

Vol. 3.

ORIGINAL

Industrial Survey  
—OF—  
DANBURY, Conn.

NOT TO BE TAKEN FROM OFFICE

THE HAT INDUSTRY

While to the resident of Danbury the hat industry only means that portion of the industry included in the manufacture of fur felt hats, as a fact the industry as a whole has a far greater scope and covers a wide variety of manufactures, including any thing and everything used for head coverings.

The varieties of these manufactures might be grouped as follows:

Caps.

Wool  
Silk  
Cotton mixed  
Waterproof  
Knit  
Fur

Men's Hats.

Soft  
Stiff  
Cloth  
Waterproof  
Straw  
Panama  
Felt (wool or fur)  
Silk (high hats)  
Opera  
Uniform

Infants and childrens hats and caps

Ladies straw hats

Ladies hat forms

Ladies felt hats

Touques and knitted caps

Paper hats

Rainproof hats

Riding hats

Rubber hats

Theatrical hats

Firemens hats.

Straw horse hats.

The United States produced wool felt and fur felt hats in 1914 to the value of \$39,294,228 in 255 different establishments. According to these figures Philadelphia produces a larger amount of fur felt hats than does Danbury as follows:

Philadelphia	\$9,914,443
Danbury	7,065,765
Newark, N.J.	3,900,954
New York City	3,601,944
Orange, N.J.	2,822,860

As to number of establishments in this industry and value of production in 1914 the leading states ranked as follows:

	Products	No. Plants
Pennsylvania	\$11,040,820	27
Connecticut	9,475,278	57
New Jersey	7,969,344	41
New York	6,637,380	39

In the manufacture of wool felt hats Pennsylvania also led in 1914 with a production of \$776,886 as compared with a production in New York State of \$413,887.

There are seven wool felt hat factories in New York.

Statistics in the straw hat industry for 1914 are not available.

There was a big slump in both fur and wool felt hat production from 1909 and 1914, due to changing styles.

Following are the tables showing the production of the various kinds of fur felt and wool felt hats in the United States in 1914, and also the manufacture of felt goods of other kinds.

MANUFACTURE OF FUR-FELT HATS IN THE UNITED STATES -1914.

Number of establishments ..... 223

Materials.

Hatters' fur .....	pounds .....	5,766,904
Fur-felt hat bodies in the rough,	dozen	395,848
Chemicals and dyestuffs.....	¢	432,161
Products.		
Total value .....	¢	37,349,755
Fur-felt hats .....	¢	33,603,531
Fur-felt hats in the rough,	doz.....	2,372,937
All other products, inc.contract work..	¢	1,373,276

MANUFACTURE OF WOOL-FELT HATS IN THE UNITED STATES-1914.

Number of establishments ..... 30

Materials.

Wool (in condition purchased)..	pounds.	606,957
equivalent of above in scoured		
condition, pounds....		561,639
Wools and wool waste ...	pounds....	454,099
Hatters' fur.....	pounds....	35,349
Wool-felt hat bodies in rough,	doz.	13,449
Chemicals and dyestuffs.....	¢	34,501
Products.		
Total value .....	¢	1,944,484
Wool-felt hats.....	dozens.....	1,777,225
Wool-felt hat bodies in the rough,		
doz.	¢	13,029
All other products, inc.contract work	¢	154,230

Silk and Opera Hats.

In the manufacture of silk and opera hats the rank of various cities is as follows:

New York	13
Philadelphia	7
Boston	3
Cincinnati	3
Cleveland	2
St. Louis	3
Providence	1
Chicago	1
Other cities	14

Considering Danbury's closeness to the New York market it would appear that the manufacture here of silk hats is entirely logical and an effort should be made to develop same to maintain Danbury's prestige as a hat center.

Straw Hat Manufacture.

The rank of various cities in the manufacture of straw hats is indicated by the number of plants in each as follows:

New York	16
Baltimore	6
Philadelphia	2
Foxboro, Mass.	4
Norwalk, Conn.	4
Danbury "	1
Milford, "	1
Beacon, N.Y.	2
North Dana, Mass.	3
Fall River, "	1
Newark, N.J.	1
Petersburg, Va.	3
Other cities	27

The only manufacturer of straw hats in Danbury at present is Herman Walther, who does some business in ladies straw hats in addition to his manufacture of hat bodies.

There appears no reason why Danbury is not just as suitable a place for straw hat manufacture as Beacon, N.Y. or Foxboro, Mass., and such hats should be made here at a less cost than in New York City.

The more variety of high class hats of all kinds that Danbury can produce, the greater the prestige of this place as a hat center.

Straw hats are made largely of imported hemp and straw braid and such material is purchased of the importers in New York City.

#### Panama Hats

New York City practically controls the production of Panama hats as is shown by the following comparison of plants in various cities:

New York	19
Chicago	2
Boston	1
St. Louis	1
Cleveland	1
Philadelphia	1
Stamford, Conn.	1
So. Norwalk	1

If Stamford and South Norwalk can manufacture Panama hats so could Danbury.

#### Uniform headwear.

The rank of the cities in the production of uniform headwear is denoted by the number of establishments in each, as follows:

New York	19
Chicago	6
Boston	4
Philadelphia	4
Cincinnati	3
Kansas City	1
Springfield, Mass.	1

As such hats are partly made from fur felt bodies it is surprising that uniform hat manufacture has not developed in Danbury, and an effort should be made to establish such plants here.

SHOWING LOCATION OF HAT INDUSTRIES & FUR CUTTERS

Red Circles--- Hat Plants  
Green " --- Fur Cutters

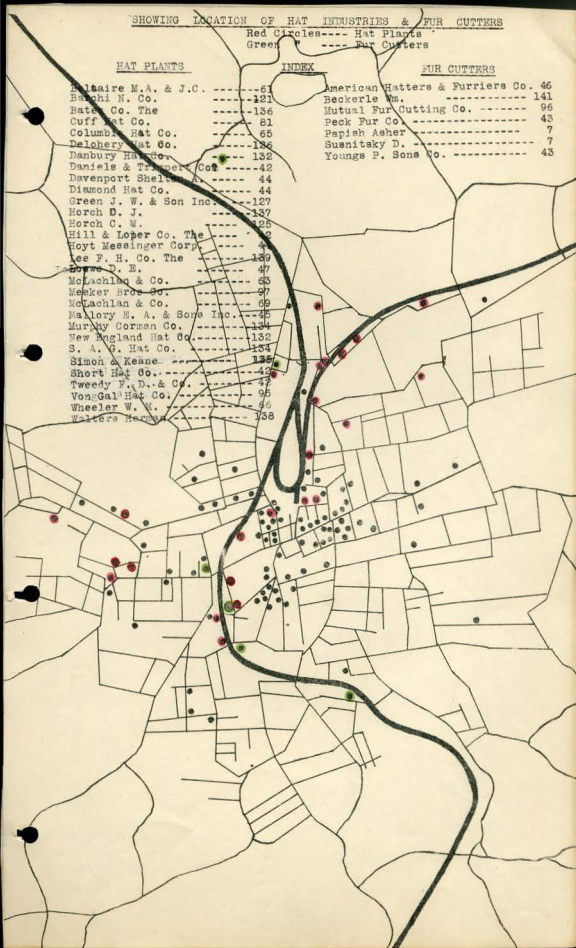
HAT PLANTS

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FUR CUTTERS

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Delohery Hat Co.	-----136
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Green J. W. & Son Inc.	-----127
Horch D. J.	-----137
Horch C. W.	-----125
Hill & Loper Co. The	----- 32
Hoyt Messinger Corp.	----- 4
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Short Hat Co.	-----42
Tweedy F. D. & Co.	----- 47
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Wheeler W. M.	----- 66
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American Hatters & Furriers Co.	46
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Mutual Fur Cutting Co.	96
Peck Fur Co.	43
Papish Asher	7
Susnitsky D.	7
Youngs P. Sons Co.	43



Cloth Hats and Caps

By far the largest number of establishments in the country producing head wear are those manufacturing cloth hats and caps, as shown by the following list:

New York	258
Chicago	25
Philadelphia	22
Baltimore	15
Cincinnati	15
Boston	12
St. Louis	8
Detroit	8
San Francisco	8
New Haven, Conn.	5
Hartford, "	2
Waterbury "	1
Hadlyme "	1
Other cities	71

Cloth hat and cap manufacture should more properly be grouped among the needle industries. While special lines of high class cap and cloth hat manufacture might be advantageously developed in Danbury, there would be little advantage in trying to develop the manufacture of cheap caps here. This line of manufacture is not desirable and is largely taken care of by the "Sweat shops" of New York.

The manufacture of waterproof hats is already established in Danbury, E. A. Mallory and Sons turning out a high grade cravenette hat as part of their product.

It is stated that Danbury hat manufacturers cannot compete with Fall River and Yonkers in the production of uniform hats owing to the higher wage scale here. This is a matter open to investigation.

FUR FELT HAT INDUSTRY.

The rank of various cities in the manufacture of fur felt hats as indicated by the number of establishments in each is as follows:

Danbury	35
Philadelphia	9
Orange, N.J.	8
Newark, N.J.	23
Other N.J. Cities	5
New York City	28
Reading, Pa.	6
Bridgeport, Conn.	1
South Norwalk, "	7
New Milford, "	1
Baltimore, "	6
Boston	3
Amesbury, Mass.	1
Fall River, "	4
Haverhill, "	2
San Francisco	7
Los Angeles	5
Chicago	3
St. Louis	6
St. Paul	4
Orange (omit)	
Beacon, N.Y.	1
Newburgh, "	1
Peekskill "	1
Walkill "	1
Yonkers "	1
Ohio cities	5
Oklahoma	2
Other Penn. cities	2
Pawtucket, R.I.	1
Houston, Tex.	1
Seattle, Wash.	2
Atlanta, Ga.	1
Peona, Ill.	1
Waukegan, Ill.	1
De Moines, Ia.	1
Louisville, Ky.	1
New Orleans,	1
Portland, Me.	1
Big Rapids, Mich.	1
Minneapolis	1
Omaha, Neb.	1

The U. S. census report for 1914 is very definite in the statement that Philadelphia led Danbury in that year in the manufacture of fur felt hats producing such hats to the value of \$9,914,443 as against Danbury's production of \$7,065,765. It is somewhat surprising to learn that Philadelphia's nine fur felt hat establishments have a larger production than Danbury's thirty-five hat manufacturing plants.

We have no reliable figures on the output of the hat plants of Philadelphia but a careful estimate of such output places the total at 350,000 dozens of finished hats annually, these being mostly the product of the great Stetson plant.

Danbury's total hat production in 1916 as ascertained through this Survey had a value of \$11,196,500. This included the value of rough hat bodies manufactured and sold to local finished hat manufacturers or sold to manufacturers in other cities.

If the government figures for 1914 of a fur felt hat production in Danbury that year of \$7,065,765 are correct this latest Survey census would indicate that the hat production of Danbury had increased four million dollars annually since 1914.

Considering only the production of finished fur felt hats, we find that Danbury in 1916 produced 745,875 dozens of finished hats valued at 9,071,000.

Philadelphia's immense production figure is due not to the quantity production but to the high selling price of Stetson hats. This one concern produced over \$9,000,000 worth of hats in 1916. The other Philadelphia hat manufacturing establishments are very small except that of Frank Schoble & Co.

The principal establishments in Newark manufacturing complete hats are those of E. V. Connett & Co., Essex Hat Mfg. Co., Ferry Hat Co., Hudson Hat Co., A. M. Rosenberg, and J. Rummel & Co. It is estimated that the total production of finished hats in Newark in 1916 was 450,000 dozens valued at \$6,000,000 or about one third less than Danbury's production.

Of the total production of fur felt hats in the United States estimated at \$50,000,000 for 1916, Danbury produced over one fifth.

Danbury's preeminence in the fur felt hat industry is unquestioned.

Newark with 23 fur felt hat establishments and New York City with 28 <sup>are</sup> greater rivals than Philadelphia with its nine plants.

Most of the 23 fur felt hat plants in New York however are finishing establishments and these consume a large proportion of Danbury's rough hat production which was approximately 336,000 dozens, in 1916 valued at \$2,125,500.

Only about a third of this rough hat-body production was sold to the eight finishing plants in Danbury, so that over 100,000 dozens of hats in the rough, were shipped out of Danbury in 1916, mostly to the New York finishers.

The local hat plants which buy their hats in the rough and do only the finishing and trimming are as follows:

Short Hat Co.,  
Hill & Loper Co.,  
F. D. Tweedy & Co.,  
Murphy-Gorman Co.,  
C. M. Horch  
C. J. Horch  
New England Hat Co.,  
N. Barchi Co.,

The general impression appears to prevail in Danbury that this city has been losing ground in the business of producing finished hats. This is a mistaken idea. Twelve finished hat concerns have gone out of existence since 1908 as follows:

D. J. Brew,	Connet Hat Co.,
Delano & Wheeler	Millard Hat Co.,
Fanning & Hoffman	W. H. Mooney & Co.,
Green Soft Hat Co.,	National Hat Co.,
A. A. Hodsohn	Rundel & White
S. C. Holley & Co.,	J. H. Townsend.



During that same period the following new finished hat plants have been established:

Hill & Loper  
 N. Barchi & Co;  
 New England Hat Co.,  
 The Danbury Co.,  
 Baird-Untiedt Co.,  
 Diamond Hat Co.,  
 Bates Company  
 C. J. Horch.

are  
 It is clear that these eight new hat plants <sup>are</sup> producing more hats annually than the twelve which went out of existence.

To this gain however we must add a large increase in the total annual production of the other 15 finished hat plants which were in operation in 1908.

It is safe to say that twenty per cent more finished hats are produced in Danbury annually now than in 1908.

Probably the impression that Danbury is not gaining <sup>in</sup> the finished hat industry is because of the large increase in this city of production of hats in the rough and shipment of same to New York City for finishing.

Even if it were possible to bring to Danbury the finishing shops which consume the surplus of Danbury's rough hat production it is doubtful if such industries could be considered desirable.

A new condition in the trade has arisen in the past few years and this condition is one which cannot be avoided or prevented. Small finishing shops have grown up in New York through sweat shop methods, the proprietors of these shops buying hats in the rough from Danbury and Newark and because they are not particular about eliminating culls or second grade bodies, their general average of body cost is lower than in the complete hat shops where effort is made to secure high quality.

This method puts on the market a cheaper quality of hats with out trade name quality value and has compelled the manufacturers of high quality hats to cease to a considerable extent the production of the cheaper grades.

This condition of affairs is not necessarily an injury to the hat industry of Danbury so far as total production is concerned, and it is far better that Danbury should make and furnish the cheaper grades of rough hat bodies to the New York finishers, than to have the New York finishers locate in Danbury.

While without doubt it will be of advantage to Danbury to secure a greater diversity of industries, yet it would be a vital loss to the city to lose its present position of importance in the hat industry, which is an asset that forms a very important factor in the industrial and commercial strength of the community.

The manufacture of hats in Danbury by 35 establishments gives employment to 5158 persons who receive \$4,165,200 annually in wages.

On top of this however are the pay rolls of 27 other industries which are dependent upon or allied to the hat industry and which would also disappear from Danbury if the hat industry ceased to exist here. These 27 allied industries employ 1050 persons.

Therefore the combined pay roll of the hat industry and allied industries of Danbury is \$4,818,200 annually.

As the total annual pay roll of all of Danbury's industries is only \$6,035,700 it can be seen that if the hat industry were to be wiped off the map here, there would not be very much left in this community in the way of industries.

The 35 hat establishments represent an investment value of \$3,683,000 and had a production in 1916 valued at \$11,196,500.

The 27 industries allied to hat manufacture produced goods in 1916 valued at \$3,975,000.

The total production in Danbury in the hat and allied industries is therefore \$15,171,500.

As a source of revenue to the mercantile banking, professional and other business interests of Danbury the total hat industry represents the following value.

Population due to presence of hat industry	18,000
Expended by wage earners yearly	\$ 4,000,000
Expended by 62 manufacturing plants for supplies, taxes, power, light, insurance, rent, etc.,	\$1,000,000
Expended by owners and officials	300,000
Total revenue of industry to Danbury	\$5,300,000

With such substantial figures before them the business interests of Danbury must realize how important it is to take every possible measure not only for the preserving and building up of these existing industries but for the securing of additional hat manufacturing establishments or industries allied there to.

That such growth of the industry is possible there can be no question. The fur felt hat industry like all others is growing and this growth should be made to take place in Danbury instead of elsewhere.

Danbury possesses the prestige, the reputation and the favorable conditions that should make such growth easier than for other communities.

As in so many other lines of industry the advantages of "centralization" and specialization are highly important.

The silk industry is not growing in Paterson, the shoe industry in certain Massachusetts cities, the automobile industry in Detroit, the pottery industry in East Liverpool or the tire industry in Akron, because those cities are peculiarly adapted for those lines of manufacture, but because of the good fortune of those cities in having had those industries centralized.

Centralization of the felt hat industry in Danbury means that there are enough hat manufacturers here to act in more or less concerted and cooperative ways for their mutual benefit, it means that through the large amount of hat shipments, certain traffic accommodations and advantages are obtained, it means that because of the number of hatteries a large number of allied industries have sprung up here giving the local hatters the advantage of ready accessibility to and low costs of fur, sweat bands, hat bands, blocks, boxes, reeds, machinery and supplies of various kinds which would not be accessible to an isolated hat plant.

In a general way it can be stated that Danbury possesses the following advantages for hat manufacture:

- 1- Cheap electric power
- 2- Cheap rentals and low property values
- 3- Low taxes and fair valuations
- 4- Freedom from harassing local building regulations.
- 5- Proximity to the New York market.
- 6- Comparatively low labor costs.
- 7- Superior package freight service.
- 8- Cheap and excellent water.
- 9- Favorable living conditions for workmen.
- 10-Excellent train and express service.
- 11-Availability and comparatively low cost of furs, glue, sweat bands, reeds, blocks, silk hat bands and machinery and repairs of all kinds.

The conditions which can be said to be disadvantageous to the development of the hat industry in Danbury are:

- 1- Slow freight deliveries
- 2- More or less union labor trouble and labor agitation.
- 3- High coal costs
- 4- Cheap competition in hat finishing by New York sweat shops.

To what extent these advantages may be increased and the disadvantages reduced offer special studies which are taken up in separate chapters.

It is obvious however that the disadvantages can be overcome or off-set to a large extent and it would appear to be to the interests of the manufacturers and to all the business interests of Danbury to better these conditions in every way possible.

The largest hat manufacturing establishment in Danbury is that of the F. H. Lee Company which has 1000 employees. Next in importance is the plant of E. A. Mallory & Sons which has 625 employees while the plant of John W. Green & Sons ranks third with 350 employees.

The hat industry had its beginning in Danbury in the year 1780. In 1909 Danbury produced about 20% of the fur felt hat output of the company and occupies the same relative position in the trade to-day.

The growth of the finished hat industry in Danbury is shown by the following figures:

1904	\$7,198,376
1909	6,858,882
1914	7,065,765
1916	9,071,000

The production of hat bodies in the entire state of Connecticut was only 335,947 dozens in 1909 valued at \$2,400,044 while the production of Danbury alone in 1916 was valued at over \$2,000,000.

The hat industry of Danbury is divided into a number of specialized groups, as follows:

(The number of males and females employed is given for each industry)

<u>Finished Stiff Hats</u>	<u>Males Employed</u>	<u>Females Employed</u>
A. Shelton Davenport	50	65
Cuff Hat Co.,	50	4

<u>Finished Soft &amp; Stiff Hats.</u>	<u>Males Employed</u>	<u>Females Employed.</u>
Short Hat Company	25	30
Hill & Loper Co.,	38	26
F. D. Tweedy & Co.,	30	30
E. A. Mallory & Sons	500	125
Von Gal Hat Co.,	50	30
Meeker Bros. Co.,	140	35
N. Barchi Co.,	5	5
New England Hat Co.,	7	5
C. J. Horch	7	9
C. M. Horch	6	8
John W. Greens & Sons	225	125
Murphy-Gorman Co.,	60	60
The Danbury Co.,	200	125
Baird Untiedt Co.,	250	100
F. H. Lee Co.,	750	250
<u>Unfinished Soft &amp; Stiff Hats</u>		
Daniels & Trimpet	115	5
Hoyt-Messenger Co.,	150	0
S.A.G. Hat Co.,	60	2
Bethel Mfg. Co.,	40	1
<u>Unfinished Soft Hats.</u>		
Columbia Hat Co.,	75	0
George Mc Lachlan	60	3
H. Mc Lachlan & Co.,	125	6
Simon & Kean	90	
Haitsch & Co.,	12	
Herman Walther	35	3
Bethel Hat Forming Co.,	20	5
Cuff Hat Co.,		
<u>Finished Soft Hats</u>		
D. E. Loewe	225	75
M.A. & J.C. Beltaire Co.,	30	10
Diamond Hat Co.,	15	8
Delohery Hat Co.,	225	50
The Bates Company	240	65
<u>Ladies Felt Hats</u>		
E. A. Mallory & Sons.		
<u>Finishing Seconds.</u>		
W. M. Wheeler	1	0
<u>Cravenette Hats</u>		
E. A. Mallory & Sons		
<u>Straw Hats.</u>		
Herman Walther.		
<u>Labor Conditions</u>		

Of the total of 5158 persons engaged in the hat manufacturing and finishing in Danbury 3892 are males and 1266 females.

Females are employed principally in the finishing shops as trimmers and the preponderance of male employees classifies the hat industry as largely a male employing trade.

The wages in most of the establishments is determined on a piece work basis, the present union schedule for piece work being as follows:

Stiff Hats	Per Week	By Piece Work	Soft Hats	Per Week	By Piece Work
Blowing	\$15-16.00	No piece work	Blowing	\$16.50	No piece work
Coning	\$25.	75¢ per 100	Coning	\$25.	85¢ per 100
Hardening	"	" " "	Hardening	"	" " "
Forming	"	" " "	Forming	"	" " "
Sizing	22.50	1.10 " doz.	Sizing	\$25.	\$1.35 " doz.
Shaving	\$25.	4¢ " "	Shaving	\$25.	4¢ " doz.
Stiffening	\$25	No piece work	Stiffening	\$25.	No piece work
Stretching	\$30	12¢ per doz.	Stretching	\$30.	5¢ per doz.
Coloring	\$15	35¢ " "	Blocking	\$30.	5¢ " "
Blocking	\$30	24¢ " "	Coloring	\$15.	35¢ " "
Finishing	\$25	1.25 " "	Finishing	\$15-30	1.75" "
Trimming	\$15.	50¢ " "	Flanging	\$25.	20¢ " "
Curling & Setting	\$30	75¢ " "(hand)	Velouring	\$25.	30¢ " "
Packing	\$20-25	35¢ " "(machy)	Pouncing	\$30-40	17¢ " "
		No piece work	Trimming	\$15.	No piece work
			Packing	\$25.	" " "

The scale in the three "open" shops, those of D. E. Loewe, M.A. & J.C. Beltaire and Meeker Bros. & Co., does not vary much from the above.

In these shops the men earn from \$15.00 to \$35.00 per week and the women from \$10.00 to \$12.00. The scale is:

For male finishers	85¢ per dozen
" " sizers	60¢ " "
" female trimmers	40¢ " "

The figures given by the manufacturers of hats in the rough as to the earning power of employees is as follows:

Stretchers	\$35.00 per week
Pouncers	40.00 " " (16¢ per doz.)
Blockers	40.00 " " (18¢ " " )
Formers	25.00 " " (85¢ per 100)
Sizers	25.00 " " (\$1.15 per doz.)
Stiffeners	25.00 " "

The figures given by the manufacturers of finished hats as to the earning power of employees is as follows:

Finishers	\$18.00 to 25.00 per week	\$1.10 per doz.
Flangers	\$30.00	(\$1.25 " " )
Trimmers	\$ 6.00 to 15.00	" " (25¢ " " )
Curlers	\$15.00	" " (50¢ " " )
		" " (25¢ " " )

While the stunt on "stent" method of limiting the production of operatives is still in force under union regulations we are informed that the restrictions are not as arbitrary as formerly and that operatives may continue work for the full work day regardless of whether they have more than completed their daily task or "stent". This permits that a manufacturer by agreement can count on continuous plant operation for the full working day if he so desires.

The fixed working day in the hat industry is 9 hours with Saturday afternoon off making a 50 hour week.

MINIMUM BILL OF PRICES FOR FINISHING AND FLANGING OF SOFT HATS TO GO INTO EFFECT IN ALL FACTORIES UNDER THE JURISDICTION OF THE UNITED HATTERS OF NORTH AMERICA.

FINISHING

	Hand	Ironed by Machine	Brims Plates	Side Lathe or Pouncing Machine with Brims Jiggered.
\$9.00				.75
10.50				.80
12.00 & 13.50		1.50		.95
15.00	1.75	1.50	1.30	1.15
16.50	1.85	1.60	1.40	1.35
18.00	2.00	1.75	1.55	1.50
21.00	2.25	2.00	1.80	1.75
24.00	2.50	2.25	2.05	2.00
27.00	2.75	2.50	2.30	2.25

FLANGING

All fancy and dress shapes ironed and bagged.....	25 cents
Hats flanged twice	
First flanging.....	20 "
Flanging second time .....	25 "
Hats flanged only once .....	25 "
Bagging flats and hammocks .....	15 "

All Bills of Prices to be made on the Selling Price of the finished product. Where quality marks are used in the Bill of Prices, they must be accompanied by figures indicating the Selling Price.

Bills of Prices cannot be accepted by Shops Crew or Local Districts unless made on the basis of Selling Price, and the Selling Price is on the Bill of Prices.

MINIMUM UNIVERSAL BILL OF PRICES

PCR

SIZING, FINISHING AND FLANGING OF SOFT HATS.

SIZING UNDER THE SYSTEM KNOWN AS "MACHINE STARTING"

\$ 9.00 and \$10.50 grades	not less than	\$.90	per dozen
12.00	" " "	1.00	" "
13.50	" " "	1.10	" "
15.00 & 16.50 up to 4 oz.	" " "	1.15	" "
18.00	" " "	1.20	" "
21.00	" " "	1.30	" "
24.00	" " "	1.40	" "

Five cents extra for every  $\frac{1}{4}$  oz. over 4 oz.  
This price only to apply to system known as "Machine Starting."

TRIMMING OF HATS.

Trimming from .....	45 to 75 cents
Binding " .....	10 to 15 "
Putting in tips .....	16 cents a dozen
Elastic and cords .....	6 to 12 cents
Pads and buckles .....	6 to 12 cents.

## PROCESSES OF MANUFACTURE

The manufacture of hats is one of the most interesting of manufacturing processes and few wearers of this important part of the male wardrobe would recognize in the great bales of rabbit, hare, muskrat, otter and other skins that come to the Danbury fur factories the material from which their (fur) felt hats are made.

The best skins and by far the largest portion are imported and arrive in great bales containing from 2,000 to 4,000 skins. Many processes are gone through in the fur factory before the fur is ready for the hat manufacturer, who, after putting it through blowers, which clean the fur from foreign substances and hair, start the actual making of a hat by weighing out just enough fur to make a given size and weight of soft or stiff headgear.

The fur is fed into an inclosed machine in which is a revolving copper cone, perforated and wet, beneath which is a rapidly revolving suction fan which creates a downward air current. The result is that the light weight fur is swirled about until it appears like a miniature snow storm and gradually and evenly settles on the cone.

When all the fur for one hat is thus fed into the former and is deposited on the cone, the machine is opened, the operator wraps a cloth about the cone with its evenly deposited covering of fur, removes the cone and slips off the first form of the hat. It appears to be a conical, wet and delicate object; but is quickly immersed in warm water, which increases the holding quality of the fur so that the "bodies" can be safely handled through the successive processes of shrinking to exact sizes, dyeing for desired colors and drying, all of which is necessary before the rough bodies begin their travels through the hands of various skilled workmen who shape and block and trim, with the aid of almost human mechanical aids, the bodies into finished hats.

The manufacturers seem to vary however in their views as to what the working week is, as follows:

Naming 48 hours per week:

The Danbury Co., Murphy-Gorman Co., Short Hat Co., Herman Walther, Simon & Keane, S.A.G. Hat Co., Daniels & Trimpet.

Naming 50 hours per week:

C. J. Horch, F.H. Lee Co., Bates Co., John W. Green & Sons, Baird-Untiedt Co., Meeker Bros. Co., F. D. Tweedy & Co., Diamond Hat Co., A. Shelton Davenport, Hill & Loper Co., Geo. Mc Lachlan, Bethel Hat Forming Co., Haitch & Co., Bethel Mfg. Co., Hoyt-Messenger Co.

Naming 54 hours per week:

New England Hat Co., C. M. Horch, Delohery Hat Co., N. Barchi Co.

Naming 55 hours as the working week:

Von Gal Hat Co., Columbia Hat Co., M.A. & J.C. Beltaire, D.E. Loewe, Cuff Hat Co., E. A. Mallory & Sons, H. Mc Lachlan & Co.,

As explained in the chapter on "Labor Conditions" the employees in the hat trade are largely unionized.

There appears no general sentiment among the local manufacturers antagonistic to the organization of labor as a principal, but there have been some very bitter clashes in Danbury in former years on the open shop question and on the application of union regulations that were considered arbitrary.

Whatever disputes formerly existed have however been apparently entirely settled and we cannot learn of any present disturbance of conditions or likelihood of further trouble.

Raw Materials

The materials used by the manufacturers of hats in the rough are as follows:

<u>Furs</u>	<u>Where obtained from</u>
Scotch Coney	Danbury & New York
Saxony Hare	" "
Australian Rabbit	" "
Domestic Rabbit	" "
Glue	" "
Shellac	" "
Dyes	New York
Machinery	Danbury
Blocks	Danbury

The materials used by the finishing shops and complete hat shops are as follows:

Hat bodies in the rough	Danbury
Silk hat bands	"
Silk braids and cords	"
Sweat bands	"
Sizing	"
Fur	Danbury
Reeds	Danbury
Blocks	"
Paper Boxes	"
Shipping cases	"
Leather bands and tips	"
Dyes	New York



Only about 10% of the fur used is from domestic rabbits, this being of an inferior character. Most of the fur used is from the skins of Australian rabbits imported into this country via New York.

It is interesting to note that practically all the materials used by the hat manufacturers are produced in Danbury, as well as the machines on which the work is done. A large part of the fur used by the hat makers is also purchased by them from the local fur cutters. Over two million pounds of fur are consumed annually in the hat shops of Danbury and about half of this or 1,000,000 pounds is purchased in Danbury, the remainder being purchased in the New York market.

#### Allied industries

As previously stated the location in Danbury of industries producing the machinery and materials used in the manufacture of hats is of vast benefit to the success and development of the hat industry in this city.

These allied industries can be grouped as follows:

#### Furs and cutting, blowing and cleaning of fur.

	<u>No. Employed.</u>
P. Young Sons Co.,	18
D. Susintsky	3
American Hatters & Furriers Co.	325
Peck Fur Co.,	125
Asher Papish	10
Mutual Fur Cutting Co.,	18

#### Hat Machinery and Tools

Doran Bros.	14
Morloch Machinery Works	5
New Machine Co.,	10
Turner Machine Co.,	100

#### Paper and Fibre Boxes and Cases

Isaac Armstrong & Co.,	29
Danbury Square Box Co.,	30
Clark Box Co.,	100
Hine Box & Printing Co.,	37
John Reid	6

#### Wooden Packing Cases

Isaac Armstrong & Co.,	
Clark Box Co.,	
Hine Box & Printing Co.,	
John Reid,	

#### Sweat Bands or Hat Leathers

D. Decker & Son	2
A. F. Hayward	2

#### Wire Reeds

W. F. Sirine	2
George A. Kinneer	4
Geo. J. E. Sherman	4
D. Decker & Son	

Wooden Blocks

C. F. Yockum Turner Machine Co.,	3
-------------------------------------	---

Tubs & Kettles (wood)

E. H. Barnum	3
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Glue & Shellac

Connecticut Glue Co.,	26
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Alcohol

Solvents Recovery Co.,	6
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Silk Hat Bands, Braids & Cords

Imperial Silk Works	42
Tweedy Silk Mills	110

Cones

P. A. Hull & Co.,	10
Danbury Hardware Co.,	10

Stays (card board)

Hine Box & Printing Co.,	
--------------------------	--

The detailed study of these allied lines of industry is taken up under the various chapter groupings to which they belong.

The hat industry of Danbury is directly responsible for the development of these allied lines of industry, but their establishments here may result in the development of other branches of industry. For example the two silk mills making hat bands have demonstrated that silk ribbon can be manufactured profitably in Danbury and it is possible that other silk mills can be established here having no relation to the hat industry.

There are about 20 barrels of alcohol used daily for cutting shellac in the hat shops.

Gas is used to a large extent by the hat manufacturers for ironing, singeing and heating shells. The hat plants altogether use 3,500,000 cubic feet of gas yearly. Some of them consume enough to reduce their rate as low as 72¢ per thousand.

Most of the shellac used in the hat industry is imported from India, very little of the local product being used. Most of the fibre hat reeds to meet the demands of hat manufacture are purchased in New York, although all the wire reeds are made in Danbury. This industry might be still further developed.

Hat leathers or sweat bands are manufactured here to a considerable extent but the most of the supply is purchased in New York. It would appear that this industry might be further expanded.

Of the aniline dyes used in hat manufacture, black is used in the largest quantities. Before the war German dyes were used exclusively, but since the war the hat manufacturers have been compelled to use American made dyes in increasing amounts and the black dye stuffs made in this country now appear to meet the demand, though there is much difficulty yet experienced in securing colors and prices are very high.

The percentages of materials of various kinds which local hat manufacturers purchase in Danbury are as follows:

	<u>Danbury</u>	<u>Other cities</u>
Shellac	10%	90%
Reeds	25%	75%
Wires	100%	0
Sweat Bands	10%	90%
Dyes	0	100%
Hat Blocks	100%	0
Glue	40%	60%
Fur	50%	50%

Fully \$4,000,000 worth of fur was used by hat manufacturers in Danbury in 1916 and over \$500,000 worth of aniline dyes.

The hat plants of Danbury purchased the entire production of the two silk hat band mills in Danbury and a large additional amount of bands from Paterson, N.J.

In the manufacture of hats, the following named machinery is used:

Fur Choppers	Fur Feeders
Fur Grinders	Fur Hat Formers
Crown Pouncers	Spray Formers
Dag Tearing Machines	Sizers
Snip Feeders	Body Rounders
Blowers	Whizzers
Fur Mixers	Second Sizers
Shaving Machines	Lathes
Printing Presses	Brush Brim Pouncers.

These machines are all made in Danbury by several machinery plants, which is of great advantage to the hat manufacturers as repairs are readily available.

All the overhead costs of hat manufacture are low in Danbury.

Tax assessments are particularly favorable, being assessed at two thirds valuation and the total tax rate is \$2.75 per \$100.

#### Marketing the product.

New York City is the hat market of the country.

