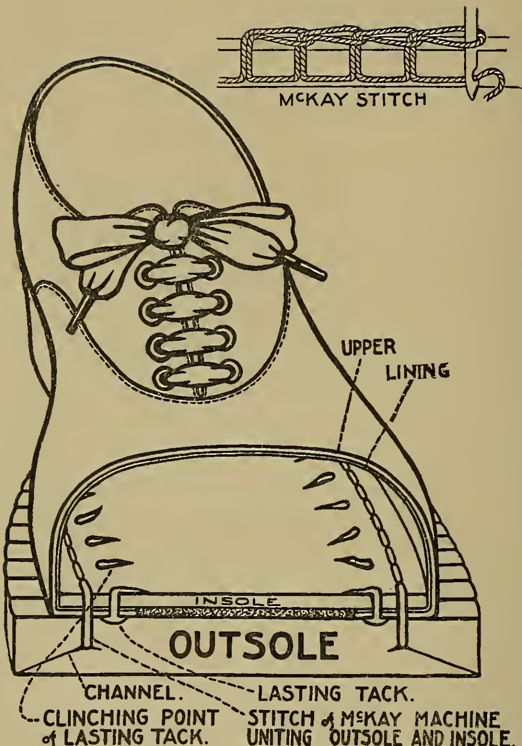
Illustrations of Methods Now in Use. Upon the following pages are presented diagrams and descriptions of the methods now in use in shoe manufacture. Most factories confine themselves to one or two of these methods, one manufacturer being known as a maker of Goodyear Welt shoes, another of McKay shoes, and so on. The lighter grades of shoes and those worn by women and children are Goodyear Welt, McKay, and turned. Many of the heavier grades, and especially shoes for outdoor wear, such as are worn by farmers, fishermen, and soldiers in some countries, are of the pegged and standard screw. The McKay method has been very extensively used in medium weight and cheaper shoes for many kinds of wear. The Goodyear Welt, however, has been used more and more extensively in the medium and better grades and is the leading process in importance at the present time.



Cross Section of a Goodyear Welt Shoe

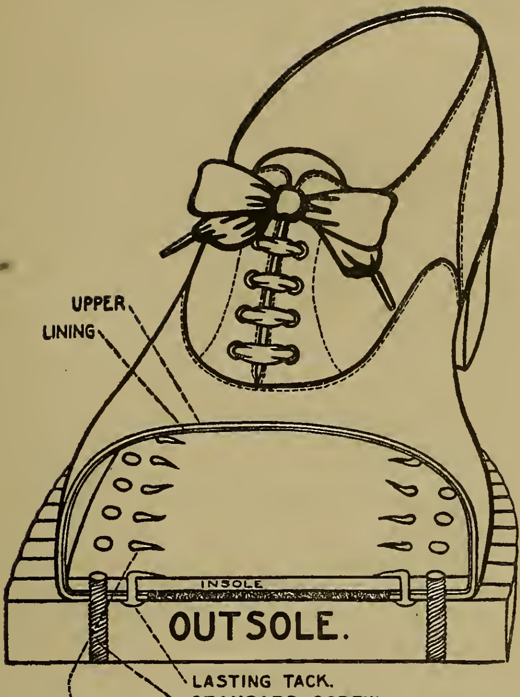
This diagram shows the ingenious method employed in constructing this now widely worn type of shoe, which is perfectly smooth inside. The tacks used in lasting are all withdrawn and a machine with a curved needle sews the welt and shoe upper to the insole without going inside the shoe. The heavy outsole is then stitched to the welt. The thread used is of the strongest linen and thoroughly waxed. It makes the most durable and comfortable type of shoe, and one on which the outsole can readily be renewed.

The excellent qualities and popularity of the welt shoe have led to many imitations of it in the McKay method.



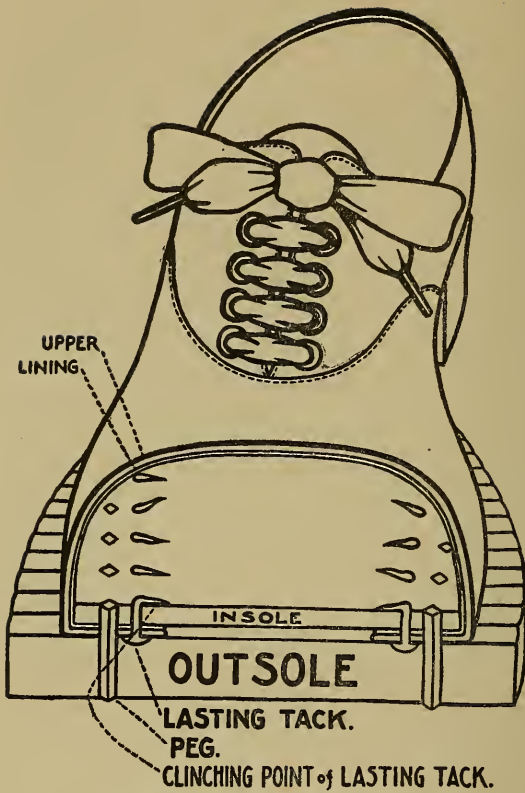
Cross Section of a McKay Sewed Shoe

While this is a sewed shoe, it differs radically from those made by the Goodyear Welt process, inasmuch as the lasting tacks and a line of stitches appear inside. It is the method very generally employed in making the cheap and medium grades of shoes.



Cross Section of a Standard Screwed Shoe

In making this type of shoe the tacks used in lasting are driven away in and clinched against the steel bottom of the last. The heavy outsole is tacked in place and fastened by means of screws. The metal which forms this fastening is in the form of wire with continuous screw thread. When the screw reaches the inside of the shoe, the machine automatically cuts it off and feeds to the next fastening. This method makes a strong but stiff shoe.



Cross Section of a Pegged Shoe

This type of shoe differs from the Standard Screwed shoe only in the sole fastening, which is of wood, in the form of a shoe peg. The machine which drives the fastening forms the peg from a coil of calendered beech wood, which, as it is required by the machine, is cut into individual pegs which are driven by the machine and cut off inside the shoe. It is a method of manufacture which was very generally used in the early part of the last century, but which has been largely replaced by other methods.

The nailed shoe has nails in place of wooden pegs.

The Turned Shoe. The "turned" or "turn" method is used in making fine shoes and slippers for women and children. The shoe is made wrong side out and then turned right side out. The sole is fastened to the last and the upper is drawn over it, wrong side out, and sewed to it through a channel cut in the edge of the sole. The seam does not show upon the finished shoe. The chief difference between the turn shoe and the welt or McKay is the absence of an insole. Only good leather of pliable quality can be used successfully in making this kind of a shoe, which is distinguished always for lightness and flexibility. This method was extensively used for light weight footwear before the introduction of machinery. The chief process has simply become a machine process.

The Lace Shoe. The items shown in the analysis of the lace shoe are as follows:

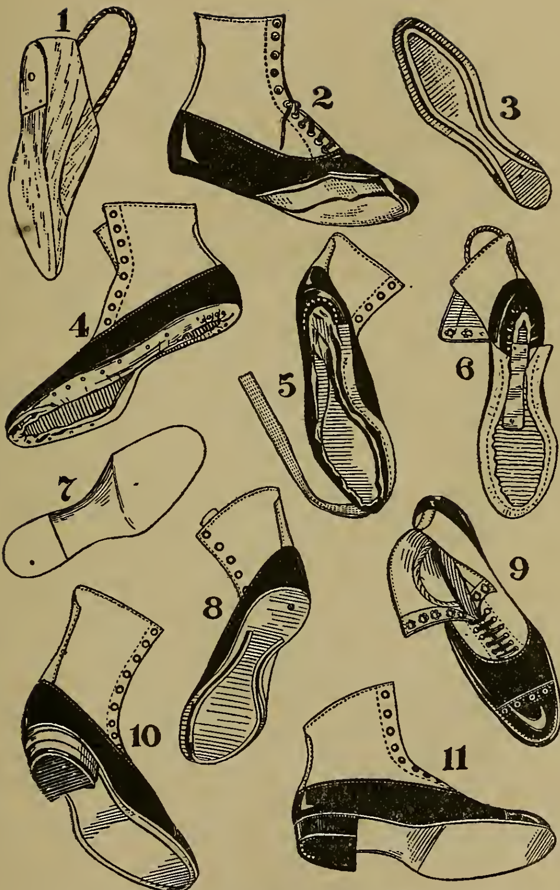
Tongue and tongue lining, welt, welting thread, top facing, back stay, top, eyelet stay, foxing, laces, eyelet stay, top, back stay, bobbin thread, vamp, toe box, eyelets, top thread, outer sole, tip, inner sole, eyelet lining, doubler, steel shank, top-lift, heel, heel pad, lining, counter.

The McKay method of manufacture led in 1909, with 41.5 per cent. of the total production; the machine or hand-welt method was second, with 32.3 per cent.; and the turned product ranked third, with 16.3 per cent., followed by the wire-screw or metal-fastened, with 7.9 per cent., and the wooden pegged, with 2 per cent.

The McKay method also predominated for three of the four classes of boots and shoes and for the two classes of slippers for which separate figures are presented. Infants' shoes and slippers were chiefly turned, while for "all other kinds" the machine or hand-welt methods show the largest number.

The Different Stages in Goodyear Welt Manufacture. The various parts of the Goodyear welt shoe as they are brought together in the making are shown in the illustration upon the following page. They are:

1. A last.
2. An upper.
3. An insole.
4. Shoe lasted and ready to have welt sewed on.
5. Welt partially sewed on.
6. Welt entirely sewed on and shoe ready to have outsole laid.
7. An outsole.
8. Shoe with outsole laid and rounded. Channel lip turned up ready to be stitched.
9. Shoe with sole stitched on.
10. Shoe with heel in place.
11. Heel trimmed and shoe ready for finishing.



A Goodyear Welt Shoe in the Different Stages of Manufacture

Table VI*—Census Statistics Showing the Number of Boots, Shoes and Slippers Made in the United States for the Year 1909 by Each Method of Manufacture.

Kind	Total	Machine or hand welt	Turned	McKay	Wooden-pegged	Wire-screw or metal fastened
Boots and Shoes	247,643,197	87,391,763	26,317,990	107,063,644	5,226,161	21,643,639
Men's	93,888,892	53,212,450	989,240	20,438,585	3,921,652	15,326,965
Boys' and youths'	23,838,626	4,423,934	50,377	15,016,611	567,939	3,779,765
Women's	86,595,314	25,871,899	14,281,764	44,518,966	533,579	1,389,106
Misses' and children's	43,320,365	3,883,480	10,996,609	27,089,482	202,991	1,147,803
Slippers	17,507,834	1,318,995	7,611,748	8,396,874	28,918	151,299
Men's, boys' and youths'	4,802,841	648,007	1,733,742	2,286,652	16,851	117,589
Women's, misses' and children's	12,704,993	670,988	5,878,006	6,110,222	12,067	33,710
Infants' shoes and slippers	15,000,721	1,979,593	11,447,508	1,520,072	41,731	11,817
All other	4,865,429	1,429,249	1,189,742	1,286,281	321,082	639,075

*Boot and Shoe Industry. General Statistics, Thirteenth Census. Table 25.

Chapter VIII

THE UPPER LEATHER DEPARTMENT

CHAPTER VIII

The Upper Leather Department

The Importance of Detail in Shoe Manufacture. It is the purpose of this and the following chapters to present actual factory processes and employment opportunities in their order. Most shoe operators are restricted to work on particular single machines and processes. In a few cases, especially in the smaller and older factories, an operator may perform several related processes; or, in other words, several related or consecutive processes may be combined in one or done on a single machine.

An average style shoe in the making must pass through over one hundred different pairs of hands and about one hundred and fifty different machines, involving over two hundred processes, according to the methods of particular factories. It is clear, then, that the details of manufacture are of the highest importance, and that every factory department must observe absolutely the specifications of each lot of shoes.

The divisions shown in the following chart are the natural divisions of the upper leather department, as will appear in this chapter. Trimmings and linings need not be separately presented at length.

Pattern making, which has been treated separately in Chapter IV, is sometimes made the first division of the upper leather department, where patterns find their chief use.

It may be said here, also, that the general plan and system of this department and of the other departments of shoemaking are the same in all factories, and that practically the same machines are in use everywhere, but that details and minor processes are so numerous that variation in them is to be expected. It will not be wise or necessary, then, to go into the minutest details of manufacture in these pages. Only processes and methods that are general or typical need be presented.

Action upon Receipt of an Order. The making of a pair of shoes begins simultaneously in the cutting department and in the sole leather department. When an order is received in a modern and well-organized factory the order department records in the order book all the details regarding the samples upon which the order was secured. The shoe must be made upon these specifications in its course through the factory, and when finished it must conform to them.

In the order department each lot is given an order number. Tags bearing this number and the details regarding the preparation of the shoe upper, with one tag for each two dozen shoes, are sent to the foreman of the cutting room. Other tags containing details about the sole leather to be used are sent to the

CHART OF THE UPPER LEATHER DEPARTMENT

UPPER LEATHER DEPARTMENT
Sorting Department
Trimming, Cutting, and Dinking Department
Lining and Cloth Cutting Department
Upper Cutting Department
Counting, Marking, and Skiving Department
Assembling Department

foreman of the sole leather department. A third lot of tags is prepared for the direction of the foreman of the making or bottoming room, where are brought together, for assembling, the various parts of the uppers prepared in the cutting and stitching rooms and of the bottoms prepared in the sole leather room.

The methods of making out the tags or tickets which are used as guides in the various rooms of the shoe factory vary in some factories. A clerk in the cutting room, for instance, may prepare them upon an order sent to him from the order department. In all cases, however, the essential points given in the tags are the same. The tag specifies the sole, heel, upper, kind and quality, the stitching, the style of last, bottom finishing, treeing, and packing. On the following pages is presented a typical tag used in the shoe factory.

The Day Sheet. The despatch department has charge of the passing of work into the factory and of following it up through the factory. From the tags received by the order department the despatch office prepares schedules or bulletins called day sheets. These sheets show accurately the details of each and every lot of shoes passing into the factory on a given day and also the scheduled time when the last lot of each day's work should pass a given point in the factory. The day sheet contains also supplementary information showing the exact quantity of each of the various special items of product composing a particular day's work. The sheets are made

READ THIS TAG

Customer's Stock No. ________ S. B. No. ________
When Ship   Date of Order

Case No.	Quarter	Vamp Lin.
Customer's No.	Vamp	D. Vamp Lin.
Stamp Carton and Case	Foxing	Side Stay
	Tip	Top Facing
Sample No.	Qr. Lining	Back Stay

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

CUTTING AND FITTING   BOTTOMING

Kind

Pattern	Last		Shk
Lining	Out Sole		Iron
Top Fac.	Slip	Ir.	Insole
Quarter St.	Tap		Counter
Vamp St.	Heel		
Foxing St.	Slug		F. S. Fudge
Tip St.	Edge		Cutter Used
B'k Stay St.	Bottom Finish		Top Fc.
Tongue	Monogram		
Label	Sock Lining		
Eyelets	Laces		Cartons

FOXING TICKET

Case No.   Kind   Pat. No.
Stitch No.   Back Stay

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

VAMP TICKET.

Style ________

TIP

Case No.   Pat. No.

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

TIP TICKET.

Case No.   Kind   Pat. No.
Stitch No.   Perf.   Tongue   B'k Stay

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

TRIMMING TICKET.

Top Face ________ Stamp ________
Case No.   Side Stay   Qr. L.   Pat. No.

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

LINING TICKET.

Tongue ________
Case No.   Vp. Lining   Sock Lining   Pat. No.

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

SOLE LEATHER TICKET.

Style ________ Edge ________
Case No.   Last   Counter   Shank
Outer Sole   Heel   Slip   Tap   Finish

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

INSOLE TICKET.

Case No.   Kind   Last

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

STRAP TICKET.

Tongues ________ Covers
Case No.

Prs.	Width	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

A Typical Shoe Tag

....Company. Sheet No..................

	No. of Pairs	Customer's No.	Case No.	DESCRIPTION	Last	Width	Out of Cutting Room	Out of Stitching Room	Out of St'k Fitting Room	Out of Lasting Room	Out of Making Room	Out of Packing Room	Out of U. L. Room

A Typical Shoe Factory Day Sheet

in duplicate. One set is kept in the office and upon it are checked off records of the work as it proceeds through the factory. This sheet also contains the name of the customer for whom the shoes are being made, their price, and the name and commission of the salesman. Other sets go to the various factory rooms as guides and records of the day's work. The sheet used in the cutting room contains the specifications which constitute the cutting instructions, such as the kind of the upper stock and linings to be used, the price, and the number of square feet. On this sheet are recorded, also, all the details of the work of cutting as the cutting is done. The use of the day sheet is quite universal in shoe manufacture and it has done much to promote efficient methods. On page 140 is presented a typical shoe factory day sheet.

The Upper Leather Room. The upper leather room is that division of the upper leather department in which leather stock is measured and sorted for the cutting room. The department includes the care, sorting, and cutting of the leather and other materials that enter into the upper of the finished shoe, and has three divisions, leather, linings, and trimmings, each being usually called a department or room.

Measuring Upper Leather. About two hundred different kinds of upper leather are now in use. They usually come from the wholesale houses or store rooms of the factory in boxes to the upper leather room. There they are taken from the boxes, counted, measured upon a machine, and stamped with the number of square feet in each piece. The machine used in measuring the upper leather is very sensitive to heat and cold, and must be adjusted every morning for the day's use. It records the exact number of square inches in the skin. The operator of it must be very careful and trustworthy. Upper leather constitutes a large part of the cost of shoe manufacture, and its economic use is absolutely essential in a factory.

The Leather Sorter. Leather sorting follows measuring and is equally important. The cutting room tags calling for particular kinds of leather for particular lots of shoes are given to the leather sorter. He must be able to judge by experience exactly the amount and quality of leather required to cut each order, though the quantity may be figured in the office. He tests its quality by doubling a skin along the back and passing his fingers over the folded edge. He rolls the skins selected or sorted for each lot of shoes into a bundle, attaches the ticket which he has used, and sends the bundle to the cutter. The leather sorter must himself have served several years' apprenticeship as a cutter, so as to become used to the kinds, feel, and cutting value of leather. After sorting, the upper leather is sometimes weighed out by thickness into lots of definite weight, and placed on shelves in the room until needed for orders from the cutting room.

The Lining Sorter. There is usually, also, a sorter of the various kinds of cloth, such as twills and drills, used for the linings of shoes. These are inspected for their weave, strength, and chemical qualities. They are inspected both for acceptance by the factory and for grades for particular kinds of shoes. They are marked and labeled and put away in grades corresponding to intended uses. The lining sorter must usually have had training in a textile school.

The Positions in a Sorting Department. In the small factory one or two persons only may be employed in the work of measuring and sorting leather. Very many shoe factories, however, in which large and valuable quantities of stock are used daily, have a fully organized sorting department.

The positions in a modern sorting department are as follows:

1. The Inspector, who examines the material selected by the sorters for particular uses, to see that it is rightly chosen.
2. The head sorter, who has charge of sorting.
3. Several or more leather and lining sorters.
4. One or two weighers of the sorted lots of leather.
5. Men who put up the work called for by the cutter's tags, selecting the leather according to the price given upon the tag, and placing the bundles in their proper places for passage into the cutting room.

6. Girls who figure the allowances of leather called for by the tags and keep the cutters' accounts. This work must be accurately done and demands considerable ability.

The Lining and Cloth-Cutting Section. The cutting of cloth tops and linings was formerly done largely by hand. The hand worker places a pattern upon the cloth and cuts quickly around the edge of the pattern with a knife. He may cut the cloth in the single piece or in layers, up to eight thicknesses. Such cutting is never accurate, and with the increased use of textiles in shoemaking it proves too slow a method. The dieing or dinking machine is being used more and more for the cutting of cloth parts. The die made in the shape of the usual pattern is accurate, and from twenty-four to forty thicknesses of cloth may be cut by it at one time, increasing the work of the section many fold. The cost in cases of die cutting is reckoned at about one-tenth of that by hand cutting. Hand dieing or dinking is in practice to some extent.

As has been pointed out, the dieing or dinking section works entirely according to the specification of tags for each lot of shoes. Lots go through the room in pairs varying from one hundred and eight to one hundred and fifty in number for hand cutting, and about four hundred for machine dieing. The usual lining parts to be cut or died out are, quarter lining, top band, inside stay, fly lining, back stay, and tip.

Patterns and dies are selected not only for each of these parts but for the particular style of shoe called for.

The Positions in the Lining and Cloth Cutting Section. The usual positions connected with the cutting of cloth tops and linings are, the Foreman, the hand cutters, the machine dinkers, the hand dinkers, the pattern boy, the cloth and lining folders, the piece sorters, the inspectors, the cripple cutter, and the stock man. There may also be an instructor, to aid the foreman in teaching new employees. After about one year's service on cloth and linings cutters may go to the outside or leather cutting room.

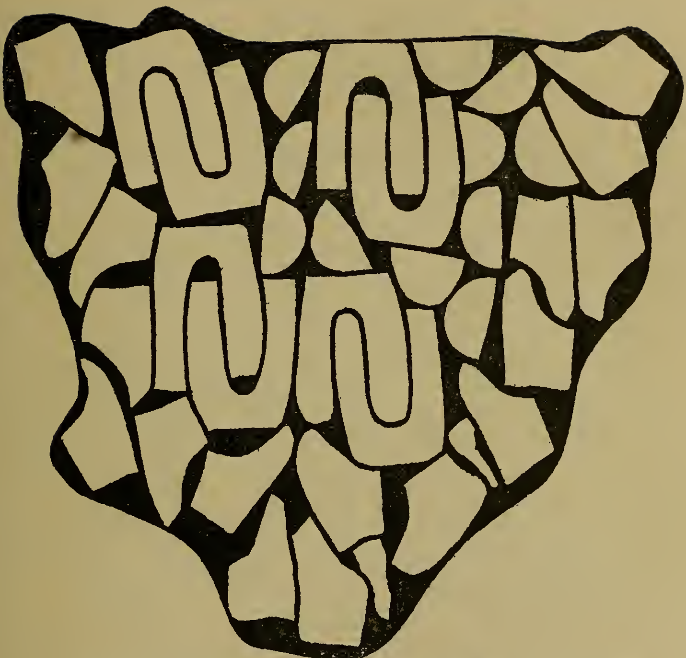
The Cutting Room. The cutting room is that division of the upper leather department in which the leather is cut, by hand or with a die, for the upper parts of the shoe. It is the most important section of the large department. The cut parts finally go to the assembling room along with the linings from the lining room, and are there put together ready for the stitching room.

The Hand Cutter. Cutting the upper parts of the shoe by hand was the method preceding the introduction of machinery, and is still in use, especially in the smaller and older factories, or in factories that handle small skins. It is an expert process demanding years of practice for the finest work, and has been so satisfactory that it gives way but slowly to the use of machinery. The particular advantage of hand cutting, in addition to the more economical use of leather, is that the hand cutter is more likely to place his pattern so that the different parts of the skin may be cut according to the qualities needed for the different parts of the shoe. With the improvements in the tanning of leather so that more uniform qualities are obtained, and with the increased demand for speed in cutting, large establishments are tending gradually to the use of machine dieing.