Fully 70% of the fur felt hats made in the United States are shipped to New York for distribution through the jobbers and wholesalers or sold direct to the large retailers of that city.

For this reason the advantage of being within easy access to this market is a decided advantage to the Danbury hat manufacturer.

Many of the local manufacturers have offices in New York as follows:

D. E. Loewe,	14 Waverly Place,
A. Shelton Davenport,	285 Mercer St.,
F. D. Tweedy & Co.,	11 Waverly Place
E. A. Mallory & Sons	234 Fifth Ave.,
Delohery Hat Co.,	27 West 4th St.,
John W. Green & Sons	21 Washington Place
Von Gal Hat Co.,	1178 Broadway
The Bates Company	739 Broadway
Murphy-Gorman Co.,	46 West 4th St.,
The Danbury Co.,	5 Waverly Place
Hill & Loper Co.,	1161 Broadway
F. E. Lee Co.,	17 Washington Place.

Daniels & Trimpet sell all their products from their Danbury office.

D. E. Loewe, M.A. & J.C. Beltaire Co., A. Shelton Davenport, Hill & Loper Co., F. D. Tweedy & Co., E. A. Mallory & Sons, and F. H. Lee Co., employ road salesmen and sell to the general trade.

The Diamond Hat Co., sells largely to jobbers.

Several of the Danbury hat manufacturers are extensive advertisers and their ads. have been noted in trade journals as follows:

F. H. Lee Company  
 E. Mc Lachlan & Co.,  
 S.A.C. Hat Co.,  
 George Mc Lachlan  
 D.E. Loewe Co.,  
 Hill & Loper Co.,  
 Columbia Hat Co.,  
 John W. Green & Sons.

It would appear beneficial to the general development of the hat industry of Danbury if the advertising of Danbury hats was made still more extensive and prominent.

Throughout the country the word Danbury in connection with hats means high quality and this prestige and prominence to the name Danbury must have a large selling value to every local hat manufacturer.

The more this name can be strengthened in the general hat trade the better for Danbury manufacturers.

Even such large retailers as Cotrell & Leonard of Albany, who have hats manufactured with their trade name, are proud to state in their advertising that their hats are made in Danbury.

Cooperative advertising such as is being done by the St. Louis hat makers and shown on an accompanying page might be to the advantage of local hatters in giving prominence to the name Danbury.

Comment is made regarding the decrease in production of stiff hats and the increase in the sales of soft hats. The reason for this appears to be more in the trend of fashion than anything else. The automobile has little to do with it, as caps and not hats are commonly worn by autoists.

The handsome shapes and styles in which soft hats have been produced have taken the fancy of men, which accounts for their increasing sales.

The stiff hat is however the distinctively dressy hat and its use will continue normally with the possibility of its return at times to much of its former vogue.

Stiff hats constituted fully 75% of the hat output of Danbury, but now constitute only about 25% of the total.

#### Power Conditions.

While nearly every hat plant in Danbury uses electricity to some extent for power, the industrial processes of hat making require the use of live steam, and for this reason most of the hat shops have steam plants and some of them operate entirely by steam.

For this reason the high price of coal in Danbury or rather the high freight cost of \$2.60 per ton on coal to Danbury is something of a handicap to the industry.

This can be understood when it is realized that some of the hat plants use as much as 6,000, 3,000, 2,000, and 1,000 tons of coal per year.

The power requirements of the hat plants are as follows:

	<u>Steam h.p.</u>	<u>Electric h.p.</u>
F.H. Lee Co.,	1350	(Make their own)
John W. Green & Sons	100	50
E. A. Mallory & Sons	850	200
D.E. Loewe	100	10
Bethel Mfg. Co.,	75	
Bethel Hat Forming Co.,	300	
Baird-Unteidt Co.,	100	35
Hoyt-Messenger Co.,	375	125
H. Mc Lachlan & Co.,	250	50
M.A. & J.C. Beltaire	250	
Diamond Hat Co.,	20	40
A. S. Davenport	20	40
N. Barochi Co.,	10	
C.M. Horch	50	
Delohery Hat Co.,	300	60
Von Gal Hat Co.,	125	10
S.A.G. Hat Co.,	90	10
Murphy Gorman Co.,	90	10
Simon & Keane	150	
Bates Company	225	
Meeker Bros. Co.,	150	
Herman Walther		45
Hatch & Co.,		35
Cuff Hat Co.,		64
Columbia Hat Co.,		72
Geo. Mc Lachlan		95
Short Hat Co.,		2
F.D. Tweedy & Co.,		15
New England Hat Co.,		6
Danbury Co.,		125
C.J. Horch		9

By large consumption of current some of the manufacturers obtain as low a power rate as  $1\frac{1}{2}$  cents per k.w.h.

#### Traffic Conditions.

The slowness of freight delivery service over the New York & New Haven railroad system is more or less a handicap on the hat industry of Danbury.

This delay results in much shipment of hats by express that should be made by freight.

However a considerable bulk of the hat production of Danbury is shipped out by express anyway and the express service is fully as important to the hat interests as the freight service.

During the last months of 1916 there was an average shipment of hats by express from Danbury of 900 cases per day.

The less than car load (l.c.l.) or package freight service from Danbury in less prosperous periods is excellent there being 35 "package" freight cars out of Danbury daily.

Supposedly a "package" freight car leaves Danbury every night for delivery of contents in New York the next morning. In fact however congestion at the Harlem River yards holds up these cars and the freight is thereby delayed in delivery several days.

## MANUFACTURING COSTS

In an effort to learn the comparative costs of hat manufacturing, as between the four principal felt hat producing points, Danbury, Philadelphia, Newark and New York, it was necessary to study to some extent the details of hat manufacturing costs using as a basis some specific grade of hat and some specific plant capacity.

The accompanying table of costs is an estimate obtained through data supplied from several sources. The mixtures of furs vary so greatly at different plants that the total costs at one plant would vary considerably from the total costs of any other plant of the same quantity capacity, and these figures must only be considered as an estimate and a means for securing comparisons. The figures given do not include overhead, selling costs, clerical and executive force, rentals or interest on real estate, depreciation or repairs and with these added it can be seen that the margin of profit on a dozen hats at present manufacturing costs is very small, if any. It cannot be learned that there is any material difference in costs in any of the four cities mentioned.

The union labor scale prevails in all these places and the price of fur is practically the same, and also of the other materials used. Danbury appears somewhat at a disadvantage on freight and express rates.

From Philadelphia, New Haven, Yonkers and Fall River the rates to New York are lower than from Danbury, as can be seen by the accompanying table. This is because these towns have water rates which have a tendency to lower rail rates.

The competition between express companies in Philadelphia has had a tendency to lower express rates from that city.

A number of motor express lines between Newark and New York have had the effect of lowering express and freight rates from that city.

These lower express and freight rates in other cities do not make a large enough total item of cost to the hat manufacturers however to give these cities any particular advantage over Danbury, and they are more than offset by the lower overhead costs that prevail in Danbury.

### COST OF HAT MANUFACTURE IN DANBURY

Estimated on the basis of a hat plant employing 300 persons and having a production of 200 dozen per day (50,000 dozens per year) the estimate being based on a production of complete soft hats selling at \$18.00 per dozen wholesale under normal conditions.

Labor - 300 persons (280 days)	\$250,000
Power and fuel-steam plant-public service	8,000
Fur - 91,500 lbs. ECBK @ \$3.00 lb.	274,500
" 27,500 " Short @ 40¢ "	11,000
" 18,500 " blown @ 1.00 "	18,500
Silk bands -50,000 doz. @ 1.25 per doz.	62,500
Leathers 50,000 " " 1.50 " "	75,000
Reeds 50,000 " " .16 " "	8,000
Paper boxes 50,000 " " .35 " "	17,500
Shellac 25,000 lbs. " .39 per lb.	9,750
Dyes 300,000 oz. " 1.50 " "	28,125
Alcohol 7,500 gal. s-@ 60¢ gal.	4,500
Cases 16,666 cases @ 45¢ & 1.00	11,900

### HOW MANY RABBITS IN A HAT?

As fur felt hats are made almost entirely from rabbits fur, the question naturally arises as to how many rabbits it takes to make a hat.

The answer is: - Three and eighty two-one hundreths rabbits.

About one third of the fur used in most hats comes from the backs of Australian rabbits. Two thirds of the fur used in hat manufacture is known as B.C.B.K. which means, "Best coney backs" and these come largely from France, the coney or coney being the European rabbit. But the one third Australian rabbit fur is a large item, when the total consumption is considered and the question has been considered seriously as to whether rabbits of the Australian variety could be bred in this country on a commercial scale at a profit for their fur bearing value in the same way that foxes are being bred now commercially for their fur.

The United States Government Agricultural Department has investigated this subject to some extent and has made a report which would indicate that such a field of industry would not be profitable.

Since the beginning of the Equopean war the price of all fur has steadily risen until now the American hat manufacturers are confronted with the necessity of largely increasing the selling price of hats or of shutting down their plants.

The high prices of fur do not necessarily mean that there is a fur famine or a very great fur shortage. The increasing prices are due to the high costs of transportation and the large difficulties and risks involved.

Best coney backs that were selling in September 1916 at \$1.65 per pound had in March 1917 risen to \$4.50 per pound.

The dwindling fur importations are indicated by the government records. These show constantly decreasing quantity importation for the past year through increasing valuation of furs has at the same time apparently kept up the totals so far as value is concerned.

Dealing in furs is a very important business in New York. The trade is largely centralized in the wholesale section in the vicinity of Washington Square. One feature is the Hatters Fur Exchange at 23 Washington Place.

The Australian rabbit is of the same species to which all domesticated rabbits belong, (*Oryctolagus cuniculus*). Its introduction into the United States as a wild animal might prove a disastrous experiment as far as farmers are concerned, but there are domesticated breeds of rabbits which produce even better fur.

As to the use of rabbit fur for hat manufacture, even the wild rabbits native to this country are contributing. A fur buyer in Baltimore handles about sixty thousand pounds of skins annually and is now paying twenty cents a pound for them. This is less than two cents per skin, but double the price paid before the war. It can readily be seen that the raising of rabbits for hatters' fur would not be a profitable business.

More skins of rabbits are collected and sold annually than of all other fur animals combined. Before the present war, Great Britain imported each year from 70,000,000 to 90,000,000 skins, while the home production added 30,000,000 more. The imported supply came from Australia and the nearer European countries. France, Belgium, Germany, the United States, and other countries also use large quantities of this fur. The bulk of it is sold in bales, bringing from 10 cents to 50 cents per pound, dependent on color and quality. The better class of skins sell by the dozen, bringing from 50 cents to \$1, that is, less than 10 cents each.

Baled rabbit furs are bought largely for felting purposes, the fur being made into cloth or coarse hats, while the skins are utilized for manufacturing glue. Fine hats are made of nutria (the fur of the South American coypu) or of nutria and rabbit fur mixed. The fur of the common wild rabbits of America does not felt well and is in slight demand. Whole skins of these animals seldom sell for more than 1 or 2 cents each.

The better kinds of rabbit skins are used for making fur garments, which, when made up, are commonly sold as "cony", but



often under other trade names. White skins are made up in imitation of arctic fox, or sheared in imitation of ermine. Gray rabbits are dyed brown or black and become "Baltic black fox" or "Baltic brown fox"; seal-dyed, they become "inland seal," "Electric seal," "coast seal," or "near-seal." Reputable furriers avoid such names, or, if they use them, frankly explain that the goods are cony or rabbit. These garments, while handsome and comfortable, have little durability and are therefore cheap.

Statements to the effect that certain breeds of rabbits produce pelts of high market value are unwarranted. The long-haired breeds, such as the Angora and the Siberian (both white animals) have poor pelts and the hairs are not well set in the skins. The short-haired varieties are much alike as to strength of pelts, but vary considerably in color. The English black-and-white has striking colors that might appeal to the fancy of individual wearers of fur garments, but they are not popular in the fur trade. Skins of piebald rabbits of any shade sell for less than those of solid colors. There is also a difference in quality of fur between hutch rabbits and those kept in the open, the latter having the better pelts.

Besides exaggerated statements as to value of fur, advertisements of fur rabbits contain totally false claims as to the origin of animals offered for sale. This practice is not a new one, for about 60 years ago, when the now well known Himalayan rabbit was first bred in England, the statement that it originated in the Himalayan Mountains was believed by a fellow of the Zoological Society of London, who described and figured the animal in the society's journal as a new species. Rabbits recently advertised as fur animals are said to have been imported directly from Siberia in one instance, and from Mongolia in another. The further statement that the animals exist in these countries in a wild state is advanced. As a matter of fact well known to naturalists no wild rabbits occur in either country and the few species of hares found there are small gray animals that turn white in winter. The support of the financial testimony of an unknown naturalist who claims to have re-

sided in Siberia and to have observed the animals in the wild state does not help the case.

So far as the "black Siberian hare" is concerned, any experienced breeder of rabbits can readily identify the animals at first sight. They are undoubtedly the common European rabbit of the Flemish giant breed. In this variety black is a constantly recurring color and sometimes appears among litters of the purest bred strain. These black individuals are usually regarded by fanciers as undesirable and are discarded. However, if the black stock be chosen for reproduction, a black strain of Flemish giants is obtained in which bluish gray individuals recur from time to time, as several breeders in the United States have proved. Such a strain of Flemish giants is now offered as a new species imported directly from Siberia, a country without rabbits unless carried there as domestic animals.

It is not to be inferred, however, that black Flemish giant rabbits have no fur value. On the contrary, owing to their great size and solid color, the skins will probably sell for more than those of most other breeds.

All known breeds of domestic rabbits belong to a single species, the European rabbit, whether they are known as Belgian hare, Flemish giant, Siberian, Himalayan, Dutch, Japanese, Kai-Gai, or any other name, and the attempt to palm any of them upon the public as a new species imported from a portion of the world not inhabited by rabbits is wholly unwarranted and to be severely condemned.

Formerly the railroad permitted the packing of hats in crates instead of cases, but stopped this practice adding to both packing costs and weight. The local hatters believe the right to pack hats in crates should be restored.

The reasons for the slowness of freight service and suggestions relating to same are covered in the traffic chapter of this Survey.

The complaints are generally in the hat industry and the need of finding some remedy to existing conditions is apparent.

The question of freight and express rates on hats is one of important and the following comparison of such rates to New York from various hat manufacturing points will be of interest. The rates given are per 100 pounds.

	<u>Express</u>	<u>Freight Wood Cases</u>
Fall River	1.00	.07
Yonkers		.147
New Haven	.75	.15
Philadelphia	.57	.19
Danbury	.75	.24
New Britain	.75	.28
Hartford	.70	.30
Williamsport, Pa.	1.40	.368
Nashua, N.H.	1.00	.38
Buffalo	1.40	.413
Cumberland, Md.	1.50	.46
Wheeling, W.Va.	1.70	.473
Springfield, Mass.	1.00	.56
Toledo	2.15	.61
Baltimore	1.00	.64
Chicago	2.40	.79
St. Louis	2.60	.922

The possibilities for a central ware house system such as has been successfully adopted by the furniture manufacturers at Grand Rapids, Mich. might be worth considering. By combining their shipments to secure car load rates these manufacturers have greatly lowered their freight delivery costs and are able to secure quicker delivery than through l.c.l. shipments and l.c.l. shipments are greatly facilitated.

One of the great needs of the hat industry in Danbury is a first class textile and hat dyeing works. Such an establishment would do dyeing for the hat manufacturers cheaper and better than they can do it themselves.

## STATEMENT ON THE MANUFACTURE OF WOOL AND FUR FELT HATS.

COMPARATIVE SUMMARY; 1909 and 1914.

	U. S. Census			1909	Percent of increase (1) 1909-1914.
	1914				
	Wool-felt hats.	Fur-felt hats.	Total.		
Number of establishments	30	224	254	304	-16.4
Persons engaged in manufactures..	1,372	22,932	24,304	29,128	-16.6
Proprietors and firm members ..	33	163	201	300	-33.0
Salaried employees .....	85	1,451	1,536	1,868	-17.8
Wage earners (average number)	1,249	21,318	22,567	27,050	-16.6
Primary horsepower.....	3,091	20,851	23,942	21,766	10.0
Capital.....	\$ 2,608,839	\$ 39,401,429	\$ 42,010,268	\$ 38,209,342	9.9
Services .....	747,131	14,000,263	14,747,394	17,433,235	-15.4
Salaries.....	147,553	1,929,451	2,077,004	2,222,350	- 6.5
Wages.....	599,578	12,070,812	12,670,390	15,210,885	-16.7
Materials.....	978,339	16,947,058	17,925,397	24,581,494	-27.1
Value of products.....	1,944,484	37,349,744	39,294,228	52,247,041	-24.8
Value added by manufacture (value of products less cost of materials).....	966,145	20,402,686	21,368,831	27,665,547	-22.8

(1) A minus sign (-) denotes a decrease.

# The "TOP-LINER"



ANOTHER *of* OUR  
UNIQUE DESIGNS

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*Made in our Surpassing Light-weight Felt*

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**D. E. LOEWE & CO.**

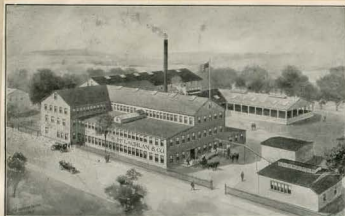
14 Waverly Place

New York

Factory: Danbury, Conn.

Sold at  
17 WASHINGTON PLACE  
NEW YORK CITY

Made at  
Danbury  
Conn.



**H. McLachlan  
& Co.**

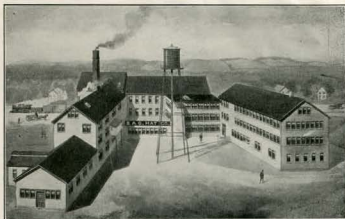
*Hats in the  
Rough*

Rowan Street  
DANBURY, CONN.

**S. A. G.  
Hat Co.**

*Hats in the  
Rough*

Taylor Street  
DANBURY, CONN.



BOTH FACTORIES UNDER THE EXCLUSIVE  
PERSONAL MANAGEMENT AND CONTROL OF

**HARRY McLACHLAN**

The high Standard of Quality established with this business has been  
maintained ever since.

*"They are started right with good materials."*

GEORGE M<sup>C</sup>LACHLAN  
DANBURY, CONN.



**ÆTNA**  
THE  
**INSURED HAT**  
THE HAT WITH A POLICY

New styles for immediate delivery,  
 and for early Spring.

An insurance policy in each hat  
 insures your customers satisfaction  
 or a new hat.

Write for a man or prepaid samples.

**SOFT—\$24.00—STIFF**  
UNION MADE

**COTRELL & LEONARD**

*The Insured Hat People*  
 ALBANY, N. Y. DANBURY, CONN.



CONSIDER THE POSTAGE STAMP MY SON.  
 ITS USEFULNESS CONSISTS IN ITS ABILITY TO  
 STICK TO ONE THING UNTIL IT GETS THERE.  
 JOSE BILLINGS.



**OUTWARDLY**, there isn't much difference between hats at a given price, but  
 there is a **difference** according to the organization that makes them—its equip-  
 ment—its experience—its economies—its standards—its pride in its product.

The principles incorporated into the policy of this house when first founded and  
 ever since steadfastly maintained, are absolute honesty in manufacture, with full  
 value always.

**Efficient Service** is the keynote of our policy—and our manufacturing organization  
 is ready to "make good" at all times.

The reputation of Hi-Lo Felt and Howard Hats is firmly established and will be  
 firmly upheld.

**THE HILL and LOPER CO.**

NEW YORK SALES ROOM: 1161 Broadway

FACTORY: Danbury, Conn.



**STIFF  
 HATS**

"Correct Styles at  
 the right time."

**JOHN W. GREEN & SONS**

FACTORY: DANBURY, CONN.

NEW YORK SALESROOM: 21 WASHINGTON PLACE

# Soft Hat Bodies in the Rough

*Ready to Finish*

---

In All Colors  
Fine and Medium  
Qualities

---

*FULL VALUES and PROMPT SERVICE*

**COLUMBIA HAT CO.**  
DANBURY, CONN.



# SAINT LOUIS HATS

Are Business  
Winners

*Keeping Up  
the Quality  
and  
Delivering  
the Goods*



SAINT LOUIS TO THE FRONT

Is the policy that has given this great Western market the greatest year in all its history.

Apple Hat Co.  
1121-1123 Washington Ave.

Rothschild Bros. Hat Co.  
1100-1104 Washington Ave.

Gauss-Langenberg Hat Co.  
Twelfth and St. Charles Sts.

Shelton Panama Hat Co.  
1508 Washington Ave.

Harris-Polk Hat Co.  
1227-1229 Washington Ave.

Sloan-Force Hat Co.  
1606-1608 Washington Ave.

White-Branch-Shelton Hat Co.  
1511-1515 Washington Ave.

THE FUR INDUSTRY .

Because fur is the chief material in felt hat manufacture, the preparation of fur for the use of the hat factories has developed into a very important industry in Danbury ranking next to hats in value of annual production.

There are seven establishments in this group employing 507 persons (of which 163 are females) and paying out \$313,200 annually in wages.

These seven establishments represent assets of \$746,000 and had a production in 1916 valued at \$2,680,000.

These establishments altogether occupy 181,000 square feet of floor space and require 1190 primary horse power.

The largest of these plants is that of the American Hatters & Furriers Co., which has an annual pay roll of nearly \$200,000.

These establishments and the number of persons employed in each are as follows:

American Hatters & Furriers Co.,	325
Peck Fur Company	125
Mutual Fur Cutting Co.,	20
F. Young Sons Co.,	18
Asher Papish	10
William Beckerle	6
D. Susintsky	3

While these establishments have grown up in Danbury as a sub-development of the hat industry, their presence here is a valuable asset to the hat industry, making raw material readily available at a lower cost than would be the case in communities where the manufacturers must have their fur supply shipped entirely from New York.

There is probably 2,000,000 pounds of fur used annually by the hat makers of Danbury and about half of this or 1,000,000 pounds is supplied by the local fur establishments.

The fur used for hat manufacture comes largely from imported rabbit skins, though imported hare and nutra are used to some extent as well as domestic muskrat and beaver. The hair of the domestic rabbit is only used in small quantities as it is inferior in quality. Most of the rabbit hair used comes from Australia, the skins being imported to New York and shipped from there to Danbury by freight.

Most of the fur establishments cut the fur from these skins on special machinery and prepare the hair by a thorough cleaning and blowing process for the hatter's use.

Three of the establishments however, P. Youngs Sons Co., Wm. Beckerle, and D. Susintski, specialize in reclaiming, cleaning and preparing fur clippings some being purchased from the hat shops and fur shops.

There is more or less local market in Danbury for domestic rabbit skins and near-by farmer boys can earn a little extra money in the fall and winter months through rabbit hunting.

The hatters fur establishments find a valuable bi-product of their industry in the skins of the rabbits. These skins are so cut into shreds in the process of taking off the hair that their only use is in making glue and shellace.

The Connecticut Blue Company has developed in Danbury because of this supply of raw material furnished by the fur houses.

Parts of the rabbit skins, notably the tails, also have a market for use in fertilizer plants.

Labor in the hatters fur industry is well paid, the men receiving from \$12.00 to \$18.00 per week and the women from \$9.00 to \$12.00. All these establishments operate as "open shops" on a 55 hour week schedule.

Some of the machinery used in the fur establishments requires a considerable amount of power for operation, the American Hatters & Furriers Co., having altogether power equipment amounting to nearly 600 horse power. This includes a 400 horse power steam plant, 90 horse power derived from water wheels and 90 horse power electric. The water power of this company is the only one of any size on the Still River.

The Peck Fur Co., has a 150 horse power electric equipment and P. Young Sons Co., a 125 horse power steam plant.

While the hatters fur industry of Danbury has already grown to considerable proportions there is no reason why it should not develop further and as men are largely employed it would appear to be a desirable industry.

As fully half the hair used by the local hat shops is purchased outside of Danbury it seems likely that fur houses in New York could be induced to locate here and thus secure some of this business.

The raising of Australian hares in the same manner that foxes, skunks and other animals are now being raised for this fur offers possibilities.

## American Hatters and Furriers Company, Incorporated

CHARLES D. PARKS PRESIDENT and MANAGER

WARREN C. MERCIER TREASURER

Importers of Rabbit, Hare, Nutria Skins, Etc., Manufacturers of Hatters' Furs.

CABLE ADDRESS: FURFACTOR, DANBURY, CONN.

NEW YORK OFFICE  
123 Marner Street  
Telephone 257 Spring

CODES: A.B.C. 5th EDITION, WESTERN UNION  
BRANCHES: PARIS, LONDON, LEIPZIG.

FACTORIES:  
Danbury, Connecticut  
U. S. A.





### LEATHER GOODS INDUSTRY

Considering the extent of leather and leather goods manufactured in New England, it would seem possible that Danbury might secure some share in the development of this industry.

This is particularly true of shoe manufacture in which New England leads.

There are ten shoe manufacturing plants in Connecticut and 464 in Massachusetts and yet Danbury has not a single establishment of this kind.

Outside of the shoe industry there are 18 plants in Connecticut manufacturing leather goods and excepting the Shepard tannery at Bethel and the sweat band establishments of Danbury, there are no plants located here making any of the large variety of leather goods that find such ready market in New York City.

The tannery of G. A. Shepard Sons & Co., at Bethel is an establishment of considerable importance employing 98 men and having a production of over \$500,000 annually.

The manufacturers of sweat bands in Danbury are as follows:

D. Decker & Son  
Isaac Armstrong & Co.,  
Clark Box Co.,  
A. F. Hayward.

All of these are engaged in other lines of manufacture but their sweat band departments altogether employ 27 persons and pay out over \$16,000 annually in wages and produce sweat bands for the local hatters to the amount of over \$50,000 annually.

W. C. Peffers, the harness maker is also included in the leather products group of industries although employing only three men.

About 40 per cent of the leather used by the local sweat band makers is supplied by the Shepard tannery.

This tannery also specializes in leather for traveling bags and for this reason it would appear that some trunk and bag manufacturer now located elsewhere could be induced to remove to this locality where he could be near the supply of raw material as well as close to the New York sales market.

The Shepard tannery uses as material, split sheep skins which are imported from New Zealand and shipped here from New York.

More tanneries would prove desirable industries for Danbury as they employ a male help and the wages are high, the men averaging \$18.00 per week.

The location of tanneries near ample supply of hemlock bark was desirable in former years but this condition does not now prevail, other materials being largely used for tanning. The Shepard tannery uses Sumac imported from Sicily.

There are a number of large tanneries in Newark, N.J., and this is tending to develop the glove and shoe industries in that city.

There are 352 establishments in the United States engaged in the manufacture of leather gloves and mittens and these produced goods in 1914 to the value of \$21,614,100.

New York State leads in the production of gloves having 216 factories or two thirds of the total. Illinois is second with 88 plants and California third.

The glove industry in New York state is largely centered in Gloversville, and vicinity but there is no reason why kid gloves or any other kind of gloves cannot be manufactured profitably in Danbury.

The location of so many tanneries in Massachusetts explains to an extent the large development of the shoe industry in that state.

There are 740 tanneries in the United States, and these produced leather in 1914 to the value of \$367,201,708.

Of the 740 plants in the country manufacturing leather, Massachusetts has 130, Pennsylvania 120, New York 100, New Jersey 66, Illinois 30, Ohio 28, Maine 13, New Hampshire 8 and Connecticut 7. X

These plants consumed 138,547,692 hides and skins in 1914.

## HAT LEATHERS

Tanners and Manufacturers of

### SKIVERS and ROANS

for Hats, Caps and Panamas

Renovators note a few seconds at **\$9.50**  
per gross. Assorted colors.

### Reeding and Printing

Send for sample pad and prices

THE GEO. A. SHEPARD & SONS CO.  
BETHEL, CONN.



## THE SHOE INDUSTRY

There was a small shoe factory in Danbury a number of years ago but it went out of business because of unprogressive management.

There is no reason why Danbury should not have shoe factories.

While the industry is centered in Massachusetts there is no logical reason for this and changing conditions are gradually spreading the industry to other parts of the country.

Danbury's adjacency to New York is a strong advantage for the development of shoe manufacture at this point and the industry is of a character to warrant effort to develop.

It is quite within the possibilities that some Massachusetts shoe manufacturers might be induced to remove here to establish branch plants here. Changes are taking place constantly in this industry offering opportunities of this kind.

There are 1,355 shoe manufacturing establishments in the country, turning out 292,666, 468 pairs of shoes in 1914, valued at \$501,707,937.

As is well known, Massachusetts is the most important shoe manufacturing state of the Union, 464 or one third of the total number of establishments being located in that state. New York ranks second with 235 plants, Pennsylvania third with 131, Ohio fourth with 62, Wisconsin fifth with 61, New Hampshire sixth with 55, Maine seventh with 50, Missouri eighth with 49, Illinois ninth with 47, New Jersey tenth with 42, Michigan eleventh with 24, California twelfth with 16, Minnesota thirteenth with 14 plants.

The efficiency of any one location for shoe manufacture is based not only upon the actual cost of manufacture, but upon the availability of materials and nearness to market.

Without question, the present advantage of cost of manufacture and convenience, is in favor of the Massachusetts cities, where such a large amount of skilled labor is available and where various allied industries are located, making the materials and supplies used in the manufacture especially available.

As in other lines of industry, many branches of the manufacture of shoes have been specialized, manufacturers finding it more economical to have as much of the special work as possible done outside of their plants. For example, at the present time there are over 50 establishments devoted wholly to operations performed on materials furnished by others. Of these 24 do stitching, 8 make button holes, 4 do crimping and 17 do contract work in whole or in part. As it is to the advantage of the silk industry in Paterson to have commission throwsters, reed and harness workers, dyers, silk machinery manufacturers etc., readily available, so it is of advantage to shoe manufacturers to have subsidiary and allied industries available and the more of these allied industries that can be secured the greater will be the possibilities for the development of the industry as a whole.

Welted shoes form over 40% of the total output of boots and shoes in the country, and what is known as Mc Kay shoes form 37% of the output. Turned shoes form about 12% and wood or metal fastened shoes about 10%. About 60% of the shoes manufactured are men's shoes and the balance women's and children's shoes.

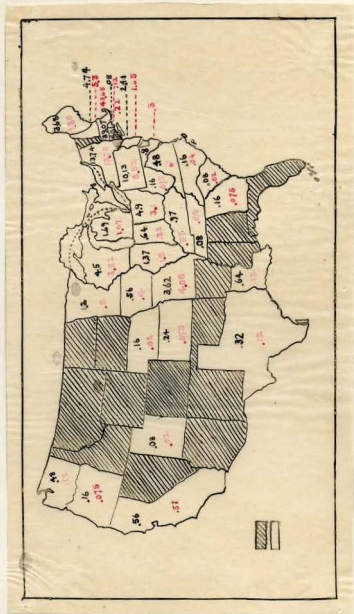
The total production of shoes for 1914 by classifications is shown in the following table:





Number of establishments.....	1,355
PRODUCTS	
Total number of pairs.....	<u>292,666,468</u>
Boots and shoes, pairs.....	<u>252,516,603.</u>
Men's .....	98,031,144
Boys' and youths' .....	22,895,719
Women's .....	80,916,239
Misses' and childrens' .....	48,322,395
Fiber .....	2,351,100
Slippers, not elsewhere specified-	
pairs	<u>17,733,689</u>
Men's boys' and youths' .....	3,666,972
Women's misses' and children's	14,066,717
Infants' shoes and slippers,pairs-	15,476,763
All other products .....	6,939,413.

The shoe industry is very highly developed in this country, and operations are conducted along well established lines. Much of the shoe machinery used throughout the country is owned or controlled by what is known as the "Shoe Trust" and this machinery is leased out to manufacturers on a percentage basis.

A large proportion of the Eastern Shoe Manufacturers are organized under the North Eastern Shoe & Leather Association of New England. This association includes some three hundred of the shoe manufacturing corporations, representing a capital of over \$30,000,000.



 States without factories

 States with "

Black figures - % of shoe factories in each state

Red " - % of " subscribers to Supt's Foreman in State



## FOOD PRODUCT INDUSTRIES & THE FARM FACTORY

The largest and most important single industry of the Danbury industrial area is the production of food products.

In the area contributory to Danbury this industry employs 15,000 persons.

The food products industry comprises two groups:

- 1- The farms which produce the raw material
- 2- The industrial plants which utilize the raw material.

Each individual farm can be likened to a factory which through certain expenditures for materials and labor turns out annually a certain amount of saleable materials.

The larger portions of the products of the farms included in the Danbury area, are sold and shipped outside of this area. Only a small portion of these products is utilized in industrial plants for the manufacture of other food products.

These few industries utilizing located in Danbury and near vicinity and using as materials the products of near by farms or the products of farms located elsewhere, are as follows:

### Grist Mills

H. E. Meeker (milling and poultry and stock food)  
Morrison & Dunham " " "

### Canning & Preserving

J. Gentenmaier, (sauer kraut and pickles)

### Macaroni

G. Pastore & Co.,

### Dairy Products

Danbury Creamery Co., (sterelized milk, butter, cream)  
Tomaino Bros. (ice cream)  
Charles Rider "  
Zepherson Bros. "  
De Klyn Bakery "

### Bakeries

Vienna Bakery  
Union Bakery  
L. Pearl  
J.J. Johnson  
Ernsts Bakery  
De Klyn Bakery  
J. De Monde  
P. Denise  
S. Corranti  
Dayton & Hurzeker

### Confectionary

Zepherson Bros.,  
De Klyn Bakery

The above 18 establishments employ 99 persons (of whom 10 are females) and pay out \$74,200 annually in wages. Their production for the year 1916 was valued at \$246,200.

The ten bakeries alone employ 68 persons and pay out over \$50,000 annually in wages.

The largest of these is the De Klyn Bakery which employs 22 persons and the products of which not only include bread, cakes and pastry but also confectionary and ice cream.

Ernsts Bakery employs 14 persons.

The employees of bakeries are well paid, master bakers receiving \$22.00 per week, 1st helpers \$17.00 per week and 2nd helpers \$14.00 per week. The bakeries operate on a 60 hour week schedule.

As the price of milk and cream is so high, resulting from the demand for the dairy output of this region for retail consumption in Bridgeport and New York, the manufacture of butter is not profitable and very few butter, creameries are in operation in Fairfield or Litchfield counties. The butter manufactured by the Danbury Creamery Co., can be considered as a bi-product being made from their surplus of milk and cream, their largest business being the supplying of the local demand for home consumption of milk and cream.

While there is large production of cereals in this region there is little milling local grains, there being largely used by farmers for their own use as feed.

The two grist mills in the Danbury area purchase their corn, oats, rye, wheat and millet from western points. They find it profitable to grind and mix these grains for stock food which is sold to the farmers of the Danbury area.

Both these mills are of a substantial character, Morrison & Dunham having a 25 horse power plant and H. E. Meek a 15 horse power milling and grinding plant.

There is very little slaughtering of animals in this vicinity to supply the local demand for meats, western meats being largely used for home consumption. The farmers of the region kill calves and swine to some extent and bring same to Danbury for sale to the local butcher shops.