Hand cutting is done upon hard wood blocks made especially for the purpose, or thick "cutting boards" arranged at a convenient height for the workman to stand before them. He uses a short-bladed, keen edged knife. It is a part of his training to know how to keep his board smooth and oiled regularly and his knife sharp.

The leather cutter is sometimes called "outside cutter," to distinguish him from the cutter of linings and trimmings.

The cutter receives a bundle or lot of leather with its tag from the sorting room, and the patterns called for by the tag from the pattern room. He lays out his patterns conveniently at hand in the order of large, medium, and small. He places one skin at a time upon the block. Placing a particular pattern upon it, so that the part selected is best suited to the corresponding part of the completed shoe, he draws his knife skillfully around the metal edge of the pattern. This involves several or more

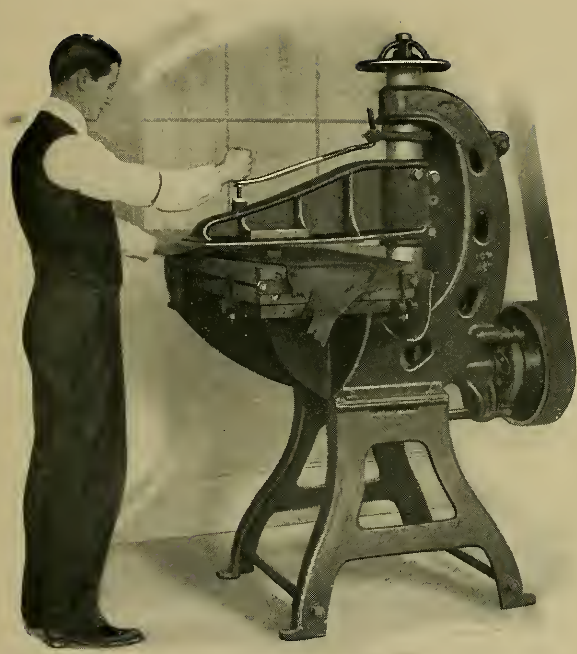


A Skin Showing how Patterns are Placed in Cutting motions, with the dangers of cutting away from the pattern and of cutting the fingers. The cutter uses his patterns alternately, or with variation of sizes and positions, so as to cut the skin most economically. Usually the waste parts are very small and unsuited to other purposes in the factory, except for such trimmings as back straps and vamp stays. They are generally sold to be consumed in making leather substitutes, or for the oil they contain. The cutter lays out all his cut parts in lots and marks the upper piece by pattern, size, width and style. He ties up these lots with the tag and a sticker attached showing the case number, the number of pairs, and the size.

The work of the cutter is checked up in the sorting room, making an exact efficiency record for each workman, and the totals of cutting are placed upon the cutting room day sheet.

The outside cutter learns his trade by work upon cloth and linings or by service in leather cutting in a small factory.

The Clicking Machine. As has already been indicated, large shoe factories are coming to use machines for cutting leather, in some factories both the hand method and the machine method being found side by side. The machine, which performs a process formerly thought impossible except by hand, has a cutting board or block like that of the hand worker. A strong arm or beam swings from side to side over this block. A skin is placed upon



Operating the Clicking Machine

the block and the operator of the machine sets a die upon the leather, just as the hand worker would place a pattern upon it. He then swings the arm of the machine over the die, which is pressed through the leather by the automatic action of the machine. The arm then returns automatically to its full height. Dies may be used alternately as in hand work, so as to cut the skin economically. They are made in various designs and sizes, with one die for each design and size. Thus it will be seen that machine cutting calls for a very large number of dies. Each is about three-quarters of an inch in height, so that the operator can see clearly where he is placing it upon the leather, and of such light weight as not to injure the leather. Cutting is done upon one thickness only. One movement of the arm of the machine, guided by the operator, accomplishes what it would take the hand cutter considerable time to do in passing his knife entirely around the edge of the pattern. All pieces cut by a die must be identically the same, while in hand cutting there would necessarily be some variation in size. The dies used for the vamps mark the location of the toe cap and Blucher foxings that may be added later. The cut parts are treated as in hand work, and sent on to the next operations.

The die cutting machine is called the "clicking machine," and is one of the most important recent innovations in the making of shoes. An illustration of this machine is on page 149.

The Counting, Marking, and Skiving Department. In a small factory many of the minor operations of shoemaking are done in some part of the rooms in which the related major processes are performed. Such minor operations may employ but few people. In the larger factories, however, they become very important because of the large number of shoes made daily. They then employ many persons and are carried on in separate rooms and departments. Such is the department in which the counting, marking, and skiving of the pieces coming from the cutting room are done. The cutter, or some other employee in the cutting room, has marked only the top piece of each lot. In this department girls untie the lots, count them to see that the number called for by the tag is present, and mark the size upon each part. The employees of this department, except for a machinist who has charge of the machines, are regularly girls and women. The entire department is sometimes called the skiving department, from the chief process in it.

Skiving. The edges of the upper leather which are to show in the finished shoe are "skived," or beveled to a thin edge which can be folded in so as to give a more finished appearance to the completed shoe. This work is done by girls upon skiving machines. Such edges on thick leather are sometimes stained the color of the leather itself instead of being skived. The skived edges are covered with a coating of cement, and placed in a machine which folds and presses them at the same time.

Nicking. All curved edges of upper leather parts are nicked or cut with little notches by girls upon nicking machines. This is done so that such parts may be folded in evenly and smoothly in stitching the shoe. Sometimes edges which will show in the completed shoe are scalloped.

Dieing Out Straps. Straps for Oxford shoes and button flies are usually died out by hand, by the use of a mallet, in this department, rather than by the cutter in the cutting room, where, being the smallest parts, they cause some delay in cutting.

Positions in the Skiving Department. The positions in the skiving department are, the Forewoman; floor girls, who give out work, gather it up, and check it off as it leaves the room; counters and markers; skivers; nickers and scallopers; edge stainers, and the machinist.

Assembling Department. The upper parts of the shoe come on trucks from the skiving room to the assembling department. Here are many boxes in which the lots are placed according to numbers, with four tags for each order, the tag for the outer, upper part of the shoe, for linings, for trimmings, and for tip. In each box are placed all the parts necessary for the complete upper, by adding to each lot what its tag calls for. Linings are marked upon a stamping machine with size, width, and case number. When all parts have been assembled they are divided for the various sections of the stitching room. For instance, quarter linings, top bands, button flies or side stays go to the tip-stitching section; tips go to the tip-stitching section; and the outside parts, vamps, vamp linings, and tongues, go to the vamping section.

Positions in the Assembling Department. The positions in the assembling department are, the Foreman, floor girls, girls for casing up, for stamping linings, and for arranging tags in order of precedence, and a stock boy.

Time and Pay Statistics in the Cutting Department. At the end of this and other chapters on factory departments are presented statistics selected from Bulletin No. 178 of the United States Bureau of Labor Statistics, showing average wages, weekly earnings, and hours per week in boot and shoe manufacture throughout the country from 1910 to 1914, and by states for 1914.

The figures here given are for a selected number of establishments, but may he regarded as representative of the entire industry, as according to the census of 1910 more than ninety-seven per cent. of the total number of employees in the industry were found in the states from which the information was secured.

Among other things, it will be observed by Table VII, on pages 156 and 157, that hand cutters, whose work is more exacting than that of machine cutters, received in 1914 thirty-six and three-fifth cents per hour, or $19.66 a week; while machine cutters received thirty-two and one-half cents per hour, or $17.93 per week. It will be seen, also, that male skivers in 1914 received twenty-nine and nine-tenths cents an hour, or $16.13 a week; while female skivers received twenty and nine-tenths cents an hour, or $11.30 a week. In Table VIII, on page 159, may be seen the variations of earnings in these operations in the great shoe manufacturing centers of the country.

Table VII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

[The figures set opposite each group of years are for identical establishments. When a second line is shown for 1914 it contains all data secured for 1914 whether or not comparable data were available for 1913.]

CUTTING DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Cutters, vamp and whole shoe, hand, male:											
48 establishments	1910	1,650	56.0	$0.319	$17.86	13	176	405	395	319	342
	1911	1,602	56.2	.317	17.75	14	158	425	398	311	296
64 establishments	1911	2,066	56.2	.313	17.50	.....	158	589	587	384	348
	1912	1,906	55.0	.322	17.63	217	162	720	272	323	212
71 establishments	1912	1,995	55.0	.322	17.58	242	162	738	297	336	220
	1913	1,987	54.5	.351	19.05	231	224	803	364	313	52
68 establishments	1913	1,923	54.5	.352	19.10	211	224	803	350	283	52
	1914	1,757	53.8	.368	19.70	354	308	405	476	183	31
75 establishments	1914	1,812	54.0	.366	19.66	354	318	405	477	203	55
Cutters, vamp and whole shoe, machine, male:											
17 establishments	1910	235	57.8	.301	17.23	.....	.....	13	70	98	54
	1911	226	57.2	.300	17.09	.....	.....	15	75	102	34
20 establishments	1911	270	57.0	.313	17.69	.....	.....	59	69	87	55
	1912	300	55.5	.319	17.54	29	24	113	.....	85	49
33 establishments	1912	490	55.8	.313	17.36	29	24	186	41	124	86
	1913	549	55.3	.323	17.77	32	27	213	117	121	39
35 establishments	1913	528	55.5	.322	17.70	29	27	178	129	126	39
	1914	568	55.1	.328	17.96	58	20	133	228	124	5
40 establishments	1914	642	55.3	.325	17.93	58	20	142	260	157	5

Skivers, upper, machine, male:											
12 establishments	1910	74	54.7	.288	15.80	.....	.....	49	13	12	.....
	1911	79	54.7	.314	17.15	.....	.....	52	21	6	.....
28 establishments	1911	136	54.8	.292	15.98	.....	.....	92	24	20	.....
	1912	146	54.6	.289	15.73	.....	10	100	11	24	1
32 establishments	1912	156	54.7	.282	15.41	.....	10	105	11	29	1
	1913	134	54.5	.299	16.23	.....	11	87	24	12	.....
22 establishments	1913	123	54.3	.300	16.26	.....	11	87	19	6	.....
	1914	107	54.2	.304	16.47	.....	10	75	19	3	.....
29 establishments	1914	116	54.4	.299	16.13	.....	10	75	24	7	.....
Skivers, upper, machine, female:											
49 establishments	1910	338	57.0	.175	9.94	1	30	40	81	86	100
	1911	314	57.3	.176	9.97	2	25	25	84	94	84
60 establishments	1911	374	57.0	.176	9.97	.....	25	33	113	108	95
	1912	345	55.1	.191	10.54	9	26	158	50	91	11
67 establishments	1912	371	55.0	.193	10.58	9	26	179	59	87	11
	1913	439	54.6	.209	11.38	12	32	231	104	60	.....
65 establishments	1913	439	54.6	.207	11.29	12	32	227	110	58	.....
	1914	402	54.0	.211	11.35	26	64	192	99	21	.....
77 establishments	1914	446	54.1	.209	11.30	26	64	211	117	28	.....

*From Table I—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U.S. Department of Labor, Bureau of Labor Statistics.

Table VIII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

CUTTING DEPARTMENT

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Cutters, vamp and whole shoe, hand, male:					
Massachusetts	24	684	52.8	$0.380	$19.99
Missouri	5	125	55.1	.377	20.71
New York	11	273	52.1	.368	19.14
Ohio	6	205	53.9	.412	22.14
Other States	29	525	56.1	.326	18.27
Total	75	1,812	54.0	$0.366	$19.66
Cutters, vamp and whole shoe, machine, male:					
Massachusetts	14	252	53.8	$0.360	$19.39
Missouri	5	95	58.0	.258	15.01
New Hampshire	2	98	55.0	.338	18.60
New York	4	68	53.2	.356	18.89
Ohio	3	26	56.1	.292	16.27
Other States	12	10	57.6	.278	16.02
Total	40	642	55.3	$0.325	$17.93
Skivers, upper, machine, male:					
Massachusetts	15	80	54.1	$0.313	$16.93
Other States	14	36	55.2	.268	14.69
Total	29	116	54.4	$0.299	$16.13

Skivers, upper, machine, female:					
Massachusetts	19	116	53.9	$0.226	$12.17
Missouri	6	56	53.5	.201	10.72
New Hampshire	7	41	55.0	.186	10.22
New York	9	53	51.8	.236	12.19
Ohio	7	44	53.8	.189	10.16
Other States	29	136	55.4	.202	11.15
Total	77	446	54.1	$0.209	$11.30

***From Table III**—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes.

Chapter IX

THE STITCHING DEPARTMENT

CHAPTER IX

The Stitching Department

Definition. The stitching department is that division of the factory in which the outer parts of the upper of the shoe, the linings, and the trimmings are sewed together upon machines, ready for putting upon the last. In some factories this division is called the "fitting room." Female employees generally work in this department, but at present men are being employed more and more on the vamping machines and other heavy parts of stitching. In a factory having 5,000 employees about 1,400 are found in the stitching department. The machines used in the stitching room are similar to the ordinary sewing machine used in the home.

Variations in Stitching Room Processes. Methods and details in the stitching department differ more than in the cutting and other departments of the shoe factory, because of the many parts composing the upper of the shoe. There are more processes involved in the making of women's shoes, with the constant striving after style and effect, than in men's shoes, in which plainness and serviceable qualities are desired. Processes may be modified, also, in making children's and infants' footwear. Different kinds of shoes, as high, low, and pumps, require variations in the methods of sewing the various parts of the upper. Altogether the stitching department involves a large number of processes of minute detail and possibility of variation. The generally prevailing methods are here presented.

The Number and Divisions of the Parts to be Stitched. For the uppers of an ordinary pair of button boots, as an example, there are forty-four different pieces of material. The stitching is done upon many of these parts simultaneously before the upper is ready for lasting. The size is marked upon every part. The linings and the trimmings are given to one division of operators, the outsides to another, and the vamps and tips to still another division. All these parts meet again when each has been sewed, and are inspected and sent on to the lasting room.

The Divisions of This Department. The natural divisions of this department are shown in the following chart. They are, the Lining department, the tip department, closing and staying, foxing, top stitching, or closing on and top stitching, and the button hole, vamping, and toe closing department.

The Lining Department. In the lining department various parts of the lining are pasted and sewed together in preparation for the top stitching department, where the lining as a whole will be sewed to the upper of the shoe. Each operation here spoken of may be a single process or may

CHART OF THE STITCHING DEPARTMENT

STITCHING DEPARTMENT
Lining Department
Tip Department
Closing and Staying Department
Foxing Department
Top Stitching Department
Button Hole Department
Vamping Department
Toe Closing Department

represent several minor processes. First the lining is closed or sewed in a seam, and taped, or stayed up and down the heel. The top band is sewed on. The button fly, which has a reinforcement in the man's shoe, is also stitched on. A lining is stitched upon the tongue for some shoes. The vamp lining is cemented merely to hold it in place for later sewing. Labels are stitched on the lining of the inside of the heel for Oxford shoes, and on the inside of the top of the lining for boots. The more common kinds of boots, for instance, are, the button, the Polish, the Blucher; of low shoes, the Oxford and the pump.

Positions in the Lining Department. The usual positions in the lining department of the stitching room are, the Superintendent, the forewoman, the inspector, operators on the closing of linings, on the staying of linings, on sewing of top bands, and on attaching labels, the floor girls, and a cripple girl who attends to all imperfect work.

The Tip Department. The tip department is that section of the stitching room in which the tip receives special preparation for its place in the complete upper, and in which it is sewed to the vamp. Tips come from the cutting room tied in bunches separate from the other parts of the shoe. In the tip department they are skived, perforated, and fitted with linings according to use on particular vamps, or, in other words, on shoes of particular styles. Usually a box to give reinforcement and style to the tips is cemented inside of it before the lining is inserted, and before the tip is stitched to the vamp. The tip may be skived and folded in, perforated, nicked, scalloped, or plain, each process involved belonging to this department. The lining is cemented in, taped over seams, and pressed firmly in place upon a machine, and the whole is top-stitched on a machine, through leather and lining, just below the line of perforation. Then the tip is stitched above the perforation to the vamp of the upper; and this part of the upper is ready for the vamping department.

Perforating. Perforating deserves special mention since it gives style to the tip, and is of itself an interesting process and a good example of intricacy in shoe making processes. A series of ornamental perforations is stamped by a combination of small dies upon the "power tip press" or upon the "perforating machine." The holes thus stamped take particular styles which are known in the shoe factories by numbers. For instance, perforation "number 69" consists of a large hole and a small one alternating in a line near the edge of the tip, over the top, thus: o ∘ o ∘ o, and "number 70" consists of a large hole alternating with two small ones, thus: o ∘ ∘ o ∘ ∘ o. The size of the holes may vary. If you will look at the tip of your shoe you will probably find one of these styles or a variation of them.

The machine feeds itself automatically, dieing the full perforation accurately at one stroke for each tip, as the tips pass through in line upon a moving band of paper, which prevents dulling the die. This machine is used also for perforating larger parts of shoes, such as vamps, foxings, and ornamental "winged tips."

Positions in the Tip Department. The positions in the tip department are numerous and may be shown more clearly, as will other departments having many positions in the following pages, by a numbered list as follows, using the terms which are common in the factory:

1. The Superintendent, in a large factory.
2. Forewomen.
3. Quality Inspector.
4. Lining Closers.
5. Stayers.
6. Toe Piece Ironers.
7. Tapers.
8. Reinforcers.
9. Tip Markers.
10. Toe Lining Reinforcers.
11. Tip Pressers.
12. Vamp Pressers.
13. Vamp Perforators.
14. Box Cementers.
15. Stitchers of tongue to vamp.
16. Tip Perforators.
17. Tip Blackers.
18. Stitchers of tip and vamp.
19. Floor Girls.

20. Cripple Girls.

21. "Hustle Girls," who look up the dates upon the tags and keep orders moving in their proper sequence.

The Closing and Staying Department. The closing and staying department deals with cementing, sewing, and securing the seams of the top of the upper, the part above the foxing and toe of all kinds of shoes, following the work done upon the linings and tips. First, the button fly is pressed, then closed or sewed to one quarter, and the two quarters of the top are sewed together. The top piece is cemented on the inside of the large quarter, which bears the button fly, and the quarter is stayed. The top of the button Oxford is ironed out at the heel seam, and a reinforcement ironed upon the button fly. The Blucher Oxford is nicked and pressed. A paper reinforcement is ironed upon the inside of the top of the circular pump. Bows of various kinds and colors are made by machines for Oxfords, and fastened upon them by a machine which drives a metal reinforcement into the bow. Canvas stays are put in the top of Oxfords. A long vamp is reinforced for eyelets, and a stay is cemented in when blind eyelets are to be inserted. Perforations are sometimes covered with imitation reinforcements on the inside, or stitched around the outside. Perforation upon the top has tape placed on the inside and stitched underneath. Buckle straps and instep straps are attached to some styles of shoes.

There are many such operations in this division of the stitching department, according to the particular kinds of shoes made in a factory. Each style is kept separate in going through the department. Stitching machines are now made for use upon certain styles and parts of shoes only, specialization in machinery extending to the most minute parts of processes throughout the factory.

Positions in the Closing and Staying Department. The usual positions in this department are as follows:

1. Forewomen, or assistants to foreman.
2. Inspectors.
3. Teacher for new help.
4. Closers.
5. Label Girls and Cementers.
6. Button Fly Pressers.
7. Button Fly Reinforcers.
8. Stayers.
9. Toe Piece Reinforcers.
10. Cementers and Pressers.
11. Floor Girl.
12. Checker Girl, who checks off all numbers of lots so that it may be known when the parts are all done and have gone to the next department.

The Foxing Department. The foxing department is one of the smallest divisions of the stitching room. The foxing is a little piece of upper leather below the quarters on each side of the heel, put on all kinds of boots and Oxfords. Foxing is used on both the high and the low styles of footwear. It is both plain and ornamented, according to the style and quality of the shoe. Back straps and fly stays are stitched upon the quarters to which the foxing is attached, and then the foxing, ornamented with perforations in this department, if need be, is stitched upon the quarters, sometimes with one row of stitching and sometimes with two rows. The operations are the same with canvas as with leather uppers. The work when done and checked off on the day sheet goes to the top stitching department.

The ordinary Polish shoe, not the Blucher, and the Oxford shoe, both Blucher and common, have a long vamp and no foxing.

Several related or similar operations, also, are performed in the foxing department, such as sewing loops at the top of the back of the shoe, on men's shoes, and sewing on buckle straps.

Positions in the Foxing Department. The usual positions here are these:

1. Forewomen, or assistants to foreman.
2. Teacher.
3. Inspector.
4. Perforators.
5. Back Strap Stitchers.
6. Side Stay Stitchers.
7. Binders.
8. Button Fly Face Stitchers.
9. Foxing Stitchers.
10. Floor Girls.
11. Cripple Girls.
12. Checker Girls.

The Top Stitching Department. The top stitching department is the division of the stitching room in which the tops, the leather upper part, coming from the foxing department, and the linings, from the lining department, are sewed together. Quarters and linings are first matched upon tables and tied together in bundles, according to tag numbers. This work is done by floor girls, who give the bundles thus matched to the machine operators. In some factories vamps are sewed on at the same time as the tops and linings are sewed together.

The methods of the department vary, as in other sections of the factory, according to the style of shoes being made. Generally the top and lining are put together back to back, or wrong side out, and stitched along the edge of the top. Then the top is turned and the seam is pounded out so that the edge of the leather on the right side comes out true and flat. Then this part goes to the top stitcher, who sews it all around except at the bottom where the vamp is still to be attached. The side of the quarter on which buttons are to be sewed on the button shoe is pinked or notched upon the edge in case of a raw edge of the lining and the leather sewed together. Usually in the case of canvas shoes vamping is done in this department before top stitching.

More men are found in this department than in the other divisions of the stitching room because the work is sometimes heavier and more exacting, calling for considerable strength when followed from day to day, as well as for skill. The parts must be sewed, carefully turned and thoroughly beaten, and sewed again in finished form, making altogether, perhaps, the most difficult work of the stitching room, and the department is the largest division of the stitching room.

Positions in the Top Stitching Department. The positions in this section are the following:

1. Forewomen.
2. Teacher.
3. Inspector.
4. Operators of closing on machines.
5. Operators for turning and pounding top.
6. Top Stitchers.
7. Vampers.
8. Floor Girls.
9. Cripple Girls.

The Button Hole Department. The button hole department includes the making of button holes and the inserting of eyelets. The tops of button and of lace shoes come from the top stitching department to this department. The small quarter under the button fly is pinked, and the fly is marked for button holes by means of a perforated pattern through which the places for buttons are marked by hand with a pencil or yellow crayon. Then the button holes are inserted by a power machine which cuts the hole and works it around at the same time. In eyeleting the upper is marked by hand for the eyelet. Then the eyelet is inserted on a machine.