It can be seen therefore that of the vast production of farm products in the Danbury area only a small portion is sold for local consumption or utilized for the manufacture of other food products.

That there are possibilities in the development of food products manufacture is indicated by a study of the farm production figures of this territory.

As shown in a previous chapter Danbury is the center of a large agricultural area and this area is outlined by an imaginary boundary line beyond which line the farmers naturally do their business with other communities.

The products of the farms that are sold and shipped by rail are of course hauled to the nearest railroad point from which they may be shipped. Thus only a small portion of the farm products

of the Danbury area is actually hauled in wagons to the railroad freight station in Danbury. A ten mile circle around Danbury would outline the utmost limits of what might be called the Danbury wagon haul territory.

The better the condition of the roads in this territory the larger will be the tonnage of farm products hauled into Danbury.

While the wagon haul is thus limited what could be properly called the Danbury agricultural area covers the major portion of Fairfield and Litchfield counties, and the town of Southbury in New Haven county, as well as liberal slices of territory in the eastern sections of Putnam, Dutchess and Westchester counties of New York state.

This area is defined on the large Danbury zone map accompanying this report. Within these boundaries the interests of the farmers are more or less identical, the character of their lands and crops similar, and their natural headquarters for the transaction of business in Danbury.

This territory is also the area that would be depended upon to provide the raw materials for any kind of specialized food products manufacture that might be undertaken in Danbury.

A study of the resources of this territory is therefore important to ascertain the local availability of raw materials.

In Fairfield County, the towns of Danbury, Bethel, Brookfield, New Fairfield, Sherman, Newtown, Monroe, Redding, Ridgefield, Wilton, Weston and Easton contain one half of the farm area of the county and it is therefore safe to assume that they produce one half of the animal crops.

In Litchfield county the towns of Woodbury, Roxbury, Bridgewater, Bethlehem, Morris, Washington, New Milford, Litchfield, Warren and Kent contain one third of the farm area of that county and it is therefore safe to assume that they produce one third of the crops of that county.

The towns of Southbury, Oxford and Middlebury in New Haven county have one sixth of the farm area of that county and produce one sixth of the crops.

Parts of the towns of Dover, Union Vale, Washington, Beekman, Pawling and East Fishkill in Dutchess county contain one third of the farm acreage of that county and therefore produce one third of its crops.

Parts of the towns of Patterson, Kent, South East and Carmel in Putnam county, contain one half of the farm acreage of that county and produce one half of its crops.

Parts of the towns of North Salem, Somers, Lewisboro, Bedford, and Pound Ridge in Westchester County have one fifth of the acreage of the county and produce one fifth of its crops.

Using these per centages as a basis of estimate and allowing for probable increase in production along certain lines we have the following figures representing the agricultural strength and production of the Danbury zone.

Total population (including villages)	101,000
Population of farm area only	34,000
Total acreage	530,236
Total acreage in farms	471,430
Number of farms	5,863
Acres of woodland	88,000
Acres under cultivation	212,000
Value of farms	\$94,286,283
Number of dairy cows	29,289

#### Production

Milk sold gals.	11,722,789
Cream sold, gals.	56,500
Butter sold, lbs.	518,092
Cheese sold, lbs.	7,017
Poultry sold (number)	232,418
Eggs sold, dozens	1,254,661
Honey produced, lbs.	38,956
Wool fleeces shown (number)	1,872
Calves slaughtered	28,091
Cattle slaughtered	19,797
Swine slaughtered	27,141
Value of vegetables produced	\$ 683,538
Corn, bushels	704,739
Oats "	225,066
Wheat "	16,827
Barley "	2,922
Buckwheat	41,067
Hay - tons	149,039
Potatoes-bu.	584,481
Tobacco, lbs.	1,164,595
Maple sugar, lbs.	4,200
Fruits, bushels	712,125
Berries, quarts	872,422

Of this immense production of the farms in the Danbury zone it would be interesting to know what proportion of the food material produced is sold to and consumed by the population of that zone, and what proportion is shipped away from that zone to feed other communities.

It would be also interesting to know the amount of food products brought into the Danbury zone for consumption that might be provided by the farms of this area.

It requires a vast amount of food to feed 100,000 persons and the greater the extent of the consumption by the local population of the products of the local area, the greater will be the benefits to the whole people of that area by keeping in circulation at home as much as possible of the money expended for food.

If there could be one superintendent of farms in control of the production of this entire area it is safe to say that the 5,800 farms would be managed more efficiently and profitably than at present. As this is impossible the next best condition would be to create greater cooperation of action among the farmers in both the production and selling of their products.

This cooperation is being accomplished to some extent through the milk leagues, the Grange and the use of the County Farm Bureau, and of the cooperation extension work of the agricultural department of Connecticut.

Fairfield County has an efficient Farm Bureau under the direction of Mr. S. J. Wright, County Agricultural Agent.

Unfortunately however the interests of the farmers in the northern and southern sections of the county are more or less divergent and for this reason a County Farm Bureau located in Norwalk is not of as much benefit to the farming interests of the northern part of the county as if this Bureau were located in Danbury.

The farmers of northern Fairfield County are much more closely associated with the farmers of Litchfield County and New Haven County and adjacent New York counties than they are with those of southern Fairfield County.

It would be a fine thing for the farmers of this section and for the industrial development of this area if the farmers of the Danbury zone had an organization of their own regardless of county and state lines and cooperated in their farm work and selling effort more fully.

It is probable that such cooperation would result in more intelligent utilization of the farm land.

Without doubt a careful study of farming methods would disclose the fact that this large area of land could be made to produce much more profit per acre than at present.

It is quite possible that such a study would not only disclose how the land could be made more productive but how it could be utilized to better advantage by development of the most profitable lines of production.

The results of farming in Fairfield County are now being made the subject of special study by the State Agricultural College. A report on 54 farms of Fairfield County shows that the net profit of these farms was from \$1000 to \$1500 per year each. The report indicates that the small farm of 40 acres is most profitable. And with dairying and fruit raising as the most profitable forms of production.

In another report by the County Farm Bureau on 46 farms located near Danbury the records showed yearly sales averaging as follows:

For milk	\$1,141.00
" cattle	337.00
" crops	317.00
" poultry	89.00

To produce the above there was an average expenditure on each farm of \$489 for feed and \$16.00 for fertilizer.

#### Dairy Products

Dutchess County ranks first in this area as a producer of dairy products having a total annual milk production of over 14,000,000 gallons. The production of Litchfield County is about half of this and Fairfield and Westchester counties rank about the same being slightly less important dairy counties than Litchfield.

The milk of this area is largely shipped to New York and Bridgeport, and two competing leagues or selling associations divide this production and each has an elaborate and well organized system for collection, shipment and delivery.





## Neuco Electric Combination Broiler, Toaster and Cake Griddle

No. 128

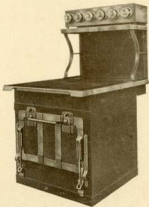
Specially Designed for  
Hotels, Restaurants and Private Residences



HE ideal device for broiling, grilling and toasting. Broils steaks, chops, etc., in eight to ten minutes, leaving the vital essences in the meat. More efficient than coal, gas or charcoal.

Waste heat is utilized for heating polished cast iron top which makes a splendid griddle. Toasts sixteen slices of bread evenly at one time. Top can also be used for keeping foods and liquids hot.

(Over)



## Neuco Electric Hotel Range

No. 510

Used by Leading Hotels, Clubs,  
Hospitals and the United States Navy



It has been demonstrated beyond argument that electricity is the ideal medium for cooking in hotels, restaurants, clubs and institutions.

Food cooked on the Neuco Electric Range, particularly roast or broiled meat, is much more savory than when cooked by old fashioned methods. There is also a big money saving, as the loss in weight is trifling, while meats cooked by coal and gas show an enormous shrinkage.

The Neuco way of cooking is a boon to the chef in other ways. The perfect system of heat regulation eliminates constant fire-tending and insures positive results. There are no ashes and soot, as with a coal fire. And—a feature that every chef will appreciate—the Neuco, by confining the heat within the oven and hot plates, keeps the kitchen cool and comfortable, while the absence of gases fumes and smoke makes the kitchen a healthy place to work in.

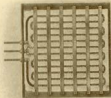
(Over)



## Description

The big outstanding features of this range are its *Durability* and *Practicability*. The Neuco is substantially constructed throughout, and does not break down under hard, continuous usage.

The Neuco Electric Hotel Range is made of heavy cold-rolled steel with polished cast iron top, ovens and doors double-walled and thoroughly insulated with, Sil-O-Cel, the most efficient of all heat insulations. This construction enables the oven to retain its heat long after the current has been turned off.



Oven Heat Unit with Expanded Metal Protector Removed

The cooking top is equipped with four 12 by 12-inch hot plates of the Neuco radiant type, enclosed in a cast iron container which provides a smooth cooking surface. By completely enclosing the heat unit the coils are protected against accident, and all possibility of short circuit is eliminated.

Each top plate and oven is controlled by a separate, three-heat switch indicating "high," "medium," "low" and "off." The high heat produces the necessary temperature quickly, the medium or operating heat holds that temperature, while the low heat is for simmering purposes. These switches may be attached to the range itself or placed on the wall near the range.

The Neuco Electric Hotel Range is not only the strongest and most practical range ever built, but its outward appearance is very attractive, the trimmings being of polished brass. The drop doors are protected by spring balances with positive catch, the wrought iron being re-infused with bronze at all joints and hinges.

This unit is a complete range in itself. Additional units can be placed side to side or back to back to meet the requirements of any size kitchen. Capacity 75 persons.

## Dimensions

Total Height, with shelf	55 inches	Floor space	31 inches
Height of cooking top from floor	32 inches	wide x 41 inches deep.	
Area of cooking top	31 inches wide x 41 inches deep.	Oven	28 inches deep x 24 inches wide x 14 inches high.
Equipment	4 Hot Plates 12 x 12 each	Shipping weight	700 lbs.
	1 Oven		1500 750 375 Watts
			3800 1900 950 "

Please state voltage when ordering.

List Price, with high shelf	\$465.00
List Price, without high shelf	450.00

Write for discount.

This range is also made to order in a five foot section, with two ovens and three top plates, 18 x 24 inches each.

**NATIONAL ELECTRIC UTILITIES CORPORATION**  
103 PARK AVENUE, NEW YORK CITY

Factory: Danbury, Conn.

# This Machine Has More Than Paid for Itself in Two Years



**TURNER  
TURRET**



The Pfeleghar Hardware Specialty Company, New Haven, Conn., owns two "Turner Turrets," one of which has been in continuous service for two years—and the Company says this machine "has more than paid for itself."

The accompanying photographs and sketch show the work. The casting is of nickel composition, tough and stringy material. All four spindles of the "Turner Turret" are used—the first drills  $\frac{1}{4}$ " hole

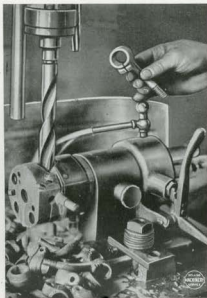
half through the piece; the second drills a  $\frac{3}{16}$ " hole through the balance of the casting; the third carries a hollow milling tool which turns off the outside and the fourth station carries a forming tool which rounds off the top face. *Production is 600 pieces in 10 hours.* Before the "Turner Turret" was installed this work was done on a screw machine, and 250 castings per day was considered good output.

The "Turner Turret" is made in several sizes and handles the same class of work as expensive chucking machines at an initial cost of about one-half. The illustrations show our Model "B" type. We shall be glad to show you what this machine can save on some of your work. Write us for details.

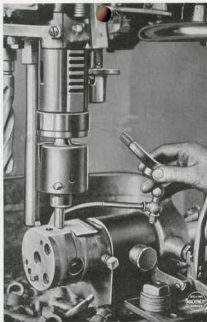
## TURNER MACHINE COMPANY

DANBURY, CONN., U. S. A. and Newark, N. J.

Incorporated with Turner, Atherton & Co., Ltd., Denton, Manchester and Stockport, England



The Turner Turret is a machine of practical design, rigid construction and wide adaptability—a machine that cuts operating time to closest limits, turns out accurate work and does not require a skilled operator. Full description on request.

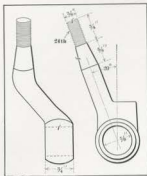


# One Minute on the TURNER TURRET

**Know any other way  
to equal this time?**

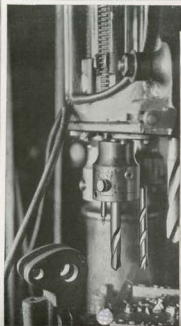
The work is the drop-forged steel lever (offset at an angle of 87 degrees) shown in the sketch at the bottom of the page, and there are four operations. A  $\frac{7}{8}$ " hole is first drilled through a  $\frac{3}{4}$ " section, then reamed. Next the opposite end is hollow-milled to size and the finished end,  $\frac{3}{4}$ " long by  $\frac{5}{8}$ " diameter, threaded with a 24-pitch thread. Production is one complete piece every 60 seconds, all day, every day, for a period of over eight months, and here's how it's done.

The work is chucked in the fixture as shown, the first turret brought into play and the hole drilled; the second spindle does its turn and reams the hole; the fixture is then turned up to present the long end for the third spindle to hollow mill, straight and taper, and the fourth spindle draws and cuts the thread. Literally faster than the work can be described. The alternative for this job would be the drill press for the first operation, a turret lathe for the other three, and a big drop in output.



**TURNER MACHINE COMPANY**  
DANBURY, CONN. and Newark, N.J. U.S.A.

Incorporated with Turner, Atherton & Co., Ltd.,  
Denton, Manchester and Stockport, England.



## TURNER TURRET

### You'll Say the Same Thing

without it." One of these is the A. O. Norton Company, Boston, makers of the well-known Norton Jacks and owners of three Turner Turrets. Two of these machines have been in use several years; the other five months—long enough for the company to know how practical and satisfactory they are.

The photos show a typical piece of work, performed on one of the old machines. The casting is a malleable iron socket for a 100-ton Norton Jack. The operations are: 1st Spindle, drill  $1\frac{1}{8}$ " hole through two  $\frac{3}{4}$ " sections. 2nd Spindle, a double cutting tool reams the lower section and counterbores the upper section. 3rd Spindle, drill a  $\frac{5}{8}$ " hole  $2\frac{3}{4}$ " deep. 4th Spindle, drill  $\frac{1}{4}$ " hole through two  $\frac{1}{4}$ " lugs. 5th Spindle, drill 5-16" hole  $\frac{1}{2}$ " deep. 6th Spindle, drill 3-16" hole and counterbore to  $\frac{1}{2}$ ". And all this work is done on the Turner Turret in 8 minutes.

*May we tell you more about this machine and the things it does?*

TURNER TURRETS are built in several sizes.

## TURNER MACHINE COMPANY

DANBURY, CONN., U. S. A. and Newark, N. J.

Incorporated with Turner, Atherton & Co., Ltd., Denton, Manchester and Stockport, Eng.

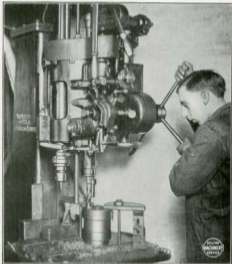
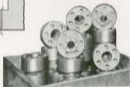
# Typical Work for the **TURNER TURRET**

Each of these steel pieces has six holes and there are four operations in each hole, that is, it takes 24 operations to complete one piece. The Turner Turret, with its four spindles, completes one of these pieces in less than 30 minutes. The work is simply clamped to the table and the successive spindles are indexed and run down to complete each operation.

There's no elaborate set-up required, and the tools can be removed in a moment and the machine set up for another job. In fact, the Turner Turret shows great profits on short-run work.



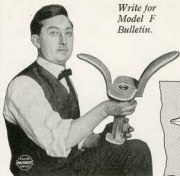
*May we tell  
you more  
about it?*



## TURNER MACHINE CO.

DANBURY, CONN., and Newark, N. J.

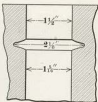
Incorporated with Turner, Atherton & Co., Ltd., Denton, Manchester and Stockport, Eng.



*Write for  
Model F  
Bulletin.*

## How Would You Machine This Hole!

This steel casting is the type of work the average mechanic would refer to as a "mean" job providing he had never seen a Turner Turret in operation. A hole 3" deep is bored, two diameters, and to make the problem interesting a recess is cut about half way down the hole. Difficult to hold, and dangerous to swing in a turret lathe, it is just the kind of a job that a Turner Turret can



handle to perfection. On the Turner Turret the work does not revolve. The tools are indexed in succession for drilling, reaming, recessing, etc. Castings of this kind are machined just as easily and quickly as small compact parts.

*Send us a sketch of the worst job of this kind that you have and we'll give you an idea of what this handy machine can do for you.*

# TURNER TURRET

**TURNER MACHINE COMPANY**  
DANBURY, CONN.      and Newark, N. J.      U. S. A.

Incorporated with Turner, Atherton & Co., Ltd., Denton, Manchester and Stockport, England



The  
**TURNER  
TURRET**

is an Accurate Machine  
as well as Productive

Precision is the rule at the Wells Bros. Company's shops, Greenfield, Mass., and for work of this character the Turner Turret can be depended upon—both for quality and quantity of output.

In the work shown (a die head) the hole is drilled to two diameters, one of which is then reamed. These three tools are automatically indexed, one after the other, without waste effort or time—and they center exactly.

*Let us show what the Turner Turret  
can do for you.*

**Turner Machine Co.**

DANBURY, CONN. and Newark, N. J.

Incorporated with Turner, Atherton & Co., Ltd.,  
Denton, Manchester and Stockport, Eng.



The **TURNER  
TURRET**

## On Second Operation Work

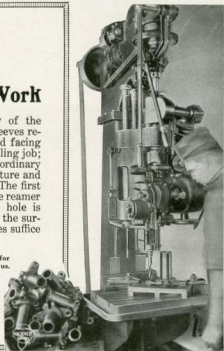
This installation shows the adaptability of the Turner Turret. Partly finished clutch sleeves required drilling, reaming, counterboring and facing (two ears on each sleeve). An ordinary drilling job; but a Turner Turret furnished a better than ordinary way of doing it. The work is held in a fixture and the four spindles of the turret are used. The first drills the hole; the second spindle brings the reamer into position; another indexing and the hole is counterbored, and with the fourth spindle the surface at the top is faced off. Five minutes suffice to finish both ears.

Doesn't this suggest Turner Turret possibilities for your second operation work? Talk them over with us.

## Turner Machine Company

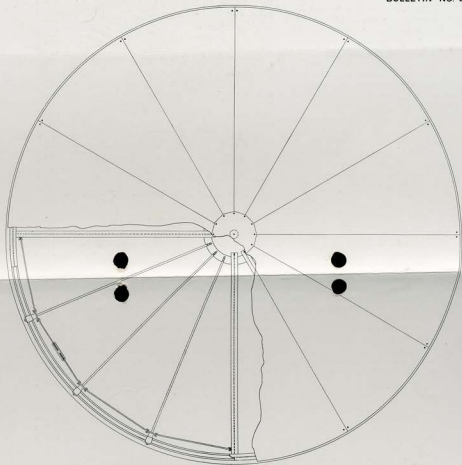
DANBURY, CONN. and Newark, N. J. U. S. A.

Incorporated with Turner, Atherton & Co., Ltd.  
Denton, Manchester and Stockport, England



**TYPE "E" ALL STEEL TURN-TABLE**

BULLETIN NO. 24



**TURNER MACHINE COMPANY, DANBURY, CONN.**



Neuco Electric Range  
No. 103  
Household Type

## A Practical Electric Range Built to Withstand Continuous Hard Usage



In the construction of this range two ideas have been constantly kept in mind—*Efficiency* and *Durability*. To be successful an electric range must, first of all, cook well. And after that, it must stand up against the wear-and-tear of everyday service.

The practical utility of the Neuco No. 103 Range as a cooking appliance has been satisfactorily demonstrated over a long period. Its durability is assured because it is "built like a battleship." Like all other Neuco products, it has rugged strength in every part. That is why the Neuco is popular wherever used—it doesn't get out of order or wear out—hence heavy repair bills are eliminated.

### Description

The Neuco No. 103 is made of heavy cold-rolled steel, double-walled throughout; walls and doors lined with two-inch Sil-O-Cel, the greatest known heat insulator. This feature gives highest cooking efficiency at minimum cost, because it literally confines the heat within the oven. The oven interiors are finished in baked aluminum. The body is of heavy "Leechburg blue" polished steel which, in contrast with the white enamel door panels, gives the entire range a very attractive appearance.

Top of range has three (four where desired) hot plates, each producing an intense uniform heat. Each hot plate is controlled by a separate switch. There are three heats: high, medium and low.

(Over)

**Type "G" Special Display Turn-table** has been designed to meet the popular demand for a motor driven Turn-table to be used for the display of merchandise in show windows, at expositions, etc. The Turn-table rests upon the floor (which need not be marred in the least). It is controlled by a push button and normally turns at a speed of one revolution every forty seconds. The machine is friction driven and is of simple design.

The idea is a good one, as is evidenced by the fact that several of these machines are in daily use by up-to-date manufacturers and dealers in various lines of trade.



TYPE "G" SPECIAL DISPLAY TURN-TABLE.

## TURNER TURN-TABLES.

### General Description.

We have manufactured Garage Turn-tables for several years. Our experience in the installation of hundreds of these machines, under widely varying conditions, has enabled us to give a Turn-table which will stand up under the most exacting usage.

A Turn-table, owing to its use and location, is subject to neglect. When used as a washstand large quantities of sand and dirt are present which show a tendency to clog the mechanism. To be a success, a Turn-table must protect its mechanism from these clogging influences. Furthermore, a Turn-table must be light, strong and well balanced. It must have stability, as well as easy turning qualities. Finally, to be available for second story installation it should be of shallow design.

When we planned the present table we considered all of these requirements. The result is, a Turn-table "par excellence", a machine which actually thrives on neglect.

**SETTING UP:** One man can set up the Turner Turn-table in a few hours time. The heaviest piece weighs approximately one hundred (100) pounds. The total weight is from three thousand (3000) to six thousand (6000) pounds according to the Turn-table diameter.

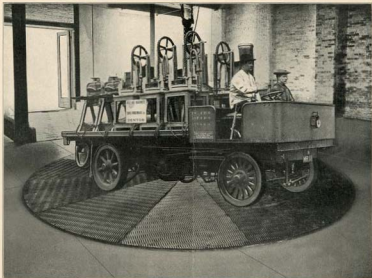
**THE TOP** is of checkered steel plates to avoid skidding. The plates are screwed on to steel "I" beams radiating from the center.

An optional floor surface of wood is often preferred on account of the considerable saving. By purchasing the necessary lumber in local markets at a cost of from \$10. to \$20., and applying the floor right on the job, a saving of from \$75. to \$150. is effected. The revolving mechanism furnished for the wood floor type is identically the same as we furnish for the all steel type of machine. Its shipping weight is 1000 pounds.

**THE REVOLVING MECHANISM** consists of a very ingenious rust-proof bearing which takes the main load at the center. It is entirely enclosed and free from accumulations of dirt and grit. The main load at or near the outside diameter is supported by (16) special steel hardened rollers revolving on an outer circular track. These rollers are attached to a spider frame which keeps them accurately spaced to carry their proportionate loads. Each roller is well protected against rust and grit. Wood bushings make them self-lubricating. Felt washers and automatically locked caps keep them clean.

For the protection of the edge of the pit we furnish with our all steel Turn-tables a channel iron ring. When it is required,—in order to harmonize with surroundings—to cover our Turn-tables with some form of surfacing material such as asphalt, tiling or concrete, we furnish an additional angle iron to protect the edge of the Turn-table surface from injury.

# The Turner Garage Turntable



Will support cars or trucks up to 10 ton burden, and 220 inch wheel base, the whole being readily turned with one hand. They last a lifetime.

Made only by the

**Turner Machine Company**  
Danbury, Conn.

# Turntable Catalogue No. 10



**FACTORIES :**

Maple Ave.,  
Danbury, Conn.

Eagles St.,  
Newark, N. J.

Whitehouse Works,  
Denton, Eng.

Virginia Mills,  
Stockport, Eng.

## **Turner Machine Company** **Danbury, Conn., U. S. A.**

Founded 1859

Incorporated with Turner, Atherton & Co., Ltd.  
Denton, Manchester and Stockport, England

**OFFICES :**

New York

London

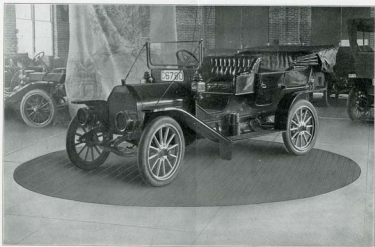
Paris

Berlin

Milan

Calcutta

Rio de Janeiro



Type A, equipped with revolving floor surface of wood.

---

### **Don't Back Into Trouble**

One accident may cost you more than several turntables. Additional space for storage of cars becomes available. This consideration alone more than compensates for the small investment. Turner Turntables are indispensable.

---



## FOREWORD

### OUR ABILITY

We offer to the turntable market our extensive experience gathered from the successful manufacture of high grade machinery for over half a century. The ability of our designers and our artisans has kept the Turner Turntable well in the van.

### RELIABILITY

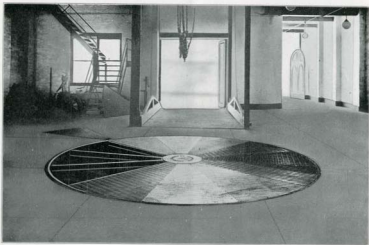
When you purchase Turner Turntables, you know our reputation is back of them and you cease to worry. Our installations in the chief cities of the east are the best possible recommendation. Ask about our turntables at any garage. We have yet to hear of a single case of even temporary failure to respond to the severest tests.

### UTILITY

We make turntables that meet the specific requirements of private, public and commercial garages. Our structural steel turntable is furnished in sizes up to 20 feet in diameter, weighing 9600 lbs. This table will support a truck weighing 10 tons, the whole being easily turned around with one hand.

### DURABILITY

Our turntable will last a lifetime. There is absolutely nothing to get out of order. We guarantee satisfaction.



Type A with 3 floor plates removed.

floor, supported on cantilever steel "I" beams, is recommended. These tables are completely assembled at our factories, then taken apart and shipped.

### Installation

The installing is easily accomplished by two men. All parts are marked with respect to each other so that no mistake can be made.

### Options

*Where the fireproof qualities of a steel top are not considered necessary, the wooden floor surface offers an ideal top. It combines economy with strength and service. When turntables with wooden floors are desired, we furnish our standard revolving mechanism only. The lumber for the floors is purchased locally and laid by carpenters working to our specifications and blue prints. By this method a great saving is effected and you secure a sterling article at a remarkably low figure.*

*We also furnish our turntables with angle iron edge adapted to be filled with asphalt, tiling, concrete or any other form of surfacing material desired to harmonize with surroundings.*



Type A as it appears before the channel ring and floor plates are assembled.

## TURNER GARAGE TURNTABLES

### Construction

The construction of the Turner Turntable is very simple. It comprises:  
1st. A revolving mechanism. 2nd. An upper or floor surface which is built onto the revolving mechanism.

### Revolving Mechanism

The revolving mechanism is a large thrust bearing. Resting upon any suitable foundation is the bed casting or track. This is cast in one piece and is accurately machined as to its rim, in which a groove is turned to receive the large ball bearings. Another casting which is a counterpart of the first, is inverted and placed directly above it. It is held in working position directly above the stationary casting or track by a "king pin," or center pin 3 1-2 inches in diameter. A locking collar, which fastens to the center pin on the under side of the base casting, prevents any possibility of dislodging the revolving casting from the bed casting.

### Floors

In floor surfaces we offer three distinct options, viz.: Wood, concrete and steel. For those who want the best at any price, our checkered steel

## CROSS SECTIONAL VIEWS



Type A. (19 3-4 in. pit.)

Showing our standard revolving mechanism covered with timber floor; this combination is recommended when depth of pit is of minor importance.



Type A. (12 1-2 in. pit.)

Showing our standard revolving mechanism covered with structural and checkered steel floor.



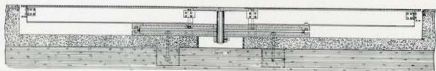
Type B. (14 1-4 in. pit.)

Showing our special shallow revolving mechanism covered with timber floor when a shallow pit is desired.



Type B. (10 3-4 in. pit.)

Showing our special shallow revolving mechanism, covered with structural and checkered steel floor. It is especially adapted for second story installations, being supported on steel "I" beams as here pictured.



Type B Truck Table. (16 in. pit.)

Showing our heavy type revolving mechanism covered with extra heavy structural and checkered steel floor. Furnished in sizes up to 20 feet diameter and 10 ton carrying capacity.

## STYLES AND TYPES

Type "A" turntables can be furnished for passenger cars in any diameter up to 15 feet. The depth of pit for this type of turntable combined with a structural steel floor is 12 1-2 inches. When the timber floor is used, the depth of pit is 19 3-4 inches.

Type "B" turntables are made especially for the upper floors of garages or wherever a shallow pit is necessary. The depth of pit for this type of turntable combined with a structural steel floor up to 15 feet diameter is 10 3-4 inches. When combined with a timber floor a pit of but 11 1-2 inches is necessary.

Type "B" truck tables are made in 16, 18 and 20 feet diameters. The depth of pit is but 16 inches.

## OPTIONS

We have here shown the most popular floor supports combined with our standard revolving mechanisms. We find they fill the conditions usually encountered in garage construction. When unusual conditions are present, we meet them by combining some one of our several types of revolving mechanisms with some of the various designs of floor structures. We can fit to order any depth of pit above 8 inches. If you have an installation to make out of the ordinary, let us figure on it. The chances are we have previously overcome the same obstacles.

The table given below shows size of turntable suitable for your car.

DIAMETER OF TURNTABLE.	WHEEL BASE OF CAR.
11 feet	107 inches
12 feet	118 inches
13 feet	132 inches
14 feet	145 inches
15 feet	156 inches
16 feet	170 inches
17 feet	182 inches
18 feet	195 inches
19 feet	208 inches
20 feet	220 inches

These figures are based on a 56 inch tread; they allow 8 inches of clearance around the four points of wheel contact.

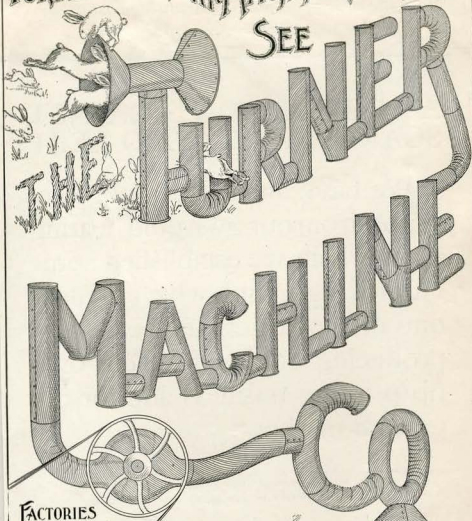
If you are building a garage, don't fail to consider what an **efficient turntable** can save you in trouble, accidents and delay.

You need a **washstand**, of course. It may suit your convenience to **use our turntable for this purpose**. It serves admirably and you get two necessities for the cost of one.

If you cannot make up your mind that a turntable will help you out, "think it over." **Place our literature on file**; you will doubtless find it of interest at some future time.

We furnish drawings and specifications for all classes of foundations. Let us hear from you when you plan your improvements.

FOR ALL YOUR HAT-MACHINERY WANTS.



FACTORIES

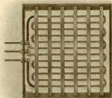
Danbury, Conn., and Newark, N. J., U. S. A.  
Denton and Stockport, England.

OFFICES LONDON, MANCHESTER,  
PARIS, RIO DE JANEIRO.

THE LARGEST BUILDERS OF  
HAT MACHINERY IN THE WORLD.



Incorporated with TURNER, ATHERTON & CO., Ltd.  
Denton, Manchester and Stockport, England.



Oven Heat Unit with Expanded Metal Protector Removed

Equipped with the famous Neuco radiant type heat unit, which is practically indestructible and cannot short-circuit. Controlled by a three-heat snap switch indicating "high," "medium," "low" and "off." The "high" heat is used for broiling and toasting; the "medium" for operating griddle; and the "low" to keep the apparatus hot for intermittent use.

Equipped with adjustable wrought steel grid and heavy wrought iron drip pan. Made of heavy enameled cold-rolled steel, doubled-walled, and insulated with Sil-O-Cel, the best heat-resisting material in existence.

Strongly built throughout, and guaranteed to give satisfactory service in continuous usage.

#### Dimensions

Total height . . . . .	43 inches	Broiler inside, 18 inches x 15 inches
Floor space, 21 inches x 14 inches		Griddle . . . 14 3/4 inches x 22 inches
Shipping weight . . . . .		150 lbs.
Consumption at "high" heat . . . . .		3400 Watts
Consumption at "medium" heat . . . . .		1700 Watts
Consumption at "low" heat . . . . .		850 Watts

Please state voltage when ordering

List Price \$..100.00

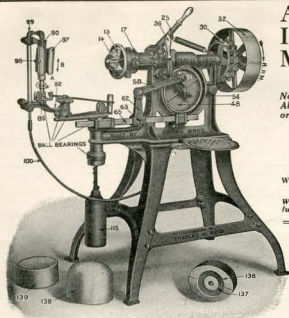
Write for Discount

Equipped with oven 20 inches high, for all kinds of roasting and baking, extra \$25.00

**NATIONAL ELECTRIC UTILITIES CORPORATION**

**103 PARK AVENUE, NEW YORK CITY**

Factory: Danbury, Conn.



# AUTOMATIC IRONING MACHINE No. 3

## BALL BEARING

*No Friction and Waste of Power  
Absolutely Even Pressure of the Iron  
on all parts of hat.*

*Pressure equal to the weight on  
weight-cord and consequently un-  
der perfect control.*

*No irregularity through wear as  
all play is easily "taken up"  
by cones.*

**We Guarantee COMPLETE Satisfaction on  
All Shapes and Qualities**

**WRITE or PHONE for circular containing  
full information, claims and guarantee**

**DORAN BROS.**  
*Successors to Charles H. Reid*  
**DANBURY, CONN.**

**European Representatives:**  
**HAT MANUFACTURERS SUPPLY CO.**  
Stockport, England

## GEORGE A. KINNER

Successor to WM. B. CURTIS & CO., Inventor of the Patent  
**ROUND HAT WIRES**

I use only high-tempered round steel wire, and  
make any shape or set desired, from any sized wire.  
Samples sent on request.

Telephone: 52 Lock Box 177 DANBURY, CONN.





Separate oven and broiler equipped with our patent indestructible Neuco broiler and oven unit which will not short-circuit nor burn out. Only one heat unit for both. Broils and bakes at the same time, at a big saving of current.

We do not believe in exposed resistance coils for hot plates, or interchangeable heat units for ovens, as experience has demonstrated that the great majority of electric range troubles come from these two sources, coupled with flimsy construction.

Neuco heat units are stationary and do not have to be changed about, thereby eliminating possible arcing and consequent destruction of metal parts.

### The Famous Neuco Hot Plate

The Neuco Hot Plate is of the enclosed type. The resistance wires are fitted securely into the grooves of a porcelain base, 1 inch thick, in such a manner that they cannot possibly work loose or buckle.

After being placed in position this porcelain base is enclosed in a cast iron container with a highly polished top plate 3-16 inch thick.

On account of the thinness of this top plate and the small space between it and the glowing coils inside, (only about 1/8 inch) the metal heats up very quickly and the top plate retains its heat long after the current is turned off.

In order to prevent loss of heat in a downward direction the bottom of the porcelain container is insulated with Sil-O-Cel, and the porcelain container, together with this insulating block, is enclosed around the bottom in a sheet iron case.



### Dimensions

Total height . . . . .	55 inches	Oven, 18 1/2" deep x 14" wide x 14" high
Height of cooking top from floor, 34		Broiler, 18 1/2" " x 14" " x 9 1/4" "
Area of cooking top 25" wide x 23" deep		Shipping weight . . . . . 340 lbs.
		Has high shelf and extension side shelf, latter 5 1/2 inches wide.
Floor space . . . . .	26 inches deep x 51 1/2 inches wide with shelf.	

Can be supplied with cooking top on right or left hand side. Unless otherwise specified, will be shipped with cooking top on left as shown in illustration.

### Equipment

3 hot plates, 3 heats, each . . . . .	1000	500	250 Watts
Oven and Broiler combined, 3 heats . . . . .	3000	1500	750 "
Oven only . . . . .			1500 "
Total maximum consumption . . . . .			6000 "
Total maximum consumption without broiler . . . . .			4500 "

Please state voltage when ordering.

☛ We also manufacture the famous Hotel type of Neuco Electric Ranges, Broilers, etc., successfully used in leading hotels, clubs, restaurants, etc. Neuco Electric Industrial Appliances are made to stand Government tests.

Write for Full Particulars

**NATIONAL ELECTRIC UTILITIES CORPORATION**

103 PARK AVENUE, NEW YORK CITY

Factory: Danbury, Conn.



## Neuco Electric Range

No. 503

For Large Private Homes, Domestic Science  
Schools, Hospitals and Diet Kitchens



BECAUSE of its large capacity this range is particularly suited to the uses named above. The lower oven corresponds in size with the oven usually furnished with hotel ranges, and is large enough for the biggest turkey or joint.

The cooking top is half as large again as the ordinary family range. These two features provide ample cooking facilities for a number of guests.

Yet this range also adapts itself economically to small families. For a small roast the upper oven (shown to the left in illustration) is used. And as each oven and hot plate is a separate unit controlled by a separate switch, only as many units are brought into use at one time as are required.

### Description

Made of heavy cold-rolled steel, double walled throughout; walls and doors lined with two-inch Sil-O-Cel, the greatest known heat insulator. This feature gives highest cooking efficiency at minimum cost, because it literally confines the heat within the oven. The oven interiors are finished in baked aluminum. The body is of heavy "Leachburg blue" polished steel which, in contrast with the white enamel door panels, gives the entire range a very attractive appearance.

Top of range has six hot plates (round or square as desired) each producing an intense uniform heat.

(Over)



## Neuco Electric Hotel Broiler With Hot Closet

No. 126

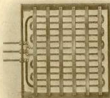
For Hotels, Clubs, Hospitals and Restaurants



CHEFS, who have used coal, gas and charcoal for years declare that meats cooked by the Neuco Electric Broiler are more juicy and tender than when cooked by any other method.

The Neuco Electric Broiler is a *real* broiler. On account of the intense heat produced it does its work quickly, leaving the vital essences in the meat, instead of drying them out.

(Over)



Oven Heat Unit with Expanded Metal Protector Removed

Equipped with the famous Neuco radiant type heat unit, which will not short-circuit nor get out of order. Three heats, "high," "medium," and "low," controlled either by an indicating snap switch or by knife switches as desired.

Economical to operate, certain in results, and ready for use at a moment's notice.

Has wrought steel adjustable grid and heavy wrought iron drip pan. Above the broiler is a hot closet with a metal shelf in addition to the bottom shelf, providing ample space for keeping food and dishes hot.

The Neuco Electric Broiler is made of heavy enameled cold-rolled steel, doubled walled, and insulated with Sil-O-Cel, the best heat-resisting material in existence.

This apparatus is durably built throughout, and is guaranteed for hard continuous usage. Neat and attractive in appearance; front trimmed with nickel plated angle iron trimmings.

### Dimensions

Total height . . . . .	60 inches	Warming Closet, inside . . .	14 inches
Wrought angle iron stand		high x 18 inches deep	
with shelf, height . . . . .	31½ "	x 25½ inches wide.	
Broiler and warming closet 28½ "		Broiler area . . . . .	24 inches
high, 21 inches deep x		x 18 inches.	
27¼ inches wide outside.		Shipping weight . . . . .	240 lbs.

Consumption at "high" heat . . . . .	4500 Watts
Consumption at "medium" heat . . . . .	2250 Watts
Consumption at "low" heat . . . . .	1100 Watts

Please state voltage when ordering.

List Price \$260.00

Write for Discount

## NATIONAL ELECTRIC UTILITIES CORPORATION

### 103 PARK AVENUE, NEW YORK CITY

Factory: Danbury, Conn.



## The Famous Neuco Hot Plate

The Neuco Hot Plate is of the enclosed type. The resistance wires are fitted securely into the grooves of a porcelain base, 1 inch thick, in such a manner that they cannot possibly work loose or buckle.

After being placed in position this porcelain base is enclosed in a cast iron container with a highly polished top plate 3-16 inch thick.

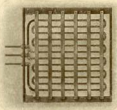
On account of the thinness of this top plate and the small space between it and the glowing coils inside, (only about  $\frac{1}{8}$  inch) the metal heats up very quickly and the top plate retains its heat long after the current is turned off.



In order to prevent loss of heat in a downward direction the bottom of the porcelain container is insulated with Sil-O-Cel, and the porcelain container, together with this insulating block, is enclosed around the bottom in a sheet iron case.

The ovens of this range are equipped with the famous Neuco radiant type heat unit, which is practically indestructible and can not short-circuit.

Each top plate and oven is controlled by a separate, three-heat switch indicating "high," "medium," "low" and "off." The high heat produces the necessary temperature quickly, the medium or operating heat holds that temperature, while the low heat is for simmering purposes.



Oven Heat Unit with Expanded Metal Protector Removed

### DIMENSIONS

Outside dimensions.....	43" wide, 24" deep,	64" high without side shelves	34" wide
Lower Oven.....	20" wide, 18" deep, 14" high		
Upper Oven.....	12" wide, 15" deep, 9" high		
Broiler.....	16" wide, 15" deep, 9" high		
		6 hot plates.....	$\frac{8}{16}$ " diameter
		Height to cooking top.....	33 $\frac{1}{4}$ "
		Shipping Weight.....	575 lbs.

### EQUIPMENT

	High	Medium	Low
Large lower oven.....	2800	1400	700 Watts
Small upper oven.....	890	440	220 "
Broiler.....	2800	1400	700 "
Hot plates, each.....	1000	500	250 "

The medium heat is the operating heat.

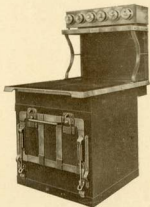
PLEASE STATE VOLTAGE WHEN ORDERING

List Price, \$435.00

Discount on Application

## NATIONAL ELECTRIC UTILITIES CORPORATION

103 PARK AVENUE, NEW YORK CITY Factory: Danbury, Conn.



## Neuco Electric Hotel Range

No. 510

Used by Leading Hotels, Clubs,  
Hospitals and the United States Navy



It has been demonstrated beyond argument that electricity is the ideal medium for cooking in hotels, restaurants, clubs and institutions.

Food cooked on the Neuco Electric Range, particularly roast or broiled meat, is much more savory than when cooked by old fashioned methods. There is also a big money saving, as the loss in weight is trifling, while meats cooked by coal and gas show an enormous shrinkage.

The Neuco way of cooking is a boon to the chef in other ways. The perfect system of heat regulation eliminates constant fire-tending and insures positive results. There are no ashes and soot, as with a coal fire. And—a feature that every chef will appreciate—the Neuco, by confining the heat within the oven and hot plates, keeps the kitchen cool and comfortable, while the absence of gases fumes and smoke makes the kitchen a healthy place to work in.

(Over)

North west, west and southwest of Danbury the New York Dairymen's League controls the situation and gathers a large proportion of the milk in this part of the territory at certain convenient collection points for shipment to the large New York dealer.

The Western Connecticut Milk Producers Association, an organization of dairy farmers, collects milk from some of the sections also reached by the New York Dairymen's League and has a practical monopoly of the milk production, north, north east, south east and south of Danbury. This milk is collected at a number of different stations and is shipped to Bridgeport to supply the local market in that city.

The milk collection points in this territory and the names of the individuals, firms or dealers handling and shipping this milk are as follows:

#### North

Kent - Willowbrook Creamery.
So. Kent - " "
Mownsville " "
New Milford - Mc Dermott Bros.
Bantam - Blake
Washington - Borden Co., New York (to
" Mitchell Dairy to Bridgeport.
Hudds Bridge - " " "
Roxbury - Mc Dermott Bros.
Roxbury Falls - Mitchell Dairy
Still River - Tutell Bros. to Stamford
Bridgewater - " " "
Brookfield - Mitchell Dairy
Hawleyville - " " (some to New Haven)
Mill Plain - Central Dairy to New York.
Windsale - Borden Co., to New York
Pawling - Sheffield Co., to New York
Patterson " "
Towner - Central Dairy
Brewsters - Borden Co.,

The city of Bridgeport has recently passed ordinances requiring the Pasteurization of milk the same as in New York and to meet the new conditions, members of the Western Connecticut Milk Producers Association have organized a stock company known as the Farmers Dairy Co., with a capital of \$100,000.

This company will erect a \$50,000 pasteurization plant at Bridgeport and endeavor to control the milk supply of this part of the state and the Bridgeport market.

An effort was made to secure the location of this plant in Danbury but the members felt that Bridgeport is the most logical location.

Danbury City requires about 9000 quarts of milk per day for consumption by its population and it can be seen that this is only a small proportion of the total supply of this area. Following are the figures for the daily production of milk in the town of Danbury and other adjacent towns.

Danbury	7800 quarts daily
Bethel	1700 " "
Brookfield	1800 " "
New Fairfield	2800 " "
Newtown	6700 " "
Redding	3300 " "
Ridgfield	3000 " "

These figures are furnished by Mr. Frank H. Stodtmueller, State Dairy and Food Commissioner.

It will thus be seen that the town of Danbury alone produces nearly enough milk to supply the needs of the City of Danbury.

It is claimed that even with butter selling in New York at more than 50¢ per pound, it is more profitable for a dairy farmer to sell his milk to the dealers for shipment to the cities, than to attempt to turn his cream into butter. The milk dealers pay higher prices for milk than a creamery manufacturing butter can afford to pay.

With this condition prevailing it is not likely that any large creamery plants will develop in this area and that farmers will still further develop milk production for shipment to the large cities.

It might be however that, with the cessation of cheese importation from foreign countries, to a large extent, that the manufacture of fancy high priced cheeses could be developed here in the midst of such an extensive dairy country.

There are also possibilities here for the development of industries manufacturing special kinds of lactated foods and dried or prepared milk preparations.

#### Honey and Sugar Products.

It would appear that the production of honey and maple sugar in this territory might be profitably increased and that even with the present available production, industries might be profitably conducted in Danbury specializing in prepared honey and maple sugar, extracts, syrups, honey wax products.

#### Animal Slaughter.

The production of animals for slaughter is not likely to largely increase in the Danbury area and yet it would seem that the industry could profitably be centralized in Danbury based on the present supply of slaughter animals available.

The considerable number of animals killed yearly in this area are slaughtered to some extent by the farmers themselves and in part these animals are gathered up by commission buyers.

It is probable that a central stock yards and abattoir near Danbury would secure enough animals to make operations profitable and such an industry would be a valuable addition to Danbury's industries.

Such an industry would probably also result in the establishment of a fertilizer plant to use the tankage and refuse, and possibly in the establishment of a soap plant. All of these industries are closely allied, and are not objectionable if properly located.

A considerable number of cow hides and calf skins are now gathered up in this territory by commission buyers who travel from farm to farm.

The centralization of this hide industry in Danbury would be of advantage and might develop other allied industries.

Coogan & Sons have already established the nucleus of such a business, buying about 200 hides per year and they also buy the animal refuse of the meat markets which they send to a fertilizer plant in Pittsfield, Mass.



### Cold Storage.

Danbury needs a cold storage warehouse. Such an establishment operated in a cooperative way would be very beneficial to the farming interests and profitable to the owners.

The statistics show an immense quantity of poultry, eggs, fruits and vegetables produced in the territory of which Danbury is the center. If the farmers could have the benefit of a cold storage warehouse here, such commodities could be held here for the most favorable market instead of being shipped immediately to New York or elsewhere.

### Cereal Products.

Most of the cereal production of this area is used by the farmers themselves for stock feed, and outside of this need grain crops, have not proven the most profitable means for utilization of land.

It is not likely that any kind of grain crop will be largely developed here for sale purposes, unless time may prove the advantage of flax growing. When methods for chemical treatment of flax fibre are developed more fully, the demand for flax straw for manufacture into linen and of flax seed for manufacture into linseed oil may be such as to make the growing of flax in New England profitable to the farmers.

The manufacture of baked food products from western flour may readily develop in any city adjacent to the New York market. There is an infinite variety of such products including special forms of fancy breads, cookies and confections. Some very large industries of this kind have been built up in Connecticut and other states adjacent to New York City.

The use of local surplus grain production for alcohol, manufacture is an interesting possibility.

### Canning and Preserving.

The large total in production of vegetables, fruits and berries in the Danbury zone would indicate that the canning and preserving industries might logically be developed here.

A large amount of these products is of course most profitably sold for the fresh vegetable and fruit markets of New York, Bridgeport, and Boston, but there is a considerable surplus of this production which does not find a sale, including the second grade goods and there is also considerable spoilage and wastage.

Certain special kinds of crops could profitably be developed here by the farmers if they were sure of a local market and cannery or preserving enterprises would assure their supply of materials through contracts with the farmers who would agree to stipulated acreage of the needed crops.

The possible lines of canned goods preserve and pickle manufacture are suggested on a following page.

Such industries might be secured through negotiations for branch plants of some of the large food products corporations.

### Potato Products.

While much of the 584,000 bushels of potatoes grown yearly in the Danbury area and consumed by the population of that area yet

there must be more or less of a saleable surplus, especially of inferior potatoes, culls and potatoes that are in the first stage of spoilage.

This surplus potato crop could be utilized either in the manufacture of starch and glucose or in the manufacture of alcohol.

Modern processes have made the manufacture of denatured alcohol from potatoes very profitable and such an industry could profitably be located in Danbury where a large amount of alcohol is used in the hat trade.

This subject is covered more fully in the chemical chapter.

#### Tobacco Products.

The statistics indicate a production of leaf tobacco in the Danbury area amounting to over a million pounds yearly. Connecticut state produces over 28,000,000 pounds of tobacco yearly and over 16,000 acres in this state are devoted to tobacco culture.

The tobacco production of Litchfield County is nearly 2,000,000 pounds yearly and of Fairfield County about 500,000 pounds yearly and of Dutchess County, N.Y. about 50,000 pounds yearly.

No figures are available as to the profits of tobacco culture in this state but it would appear that the tobacco raised in this section should be the means in part of more largely developing the cigar manufacturing industry of Danbury.

The following are some suggested lines of food products, the manufacture of which could be profitably carried on in Danbury because of availability of materials and the adjacency of the New York market.

#### BAKERY PRODUCTS

Pretzels  
DOG biscuits  
Fancy pastries  
Fish food  
Ice cream cones

#### ANIMAL & FISH PRODUCTS

Fish oils  
Smoked fish  
Gelatine  
Canned oysters  
Canned clams  
Sardines

#### CANNED AND PRESERVED GOODS

Tomato catsup  
Chili sauce  
Pickled tomatoes  
Pickled onions  
Pickled cauliflower  
Pickled cucumbers  
Worcestershire sauce  
Dried apples  
Canned asparagus  
" peas  
" beans  
" tomatoes  
" fish  
" berries  
" fruits

Food colorings  
 Olive bottling  
 Marmalade  
 Olive oil bottling  
 Banana oils

COFFEES, TEAS AND SPICES

Tea packing plant  
 Coffee roasting  
 Spice grinding  
 Chocolate preparations

GENERAL VEGETABLE AND FRUIT PRODUCTS

Tapioca preparation  
 Starch  
 Baking powder  
 Buckwheat products  
 Banana flour

BOTTLED GOODS

Fruit juices  
 Fruit beverages  
 Bottled sodas  
 Birch beer  
 Ginger ale  
 Root beer  
 Coca-Cola

DAIRY PRODUCTS

Oleomargarine  
 Butter reworking  
 Ice Cream  
 Fancy cheeses.

Canning industries of the United States

The government statistics of 1914 show 3,199 establishments in the country devoted to the production of canned goods of various kinds, their combined product for that year being valued at \$158,015,893 divided as follows:

Vegetables .....	84,413,667
Fruits .....	24,897,174
Fruits (dried).....	34,771,912
Soups .....	7,877,057
Other canned goods .....	6,056,083.







THE CIGAR INDUSTRY

There are only 10 cigar manufacturing establishments in the Danbury area and these are of small size employing but 48 persons and paying out less than \$50,000 annually in wages.

And yet Connecticut is a tobacco state and the industry is one which might be well developed here.

Cigar manufacture largely employs men and these men receive comparatively high wages averaging \$18.00 per week.

Cigar makers as a rule are an orderly self respecting class of man and are not undesirable as residents.

The largest of the local cigar plants is that of the Fountain Cigar Co., at Bethel which employs 15 persons, all but three of whom are males.

M. Simon and C. A. Hofman in Danbury employ six men each.

The total production of Danbury's ten cigar plants has a value of over \$100,000 annually.

As stated, Connecticut is a tobacco state, producing leaf tobacco annually to the amount of over 30,000,000 pounds.

Hartford County produces the major portion of the Connecticut tobacco crop though Litchfield County produces over a million pounds per year and Fairfield County about half a million pounds. The Connecticut tobacco is of high grade and is used largely for wrappers and binders, the local cigar makers purchasing their imported Cuban tobacco for fillers in the New York market, and in Elmira, N.Y.

The wage scale in Danbury runs slightly lower than in New York City, the piece rate being from \$9.00 to \$15.00 per 1,000 according to the grade of goods made.

Danbury alone consumes enough cigars to keep at least 100 cigar makers busy here, to say nothing of the large adjacent area offering a large local market to the Danbury cigar manufacturer.

There is much complaint among the local cigar makers that the cigar merchants and stores selling cigars in Danbury do not give as much patronage as they should to the local cigar manufacturers.

This should not be overlooked if a "Buy at Home" campaign is inaugurated, as suggested elsewhere.

It would appear that there are large possibilities offered in the development of this industry. Effort should be made to interest some of the large cigar companies to locate branch plants here. This would not be difficult as Danbury is favorably located to the New York market and manufacturing costs here are lower than in New York City.

New cigar plants are constantly being established by the larger companies in communities having less claim for consideration than Danbury.





BOTTLING INDUSTRY

While there are no brewers in Danbury there are six establishments specializing in the bottling of beer, mineral waters and soft drinks, as follows:

Jean Horning  
Bartley Estate  
H. Dick  
Mc Philing Estate  
Bartley & Clancey  
J. P. Nichols Estate.

These six concerns employ 15 men and pay out \$10,500 annually in wages.

Their products in 1916 were valued at \$29,000.





### THE USE OF LIME

The abundance of lime stone in the vicinity of Danbury suggests large possibilities for the development of various allied industries.

At present this limestone is only used for building purposes and for grinding into fertilizer. The various forms of limestone products can be enumerated as follows:

- Building stone
- Ground limestone for fertilizer
- Burned to produce calcium oxide or commercial lime.
- Hydrated lime for building purposes
- To make natural cement
- To make sand-lime brick
- To use in glass making
- In the manufacture of porcelain
- For water purification
- In making soda ash and caustic soda
- In making bleaching powder
- To make calcium carbide
- To make calcium nitrate
- To make material for spraying trees
- For distillation of wood
- In the manufacture of paper
- To make cold water paints
- For depilation in tanning industry.

It would appear that a corporation with sufficient resources for developing all these forms of limestone products could build up a very successful industry here as Danbury limestone is of a superior quality and to be found in abundance.

CHEMICALS, ACIDS, DYES, DRUGS, GLUE, MEDICINAL PREPARATIONS  
AND TOILET ARTICLES.

---

These industries are grouped together because all require in one way or another the use of chemical processes.

Danbury has few establishments of this kind at the present time as follows:

Kerr Chemical Co., - Proprietary medicines  
Vass Chemical Co., - " "  
Solvents Recovery Co., Alcohol.  
Connecticut Glue Co.,- Glue and Shellac.

All of these are small establishments except the Connecticut Glue Co., which employs 25 persons, eight of whom are females.

The Kerr Chemical Co., manufactures a preparation having the trade name of "Linonine". The Vass Chemical Co., produces a rheumatic remedy known as "Thialion".

The Connecticut Glue Co., for the manufacture of its products uses the skins of rabbits, which are a bi-product of the fur plants and also other refuse materials. Their shellac is manufactured under a secret process.

Both glue and shellac are used in large quantities in Danbury in the manufacture of hats. Glue is also used in the manufacture of paper boxes.

In the manufacture of hats large quantities of denatured alcohol are used for "cutting" shellac. This alcohol after use is sold to the Solvents Recovery Co., and reclaimed at their plant here. By means of certain processes the alcohol waste of the hat plants is purified and turned into useable material again and then resold to the hat makers. It is called re-denatured alcohol.

Over twenty barrels of denatured alcohol are used daily by the hat manufacturing plants in Danbury. This demand would seem to make possible the development here of the manufacture of denatured alcohol.

Alcohol can be made from a variety of products. Denatured alcohol is simply spirituous alcohol subjected to certain chemical treatment making same poisonous and unusable as a beverage.

Denatured alcohol is usually a combination of wood and grain alcohol in the proportion of one part of the former and ten parts of the latter.

The manufacture of wood alcohol in Danbury is entirely logical. A sufficient supply of native hard woods is available in the vicinity.

Wood alcohol is derived through the distillation of birch, beech, ash, maple and oak chips. The products of hardwood distillation consist of 82 per cent of wood alcohol, the balance of the products being charcoal and acetate of lime.

A large number of such hardwood distillation plants are located in central New York. There is one at Stamford, Vt.

The charcoal and acetate of lime are valuable bi-products of such plants.

Grain alcohol is made from a variety of products. In fact such alcohol, known as methyl spirits, can be made from any material containing a sufficient amount of starch and sugar substance. Grain or fruits of any kind are used. Even corn cobs can be utilized. Potatoes have been found an excellent material for alcohol production. For this reason Danbury, with its large available farm production seems to be a very favorable location for alcohol manufacture.

For every per cent  $\frac{1}{2}$  of starch in potatoes they should yield about 1.6 gallons of alcohol per ton. On this basis a ton of Connecticut potato culls should produce 25 gallons of alcohol. Cull potatoes in this section, otherwise thrown away, should be delivered to a factory at \$5.00 per ton which would make the raw material for a gallon of alcohol cost about 20 cents.

In Germany potatoes are almost the only material used for the manufacture of industrial alcohol.

Danbury would be an excellent location for the manufacture of dye-stuffs the development of this industry being made profitable and possible through the cessation of importations from Europe.

It is possible that the gas tar which is bi-product of the local gas works, might be used as a basis for a dye-stuff industry here. There are 35,000 gallons annually of this gas tar waste, which is now used as fuel at the gas plant though it would seem to have far too great a value to be used for such purpose. Gas tar such as this is used elsewhere for making creosote, road oils, tar paper, benzol and menthol. The two last named products are basic materials for the production of dye stuffs.

Water gas tar, while thinner than ordinary coal tar, contains many of the same constituents, such as benzine, toluen, xylene, naphthalene and anthracene. Such tar can be used in connection with coal tar for the production of the refined products required in dye stuff manufacture.

By gathering the coal tar by-products of various gas works in New England to one central point like Danbury, sufficient material would be available to warrant a dye-stuff industry. A study of the present status of the dye industry in this country is made on another page.

On following pages also are <sup>reviewed</sup> certain classifications of the chemical products industries. A large number of these chemicals, acids and drugs could be manufactured to advantage in Danbury.

Statistics of the Chemical Industry.

The lines of manufacture or production that would be included under this general head are greatly diversified and might be classified in the following groups:

Wood distillation  
Compressed or liquefied gases  
Sodas and sodium compounds  
Agricultural Chemical products  
Cyanides  
Elastics  
Alums  
Soaps  
Electrical Chemical products  
Acids  
Miscellaneous Chemical Products.

No serious attempt could be made within the scope of this Survey to enter into a detailed study of these various lines of manufacture, but following list of minor classifications with the production in the United States in 1914 will be of interest.

Wood distillation 101 plants

	Quantity	Value
Crude Wood alcohol,	7,196,975 gals	\$1,605,880
Refined " "	6,216,727 "	2,709,369
Acetate of lime	164,483,854 lbs.	2,130,909
Charcoal	39,184,475 bu.	2,507,903
Turpentine	575,555 gals.	194,183
Acetone		
Formaldehyde		
Acetic Acid		1,790,000
Wood creosote		
Rosin & tar		
Total.		\$10,236,322

Compressed or liquefied Gases - 133 plants.

Anhydrous ammonia,	16,659,789 lbs.	\$3,140,848
Carbonic acid gas	50,445,779 "	2,329,685
Nitrous oxide laughing gas	17,837,908 gals.	213,099
Oxygen	104,714,321 cu.ft.	1,829,446
Hydrogen	1,669,063 "	16,671
Chlorine	12,217,000 lbs.	472,836
Cyanogen		
Liquid Air		
Nitrogen		104,135

Sodas and Sodium Compounds 68 plants.

Bicarbonate of soda	90,109 tons	\$1,439,014
Caustic soda	212,539 "	6,657,514
Sol soda	106,591 "	1,510,449
Soda ash	995,305 "	10,935,945
Borax	26,501 "	2,071,774
Total soda products		\$22,616,696

Sodium Benzoate		61,408
" Bichromate	11,824 tons	1,125,398
" Phosphate	15,397 "	853,528
" Silicate	169,049 "	1,648,854
" Sulphide	20,263 "	516,644
" Sulphite		612,728
Glaubers Salt	24,506 "	316,338
Lye		1,556,551
Salt cake,	90,442 "	841,887
Washing Compounds,	12,441 "	204,230

Sodium sesqui-carbonate	)	
" acetate	)	
" bromide	)	
" iodine	)	
" fluoride	)	\$278,685.
" bisulphate	)	
" citrate	)	
" diomide	)	
" oxalate	)	

#### Fertilizers - 1,124 plants

Complete fertilizers	- - - -	4,488,565 tons	\$152,815,736.
Amoniated "	- - - -	1,116,739 "	24,544,271.
Super phosphate and concentrated fertilizers	- - - -	1,760,290 "	16,145,659
Other fertilizers	- - - -	1,049,565 "	15,279,031.

#### Cyanides - 6 plants

Production	- - - -	16,450,225 lbs.	\$2,398,674.
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#### Acids of all kinds.

Sulphuric (194 plants)	4,047,675 tons	\$ 15,395,133.
Nitric (52 plants)	78,589 "	1,591,625.
Sulphuric-nitric (37 plants)	112,124 "	2,204,480.
Acetic (13 plants)	75,503,375 lbs.	1,272,294.
Boric (5 plants)	8,590,511 "	568,981.
Citric (3 plants)	2,729,943 "	1,516,336.
Hydrofluoric (9 plants)	7,209,248 "	325,240.
Muriatic (31 plants)	337,167,882 "	1,348,905.
Oleic (7 plants)	23,187,579 "	1,301,553.
Phosphoric (7 plants)	12,420,191 "	680,239.
Stearic (10 plants)	14,960,109 "	1,242,492.
Tannic (5 plants)	853,830 "	287,142.
Fatty		206,576.

#### Electrically Produced Chemicals - 56 plants

Chlorates (5 plants)	8,304 tons	\$ 1,131,316.
Hypochlorates (4plants)	73,197 "	1,714,837.
Caustic soda, caustic potash and lye (5 plants)	48,663 "	2,309,511.
Ferro & other alloys (7 plants)		2,859,482.
Oxygen and hydrogen (5 plants)		368,441.
Aluminum, calcium carbide, abrasives, electrodes, sodium and sodium peroxide, phosphorus silicon, chlorine, carbon bisulphide, muriatic acid (17 plants)		21,578,062.

#### Alums - 19 plants

Aluminum sulphate	- - - -	142,438,000 lbs.	\$ 1,277,836.
Alum cake	- - - -	22,338,000 lbs.	251,186.
Concentrated alum	- - - -	42,562,000 lbs.	540,730.
Burnt alum	- - - -	22,629,000 lbs.	364,656.
Potash alum	- - - -	12,765,000 lbs.	219,968.
Soda alum	- - - -	13,995,000 lbs.	254,477.
Porus alum	)		
Excelsior alum	)		
Pearl alum	)	55,985,000 lbs.	649,116.
Ammonium alum	)		
Chloride alluminium	)		



Lime products

Calcium oxide  
 Water purifier  
 Soda ash and caustic soda  
 Bleaching powder  
 Calcium carbide  
 Ammonia  
 Calcium nitrate  
 Calcium cyanamide  
 Whiting  
 Tanning liquid

Miscellaneous chemicals

Potash and potassium			
Salts - total (39 plants)		\$ 4,094,927.	
Crude potash		30,644.	
Potassium carbonate		19,007.	
Potassium nitrate (saltpeter)	14,740 tons	1,244,051.	
Caustic potash	}		
Potassium bichromate			
Chlorate (potash)			2,802,225.
Iodine "			
Citrate "	}		
Acetate "			
Silicate "	}		
Coal tar distillery products (40 plants)			8,065,156.
Chemicals and preparations from			
coal tar		774,350.	
Alkaloids	5,805,212 ounces	4,738,335.	
Amyl acetate	1,300,052 lbs.	465,664.	
Chloroform	1,333,954 "	295,317.	
Ether	2,120,082 "	278,816.	
Gold salts	28,817 oz.	291,658.	
Silver salts	2,563,238 "	846,059.	
Platinum salts	365 "	86,998.	
Thorium compounds, radium, uranium and vanadium		1,388,477.	
Vanillin	120,619 lbs.	525,219.	
Acetone (8 plants)	10,425,817 lbs.	1,099,569.	
Acetate of lime (78 plants)	164,483,854 "	2,138,899.	
Ammonium salts (chloride)	11,511,954 "	641,040.	
" " (sulphate)	8,646,616 "	211,314.	
" " acetate	}		
" " bifluoride			
" " carbonate			200,801.
" " phosphate			
" " picrate	}		
Aqua ammonia			35,544,246 lbs.
Barium salts (sulphate)	18,278,000 "	257,415.	
Copper salts			
(blue vitriol)	37,152,351 "	1,598,944.	
Cream of tartar (8 plants)	12,646,120 "	3,124,958.	
Epsom salts (12 plants)	29,265,115 "	296,999.	
Formaldehyde (3 plants)	8,426,247 "	655,174.	
Glycerine (crude)	16,568,920 "	2,278,526.	
Iron sulphate			
salts (copperas)	92,478,823 "	332,772.	
Ferrons acetate			
" chloride	}		
" nitrate			
" oxide			
" tungsten			
" vanadate			
Lead salts (arsenate)	11 plants 8,641,856 "	511,688.	
" (other)	4,394,873 "	323,863.	
Mercurial salts	605,701 "	518,023.	
Nickel salts	409,458 "	157,149.	
Niter cake (31 plants)	46,143 tons	31,580.	

Sugar of milk	4,051,320 lbs.	\$ 400,613.
Sulphur (refined)	31,166 tons	1,141,000.
Tin salts	8,291,259 lbs.	2,028,511.
Zinc salts	40,766,886 "	1,130,959.

Soaps and Soap products - 512 plants

Hard soaps	(Total)	938,447,000 lbs.	\$104,500,542.
" "	(Tallow)	938,447,000 lbs.	
" "	Olein	42,524,000 lbs.	
" "	Foets	111,063,000 lbs.	
" "	Toilet	169,926,000 lbs.	
" "	Powered	367,744,000 lbs.	
" "	Chips	97,746,000 lbs.	
Soft soap		57,002,000 lbs.	1,697,424.
Glycerine		45,419,827 lbs.	7,593,423.

Plastics - 24 plants

Pyroxlen - celluloid, fiberloid, viscoloid, xylonite, etc.	8,376,509.
Rubber substitutes	428,605.
Artificial silks, etc.	4,590,670.

The location of the principal raw materials frequently determines the location of chemical products plants.

The raw materials used in the manufacture of some of these chemical products are as follows:-

For alcohol--Saccharine materials such as fruits, apples, bananas, grapes, oranges, peaches, pears, pineapples, tomatoes, watermelons, agave, molasses, sugar beets, sugar cane, sugar corn cannery wastes. Starchy materials such as barley, maize, oats, rye, sorghum, seed, wheat, artichoke, cassava, potatoes.

Ammonium Sulphate  
Yeast cake  
Sulphuric acid

FOR ACIDS

Sulphur and pyrites  
Brimstone  
Pyrites  
Nitrate of soda

FOR FERTILIZER

Ammoniates  
Cotton seed meal  
Tankage  
Fish  
Ammonium, sulphate  
Cyanamid (lime nitrogen)  
Nitrate of Soda  
Phosphate rock  
Bone  
Pyrites  
Sulphur  
Basic slag  
Guano  
Kainit  
Muriate of potash  
Sulphate of potash  
Manure salts





MANUFACTURE OF DYES

While the proportion of the number of persons employed to the amount of the capital invested is less than in most industries, yet such industries can be considered desirable, as the workmen are well paid and the industries are permanent and offer possibilities for large future development.

At the commencement of the European War, the artificial dye stuff industry in this country was in its infancy, there being only 6 plants manufacturing coal tar products to the extent of 3,300 short tons annually.

Imports from Europe amounted to 25,700 short tons annually of which 22,000 tons were imported from Germany.

As the annual consumption of synthetic colors in the United States is upwards of 29,000 short tons, the extent of the calamity to our industries when the imports from Germany were shut off can be readily seen.

The shortage in dyes resulting from the European War affected 5,353 textile establishments, 5,728 leather manufacturing plants, 2,439 paper mills, 791 paint and varnish plants, and 118 ink manufacturers in addition to a large number of minor industries, including manufacturers of whats, furs, straw work, wood work, etc.