A machine has recently come into use which inserts eyelets in both sides of the top at the same time. In the case of "blind eyelets" a hole is stamped through the leather, lining, and reinforcement. The leather is then held back by the operator and eyelets are stamped through the lining and the reinforcement, the leather only showing on the outside of the hole. In some factories blind eyelets are inserted as a single process on an automatic machine. In men's high lace shoes hooks are inserted by a machine above the rows of eyelets. Raw edges are blacked or colored so as to make the edge of the lining resemble the leather.

Pairs of tops are now examined for matching and are tagged by sizes ready for vamping.

Positions in the Button Hole Department. The usual positions in the button hole section are as follows:

1. Forewoman.
2. Teacher.
3. Inspector.
4. Quarter Pinkers.
5. Button Hole Makers.
6. Button Hole Workers.
7. Machine Eyeleters.
8. Button Hole Finishers.
9. Button Hole Trimmers.
10. Operators for Cording the cloth button shoe.
11. Edge Blackers.
12. Girls for Matching and Tagging pairs.

13. Floor Girls.
14. Cripple Girls.

The Vamping Department. The vamp is the lower, front part of the shoe upper. It is the most important part of the upper and should be cut from the best of leather. The "cut off vamp" extends only to the shoe tip. The whole vamp extends from toe to heel with a seam at the heel only. Vamping consists in stitching the vamp to the quarters of the top. While some vamping may be done in the top stitching department, the process itself is an important one, and is a separate section in a factory. Vamps are first centered by being folded and marked in the center of the throat. Then the vamp is stitched to the quarters, each style of shoe calling for its special process. Usually leather parts only are sewed, the lining being held back.

Vamping is the most painstaking work of the stitching room and the best paying. Judgment and carefulness are absolutely essential to the operator. Three-fourths of the vampers are men. Hand strength is necessary in the heavier kinds of vamping, to pull and hold parts in place while they are being stitched, and to guide the work through the machine.

Positions in the Vamping Department. The few positions of the vamping department are, the Superintendent, foreman, man instructor, inspector, vampers, floor girls, cripple girls, and checker.

The Toe Closing Department. The toe closing department is the final division of stitching. The toes of all linings are made in two pieces. When the toe closing department is reached tops and linings have been stitched together and vamps have been sewed to the tops. In the toe closing department the leather vamp is held back and the two parts of the toe lining, one being laid flat upon the other so as to avoid a thick seam, are double stitched. This is a quick and easy operation.

Several other processes best done at this stage of shoemaking are performed in this department. In button shoes the side of the top which is to bear the buttons is marked for the buttons through the holes of the other side, by hand. Then the buttons are sewed on by a machine operator. Then comes the process of barring, or inserting a few stitches on a machine just below the buttons and above the vamp. Button Oxfords are fully buttoned, high button shoes only part way, in preparation for lasting. Laced shoes are laced by hand or on a machine. Lots are made ready by tags and numbers for the lasters.

Positions in the Toe Closing Department. The positions in this division are, the Superintendent, forewoman, inspector, toe closers, markers for buttons, button sewers, operators of barring machines, girls for buttoning and lacing shoes, floor girls, cripple girls, and packers who sort cases of lots of shoes for lasting.

Operating Stitching Machines. The stitching department deserves special mention on account of its magnitude, intricate processes, and peculiar machines.

Machine operators in the stitching room generally learn on inside work, as linings, or by work upon cheaper leather parts, or by low grade work. In certain seasons of the year there is a transfer of operators from department to department, according to need. Some operators know how to run a number of machines, frequently being taught to run a second one as if just entering the factory. The difficulty of handling a power sewing machine, as of a power machine in general, is to know when to start and when to stop the machine. On all machines the start is made by pressing the toe, and the stop by pressing the heel. Sometimes a factory has a special room where not only the processes of stitching take place but all other processes as well, for the making of special "hurry orders" of shoes.

Some automatic machines produce in operators, especially in the case of girls, the particular movement of the machine so that the operator responds to the motion, swinging or jumping the entire body or exhibiting a nervous, spasmodic action. This is especially noticeable in running the barring machine in which the part bearing the needle rises and springs toward the operator at each operation, and upon machines having an eccentric movement. In such cases operators are usually transferred in time to different or less injurious machines or processes.

Table IX*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

FITTING OR STITCHING DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Backstay stitchers, female:											
49 establishments	1910	307	56.6	$0.177	$ 9.95	1	32	35	88	84	67
	1911	299	56.6	.180	10.16	1	28	36	79	99	56
67 establishments	1911	392	56.5	.185	10.42	.....	28	69	110	121	64
	1912	378	55.2	.189	10.42	11	8	203	41	97	18
78 establishments	1912	426	55.1	.187	10.31	12	8	231	48	109	18
	1913	389	54.7	.195	10.62	11	12	208	114	44	.....
73 establishments	1913	379	54.6	.192	10.49	11	12	206	112	38	.....
	1914	399	54.2	.196	10.59	13	39	227	104	16	.....
82 establishments	1914	432	54.3	.197	10.68	13	39	250	106	24	.....
Button fasteners, female:											
26 establishments	1911	55	56.4	.157	8.88	.....	5	9	12	26	3
	1912	70	55.9	.183	10.21	.....	6	28	2	34	.....
72 establishments	1912	205	55.3	.177	9.78	3	15	101	19	58	9
	1913	232	54.8	.199	10.95	10	17	127	22	56	.....
66 establishments	1913	221	54.7	.196	10.70	10	18	126	21	46	.....
	1914	198	53.7	.197	10.57	18	40	105	26	9	.....
74 establishments	1914	208	53.8	.200	10.78	18	40	108	29	13	.....

Buttonhole makers, female:											
33 establishments	1911	108	56.3	.176	9.83	.....	2	29	23	48	6
	1912	168	55.4	.180	9.96	.....	17	79	8	64	.....
74 establishments	1912	468	55.1	.180	9.87	12	27	257	41	111	20
	1913	517	54.7	.194	10.60	6	41	306	70	94	.....
71 establishments	1913	489	54.6	.192	10.50	6	41	302	69	71	.....
	1914	477	53.8	.200	10.76	46	99	231	70	31	.....
80 establishments	1914	506	53.9	.198	10.70	46	99	249	73	39	.....
Closers-on, female											
49 establishments	1910	262	57.1	.178	10.13	1	23	34	57	60	87
	1911	277	57.1	.178	10.09	1	5	36	89	72	74
65 establishments	1911	350	56.9	.180	10.18	.....	5	62	108	88	87
	1912	331	54.9	.187	10.21	15	16	178	36	71	15
74 establishments	1912	344	55.0	.186	10.17	15	16	182	40	76	15
	1913	349	54.4	.194	10.53	18	17	206	73	35	.....
69 establishments	1913	337	54.4	.191	10.39	14	17	203	73	30	.....
	1914	325	53.8	.193	10.36	28	54	170	63	10	.....
77 establishments	1914	347	53.9	.193	10.42	28	54	183	68	14	.....
Lining makers, female:											
53 establishments	1910	585	56.5	.164	9.19	2	88	76	145	141	133
	1911	576	56.5	.162	9.08	3	81	75	162	154	101
72 establishments	1911	721	56.5	.166	9.28	.....	81	136	190	189	125
	1912	706	55.0	.171	9.36	21	39	373	85	161	27
80 establishments	1912	764	55.0	.170	9.31	21	39	391	98	188	27
	1913	854	54.6	.190	10.38	29	47	469	199	110	.....
76 establishments	1913	833	54.5	.190	10.31	29	47	457	199	101	.....
	1914	804	53.9	.188	10.15	52	134	409	177	32	.....
84 establishments	1914	852	54.1	.189	10.21	52	134	436	180	50	.....

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table IX*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

FITTING OR STITCHING DEPARTMENT—*Concluded*

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were—					
						Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Tip stitchers, female:											
36 establishments	1911	134	55.8	$.205	$11.38	.....	10	38	32	49	5
	1912	137	55.2	.216	11.87	.....	12	68	17	40	.....
79 establishments	1912	335	54.9	.208	11.36	10	17	186	48	68	6
	1913	337	54.7	.219	11.94	10	27	175	78	47	.....
75 establishments	1913	329	54.6	.218	11.91	10	27	171	79	42	.....
	1914	328	54.1	.218	11.82	10	47	182	75	14	.....
83 establishments	1914	348	54.2	.219	11.87	10	47	195	77	19	.....
Top stitchers or undertrimmers, female:											
53 establishments	1910	721	56.9	.188	10.69	3	64	111	148	192	203
	1911	742	56.8	.192	10.83	4	63	109	169	232	165
73 establishments	1911	911	56.7	.194	10.95	.....	63	183	212	268	185
	1912	950	54.9	.198	10.82	29	81	521	80	212	27
82 establishments	1912	1,033	54.9	.198	10.81	29	81	572	96	228	27
	1913	1,070	54.6	.210	11.47	25	96	573	237	139	.....
77 establishments	1913	1,033	54.5	.211	11.46	25	96	558	237	117	.....
	1914	1,005	54.1	.211	11.39	52	156	524	225	48	.....
86 establishments	1914	1,076	54.2	.212	11.48	52	156	571	230	67	.....

Vampers, male:											
33 establishments	1910	263	55.5	.293	16.24	.....	48	67	63	57	28
	1911	249	55.7	.303	16.88	.....	21	69	81	53	25
51 establishments	1911	343	55.5	.315	17.42	.....	21	138	94	61	29
	1912	435	54.9	.310	16.97	15	56	199	57	93	15
66 establishments	1912	483	55.0	.306	16.76	15	56	215	67	112	18
	1913	554	54.8	.320	17.47	12	74	227	164	72	5
57 establishments	1913	531	54.7	.320	17.44	12	74	225	153	62	5
	1914	515	54.5	.315	17.13	6	89	195	187	36	2
65 establishments	1914	534	54.6	.312	17.04	6	91	195	189	46	7
Vampers, female:											
53 establishments	1910	863	56.9	.238	13.46	20	39	125	206	241	232
	1911	909	56.7	.238	13.43	26	45	138	229	268	203
71 establishments	1911	1,124	56.5	.238	13.46	21	45	191	291	315	261
	1912	1,019	55.1	.233	12.84	15	66	546	107	237	48
79 establishments	1912	1,088	55.1	.231	12.68	15	66	575	121	263	48
	1913	1,072	54.7	.246	13.45	14	72	620	216	150	.....
77 establishments	1913	1,052	54.6	.246	13.40	14	72	620	216	130	.....
	1914	1,037	53.9	.244	13.13	80	181	513	209	54	.....
85 establishments	1914	1,116	54.1	.243	13.14	80	181	564	218	73	.....

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table X*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

FITTING OR STITCHING DEPARTMENT

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Backstay stitchers, female:					
Massachusetts	24	137	53.9	$0.228	$12.32
Missouri	8	54	53.6	.162	8.63
New Hampshire	6	54	55.0	.167	9.17
New York	9	39	53.0	.224	11.85
Ohio	7	36	53.8	.168	9.06
Other States	28	112	55.5	.189	10.49
Total	82	432	54.3	$0.197	$10.68
Buttonhole makers, female:					
Massachusetts	23	164	53.8	$0.239	$12.89
Missouri	7	59	53.1	.195	10.32
New Hampshire	6	32	55.0	.156	8.60
New York	9	77	51.6	.189	9.80
Ohio	7	49	53.8	.163	8.77
Other States	28	125	55.7	.177	9.86
Total	80	506	53.9	$0.198	$10.70
Closers-on, female:					
Massachusetts	21	83	53.9	$0.216	$11.63
Missouri	8	52	53.3	.170	9.05
New Hampshire	5	19	55.0	.209	11.48
New York	10	61	52.0	.190	9.86
Ohio	6	33	53.8	.160	8.50
Other States	27	99	55.1	.197	10.88
Total	77	347	53.9	$0.193	$10.42

Lining makers, female:					
Massachusetts	24	265	53.9	$0.210	$11.28
Missouri	6	57	53.0	.163	8.65
New Hampshire	6	76	55.0	.161	8.85
New York	11	117	52.1	.207	10.78
Ohio	7	100	53.7	.168	9.01
Other States	30	237	55.4	.181	10.01
Total	84	852	54.1	$0.189	$10.21
Tip-stitchers, female:					
Massachusetts	23	120	53.9	$0.243	$13.11
Missouri	8	36	53.6	.190	10.17
New Hampshire	6	29	55.0	.216	11.87
New York	10	29	52.4	.224	11.73
Ohio	7	30	53.8	.189	10.14
Other States	29	104	55.2	.210	11.58
Total	83	348	54.2	$0.219	$11.87
Top stitchers or undertrimmers, female					
Massachusetts	24	348	53.8	$0.230	$12.40
Missouri	8	119	53.5	.190	10.13
New Hampshire	6	134	55.0	.117	9.73
New York	11	115	52.2	.237	12.32
Ohio	7	116	53.8	.200	10.78
Other States	30	244	55.6	.211	11.71
Total	86	1,076	54.2	$0.212	$11.48
Vampers, male:					
Massachusetts	22	289	54.0	$0.333	$18.02
New Hampshire	6	59	55.0	.259	14.27
New York	7	40	52.7	.327	17.24
Other States	30	146	56.2	.288	16.15
Total	65	534	54.6	$0.312	$17.04

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U.S. Department of Labor, Bureau of Labor Statistics.

Table X*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

FITTING OR STITCHING DEPARTMENT—*Concluded*

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Vampers, female:					
Massachusetts	24	292	53.9	$0.266	$14.36
Missouri	8	122	53.0	.240	12.67
New Hampshire	6	105	55.0	.237	13.01
New York	10	155	52.1	.266	13.84
Ohio	7	154	53.8	.219	11.79
Other States	30	288	55.5	.225	12.49
Total	85	1,116	54.1	$0.243	$13.14

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U.S. Department of Labor, Bureau of Labor Statistics.

Chapter X

THE SOLE LEATHER DEPARTMENT

CHAPTER X

The Sole Leather Department

Its Nature. As the upper leather department is sometimes called upper stock fitting, so the sole leather department is often called bottom stock fitting. It deals with the preparation of the bottom parts of the shoe. These are:

1. Soles.
2. Insoles.
3. Counters.
4. Toe Boxes.
5. Heels.

The Preparation of Sole Leather Parts. These parts may all be prepared in specialized factories and sold to shoe factories, or large shoe concerns may themselves have special departments for the preparation of these parts from the sides of sole leather. Briefly, in either case the sole leather is dampened by dipping it in water to make it cut more easily, and the desired parts are cut out in the rough by means of dies in "dieing-out machines." The shoe factory, when buying such parts, usually buys them in this condition. The cut parts are then made to conform nearly to the desired shape for shoemaking by rounding them in the "rounding machine." This machine uses a pattern of the required shape and by means of a knife cuts around the sole in conformity with the pattern. The outsole is passed through a heavy rolling machine to press the fibers very closely together, so as to increase the wear of the shoe as did the hammering of the old time shoemaker. The sole is then passed through a splitting machine which reduces it to an even thickness. The insole, or innersole, is made in the same way as the outersole but of lighter leather. These and other parts of the shoe bottom will be spoken of again in the following pages.

The Division of Bottom Stock Fitting. There are three important divisions in the bottom stock fitting or sole leather department. That dealing with the divisions of the insole depends upon two special methods of shoemaking as described in Chapter VIII. The three divisions are the following:

1. McKay Insole Division.
2. Welt Insole Division.
3. Outer Sole Division.

The McKay Insole Department. In the making of McKay insoles material is usually bought in roughly blocked form. Since light leather is used regularly for the inner sole in this method of shoemaking the blocks are first dipped in a solution of glue, so that when dried they will become somewhat hardened and strengthened. They are then died out or dinked upon a machine in sizes and widths, with a full set for each style of shoe to be made.

They are cased up by girls, according to the accompanying tags.

Positions in the McKay Insole Department. The few positions here are, the Foreman, girls for dipping the insoles in glue, dinkers or operators of dieing out machines, girls for casing up soles, and a checker girl.

There may be other operations in this division, such as "stitch slashing" and reinforcing the heels of insoles.

The Welt Insole Department. Inner soles made by the welt method are of two kinds, leather and reinforced. The all-leather sole must be of good quality, and at least of a standard thickness. The reinforced sole may be of poorer quality and thinner, yet of a fixed standard. In such soles the leather is reinforced or strengthened by a covering of canvas cemented firmly upon it. For welt insoles the leather is bought in full side stock, that is, uncut, and in the rough block form. The soles are first dinked out as in the McKay division, and sizes are stamped upon the heels by hand. Then the heel seat is cut across in a machine to indicate the position of the front of the heel. Girls usually perform this operation because of their quickness of hand. One person may cut the heels of 10,000 insoles in a day. This is a good illustration of a process in which scarcely more than one simple motion is involved.

Channeling. The purpose of the welt method is to give a smooth, even inner sole in the finished shoe. To effect this the sole must be either pasted in or attached on its under surface. The latter is accomplished by passing the insole through the Goodyear channeling machine which makes incisions, or a double "lip," with two knives acting at the same time. A slit about one-half inch deep is cut from within along the edge of the insole. Then the channel thus made is opened up on a lip-turning machine, forming a ridge around the outer edge. The welt is later sewed to this lip or shoulder.

Slashing. The welt inner sole is sometimes slashed or cut across the ball of the foot on the under side, to make it flexible.

Wetting. Leather inner soles are passed through heavy rollers, in which they are wet and compressed at the same time. They are now sorted and packed to go to the lasting room.

Randing. The rand is a strip of leather made thin at one edge. It is attached to the heel part of the sole, or later to the heel itself, so as to fill what would otherwise be an open space between the sole and the heel.

Reinforced Insoles. The reinforced insole is characterized by lightness and strength. Soles which are to be thus treated are first died or stamped out as in other cases. They are channeled with a single lip which is turned up to indicate the place of the canvas reinforcement. They may be slashed and dampened as in the case of the leather sole. They are then dried under a large fan or in a blower, having been cemented by a brush on the surface inside the lip.

The Canvas Reinforcement. A large roll of canvas of suitable width is run through a cement box and over a great reel, one side of the canvas only being wet with cement. The canvas dries upon the reel, is taken off in a roll, and cut in the proper reinforcement lengths, which are later fitted by hand upon the leather insole inside of the lip and "formed" or rubbed thoroughly into the space by a machine. The surplus canvas is then trimmed off at the edge of the lip. The soles are then cleaned, inspected, sorted, and packed up for the lasting room.

Positions in the Welt Insole Department. The positions in this department, including those already indicated and several others which may be found in most factories, are as follows:

1. The Superintendent.
2. Foremen.
3. Assistant Foremen.
4. Quantity Man, who makes a study of the volume of work done in the department.
5. Quality Man, who inspects work for quality.
6. Dinkers and Stampers.
7. Heel Markers and Cutters.
8. Channelers.
9. Slashers.
10. Lip Cutters.
11. Lip Turners.
12. Toe Cutters.

13. Wetters and Cementers.
14. Heel Counters.
15. Randers.
16. Canvas Cutters.
17. Canvas Attachers.
18. Canvas Formers.
19. Canvas Trimmers.
20. Sorters and Packers.
21. Floor Boy.

The Outer Sole Department. The treatment of outer soles is largely like that given to inner soles. The main processes are much the same with a few additional processes and features. Outer soles are first cut into the rough block form and are then dinked out, or "rounded" by being cut by pattern upon a machine. Sizes are stamped upon the heel. They are shanked out and the heel seat is smoothed by a machine. They are then wet and moulded upon a high pressure machine to the shape of the shoe bottom, being at the same time hardened by the pressure. A feather edge is given to the forepart and heel seat of the soles which are to be treated by the McKay process. Channels are cut and turned in those to be treated by the welt process.

Positions in the Outersole Department. The positions in this department, from the superintendent down, are practically the same as those of the insole department, on page 191, with the exception of cementers and canvas workers.

The Counter Department. As has been said already, small parts of the shoe, such as the counter, toe box, and heel, presented briefly at this place, are largely manufactured in special factories and purchased in quantity by the shoe companies. Large factories, however, or shoe manufacturing companies operating a number of factories, usually have departments for making their own counters, toe boxes, heels, and other minor parts. Opportunities for employment in the specialized factories depend mainly upon the magnitude of manufacture, the large number of parts turned out daily requiring little skill but many hands in the making.

The counter is a stiffening in the back part of the shoe between the leather and the lining, and lasted with the rest of the top to the bottom of the shoe. Its purpose is to prevent running over at the heel. It is made of sole leather, leatherboard, leather fiber, or similar substance that may be easily worked and yet left firm after treatment, and sometimes of metal in the case of heavy shoes.

The counter is died out and its edges skived thin. It is treated with shellac or glue and moulded into shape.

The Toe Box Department. The toe box is a reinforcement placed in the toe of the shoe to give permanency of shape or a distinctive style. It is usually made of sole leather, but it may be made of leatherboard, pasteboard, canvas, linoleum, celluloid, or of other materials which can be easily worked and made to retain their shape. The box is died out, skived upon the part above the toe, soaked in shellac or gum so as to be stiff when dry, and usually moulded to the desired form, ready for use in the lasting room.

The Heel Department. In Chapter XIV, upon the terms used in shoemaking, an explanation is given of the heel and its varieties. So it is necessary here to speak only of the materials and processes of its manufacture.

Heels are usually made of the poorer parts of sole leather, including the remnants from counters and toe boxes, leatherboard, "hydite," or other leather substitutes, and of wood.

The Processes of Making Heels. The leather is first "fitted," which consists of skiving and rolling. It is skived by being run through a machine to give it an even thickness, and rolled to make it hard and firm. It is then weighed and given to the cutter. Each operator on the cutting or dinking machine has five or six dies and cuts the leather as economically as possible into various sizes for heel lifts. These are then sorted by hand into four grades, and put into bins according to sizes, ready for "heel building." The heel builder receives a tag calling for so many heels of a certain size and gets from the bins the lifts required by the size. The lifts are placed one upon another, by a gradation of sizes, up to the height necessary for the heel. The pile is pasted or glued and a nail is driven through by a machine to hold it firmly together. Many of these piles, or heels in the rough form, are put upon boards and placed in the flat press where they remain for twenty-four hours under high pressure. They are then put into a compressing machine which moulds them into any desired shape. After this rands are tacked upon them, when not first attached to the heel seat, so that they will fit closely upon the heel seat of the sole of the shoe. Then the front part or breast of the heel is cut off smoothly, as this can be done better before the heel is attached. Heels are then sorted, gauged for height, trimmed upon their edges, put into bags, and stored away until called for by the making department. A top piece, or lift of superior leather is put upon the heel later in the making department.

Positions in Heel Making. The usual positions in a heel factory or in the heel department of a modern shoe factory are as follows:

1. The Superintendent.
2. Assistant Superintendent.
3. Foreman.
4. Assistant Foreman.
5. Skivers.
6. Rollers.
7. Cutters.
8. Weighers.
9. Heel Lift Sorters.
10. Heel Lift Gaugers.

11. Heel Builders.
12. Flat Press Men.
13. Rand Makers.
14. Rand Tackers.
15. Compressors.
16. Heel Sorters.
17. Heel Repairers.
18. Lumpers.