As a result of this shortage of dyes, a considerable number of new dye manufacturing plants have sprung up and the situation is gradually being relieved to some extent by the increased production of the American dye products, altho the shortage cannot be fully supplied for many years to come and there is ample opportunity for the development of additional dye stuff plants and for assurance of the successful and profitable operation of same.

Up to November 1915, the domestic production of dye stuff had been rapidly increased and at that time the approximate monthly output of American dye stuff plants was as follows:

Benzol	7500 short tons
Tolnol	1870 short tons
Xylol	950 " "
Napthaline	12500 " "
Phenol or carbolic acid	10000 " "

Unfortunately, the demand for phenol, benzol, and tolnol, to be used in the manufacture of explosives, has been so great that there has been great difficulty in securing enough for the present manufacturing plants producing coal-tar intermediates.

There are now 17 firms in this country engaged in the production of aniline and there are 12 firms engaged in the manufacture of finished coal-tar dye stuffs.

Among the present most important manufacturers of dyes in this country are the following:

MANUFACTURERS OF COAL-TAR CRUDES.

The Barrett Manufacturing Co., 17 Battery Place, N. Y. City.  
 Bayway Chemical Co., Bayway, Elizabeth, N. J.  
 Baird & McGuire, (Inc.) 141 Milk Street, Boston, Mass.  
 Isaac Winkler & Bro., Cincinnati, Ohio.  
 Thomas A. Edison, (Inc.) Orange, N. J. (synthetic carbolic acid; monthly 150 short tons.)

Manufacturers of coal-tar intermediates.

The Benzol Products Co., 25 Broad Street, N. Y. City, (aniline, substituted anilines, and hydroquinine). The extensive works at Marcus Hook, Pa., has received notable additions. It is now the leading source of supply. This company, organized in 1910, was the first to manufacture aniline on a large scale in this country.

Thomas A. Edison, Inc., Orange, N. J. (aniline, paraphenylenediamine). The monthly production of aniline is 138,000 pounds; of nitrobenzol, 45,000 pounds.

The Midvale Chemical Co., Elizabeth, N. J. (aniline).

The American Synthetic Color Co. Stamford, Conn., (aniline).

The Blackstone Chemical Works, 531 Grosvenor Building, Providence, R. I. (aniline).

Paul Weiller, 326 Front Street, Perth Amboy, N. J.

Middlesex Aniline Co., Lincoln, N. J. (aniline).

May Chemical Co., Perth Amboy, N. J., (aniline).

Upton Brothers, Bristol, Ind., (aniline).

The U. S. Coal-tar Products Co., 40 West 32d Street, N. Y. City. (aniline).

Seydel Manufacturing Co., 86 Forrest Street, Jersey City, N. J. (aniline).

The Chemical Co. of America (Inc) Springfield, N. J., Office-320 Broadway, New York City (aniline).

The Butterworth Judson Co., Newark, N. J. (aniline)

American Synthetic Dyes (Inc) Newark, N. J., Office 60 Wall Street, New York City (aniline).

Standard Aniline Co., Wappingers Falls, N. Y., Office, 366 Fifth Avenue, New York City. (beta-naphthol and paranitraniline)

The Monsanto Chemical Works, St. Louis, Mo. (dinitrochlorbenzol)

The Middlesex Chemical Co., Chester, Conn.

Schoellkopf Aniline & Chemical Works, Inc., Buffalo, N. Y., office 100 William Street, New York City. This is the oldest and most important company engaged in this branch. It was organized in 1879. Prior to the war it manufactured over 100 different dye-stuffs. Its colors are used very largely by the cotton textile mills, but also by silk, woolen and other industries.

W. Becker's Aniline & Chemical Works, 100 Underhill Avenue, Brooklyn, N. Y. The works of this company, completed in June 1915, are very extensive. It manufactures a large variety of dye-stuffs and specializes on colors for the woolen industry, more particularly alizarin substitutes. Capital \$1,000,000.

Heller & Mers, Newark, N. J., office, 505 Hudson Street, N. Y. City. This company specializes on coal tar colors used for the manufacture of paper, in connection with its extensive production of mineral pigments.

The Central Dyestuff Co., Newark, N. J. A variety of dye stuffs for use in all branches are manufactured.

The Consolidated Color & Chemical Co., Newark, N. J., office, 122 Hudson Street, N. Y. City. The production is limited to a small group of standard aniline dyes, used chiefly in textile mills.

The Bayer Co., (Inc) Rensselaer, N. Y., office 117 Hudson St., N. Y. City. This company manufactures some of the colors which are specialties of the Bayer Co., of Leverkusen, Germany.

The Pearate Co., Clay City, Ky., office, 346 Broadway, N. Y. City This company, recently organized with an authorized capital of \$2,000,000, manufactures a group of six colors, from the products of the distillation of cannon coal.

The Federal Dyestuff & Chemical Co., Kingsport, Tenn., office 30 Pine Street, N. Y. City. This company, organized in October 1916, with an authorized capital of \$15,000,000, plans for the construction of several plants in different sections of the country. The first plant at Kingsport, Tenn., is largely devoted to the production on a large scale of sulphur black.

A. Klipstein & Co., West Charleston, W. Va., office, 644 Greenwich Street, N. Y. City. The recently constructed factory of an old and well known importing house is chiefly devoted to the manufacture of sulphur dyes - browns, and especially sulphur black.

The Dow Chemical Co., Midland, Mich. This company has embarked upon the manufacture of synthetic indigo.

The American Cooperative Dyes and Chemical Co., 848 Drexel Building, Philadelphia, Pa. This company is devoting its attention at the outset to the manufacture of direct blacks for cottons.

The United Securities Dye and Chemical Co., Wilmington, Del. Incorporated December 11, 1915. Authorized capital \$5,000,000.

During the last 50 years a sweeping revolution has been effected in the art of dyeing. Vegetable dyes formerly used, and some of the animal dyes like cochineal and the crude mineral pigments, have all been displaced completely or in great part, by the products of synthetic chemistry - in other words, the adaptation of the bi-products of coal-tar.

The United States now produces 125 million gallons of coal-tar annually and with this production of raw materials as a basis, there is no reason why the development of the bi-products cannot be fully accomplished here as well as in Germany. The average coal-tar yields only 6% of materials useful to the color industry.

Contrary to popular opinion, the location of a plant manufacturing dye stuffs need not necessarily be adjacent to a near supply of coal tar, as the proportion of refined coal tar products used in manufacturing dyes is so small and the relative value so great in proportion to weight, that the element of freight cost does not play so important a part in the manufacture of this product as do the other items of cost. Nevertheless, even though this difference of freight costs in materials might be considerable, the advantage of location near New York is greater as the class of labor required cannot be secured or held in the coke districts.

As New York is the logical market for the refined coal tar products used in dye manufacture, location of a dye stuff plant is logical in any part of the New York zone and this is the reason so many of the present American dye plants have been built up in New Jersey and on Long Island.

One of the most important dye stuff products is aniline black, which constitutes a large proportion of the dye stuff product consumed in the country. Aniline itself can be classed as a finished dye stuff and a large share of the aniline now being used is produced for this purpose, especially in hosiery materials. Two of Quenne's dye stuff plants produce aniline black in large quantities.

An interesting feature in the evolution of this aniline industry in the narrower sense of the term - is the introduction of small plants for making the oil, devised more particularly for installation in textile works, consuming relatively limited amounts, for the production of aniline black. An enterprising Rhode Island firm, manufacturing itself considerable quantities of the oil, is now installing in various textile mills standard plants capable of producing daily 100 pounds or more of aniline. Such a plant, built to produce 100 pounds daily, costs from \$1,500 to \$2,000. The services of a single operative are needed to carry on the transformation of benzol into aniline, with occasional assistance in the moving of heavy objects. The operations and the application of the requisite tests can be intrusted to a man of ordinary intelligence, without chemical education. The ordinary output is 85 pounds of aniline for each 100 pounds of benzol employed. And at current rates for this hydrocarbon, it is found possible to make aniline at a net cost of from 30 to 40 cents per pound. This compares favorably with the daily quotations of \$1 to \$1.40 for immediate delivery and of 70¢ to 85¢ for early contract delivery. Within the past month two textile mills have contracted for larger plants, capable of furnishing 500 pounds of aniline daily.

The most interesting feature to note in this development is the establishment recently on our soil of the commercial production of synthetic indigo. This manufacture has been taken up by one of the older chemical companies and with success. The daily output will soon reach 6,000 pounds. Naturally all that can be made is sold for months ahead. Three other powerful firms are carefully studying the possibilities of manufacturing this most important dye stuff.

When one reflects that the great "Badische" company on the Rhine expended \$5,000,000 on its indigo plant and on the necessary research before a single pound was placed upon the market, and when we further consider that indigo is upon the free list, the pluck and enterprise now manifested in this field cannot but excite admiration.

As a rule, the firms now engaged in the production of intermediates contemplate the manufacture later on of finished dyes. Mr. Edison, who has done such magnificent work in this field by his rapid organization of the production on an extensive scale of synthetic carboic acid and of aniline, does not intend to continue the output of the latter after the close of the current war. With this exception all of the numerous firms now occupied with the manufacture of coal-tar compounds are planning to continue their production along the lines already taken up, and to enlarge such production or enter upon the manufacture of additional intermediates of finished dyes, as circumstances dictate.

From a recent report by Thomas H. Norton we quote the following:

"Before the advent of this deplorable war, we imported annually about 2,500 short tons of aniline oil and aniline salts. In 1916 over 8,000 tons will be manufactured on American soil, from American coal-tar crudes.

"In 1913 our American color works produced 3,300 short tons of coal-tar colors, made chiefly from German intermediates. We imported 25,700 tons of artificial dyes, 22,000 tons coming from Germany.

"Today we are making nearly 15,000 tons of these colors, all from American coal-tar. Are the Nation's color chemists too optimistic in confidently looking forward to the year 1917 as a date when the great bulk of artificial dyes consumed in this country will be made in American works, from American



raw materials, by American labor?"

The latest government report estimated that the American consumption of artificial dye stuff amounts to fifteen million dollars annually and that the dye stuff now being produced in this country amounts in value to over three million dollars annually.

While the government statistics for 1914 show 25 establishments manufacturing coal-tar dyes, yet it is to be noted that over 1/2 of the amount reported by various firms consisted of dyes made largely from products obtained by mixing or grinding artificial colors of various origin.

The above statements covering the coal-tar dye industry is, however, only a part of the present dye stuff and extract industry in the country.

There are altogether engaged in the manufacture of such products 133 establishments in the country, having a total production valued at \$21,341,000 annually.

In 1914 there was a production in this country of 29 million pounds of log wood extracts and 4,500,000 pounds of fustic extract, in addition to a large amount of other wood and vegetable colors.

Following is a list of total production of dye stuff in the U. S. for 1914:

Number of establishments	111
Total value .....	\$20,576,769
Dyestuffs, Value .....	\$7,112,490
Natural dyestuffs, value .....	\$1,865,835
Logwood:	
Pounds .....	28,989,962
Value .....	\$1,311,966
All other, value .....	\$553,869
Artificial dyestuffs, value .....	\$5,246,655
Synthetic, or coal-tar dyes, including intermediates and products resulting from the blending of imported colors:	
Pounds .....	12,169,635
Value .....	\$4,652,947
Mineral colors or dyes, such as chrome yellows, orange or green; iron buff, Prussian blue, ultramarine, etc.	
Pounds .....	4,961,336
Value .....	\$593,708
Tanning materials, value .....	\$7,658,027
Chestnut and oak extract:	
Pounds .....	320,838,798
Value .....	\$4,044,477
Hemlock extract:	
Pounds .....	17,579,866
Value .....	\$312,317
Other tanning extracts and materials, Value .....	\$3,301,233
Mordants, assistants, and sizes, value .....	\$4,467,940
All other products, value .....	\$1,338,312

In 1915 over 68,000 tons of dye woods were imported into this country. Log wood is the most widely used dye wood and made up over 55,000 tons of the total in 1915, most of it coming from the Central American countries.

Seventy five per cent of the vegetable dyes came from logwood and the balance from other woods such as fustic, red wood and Brazil wood.

These dyes are used for all the various purposes for which any other dyes are used. In fact it is stated that the use of vegetable dyes is necessary in conjunction with aniline dyes to secure the required lustre and brilliancy.

All of the log wood and other woods used are purchased through the importers and jobbing houses of Manhattan and this City has the advantage of near location to the market for raw materials.

The woods used in manufacture are ground up in heavy wood grinder and are then subjected to a boiling process and the dyes are sold in liquid form. The equipment of a dye plant of this kind, therefore, consists simply of grinders and tanks and while few men are employed to tend these, large floor space is necessary.

In the manufacture of aniline dyes, the raw material used is coal-tar, which is shipped largely from the coke ovens of the Pittsburg district.

Other important materials required for treatment of the coal-tar are sulphuric acid, nitric acid and hydro-chloric acid.

The various processes of aniline dye manufacture produce dyes of all shades and colors in powder or paste form. A plant of this kind is practically a chemical laboratory and does not require large floor space or many employees.

The chemists and dye experts employed in these establishments are paid very high salaries and the lowest paid laborer receives from \$12 to \$20 per week.

Little power is required in an aniline plant and only a small amount for operating the grinders in a wood dye works.





PAINT AND VARNISH MANUFACTURE

The purpose of this Survey is to establish a basis for logical effort to promote the development and expansion of the various lines of industry and manufacture in Danbury.

With such objects in view in relation to the paint and varnish industry, it is necessary to make a general study of the entire industry to ascertain the relation of the city and its comparative efficiency as a location for manufacturing plants producing the various products which would be classified under the head of "paint and varnish."

The government statistics of 1914, with ten per cent, added for growth of the industry during the past three years, indicate an annual production of paint and varnish products in the United States amounting in value to \$160,000,000.

The entire group of paint and varnish plants represent a large variety of finished products, and each of these various kinds of product forms a trade group distinctive in itself. It will therefore be necessary to consider each of these groups of products separately to ascertain the relation of Danbury, to this industry.

There are some 600 corporations, firms or individuals in the United States manufacturing various forms of paint products and about 400 manufacturing varnish products. Many of these corporations manufacture both paint and varnish. The government figures report only 855 establishments.

The 1914 Government census of manufacturing gives the following statistics in relation to the paint and varnish industry:

Establishments, report .....	855
" of which product is largely paint	618
" " " " " " varnish.	237
" whose product was largely other than paint or varnish .....	56

Total value of paint and varnish product .....	\$149,049,820
Gain over 1909 - 16.9% .....	21,577,001

Production of 1914 classified as follows:

Colors or pigments .....	\$17,407,955
Oil paints .....	70,582,451
Water paints & Kalsomine .....	2,202,281
Varnishes & Japans .....	36,061,203
Fillers, including putty .....	3,239,174
Bleached shellac .....	1,806,802
Other products .....	17,749,944

The 855 establishments reported were located as follows:

New York .....	164	Massachusetts.....	36	Connecticut ...	15
Pennsylvania .....	117	Missouri .....	36	Minnesota .....	15
Ohio .....	99	Michigan .....	27	Wisconsin .....	10
Illinois .....	77	Indiana .....	25	Maryland .....	9
New Jersey .....	74	Kentucky .....	18	Tennessee .....	9
California .....	41			Texas .....	8

Cleveland, Ohio, leads in the manufacture of paints, having over fifty plants of this kind. Chicago ranks next, Philadelphia third and Brooklyn fourth.

Classification of Paint Production - 1914.

Quantity	Value
----------	-------

White Lead, ground in Oil (lbs)	281,417,565	\$18,141,444
Zinc Oxide, ground in Oil (lbs)	9,551,840	730,918
All other ground in Oil (lbs)	129,042,658	10,165,819
Ready mixed, in Oil (gals)	40,745,563	34,279,989

## Classification of Varnish Production - 1914.

	Quantity	Value
Oleoresinous varnishes (gals)	17,789,212	\$18,691,346
Spent varnishes (not turpentine)	2,964,172	3,080,425
Dammar, turpentine & benzine varnish	3,297,371	2,865,296
Pyroxilin varnishes	852,571	1,308,796
Drying Japans & dryers (gals)	6,560,406	3,015,967
Baking Japans & lacquer (gals)	4,888,816	2,960,856
All other varnishes	-----	4,148,617

Some 90 concerns are listed as manufacturers of paint in the Borough of Manhattan, but very little paint is actually manufactured in Manhattan. There are 27 manufacturing plants in the Borough of Brooklyn. Newark, N. J. has only ten.

Among the 400 varnish industries Chicago appears to lead with over forty varnish concerns listed. Many of these listed are offices of jobbing houses and it is probable that Newark with its 19 plants is the largest producer of varnish at the present time with the Borough of Brooklyn second with 16 plants. Some fifty varnish manufacturers are listed in Manhattan, but as in the case of paint, most of these addresses represent offices or warehouses.

Some eighty different varieties of paints are manufactured as follows:

Carbide*	Fireproof*
Carbon*	and fire-resisting
Carrriage & Wagon*	Flat wall*
Casting*	Floor*
Ceiling*	Gas Holder
Cement & Concrete*	Gilding*
Coach*	Gold*
Coal tar*	Graphite
Cold Water*	Heat Resisting*
Copper*	Hot Metal*
Damp Resisting*	Hot Water*
Dipping*	House & Porch*
Dry*	Hydraulic*
Dry Mineral Grinders*	Ice Can*
Dryer*	Insulating*
Earth*	Iron Oxide*
Enamel*	Iron & Steel or
Export*	Structural*
Face	Iron and Steel work
Family*	Grating & Preserving*
Garn	Japan*
Lead or	Semi-Paste*
Oxide of Lead*	Sheep Branding*
Locomotive*	Shellac*
Machinery*	Shingle*
Marine*	Ship Bottom*
Metallic*	Sile
Mine*	Silver*
Mineral*	Slate*
Ready Mixed*	Smoke Stack*
Oil*	Stand Pipe*
Oil Cloth	Steam Proof*
Oxide	Structural Iron*
Paste*	Tank*
Pile Preserving*	Technical*
Preservation*	Tesode Proof*
Radiator*	Trolley Polo*
Railroad*	Wall*
Railway Signal*	Water Color*
Roof*	Waterproof*
Rubber Tire*	Wood Preserving*

Rust Proof\*  
S green\*

Wood Preserving\*  
Zinc

There are forty five different kinds of varnish produced in this country as follows:

Agricultural*	Floor*
Architectural*	Gas Engine*
Armature*	Glazing*
Asphalt*	House*
Automobiles*	Implement*
Automobiles*	Lead*
Black*	Linseed*
Boat or Marine	Linoleum and
Bronzing*	Oileloth*
Cabinet or Furniture*	Lithograph*
Car or railroad*	Metal*
Carriage or Coach*	Mixing*
Cement*	Opaque*
Clear*	Piano*
Color*	Printers*
Copal*	Rosin*
Cotton Frating*	Rubbing*
Damar*	Shellac*
Egg Shell Finish*	Sear*
Elastic*	Stain*
Electrical or Insulating*	Structural*
Embossing*	Tin Printers*
Flattig*	Trunk*

A general study of the paint and varnish trade indicates that the present is a most opportune time for promoting the growth of the paint and varnish industry in this city.

As in most lines of industry the paint and varnish industry has entered an era of wonderful expansion, which is likely to continue for some time. New manufacturing companies are being incorporated and are building plants, and established concerns are preparing and expanding to such extent as to require additional capacity and the removal of plants to other locations or the creation of branch plants.

It is safe to assume that the more plants of this kind that are established here, the easier it will be to secure the location here of other similar plants; for small concerns manufacturing paints exclusively do not maintain their own varnish plants and a convenient or satisfactory source of supply is necessary for their successful operation.

This is illustrated in the cases of Newark and Springfield.

The first named City is not any more favorable a location for varnish manufacture than Paterson and yet Newark leads in the industry. The reason may be found largely in the fact that the Murphy Varnish Company and a few other large concerns established themselves there and the smaller concerns have since grown up around them being started by former employees of the big companies, or located there because of the prominence that the name Newark has gained in the trade, securing thereby a more or less "reflected glory"

The same is true to a large extent of Cleveland, as relates to the paint trade. It is safe to say that the location of the Sherwin-Williams plant in Cleveland has had much to do with the location of other paint plants in the same city.

Whether the product of a plant in varnish or any of the various kinds of paints, two important factors govern the merit of plant location, as follows:

- 1- Cost of delivery to the plant of raw materials from the source of supply.
- 2- Cost and time of delivery of finished product to more important points of distribution.

Practically all of the raw materials used in paint and varnish manufacture are either the products of oil refineries and smelters, and flax seed crushing plants or are imported from abroad or brought to the New York market by water from southern ports.

The fact that some of the largest refineries of the Standard Oil Co. and many lead and zinc smelters are located in the New York zone and that the coastwise and foreign trade centers in New York make location in the New York zone most favorable from the standpoint of accessibility to and cheapness of raw materials. The linseed oil people recognize the fact that they must locate in this immediate locality because of the growing demand for their products here and four large linseed crushers are located in the New York zone, each producing about 1800 barrels of oil per day. The decrease of the domestic flaxseed supply and increase in importation of flaxseed is likely to further develop the manufacture of linseed oil at this point.

The most important of the materials used in the manufacture of Paints and Varnishes are shown by the government statistics for 1914 as follows:

Raw Materials Used in Manufacture of Paint & Varnish  
in the United States in 1914.

	Quantity	Cost
Pig Lead, tons	149,908	\$11,424,544
Grain, Alcohol, gals.	887,273	360,737
Wood Alcohol, gals.	919,581	367,539
Linseed Oil, gals.	24,025,502	11,843,236
Gums, lbs.	48,113,516	4,662,972
Colors, pigments	----	17,407,955
White Lead, dry lbs.	271,370,082	----
Leads, oxides, lbs.	51,335,290	----
Barytes lbs.	46,920,380	325,922
Iron, buff & earth colors	92,896,956	797,819
Lithophone	48,792,062	1,857,910
Chrome yellow	5,747,317	641,534
Orange or green	8,024,400	677,329
Prussian Blue	1,239,382	387,077
Ultramarine	2,698,059	222,769
Other dry colors	95,616,903	3,515,445
Vermillion, true	322,769	200,134
Other fine colors	4,215,874	690,235
Pulpcolors	21,420,854	1,011,765

The nearest source of supply of some of these materials is as follows:

Light Varnish Gum

Kauri from Sealand  
Congo from Africa  
Damar from East Indies  
Manilla from East Indies  
Rosin from Southern United States

Black Varnish Gum

Gilsonite from Colorado & Utah  
Manjak from British West Indies  
Pitch from France and Holland  
Petroleum from local refineries

Fixed Oils

Linseed from Jersey City, Brooklyn and Staten Island  
China Wood from China



Volatiles

Turpentine from Georgia, N. Carolina and Florida  
 Benzine from local refineries  
 Kerosine from local refineries  
 Coal-tar naphtha from local refineries  
 Alcohol from New York territory

Colors

White zinc from Missouri, Colorado & Northwest  
 White lead from Missouri

Most all colors are dependent on imported materials of one kind or another.

The cost of securing the raw materials used in varnish manufacture would be about the same in Newark as in Danbury. Newark varnish manufacturers must pay a local freight of \$.084 per 100 lbs. on such materials from New York.

As in the case of raw material supply, the advantages as to delivery of finished products are all in favor of Danbury.

New York City is the central distribution point for a large percentage of the finished paint and varnish products manufactured in the entire country. Nearly every paint and varnish manufacturing company has its main office in New York and its largest warehouse and storage facilities for distribution of products.

Fully 50% of all paint and varnish products are distributed from New York.

It is clear, therefore, that no matter what the particular varieties or grades of products, the Danbury paint or varnish manufacturer has a distinct advantage in this respect in adjacency to New York.

The near by hamlets of Still River and Branchville have Paint Plants, their product being Silica Paint, made from Lime Rock.





### THE STONE INDUSTRY

Outside of the cutting work of Hughes & Chapman and Schlitter & Co., who do a small monumental business, the stone industry of Danbury consists of the operations of the Stearns Lime Co., which employs 20 men and conducts a lime stone quarry and crushing plant adjacent to the city.

The production of this company amounts in value to nearly \$50,000 per year. Their plant is well equipped and requires 170 h.p. for operation.

The product of the Stearns Lime Co., is ground limestone same being used for fertilizer and for concrete work in building construction. They make sales throughout New England but largely in Connecticut.

There is little data available concerning the mineral resources of this part of Connecticut, but the opinion seems to prevail that there is little rock or mineral of commercial value in the vicinity of Danbury.

This is however apparently only a matter of opinion and reliable geological data would be of interest and might reveal possibilities for industrial development.

The state of Connecticut produces building stone to the value of a million dollars annually and also produces a considerable amount of feldspar.

Sandstone and granite are the chief building stones quarried in this state.

Trap rock is found in various parts of the state including Fairfield county. This stone is largely used for road surfacing.

At Branchville, near Danbury is located a paint works producing "silica paint". This paint is made from a lime rock.

Feldspar rock is found in Newtown and New Milford of commercial value but not in large quantities.

A stone containing 12% potash has been found near here in considerable deposits but no way has been found as yet of separating the potash from the other minerals.

A sand high in silica is found in quantities near Danbury and might be utilized in glass manufacture.

The cement works nearest to Danbury are located at Hudson and Catskill, N.Y.

## GEOLOGICAL AND NATURAL HISTORY SURVEY OF CONNECTICUT

## COMMISSIONERS

Marcus H. Holcomb, Governor of Connecticut  
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## SUPERINTENDENT

Herbert E. Gregory

YALE UNIVERSITY.

NEW HAVEN, CONN. January 29th 1919

Mr. Daniel D. Lovelace, Executive Sec.,

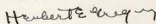
Danbury Chamber of Commerce,

Danbury, Connecticut.

Dear Sir:

Material regarding the mineral resources of Fairfield and Litchfield counties is contained in the publications of the Connecticut Geological and Natural History Survey, also in reports of the United States Geological Survey in Washington. You doubtless have these publications. I have on hand a manuscript of a report of the geology of the region about Danbury, which will see the light of day within a year or so.

Very truly yours,



HEG:N

Superintendent.

over



CLAY PRODUCTS MANUFACTURE

Danbury is a large consumer of brick and should be a still greater consumer.

Connecticut is a large producer of brick and sends large quantities to the New York market.

No brick is manufactured in the vicinity of Danbury and we are unable to learn definitely whether there are any nearby deposits of clay or shale suitable for the purpose.

A geological expert should be engaged to make an investigation of this matter as a local brick plant would be a great advantage to the community and would prove very profitable.

Several persons have claimed that suitable deposits of clay are available in this vicinity.

It would seem quite possible that in the higher forms of clay products manufactured, Danbury might be suitable location.

Without having clay here suitable for the manufacture of any kind of pottery, it would appear at first thought that it would be unreasonable to expect that high grade pottery could be manufactured here to any advantage or profit.

It is a fact however, that the manufacture of pottery could almost as advantageously be entered into here as anywhere in Ohio, the greatest pottery state in the Union, in which \$15,000,000 worth of pottery is manufactured annually. It is a curious fact that table-ware, art ware and other forms of pottery are made in East Liverpool, Ohio, from clays imported largely from the southern states.

The reason for this suggestion is largely based on present market conditions. Before the war fully one-half of the pottery sold in this country was imported from Germany, Austria, France and England. The war has cut off a large proportion of this importation and the demand therefore for domestic pottery exceeds the capacity of the present American Potteries. The result will be that when the war is over American pottery will have an established market and one which can largely be held.

It is suggested that the matter is worthy of further investigation with a view to finding what particular class of table-ware, toilet ware, kitchen ware, electrical supplies or art pottery manufacture might be entered into to the best advantage.





While the glass industry is at present centralized in the Pittsburgh district where three-fourths of the glass made in this country is now produced, a number of successful glass plants in the Eastern States are demonstrating that glass can be made profitably outside of the "gas belt".

The reason for the centralization of the industry in western Pennsylvania, West Virginia, Ohio and Indiana has been because of the low cost of natural gas as a fuel.

Outside of the natural gas belt, glass plants are obliged to use as fuel producer gas made from coal.

With the advancing cost of natural gas in the Pittsburgh district as a result of the lessening supply, the advantage of location of glass plants there is growing less, and it is probable that the industry will be more largely distributed.

With coal at about \$2.50 to \$5.00 per ten producer gas can be made at a cost about equivalent to natural gas at 15¢ per thousand cubic feet.

The large bottle plant of the Bottlers Manufacturing & Supply Co. located in Long Island City, uses as fuel producer gas made from coal and yet this company is manufacturing bottles profitably and has the added advantage of proximity to the great New York market, disposing of its products without adding freight costs for delivery.

The government census lists 347 establishments in the United States engaged in the manufacture of glass. Pennsylvania leads the list in importance with 103 plants, Ohio has 39 plants and ranks 2nd, while Indiana, West Virginia, rank 3rd and 4th in glass production. New Jersey and Illinois come next and New York ranks 7th with 21 plants.

Pennsylvania produces about \$15,000,000 worth of building glass annually and Ohio about \$3,000,000. Indiana ranks 2nd to Pennsylvania in the production of bottles and jars, New Jersey 3rd and Ohio 4th.

72,373 persons are employed in the glass industry in the United States and the annual production amounts in value to over \$122,000,000. Some 30 different kinds of glass products are produced in the 347 plants located in the United States, the varieties being as follows:

A cheaper grade of sand, which can be used for window glass manufacture, is obtained in the Pittsburgh district. A grade of sea sand suitable for bottle manufacture is obtained on Long Island. This sand would not be suitable for the higher grades of glass.

One of the most important materials is soda ash, known as salt cake. This comes largely from the chemical works of the middle west from such points as Barbervtown, Ohio and Detroit.

The cost of fuel plays a most important part in glass manufacture. Large glass concerns would use from 15,000,000 to 20,000,000 cubic feet of gas per month.

The cost of lead used in glass manufacture would be about the same in any part of the country, the lead coming largely from Missouri and being laid down at practically the same prices in all parts of the country. The large glass concerns would use about a car load of lead per month and from one to two car loads of soda ash.

The manufacture of plate glass in Conn. does not appear favorable, as such a plant represents an investment of from \$500,000 to \$1,000,000 and this product is manufactured at a very small profit, requiring the lowest production costs, which mean nearness to the supply of high grade silica and low fuel cost.

The statistics of production of glass under the various groups with the quantities produced in 1914 are as follows:

Number of establishments	347
<u>PRODUCTS</u>	
Total value .....	\$122,964,792
Building glass .....	\$56,794,869
Window glass:	
Quantity (square feet) .....	400,998,893
Value .....	\$17,456,756
Obscured glass, including cathedral & skylight:	
Quantity .....	43,040,079
Value .....	\$2,417,253
Plate glass (made for sale)	
Quantity (square feet) .....	60,515,008
Value .....	\$14,799,846
Wire glass:	
Quantity (square feet) .....	15,688,944
Value .....	\$1,590,934
All other building glass	
Value .....	\$520,280
Pressed & Blown glass	
Value .....	\$30,130,077
Bottles, jars, etc. Value .....	\$51,425,022
All other products, Value .....	\$4,614,824
Art	Ornamental
Bent	Plate
Beveled	Pressed
Chipped	Prismatic
Colored	Pyrographic
Decorated	Quartz
Enameled	Rolled
Engineering specialties	Rough Ribbed
Ground	Sand blast
Headlight	Sidewalk
Leaded & Stained	Silvered
Mirror	Skylight
Mosaic	Structural
Opalescent	Window
	Windshield
	Wire

By far the largest number of glass plants in the country are devoted to the manufacture of window glass and 68 firms are included in this group, the largest proportion of them being located in the Pittsburgh district. Clarksburg, Va., has six plants of this kind.

Next in importance are the plate glass plants, of which there are 45 in the country, mostly located in the Pittsburgh district.

New York City ranks high in the production of mirror glass and mosaic glass.

While the location of the glass industry in the Pittsburgh district has seemed most logical heretofore, it is notable that the industry is gradually spreading through the country and it has been demonstrated that proximity to the natural source of supply of silica is not necessary to the success of plants of this kind. The development of the industry in Corning, N. Y. is a demonstration of this. In that city are located 4 plants manufacturing flint glass goods. One of them is devoted to the production of table glass ware, two of them to the production of lighting goods and one to the

production of specialties and novelties, while several others are engaged in the production of cut glass. Brooklyn Borough leads in the production of cut glass ware, having 17 establishments devoted to this line of industry.

There are, altogether, 166 cut glass works in the country, of which Brooklyn has 17, New York City 8, other cities of New York State 16, New Jersey 12, Connecticut 7, Philadelphia 2, Massachusetts 1 and Rhode Island 1. Of 14 establishments manufacturing electric bulbs, New Jersey has 2 and Brooklyn 2.

New Jersey appears to lead in the manufacture of fruit jars, most of the important establishments of this kind being located in Salem, N. J.

There are 57 plants in the country devoted to the manufacture of lighting goods, of which Brooklyn has 2, Corning, N. Y. 2, Fort Jervis 1 and New Bedford, Mass. 1.

While the different varieties of glass manufactured are many as above noted, yet in a general way the manufacture of glass can be divided into three groups under the heads of building glass, pressed and blown glass and bottles and jars.

Under the head of building glass is included window glass, plate glass, cathedral goods, sky lights and vault lights. Pennsylvania leads in the production of this glass of goods, with West Virginia 2nd, Ohio 3rd, Missouri 4th, Kansas 5th and Indiana 6th, there being a total of 104 plants of this kind.

There are 114 plants devoted to the manufacture of pressed and blown glass, including table ware, tumblers and goblets, lamps, chimneys, globes and electrical goods, globes and gas goods, peir glass, opal ware and cut ware. Pennsylvania leads in the production of this class of goods, with Ohio 2nd, West Virginia 3rd, Indiana 4th and New Jersey 5th.

In the manufacture of bottles and jars, 166 plants are engaged, Pennsylvania again leading the list, with Indiana 2nd, New Jersey 3rd, Illinois 4th and California 5th. Goods of this kind are divided into the following classes, the production of each for 1915 being indicated:

Druggists Ware	3,624,000	gross annually
Beer, soda & Mineral water	2,345,000	"
Liquors & flasks	1,887,000	"
Milk jars	440,000	"
Fruit jars	1,124,000	"
Battery jars	9,000	"
Patent & proprietary medicines	1,637,000	"
Packers & preserved jars	1,237,000	"
Demi-johns & carboys	122,000	"

The principal materials used in glass manufacture are as follows, named in the order of their importance:

Glass sand  
Soda ash  
Lime & Limestone  
Salt cake (sulphate of soda)  
Nitrate of soda  
Arsenic  
Carbon  
Manganese  
Litharge  
Potash  
Rouge  
Grinding sand

As our exports of glass ware to foreign countries amount to nearly \$5,000,000 annually, it is apparent that any glass manufacturing corporation which produces goods for foreign shipment could be most advantageously located in the vicinity of New York.

This advantage of location near New York is also true in relation to the production of all forms of glass for domestic consumption. While building glass would be shipped direct from the works to the consumers, the smaller specialties are to a large extent distributed from New York and much of these goods would be shipped to New York and distributed from there to various parts of the country.