Employees in the Sole Leather Department. The heavier processes in this department and the larger machines require men as operators, but the many lighter processes and the handling of small parts make possible the employment of large numbers of boys and girls and women. In the average factory this department usually has about an even division of male and female employees, standing next to the stitching room in its proportion of the latter.

Table XI*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914

SOLE LEATHER DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Channelers, insole and outsole, male:											
44 establishments	1910	138	56.3	$0.296	$16.61	4	7	39	22	48	18
	1911	140	56.2	.306	17.12	4	7	37	31	48	13
57 establishments	1911	157	56.3	.289	16.21	.....	7	46	38	45	21
	1912	149	55.5	.296	16.35	.....	12	61	30	39	7
75 establishments	1912	200	55.9	.298	16.62	.....	12	63	52	57	16
	1913	196	55.4	.333	18.42	.....	17	71	59	44	5
69 establishments	1913	190	55.4	.335	18.48	.....	17	70	56	40	7
	1914	194	55.0	.337	18.51	3	26	48	84	29	4
77 establishments	1914	213	55.2	.331	18.24	6	26	48	89	36	8
Cutters, outsole, male:											
31 establishments	1910	143	56.6	.274	15.44	.....	.....	48	29	46	20
	1911	129	56.5	.277	15.62	.....	.....	40	34	39	16
36 establishments	1911	146	56.6	.278	15.70	.....	.....	43	43	39	21
	1912	161	56.4	.286	16.09	.....	2	56	34	48	21
42 establishments	1912	177	56.2	.281	15.75	.....	2	66	39	49	21
	1913	196	55.4	.303	16.69	.....	16	83	46	51	.....
38 establishments	1913	186	55.2	.304	16.75	.....	16	83	42	45	.....
	1914	175	54.8	.313	17.12	2	9	88	58	10	8
47 establishments	1914	225	55.0	.302	16.64	2	9	89	97	17	11

*From Table I—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

SOLE-LEATHER DEPARTMENT

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Channelers, insole and outsole, male:					
Massachusetts	21	78	54.3	$0.376	$20.45
New York	11	32	52.6	.330	17.35
Other States	45	103	56.6	.298	16.85
Total	77	213	55.2	$0.331	$18.24
Cutters, outsole, male:					
Massachusetts	14	74	54.4	$0.324	$17.58
Missouri	2	44	54.0	.346	18.70
Other States	31	107	55.9	.270	15.06
Total	47	225	55.0	$0.302	$16.64

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Chapter XI

THE MAKING DEPARTMENT

CHAPTER XI

THE MAKING DEPARTMENT

Its Nature. This department is called also the bottoming department and the "gang" room, the last name arising from the earlier custom of work in this department under the gang system. Here the uppers of shoes, prepared in the cutting room and stitching room, and the soles, fitted in the sole leather room, are brought together, lasted, and made into shoes ready for finishing. This department falls into natural divisions as follows:

1. The Lasting Department.
2. The Welt Bottoming Department.
3. The McKay Bottoming Department.
4. The Heeling Department.
5. The Turn Shoe Department.
6. The Standard Screw, Nailed, or Pegged Department.

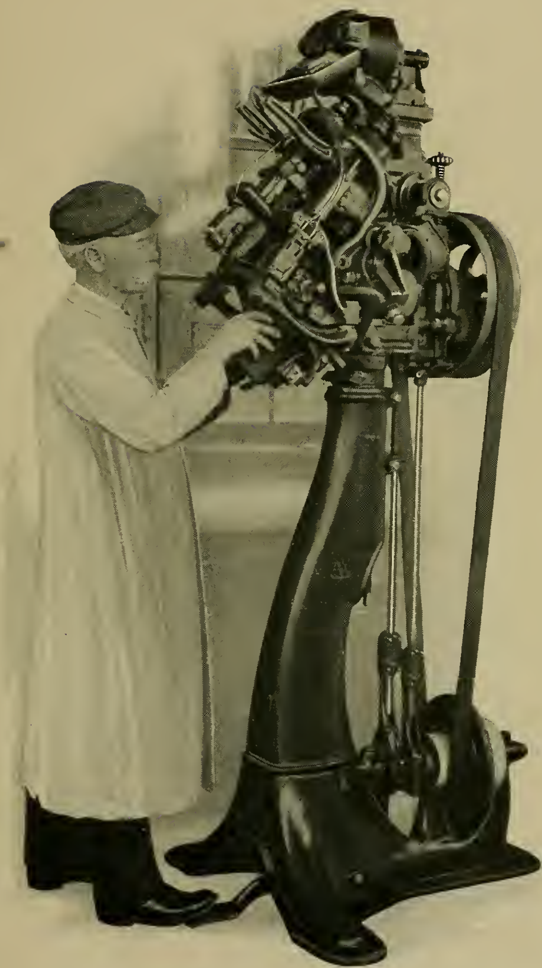
These divisions are not clearly drawn and through them all runs the large general method of bottoming, modified only by the variations necessary for attaching uppers to the bottoms of certain styles and kinds of shoes, as has been already explained at length in Chapter VIII upon "Methods in Shoe Manufacture." There are many processes in the making room, about fifty, for instance, following through any one method, and many more made necessary by the multiplication of methods.

The Lasting Department. There are two methods of lasting, by hand and by machinery. The first, like most other processes in shoemaking, is giving way rapidly to the machine method.

Adjusting the upper of the shoe to the last is the beginning of the work done in the bottoming department. The box toe is put in its proper place between the lining and the upper, and the counter in its place at the heel, between the lining and the upper. Then the upper is drawn over the last upon which has already been tacked the insole, which conforms exactly to the shape of the last, and is tacked to hold it in place.

The Pulling Over Machine. As the parts of the shoe have been cut to conform to the shape of the last they must be accurately attached upon it. The pulling over machine has pincers which act exactly like the human fingers. These pincers grasp the leather at various points around the toe and draw it closely against the wood of the last upon the inner sole. By an adjustment of levers all parts of the upper are drawn in evenly and tacked securely in place.

Toe and Heel Wiping. The toe and heel are the most difficult parts to last properly. These are drawn in by a series of wipers upon the lasting machine, so evenly that no wrinkles are left, and



Operating the Rex Pulling Over Machine

held in place by a strip of tape, fine wire, or by tacks. Tacks except at the heel, where they are clinched on the inside, are driven only part way in so that they may later be withdrawn to leave the inside of the shoe perfectly smooth, the distinctive feature of the welt method.

The Upper Trimming Machine. The surplus upper leather drawn over the bottom at the toe and heel and sometimes at the sides of the shoe, is removed upon the upper trimming machine in which a knife cuts the extra parts away very smoothly and evenly, while at the same time a small hammer pounds the leather smooth along the sides and toe of the shoe.

The shoe then passes to another machine by which the leather and counter around the heel are beaten into conformity with the last, making the entire bottom ready for the welt bottoming processes.

Positions in the Lasting Department. The chief positions in this department are, the Superintendent, foreman, operators of the pulling over machine, the lasting machine, and the trimming and pounding machines.

The Welt Bottoming Department. The welt method of bottoming is coming increasingly into use because of producing a smooth inside bottom of the shoe, and because of the ease with which a welt shoe can be repaired after being worn. After the lasting operations the shoe is ready to receive the outsole.

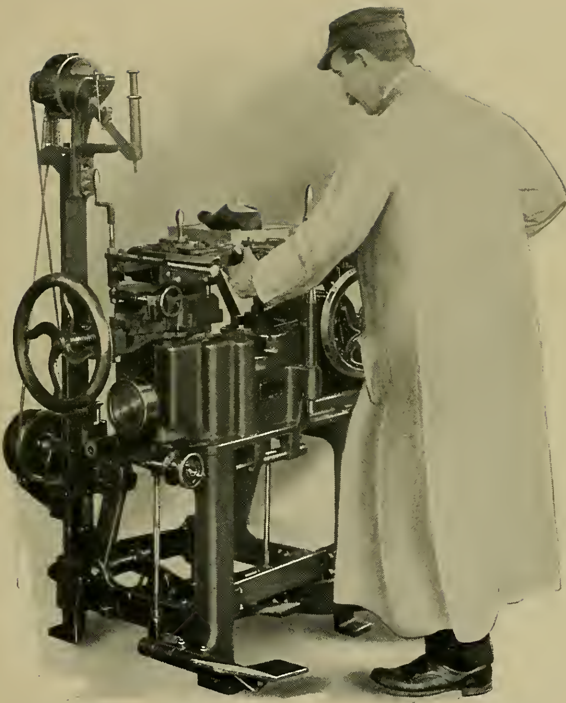
*13

Welting. First the welt which is distinctive of this method of shoemaking is attached. The welt is a narrow strip of leather so prepared that it may be sewed first to the lip of the inner sole and to the upper leather and later to the outer sole, no stitching passing entirely through the bottom of the shoe as in the McKay method. The welt extends in front of the heel entirely around the shoe. This process was a very difficult one in the days of hand shoemaking, but as performed upon a machine it becomes simple and rapid. It is claimed, indeed, that this particular machine process has been the leading factor in the great development of shoe manufacturing in recent times. After this process the surplus parts of the lip, upper, and welt are trimmed off by the inseam trimming machine.

Welt Beating. The next process is welt beating upon a machine in which a small hammer with rapid strokes beats the welt down evenly at the side of the shoe. The insole and the welt are now coated over with rubber cement. At the same time the outsole receives a coating of cement.

Sole Laying. When this has dried slightly the process of sole laying takes place. The sole is put in place and pressed firmly upon the shoe and welt in the sole laying machine, remaining in the machine a sufficient length of time for the cement to set firmly.

Rough Rounding. Next comes the trimming of the sole and welt so that they will extend a uniform distance from the upper leather. This process is



Operating the U. S. M. Co. Lasting Machine

called rough rounding and is one of the most important, exacting, and arduous processes found in the entire factory. A machine gauges the distance at which the cutting shall be done from the last, cutting usually wider on the outside of the shoe than on the inside and reducing the width of the shank. In any lot of shoes, large or small, passing through the hands of the rough rounder there must be the same variation of margin according to size and design.

The rough rounding machine cuts also a little slit or channel along the edge in the bottom of the sole. This channel was formerly cut by hand. Its purpose is to allow a covering for the stitching that follows.

Heel Seat Nailing. The process of rough rounding deals simply with that part of the shoe in front of the heel to which the welt has been sewed. The heel portion of the outsole is next fastened by nailing securely through to the inner sole. The surplus leather around the heel is now trimmed off on the heel seat rounding machine, which cuts a channel also. This channel is opened evenly to provide for stitching.

Sole Sewing. The outsole is now stitched to the welt entirely around the shoe upon the outsole lockstitch machine, a process very similar to welt sewing. This stitching, however, is finer and very durable. It shows on the upper side of the welt around the finished shoe.

Channel Laying. The lip of the channel is now cemented upon a machine, partly dried, and is rolled smoothly and evenly back into place upon the channel laying machine, completely covering the stitches which would otherwise show on the bottom of the shoe.

Leveling. The shoe is passed beneath a vibrating roller under heavy pressure in the automatic sole leveling machine. The roller passes completely up and down each side of the shoe, canting first to the right and then to the left and removing every unevenness on the bottom.

Welt Finishing. The edge of the fore part of the shoe was left in a slightly rough condition after the process of rough rounding. This roughness is now smoothed away upon the trimming machine, which has a set of rapidly revolving cutters. The edge and welt of the shoe receive a coat of blacking, and the stitches showing on the upper side of the welt are separated upon a machine so as to present an even appearance. The indentations thus made are burnished upon a machine. The edge of the shoe is burnished upon the edge setting machine by means of two rapidly vibrating hot irons. The surface of the top lift of the heel is leveled upon the top lift sanding machine, and the breast is scoured on a rapidly revolving disk.

Other Finishing Processes. From this point on there are various processes of finishing the heel and the bottom of the shoe, which may be performed in

Operating the Goodyear Welt Sewing Machine

the bottoming department or in a separate finishing department. Some of these, such as tip repairing, are quite separate from the work of the bottoming department. The more important of the finishing processes may be presented here.

The heel and the edges of the shoe are blacked or covered with the dressing suitable to the leather used on shoes other than black, and finished on burnishing machines. The bottom of the shoe is buffed upon revolving rollers covered with sandpaper, to remove the marks of handling in various processes. It is then buffed to a finer degree on the Naumkeag buffing machine upon a pad of rubber covered with fine emery paper, revolving still more rapidly than the first buffing machine. The bottom of the shoe is now "hard finished" by receiving coats of stain or other material, and by polishing. In some cases the bottoms are blacked in whole or in part, and some receive a dull finish on the forepart, while the whole is thoroughly polished upon revolving brushes.

Positions in the Welt Bottoming Department. The more usual positions in the welt bottoming department are as follows:

1. The Superintendent.
2. Foreman.
3. Assistant Foreman.
4. Tack Pullers.
5. Welters.
6. Inseam Trimmers.

7. Welt Scarfers.
8. Welt Beaters.
9. Shank Nailers.
10. Bottom Fillers.
11. Welt Cementers.
12. Sole Cementers.
13. Sole Layers.
14. Heel Seat Nailers.
15. Rough Rounders.
16. Channel Openers.
17. Goodyear Stitchers.
18. Channel Cementers.
19. Channel Layers.
20. Wheelers.
21. Randers.
22. Levelers.
23. Heelers.
24. Sluggers.
25. Heel Shavers.
26. Heel Breasters.
27. Edge Trimmers.
28. Heel Scourers.
29. Heel Jointers.
30. Edge Setters.
31. Burnishers.
32. Blackers.
33. Buffers.
34. Hard Finishers.
35. Polishers.
36. Floor Persons.

Operating the Goodyear Rough Rounding Machine

The McKay Bottoming Department. The McKay bottoming department is that division in which the upper is attached to the sole by a machine which sews directly through the outsole, upper leather, and insole. The upper parts come to the McKay room from the lasting room; the outer soles come from the sole leather department, having been kept in humidifiers so as to be moist and ready for use.

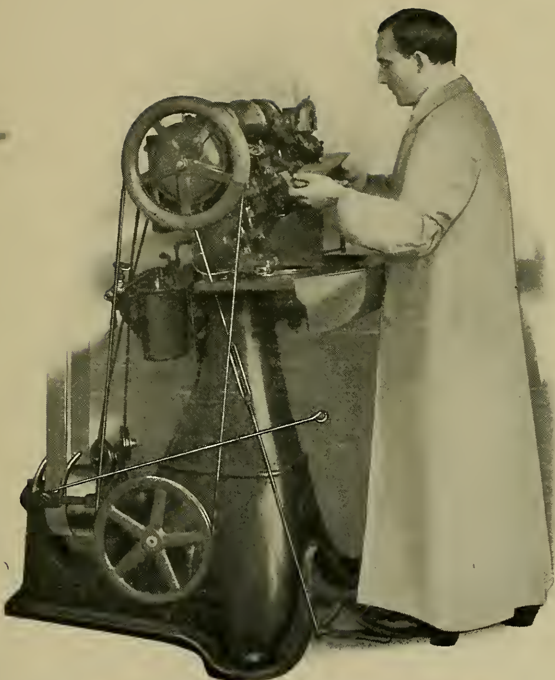
Processes Connected with the McKay Method. First the toes of the uppers, already upon the lasts, are buffed upon an emery wheel which grinds off the surplus leather and nails, so that the outer sole will lie even upon the shoe. The outer sole is then "layed" in place and nailed or tacked in the toe, shank, and heel upon a machine. The lasts are now pulled or withdrawn from the shoe by hand, and the McKay stitching process is performed upon the McKay machine. This is a very particular and exacting process and is found in most shoe factories at the present time. For comparison between this and other methods the reader is referred again to Chapter VII.

The usual processes following the McKay stitching are, Heel seat nailing on a machine, channel lifting or opening and cementing, wetting the bottom of the shoe upon a brush revolving in water, channel laying upon a steel roller which by a corrugated lip draws the channel in smooth, beating out the bottom on a machine and by hand to make it smooth and give it proper lines, drying, and heel attaching.

Before relasting McKays and sending them on to finishing, the bottom lining must be inserted, a work generally done by girls. Linings of thin leather or leather substitute, which were dinked out in the upper cutting department, are selected by sizes. The inside of the bottom of the shoe is cemented by a brush, and the linings are inserted by hand and smoothed down by means of a stick. Wooden lasts or "followers" are now inserted upon a machine.

Positions in the McKay Bottoming Department. The positions in this department are generally as follows:

1. The Superintendent.
2. Foreman.
3. Buffers.
4. Sole Layers.
5. Last Pullers.
6. McKay Stitchers.
7. Heel Seat Nailers.
8. Channel Lifters.
9. Cementers.
10. Bottom Wetters.
11. Channel Layers.
12. Inside Bottom Cementers.
13. Lining Inserters.
14. Lasters.
15. Floor People.



Operating the Goodyear Stitching Machine

The Heeling Department. The heel is now attached to the shoe upon the heeling machine. The shoe is placed upon a jack in the machine and an arm bearing the nails is swung automatically over the heel, driving the nails through the heel, outsole, upper leather, and insole, where they are clinched upon the inside.

Blind Nailing. The heads are left extending far enough outside the heel to receive the top lift. This is made from the best of leather, and is subjected to great pressure to harden it. Previously prepared, and with a coating of glue, it is now placed in position, with the shoe still in the machine, and driven down over the protruding nails. This is the process of "blind nailing."

Slugging. Short nails, or "slugs," of brass or other metal are now driven into the top lift by the slugging machine, to increase the wearing qualities of the heel.

Heel Trimming. The top lift is made in the exact size of the finished heel, and is a guide for the operator of the trimming machine, which by means of a rapidly revolving knife cuts away all the surplus leather on the outside. The breast or front is trimmed evenly across on the "heel-breasting" machine. The outside of the heel is scoured or smoothed by rolls covered with sandpaper, on the heel scouring machine.

Heel trimming, like the rough rounding of the sole, is an exacting process, calling for strength and skill. It sometimes produces in the operator what is called "broken wrist," or a weak wrist, as the shoe, held firmly in both hands against the knife of the machine, must be turned nearly through an entire circle, both turning and twisting the wrist joints. When the effect upon the operator becomes marked he usually changes to some other process.

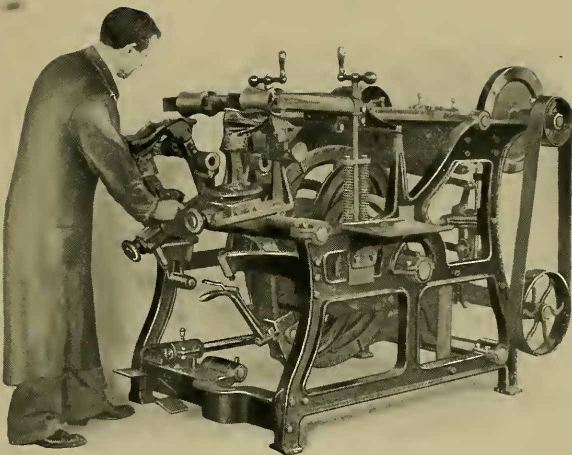
Positions in the Heeling Department. The chief positions in this small department are, the Superintendent, the foreman, and the operators of the nailing, slugging, and trimming machines.

The Turned Shoe Department. The turned shoe or slipper is made with an ordinary upper, usually of light weight, and with a single sole of flexible quality. Soles are prepared or fitted in this department one day in advance of their use. The main processes in the preparation of the soles are the following:

The soles are channeled and placed in humidifiers over night. In the morning the shank is trimmed out, the heel scarfed or trimmed off, and the sole is moulded into shape.

Lasting the Turned Shoe. In lasting the sole is placed upon the last upside down, and the upper is drawn over the last, inside out. The counter is put in wrongside out. All parts are tacked carefully in place.

The sewing of the upper to the sole now takes



Operating the Sole Leveling Machine

place upon a special turn shoe machine. Tacks are withdrawn and the selvage trimmed off, and a small steel shank is sewed in the space between the heel and the ball of the front. The last is then withdrawn and the shoe is turned by hand over the toe upon an iron support. The last is then put back in the shoe and the lining smoothed out around the heel part, which is then leveled and prepared for the heel which is to be added, either of leather, leather substitute, or of wood. This is glued, clamped on firmly and left to dry, and finished later. Usually three nails are inserted to hold it permanently. A lining or heel piece is inserted for smoothness.

Positions in the Turned Shoe Department. The usual positions in this department are as follows:

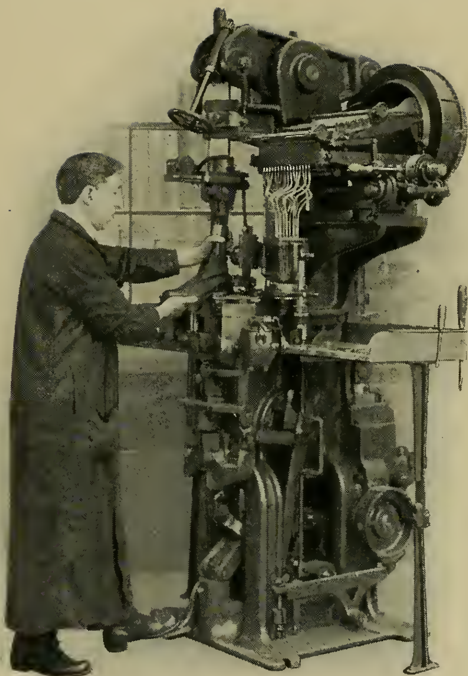
1. The Superintendent.
2. Foreman.
3. Inspector.
4. Stock Fitter.
5. Laster.
6. Stitcher.
7. Tack Puller.
8. Trimmer.
9. Shank Soler.
10. Second Laster.
11. Heel Laster.
12. Leveler.
13. Finisher.
14. Heeler.

15. Cover Sewer, who sews a cover over white shoes to keep them clean while passing through the various processes of the department.
16. Floor Boys.

The Standard Screw, Pegged, and Nailed Departments. Various kinds of heavy working shoes are manufactured by the standard screw method, by pegging, or by nailing the outsole and insole together, thus fastening the bottom of the shoe to the upper. By the first method a wire with screw thread upon it is driven through the bottom and automatically cut off by the machine, piece after piece, rapidly around the bottom. This is practically a wire sewing in place of McKay stitching. The pegged shoe is made in about the same manner, a machine inserting wooden pegs instead of the sections of wire. The use of pegs was once very general, but is now gradually giving way to other methods. Nails when used are generally clinched on the inside. These three methods give strong and firm but inflexible and heavy bottoms to footwear.

The other processes connected with these special kinds of footwear are similar to the general processes of welt and McKay manufacture. Finishing does not, however, call for so high a degree of perfection.

Aside from the operators of the special machines used for inserting the wire screws, pegs, and nails,



Operating the Heeling Machine

the positions in general are the same as in the welt and McKay departments.

Work in the Making Department. In the early days of American shoe factories the bottoming of shoes was quite generally let out to men on contract, as has been indicated earlier in this volume. Such contract work was performed by gangs of men who went from factory to factory. And we find the gang system in use to a degree in factories at the present time. It is easier, for instance, for several men to work together upon a process or group of processes involving operations that must be done together in a very brief space of time, working at one bench or upon a complicated machine.

This department involves the heaviest and most exacting processes of shoe manufacture, and the major processes are regularly performed by men, who in the main must be strong and active. Boys, girls, and women assist in the minor processes and in the handling of materials.

In the bottoming or making room the machines are always ranged along the sides of the room, next to the windows, so that there may be good light for the many intricate operations necessary. Shoes in process of making are arranged upon racks along the inner spaces of the room.

Table XIII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

LASTING DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Assemblers, for pulling-over machine, male:											
17 establishments	1911	218	55.4	$0.274	$15.14	.....	.....	93	69	49	7
	1912	228	54.8	.265	14.45	31	.....	102	37	47	11
50 establishments	1912	542	55.8	.238	13.21	31	26	174	96	131	84
	1913	532	55.5	.261	14.46	14	31	201	134	121	31
54 establishments	1913	597	55.4	.272	15.01	14	31	245	160	116	31
	1914	646	55.2	.281	15.45	44	50	188	204	146	14
64 establishments	1914	708	55.3	.279	15.37	44	50	188	232	170	24
Bed-machine operators, male:											
35 establishments	1910	513	56.4	.311	17.50	.....	15	169	77	153	99
	1911	568	56.1	.323	18.09	.....	26	172	159	113	98
54 establishments	1911	793	56.1	.321	17.96	.....	26	263	201	183	120
	1912	1,004	55.5	.304	16.88	.....	99	438	151	218	98
65 establishments	1912	1,127	55.6	.300	16.67	.....	99	446	216	246	120
	1913	1,220	55.2	.330	18.21	.....	123	502	354	200	41
60 establishments	1913	1,185	55.1	.331	18.21	.....	123	501	343	177	41
	1914	1,117	54.9	.322	17.68	.....	172	357	432	136	20
70 establishments	1914	1,173	55.1	.321	17.68	.....	172	357	443	167	34

Hand-method lasting-machine operators, male:											
33 establishments	1910	325	57.4	.306	17.49	4	.....	39	90	86	106
	1911	352	57.3	.309	17.65	5	.....	45	94	107	101
39 establishments	1911	477	57.0	.316	17.96	.....	.....	94	137	112	134
	1912	478	55.8	.324	18.03	26	.....	184	86	97	85
41 establishments	1912	456	55.7	.325	18.05	26	.....	167	102	83	78
	1913	449	55.3	.357	19.72	13	.....	200	144	66	26
35 establishments	1913	402	55.2	.355	19.58	13	.....	177	135	51	26
	1914	418	55.2	.349	19.20	43	.....	66	214	84	11
41 establishments	1914	456	55.5	.348	19.25	43	.....	66	218	117	12
Pullers-over, hand, male											
35 establishments	1910	784	56.4	.291	16.38	5	19	207	178	228	147
	1911	784	56.2	.309	17.28	7	27	204	206	234	106
45 establishments	1911	897	56.3	.312	17.50	.....	27	263	234	219	154
	1912	899	55.4	.319	17.62	24	111	297	188	212	67
52 establishments	1912	1,036	55.3	.316	17.41	24	111	343	287	195	76
	1913	937	55.3	.333	18.37	.....	65	342	332	190	8
47 establishments	1913	907	55.1	.334	18.42	.....	65	354	323	157	8
	1914	729	54.9	.350	19.24	2	60	212	368	82	5
49 establishments	1914	749	54.9	.350	19.21	2	60	228	368	86	5
Pullers-over, machine, male:											
31 establishments	1910	251	57.4	.320	18.37	.....	.....	50	36	85	80
	1911	266	56.5	.319	17.95	.....	.....	77	91	47	51
43 establishments	1911	238	56.1	.325	18.18	.....	.....	110	120	52	46
	1912	305	55.6	.312	17.31	15	34	113	43	47	53
60 establishments	1912	402	55.8	.312	17.39	7	34	148	64	82	67
	1913	421	55.4	.351	19.42	5	19	183	107	82	25

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XIII*—Average Rate of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

LASTING DEPARTMENT—*Concluded*

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were—					
						Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Pullers-over, machine, male: *concluded*											
59 establishments	1913	421	55.4	$0.352	$19.45	5	19	183	112	77	25
	1914	396	55.3	.360	19.87	16	26	108	155	81	10
71 establishments	1914	443	55.5	.356	19.66	16	30	108	171	100	18
Side lasters, hand, male:											
20 establishments	1913	224	54.2	.303	16.40	.....	96	60	54	14	.....
	1914	237	54.0	.308	16.59	.....	119	44	63	10	1
Side lasters, machine, male:											
16 establishments	1913	155	56.1	.323	18.23	.....	.....	63	34	52	6
	1914	167	54.3	.343	18.54	31	.....	58	53	18	7
Turn lasters, hand, male:											
28 establishments	1912	452	55.6	.275	15.25	.....	106	56	74	127	89
	1913	524	55.0	.310	17.00	.....	140	122	89	149	24
26 establishments	1913	499	55.0	.307	16.81	.....	140	122	64	149	24
	1914	630	54.4	.322	17.45	86	95	69	297	53	30
31 establishments	1914	689	54.4	.324	17.56	86	110	69	335	56	33

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XIV*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

LASTING DEPARTMENT

Occupation, sex, and State		Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Assemblers for pulling-over machine, male:	Massachusetts	16	223	54.0	$0.327	$17.67
	Missouri	8	104	56.7	.239	13.42
	New Hampshire	4	45	55.0	.259	14.23
	New York	7	105	52.5	.266	13.96
	Ohio	6	71	57.5	.281	16.14
	Other States	23	160	57.3	.250	14.32
	Total	64	708	55.3	$0.279	$15.37
Bed-machine operators, male:	Massachusetts	20	501	54.2	$0.337	$18.28
	Missouri	5	89	56.3	.343	19.21
	New Hampshire	4	138	55.0	.245	13.49
	New York	9	109	53.2	.316	16.81
	Ohio	5	64	56.7	.356	20.14
	Other States	27	272	56.8	.316	17.95
	Total	70	1,173	55.1	$0.321	$17.68
Hand-method lasting-machine operators, male:	Massachusetts	10	152	54.2	$0.376	$20.34
	Missouri	4	72	57.4	.313	17.88
	New Hampshire	2	39	55.0	.276	15.16
	Ohio	6	68	55.6	.367	20.42
	Other States	17	125	56.1	.347	19.35
	Total	41	456	55.5	$0.348	$19.25

Pullers-over, hand, male:	Massachusetts	16	379	54.4	$0.367	$20.00
	New Hampshire	2	24	55.0	.298	16.36
	New York	6	38	52.8	.345	18.20
	Ohio	5	66	56.1	.355	19.98
	Other States	20	242	55.8	.327	18.19
	Total	49	749	54.9	$0.350	$19.21
Pullers-over machine, male	Massachusetts	19	145	54.2	$0.402	$21.74
	Missouri	8	58	57.1	.328	18.59
	New Hampshire	4	38	55.0	.309	17.01
	New York	10	53	53.0	.341	17.99
	Ohio	6	38	56.4	.384	21.68
	Other States	24	111	57.4	.323	18.53
	Total	71	443	55.5	$0.356	$19.66
Side lasters, hand, male:	Massachusetts	9	138	53.6	$0.327	$17.56
	New Hampshire	2	45	55.0	.208	11.45
	New York	3	31	52.5	.331	17.39
	Other States	6	23	56.5	.351	19.76
	Total	20	237	54.0	$0.308	$16.59
Side lasters machine, male:	Massachusetts	6	59	54.4	$0.373	$20.29
	New York	3	46	51.1	.361	18.26
	Other States	7	62	56.6	.302	17.09
	Total	16	167	54.3	$0.343	$18.54
Turn lasters, hand, male:	Massachusetts	4	81	54.1	$0.385	$20.79
	Missouri	3	81	54.4	.316	17.20
	New York	8	226	52.1	.357	18.58
	Ohio	3	80	57.0	.312	17.74
	Other States	13	221	56.0	.275	15.42
	Total	31	689	54.4	$0.324	$17.56

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor. Bureau of Labor Statistics.

Table XV*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

BOTTOMING DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Buffers, male:											
36 establishments	1911	174	55.8	$0.294	$16.37	.....	5	51	49	67	2
	1912	170	55.8	.307	17.06	.....	5	52	48	58	7
72 establishments	1912	338	56.0	.289	16.09	.....	21	107	67	105	38
	1913	354	55.3	.319	17.57	.....	23	123	134	57	17
72 establishments	1913	358	55.3	.318	17.52	.....	23	126	132	60	17
	1914	370	55.2	.310	17.06	14	33	75	181	59	8
81 establishments	1914	396	55.3	.309	17.05	14	33	75	192	70	12
Edge setters, male:											
54 establishments	1910	560	56.3	.373	20.94	3	72	97	142	146	100
	1911	573	56.3	.380	21.31	4	60	113	148	147	101
68 establishments	1911	722	56.3	.380	21.29	.....	60	191	170	177	124
	1912	698	55.8	.389	21.63	.....	52	257	149	142	98
78 establishments	1912	789	55.8	.379	21.05	.....	52	273	190	171	103
	1913	815	55.3	.413	22.78	.....	64	300	276	148	27
77 establishments	1913	826	55.3	.411	22.70	.....	64	300	276	159	27
	1914	827	55.1	.410	22.54	20	109	187	366	127	18
86 establishments	1914	872	55.2	.410	22.54	28	109	187	374	149	25
Edge trimmers, male:											
55 establishments	1910	573	56.4	.382	21.44	3	58	117	137	137	121
	1911	615	56.2	.390	21.80	4	55	139	175	140	102
71 establishments	1911	765	56.1	.389	21.73	.....	55	220	200	174	116
	1912	751	55.9	.386	21.48	.....	51	264	146	192	98
81 establishments	1912	827	55.9	.380	21.15	.....	51	285	176	214	101
	1913	838	55.4	.410	22.66	.....	49	314	285	160	30

Edge Trimmers, male—*Concluded:*											
77 establishments	1913	815	55.3	.411	22.66	.....	49	314	282	140	30
	1914	839	55.0	.404	22.18	19	100	220	363	122	15
85 establishments	1914	886	55.1	.400	22.01	19	100	220	384	142	21
Goodyear stitchers, male											
45 establishments	1910	366	56.3	.374	20.97	3	21	88	96	89	69
	1911	398	56.0	.388	21.65	3	28	106	118	81	62
61 establishments	1911	529	55.9	.387	21.56	.....	28	184	133	110	74
	1912	562	55.9	.385	21.40	.....	38	221	103	105	95
70 establishments	1912	627	55.9	.376	20.96	.....	38	232	125	128	104
	1913	642	55.2	.399	21.96	.....	60	267	184	119	12
67 establishments	1913	633	55.1	.398	21.87	.....	60	267	185	109	12
	1914	569	54.9	.413	22.65	.....	73	190	231	68	7
74 establishments	1914	594	55.1	.410	22.57	.....	73	190	232	86	13
Goodyear welters, male:											
45 establishments	1910	275	56.2	.437	24.49	2	19	79	62	61	52
	1911	289	56.0	.464	25.88	2	27	78	79	52	51
60 establishments	1911	392	56.0	.452	25.21	.....	27	132	93	77	63
	1912	411	55.8	.454	25.27	.....	40	162	68	84	57
70 establishments	1912	466	55.8	.445	24.75	.....	40	177	91	98	60
	1913	472	55.3	.501	27.60	.....	44	188	139	85	16
66 establishments	1913	458	55.2	.503	27.71	.....	44	188	136	74	16
	1914	418	55.0	.508	27.90	.....	48	145	167	52	6
74 establishments	1914	439	55.2	.503	27.68	.....	48	145	169	66	11
Heel breasters, male:											
35 establishments	1911	76	56.1	.291	16.23	.....	2	20	20	31	3
	1912	77	55.7	.302	16.74	.....	8	23	19	23	4
75 establishments	1912	163	55.9	.295	16.36	.....	16	48	38	40	21
	1913	171	55.4	.313	17.27	.....	17	57	56	34	7
73 establishments	1913	167	55.4	.310	17.10	.....	17	57	54	32	7
	1914	161	55.2	.306	16.81	3	20	35	73	27	3
82 establishments	1914	173	55.3	.303	16.71	3	20	35	78	33	4

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XV*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

BOTTOMING DEPARTMENT—*Concluded*

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Heel burnishers, male:											
33 establishments	1911	106	55.6	$0.306	$16.97	.....	2	42	27	34	1
	1912	108	55.4	.313	17.31	.....	5	45	25	30	3
74 establishments	1912	254	56.1	.292	16.31	.....	13	84	57	63	37
	1913	268	55.4	.313	17.29	.....	15	108	83	51	11
75 establishments	1913	280	55.5	.317	17.54	.....	15	108	90	56	11
	1914	261	55.3	.323	17.85	4	26	59	118	46	8
84 establishments	1914	283	55.5	.322	17.86	4	26	59	123	59	12
Heelers, male:											
31 establishments	1911	115	55.8	.403	22.52	.....	10	33	26	44	2
	1912	124	55.7	.391	21.71	.....	8	46	25	39	6
67 establishments	1912	254	56.2	.378	21.17	.....	9	87	49	69	40
	1913	269	55.4	.424	23.41	.....	12	114	83	52	8
72 establishments	1913	291	55.3	.424	23.32	.....	21	121	87	54	8
	1914	293	55.1	.400	21.98	7	38	70	120	48	10
84 establishments	1914	324	55.3	.402	22.18	7	38	73	131	61	14
Heel scourers, male:											
35 establishments	1911	125	54.8	.291	16.12	.....	7	44	30	42	2
	1912	154	55.5	.294	16.25	.....	15	59	24	52	4
78 establishments	1912	342	56.0	.289	16.09	.....	20	116	67	89	50
	1913	364	55.4	.314	17.35	.....	36	123	122	66	17
76 establishments	1913	360	55.4	.313	17.29	.....	36	123	121	63	17
	1914	345	55.2	.312	17.18	7	44	78	151	57	8
84 establishments	1914	372	55.3	.310	17.10	7	44	78	161	68	14

Heel trimmers or shavers, male:											
55 establishments	1910	189	56.6	.410	23.03	1	17	27	54	50	40
	1911	193	56.5	.415	23.34	1	16	29	59	52	36
71 establishments	1911	246	56.5	.415	23.32	.....	16	47	80	60	43
	1912	239	56.0	.415	23.10	.....	18	70	56	63	32
81 establishments	1912	252	56.0	.420	23.39	.....	18	75	61	66	32
	1913	277	55.4	.448	24.74	.....	30	90	91	59	7
77 establishments	1913	271	55.3	.443	24.46	.....	30	90	89	55	7
	1914	262	55.1	.439	24.14	6	37	51	123	40	5
85 establishments	1914	277	55.2	.433	23.88	6	37	51	127	47	9
McKay sewers, male:											
28 establishments	1910	95	57.1	.290	16.46	1	10	5	24	30	25
	1911	107	56.7	.290	16.35	1	13	7	29	43	14
30 establishments	1911	129	56.5	.296	16.63	.....	13	9	49	43	15
	1912	128	56.3	.285	16.10	.....	3	24	40	50	11
32 establishments	1912	131	56.1	.286	16.00	.....	3	26	42	52	8
	1913	136	55.6	.319	17.70	.....	5	35	62	30	4
32 establishments	1913	128	55.3	.319	17.68	.....	5	35	63	21	4
	1914	130	55.5	.343	19.00	8	7	6	74	31	4
39 establishments	1914	147	55.7	.338	18.77	8	7	6	83	36	7
Rough rounders, male:											
44 establishments	1910	165	56.7	.406	22.85	1	.....	41	40	44	39
	1911	167	56.5	.438	24.56	1	.....	39	59	33	35
60 establishments	1911	221	56.3	.436	24.44	.....	2	65	68	43	43
	1912	248	55.9	.439	24.41	.....	23	88	50	50	37
69 establishments	1912	273	55.9	.435	24.21	.....	23	93	60	56	41
	1913	265	55.2	.497	27.37	.....	27	99	84	47	8
67 establishments	1913	261	55.2	.497	27.35	.....	27	99	83	44	8
	1914	240	54.9	.506	27.74	.....	34	73	102	26	5
73 establishments	1914	252	55.1	.503	27.64	.....	34	73	102	34	9

*From Table I.—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XVI*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

BOTTOMING DEPARTMENT

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Buffers, male:					
Massachusetts	24	145	54.5	$0.353	$19.24
Missouri	8	37	57.0	.265	15.08
New Hampshire	6	56	55.0	.221	12.13
New York	8	37	52.0	.330	17.26
Ohio	7	36	55.9	.350	19.52
Other States	28	85	57.2	.286	16.29
Total	81	396	55.3	$0.309	$17.05
Edge setters, male:					
Massachusetts	24	321	54.4	$0.442	$24.05
Missouri	8	65	56.6	.387	21.75
New Hampshire	6	72	55.0	.339	18.64
New York	11	101	52.2	.435	22.66
Ohio	7	85	56.4	.373	20.97
Other States	30	228	56.8	.395	22.34
Total	86	872	55.2	$0.410	$22.54
Edge trimmers, male:					
Massachusetts	24	368	54.4	$0.414	$22.52
Missouri	8	70	56.5	.376	21.11
New Hampshire	6	88	55.0	.351	19.31
New York	10	94	52.7	.429	22.57
Ohio	7	80	56.3	.349	19.63
Other States	30	186	56.9	.411	23.35
Total	85	886	55.1	$0.400	$22.01

Goodyear stitchers, male:					
Massachusetts	21	253	54.2	$0.434	$23.54
Missouri	6	49	56.0	.349	19.57
New Hampshire	4	58	55.0	.305	16.78
New York	8	47	52.9	.455	24.13
Ohio	7	54	56.1	.324	18.09
Other States	28	133	56.8	.454	25.65
Total	74	594	55.1	$0.410	$22.57
Goodyear welters, male:					
Massachusetts	21	192	54.3	$0.531	$28.82
Missouri	6	38	55.8	.440	24.51
New Hampshire	4	40	55.0	.430	23.64
New York	8	34	53.3	.516	27.51
Ohio	7	36	56.2	.427	23.87
Other States	28	99	57.0	.524	29.74
Total	74	439	55.2	$0.503	$27.68
Heel breasters, male:					
Massachusetts	24	59	54.4	$0.349	$19.03
Other States	58	114	55.8	.279	15.50
Total	82	173	55.3	$0.303	$16.71
Heel burnishers, male					
Massachusetts	24	99	54.5	$0.359	$19.57
Missouri	8	27	57.1	.251	14.32
New Hampshire	6	24	55.0	.245	13.45
New York	9	30	52.6	.335	17.64
Ohio	7	28	57.0	.296	16.91
Other States	30	75	57.0	.329	18.69
Total	84	283	55.5	$0.322	$17.86

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XVI*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

BOTTOMING DEPARTMENT—*Concluded*

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings
Heelers, male					
Massachusetts	24	109	54.5	$0.446	$24.27
Missouri	8	33	56.6	.369	20.74
New Hampshire	6	27	55.0	.293	16.14
New York	10	45	52.6	.424	22.30
Ohio	7	35	56.5	.337	18.92
Other States	29	75	57.3	.409	23.40
Total	84	324	55.3	$0.402	$22.18
Heel scourers, male:					
Massachusetts	23	119	54.4	$0.347	$18.89
Missouri	8	39	56.3	.242	13.55
New Hampshire	6	45	55.0	.250	13.73
New York	10	45	52.9	.365	19.34
Ohio	7	36	56.4	.279	15.78
Other States	30	88	57.1	.304	17.36
Total	84	372	55.3	$0.310	$17.10
Heel trimmers or shavers, male:					
Massachusetts	24	95	54.4	$0.472	$25.68
Missouri	8	21	56.3	.363	20.35
New Hampshire	6	20	55.0	.334	18.36
New York	10	31	52.6	.496	26.15
Ohio	7	28	56.4	.367	20.64
Other States	30	82	56.6	.430	24.28
Total	85	277	55.2	$0.433	$23.88

McKay sewers, male:					
Massachusetts	10	46	55.1	$0.394	$21.65
Other States	29	101	56.0	.313	17.46
Total	39	147	55.7	$0.338	$18.77
Rough rounders, male					
Massachusetts	21	98	54.2	$0.544	$29.46
Missouri	6	18	55.9	.501	27.84
New Hampshire	4	24	55.0	.413	22.73
New York	8	22	53.1	.476	25.41
Ohio	7	24	56.0	.386	21.55
Other States	27	66	56.7	.525	29.63
Total	73	252	55.1	$0.503	$27.64

*From Table III—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Chapter XII

FINISHING, TREEING, PACKING, AND SHIPPING

CHAPTER XII

Finishing, Treeing, Packing, and Shipping

Additional Departments. In a large shoe factory the magnitude of manufacture calls for separate departments of considerable size for the finishing and treeing of the shoe, and for the packing and shipping of the completed product. There will be found in especially large establishments, also, various other departments, or even small factories, manufacturing particular supplies or doing particular work. Such are departments or factories for the manufacture of leather parts of shoes, for the preparation of accessory materials, and for the provision for work that would otherwise have to be given to outside companies or individuals. We have already spoken of the heel, toe box, and counter departments and factories. The second division is seen in cases where the great shoe manufacturing corporation conducts its own sawmill and factories for the making of wood shipping cases and paper cartons in which shoes are sent out to the trade. An example of the third division is the printing department or shop now being added to many factories because of the great cost of printing the many business forms necessary for office and factory use, and because of the continual increase in the output of advertising material.

All such factories, departments, and shops provide numerous opportunites for employment according to the trades involved, but with little interchange of labor between them and the shoe factories except where the manufacture of shoe parts is involved. Then, of course, it is a matter of employment in a subdivision of the shoe industry.

Finishing. It has already been said that in a large shoe manufacturing establishment the finishing processes detailed in the preceding chapter would constitute a separate department. In a small factory, however, the only part of the finishing that would be distinctly separate from other operations is tip repairing.

The Tip Repairing Department. In the passage of the shoe through the factory we have seen the vamp, the linings, the toe box, and the tip brought together in the completed toe of the shoe. Sometimes, also, oiled paper is added as a protection against injury in the handling of the shoe. All of these parts give a thickness of about one-half inch to the toe of the ordinary shoe. In lasting so many thicknesses it is especially hard to draw the tip evenly over the last without injuring the leather of the tip. This danger is considerably increased by the use of patent leather, which is easily broken or scarred, for tips. The use of patent leather is so general that tip repairing is a problem of considerable magnitude in all factories. In the general handling to which a shoe is subjected in passing through the various departments of the factory, tips are likely to be scratched and broken. In the case of ordinary leather scratches, scars, or other marks can be quite easily disposed of by rubbing down, by hand or upon machine brushes. But patent leather, having a varnished surface, is repaired with greater difficulty. If the injury is considerable the old enamel or varnished surface is sandpapered entirely off, and a new coat of varnish is applied by hand. This is allowed to dry and is polished, giving usually an entirely fresh and perfect surface. This work is mainly a hand process, usually done by women, though recently a tip repairing machine has been introduced in some factories.