It is, therefore, apparent that it is to the advantage of the producer of any form of glass goods to be located as near the New York market as possible, consistent with economical manufacture and availability of fuel and raw materials. The efficiency of Conn. as to the manufacture of various forms of glass as compared with other important glass centers is demonstrated on succeeding pages and while higher cost of manufacture is shown in Conn. than in some other locations, this disadvantage is offset to a large extent by the advantage of nearness to the New York market.

The glass bottle industry has greatly developed in importance since the commencing of the European War. There are now no importations of empty bottles and we in fact shipped bottles abroad for the shortage in France the past year of over 30 million bottles, due to the occupation by the Germans of territory formerly producing most of the bottle supply.

Of the materials used in the manufacture of glass, sand is, of course, of 1st importance. The best grade of silica sand comes from Ottawa, Ill.





## WOOD PRODUCTS INDUSTRIES

Into this group of industries would be classified all establishments requiring lumber or wood as the principal material of manufacture.

The industries of this kind located in Danbury are as follows:

### Housetrim and cabinet work.

Poster Bros.,  
W. W. Sunderland  
Joseph Vaghi

### Wagon making and repairing.

R. C. Bates,  
W. L. Hall,  
H. Tine & Son  
Wm. Olmsted  
R. J. Vaughn  
Danbury Carriage Co.,  
W. C. Peffers & Co.,  
William Moore.

### Wood products specialties.

Isaac Armstrong & Co.,	shipping cases
C. F. Yoekum	hat blacks
Clark Box Co.,	shipping cases
P. Durkin	brushes
W. F. Sivine	hat drying racks
E. H. Barnum	wood tanks and "kettles"
Hine Box & Printing Co.,	shipping cases
John Reid	shipping cases

These 19 establishments employ 105 men and pay out \$101,000 annually in wages. Their production in 1916 was valued at \$290,500 and they represent investment assets of \$115,000.

The four establishments making wooden cases or boxes for the shipment of hats also manufacture paper boxes and the wood cases are only a small part of their business. These cases are made of pine lumber which comes largely from Canada.

The plant of W. W. Sunderland is the largest wood working establishment in Danbury employing 25 men. This plant includes a planing mill and all the machinery necessary for turning out house trim and manufacturing sash, doors, blinds, stairways and interior wood work of all kinds.

The lumber used is largely maple, spruce, pine, redwood, white wood and hemlock and is obtained from New Haven and South Norwalk, some of it coming to the latter place by coastwise steam and sailing vessels from Maine and southern points.

Foster Bros., who are in the same line of industry employ eight men.

The sawyers, planers and carpenters in these plants are well paid, the wages being 40 cents per hour and average earnings being \$19.50 per week.

These shops are unionized and operate on the basis of a 48 hour a week.

The Sunderland plant is operated by a 40 h.p. gas engine and the Foster plant by an 80 h.p. steam engine, the saw dust and trimmings of the plant being used in part for fuel.

Joseph Vaghi who employs three men conducts the only furniture manufacturing plant in Danbury, his specialty being rustic furniture although he also does cabinet and carpenter work of all kinds.

E. H. Barnum specializes in the manufacture of wooden tubs, tanks and kettles used in the manufacture of hats. These are made of cypress, white pine and white wood.

C. F. Yockum specializes in the manufacture of wooden blocks used by the hat manufacturers in the shaping of the rough hat body. These blocks are made of whitewood. He also makes wood flanges used in the hat shops.

The large amount of lumber used annually in Danbury for construction purposes comes from various sections and is purchased here through local dealers or of dealers in South Norwalk, Bridgeport or New Haven.

White pine and cypress come from the South, spruce from Maine and oak and chestnut from near-by points.

There are no saw mills in the near vicinity of Danbury but there are a few small saw mills in the Danbury area and a number of portable saw mills which are moved from place to place to cut up such local timber as can be purchased from the farmers. I. F. Terry of Bethel has a small saw mill for cutting up native timbers.

The 1910 census states that there were in that year 60,959 acres of woodland in Fairfield County and 143,307 acres of woodland in Litchfield County. It is estimated that there are over 88,000 acres of woodland now within the indicated Danbury zone described in another chapter.

Much of this woodland is in small parcels however and part of the farm properties.

The total of ripe hardwood timber coming to maturity annually in this area, and which could be cut under conservation principles, is doubtless large, but this timber is scattered and the cost of getting it to the saw mill is large.

Never-the-less an industry located in Danbury and using oak, ash, maple, birch, beech and chestnut lumber and provided with a portable saw mill outfit could probably secure a considerable supply of such lumber at reasonable cost by purchasing trees or wood lots from the farmers of this area.

In the Berkshire Hills about 90 miles north of Danbury there are large quantities of birch, beech, maple and ash suitable for furniture manufacture and this timber or the lumber cut from such timber could be brought to Danbury by rail at low cost.

There is also a large supply of hard woods in the Shangatuck Hills 90 miles west of Danbury.

What local supply of hard wood is now available from points close to Danbury is now selling, cut into lumber at the following rates:

Oak	\$40.00	per	thousand	feet
Ash	40.00	"	"	"
Chestnut	30.00	"	"	"



Considerable amounts of building lumber are brought from Bridgeport, the freight rate on same to Danbury being 7¢ per cwt. in car load lots.

Wood working industries are so desirable for any community that it is to be hoped that effort will be made to secure more of such industries for Danbury. While the local supply of native lumber is small this is not an important factor in the manufacture of many lines of wood specialties.

With a seven cent rail rate from Bridgeport, combined with a low coastwise shipping rate, southern and Maine lumber are available in Danbury at a cost as low as many points further inland. For example southern lumber can be placed in Danbury at less cost than in Jamestown, N.Y. which is in a very important furniture manufacturing point.

Little solid hard wood furniture is manufactured now-a-days. It is largely made of southern pine covered with hardwood veneers, and a town to develop the furniture industry should have a comparatively low freight rate on Southern lumber and be possessed of a veneer plant.

There is a large variety of wood specialties which could be manufactured in Danbury to advantage because of the nearness of this city to the New York market.

There are 3155 furniture manufacturing plants in the country employing 128,452 persons and having an annual production amounting in value to over \$250,000,000.

These plants are further classified in the government statistics with their annual productions as follows:

Wooden Furniture	2185	Production	\$170,488,252
Metal	"	"	24,396,377
Store, Bar & Office	687	"	34,312,602

There are 266 furniture plants of all kinds in Greater New York. Of these, 175 are in Manhattan, 67 in Brooklyn, 6 in the Bronx, 2 in Richmond and 16 in Queens.

There are 131 refrigerator manufacturers in the United States producing refrigerators annually to the value of over \$10,000,000.

In a general way it can be stated that the most efficient location of wood furniture plant is at a point nearest to the source of supply of raw lumber. That would be the primal reason for the centralization of the industry in past years in such places as Grand Rapids, Michigan, Jamestown, N.Y., Rockford, Ill; and other points.

There has been a vast change, however, in the past few years in the source of lumber supply and many localities that formerly had the advantage of nearby supply of raw material for lumber manufacture no longer possess that advantage. Much of the lumber now used by furniture plants in Grand Rapids and Jamestown comes from the South or from West or from foreign countries. This tends to lessen the importance and advantage of those cities as furniture manufacturing locations and it is now possible for factories located elsewhere to compete with them on even terms.

These leading furniture cities of course have the advantages of adjacency of allied lines of manufacture, as is the case in all industries which have been specialized in certain localities. For

example, a Grand Rapids manufacturer can obtain his machinery in Grand Rapids, his trimmings, his veneer, his hardware, such as casters, hinges, etc., and all the supplies and materials needed in the production of his finished products.

There is also the advantage of special commodity rates and warehousing and shipping facilities applied particularly for the benefit of the furniture industry that are not possessed by other cities.

Another change that has taken place in the furniture industry that is of great importance is the development of special lines of manufacture. Formerly, a large general furniture factory would turn out all lines of furniture, but now most of the factories specialize not only in chairs but in a particular line, such as Morris chairs.

There are 247 different lines of furniture classified in this way and in each line there are factories that turn out no other product, though some of them may specialize in several different lines.

The result of this specialization is that the location of a furniture factory is not determined now by any general rules, but by the advantages for the manufacture of some particular specialty.

This condition in the industry makes it possible for Danbury to secure the development of furniture manufacture along certain lines for which the location is particularly suitable.

It would appear that in the manufacture of high class furniture, largely using imported lumber, Danbury is an advantageous location because of the ability of manufacturers to obtain their material here at cost.

New York is the largest market in the country for high grade furniture and the manufacturer thus has the advantage here of low delivery cost of his finished product.

The various classifications of the furniture industry are as follows:

Antique Furniture	Cabinets, bachelor
Baby carriages	barbers
Baby jumpers	card index
Baby walkers	catalogue
Bamboo Furn.	curio
Banquet table tops	dentists
Basketry	disc record
Bassinettes,	filing
Bed Davenport	hanging
Beds, brass	hardware
walnut	medicine
folding	music
mantel	office towel
Institution	parlor
Iron & steel	piano player
mahogany	sewing
oak, maple gum	shoe
sofa	smokers
Benches, park	Carpet sweepers
wood	Carriages, doll
Bentwood furn.	Cedar chests
Black boards	Cedar furn.
Blacking cases	Cellerettes

Book cases, combination	Chairs, adjustable
sectional	automatic
library	baby
mission	barber
Book shelves	bedroom
Bolster rolls	white enamel
Boxes (matting covered)	bent wood
shirt waist	boot black
skirt	children
Buffets	colonial
Chairs, step ladder	dining
double cane	Divans
folding	Doll beds
gilt	Dressers
hall	Easels
hammock	Electroliers
high	Filing devices
invalid	Fireless Cookers
kitchen	Fixtures, bank
metal	bar
morris	store
office	"    office
opera	Foot stools
grass	Frames, pictures
reed and rattan	Go carts
reclining	Grilles
revolving	Hardware cabinets
rolling	Hassocks
rustic	Hotel Furniture
slipper	India seats
splint	Inlaid furn.
steamer	Jardiniere stands
surgeons	Kitchen cabinets
Turkish	safes
typewriter	"    tables
Chambers suits- Birds eye maple	Lamps, mission
Circassian walnut	Lawn furn.
Curly birch	Lawn swings
Elm	Leather furn.
Mahogan@y	Lockers, wood
Maple	"    steel
Oak	Lodge furn.
Ash	Mantels
"    Red Gum	Mattresses, wool
Cheval glasses	felt
Chiffonieres	hair
Chiffo-Robes	"    excelsior
China closets	"    moss
Church furniture	Metal furn.
Clocks-Hall	Mirrors
"    Mantel	Office Furn.
Colonial reproductions	Ottomans
comforts	Pedestals
commodes (sanitary)	Piano benches
costumers	Pillows
Clothes poles	Porch furn.
cots - metal	Racks, hall
wood	hat
folding	"    hanging
Couches	"    magazine
Couches, bed	"    music
box	"    umbrella
porch	"    plates
rocking	Reed & Rattan furn.
"    steel	

Cradles,  
 Cribs, metal  
     " wood  
 Cupboards, kitchen  
 Curtains in poles  
     " stretches  
 Davenport  
 Desks, bookkeepers  
     childrens  
     combination  
     flat top  
     ladies  
     roll top  
     school  
     " typewriter  
 Dictionary holders  
 Dining room suits  
 Display racks  
 Tables, adjustable  
     dining room  
     card  
     desk  
     directors  
     draughtsman  
     dressing  
     drop leaf  
     extension  
     folding  
     kitchen & laundry  
     library  
     manicure  
     parlor  
     cafe  
     sewing  
     side  
     smokers  
     store  
     tea  
     " telephone  
     " work  
 Tabourettes,  
 Toy furn.  
 Trays, butlers  
     " serving  
 Typewriter stands  
 Upholstered furn.  
 Wardrobes  
 Wash stands  
 Waste baskets  
 Willow & Wicker furn.  
 Window boxes.

The following are some of the materials and supplies required in furniture manufacture:

Bed springs  
 Mattresses  
 Cabinet makers benches  
 Burlap  
 Cabinet butts  
 Cabinet locks  
 Cambrics  
 Cane webbing

Refrigerators  
 Rockers  
 Rustic furn.  
 School furn.  
 Settees, garden  
     hall  
     " rattan  
 Shades, window  
 Show cases  
 Side boards  
 Smoke stands  
 Shaving stands  
 Stands, umbrella  
     " trunk  
 Stools, bath room  
     folding  
     " office  
 Cold paint  
 Curled hair  
 Hand screws  
 Handles  
 Burniture keys  
 Knobs  
 Lacquers  
 Leather  
 Linters and batts  
 Locks  
 Mirror plates  
 Machinery, chair  
     hair picking  
     " mattress making  
     " wood working  
 Moss  
 Packing pads & wrappers  
 Polish  
 Pulls  
 Screws  
 Shelf supports  
 Sea Shellac  
 Shoddy  
 Desk slides  
 Chair spindles  
 Springs, spiral  
     " woven wire  
 Drawer stops  
 Table locks  
 Table tops  
 Upholsterers fabrics  
 Veneer coatings  
 Wax  
 Jute webbing  
 Wood screws.

Following are the principal varieties of woods used in furniture manufacture:

Mahogany  
 Maple  
 Oak  
 Birch  
 Circassian walnut  
 Red Gum  
 Cedar  
 Curly birch

Tattan fabrics	White maple
Casters	Elm
Catches for doors	Ash
Chair seats	Red Gum
Spring chair seats	
Cheese cloth	
Cheval glass	
Cabinet makers clasps	
Colors, stains & paints	
Varnishes	
Cotton fabrics	
Cotton hats	
cotton waste	
Cushions	
Drawer pulls	
Enamels	
Excelsior	
Fall supports	
Millers	
Glass trimmings	
Rings	
Pins	
Wire	
Brass trimmings	
Glue	

There are less than a hundred manufacturers of wooden burial cases in the country, and New York City has ten of these, of which four are located in Queens Borough, two in Brooklyn, and the remainder in Manhattan.

Outside of New York City, Bangor, Me., and Chicago are the largest producers of caskets.

There is an unlimited field for development in the production of wooden specialties of all kinds, and these industries should be encouraged as they employ well paid skilled labor and tend to the development of other industries.

Among the lines of manufacture under this head, the following are of greatest importance:

Cigar boxes	Rulers
Kitchen utensils	Toys
Dairy "	Bungs
Laundry "	Fret work & grills
Dishes & bowls	Handles
Trays	Plugs
Rolling pins	Bobbins
Butter bowls	Croquet sets
Potato mashers	Brush blocks
Bowling balls & ten pins	Brown handles
Pulleys	Shovel handles
Clothespins	Clothes frames
Curtain poles	Spools
Coat hangers	Steering wheels
Tooth picks	Hair brush backs
Ladders	
Grain measures	
Boot & shoe lasts	
Mirror & picture frames	



THE MAKING OF TOYS

It would appear that the manufacture of toys might be largely developed in Danbury.

As to the possibilities in toys manufacturing, they are very much the same as they are in other lines of business. There seems to be a very mistaken idea that the toy industry in this country is a new one, suddenly springing into existence by the cutting off of toys from Germany. Any manufacturer relying on this supposed condition for the success of his business would make a very serious mistake. Toys have been manufactured in this country for generations and there are many factories which have been doing a large and successful business for the last thirty or forty years.

Naturally the cutting off of German toys is having, and will continue to have a stimulating effect on the American toy market as far as the American manufacturer is concerned, and it is the belief of the writer that this effect will continue for some time after the war. On the other hand, Japan has entered the market very extensively and many of the houses which were extensively engaged in the business of importing toys from Germany have sent representatives to Japan and are now receiving goods from that country.

If a manufacturer is in a position to make wooden toys, that should be the line in which he would most likely succeed. These toys do not come in competition with foreign toys to any great extent, owing to the fact that conditions of freight and climate work against their importation. There are a great many manufacturers of wooden toys in this country, and the essential features of a new line should be those which would appeal to the trade in competition with other lines already existing. The manufacture of what might be called staple toys is done at a very conservative profit and the outlook for a new manufacturer without knowledge of the trade in making such goods would be problematical. A suggestion would be that a local man get in touch with some concern or individual already engaged in the line, so as to combine his financial backing and factory plant with the experience of someone else.

Mr. R. H. McCready, publisher of the magazine "Playthings", 118 East 28th St., New York, is the best informed man in the country on this subject. A copy of the "Plaything Index" would be useful in a study of this industry.





In very few cities of its size in the country has paper box manufacture been developed to such an extent as in Danbury.

Some of the hat box manufacturing also make card board stays, such as are used for packing hats.

It would appear that the local demand for fine glazed and fancy papers used in covering hat boxes might be sufficient to warrant the establishment here of a paper mill to produce that kind of material.

Some of the employees of the box factories are very highly paid. A "molder" receives \$32.00 per week. A "Lidder" is paid \$28.00 per week and other workmen get from \$15.00 to \$20.00 per week. Female employees are paid from \$6.00 to \$12.50 per week.

All of the box shops with the exception of the Clark Box Co., appear to be unionized, and operate on a 55 hour week schedule.

Another industry which is classed in the paper products group is the Danbury Book Bindery.



THE RUBBER INDUSTRY

Danbury has a distinct advantage in the development of this industry in its ample supply of pure water supplied at comparatively low rates.

There are 227 establishments in the United States devoted to the manufacture of rubber goods of various kinds. These establishments have an annual production of nearly \$200,000,000.

By far the largest proportion of this production is in pneumatic and solid automobile tires and inner tubes. In addition to these the following lines of rubber goods manufactured are of greatest importance:

Hard Rubber goods	Rubber Blankets & Covers
Soft rubber goods	Rubber collars and cuffs
Moulded rubber	Rubber covered wire
Rubberized cloth	Diaphragms
Rubber clothing	Disks
Automobile Top material	Dip rubber goods
Air cushions & mattresses.	Rubber gloves and fingers
Rubber bands	Balloons
Bath brushes	Door mats
Bumpers	Dress Shields
Card cloth	Ear Cushions
Embalmers rubber	Erasers
Carriage cloth	Reclaimed Rubber
Fountain pen Fillers	Sash Rubber
Fricition cloth	Plumbers Specialties
Horse shoe pads	Rubber toys
Caskets	Druggists Specialties
Bowling balls	Stationery goods
Razor handles	Dental rubber goods
Hospital sheeting	Surgical goods
House Balls	Rubber thread
Insulating Tape	Water Bottles
Fruit Jar rings	Electrical Specialties
Nursing Bottles & Nipples	Mechanical Specialties
Oil Well caps	Rubber Belting
Rubber linings	Rubber Hose
Rubber Stoppers & Stopples	Rubber Botss & Shoes
Insulating Paint	Pedal Rubbers
Shoe Rubbers	Sponge Rubbers
Shoe Soles	Stamp Rubber
Mineral Rubber	Vulcanite Rubbers
Photographic Rubber goods	Weather strips
Sheet rubber	Toilet goods

In the total manufacture of rubber goods, including tires, Ohio ranks first among the states with New Jersey second, Massachusetts third and New York Fourth.

Exclusive of the tire industry, however, New York ranks first as to number of establishments and value of products.

There are various lines of rubber goods manufactured which might be developed here.

Corrugated rubber is now produced largely in Manhattan by the Gutts Percha & Rubber Mfg. Company, and the N.Y. Belting and Packing Company.

There are four plants in the country producing mineral rubber.

Of the four sash rubber manufacturers, the Home Rubber Company of Trenton, N.J. is the largest.

The largest of the nine manufacturers of sheet rubber are the N.Y. Belting and Packing Company, the Mechanical Rubber Company of Cleveland, Continental Rubber Works of Erie and Quaker City Rubber Company of Philadelphia.

There are only four manufacturers producing weather strip rubber of which the Boston Belting Company is the largest.

The three large concerns producing carriage rubber goods are the Goodyear Company of Akron, Ohio, Indiana Rubber Company, Jonesboro, Indiana, and Canfield Rubber Company, Bridgeport, Conn.

There are 42 manufacturers in the country producing druggists rubber goods, one of the largest being the American Hard Rubber Company of Queens. The other large manufacturers are as follows:

Hodgman Rubber Co.,	New York.
Peerless Rubber Co.,	" "
U. S. Rubber Co.,	" "
N.Y. Rubber Co.,	" "
Goodrich Rubber Co.,	Akron, Ohio.
National India Rubber Co.,	Providence, R.I.
Johnson & Johnson,	New Brunswick, N.J.
Tyer Rubber Co.,	Andover, Mass.

There are 12 manufacturers producing hard rubber goods, of which the American Hard Rubber Company of Queens is the largest.

Rubber goods <sup>for</sup> are hat makers are manufactured by the Mattson Rubber Company of New York.

Ninety-eight manufacturers are engaged in the production of mechanical and electrical rubber goods, Trenton, N.J. with 15 plants leading in this line of manufacture.

Of the 46 moulded rubber plants in the country Trenton has seven.

Outs of the 36 plants engaged in the manufacture of plumbers goods, Trenton leads with six such establishments. The Mechanical Rubber Company of New York is the largest producer of this class of goods.

In the manufacture of stationers goods the American Hard Rubber Company is one of the largest ranking with the Dixon Crucible Company, Eberhard Faber, Tyer Rubber Co., American Lead Pencil Co., and Hodgman Rubber Co. There are 18 manufacturing plants in this line.

The Tyer Rubber Company of Andover, Seamless Rubber Company of New Haven, and Seabury & Johnson of New York are leaders among the seven manufacturers of Surgical rubber goods.

Trenton, N.J. has six out of the 22 plants specializing in fruit jar rings.

There are 32 important manufacturing plants in the country engaged in the manufacture of rubber boots and shoes. Boston leads in this line of industry, having five plants, three of which are the largest in the country.

Akron, Ohio, with only ten establishments, produces 70% of the automobile tires manufactured in this country. Trenton, N.J. has nine tire plants and ranks second in this line of industry.

12,000,000 automobile tires are produced in Akron annually, valued at over \$150,000,000.

The largest tire manufacturers in Akron are the Firestone, Goodrich, Goodyear and Swineheart Companies.

The Michelin Tire Company is located in Milltown, N.J., the Republic Tire Company at Youngstown, Ohio and the Acme and Ajax companies at Trenton.

There is no logical reason why tire manufacture can be conducted more profitably in Akron or Trenton than in some other parts of the country.

The great requisites for successful tire manufacture are cheap fuel costs, and an ample supply of pure soft water at low cost.

The price of crude rubber has gone up materially during the past two years. Normally, the fine "up river" Para rubber was sold at 75¢ to 80¢ per lb. The varieties of crude rubber with their market quotations in January were as follows:-

PARA	Up-river, fine per lb.....	87	a...
	Up-river, coarse .....	67	a..68
	Islands, coarse .....	43	a...
	Caucho ball, upper.....	71	a...
	Caucho ball, lower .....	69	a....
	Cameta .....	44	£....
	Islands, fine .....	82	a....
CEYLON	First Latex pale crepe .....	94	a 95
	Brown crepe.....	92	a 93
	Smoked sheets .....	92	a 94
CENTRALS-Corinto	.....	64	a 65
	Esmeralda .....	63	a ..
	Guayule .....		a
	Balata, sheet .....	60	a 62
	Balata, block .....	41	a 48
AFRICAN	Massai, red .....		a

#### STATISTICS OF THE RUBBER INDUSTRY

The government census for 1914 shows 331 establishments engaged in the manufacture of rubber products, the total value, of their production for that year being valued at \$300,251,827 divided as follows:-

Boots .....	4,024,486	pairs .....	\$12,647,934
Shoes .....	57,211,728	" .....	37,856,222
Automobile Tire Casings ..	8,020,815	.....	105,671,223
" " Tubes .....	7,906,993	.....	20,098,936
" " Solid .....		.....	13,735,681
Bi & Motor Cycle Tires ..	3,728,138	.....	6,905,852
Belting .....		.....	7,989,405
Hose .....		.....	16,853,693
Packing .....		.....	3,507,651
Clothing .....		.....	6,396,810
Druggists & Stationers .....		.....	7,527,755
Other rubber Manufactures.....		.....	39,983,969.

## STATEMENT OF THE MANUFACTURE OF RUBBER GOODS.

COMPARATIVE SUMMARY: 1909 AND 1914.

	CENSUS			TOTAL	1909	Percent of increase (%) 1909-1914.
	1914		Rubber goods other than belting and hose, and boots and shoes			
	Belting and hose.	Boots and shoes.				
Number of establishments . . . . .	18.	23.	301.	342.	267.	28.1
Persons engaged in manufacture . . . . .	6,205.	20,359.	62,257.	88,821.	56,059.	58.4
Proprietors and firm members . . . . .	.	2.	85.	87.	103.	15.5
Salaried employees . . . . .	1,090.	1,670.	11,952.	14,712.	6,692.	119.8
Wage earners (average number) . . . . .	5,115.	18,687.	50,220.	74,022.	49,264.	50.3
Primary horsepower . . . . .	22,995.	24,621.	151,927.	199,543.	122,436.	63.0
Capital . . . . .	\$ 22,437,000.	\$46,051,000.	199,183,000.	267,671,000.	\$ 162,145,000.	65.1
Services . . . . .	4,595,000.	11,945,000.	43,906,000.	60,446,000.	32,978,000.	82.3
Salaries . . . . .	1,693,000.	1,958,000.	12,627,000.	16,278,000.	7,841,000.	107.6
Wages . . . . .	2,902,000.	9,987,000.	31,279,000.	44,168,000.	25,137,000.	75.7
Materials . . . . .	12,967,000.	23,956,000.	126,112,000.	163,035,000.	122,746,000.	32.8
Value of products . . . . .	23,561,000.	53,822,000.	223,611,000.	300,994,000.	197,395,000.	52.5
Value added by manufacture (value of products less cost of materials) . . . . .	10,594,000.	29,866,000.	97,499,000.	137,959,000.	74,650,000.	84.8





THE BUTTON INDUSTRY

New York City is the button market of the world. Practically all the buttons of every kind sold in the United States have their original source of distribution in New York, and buttons to the value of over \$1,000,000 are annually exported from New York to foreign countries; this export business having increased over 100% during the past five years.

The greater portion of the buttons of all kinds manufactured in other parts of the country are shipped to the jobbing houses in New York, and sold from the stocks carried there to the retailers and consumers throughout the country.

In other words a manufacturer of mussel shell buttons in Iowa would ship most of his finished product to his jobbing house in New York even though, a large proportion of that product might later be shipped back again to ultimate consumers in the middle-west.

The fact that New York is the great button market of the country gives a distinct advantage to the button manufacturer whose plant and main office is near New York.

An infinite variety of buttons is manufactured, but these varieties can be divided into the following general groups:

- Pearl Buttons
- Shell (other than pearl)
- Bone
- Metal - (Military)
- Wood
- Cloth covered (metal, paper or other material)
- Celluloid
- Composition
- Jet
- Glass
- Agate
- Collar-cuff
- Horn
- Ivory
- Shoe
- Vegetable Ivory
- Glove

The production of all varieties of buttons in the United States during the year 1914 amounted to

\$20,791,985.

In quantity the annual output of buttons in the United States according to the Government census is upward of sixty million gross.

The most important branch of the button industry is the mother of pearl buttons. The output of pearl buttons for 1914 was twenty six million gross, or nearly half of the button production of the country.

Of the two branches of the pearl button industry, the manufacture of buttons from fresh water shells, known as the mussel or unios, is of the greatest importance, over twenty one million gross of buttons made from fresh water shells being manufactured in 1914 as against four million, five hundred thousand gross manufactured from ocean pearl shells, or mother of pearl.

Next in importance is the manufacture of buttons from vegetable ivory, amounting to over five million gross and third in importance is the manufacture of covered buttons. The quantity and value of the various kinds of buttons manufactured in 1914, is as follows:

	GROSS	VALUE
Total value .....		\$20,791,985
Agate .....	3,660	5,100
Bone .....	2,198,946	329,934
Celluloid, plastic .....	623,169	724,354
Collar & Cuff .....	1,771,053	56,251
Glass .....	217,224	100,201
Horn .....	537,096	299,487
Ivory .....	382,560	283,484
Metal, not including trouser or collar and cuff:		
Dress or uniform .....	257,823	285,352
All other .....	617,740	172,133
Pearl or shell:		
Fresh water .....	21,664,436	4,879,844
Ocean .....	4,516,969	2,489,364
Shoe .....	15,820,037	610,795
Covered .....	3,017,436	1,600,178
Trouser:		
Steel .....	535,207	307,802
Other metal .....	252,248	44,150
Vegetable ivory .....	2,289,402	1,326,227
Other composition .....	1,510,272	658,880
Vegetable ivory, not includ- ing trouser:	2,838,603	1,559,276
Wood .....	1,331	2,522
Others, not specified	1,458,446	388,538
Parts of buttons .....	388,201	111,325
Blanks, or molds .....	14,304,148	2,349,412
Snap fasteners (great gross)		
Steel .....	517,895	159,351
Other metals .....	641,151	252,034
All other products .....		1,797,990

The Government reports show that New York is the most important button manufacturing state in the country, having 224 or nearly half of the total number of 517, button plants. Iowa runs next with 81 plants, - New Jersey, third, with 60 plants, - Illinois, fourth, with 31 plants, - Pennsylvania, fifth, with 21 plants, and other states in order are Connecticut, Massachusetts, California, Missouri, Ohio, Arkansas, Kentucky, Minnesota, Washington, Rhode Island, Tennessee, West Virginia and Wisconsin.

The Thomas Register of Manufacturers lists only about 100 of the total button manufacturers of the country. On the basis of the Thomas reports and other reports available, Queens Borough, with its 13 pearl button plants, appears to stand 1st in the number of establishments manufacturing ocean pearl buttons and in the quantity and value of this particular product. Manhattan comes next and Newark third.

In the manufacture of fresh water pearl buttons, Muscatine, Iowa, ranks 1st with 17 plants.

In the manufacture of other forms of buttons, the honors appear divided among the various cities, altho Newark, N. J., with a total of 41 plants, leads as the most important button city in the country.

Bone buttons are manufactured in Middletown, Conn., in Chicago and Philadelphia.

Most of the output of the shoe button industry is manufactured in New England, altho New York has four such plants and Newark 3.

Connecticut had several important plants devoted to the manufacture of brass and military buttons of various kinds.

There are 13 celluloid button plants in the country, of which Chicago has 3 and New York 3.

There are 5 composition buttons plants, of which Connecticut has 2 and New York 2.

There are 3 plants devoted to the manufacture of glass buttons, 2 of them being located in New York.

There are 7 plants specializing in glove buttons, of which 4 are located in New York.

6 plants manufacture horn buttons, several of these being located in Chicago.

2 plants manufacture jet buttons and are located in New York.

There are 7 plants listed manufacturing wooden buttons, most of them being located in Indiana, Ohio and Michigan.

The process of manufacture of pearl buttons is most interesting. All the shell is used, with the exception of what is called the "hill" which is too hard to cut. All ocean pearl buttons are made from the shell of the bivalve known as *Meleagena Margaritifera*, or better known to manufacturers as Mother of Pearl shell. These shells are imported from Australia, the Indian and Pacific Ocean countries and the Philippines.

Over 2,000 tons of this shell are imported into the United States yearly, most of it coming to New York and distributed as follows:

22% Queens	12% Philadelphia
18% Manhattan	9% West New York & North Bergen
17% Newark	22% elsewhere

The steamship shipping rate at present is upwards of \$100 per ton, although before the war the rate was much less. The shell is received in boxes weighing from 200 to 400 lbs. and is worth from \$1,000 to \$1,200 per ton.

Oyster shells and other Atlantic coast shells cannot be used for button manufacture for the reason that they are too soft and there is more to be had.

The shell is first soaked in water for a few days. This has a tendency to soften it before it is cut into what is called "blanks" by tubular steel cutters, cooled by water. The blanks are then split by hand into different thicknesses, after which they are faced and shaped. The holes are then drilled by special multiple drilling machines, which drill a number of buttons at one time. They are then placed in revolving drums, which contain polishing materials, and polished after which they are sorted by machines as to grades in thickness and later sorted by hand as to color or defects.

As the "hill" of the shell cannot be used in making buttons, there is a considerable waste, but this "hill" forms a valuable "bi-product" as it is made into umbrella and knife handles, and the like.

The machines on which the shell is cut, ground, drilled and polished into buttons are not of complicated design and so the equipment of a button plant does not represent a very great investment and the cost of up keep is very small, as the tubular cutters and small drills are about all which requires often replacement.

Other materials used in the manufacture of pearl buttons are sulphuric acid, muratic acid, saw dust, peroxide, henna, lime dye. These materials are used purely to polish and give the button the glassy effect and to give them a clearer color.

The cards on which the buttons are carded are most all bought from New York and the same is true of the boxes, many concerns using as high as \$1,000 worth of cards and boxes each year.



PRINTING AND PUBLISHING

Danbury can feel proud of its one newspaper, the Danbury News, which is issued every afternoon. This newspaper is strictly up to-date and progressive and furnishes an excellent news service.

There are eight job printing establishments in Danbury as follows:

Danbury Printing Co.,  
S. E. Whittaker  
Geo. F. Allen  
Danbury News  
F. S. Olmsted  
E. E. Hamilton  
Prompt Printery  
E. C. Gehrek

These eight plants employ 52 persons (15 of whom are females) and pay out \$34,900 annually in wages.

The largest of these is that of the Danbury Printing Co., which has 30 employees.

The further development of the printing and publishing business in Danbury is both possible and desirable, as the employees are males and well paid.

The local printing needs of Danbury are well supplied, by the present plants, but Danbury would be a favorable location for a large commercial printing establishment doing a general business throughout New England, or some plant specializing in some form of printing or lithographing such as labels or calendars.

Plants of this kind are operated successfully outside of New York .

The union wage scale for printing offices is: pressmen \$21.00 per week, press feeders \$12.00 to \$15.00; compositors \$15.00 to \$18.00 per week.

A number of the hat supply houses and paper box concerns such as the Hine Box & Printing Co., have printing plants in connection with their other lines of work and do a considerable amount of special printing for the hat trade.



### TEXTILE INDUSTRIES

The textile industry of Danbury is confined to the operation of three silk mills, one plant making cotton thread and one small plant making rag carpets and rags.

The latter, the Danbury Rug Works, is of small present importance employing only three men, but is likely to develop into a manufactory of wire cloth.

The thread works, that of C. I. Robinson & Co., is also a small enterprise, employing only eight hands, six of whom are females, but it is of importance as the first foothold here of the cotton textile industry.

The material used at this plant is cotton yarn and this is twisted or spun and wound into finished spool sewing thread and sold to the general trade.

The cotton textile industry has largely developed in Connecticut the total production of cotton goods in this state being over \$25,000,000 in value annually.

To produce these goods which consist of plain cotton cloth, sheetings, fancy woven fabrics, ticks, denims, yarns, thread and waste over 57,000,000 pounds of raw cotton are required annually.