Tip repairing calls for careful observation, painstaking application to a process often requiring considerable time upon a single shoe, deftness of touch, and good judgment.

The Treeing Department. Treeing is the method of making the shoe conform perfectly to the shape of the last, and of restoring the finish belonging to the leather, after its passing through many hands. The last is removed in this department, or before reaching this department, to allow for the processes of treeing. The shoe is first examined for tacks or other imperfections inside. Bottom linings or heel pads are put in by girls, when this has not been done in the making room. The shoe is then placed upon the tree arm, there being several arms revolving upon a machine, so that one shoe may be worked upon while others are drying. The department is sometimes called the treeing and dressing room. Nearly every kind of leather or shoe material requires a distinct method of handling and of dressing or finishing. Dirt or other materials that have adhered to the surface of the shoe in making are removed by a brush which is adapted to the surface of the leather, or by washing with different cleaners. Then an oil lubricator or dressing is applied to fill the pores of the leather. The covers of fabric shoes and of shoes made of delicate shades of leather are removed by hand, cutting with a knife closely around the sole so that no trace of the cover remains and no injury results to the shoe. The operator may have to restain some leathers as well as to fill the pores with oil, so as to bring out the richest effect of the surface. There are many special processes in various factories, according to particular styles of shoe and kinds of finish used.

Embossing. Then on the bottom of the shoe or upon the lining at the top a trade-mark or the name of the maker of the shoe is embossed or stamped.

Ironing. When the surface of the upper has been fully restored the shoe is ironed upon the tree to give it perfect and permanent form. Rubbing over with the warm or hot iron is a very important and careful process, and is done regularly by men.

Inspecting. Slight repairs not made before the processes of treeing are made after it, and the shoe is inspected before passing out of the department. Shoes intended for samples or display in store windows have a wooden form placed in them, rather than a last, to keep them in shape.

The "treeing man" should be familiar with the nature and tanning of leather, and with the processes of shoe making, so that he may correct defects in leather or poor workmanship in the earlier processes of the factory.

Positions in the Treeing Department. The positions usually found in treeing and dressing are the following:

1. The Superintendent.
2. Foreman.
3. Instructor.
4. Inspectors.
5. Embossers.
6. Toe Crease Stampers.
7. Lacers.
8. Repairers.
9. Treeing Men.
10. Floor Boy.
11. Cripple Boy.

The Packing Department. The great advance in shoe manufacture during the last half century is seen not only by studying machinery and processes, but by observing the excellent condition in which boots and shoes are sent out to the trade. Before the use of special cartons, which is distinctive of the present day, shoes were tied in bundles or packed loose in barrels and boxes, often reaching the customers in wrinkled and battered condition. Now a single pair, except in the case of heavy and cheap grades, is packed in a pasteboard box or carton.

For packing, shoes are first brushed upon the heels and bottoms, inspected, and placed out on tables in pairs by sizes. The labels on the ends of the cartons are stamped in a machine with style, stock number, size, width, kind of leather, or other distinguishing term. Then the shoes are wrapped in tissue paper and placed carefully in cartons, which are packed securely in wooden or fibre-board cases, usually with thirty-six pairs to a case, ready for shipment.

Positions in the Packing Room. The work of this room is done mainly by girls and women, and the few positions are, the Superintendent, foreman, brushers, inspectors, carton stampers, packers, and floor girl.

The Shipping Department. From the packing room shoes are sent to the shipping department where they are placed in "assembling aisles" in alphabetical arrangement, according to the names of customers orders and styles. Copies of original orders as received by salesmen are kept in the shipping department, and shoes are checked off upon one set as they come from the packing room, another set of orders being used for shipping. The cases of shoes are sent out to the freight offices accompanied by bills of lading as the time for filling each order approaches, and shipment is made so that the goods will reach each customer on a specified day.

Foreign shipments require a great amount of detail, since they must have a different form for bills of lading and different weights and measures.

Large shipments go out by freight, small ones by express, and by parcel post.

After the bills of lading which are to go with shipments are made out, special tags bearing full particulars about each shipment are sent to the bookkeeping department so that the proper charges may be entered in that department.

Positions in the Shipping Department. The positions of the shipping department are as follows:

1. The Superintendent.
2. Foreman.
3. Checkers.
4. Assemblers.
5. Men for casing up, sealing, nailing, and stacking goods.
6. Truck Boys.
7. Shippers.
8. Clerks and Assistants.

Table XVII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings and Average and Classified Full-Time Hours per Week in the United States, by Years, 1910 to 1914.

FINISHING DEPARTMENT

Department, occupation, sex, and number of establishments	Year	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earning	Employees whose full-time hours per week were— Over 48 and under 51	51 and under 54	54	Over 54 and under 57	57 and under 60	60
Treers or ironers, hand, male:											
44 establishments	1910	832	55.9	$0.259	$14.42	.....	173	140	225	150	144
	1911	786	56.1	.260	14.50	.....	100	156	250	141	139
63 establishments	1911	1,006	56.0	.267	14.84	.....	100	265	311	181	149
	1912	1,076	55.9	.262	14.57	.....	115	334	239	239	149
73 establishments	1912	1,145	55.8	.266	14.76	.....	115	385	263	220	160
	1913	1,110	55.3	.282	15.54	.....	125	407	319	220	39
70 establishments	1913	1,100	55.3	.282	15.54	.....	125	410	321	205	39
	1914	1,109	55.1	.281	15.45	.....	156	327	433	170	23
80 establishments	1914	1,204	55.3	.279	15.38	.....	163	327	462	214	38
Treers or ironers, hand, female											
8 establishments	1910	74	57.8	.143	8.19	.....	.....	22	.....	32	20
	1911	70	57.7	.144	8.21	.....	.....	23	.....	25	22
11 establishments	1911	85	58.1	.145	8.32	.....	.....	23	.....	25	37
	1912	105	54.3	.154	8.35	.....	11	67	13	14	.....
13 establishments	1912	108	54.4	.153	8.32	.....	11	67	13	17	.....
	1913	110	54.6	.158	8.56	.....	20	61	.....	29	.....
12 establishments	1913	110	54.6	.158	8.56	.....	20	61	.....	29	.....
	1914	112	52.2	.174	9.06	41	40	24	7	.....	.....
18 establishments	1914	123	52.3	.175	9.12	41	40	33	9	.....	.....

*From Table 1—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

Table XVIII*—Average Rates of Wages per Hour, Average Full-Time Weekly Earnings, and Average Full-Time Hours per Week, by States, 1914.

FINISHING DEPARTMENT

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings.
Treers or ironers, hand, male: .					
Massachusetts	23	538	54.2	$0.302	$16.38
Missouri	8	105	56.3	.226	12.72
New Hampshire	6	78	55.0	.253	13.92
New York	8	88	53.6	.249	13.37
Ohio	7	87	56.7	.230	13.05
Other States	28	308	57.0	.284	16.15
Total	80	1,204	55.3	$0.279	$15.38

OTHER EMPLOYEES,† ALL DEPARTMENTS

Occupation, sex and State	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour	Average full-time weekly earnings.
Male:					
Massachusetts	25	7,017	54.4	$0.250	$13.57
Missouri	11	1,890	56.5	.204	11.51
New Nampshire	7	2,060	55.0	.199	10.27
New York	11	2,717	52.6	.239	12.59
Ohio	7	2,079	56.3	.190	10.67
Other States	30	5,124	55.9	.211	11.86
Total	91	20,887	55.0	$0.224	$12.29

Female:					
Massachusetts	25	4,670	53.8	$0.184	$9.90
Missouri	9	1,133	53.3	.151	8.05
New Hampshire	7	851	55.0	.171	9.40
New York	11	1,435	51.9	.183	9.49
Ohio	7	1,090	53.8	.142	7.63
Other States	30	3,168	55.4	.151	8.36
Total	89	12,347	54.0	$0.168	$9.05

* **From Table III.**—Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U.S. Department of Labor, Bureau of Labor Statistics.

† In minor operations not included in the tables already given in this and other chapters.

Chapter XIII

EMPLOYMENT CONDITIONS AND SUPPLEMENTARY MATERIAL

CHAPTER XIII

Employment Conditions and Supplementary Material

The Sex Division of Employees. In a shoe factory making both men's and women's shoes of the ordinary kinds, substantially the following percentages of labor are found:

Male employees, sixty-nine per cent.
Female employees, thirty-one per cent.
Boys under eighteen years, one-seventh or fourteen per cent. of male employees.
Girls under eighteen years, one-twenty-fifth or four per cent. of female employees.

These percentages may be given as fairly exact for the average shoe factory and for the boot and shoe industry as a whole. In factories making mostly heavy shoes or men's wear, however, the proportion of male employees runs somewhat higher than the sixty-nine per cent, and that of female employees lower than the thirty-one per cent. On the other hand, in factories making women's, children's, and infants' footwear, there will be found some increase in the percentage of female employment with a corresponding decrease in the male.

In studying the departments of shoe manufacture we have seen that the more difficult processes and the operation of heavy machines are given regularly to male employees. This is especially true in the cutting department, in some divisions of the stitching department, in the sole leather department, in the gang room, and in treeing. On the other hand, the lighter processes and the simpler machines are regularly given to girls and women, especially in stitching, finishing, dressing, and packing.

Further statistical information upon employment in the shoe industry, in comparison with other leading industries, is given in Table XX on page 290.

The Divisions of Employees Among Departments. To enable a factory to work as a whole with all operatives in all manufacturing departments equally busy each day, the division of employees among departments must have about the percentages following:

> In the cutting room, twelve per cent. of all operatives.
> In the stitching room, twenty-seven per cent.
> In the sole leather room, twelve per cent.
> In the gang room, twenty-three per cent.
> In finishing, eight per cent.
> In treeing and dressing, ten per cent.

Small numbers of employees, making perhaps seven or eight per cent., are found in minor departments of the factory.

At the same time the business offices employ from fifteen to twenty per cent. of the total number of people connected with the industry.

Shoe Manufacture Highly Specialized. Shoe manufacture has become more and more highly specialized in recent years. Each factory can produce a larger output with smaller costs when making only a single or a few kinds of footwear. The large American market has greatly aided in this specialization; an increased trade abroad, in about ninety different countries at the present time, makes it still more profitable for the American shoemaker to devote his plant to a single line of product in the assurance that he will find a steady market. We find, then, factories, for example, making men's heavy work shoes, leg boots, walking shoes, or shoes for dress wear; and other factories making footwear for women, children, and infants, exclusively. At the same time we find the long list of factories manufacturing special parts and findings.

Seasons. One of the chief objections to entering into shoe manufacture is the fact that it is a seasonal employment. The busiest seasons are the fall and winter; the least busy season is the summer, with an average idle period of from three to eight weeks, coming usually in or around the month of July. As has been said earlier, the progressive shoe manufacturers are making great efforts to obtain orders far enough in advance, and to study trade conditions, so that a year's steady employment may be provided for the factory. Large concerns capable of handling extensive contracts may do this more easily; the small concern with a limited trade must adjust its output to its volume of trade and suffer usually from an idle season.

In a few rare cases factories having large contracts or accumulations of orders make a twenty-four hour day, with three full shifts of employees working in eight-hour periods.

Shoemaking a Trade. Shoemaking is a trade, with many specialized divisions. Some of these divisions, such as the simpler operations in the various rooms, are distinctly unskilled trades; others, like cutting, welting, and trimming edges, are highly skilled trades. The first kind calls for a very brief period of learning, sometimes a few days only; the other division includes processes requiring in many cases, several years for learning.

The operator may learn several related processes, but in the large factory he remains essentially a worker or an expert in one.

Entering Upon Work in a Shoe Factory. In a small shoe establishment, and quite regularly in a country town, inexperienced persons may be taken in to learn most processes. Persons thus learning branches of shoe manufacture quite often enter the large factories as experienced operators. In the large factories, especially in the great shoe centers, inexperienced persons are taken in only for the minor processes, and more often in the stitching than in other departments. There is quite a steady movement of the more highly skilled shoe operatives from factory to factory, and from one shoe center to another.

Promotion. The operator who can perform several processes in shoemaking is usually kept upon the process in which his work is most needed at any time. Frequently a worker showing a special aptitude for an advance process is put forward to learn it, and given permanent promotion if he becomes expert in it. There is not, however, such a gradation of operations in the departments of the shoe factory as to offer promotion regularly or to the many. The most conspicuous promotion is that of a workman who comes to understand the work of a room fully, with ability to direct others, to the position of assistant foreman or foreman.

Securing Skilled Labor. "The desirability of securing employees that are skilled in their respective branches of work is appreciated in every industry, and in none more so perhaps than in the shoe industry. The truth of this assertion is evidenced by the methods of securing employees in different shoe manufacturing centers.

"In some of these centers shoe manufacturers cooperate through their local association in keeping records as to the workmanship and character of their employees which have some bearing upon future employment. In other places each factory may have a bulletin board on which it makes known the classes of employees that are desired, but in both cases the kind of an operator that is wanted is specified, and this in itself is an indication of the desire of the concern to engage a skilled employee for that particular operation.

"We are sometimes told by thoughtless persons that the amazing improvement in shoe machinery that has been witnessed in the last fifty years has practically eliminated the skill of the shoe operative. It would perhaps be more proper to say that the larger use of vastly improved machinery, subdividing the labor of shoemaking as it has, has simplified shoemaking to the extent that it is much easier to manufacture skilled employees in the shoe factory of today than it was in the shoe factory of fifty years ago, when it was necessary to teach the shoe operative much more of the shoemaking art than he needs to know at the present time."*

Schools and Courses for Shoemaking. In several large shoe centers private schools for shoe workers have been established. The work upon which operators learn usually consists of low grade shoes made by the school for factories, on a contract basis, or upon shoes manufactured from materials of second quality, bought at a low price from supply factories or from shoe factories. Persons wishing to learn a process of shoemaking are taken on rather as helpers at first in that process, giving their time and paying a fixed tuition, such as thirty or sixty or eighty dollars, without special

* *Superintendent and Foreman*, Boston, August 26, 1914.

regard to the time required for learning. The time spent in learning, however, may run from one to seven or eight months. Operators run the same machines, though sometimes second hand, as are used in the shoe factory, and generally become capable of entering factories as fairly efficient workers.

A few towns and cities, in co-operation with shoe and leather manufactures, have established courses in shoe and leather subjects in the public school system. These courses, however, are mainly attended by persons already working in factories and leather houses and seeking additional training to increase their efficiency and earning capacity.

The instructors are superintendents and experts in the trade who have been given special training for teaching. The establishment of such courses marks a great advance in the shoe and leather industries.

Superintendents and foremen sometimes conduct classes at the factory for employees under them.

Quotation from a Report Upon Industrial Education in Shoe Manufacture. The report of the Committee on Industrial Education of the National Boot and Shoe Manufacturers' Association, at the annual convention of the association in New York on January 13, 1915, contains the following:

> "The subject of industrial education in the shoe manufacturing industry, which was referred to the undersigned Committee, is in our opinion

a matter of great importance to our trade—so important indeed that, disturbed by the prevailing business conditions, in common with the other manufacturers in our country, we have been unable to give to it the careful investigation that it deserves. This report, therefore, may be considered as merely one of progress, designed to lead to a broader investigation of the subject later.

"That there is need of higher efficiency, based on a broader knowledge of, and a greater enthusiasm for, the work in which they are engaged on the part of the employees in our American shoe factories, and especially the young beginners in the industry, is sufficiently obvious to require no argument.

"This same need has been recognized in many other manufacturing industries, not only in this country, but in many foreign countries, and in the case of several of the latter notable progress has been made during the last ten or fifteen years.

"We therefore find that not only is industrial education of various grades being generally carried out in the older countries, like England, France, Germany, Belgium, Holland, Switzerland, and Denmark, but that even the great Orient countries, just now awakening from their centuries of conservatism, and incidentally opening up encouraging vistas of future trade opportunities for our United States manufacturers—China, Japan, and India—are also seriously taking up this question of higher efficiency in industry. Canada, one of the most progressive of all the world's countries, has established a National Commission for the investigation of this question, and its report will be awaited with much interest by the friends of modern education.

"The more active campaign along this line in the United States has extended over the last ten years, and already has brought forth some valuable results. At the present time the National Society for the Promotion of Industrial Education is making an exhaustive national survey of the field, somewhat similar to that undertaken by Canada; and naturally the conclusions that may be reached by this organization will have a far-reaching influence on the future of industrial education.

"In so far as our American shoe industry is concerned we find that some excellent preliminary work already has been accomplished by one of our leading organizations, the New England Shoe and Leather Association.

"This Association had the merits of the German and English system of continuation, or part-time, industrial instruction brought to its attention by representatives of the Boston School Committee, and arranged to co-operate with that Committee in the establishment in 1910 of what we understand was the first shoe and leather continuation school in the United States.

"The first class brought together numbered thirty-nine pupils, representing twenty-nine different concerns in various branches of the allied shoe and leather trade, mainly boys and young men between the ages of fifteen and twenty, employed in offices, warehouses, and manufacturing departments, etc., of the shoe factories, tanneries, and other establishments. Since that time, there have been graduated from this school more than two hundred pupils, each of whom has received an official certificate of his technical ability, and in this way there has been laid a splendid foundation for the larger scheme of industrial education that is now being considered by the Association.

"The working method of this Boston Shoe and Leather Continuation School Class, briefly, is the holding of a series of two-hour sessions on two afternoons a week, covering a period of twelve weeks.

"The School Committee provides the classroom and the instructor, who, of course, has specialized in this particular branch of industry; and the Association and the trade it represents co-operates by furnishing competent lecturers, and other experts, who from time to time give the pupils formal or informal talks on the subjects in which they are experts.

"Incidentally various trips of inspection are made to nearby shoe factories, tanneries, and other plants, the result being that the boys not only acquire a broad idea of the fundamentals of tanning and shoemaking, together with its ramifications of foreign-trade extension, advertising, and general efficiency, but, what perhaps is as important as anything, they graduate with an interest and enthusiasm for their chosen vocation that will mean more than half the battle for them in their future life.

"This lack of real interest on the part of so many young beginners in our industry, which springs largely from the existing narrow vision of their work that lies before them, in any one department of it, is one of the greatest handicaps to both the youths and to the manufacturer who employs them; and if the continuation school did nothing more than inspire them with a real interest in what they are doing day by day for a livelihood, it would well repay all that it costs.

"There is no charge for tuition in the Boston Shoe and Leather Continuation School, except that non-resident pupils are charged a nominal fee, so that the only expense entailed is the four hours or so per week of the pupils' time that the employer donates to the good cause.

"In conclusion your Committee would strongly recommend:

"*First.*—The establishment of shoe and leather continuation schools, similar to the Boston School, in every shoe manufacturing city and town in the United States that is in a position to support one, in this way possibly laying a foundation for a broader scheme of industrial education in the trade.

"*Second.*—That the National Boot and Shoe Manufacturers' Association establish a Standing Committee on Industrial Education to make a careful survey of the question and report to each annual meeting; and

"*Third.*—That the Association co-operate in every feasible way with the National Society for the Promotion of Industrial Education."

The Shoe Superintendent. The superintendent of a shoe factory or of a department or room must be first of all a manager. He need not necessarily have exact knowledge of processes, but he must know much of resources, materials, equipment, employees, and of methods of efficiency and improvement in employment conditions. He must be able to work through subordinates and yet keep a firm and helpful hand on the activities of manufacture.

The superintendent usually comes to his position from the business side of the industry. Young men are trained for this work in some factories by a period in office service, of from six months to several years, followed by service in the factory long enough to make them familiar with the general features of manufacture.

The superintendent may be a member of the firm or corporation, a stockholder, or simply an employed officer. His salary, as in other great lines of manufacture in present times, may vary from some hundreds of dollars in a small factory or department to many thousands of dollars in the great corporation.

The Shoe Foreman. The shoe foreman, on the other hand, rises from the bench or is promoted from the machine. He must have intimate knowledge of processes and be able to train employees in them; he must be able to select operators for his department and to make their work efficient; he must be a master of method, of handling men at work, and of maintaining discipline in his room, tactful, firm, friendly with all, yet not forfeiting their obedience and respect.

The position of the foreman is exacting. He stands between the superintendent and the operator and is responsible for the work of his department. He must keep every employee occupied and the work passing through on schedule time. His pay is usually about the same as that of the most expert operators in his room, varying from $15.00 upwards a week, reaching $50.00 or $60.00 in some cases.

Forewomen are employed in divisions of the stitching room or in small departments in which the employees are mostly girls or women.

The superintendents and foremen of a factory usually hold weekly meetings for the discussion of topics of mutual interest and helpfulness.

Assistant superintendents and foremen receive salaries graded below the amounts given, according to the responsibility and service demanded.

There is considerable change of foremen among shoe factories, more, probably, than of other officers or employees. In every shoe journal advertisements like the following are constantly appearing:

> "POSITION WANTED as foreman of sole leather room. Experience on welts, turns, and McKays, and can operate all machines. Also, expert on new economy insole. Best of references. Address, ——, care of American Shoemaking."

The Quality Man and the Quantity Man. Some factories have, in addition to superintendent and foremen, a person whose special duty is to examine all work being done in a department for its quality of workmanship and another person who observes all work for its quantity, so that each room is held up to the standard set by the factory both in grade and volume of product. These persons are practically assistants to the foremen, yet responsible to the factory management only. With them, the foreman can give his time more fully to training and supervising employees. On the other hand such a multiplication of supervisors,—superintendent, foreman, and inspectors,—is likely to bring uncertainty as to authority and confusion of oversight.

The quality and quantity men have about the same rank and pay as foremen.

The Efficiency Engineer. Some large concerns employ a person skilled in efficiency methods. His work in the factory consists in studying methods and processes so that the best results may be obtained with the least expenditure of time, with the least wear of machinery, and with the most economical use of materials possible. When his duties deal with the operations of manufacture he is usually called an efficiency engineer. He is a specialist in work belonging more naturally to the foreman, and attended to by the foreman or his assistant in the smaller establishments.

The efficiency engineer must have a very accurate knowledge of the nature of machine operations, of the qualities of materials, of the factory schedule, of the mental and physical qualities of the operative, of the effect of monotony and routine, and of the value of encouragement and incentive for the worker.

The Monotony of Shoemaking. Like those of many other kinds of manufacture the machine processes of shoemaking are monotonous. The hand processes are in general of a lighter and less wearing nature, and are not so distinctly characterized by monotony. Operating an automatic machine, however, upon which materials or parts of shoes must be placed and controlled in an unvarying time period, is depressing and wearing for the operator. In a sense he becomes a part of the machine until he may almost seem to have little mental or physical activity aside from it.

There are several possible offsets to monotony in shoe manufacture. One is an incentive to speed, which, while in itself a wearing element for the workman, has a speeding up effect upon him in the case of payment by piece. He works faster, and in many cases accomplishes a full day's work in less than a full day's time, thus gaining for himself some hours of the working day to spend outdoors or at home. It is a common thing to enter the gang room of a shoe factory, for instance, towards night and find some machines idle because the operators upon them have performed their work on the lots of shoes passing through the room on that day.

A second offset is found in the advantage to the operator of learning to run more than one machine, so that at times he may be transferred from one to another.

It is a relief and often a pleasure to the mind of the worker to have to handle leathers and other shoe materials of high grade and finish.

Another means of lessening monotony lies in the operator's being able to care for his own machine, to understand its parts, or to suggest improvement upon it. This kind of ability, which is much sought after in the shoe factory, often leads to promotion and to work upon more important machines.

Quotation Upon Efforts in Some Factories to Lessen Monotony. The following quotation indicates the tendency of the present time to ameliorate the effects of monotony:

> "In some German factories the routine of the day is broken by a recess in the morning and in the afternoon. In a western factory, which makes supplies for the shoe trade, there is a morning and afternoon recess for employees. Lunch is served during the recess. Some of the employees work as waitresses. In a number of shoe factories there are now rest rooms for women.
>
> "In some high-class American manufacturing establishments, the grounds about the factories are made attractive. When an employee looks out the window, he sees a cheerful prospect. This breaks the monotony of his task. It is possible that the American shoe factory system

requires too steadfast an application of the worker to his machine. The enthusiasm with which shoemakers demand factory legislation, particularly short working hours, is a sign that this is so. Perhaps shoemakers would be more steady and more efficient if they had ten or fifteen minutes of recess in the morning and in the afternoon. The idea may seem radical, perhaps preposterous; but it's pretty certain that something will be done the next few years to break up the monotony of the task of shoemaking."*

Social Service in the Shoe Factory. Some large factories conducted under modern conditions take measures for the occupational and social welfare of their employees. They provide classes for training, in some features, at least, of the work of the factory; separate rooms for rest and recreation, dancing, and social clubs for male and female employees; libraries equipped with books and magazines relating to shoe manufacture, and with general literature; restaurants conducted on a co-operative basis, or at low rates, so that employees may afford to patronize them; medical attendance and equipment; and sometimes elaborate parks and playgrounds.

Quotation from a Government Study of Social Service. The best summary of social service, or welfare work, as it has long been called, in the shoe industry, is to be found in the report upon Employers' Welfare Work, published by the

* *American Shoemaking*, Boston, October 18, 1913.

Bureau of Labor Statistics at Washington in 1913, as follows:

> "The ——————— Shoe Co., ——————— has done much to improve working conditions for its 5,000 employees. The huge factory is built in the form of a hollow square, so that all the workrooms are well lighted. On the top floor, where the shoe leather is cut, the roof has saw-tooth skylights to increase the light. The ventilation throughout the building is admirable, and every effort is made to keep down dust. The lavatories are very sanitary and clean. Individual lockers of perforated iron are placed about in the workrooms near the machines, and are turned over to employees on their making a small deposit—enough to cover the cost of the key. There is a check-room for umbrellas and wet garments. Separate elevators are installed to transport the women employees to the upper floors. The company has a lunch counter for the employees, where food is sold at cost. Employees who bring their lunches eat them in the workrooms.
>
> "Apart from good workroom conditions the company conducts recreation work—the name it gives the usual welfare work. The ground around the building has been converted into a noonday-rest park for the employees, with a beautiful, trim, green lawn and flowers. There is besides a roof garden covering over half of the roof space. Part of this is reserved for women and part for men, with separate stairways leading to each section. A dance hall for women open at noon and on special oc-

casions in the evening, a pool room and bowling alleys for men, open every evening after working hours until ten o'clock, give the much-needed amusement. The men pay a small fee for the use of the tables and the alleys. A handsomely furnished reading room, with attractive ferns and flowers from the company's greenhouse, has been opened to the employees. There is a branch station of the City Public Library here, besides books owned by the company and numerous weekly and monthly periodicals.

"A woman physician, constantly in attendance, has the medical care of the employees under her supervision. There are rest rooms and an emergency hospital, with a nurse regularly employed, in the building. Twice a week an oculist spends the forenoon at the factory and may be consulted free by the employees. He fits them with glasses at very reduced prices.

"The company, with the aid of employees' dues, maintains the Relief Fund Department. Out of this fund, sick, accident, and death benefits are paid. There is at present over $5,000 in the treasury. The dues are ten cents each week for adults and five cents for employees under twenty years of age, and they are deducted from wages by the paymaster's department. In case of sickness or accident the members receive $7 and $3.50 a week. No member can draw benefits longer than seven weeks in one year. Benefits do not become due until the member has been incapacitated one week, except in case of severe injury. At death $100 or $50 is paid the beneficiaries of the deceased, according to the amount of the weekly dues. A medical examiner is employed to report upon the condition of disabled members and to decide upon the members' claims for benefits. The administration of the relief fund is entirely in the hands of the company, and all the receipts of the fund are held by the company in trust for the relief department."

General Sanitary Conditions Observed in Boot and Shoe Factories.* The general sanitary conditions, dangers, and injurious processes in shoe factories have been clearly presented in the report of the Massachusetts State Board of Health for 1912, upon the Hygiene of the Boot and Shoe Industry in Massachusetts. As this State has always been the center of the industry in this country, and as its factories, some six hundred in number, are typical of the American shoe factories, the facts presented in this report may be considered fairly typical of the industry at the present time. The following is taken from the report:

"The construction, location and interior conditions of the shoe factories of Massachusetts vary so widely, even in the same community, that it is difficult to formulate general statements which would be applicable to all of them. Not a few of these factories are located in small country towns and are operated by employees descended from generations of shoemakers.

* Hygiene of the Boot and Shoe Industry in Massachusetts State Board of Health, 1912.

These factories are generally isolated and, because of the absence of neighboring structures, quite well lighted. On the other hand, in the cities, where all available space is utilized, the buildings are at times crowded together, impairing the lighting conditions of the workrooms. It should be remembered, however, that, unlike the textile industry, the operatives in shoe factories work at machines or at benches placed along the sides of the rooms near the windows. The only exception to this may be found in the stitching rooms, where the operatives work in all parts of the room. This room, however, was as a rule found well lighted in all establishments visited.

"It is to be noted that the modern buildings constructed for the shoe industry have been so placed that neighboring structures cannot shut out natural illumination. This feature of construction has proved a valuable asset to those who have constructed these buildings. Note has already been made of the use of electricity as an artificial illuminant.

"The laws of Massachusetts require that all factories be kept clean and well ventilated, and these laws are well observed.

"The odor of leather is inseparable from the art of making shoes, as is the odor of wool and of cotton in the textile industry.

"One of the most vexing problems that has arisen in the inspection of shoe factories has been the maintenance of proper toilet facilities. This question, by no means common to the shoe industry, can only be met through repeated inspections and the education of the manufacturer. It is not that the manufacturer is not willing or does not desire to maintain proper toilet facilities, but he is oftentimes careless and leaves this part of the work to others who fail in their duty. A decided improvement in these conditions has, however, been noted."

Conditions in 483 Factories, as to Light, Ventilation, and Water-closets:

Light:	
Excellent	30
Good	441
Moderately bad	2
Distinctly bad	10
	483
Ventilation:	
Excellent	7
Good	468
Moderately bad	3
Distinctly bad	5
	483
Water-closets:	
Excellent	6
Good	415
Moderately bad	7
Distinctly bad	55
	483

For further information on health conditions in shoe manufacture, the reader is referred to the report from which the preceding quotation has been made. In that report he will find an exhaustive discussion, with numerous diagrams, of the injurious features of the occupation. There is danger in operating most machines, which can, however, be avoided with due care on the part of the operator; there is danger, also, from the fumes of naphtha, from cement used in the stitching room and making room; and while dust removers are in general use, under the compulsion of state legislation, there is considerable menace to the health from dust which is produced by nearly all processes of work upon the bottoms of shoes, such as edge trimming, bottom scouring, buffing, and bottom finishing.

Piece and Time Payment. Two-thirds, or about sixty-six per cent. of the processes of boot and shoe manufacture, are paid for on a piece basis, usually at a fixed rate per dozen pairs. Such processes are those in which good work can be done at high rate of speed, and in which the possibility of increased earnings produces a larger volume of work from the shoe operator. On the other hand, where accuracy and care are required, as in the cutting room, and where work is of a routine nature, as in shipping, pay rests upon a time basis.

The Best Paying Processes. Some of the best paying processes in the factory are, cutting, stitching, lasting, wiping in, welting, rounding, trimming, and edge setting. The pay in these processes ranges from $15.00 to $35.00 or more per week.

Wages and Variation in Employment. Wages have been given in statistics at the ends of the chapters on factory departments. Additional figures are presented in the following tables, and pay is so associated with variation in employment that the two are properly treated together. The material here given is drawn from "Wages and Hours of Labor in the Boot and Shoe Industry: 1907 to 1914," United States Bureau of Labor Statistics, Washington, 1915.

Following are explanatory statements from the report:

> "This report, based on information obtained from representative establishments, shows the full-time weekly earnings, the full-time hours of labor per week, and the rates of wages (or earnings) per hour in the principal occupations of the boot and shoe industry of the United States. Figures relating to full-time hours of labor per week and rates of wages (or earnings) per hour are presented for the years 1907 to 1914, inclusive, and for full-time weekly earnings for the years 1910 to 1914, inclusive.
>
> "In addition, this report presents material relating to the variations in the amount of employment furnished by this industry in the year ending in February, 1914.
>
> "Earlier reports of this bureau have presented wages and hours of labor in the industry from 1890 to 1913.
>
> "Summarized briefly, the average full-time weekly earnings of the employees in this indus-

try in 1914 were the same as in 1913, eight per cent higher than in 1912, six per cent higher than in 1911, and nine per cent higher than in 1910.

"The average full-time hours of labor per week in 1914 were one per cent lower than in 1913, two per cent lower than in 1912, and three per cent lower than in 1911 or 1910.

"The average rates of wages (or earnings) per hour in 1914 were one per cent higher than in 1913, nine per cent higher than in 1912, ten per cent higher than in 1911, and twelve per cent higher than in 1910. Owing to the reduction of hours, the increase in full-time weekly earnings between 1910 and 1914 was not so much as in rates of wages per hour.

"A summary of the rates of wages and hours of labor in 1914 in the principal occupations of the industry is presented in the table following."

"In this table it is seen that in 1914 the average full-time weekly earnings of males engaged in the industry, represented by twenty-seven specific occupations, varied from $15.37 for assemblers to $27.68 for Goodyear welters.

"The average full-time weekly earnings of females in 1914, represented by ten specific occupations, varied from $9.12 for treers or ironers, hand, to $13.14 for vampers."

The average earnings of shoe factory employees, as given in the census, vary from about $375.00 per year to about $530.00 per year, according to local conditions in the different shoe manufacturing states.

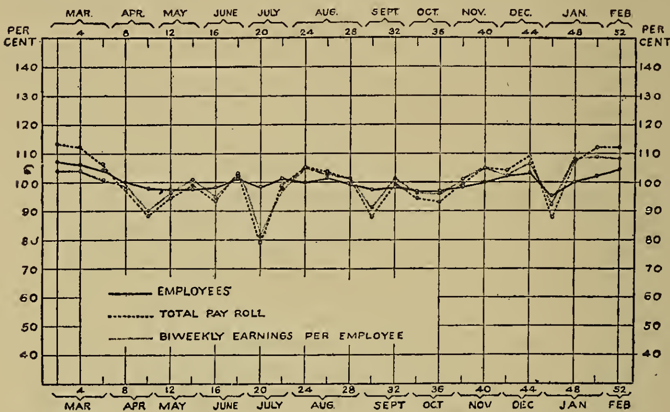
Table XIX*—Average Full-Time Hours Per Week, Rates of Wages Per Hour, and Full-Time Weekly Earnings; and Per Cent. of Employees Earning Each Classified Rate of Wages Per Hour in the Principal Occupations in 1914.

Occupation and sex	Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour.	Per cent of employees earning each classified rate of wages per hour: Under 12 cts.	12 and under 16 cts.	16 and under 20 cts.	20 and under 30 cts.	30 cents and over	Average full-time weekly earnings.
Backstay stitchers, female	82	432	54.3	$0.197	8	23	24	40	5	$10.68
Button fasteners, female	74	208	53.8	.200	11	21	29	28	11	10.78
Buttonhole makers, female	80	506	53.9	.198	10	24	24	34	7	10.70
Closers-on, female	77	347	53.9	.193	10	21	26	39	4	10.42
Lining makers, female	84	852	54.1	.189	12	21	27	36	5	10.21
Skivers, upper, machine, female	77	446	54.1	.209	4	15	29	43	8	11.30
Tip stitchers, female	83	348	54.2	.219	6	14	22	46	13	11.87
Top stitchers or under-trimmers, female	86	1,076	54.2	.212	5	16	24	46	9	11.48
Treers or ironers, hand, female	18	123	52.3	.175	13	26	31	29	1	9.12
Vampers, female	85	1,116	54.1	.243	2	9	20	49	21	13.14
Other employees, male	91	20,887	55.0	.224	10	16	18	36	19	12.29
Other employees, female	89	12,347	54.0	.168	24	25	24	24	3	9.05
					Under 16 cts.	16 and under 20 cts.	20 and under 30 cts.	30 and under 40 cts.	40 cents and over	
Assemblers, for pulling-over machines, male	64	708	55.3	.279	6	11	43	32	8	15.37
Buffers, male	81	396	55.3	.309	3	9	33	41	14	17.05
Cutters, male	47	225	55.0	.302	†	2	40	57	†	16.64
Side lasters, hand, male	20	237	54.0	.308	3	7	35	45	11	16.59
Skivers, upper, machine, male	29	116	54.4	.299	3	9	20	58	10	16.13
Treers, or ironers, hand, male	80	1,204	55.3	.279	5	13	43	32	7	15.38
Vampers, male	65	534	54.6	.312	3	6	37	37	16	17.04

					Under 20 cts.	20 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 cts and over	
Bed-machine operators, male	70	1,173	55.1	.321	5	35	45	12	3	17.68
Channelers, insole and outsole, male	77	213	55.2	.331	5	30	46	16	3	18.24
Cutters, vamp and whole shoe, hand, male	75	1,812	54.0	.366	3	17	50	20	10	19.66
Cutters, vamp and whole shoe, machine, male	40	642	55.3	.325	5	33	49	9	3	17.93
Edge setters, male	86	872	55.2	.410	1	12	38	35	15	22.54
Edge trimmers, male	85	886	55.1	.400	2	16	37	28	17	22.01
Goodyear stitchers, male	74	594	55.1	.410	1	17	35	27	20	22.57
Goodyear welters, male	74	439	55.2	.503	†	5	17	29	49	27.68
Hand-method lasting-machine operators, male	41	456	55.5	.348	3	28	43	19	7	19.25
Heel breasters, male	82	173	55.3	.303	16	38	30	13	4	16.71
Heel burnishers, male	84	283	55.5	.322	7	40	36	12	6	17.86
Heelers, male	84	324	55.3	.402	2	22	30	23	24	22.18
Heel scourers, male	84	372	55.3	.310	10	43	30	9	8	17.10
Heel trimmers or shavers, male	85	277	55.2	.433	3	14	30	29	25	23.88
McKay sewers, male	39	147	55.7	.338	9	28	40	15	8	18.77
Pullers-over, hand, male	49	749	54.9	.350	3	27	43	21	6	19.21
Pullers-over, machine, male	71	443	55.5	.356	2	26	42	23	6	19.66
Rough rounders, male	73	252	55.1	.503	.....	5	19	30	46	27.64
Side lasters, machine, male	16	167	54.3	.343	5	29	38	25	4	18.54
Turn lasters, hand, male	31	689	54.4	.324	7	37	35	17	4	17.56

* Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U.S. Department of Labor, Bureau of Labor Statistics.
† Less than 1 percent.

The accompanying graphic chart is based upon the percentages of figures gathered from eighty-three representative establishments throughout the country.



Variations in Number of Employees, Total Pay Rolls, and Biweekly Earnings Per Employee*

In some establishments the regular pay-roll period covers two weeks. Of this twelve-day working period the factories whose number of employees and pay roll were the basis of the preceding chart, were in operation 11.4 days. This was in the proportion of ninety-five per cent. of the working days of the year ending in February, 1914, or 48.4 weeks, leaving the equivalent of an average idle period of 3.6 weeks.

It will be observed by the chart that the number of employees does not vary greatly throughout the

* Wages and Hours of Labor, 1907 to 1914—Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

year from the normal of one hundred per cent., but that the pay roll and earnings do vary considerably, according to seasons, being highest in March, August, December, the latter part of January, and February, and lowest in April, July, September, October, and the early part of January. In the busy season individual earnings are at a maximum; in the dull season, with fewer hours, they are at a minimum.

Sex and Age Distribution of Wage Earners in the United States by Leading Industries: 1909. Table XX shows, for the forty-three leading industries, the number and percent. of distribution, by age and sex, of wage earners as reported for December 15, or the nearest representative day. It does not include salaried persons. As a means of judging the true importance of the several industries as employers of labor, the average number employed for the entire year is also given in each case, this number, in the case of seasonal industries, being much smaller than the number on the representative day. The per cent. of distribution for all industries combined, based on the average number employed, is also presented.

In all industries combined, seventy-eight per cent. of the average number of wage earners were males sixteen years of age or over, 19.5 per cent. females sixteen years of age or over, and 2.5 per cent. children under the age of sixteen.

The industries for which the largest proportions

Table XX*—Sex and Age Distribution by Leading Industries: 1909.

INDUSTRY	WAGE EARNERS							
	Average number	Number Dec. 15, or nearest representative day				Per cent of total		
		Total	16 years of age and over		Under 16 years of age	16 years of age and over		Under 16 years of age
			Male	Female		Male	Female	
All industries	**6,615,046**	......	......	......	......	**78.0**	**19.5**	**2.5**
Agricultural implements	50,551	55,429	54,529	674	226	98.4	1.2	0.4
Automobiles, including bodies and parts	75,721	97,250	96,060	982	208	98.8	1.0	0.2
Boots and shoes, including cut stock and findings	198,297	211,507	132,411	70,457	8,639	62.6	33.3	4.1
Brass and bronze products	40,618	46,230	42,908	2,774	548	92.8	6.0	1.2
Bread and other bakery products	100,216	104,443	84,956	17,407	2,080	81.3	16.7	2.0
Butter, cheese, and condensed milk	18,431	19,323	17,743	1,468	112	91.8	7.6	0.1
Canning and preserving	59,968	155,847	67,219	77,593	11,035	43.1	49.8	7.6
Carriages and wagons and materials	69,928	72,783	71,104	1,126	553	97.7	1.5	0.8
Cars and general shop construction and repairs by steam-railroad companies	282,174	302,080	301,431	455	194	99.8	0.2	0.1
Cars, steam-railroad, not including operations of railroad companies	43,086	58,274	58,046	190	38	99.6	0.3	0.1
Chemicals	23,714	25,341	24,102	1,061	178	95.1	4.2	0.7
Clothing, men's, including shirts	239,696	257,128	109,139	142,781	5,208	42.4	55.5	2.0
Clothing, women's	153,743	162,859	58,316	103,063	1,480	35.8	63.3	0.9
Confectionery	44,638	52,421	18,836	30,453	3,132	35.9	58.1	6.0
Copper, tin, and sheet-iron products	73,615	78,909	66,797	9,716	2,396	84.6	12.3	3.0

Cotton goods, including cotton small wares	378,880	387,698	197,420	150,057	40,221	50.9	38.7	10.4
Electrical machinery, apparatus, and supplies	87,256	102,950	78,605	23,398	947	76.4	22.7	0.9
Flour mill and gristmill products	39,453	42,495	41,787	565	143	98.3	1.3	0.3
Foundry and machine-shop products	531,011	604,167	587,636	11,895	4,636	97.3	2.0	0.8
Furniture and refrigerators	128,452	138,829	132,176	3,677	2,976	95.2	2.6	2.1
Gas, illuminating and heating	37,215	37,396	37,308	71	17	99.8	0.2	......
Hosiery and knit goods	129,275	136,713	37,419	88,183	11,111	27.4	64.5	8.1
Iron and steel, blast furnaces	38,429	47,278	47,184	10	84	99.8	......	0.2
Iron and steel, steel works and rolling mills	240,076	284,264	281,801	1,114	1,349	99.1	0.4	0.5
Leather goods	34,907	36,502	29,868	5,738	896	81.8	15.7	2.5
Leather, tanned, curried, and finished	62,202	66,717	64,005	2,230	482	95.9	3.3	0.7
Liquors, distilled	6,430	8,130	7,008	1,111	11	86.2	13.7	0.1
Liquors, malt	54,579	54,135	52,865	1,040	230	97.7	1.9	0.4
Lumber and timber products	695,019	838,160	826,978	4,027	7,155	98.7	0.5	0.9
Marble and stone work	65,603	67,921	67,575	112	234	99.5	0.2	0.3
Oil, cottonseed, and cake	17,071	29,691	29,551	49	91	99.5	0.2	0.3
Paint and varnish	14,240	14,426	13,207	1,137	82	91.5	7.9	0.6
Paper and wood pulp	75,978	78,672	68,497	9,909	266	87.1	12.6	0.3
Patent medicines and compounds and druggists' preparations	22,895	24,683	11,503	12,672	508	46.6	51.3	2.1
Petroleum, refining	13,929	14,873	14,657	170	46	98.5	1.1	0.3
Printing and publishing	258,434	272,027	204,388	60,973	6,666	75.1	22.4	2.4
Silk and silk goods, including throwsters	99,037	102,369	35,785	58,441	8,143	35.0	57.1	8.0
Slaughtering and meat packing	89,728	94,854	88,352	5,960	542	93.1	6.3	0.6
Smelting and refining, copper	15,628	16,029	16,013	......	16	99.9	......	0.1
Smelting and refining, lead	7,424	8,002	8,001	1	......	99.9	......	......
Sugar and molasses, not including beet sugar	13,526	25,134	24,626	376	132	98.0	1.5	0.5
Tobacco manufactures	166,810	181,036	90,417	84,193	6,426	49.9	46.5	3.6
Woolen, worsted, and felt goods, and wool hats	168,722	175,171	92,820	72,409	9,942	53.0	41.3	5.7

*Table XII. Abstract of the Thirteenth Census of the United States: Manufactures.

of males sixteen years of age or over are shown are those in which the work is of a nature requiring considerable physical strength or a high degree of skill.

The proportion of women and children, naturally is larger in those industries in which the processes require dexterity rather than strength.

The importance of the shoe industry as a field of employment, in comparison with the other staple industries, may be seen by this table.

The average number of wage earners employed in the industry during the year is 93.7 per cent. of the total number employed on the day taken by the Census Department as properly representative. Of those sixteen years of age or over, 62.6 per cent. are males, and 33.3 per cent. are females. The percentage under sixteen is 4.1 of the whole number.