It is rather strange that the cotton industry has not spread from other parts of Connecticut and Massachusetts into Danbury and developed here to large proportions.

It is still possible that the industry may be developed here and a careful study should be made of the character and trend of cotton manufacture to ascertain which of the special lines could be most easily and advantageously developed.

Effort should then be made to interest large cotton manufacturing concerns to establish branch plants here.

It is probable that the development of mixed cotton and silk fabrics would prove most advantageous and a line most easily developed. There is already a good customer for such a plant establishment here, Warner Bros. Co., manufacturers of corsets who consume a large quantity of cloth of various kinds.

The manufacture of the coarser grades of cotton goods is rapidly developing in the South and it is probable that the cotton industry in the North will only expand and grow in the finer lines of cotton wares.

The manufacture of cordage particularly of cotton rope and twine is entirely logical for Danbury and these are lines of industry that might readily be developed here.

While New England is no longer the most logical location for the woolen textile industry, yet it is so thoroughly established in these states that it is not likely to be removed to any large extent to other localities.

The most that can be said of the possibilities for wool textile development in Danbury is that this location is as favorable as many others where woolen mills are now established and it is possible that through the expansion of the industry and the establishment of branch plants of the large woolen companies, Danbury may find an opportunity to secure an industry of this kind.



Owing to Danbury's nearness to the New York market, this would be a particularly favorable location for a mill specializing in wool or mixed upholstery fabrics, in fancy wool rugs and automobile robes, or in wool felt, wool hats, or woollen cap material.

In fact the development of the wool cap industry would be especially logical because of Danbury's high reputation in the hat trade.

#### The Silk Industry.

It is in silk manufacture however that Danbury has the greatest opportunity for development in the textile industry.

Danbury has already become thoroughly established as a silk manufacturing location through the building up here of three very substantial silk mills, two of which manufacture narrow fabrics and one broad silks.

These plants with the number of persons employed by each are as follows:

Tweedy Silk Mills	110
Imperial Silk Works	42
Berfelden Silk Mills	50

Altogether these silk mills employ 202 persons of whom 170 are females.

Their united production in 1916 was valued at \$340,000. They pay out \$106,600 annually in wages and represent assets of \$575,000.

These three plants occupy 47,000 square feet of floor space and require 210 primary horse power.

Employees of the silk mills are well paid, the men receiving from \$16.00 to \$22.00 per week and the girls and women from \$6.00 to \$18.00. Two of the mills are open and one is union and the working time is 50 hours per week. The wage scale is as follows:

Weavers	\$17.00 to \$22.00 per week
Winders	10.00 to 12.00 " "
Warpers	10.00 to 12.00 " "

The Berfelden Silk Mill located in Bethel manufactures broad silks, principally dress silks.

The Tweedy and Imperial mills manufacture hat band ribbon and silk cord and braid. Their establishment here was brought about by the demands of the hat trade by which large quantities of hat band ribbon are consumed annually.

largely

The raw silk used by these mills is imported from Japan through some comes from China, India and Italy. This raw silk is purchased in New York, the silk market of the country.

The hat band manufacturers use some artificial silk and some cotton in various grades of their products.

The silk manufacturers are able to secure their cut cards and winding cards from the local paper box concerns.

It would be greatly to the advantage of the three silk mills already established here and to the future development of the industry if a dyeing works were established here.

The location of large dyeing works in Paterson, N.J., did much toward the development of the silk industry in that city.

The main requirement of a dye works location is ample supply of pure cheap water and Danbury can fill this requirement.

As the three silk mills now located here already offer considerable business for such an establishment and as there would be plenty of business from other textile works in Connecticut, it appears that it would not be difficult to induce some dyeing concern now located elsewhere to put in a plant here. Such works employ male help and pay good wages.

In considering the silk industry there must necessarily be made a close study of the conditions existing in the industry in Paterson, N.J., which is the leading silk manufacturing community in this country.

There are 397 plants of various kinds in Paterson devoted to the production of silk goods. These silk mills employ 23,120 persons (about half women) and pay out \$15,829,516 annually in wages. The value of their products in 1915 was \$52,358,000 and there is over thirty six million dollars capital invested in the industry in this one city.

The 1914 government statistics show a total of 900 silk manufacturing establishments in the country.

These 900 silk mills produced silk goods in 1914 valued at \$253,764,170.

Using the value of silk products of Paterson in 1915 as a basis and assuming that the total silk production of the United States was about the same in 1915 as in 1914. Paterson appears to produce about one-fourth of the total silk manufactured in the entire country.

The production of silk goods of various kinds in 1914 was as follows:

<u>Broad silks-</u>	
Yards	216,033,696
Value .....	\$ 137,719,564
<u>All silk goods-</u>	
Yards	142,713,359
Value .....	96,689,801
<u>Piece, dyed-</u>	
Yards	59,304,041
Value	38,819,874
<u>Printed-</u>	
Yards	4,528,453
Value	2,637,231
<u>Yarn, dyed-</u>	
Yards	78,880,865
Value	55,232,696
<u>Mixed goods-</u>	
Yards	73,320,337
Value .....	41,029,763
<u>Piece dyed-</u>	
Yards	39,559,303
Value	21,843,055
<u>Printed-</u>	
Yards	310,731
Value	203,848
<u>Yarn dyed-</u>	
Yards	33,450,303
Value	18,982,860

<u>Velvets</u>		
Yards		16,318,135
Value		\$ 8,570,022
<u>Flushes</u>		
Yards		9,114,992
Value		10,135,842
<u>Upholstery and tapestries-</u>		
Yards		477,699
Value		840,126
Ribbons, value		\$ 38,201,293
Laces, nets, veils, veillings, etc., value		1,328,933
Embroideries, value		33,500
Fringes and gimps, value		1,025,188
Braids & bindings, value		3,073,648
Tailors' trimmings, value		210,741
Military trimmings, value		431,422
Machine twist-		
Pounds		659,540
Value		4,036,807
Sewing and embroidery silks-		
Pounds		744,708
Value		5,046,452
Fringe and floss silks-		
Pounds		157,791
Value		598,354
Organsine, for sale-		
Pounds		1,492,999
Value		6,325,291
Tram, for-sale-		
Pounds		2,577,402
Value		9,698,637
Spun silk, for sale-		
Pounds		1,607,416
Value		4,577,058
All other products, value		13,516,248
Received for contract work		8,395,044

Work done by throwsters (materials furnished  
by others.)

Thrown into organsine, pounds	7,130,032
Thrown into tram, pounds	6,806,948

While Paterson still leads as the center of the silk industry there appears to be a tendency among silk interests to spread over the country, and Paterson appears to be losing its grip on the industry.

According to Davidsons Silk Directory, Paterson possessed 32% of the total number of silk mills in 1909 while in 1916 the city possessed only 21% of the total.

Pennsylvania has been the largest gainer by the spread of the industry, although New York State and New England have profited to some extent.

The Davidson Directory lists 540 silk mills as located in Pennsylvania, 513 in New Jersey, 403 in New York State, 223 in New England States and 151 located elsewhere.

Davidsons Directory includes silk hosiery establishments and throwsters in making its total of 1830 plants.

Of the total 498 mills in the country making broad silks, Paterson has 241 and Pennsylvania 137.

Of the total 172 mills manufacturing ribbons, Paterson has 57 and Pennsylvania 56.

Of the total 246 fancy and tie silk manufacturers in the country Paterson has 35 and Pennsylvania 89.

Of the 162 silk dyeing plants in the country Paterson has 40 and New York City 46.

In the manufacture of silkbraids Paterson has only 2 plants, New York City 56 and Philadelphia most of the others.

In the manufacture of silk hosiery Pennsylvania leads with 102 plants out of a total of 186.

Out of the 185 new silk manufacturing plants of all kinds established during the past year Paterson gained 91, Pennsylvania 41, New York City, 19, Massachusetts 5, Connecticut 4, and Rhode Island 2.

Outside of Paterson and New York City the most important silk manufacturing localities are Philadelphia, which has 79 plants, Allentown, Pa. 28 plants, Reading, Pa., 26 plants, Scranton, Pa. 21 plants, Bethlehem, Pa., 12 plants, New Bedford, Mass. 12 plants, Boston 11 plants, Easton, Pa., 11 plants, York, Pa., 8, Lowell, Mass., 7, Bridgeport, Conn. 7.

In the various classes of silk manufacture the sectional division of plants is as follows, as to number of plants:

Kind of Manufacture	Total	Pat.N.J.	Pa.	N.Y.C.	N.Eng.	Elsewhere	
Braids	125	2	6	19	56	38	16
Plain silks	498-241	47	137	9	26	39	
Fancy & Tie silks	246	70	35	88	4	27	22
Cotton & Silk-Mixed	46	7	3	7	-	24	5
Silkgloves & Mittens-	53	1	2	8	5	7	30
Silk Hd'ks." Mflrs.	31	2	2	8	8	3	8
Hat Bands	35	15	-	4	8	8	0
Silk Hosiery	186	2	12	102	7	20	43
Insulating silks	9	-	-	2	-	4	3
Knit Neckties	63	1	1	27	22	2	10
Tabular neckwear	7	1	-	2	-	3	1
Labels and badges	19	4	1	2	4	2	6
Silk lacings	33	1	1	5	5	6	5
Silk linings	18	-	-	1	1	9	7
Plushes & velvets	24	3	1	8	2	9	1
Ribbons	172	57	13	56	25	7	14
Silk shawls	11	3	-	2	1	2	3
Sewing silk, etc.	34	-	-	1	1	20	12
Spun Silk Yarns	19	-	1	3	3	8	4
Silk Sweaters	130	1	5	19	50	9	46
Silk Tapes	32	2	1	10	6	9	4
Com. Throwsters	190	35	8	99	-	12	56
Thrown silk	63	7	4	28	2	6	22
Trimmings	233	2	9	24	142	15	45
Upholstering Goods	33	3	-	20	2	3	5
Umbrella silks	9	-	4	4	-	1	0
Silk Underwear	88	1	3	11	6	12	55
Veilings & laces	43	5	5	4	2	8	19
Silk Wire	38	-	6	4	8	13	7
Warping & Winding	22	14	1	4	-	2	1
Silk Winding&spooling	61	9	3	19	27	3	-
Silk Machinery Wipers-	6	-	-	2	-	4	-
Dyers Finishers & Printers	162	40	23	38	46	15	-

Paterson is far in the lead in the manufacture of broad silks as compared with other silk centers, having 241 mills producing this class of goods as against 10 mills in Allentown and 7 in Philadelphia.

In the manufacture of fancy and tie silks Paterson has 70 mills, Philadelphia 3 and Allentown 6.

In the manufacture of ribbon Paterson has 57 mills, Philadelphia 12 and Allentown 13.

Philadelphia leads in silk hosiery manufacture with 53 plants.

The business of "throwing" silk has drifted away from Paterson most rapidly due to the increasing cost of labor. In 1904 there were 31 thrown silk concerns in Paterson, while Pennsylvania showed 48 concerns in the same line. In 1916 there were only 19 of these "commission throwster" establishments in Paterson, while Pennsylvania has 108, thus indicating that so far as the "throwster" branch of the industry is concerned Pennsylvania is safely in the lead.

These "commission throwster" plants is largely located in small towns where female labor is cheaper than in the cities.

The principal reason for the spreading of the industry from Paterson has been this matter of labor costs and supply of female labor. Girls can be employed in some small towns at from \$3.00 to \$6.00 less per week than in Paterson or any part of the New York zone.

Where plenty of female help can be secured the ratio of 90 female to 10 male workers can be maintained in operation of silk mills thus greatly lowering manufacturing costs.

In Paterson, however, at the present time the ratio is about 50-50 due to the shortage of female labor.

While lower labor costs are an advantage to Manufacturers who have mills in these smaller towns, yet it is a question whether the disadvantage of being so far away from New York City does not offset the lower manufacturing costs.

New York is the silk market of the country. No matter where the silk is made it has to be shipped to Manhattan Borough, New York for sale and distribution.

So also in the matter of raw materials. All manufacturers must purchase their raw silks in New York and therefore if a mill is located in New England or anywhere else in the country, the raw material must be brought by express from New York and the finished goods sent back to New York.

Any silk manufacturer would prefer to be located as closely as possible to the Manhattan buying and selling market to be in close touch with same daily.

There are various reasons for Paterson's continued supremacy in the silk industry, despite high labor costs and more or less labor troubles.

The chief advantage is in the centralization of the trade and the concentration at this point of allied industries.

One of the most important factors has been the location there of so many large silk dyeing establishments. There are 24 such plants employing 7,610 persons who receive \$3,628,480 annually in wages.

The product of these dyeing plants was \$12,414,000 in 1915. Among these were such immense establishments as those of the National Silk Dyeing Co., and the Weidmann Silk Dyeing Co., the two largest in the country.

The particular reason for the location of these dyeing works in Paterson is the excellence, abundance and comparative cheapness of the water supply, an immense consumption of water being required in this industry.

Paterson silk manufacturers are particularly fortunate in possessing so many manufactures of textile machinery and supplies. There are 18 concerns in Paterson engaged in making various kinds of textile machinery, particularly silk mill machinery and some of these such as the Eastwood Company, Sipp Machine Co., John Royle & Sons, are of large size and able to meet every demand. There is a great advantage to any textile manufacturer in being able to obtain his machine replacements and repairs quickly and at the lowest possible price.

Several concerns are engaged solely in the manufacture of "reeds and harness", one of these being the Jacob Walder Company, which employs 100 men. There are 14 concerns in Paterson engaged in making silk small supplies of various kinds.

The eighteen "commission throwsters" still located in Paterson serve a large number of the mills in the preparation of the raw silks for manufacture, and five concerns are solely engaged in "warping and winding." Several establishments do card cutting for the silk trade and a testing laboratory is an added convenience in permitting the testing of the raw silk as it is received from Japan, this being necessary in the case of all shipments to permit settlements and to protect the manufacturers.

Another advantage to Paterson silk manufacturers is the preponderance of skilled labor.

Paterson's Association of Silk Manufacturers has wisely established a textile school, and this school is continually providing new labor for the mills partly trained in the process of silk manufacture.

## TWEEDY SILK MILLS INC.

Manufacturers of  
*American*  
Hat Bands  
and Braids

Office and Factory  
Danbury, Conn.



CORDAGE AND TWINE

There are 157 plants in the United States manufacturing cordage, twine, linen thread, and jute flax and hemp products. These plants had an annual production valued at \$83,223,424 in 1914.

The quantity and cost of materials used in manufacture and the quantity and value of the various finished products for 1914 was as follows:-

MANUFACTURE OF CORDAGE AND TWINE AND JUTE AND LINEN  
GOODS IN THE UNITED STATES -- 1914.

Number of establishments .....	157
Total cost .....	\$52,527,239
Hard fibers:	
Pounds .....	437,330,684
Cost .....	\$23,576,735

Of the 157 establishments in these industries 29 were located in Pennsylvania, 20 in Massachusetts, 17 in New York State, 13 in New Jersey and 9 in Connecticut.

Philadelphia is the largest producer of cordage while New York City ranks second.

Manhattan has 6 cordage and twine plants, Brooklyn 4, the Bronx 1, and Queens 1.

The only jute mill in Greater New York is located in Brooklyn.

The varieties of twine manufactured is as follows:-

- Asbestos
- Braided Cotton
- Cotton rope and twine
- Flax cordage
- Gilling
- Jute cordage
- Hemp cordage
- Sisal cordage
- Manilla rope
- Binder twine
- Oil well cordage
- Sea Island
- Seine and Gill net
- Tarred cordage
- Twine of cotton, hemp, and flax.

There appears no reason why cordage and twine cannot be manufactured to advantage in Danbury.





## MANUFACTURE OF FELT GOODS IN THE UNITED STATES - 1914.

No. of Establishments ..... 53

M A T E R I A L S

	<u>No. or Quantity</u>	<u>Cost or Value</u>
Wool (in condition purchased) pounds..	14,969,852	\$4,030,114
Equivalent of above in secured condition .....	pounds..10,476,716	-
Animal hair (inc. mohair, camel hair.) etc.) .....	pounds..11,540,575	739,955
Cotton .....	pounds.. 3,117,272	297,632
Rags, clippings, etc. ....	pounds.. 1,170,409	70,813
Reclaimed wool fiber .....	pounds.. 3,502,795	409,513
Wool and other noils and wool waste, pounds..	4,064,699	1,019,687
Tops .....	pounds.. 17,381	6,897
Chemicals and dyestuffs .....	pounds.. -	269,921

P R O O D U C T S

Total value .....	sq. yds..	\$13,692,765
Felt cloths .....	sq. yds.. -	797,048
Trimming and lining felts, including felt skirts and skirtings..	sq. yds.. 7,431,152	1,048,583
Table and piano covers.....	sq. yds.. 458,178	272,754
Saddle felts .....	pounds .. 2,291,662	973,353
Endless belts .....	pounds .. 3,941,795	4,164,186
Boot and shoe linings .....	pounds .. 3,028,286	1,512,783
Hair felting .....	sq. yds.. 1,350,436	636,041
All other felts .....	pounds .. 7,477,263	3,691,061
Waste .....	pounds .. 332,384	44,751
All other products, including contract work .....		553,165

M A C H I N E R Y

Woolen cards .....	sets ..	575
Spindles:		
Spinning, mule .....	number ..	34,831
Spinning, frame .....	number ..	1,631
Doubling and twisting .....	number ..	1,050
Broad looms .....	number ..	446
Narrow looms .....	number ..	26
Pickers .....	number ..	88
Garnet machines .....	number ..	25

CARPETS AND RUGS

New York City and Philadelphia lead in the manufacture of carpets and rugs. The former has 14 carpet and rug plants and the latter 52.

There are altogether 97 establishments in the United States manufacturing carpets and rugs and the products of their plants in 1914 was valued at \$69,128,185.

The production of woolen carpets and rugs is confined to six States. Of these New York State (largely New York City) produces more than 37% of the total output. Pennsylvania ranks second, Massachusetts third, Connecticut fourth, and New Jersey fifth in production. The number of plants is divided as follows:-

Pennsylvania	63
New York	14
Massachusetts	12
New Jersey	4
Connecticut	3
Indiana	1

The production of the various kinds of goods manufactured and the quantity of materials used in manufacture is as follows:  
Principal Materials.

Wool (in condition purchased):	
Pounds .....	52,582,449
Cost .....	\$10,493,743
Equivalent of above in-scoured condition,	1639,218,831
Wool and other noils and wool waste:	
Pounds .....	3,419,715
Cost .....	\$476,610
Animal hair (including mohair, camel hair, etc.):	
Pounds .....	3,469,283
Cost .....	\$402,225
Cotton, domestic:	
Pounds .....	3,802,789
Cost .....	\$343,916
Yarns:	
Woolen-	
Pounds .....	21,628,560
Cost .....	\$5,821,843
Worsted-	
Pounds .....	9,257,278
Cost .....	\$4,592,906
Merino (cotton mixed)-	
Pounds .....	68,082
Cost .....	\$13,398
Cotton-	
Pounds .....	24,619,157
Cost .....	\$4,637,673
Linen-	
Pounds .....	7,602,200
Cost .....	\$1,414,924
Jute, ramie, and other vegetable fiber-	
Pounds .....	59,148,266
Cost .....	\$8,040,186
Chemicals and dyestuffs, cost .....	\$1,378,509
PRODUCTS	
Total value .....	\$69,128,185
Axminster and Moquette carpets and rugs:	
Square Yards .....	15,742,835
Value .....	\$18,578,693
Wilton carpets and rugs:	
Square Yards .....	5,616,263
Value .....	\$11,929,605

Continued next page.

Body Brussels carpets and rugs:	
Square yards .....	2,698,840
Value .....	\$3,995,626
Tapestry velvet carpets and rugs:	
Square yards .....	\$13,227,819
Value .....	\$12,867,635
Tapestry Brussels carpets and rugs:	
Square yards .....	13,614,354
Value .....	\$9,852,647
Ingersin carpets and rugs:	
Square yards .....	8,973,270
Value .....	\$3,406,381
Smyrna rugs:	
Square yards .....	822,150
Value .....	\$870,891
Colonial or rage rugs:	
Square yards .....	779,732
Value .....	\$530,259
Wool and paper-fiber rugs:	
Square yards .....	4,168,954
Value .....	\$1,543,079
Other wool rugs:	
Square yards .....	695,957
Value .....	\$ 1,108,506
All other products, value .....	\$ 4,444,863
	MACHINERY
Wollen cards .....	465
Spindles:	
Spinning, mule .....	102,238
Spinning, frame .....	110,090
Doubling and twisting .....	34,434
Carpet and rug looms:	
Power .....	9,821
Hand .....	29

There are 975 establishments in the United States devoted to the manufacture of woollen and worsted goods. These are divided as follows:

Worsted (combed wool) goods	294
Woollen (carded wool) goods	501
Carpets and Rugs	97
Felt Goods	53
Wool felt hats	30

The value of the production of all these plants in 1914 was \$464,249,813, which showed a loss as compared with 1909. Since 1914 however, the wool industry has had a new lease of life and is now very prosperous.

The production of woollen goods is classified into various groups and the value of this production in 1914 was as follows:

All wool woollen fabrics	\$ 55,660,900
All wool worsted fabrics	141,778,035
Cotton warp woollen fabrics	13,598,007
Cotton warp worsted fabrics	14,897,757
Cotton mixed fabrics	11,710,000
Flannels for underwear	1,089,561
Dornett flannels and shirtings	2,814,084
Linings and lastings	9,804,661
Satinets and lindseys	1,536,291
Bed blankets	6,186,764
Horse blankets	1,832,598
Carriage blankets	1,215,420
Woven shawls	66,395
Upholstery goods	1,539,381
Woollen yarn	8,783,020
Worsted yarn	69,801,271
Merino yarn	4,862,564
Mohair yarn	2,279,162
Cotton yarn	109,308
Wools and wool waste	10,155,250
Tops and slubbing	4,926,430

It is surprising that Danbury has not developed any branch of the woollen industry along with other New England cities. There are still large opportunity in this field and it will be possible to secure the removal of some woollen plant now located elsewhere to Danbury.

In this industry Massachusetts leads in value of production, producing one third of the total in value of products. Pennsylvania ranks second, Rhode Island third, New Jersey fourth and New York State fifth.

New York State produces woollen goods to the value of over \$25,000,000 annually.

Much of the machinery used in the woollen industry is made in Massachusetts, Connecticut and Rhode Island. To show the extent of this machinery manufacture following is the number of each kind of machine in use in this country.

Mule spinning spindles	2,340,000
Frame spinning spindles	1,600,000
Doubling and twisting spindles	839,000
Broad looms	56,000
Narrow looms	18,000
Wool combing machines	2,294
Pickers	1,201

The United States has 1325 cotton mills producing various forms of cotton goods to the value of seven hundred million dollars annually as follows:

Woven goods:		
Square yards .....	6,815,645,683	
Value .....	\$488,729,054	
Ducks-		
Square yards .....	248,539,379	
Value .....	\$47,921,989	
Ginghams-		
Square yards .....	489,661,133	
Value .....	\$56,766,542	
Fancy weaves, total-		
Square yards .....	1,422,787,368	
Value .....	\$131,813,609	
Drills-		
Square yards .....	289,969,885	
Value .....	\$21,256,698	
Twills, sateens, etc.		
Square yards .....	392,108,735	
Value .....	\$32,891,854	
All other fancy weaves-		
Square yards .....	740,708,748	
Value .....	\$77,665,057	
Napped fabrics-		
Square yards .....	265,862,227	
Value .....	\$24,352,020	
Velvets, corduroys, plushes, etc.-		
Square yards .....	29,128,703	
Value .....	\$3,540,143	
Toweling and terry weaves-		
Square yards .....	75,732,241	
Value .....	\$9,805,232	
Mosquito netting and similar fabrics-		
Square yards .....	97,981,783	
Value .....	\$2,820,524	
Bags and Bagging-		
Square yards .....	129,357,002	
Value .....	\$9,705,616	
Tapestries-		
Square yards .....	10,137,710	
Value .....	\$5,411,592	
All other woven goods-		
Square yards .....	4,048,458,137	
Value .....	\$211,650,787	
Yarns manufactured for sale:		
Pounds .....	497,986,999	
Value .....	\$127,365,952	
Soft fibers:		
Pounds .....	358,345,841	
Value .....	\$18,273,553	
Jute-		
Pounds .....	128,312,082	
Cost .....	\$9,737,870	
Jute Butts-		
Pounds .....	114,389,155	
Cost .....	\$3,535,552	
Flax and flax tow-		
Pounds .....	24,717,598	
Cost .....	\$3,205,975	
Hemp and hemp tow-		
Pounds .....	22,752,353	
Cost .....	\$1,861,817	
Other soft fibers-		
Pounds .....	48,174,653	
Cost .....	\$932,339	
Cotton:		
Pounds .....	32,336,685	
Cost .....	\$3,453,348	
Yarns purchased:		
Cotton-		

Pounds .....	8,858,054	415
Cost .....	\$1,458,169	
Flax, hemp, jute, and ramie-		
Pounds .....	6,269,660	
Cost .....	\$765,444	

PRODUCTS

Total Value .....	\$35,228,424
Rope and binder twine, exclusive of cotton rope:	
Pounds .....	487,443,356
Value .....	\$43,085,517
Cotton rope:	
Pounds .....	13,244,198
Value .....	\$2,539,906
Twine, other than binder:	
Pounds .....	105,249,677
Value .....	\$13,996,522
Cotton-	
Pounds .....	17,927,286
Value .....	\$3,472,056
Jute-	
Pounds .....	55,282,159
Value .....	\$5,268,357
Hemp-	
Pounds .....	9,318,771
Value .....	\$1,583,354
Flax-	
Pounds .....	3,953,622
Value .....	\$1,051,684
Other, including mixed-	
Pounds .....	18,767,839
Value .....	\$2,621,071
Yarns for sale:	
Pounds .....	75,875,322
Value .....	\$8,320,186
Jute-	
Pounds .....	69,827,005
Value .....	\$7,357,688
Other-	
Pounds .....	6,048,317
Value .....	\$962,298
Linen thread:	
Pounds .....	5,707,568
Value .....	\$3,409,136
Bags and Bagging:	
Square Yards .....	131,827,658
Value .....	\$6,440,594
Jute carpets and rugs:	
Square yards .....	3,326,302
Value .....	\$816,845
All other products, value .....	\$4,619,718
Thread:	
Pounds .....	25,507,025
Value .....	\$22,917,099
Twine:	
Pounds .....	13,284,875
Value .....	\$2,792,125
Cordage and rope:	
Pounds .....	5,515,658
Value .....	\$891,223
Cotton waste not used:	
Pounds .....	317,363,019
Value .....	\$14,421,929
All other products, value .....	\$44,037,866

New England leads in the manufacture of cotton goods though the Southern States are rapidly gaining ground, many northern cotton manufacturers having established plants in the South.

Of the most important cotton goods manufacturing cities Fall River, Mass. leads having 45 mills. Boston ranks second and New Bedford, Mass. third.







KNIT GOODS INDUSTRY

It is somewhat surprising that the manufacture of knit cotton, silk and woolen knit goods has not developed in Danbury, considering the extent of the industry in New England and Danbury's favorable location for plants of this kind.

Danbury would be a particularly favorable place for the manufacture of hosiery, because of its adjacency to the New York market, nearness to the supply of yarns, and comparatively low manufacturing costs.

Philadelphia leads in the production of knit goods of all kinds, including hosiery, producing over \$25,000,000 worth of such goods yearly or over 12 per cent of the total knit goods production of the United States.

New York ranks second with a production of over \$13,000 yearly more than 6 per cent of the total.

Other cities prominent in this industry in the order of their importance are Amsterdam, Utica, Cohoes, Little Falls, N. Y. and Reading, Pa.

The production in the United States was \$200,143,527 in 1914, being the product of 1374 factories. There are 136,130 persons engaged in the industry.

Classifying knit goods we find that the principal centers for manufacture are as follows:-

Cotton Hosiery - Philadelphia and Reading Pa.  
 Woolen Hosiery - New England  
 Silk Hosiery - Philadelphia  
 Cotton Knit Underwear - Utica and Amsterdam and Little Falls, N.Y.  
 Woolen Knit Underwear - Cohoes, N. Y.  
 Sweaters - Little Falls, N. Y.  
 Bathing Suits - New York City.

During the past few years there has been a rapid increase in the number of plants manufacturing cotton hosiery and underwear in the Southern States, and it is expected that there will be a still greater development of this industry in the South.

The value of hosiery product alone is over sixty million dollars per year.

The annual production of silk hose is over \$4,000,000, marine and mixed hosiery over \$5,000,000, woolen hosiery \$4,000,000 and cotton hosiery \$56,000,000.

New York leads in the amount of production of knit underwear. Pennsylvania in hosiery. New Hampshire in woolen and merino hosiery. Pennsylvania in silk hosiery and also in cotton hosiery.

In addition to the classification of manufacture the hosiery establishments of the country can be further classified in three groups of those which manufacture seamless hose, full-fashioned hose, and those manufacturing both full fashioned and seamless hose.

Some of the mills spin their own yarns, while others buy their yarns, and simply do knitting.

The average manufacturing profit in the knit goods industry is 6.66 per cent in net sales and 11.56 per cent on capital employed. The per centage of profit is largest in the manufacture of seamless cotton hosiery in the Southern States, the profit being as high as 15.50 per cent on capital employed. In New York and Pennsylvania the profit on seamless cotton hosiery is only 2.95 per cent of capital employed and 1.76 per cent on net sales. Larger profits are made in the manufacture of full fashioned hosiery than of seamless hosiery.

A long established custom compels retailers to sell hosiery at fixed prices, 25 cts., \$1.00, etc. The public educated to these prices looks with suspicion upon odd priced goods and this is a great handicap to manufacturers as they must figure their cost of production with these fixed retail prices in view.

The constantly rising costs of production without proportionate use in retail prices has greatly narrowed the margin of profit in this industry, compelling manufacturers frequently to change location of plants in order to reduce production costs.

Seamless hosiery is knit without seams on a circular machine. Full fashioned hosiery is knit on a flat-frame machine and in the proper form to make the hose when it is closed by seaming or "looping".

The machinery used in hosiery factories consists of standard seamless knitting machines, multiple head flat frame machines for full fashioned hosiery, ribbing machines, loopers, boarding machines, etc.

Success in the manufacture of knit goods of all kinds appears to depend largely upon the ability and judgment of the manufacturers in the buying of their materials, cotton, wool, cotton yarns, woollen yarns, and silk yarns. Other important factors are modern machinery and reasonably low labor costs.

The knit goods industry is well organized, the leading trade body being the National Association of Hosiery and Underwear Manufacturers.

About 25% of the labor employed in knitting mills is made and the balance female. Wage scales fluctuate greatly, but the following can be considered the average in localities where labor costs are low:

Inspectors and folders (female)	16 cts. per hour.
Knitters and footers (male)	19 " " " "
" " " (female)	17 " " " "
Knitters Rib (female)	17 " " " "
Loopers (female)	16 " " " "
Menders "	16 " " " "
Press hands "	13 " " " "
Seamers "	18 " " " "
Welters "	17 " " " "

The knit underwear industry is entirely separate from the hosiery industry, although the same materials, processes and class of workers is used in the entire knit goods industry.

There are over four hundred manufacturing establishments making knit underwear in the United States. In this line of manufacture New York State leads with 145 factories, Pennsylvania second with 143, while Massachusetts is third with 26 plants.

The varieties of knit underwear are known as rib, flat, fleeced-lined, mesh, union suits and children's wear. Some of the factories manufacture several of these different varieties of goods, and New York leads in all lines.

The average manufacturing profit on net sales in the knit underwear industry is 5.73 per cent, and on capital employed 8.45 per cent.

### THE NEEDLE INDUSTRIES

Under this head comes all industries in which the principal processes of manufacture require power machine or hand sewing.

While it is true that such industries are not of the most desirable kind because they largely employ female help, yet Danbury can feel well satisfied with the substantial character of its existing industries of this kind and might well be glad to have more of them if the present shortage of female labor could be provided for through increase in population or other means.

The present needle industries of Danbury with the number of males and females employed is as follows:

	Males	Females
Danbury Mfg. Co. (Mens Underwear)	22	150
Warner Bros. Co. (Corsets)	32	206
E. Londa (Mattresses)	2	1
Elbridge Gerry Co. (Awnings)	1	2
P. Durkin (Awnings)	1	2

These industries altogether employ 419 persons and pay out \$235,100 annually in wages.

They represent an investment of \$239,500 and produced goods in 1916 to the value of \$1,833,000.

The Danbury Manufacturing Co. has established a high reputation for mens underwear of the B. V. D. type. They occupy two factory buildings, but one of these is not in use for the reason that they cannot obtain sufficient help to operate the full capacity. They could now use 10 more men and 100 more women and girls if some could be secured.

This company uses a considerable amount of gas for pressing purposes. Their New York office is at 377 Broadway.

The principal materials used in this plant are cotton cloths, silk tapes and buttons.

Female workers in this plant begin at \$6.00 per week and wen skilled earn as high as \$12. per week, most of them being paid on the piece rate system. The male employees earn from \$9. to \$22. per week. The annual pay roll at this plant is nearly \$100,000 per year.

The local plant of the Warner Bros. Co. is a branch plant of one of the largest corset manufacturing concerns in the country, their main plant being at Bridgeport. This company now pays out over \$130,000 annually in wages in Danbury and their pay roll would be twice that amount if they could secure the female help. Corset cloth to supply the needs of Warner Bros. might well be made to advantage in Danbury.

New York City is the center of the needle working industries of the country and Danbury could secure any number of such industrial plants if sufficient female help could be provided here.

A brief review of the garment industry of the country will be of interest.

### THE WOMEN'S CLOTHING INDUSTRY

The woman's muslin underwear industry, comprises the manufacture of garments commonly known as "lingerie" such as night gowns, petticoats, drawers, princess slips, corset covers, skirts, etc., and made from cotton, linen or silk.

The cotton fabrics used are percale, muslin, mainsock, batiste and lawn. The silk fabrics used are crepe de chine and China silk. All the fabrics used in this industry are of domestic manufacture.

Nearly all the lingerie made in the United States is machine made and is trimmed with machine made lace and embroidery. In the cost of manufacture of such garments the lace and embroidery averages 55 per cent of the total cost. Domestic ribbon is also used in lingerie manufacture as are also buttons, bindings, tape, thread and fasteners.

Fifteen million dollars is invested in this industry in the United States and the annual production of such goods in this country is over \$40,000,000.

From the records of the Cotton Garment Manufacturers Assn. of New York, it appears that there are 339 establishments in the country producing this class of goods. Of these New York State has 262, Pennsylvania 31, Massachusetts 23 and Missouri 13.

New York City is the center of the industry having 246 establishments making lingerie, Philadelphia has 17 plants, Boston 13 and St. Louis 12.

There are altogether 375 factories in New York City making "womens white goods" but these include not only lingerie, but also aprons, hemstitching for dresses and tucking.

These 375 factories in New York City employ 13,517 persons of which 11,762 are females.