The Shoe Repairing Industry. Besides the repair work done by the individual shoe cobbler in every community, repairing has become an important and well organized shop industry in recent years. A brief and comprehensive statement of this development is the following, from *American Shoemaking* for June 12, 1915:

> "The industry of repairing shoes has grown swiftly in the last few years, and now is of such size that it may be recognized as a special branch of the great shoe industry. There are about 45,000 shops in this line, and they do a

business of about $100,000,000 annually. Besides there are many retail stores that have repair departments. Of the 45,000 shoe repairing shops, about 18,000 are equipped with machinery. The machinery of the modern repair shop corresponds to that of the factory, save that it is simplified. Necessarily, it is simple because it often must be operated by unskilled workers, or at least by workers who have had scant experience in operating shoe machinery. Commonly, the machines are all set on one motor-drive shaft, along one side of the repair shop. There is a lock-stitch machine at the head of the shaft. This machine has about 260 parts. It is easy of adjustment, and it is capable of good all-around work, such as changing quickly from a woman's flexible sole shoe to a boy's stiff-soled shoe. It will stitch anywhere from four to sixteen stitches to the inch. Along the shaft there are machines for finishing the sole after it is sewed on. Among these machines are levelers, sanders, trimmers, edge setters, stitch cleaners, burnishing rolls and polishing brushes. Besides there are tool boxes, shelves for the work, and fans.

"The largest of the modern shoe repairing shops handle from 60,000 to 70,000 pairs of shoes a year. They employ from twenty-five to thirty-five men. They use a tag system, something like that of the regular factories. They subdivide the work. In the small shops, one or two men may do all the work. One man may run all the machines on the shaft, operating one after the other. Or, seven men may work at one time on the machines on one of the longest of the shafts, say one of the twenty-two-foot shafts.

"The main thing in the modern shoe repairing business is to build up patronage. Salesmanship is as necessary to success in it as is good workmanship. Somebody must go out and convince customers that they should have their shoes re-soled, or otherwise repaired. This selling work may be carried on in big cities, small cities, in towns, or out in the country.

"In the business district of one large city some bootblacks put some repair machines in their back shop. One of them went among the offices of the neighborhood asking for shoes to be repaired. He offered to give tickets good for six free shines with every pair of shoes that he re-soled. By this means a repair business was built up among occupants of the offices sufficient to keep four men employed. Besides, the shoe shining business flourished.

"In the small cities and towns, the repair men send agents in autos, or on motorcycles, along the highways, to call at door after door and collect shoes to be repaired and returned. In some western communities the steam laundries have started shoe departments, and their wagons collect shoes to be shined or repaired, and to be returned with the regular basket of laundry.

"The rapid increase in the repair business has probably cut into the sale of new shoes. But it has opened a new field for enterprising men in the starting of repair shops, and in selling goods to repair shops."

Earnings in the Repair Shop. In the small shop, employing few workers, and doing mostly hand repairing, the earnings may vary from two to five dollars or more a day. In the large shop, in which repair work is done mainly by machinery, the operative earns about the same as he would in the same processes in the shoe factory. Employment in repairing is fairly steady through the year in most communities, but it is somewhat reduced in the large town or city during the summer season.

The Shoe Factory Chemist. There are numerous chemical companies which produce the materials used in tanning leathers and in finishing shoes. In recent years, however, some large shoe factories have drawn chemists from such establishments or from other sources to work steadily in the factory. The duties of such chemists are twofold: To examine all leathers purchased to see that they have been properly tanned and cared for, and to examine all finishing materials, to see that they are of the right quality. A few factories have laboratories in which the chemist makes finishing materials from formulas which can be purchased or from his own or the factory formula.

The salary of the shoe factory chemist, whose service is of high value in shoe manufacture, ranges from $20 or $25 a week upwards.

Chapter XIV

AN EXPLANATION OF THE TERMS USED IN SHOEMAKING

CHAPTER XIV

An Explanation of the Terms used in Shoemaking

The Need of Knowing These Terms. For an intelligent reading or study of factory departments and processes it will be found necessary to know the meaning of the chief technical terms used in connection with leather and shoe manufacture. An explanation of a process in popular language only would prevent an exact and clear understanding of its nature. It is well to describe industry to one who wishes to enter it, either temporarily or as a life occupation, in such a way as to show it in its real setting and to use "shop language" as far as may be necessary to a right presentation of it. One should, if possible, see a machine in operation and hear the workman who operates it explain the working of the machine. The language of the trade is simple but expressive, and not at all difficult to understand. Throughout the pages of this book processes and machines are spoken of in technical terms and explained in popular language, so as to give the reader who may not be able to visit the factory an accurate and helpful picture of modern shoemaking. Terms relating mainly to leather are given in Chapter V on Leather. Herewith, in Chapter XIV, is presented an explanation of the more common terms used in shoemaking.

Acid-tanned. Tanned by a mineral acid, instead of by a vegetable substance such as the bark of certain trees and plants.

Adjustment. The fastening by which the shoe is adjusted to the foot, such as button, strap and buckle, webbing or lacing.

Aloft. (See "Stitched Aloft").

Anatomic. Referring to the conformity of the shoe to the natural shape of the foot.

Arch. The bony framework of the foot between the heel and the toes. The "broken arch" is a settling of this part of the foot due to a yielding of the muscles and ligaments. An "arch-support" is a mechanical contrivance placed in the shoe beneath the arch of the foot to keep it in its natural position. The term arch is used also for the corresponding portion of the shoe bottom.

Assembling. Putting together the various parts of the shoe as they come from separate departments of the factory. It includes the tacking of the inner sole to the last, inserting the toe box and counter of the shoe, and putting the upper part of the shoe on the last.

Backstay. A strip of leather covering and strengthening the back seam of a shoe on the outside.

Back Strap. The strap or loop by which the shoe is pulled on the foot.

Bal. An abbreviation of Balmoral, the original English name for the shoe. A front-laced shoe of medium height, as distinguished from shoes adjusted by other fastenings, and also from other patterns of shoes, such as Blucher or Oxford.

Ball. The fleshy part of the foot back of the toes, or the corresponding part of the shoe or of the last.

Beading. Folding in the skived edges of the upper leather; or making an impression by a wheel around the sole of the shoe above the heel. Frequently called "seat wheeling." Sometimes referring to the beads placed on the vamps of women's slippers.

Beating Out. The term used for leveling the bottom of the shoe.

Bellows Tongue. A wide folding tongue sewed to the sides of the top for the purpose of making it water tight, as in the case of heavy shoes for working or tramping.

Belting. That part of bark tanned cowhide, rubber, or canvas used for machinery belts.

Bench-Made. Applying to shoes made by hand at the cobbler's bench.

Bend. The main or best portion of a side of leather.

Blackball. A mixture of grease and lamp-black used by hand shoe workers to polish the edges of soles and heels.

Blacking the Edge. Dyeing the edge of the sole or welt after the shoe has passed through the making room.

Blind Eyelet. An eyelet inserted on the inner side of the eyelet facing, the hole on the outer side being left raw-edged.

Blocking. The cutting of a sole into rough or approximate shape, suitable for rounding. Also cutting top or vamp into form suitable for the use of the pattern.

Blucher. The name of a high shoe or half boot originated by Field Marshall Blucher of the Prussian Army in the time of the first Napoleon. Its distinguishing feature is the extension of the quarters forward to lace across the tongue. The name now applies to any shoe having this extension.

Boot. A term usually and properly restricted to high-cut foot wear with tongue of firm leather, and sometimes laced, as in hunting boots. Formerly high footwear with no fastening. Often restricted to women's high-cut shoes.

Bottom Filling. The filler for the low space in the bottom, between outer and inner sole, in the fore part of the shoe, as ground cork or tarred felt.

Bottom Finishing. The final polishing, buffing, and other processes applied to the bottom of a completed shoe.

Bottom Scouring. Sandpapering the parts of the sole in front of the heel.

Box. A reinforcement placed in the toe of a shoe to preserve its shape, made of leather, leather-board, canvas stiffened with glue or shellac, or other material. Called also "box toe."

Brogan. A heavy pegged or nailed work shoe of medium height.

Broken Arch. (See Arch).

Brushing. Finishing the edge, heel, or bottom with a polishing brush.

Buckram. Canvas stiffened with glue and used as a toe box or as a backing for shoe fabrics.

Buffing. Scouring off the outer or grain side of leather. See bottom scouring.

Button. The use of the button as a shoe fastening is of quite recent date, having increased very rapidly since about 1907. At the present time women's shoes have about one-half of the buttoned type. The latest tendency is to seek ornamental effects through the use of special materials for shoe buttons.

Button Fly. The strip of leather in the front of the top of a button shoe having the button holes. 7

Cabaretta. A tanned sheepskin of superior quality and finish.

Calfskin. Skins of neat cattle, up to fifteen pounds weight. For trade convenience such are called "calfskin," those weighing from fifteen to twenty-five pounds, "kips," and all above twenty-five pounds are called hides. Calfskin makes a strong pliable leather highly susceptible to polish and to a dull, velvet or "Suede" finish, or to a patent leather finish. It has long been in use for all kinds of shoes.

Calking Machine. An appliance to shape the inner sole of a shoe in conformity with the bottom of the foot.

Carton. The pasteboard box in which each pair of shoes is packed. A comparatively late development in the trade. Formerly pairs of shoes were fastened together with strings at the heel; after that they were sometimes wrapped in pairs in ordinary paper. Standard sizes of cartons are now generally used, for convenience in packing in cases and for uniformity in size when the cartons are placed upon shelves in the shoe store.

Case. The box in which shoes are packed for shipment. Men's shoes are usually packed twelve pairs in a case; women's, twenty-four to thirty-six pairs.

Channel. A slanting cut around the edge of the sole for convenience in stitching the top to the bottom of the shoe. The lip of the channel or the raised portion is cemented down after the stitching so as to preserve the stitch from immediate wear. Channeling means preparing the channel for the stitch.

Channel Screwed. The bottom held to the upper by wire screws fastening in the channel.

Channel Stitched. The soles fastened to the uppers by stitches which are concealed in the channel.

Channel Turning. Raising the lip of sole leather, or channel, so that the stitching can be done beneath it.

Chrome-tanned. Tanned by the use of bichromate of potash and muriatic acid.

Clicking. Cutting the uppers of shoes by a machine.

Closing On. Stitching the lining and outside together at the top, wrong side out.

Collar. A narrow strip of leather stitched around the outside of the shoe at the top.

Colonial. A woman's low shoe with wide tongue and ornamental buckle.

Combination Last. One having an instep of different width from that of the ball. Also a last that will allow both low and high shoes to be made upon it.

Congress Gaiter. A shoe having rubber goring for adjustment at the ankles.

Copper Toe. A copper outer boxing to protect the toe in children's shoes.

Counter. The stiffening in the back or heel part of a shoe to support the heel and prevent the shoe from running over, usually made of leather, leather-board, felt, or canvas stiffened with shellac or paste.

Cravenette. A proprietary name for a closely woven cloth used in shoe uppers.

Creasing Vamp. Making hollow grooves or wrinkles across the front of the vamp.

Crimping. Shaping any part of the upper to conform to the last.

Cushion Sole. An elastic or padded inner sole, usually of felt.

Custom-Made. Made by hand to special order and measurement.

Cut-off Vamp. One cut off at the tip and stitched to the toe cap, not extending under the tip beyond the tip stitching.

Dieing or Dinking. Cutting soles or other parts of the shoe with machine and die.

Dom Pedro. A heavy single-buckle shoe with bellows tongue, usually of a cheap grade.

Dressing. A process for restoring the finish of the upper. Also used for the materials for cleaning and polishing the shoe.

Edge Setting. Finishing and polishing the edge of the shoe.

Edge Trimming. Cutting the edge of the shoe smoothly to conform to the shape of the last.

Embossing. Stamping or carving figures and trademarks on leather.

Eyelet. A small ring of metal set in the lacing hole. The eyelet hole is sometimes worked with thread.

Fabric. A general term for the cloths used in shoemaking.

Facing. The leather used around the top of the shoe and down the eyelet row, inside.

Fair Stitch. The stitching sometimes run around the edge of the sole to give the McKay the appearance of the welt.

Filler. A light, hollow, wooden form used to keep a shoe in shape. Called also "form."

Findings. The small parts or accessories of a shoe, practically everything except leather and lining, such as laces, polishes, cement, nails, brushes, thread, and numerous other incidental articles used in the making and care of shoes.

Finish. Polishing, buffing, or other final treatment of the soles of shoes.

Fitting. The selection and adjustment of ready-made shoes to the foot of the wearer. In the old days of hand work, shoes were made to individual measurement. Such is still the case with the "custom shoe" where the added cost can be afforded. The factory-made shoe, of typical form, throws upon the salesman in the retail store the problem of fitting. Some adjustment can be provided by stretching the upper or by moving buttons, but it is chiefly a problem or right selection from standard patterns.

Fitting Room. The department of the factory in which the various parts of the upper of the shoe are stitched together, before going to the lasting room.

Form. (See heel.) Used also for the bench of the hand shoemaker.

Foxing. That part of the upper extending from the sole to the lacing or adjustment in front, and to about the height of the counter in the back, being the full length of the upper. More simply, the lower part of the quarter.

French Size Marking. A cipher or secret method of marking concealing from the customer the exact size of the shoe. Many varieties of this system are in use.

Gaiter. A term now applied mainly to a separate ankle covering.

Gem Insoles. A cloth-reinforced leather insole for welt shoes.

Golf Shoe. A low shoe with rubber sole used for out-door sports.

Goodyear Welt. The method of attaching the sole to the upper by the use of a narrow strip of leather called the welt.

Gore. A rubber elastic used on both sides for the adjustment of a Congress shoe.

Grading. The sorting of soles for uniform thickness in the edges of finished shoes. Also selecting skins for shoes of different prices.

Half-Sole. Half of a complete sole used under the front part of the out sole.

Heel. The leather or other material attached to the back part of the sole, or "heel seat," to give a desired height above the ground. The chief varieties are named after their style or shape. Their height is usually expressed in eighths of an inch. Heels are made in layers or lifts of leather, of wood, of leatherboard, and of substitutes for leather. The breast of the heel is its front face. The French heel is extremely high with a curved outline; the Cuban, high with a straight outline; the military, like the Cuban but lower; the spring heel is very low and formed by inserting a slip of leather between the out sole and the heel seat, so that the out sole forms the heel; the flange heel is made flaring toward the bottom. In women's fabric shoes heels are often covered with the same material as the upper. The "pitch" of a heel is its direction or inclination under the foot. Heels are attached to the heel seat by nails and cementing. The nails inside the shoe are covered by a small piece of felt or other substance called the heel pad.

Heel Scouring. Sandpapering the outside surface of the heel.

Heel Seat. The rounded part of the sole on which the heel is fastened. Heel seat nailing consists in nailing this part of the sole; heel seat trimming, smoothing this part.

Heel Shaving. Shaping the heel by shaving off the surplus leather.

Hemlock Tanned. Preserved by the use of hemlock bark.

Inseam Trimming. Cutting off surplus leather from the seam which fastens the upper to the bottom in the turn shoe and in the welt.

Insole. The inner sole of a sewed shoe, which is first placed upon the last. The inner soles are attached to both the upper and the out sole.

Inspecting. Examining shoes for imperfections.

Ironing Uppers. Smoothing the upper with a hot iron.

Lace. A string of leather or fabric used in adjusting and holding the shoe to the foot.

Lace Stay. A strip of leather reinforcing the eyelet holes.

Lap Stone. An iron plate or stone upon which the cobbler beats sole leather or seams or folded edges with a flat faced hammer.

Last. The wooden or metal form upon which the shoe is constructed, and which gives the shoe its distinctive shape.

Lasting. Stretching the upper tightly over and making it conform to the last. Assembling and pulling over the parts of the upper on the last.

Leveling. Shaping the sole to the bottom of the last by the use of heavy rollers or moulds.

Lift. A single thickness of the material used in the heel.

Lining. The inside part of the upper, made of fabric or of thin, light-weight leather.

Low-cut. A general term applying to such low shoes as Oxford, pump, tie, colonial, slipper, and sandal.

McKay Sewed. A mode of shoemaking named after the inventor. After the upper is lasted upon the inner sole the last is removed and the outer sole is attached by a thread passing directly through the upper and inner sole. The out sole is generally channeled and the lining is put over the inner seam, on the inside of the shoe. This mode has lowered the cost of making medium-priced shoes. It is a less satisfactory mode than the welt process.

Measurement. Taking the dimensions of the foot for custom made shoes. The chief points of measurement are, the ball of the foot, the waist, the instep, ankle, and total length.

Moulding. Shaping the sole to conform to the bottom of the last.

Naumkeaging. Smoothing up the bottom of the shoe with fine sandpaper after buffing on course sandpaper.

Oak-Tanned. Preserved by means of oak bark. Regarded as the best tanning of sole leather.

Oxford. A low-cut shoe in lace, strap, or button, made in men's, women's, and children's sizes. This style is said to have been first worn in Oxford, England, over three hundred years ago.

Pasted Counter. Made of two pieces of sole leather pasted together.

Pattern. Metal or cardboard model or form by which any part of the shoe upper is cut.

Pegging. Attaching the outer sole with pegs.

Perforating. Making decorative holes around upper parts. Also the term for the work done on the edges of the upper after skiving and folding.

Polish. Ladies' and misses' front-laced, high-cut shoe, originating in Poland.

Pressing. Applying a flat-press to heels and soles.

Pulling Lasts. Removing lasts from shoes.

Pulling Over. Drawing the upper over the last and tacking it into position.

Pump. A shoe cut below the instep and having no fastening.

Quarter. The rear part of the upper when a full vamp is not used.

Rand. A strip of sole leather made thin on one edge and placed around between the heel and the sole, to fill empty space and balance the heel.

Relasting. Putting lasts in shoes from which the original lasts have been drawn.

Repairing. Filling cracks in patent leather on the finished shoe. Any cobbling work.

Rolling. Passing leather between rolls to make it firm and durable. Also, polishing shoe bottoms on a roll bearing a brush.

Rough Rounding. Shaping the outsole to the last, and channeling also in the welt-channeled shoe. One of the hardest of processes.

Royalties. Sums based on production paid by shoe manufacturers for the use of machines when hired of the machine companies or for protected processes.

Rubber Cement. A powerful, quick-drying solution of rubber, often used in leather shoemaking and shoe repairing.

Rubber Shoes. Footwear in considerable variety from the sandal to the hip length boot. The low rubber overshoe is the most common. Rubber footwear consists of fabric coated with rubber. Rubber heels and soles are used more and more on shoes of leather or fabric tops.

Sample. In the shoe trade a single shoe to show the character of an entire lot. As a rule samples are made up by factories twice a year, in the spring and fall, and carried by the traveling salesmen on their routes. Shoes are then made in the factory from the orders received upon each sample.

Sandal. A woman's or child's strap slipper.

Screw Fastened. Having the bottom attached to the upper with wire screw nails, as in some heavy shoes.

Shank. A strip of metal or other material used between the inner and outer sole, between the heel and the ball, to stiffen the sole of the shoe. Also, this part of the shoe.

Shank Burnishing. Polishing the black shank part of the shoe with a hot iron. Shanks are finished in black or in colors.

Shanking Out. Thinning and smoothing the shank part of the shoe.

Size. The length measure of the shoe on standard widths. The length is expressed by numbers or the French cipher and the widths by letters. American and English sizes vary by one-third of an inch. The American size system runs from 0 to 13½, and then starts over again at 1. The infants' size runs from 0 to 5; children's from 5 to 11; misses', from 11½ to 13½ and then to 2 in the second series; women's, from 2½ to 8; little men's, from 8 to 13½; youths', from 1 to 2; boys', from 2½ to 5½, and men's from 6 to 12. Larger sizes are made on special orders.

Skiving. Cutting sole leather to a uniform thickness. Shaving upper leather, especially, to a thin edge, in the cutting or stitching department.

Slipper. A name for low footwear, other than rubber, without special means of fastening to the foot.

Slugging. Driving slugs, or short nails, in heels.

Sneaker. A rubber-soled canvas shoe for out-door wear.

Sock Lining. The lining which covers the McKay insole.

Soft Tips. Having no box toe under the tip.

Soles and Sole Leather. The pieces of heavy leather, mainly, from neat animals and used in the soles of shoes.

Sole Laying. The preliminary process of attaching the out-sole in position for stitching, nailing, or pegging.

Sorting. The process of arranging out-soles or upper leather by grades.

Split. A layer of a hide which has been cut into thicknesses.

Spring. The deviation from a straight line at the toe or arch of a shoe.

Stamping. Putting size and width on the inside of the shoe, or the name on the bottom, or marks on the carton.

Stay. A piece of leather used to strengthen a part or seam.

Stitch Separating. Marking indentations between stitches to make the stitching conspicuous.

Stitched Aloft. Sewed without channeling, so that the stitches show on the bottom. The name comes from the manner of the holding of the shoe in the process, bottom up.

Stock Keeping. Caring for stock in storage, following sales, and keeping a supply on hand. The manufacturer must know how his styles are selling and how large his supply must be to keep ahead of his trade. Accurate and proper stock keeping is very important in shoe manufacture.

Stripping. Cutting hides into strips wide enough to make soles of a desired size.

Style. The shape, model, or material determined by standards in use or in fashion, or by forms which manufacturers desire to put upon the market. A particular pattern or design, applying to the shoe as a whole or to any part which may be given special distinction.

Tan. From the Norman-French word for oak bark. A yellowish brown color given by the bark used in tanning, finished without applying special colors.

Tanning. Converting hides and skins into leather by astringent acids or mineral substances.

Tap. An outer half sole.

Tempering. Softening leather in water.

Tip. The toe piece stitched to the outside of the vamp. Often of different leather than that of the rest of the shoe, as "patent tip."

Tongue. A narrow piece of leather placed beneath the lacing or other fastening of a shoe.

Top. The part of the upper above the vamp.

Top Facing. The leather or band of cloth around the inside of the shoe top.

Top Lift. The outer piece of leather in the heel.

Top Stitching. Sewing across the top and down the side.

Treeing. Shaping the shoe, smoothing it in the treeing room.

Trimming Cutting. Cutting stays, facings, and other small parts of the shoe upper.

Turned Shoe. A woman's fine shoe, of flexible sole, with upper stitched to the sole wrong side out, the shoe being then turned right side out. One of the three chief methods of shoemaking at the present time.

Turnover. The gross amount of sales in comparison with the gross amount of stock.

Upper. A collective term for the parts above the sole and heel of a shoe.

Vamp. The front or lower part of the upper. A "cut-off" vamp extends only to the tip. A "whole vamp" extends to heel without a seam. The vamp is the most important part of the upper and should be made of the best leather.

Vamping. Sewing the vamps to the top.

Viscolizing. A patent method of making sole leather waterproof by treating it with oil emulsions.

Welt. A narrow strip of leather sewed to the upper and insole, having the edge of the welt extending outward so that the outsole can be attached by sewing through welt and outsole around the outside. This is the most modern and best method of shoemaking. "Goodyear Welt" is a welt sewed by the Goodyear welting machine.

The three chief kinds of sewed shoes, from methods used in making, are the welt, the McKay, and the turned shoe.

Welt Beating. Flattening out the welt, after sewing.

Welting. The material used for the welt. Also sewing the welt to the shoe.

Wheeling. Running a corrugated wheel around the edge or bottom of a shoe, to give finish or to imitate stitching.

Width. More properly the girth of the ball, waist, and instep of the foot or last. Widths vary in quarter inches of these measurements from "double narrow" to "double wide," through the series of sizes.

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