The womens clothing industry taken as a whole is of great importance ranking fifteenth among all the industries of the country as to value of product and eleventh as to number of wage earners.

There are 4558 establishments listed under this head as manufacturing womens garments and these industries employ 153,743 persons and pay out over \$90,000,000 annually in wages and produce garments the total value of which is over \$400,000,000.

In the manufacture of womens garments New York State and City are naturally far in the lead. 3083 establishments or three fifths of the total are located in this state, producing goods valued at over \$300,000,000 annually or one fourth of the total for the country. Philadelphia and Chicago rank second and third in this industry.

While a large amount of the womens clothing is made in small shops yet there are 2000 plants in the country producing over \$100,000 products annually and 22 establishments having a production of over \$1,000,000 annually.

The preponderance of the industry in New York City is due to the fact that New York is the great selling and distribution market of these goods for the entire country, and manufacturers here also have the advantage of securing first selections and greatest buying advantages in the purchase of fabrics and materials.

It is true however that manufacturers in smaller cities have the advantage of cheaper and steadier labor.

As 55 per cent of the cost of ladies undergarments is in the laces and embroideries, it can be seen that lace and embroidery manufacture is a most important feature of the industry. There are 12 establishments in Queens devoted to the production of laces and embroidery and braids. The largest of these is the Leading Embroidery Works, employing 500 persons, and the Berthels Mfg. Co., employing 100 persons.

Forty percent of the lace and 15% of the embroidery used in the manufacture of womens undergarments is made in this country and the balance is imported.

Machine made lace can be manufactured successfully and profitably in the United States and this industry is growing rapidly.

There are 26 firms in this country now making machine made lace, operating 527 lace machines. The average production of each machine is \$20,000 per year.

Most of the embroidery made in this country is known as "schiffle" embroidery and is made on schiffli machines. These machines are all imported and there are some 1500 now in operation in this country. The lever and Tothrough lace machines are also all imported.

There are large profits in the womens undergarment industry especially for the larger establishments. These profits run from 16 to 23 per cent on capital invested and 5 to 8% on net sales.

#### MEN'S CLOTHING

The ready made clothing industry has developed rapidly within the past few years and the United States leads the world in this industry.

This industry which formerly centered in New York City, where it was largely in the hands of the Russian Jews, has developed into an important business, spreading westward and is now established on a modern manufacturing basis, although yet dependent to a large extent for labor upon the cheaper class of Jewish immigrants.

Even as late as 1914 there were 19,793 Jewish emigrants admitted to this country, giving "tailoring" as their vocation.

The building up of the large "tailor to the trade" establishments has made deep inroads upon the so called "sweat shop" clothing business of New York City, although the latter is yet an important factor.

There are 5,584 establishments in the United States manufacturing mens clothing, employing 191,183 persons and the value of the annual production of these plants is over a half billion dollars.

Of these establishments 2367 are regular factories and 3217 are known as "contract shops."

The production of mens clothing in New York City is over \$200,000,000 annually or 40% of the total of the United States.

Most of this industry in New York is centered in the contract shops of Manhattan, though there are a few establishments of this kind in Queens Borough, as previously noted.

Chicago produces 17% of the total of mens clothing manufactured, and among other important clothing centers are Cleveland, Baltimore Philadelphia and Rochester.

Chicago and Rochester are the principal centers for high grade clothing, and Baltimore ranks third. In these cities the bulk of the manufacturing is done by a few large houses, while in New York the industry is in the hands largely of the contract shops, manufacturing the cheapest class of clothing.

In the manufacture of clothing skilled labor does not play the important part that it did in former years, as there is now such a subdivision of labor in the large factories, so many different operations, that the experienced tailor is no longer essential.

New York has a decided advantage as to market both in the buying of materials and the selling of product through jobbers and wholesalers. Every important woolen mill has sales and distributing headquarters in New York in which a complete line of fabrics can be seen, and from stocks carried, goods are delivered without charge to the clothing manufacturers anywhere in New York, while manufacturers in other cities must pay freight and express charges from the mills.

As novelties in woolen and mixed goods are constantly being introduced there is a distinct advantage in being close to the New York fabric market.

The clothing retailers in all parts of the country also prefer to make their stock selections in the sample rooms of the New York wholesalers, regardless of where the goods are manufactured.

The profits of clothing manufacture are not large, the biggest producers in the country earning not more than 4.67 percent profit on net sales.

#### THE SHIRT & COLLAR INDUSTRY

The only reason for the centralization of the collar industry in Troy, N. Y., is that the industry was founded and built up there and a large amount of capital finally became invested there in this line of business.

Although Troy still maintains precedence in the collar industry, the shirt industry has greatly expanded and is now spread all over the country.

It is commonly stated that any town which has cheap enough girl help can secure a shirt factory.

There are now 770 shirt factories in the United States, employing 48,513 wage earners (mostly girls) and the value of the shirt products of the country is over \$90,000,000 yearly.

New York State leads in the manufacture of shirts with 263 factories and an annual product of \$40,000,000, over half the total for the country. Pennsylvania ranks second with a production of \$12,000,000.

Among the individual cities New York City leads in this industry, with a total annual production of \$25,000,000 or over one fourth of the total of the country. Troy and Albany come next in importance and Philadelphia ranks fourth, with Baltimore about equal in prominence.

There are 47 collar and cuff factories in the United States, of which Troy and Albany have 22, the remainder of New York State 12. Troy and Albany produce collars and cuffs to the value of \$12,000,000 annually, while all the rest of the country has a production in this line of only about one million dollars.

The contract system is prevalent to a marked degree in the manufacture of mens shirts, especially in the cheaper grades. This system is predominant in New York and Baltimore.

CORSET MANUFACTURE

Warner Bros. Co., is one of the largest and best known manufacturers of corsets in the country.

Their main office and plant is at Bridgeport and yet their plant at Danbury is of no small importance employing 230 persons of whom 200 are females. The men in this plant are paid \$15.00 per week and the women average \$8.00.

This plant not only produces corsets but also suspender buckles, hose supporters and parts, clasps and corset laces and steels.

In the production of these goods a large amount of silk, linen percale and cambric corset cloth is used and also steel and composition metal for the metal parts.

There is a large paper box plant operated in connection with the establishment for the manufacture of corset boxes.

This company occupies over 50,000 square feet of floor space and the annual production of the Danbury plant exceeds \$1,500,000.



LAUNDRY AND CLEANING INDUSTRY

The four laundries located in Danbury employ 102 persons of whom 73 are females and pay out \$52,200 annually in wages.

These establishments represent an investment value of \$87,000 and their production in 1916 was valued at \$79,700.

These plants occupy 28,000 square feet of floor space and require 165 primary horse power.

The largest of these plants are those of the Danbury-Troy Laundry Co., and Target & Siemon Co., each having over 40 employees.

The Troy Laundry Co., also does dyeing and dry cleaning in addition to laundry work.

Most of the establishments operate by steam and use gas for ironing.

The wage scale is as follows:

Washmen	\$17.00 per week
Male ironers	15.00 " "
Female ironers	10.50 " "
Females	7.00 to 12.00 per week.



### THE METAL WORKING INDUSTRIES.

There is no more important group of industries than those which would come under this head, as these industries as a rule employ the better class of labor to a large extent, skilled mechanics receiving high wages, who make a most desirable class of citizens and the operations of these establishments form a most important asset to the community.

Under the general head of metal working industries would come all establishments in which metals in one form or another are the chief materials used in producing the finished product of such plants.

Placing all such industries in one general group, we find that there are 48 establishments of all kinds located in Danbury, which can be classified in this group of industries.

These 48 establishments employ 757 persons and pay out annually \$622,900 in wages.

The general group of metal working industries can be divided into several subsidiary groups, as follows:

- 1- Basic industries, such as iron and steel works, smelters, refineries, etc.
- 2- Secondary basic industries, including foundries, malleable iron & steel plants, drop forging works, brass works, etc.
- 3- Sheet metal iron works and steel fabrication works.
- 4- Manufacture of complete machinery or parts thereof.
- 5- Manufacture of tools, hardware and small parts.
- 6- Manufacture of specialties.
- 7- Manufacture of vehicles.

There are over 36,000 different kinds of articles or products manufactured in whole or in a large part of metal.

It would be impossible to take up a study of each of these manufactured products in detail within the scope of this work, but by dividing the various lines into allied groups we can arrive at fair conclusions and the following pages are devoted to information concerning these various lines of manufacture.

As nearly every form of product manufactured from metals is produced at a profit in the New York zone, it might be assumed that any of these products can be manufactured in Danbury on an equally profitable basis. Conditions in different localities vary, however, creating variations in manufacturing cost, and the conditions governing distribution of products also vary, thus making one location more suitable for the manufacture of a specific product than another.

#### BASIC IRON & STEEL MANUFACTURE

While the long railroad haul of raw materials and partly finished materials would seem to make manufacture of basic iron and steel products in Danbury prohibitive, yet it is interesting to note that many of these lines of iron and steel manufacture are now being carried on in places Connecticut, where freight costs are no less than to Danbury and these industries appear to be manufacturing at a profit.

There are structural steel mills at Trenton, N. J., Edmore, Del., Horseheads, N. Y., and Perth Amboy, N. J. and there is a successful sheet and tube mill at Bridgeport, Conn., and one at Wilmington, Del.

There are open-hearth steel works at Bloomfield, Chrome, Phillipsburg, Rahway, Hoboken and Newark, N. J. and Staten Island.

What is known as "merchant" mills are located at Trenton, Rock-ling, Rockaway and Dover, N. J., one in Connecticut and one in Massachusetts.

Two crucible steel works are located at Newark, one in Jersey City and one in Harrison.

Steel works are located in Providence and Newark, N. J.

The Central Iron & Coal Company and the Hudson Iron Company operate blast furnaces for the manufacture of pig iron in the New York zone and other blast furnaces are located in nearby New Jersey points and in Connecticut.

Newark has 3 steel casting works and there are also other works of this kind in several New Jersey points and one in Ansonia, Conn.

Newark has two malleable casting works and Trenton another.

Worcester, Mass. and Bridgeport, Conn. have electrical steel works.

It can thus be seen that we should not be too hasty in assuming that basic metal industries could not be profitably operated in Danbury and a further study of this subject would be of interest.

A community to be most successful in the metal working industries should have within itself located all the necessary basic metal industries to supply materials to its manufacturing plants.

This would include blast furnaces, smelters rolling mills, wire mills and tube mills and among the other products would be

- Machinery & tool steel
- Structural steel
- Low carbon steel for saw case hardening
- Medium carbon steel for forging
- High carbon steel for hardening
- Alloyed steels such as nickel, chrome-nickel, vanadium.

It is unreasonable to expect that there will ever be located in Danbury blast furnaces and steel works such as are operated in Western Pennsylvania and the middle west. Under modern processes blast furnaces are not operated profitably nor are open hearth steel plants unless equipped with blast furnace facilities. In fact, it is not considered good practice nowadays to attempt to build a plant for the manufacture of steel without blast furnace facilities. As an instance, the Crucible Steel Company of America, when it prepared to go into open-hearth manufacture, bought a blast furnace at Midland, Pa., just west of Pittsburgh, with a spacious site adjoining and has centralized its open-hearth operations there, with plans for a second blast furnace when one unit proves insufficient. The Pittsburgh Steel Company, when it decided to go into the manufacture of open-hearth steel instead of buying billets in the open market, built blast furnaces to round out its new open-hearth plant at Monessen. The Duplex system of operating blast furnaces and open-hearth, by which the pig iron is charged molten, has aided in making the twin blast furnace open-hearth combination an essential to low manufacturing costs. A charging of molten iron was first put in practice by the Carnegie Steel Company years ago, and the saving in fuel by charging molten metal as against melting cold metal is a large factor. Even where a steel concern buys its pig iron, it is considered good business to close a long time contract with the merchant furnace and move to a site close enough to the furnace to permit of deliveries of molten iron. This arrangement exists between the Snyder interests and the West Steel casting interests at Sharpville, Pa., and between the Corrigan-McKinney Company and a user of the iron from its Josephine (Pa.) furnace.

There will always be idle blast furnaces and plants so long as a furnace or a mill becomes antedated in as short a time as in the iron and steel industry. The isolated "high-cost" plants are the ones that suffer in eras of low consumption and low prices. There are groups of blast furnaces known as "high-cost stacks" in Southern Ohio, Central Pennsylvania, Virginia and the South that operate only when pig iron raises to a base price of more than \$17 or \$18 at Pittsburgh. These have been idle most of the time since 1907 until last year. They come in as the price of pig iron goes high enough to allow them a margin of profit. There are steel plant failures, either standing idle ordismantled, all through the Ohio Valley, Eastern Ohio and Pennsylvania. Isolation, improper management, poor freight facilities and "punk" products are the most glaring causes of failure. It takes a good steel man to make good steel.

With the application of modern processes and methods of efficiency, the most economical and advantageous operation of blast furnaces is secured through the immediate subjecting of the iron while yet in a molten state to further manufacturing processes, it being converted largely into steel.

Thus it is that the economical advantage in this industry is in the operation of blast furnaces in combination with steel works, rolling mills and wire mills and for the establishment of this kind of industry. Danbury has no hope.

There are large possibilities, however, for the development of iron and steel consuming industries and in Danbury and in fact this field for development is unlimited. The more plants that can be established producing partly finished materials, the easier it will be to secure the location here of establishments manufacturing machinery, tools, automobiles, appliances and other finished products.

For this reason, particular effort should be directed toward securing the location in Danbury of the following:

- 1-Malleable iron plants.
- 2-Steel forging plants.
- 3-Steel stamping plants.
- 4-Ironbrass and bronze foundries.
- 5-Steel casting plants.
- 6-Gear plants.
- 7-Other plants manufacturing machinery parts.
- 8-Sheet metal stamping plants.

There is a decided shortage in Danbury of foundry capacity and a large proportion of the castings required by various machinery and specialty plants are secured from foundries located in Bridgeport and elsewhere.

Bridgeport is not better situated as a manufacturing location than Danbury and yet has developed to a wonderful degree as a metal working center. Nearly every metal product that is manufactured in Bridgeport could be manufactured equally as well in Danbury.

The variety of metal products manufactured in Bridgeport is shown by the following list:

Automatic Machinery	Corset Clamps & Forms
Automobile Accessories	Cutlery & Cuttars
Express Boxes	Ties
Babbitt Metal	Drawing Steel
Bills-Buckles	Deep Forgnigs
	Engravers Plate
Brackets	
Brass tabels-castings-tubes	Fire Escapes& Extinguishers
Bronze	Foundry Equipment
Cabinet	Furnaces
Cans- Clack Movements	Gas engines-meters & Fixtures
Carpenter Tools	Ranges & Gong Bells
Carriage & Hardware	Gear Cutters-Grease Cups.
Casters-	Hardware

Chain- Coffee Roasters	Incubator Wire
Cold Steel	Iron Foundries-
Copper-Rivets-Wire-Tubing	Iron & Steel- Cold
Iron Work for Buildings	Ornamental Iron Work
Jewelry	Paper Machinery
Kerosene Engines	Patterns- Metal
Key Steel	Pens
Lamps & Lamp Burners	Piano & Organ Hardware
Lathe Mfg's.	Pipe & Thread Cutting Tools
Machine Forgnig's & Tools	Pipe Visos & Wrenches
Machinery	Piston Rings
Magnets	Plumbing Material
Metal Cormices & Sky lights	Press Mfrs.
Metal Goods & Novelties	Printing Presses
Metal Windows & Doors	Pumps
Metal Working Mch'y	Railroad Supplies-Seals & Couplers
Motors- Electric & Gasoline	Razors
Moving Picture Mchs.	Rubber Mch'y.
Novelties- Metals	Safety Valors
Oil Pump Mfrs.	Chains & Fasteners
Screens-windows & Doors	Steel &
Screw-Machines	Stoor Display Fixtures
Screws	Folding Machines
Seamless Boxes-Cans & Tubes	Telephone
Sewing Machines	Fixtures & Mill Supplies
Shears	Tools & Tool sets
Sheet Metal Goods	Toys
Shuttle Iron	Tubing
Silver Plated Ware	-umbling Bilrs.
Silverware	Typesetting Machines
Skirt Supporters	Typewriting Machines
Solder	Valves
Springs-Bed, Auto, Carriage	Ventilations
Stamped Metal Goods	Welding Machines
Steam Engines & Valves	Whistles
Steel Forgings	Wire Goods
Steel	Wire
	Wire Working Machinery

There are no individual jobbing iron foundries in Danbury and the need for such establishments is very great. About the first question that would be asked by a manufacturer of machinery or appliances considering location here is - "What are your foundry facilities"?

The Turner Machine Co., operates an iron and brass foundry at its machine plant in Danbury, for the production of its own castings requirements, which are about 180 tons per year. Their foundry capacity permit them to make castings to about an equal amount to supply local demands.

Out side of this small supply of local castings available, the manufacturers in Danbury, purchase their soft gray iron castings from Norwalk, Bridgeport and Waterbury, paying 4¢ to 6¢ per pound for same f.o.b. The freight rates on castings from these points is as follows to Danbury:

From Norwalk--11 cts.  
 " Waterbury--14 cts.  
 " Bridgeport-- 9 cts.

There are probably 400 to 500 tons of castings per year purchased by Danbury industries from these cities and this would make a very respectable business beginning for a new foundry. Say of five tons daily capacity. A large amount of castings business would be secured by a Danbury foundry from the extensive surrounding territory and neighboring towns.

The foundry department of The Turner Machine Co., has one cupola of eight tons capacity and a brass furnace of one half ton capacity. This company can make gray iron castings up to two tons weight.

The pig iron used by this plant is purchased from Reading and Boston, Pa. and the moulding sand is obtained from Albany. The Turner foundry employs forty men.

A new local foundry could pick up a large amount of scrap iron in this territory at low cost and probably not more than 50 % of new pig iron would be required.

This pig iron would doubtless come from western Penn., though a merchant blast furnace is located at Lime Rock, Conn. and another at Richmond Hill, Mass.

For a foundry making a vefy high grade of castings the charcoal pig iron made by the Barnum-Richardson Co. at Lime Rock as by the Richmond Iron Works at Richmond Furnace, Mass., would be especially suitable and the freight rates from those points are lower than from Pennsylvania.

A local foundry would however, probably find the iron made by these furnaces too good and too expensive for ordinary use.

The freight rate from Richmond Furnaces to Danbury is only \$2.00 while the freight rate from the Pittsburgh district to Danbury in pig iron is \$2.80.

At present No. 2x or foundry pig is quoted in Philsdelphia at \$30.00 per ton. The price of the Richmond Furnace and Lime Rock charcoal pig in normal times is \$30.00 per ton , but is now \$35.00.

Connecticut is only a small producer of pig iron the production of the state in 1914 being only 70,524 tons.

In considering the available sources of ran material for metal working industries it is well to mention that merchant iron bars can be purchased from the rolling mill of the Aetva Nut Co, at Southington, Conn. and merchant steel bars from the New Haven Iron & Steel Co., or from the Farist Steel Co., at Bridgeport. The American Tube & Stamping Co., at Bridgeport make iron forgings, ingots, blooms, billets and hoops and cold rolled steel, steel plates and steel tubes, but most of this material is made for their own use.

Brass bronze and metal products are the most important line of manufacturers in the state of Connecticut and it is to be hoped that Danbury will be able to secure a larger share of this kind of industrial development.

At the present time the industries in Danbury which can be classed as metal working are as follows:

- Machinery and General Machine Work.
- Doran Bros.
- Morlock Machine Works
- Turner Machine Co.
- New Machine Co
- Boesch Manufacturing Co.
- William Backus

- Metal Specialties.
- Bell & Roller Bearing Co. ( ball & roller bearings)
- Russell Electric Co ( electric specialties)
- Natl. Electric Utilities Co.( electric heating devices)
- Rogers Silver Plating Co. ( silverware)
- Danbury Brass Works ( umbrella handles)
- George H. Kinneer (steel wires & clasps)

- Sheet Metal Specialties.
- Danbury Hardware Co.
- Danbury Welding Co.
- Thomas Scofield
- Frank Kepwick Co.

## Sheet Metal and Plumbing.

C. T. Moore	Norman & Ellingwood
W. T. Wright	H. T. Outhouse
W. C. Taylor	H. C. Gan Nung
W. H. Mc Evoy	Danbury Plumbing Co.
W. H. Hodskon	Gallagher Bros.
J. R. Blackburn	F. A. Hall & Son.

Dusne &amp; Calhane

## Auto Machine Shops

D. W. Flint	Fred & Taylor
Ideal Garage	G. A. Lewis
Green Auto Co.	Tappans Garage
E. M. Jennings Co.	Fellow Auto Co.
Pyramid Garage	Danbury Garage

Bethel Garage

Machine shops are also operated by the New York, New Haven and Hartford R.R. the Danbury & Bethel Street Railway Co., and the Danbury & Bethel Gas & Electric Co.

The largest of the Danbury's metal working industries is the Turner Machine Co. which employs over one hundred men.

The Ball & Roller Bearing Co., employ about 100 men and the Rogers Silver Plating Co. have 100 employes of whom 25 are females.

The products of the Turner Machine Co., Doven Bros., New Machine Co., Morloch Machine Co. and Boesch Mfg. Co. are largely machinery and tools for hat manufacture and the cutting and preparation of fur.

The particular machines of this kind manufactured are fur choppers, fur grinders, crown pounce, dog-tearing machines, snip feeders, blowers, fur mixes, shaving machines, printing presses fur feeders, fur hat formers, spray formers sizes, body rounders, whizzers, second sizers lethes and brush brim pounces.

The hat machinery industry of Danbury has developed to considerable proportions and is steadily growing, the local machine manufacturers doing a large business outside of Danbury.

The Turner Machine Co., also operates a large plant in Newark, N.J.

The increasing use of the automobile has developed a considerable business in repair work and the garage shops in Danbury employ 65 automobile machinists. The Green Auto Co. employs 11 men and the Fellow auto Co. 10 men.

The only iron forging done in Danbury outside of the large machine shops is that done by blacksmiths and it would appear that there is an excellent opportunity in this city for an industry doing general forge work, ornamental iron work, fencing, etc.

Then also appears an excellent opportunity here for a large sheet metal plant handling heavy work such as boilers, tanks, smoke stacks, skylights, ventilators etc.

Outside of the makers of steel hat reeds there are no wire works of any kind in Danbury and this would be an excellent location for such an industry, special in wire fencing, office grills, baskets, guards, etc.

A small sheet metal works specializing in dairy utensils and equipment, poultry and stock watering troughs and farm specialties would have a large market in the Danbury territory.



The railroad yards in Danbury employ about 100 men and the railroad shops 50 men. The N.Y.H.R.R. is <sup>meeting</sup> ~~opening~~ shops here and will employ a larger force of mechanics.

Warner Bros Co., corset manufactures, while classed elsewhere, have an important metal working department, making the clasps and buckles used on corsets and hose supporters.

D. Decker & Son, W. F. Sirine, George A. Kinneer and George B. Sherman are manufacturing of the wire reeds used by hatters and also of steel reed clasps.

The Danbury Rug. Co. has recently perfected a method for manufacturing a fine wire mesh cloth such as is used by paper makers and porcelain manufacturers. It is made of a very fine brass wire. They are receiving orders for this material in such quantity that the business is likely to develop into an industry of considerable importance, and they all will soon enlarge their plant.

The Ball & Roller Bearing Co. is an industry to be proud of and demonstrates that Danbury is a suitable location for almost any line of small metal products manufacture. This company makes steel balls, ball thrust bearings, roller thrust bearings, radial roller bearings, annular roller bearings, anti-friction bearings, journal roller bearings, and locating washers in large variety and of high grade, and also does screw machine work to order, and specializes in carbonizing and heat treating of steel parts.

The Danbury Hardware Co., specializes in hatters comes for use in hat manufacture.

The Turner Machine Co. not only makes hatters machinery but also specializes in machine tools among their products being a turret lathe of superior merit and excellence of workmanship.

The National Electric Utilities Corporation is an infant industry which should be fostered. They have some most excellent and saleable products including electric cooking ranges and dences of various kinds.

The Rogers Silverware Plating Co. is another important industry to Danbury., manufacturing a variety of silver novelties including desks sets, electric fixtures, mirror frames, smoking sets, ink wells, pen racks, clock frames, ornaments, chandeliers, etc.

The Russell Electric Co., specializes in electric horns, whistles and signals, and its expansion should be encouraged and assisted.

Labor in the metal industries is reasonable in Danbury, skilled machinists being paid \$21.00 to \$25.00 per week.

The growth and expansion of the electrical apparatus, equipment and supplies industry offers great possibilities for Danbury

The manufacture of electric machinery apparatus and supplies has become a very important industry in the country, there being 1121 establishments of this kind in various parts of the country, producing goods valued in 1914 at \$259,412, 676.

Under this head comes the manufacture of dynamos, generators converters, transformers, batteries, carbons, search lights, projectors, and focusing lamps, incandescent lamps, sockets, receptacles bases and electric lighting fixtures, telegraph apparatus, telephone apparatus, magnetos, electric heating and cooking apparatus, electrical novelties electric locomotives and cars, switches, signals, annunciators electric clocks, insulated wire, circuit fittings and numerous other products.

The wonderful expansion of the automobile industry offers opportunities for Danbury

The tendency of automobile manufacturers to lower prices of motor cars means a battle for supremacy that will force manufactures to go where there is a greater number of skilled wage earners, where labor is more efficient and stable, and costs less, and to get closer to their raw material and center of distribution. Already there is an unmistakable sign of tendency of migration to the east, of automobile manufacturers from the Middle West, where, during 1915, about \$400,000,000. worth of motor cars were manufactured.

The amount of cars that can be sold from any one section is bound, by reason of economic considerations, to be limited. The economic factors of labor-availability, character of; raw material proximity to, abundance of; market-competition encountered, and center of distribution, and transportation,-cheapness and despatch, are forcing, and will continue to force in increasing ratio, migration of motor car manufacturers from the Middle West.

While the automobile industry as a whole represents varied forms of manufacturing, it is classified under the general head of metal working industries for the reason that most of the materials used are of metal. The industry is so important, however, and the future possibilities for its development in Danbury are so great that a separate chapter is devoted to its consideration.

As is well known, the center of the automobile industry is in Detroit, Mich., which city produces 87% of the automobiles of the United States. Notwithstanding this fact, there appears no logical reason why Detroit should have become the center of the automobile industry and it is to be noted that the industry is gradually spreading throughout the country and many other cities have already become important production points.

The production of automobiles is largely a matter of the assembling of parts and the manufacture of these parts is distributed throughout the large area of the country from the Mississippi to the Atlantic seaboard. Many of the large automobile producers manufacture their own motors and some of the other parts used in construction, but by far the greatest amount of the parts used in motor construction, are produced by manufacturers specializing in such parts.

For example, in the production of motors, transmissions, steering gears, ball bearings, drop forging parts, gears, valves and engine parts, tires and accessories, electrical equipment, carburetors and magnets and

It can thus be understood that the advantage of location of automobile plants depends largely upon the accessibility to the various sources of supply of subsidiary parts and materials and also upon strategic position as to distribution of the finished product.

In a general way it would, therefore, appear that the most advantageous location for automobile plants desiring a national distribution would be somewhere in the middle west.

It is a fact, however, that the production of automobiles has become so large that the more important manufacturers now have divided their distribution into a number of separate major territories and in some cases have found it of advantage to assemble their cars at some central point within these various major territories. For example, the New York zone would be the most advantageous point for the distribution of cars throughout the eastern cities and along the Atlantic Seaboard as far south as Florida and as the cost of freight on parts and materials used in the construction is much less than on the complete automobiles, economy is produced by assembling cars for eastern distribution at a point within that territory.

Danbury has commenced its establishment of automobile parts industries through the location here of the Ball and Roller Bearing Co.

Igniters  
 Injectors  
 Insulating materials  
  
 Jackets  
 Jacks  
 Jigs  
 Joints ( universal )  
  
 Lamps  
 Lamp brackets  
 Lamp lenses  
 Lamp lighters  
 Leather  
 Levers  
 License brackets  
 Light dimmers  
 Lighting dynamos  
 Lighting switches  
 Lighting and starting systems  
 Lens reamers  
 Lubricators  
 Luggage carriers  
 Lunch kits  
  
 Manifolds  
 Motors  
 Mouldings  
 Mountings  
 Mud guards  
 Muffler out out  
  
 Name plates  
 Nuts  
  
 Odometers  
 Oil cans  
 Oil gauges  
 Oilers  
  
 Packers  
 Pedals  
 Pedal rubber pads  
 Pistons  
 Plates  
 Pliers  
 Pressure regulators  
 Polish  
 Primers  
 Projectors  
 Propellor shafts  
 Pumps  
 Push buttons  
  
 Radiators  
 Radiator fans  
 Radiator hose  
 Radiator ornaments  
 Radiator protectors  
 Rims  
 Rim removers  
 Running boards  
 Running gears  
  
 Screws  
 Search lights  
 Seats  
 Self starters  
 Shock absorbers  
 Silencers  
 Spark plugs  
 Sparking batteries  
 Sparkers  
 Speed Change Levers  
 Speedometers  
 Spokes  
 Springs  
 Sprockets  
 Starters  
 Steel ( machine )  
 Steering gears  
 Steering wheels  
 Steering levers  
 Stop hangers  
 Stools  
 Storage batteries  
 Straps  
 Storm aprons  
 Switches  
  
 Tanks  
 Throttles  
 Throttle grips  
 Timers  
 Timer locks  
 Tire lugs  
 Tire tools  
 Tire pumps  
 Tire valves  
 Tire Vulcanizers  
 Tool kets  
 Tops  
 Top holders  
 Top irons  
 Top lining  
 Top rests  
 Top stays  
 Towing lines  
 Trailers  
 Transmissions  
 Transmissions cases  
     " chains  
     " gears  
 Trimmings  
 Trunks  
 Trunk racks  
 Turn buckles  
  
 Valves  
 Valve turningtools  
  
 Washers  
 Wheels  
 Wheels removers  
 Wheel rims  
 Windshields  
 Wire  
 Wire wheels

To develop the Automobile Industry.

Angle Iron & Steel	Cylinders
Aluminum bodies	Cylinder Boring machinery
Ammeters	Cylinder cleaning apparatus
Auto Battlers	Dash boards
Auto Skids	Dash boards mirrors
Apron fasteners	Decarbonizers
Axles	Dome lights
Axle housings	Doors
Axle stools	Door fasteners
Axle stool supports	Door hinges
	Door locks
Bearings	Drip pans
Bearing Scrapers	Drop forgings
Belts	
Bent wood	Elastic shafts
Body panels	Electric switches
Body irons	Electric lights
Body hinges	Engine starters
Body linings	Exhaust mufflers
Body presses	
Bolts	Fabrics
Box sockets	Fan blades
Brakes	Fans
Brake bandings	Fan pumps
Brake cables	Fan pulleys
Brake linings	Felloes (wheel)
Brake levers	Fenders
Brass mountings	Flanges (hub wheel)
Buckles	Floor plates
Buffers	Fly wheels
Bumpers	Foot rails
Burners	Frame padding
Bushings	Friction transmission
Carburetors	Fuel indicators
Carbon scrapers	Fuel tanks
Carpets	Funnels
Cleaning apparatus	Fuses
Castings	
Chains	Gas lamps
Chain guards	Gas tanks
Chain tools	Gaskets
Charging apparatus	Gasoline hose
Chimes	Gasoline tubing
Circulation pumps	Gauge lights
Clamps	Gears ( differential)
Clips	Gears ( Steel)
Clocks	Gears ( rawhide)
Clutches	Gear shift levers
Clutch covers	Goggles
Clutch linings	Generators
Clutch leather	
Clutch pedals	Hampers
Clutch levers	Headlight
Coat rails	Headlight brackets
Coils	Heaters
Countershafts	Heel plates
Covers	Hinges
Crank Cases	Hoists
Crank case reamers	Hoods
Crank handles	Hood fasteners
Crank hangers	Hood locks
Creepers	Horns
Curtains	Horn bulbs
Curtain fasteners	Horn tubing
Cushions	Hubs
Cushion fillings	Hub caps
Cushion springs	Hub reamers



The New  
Machine  
Company

*Builders of*  
FUR CUTTING  
AND HATTERS'  
MACHINERY

DANBURY, CONN.

# The New Machine Company

*Builders of*

Fur Cutting and Hatter's  
Machinery

*(Incorporated 1896)*

*1908 Catalog*

DANBURY, CONN., U. S. A.

(CROSBY STREET)

Ironing Mch 3

Remitting — 3

Finishing — 2



VIEW IN OUR CARPENTER SHOP



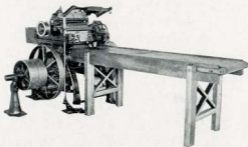
**I**N PRESENTING this Catalog to  
Hat Manufacturers and Fur Cutters,  
we beg to call your attention to the  
extensive line of machinery we build as shown  
on the following pages.

☛ We are always glad to learn your requirements and will be pleased to submit prices we are sure you will find attractive.

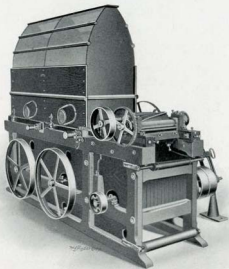
☛ We give our personal attention to the building of each machine, and because we use the best material and workmanship we have been able to produce machines that have always been found satisfactory.



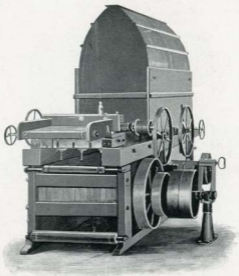
SKIN BRUSHING MACHINE  
Cap and front board removed



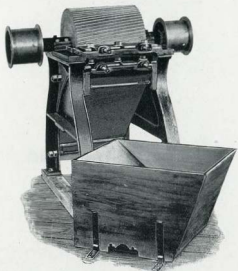
FUR CUTTING MACHINE



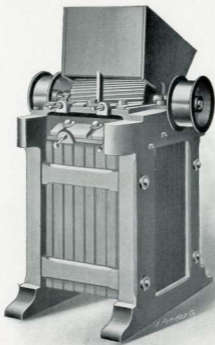
18" SHELL CHOPPER  
Combined with two section Blower



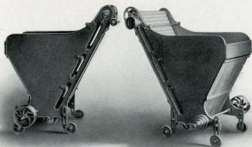
22" CHOPPER  
Combined with 30" two section Blower



16" x 16" GRINDER

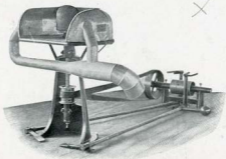


10" x 16" GRINDER

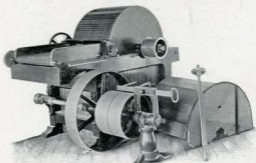


SNIP FEEDER

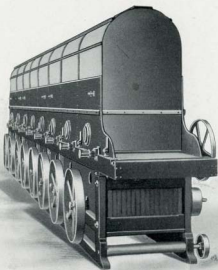




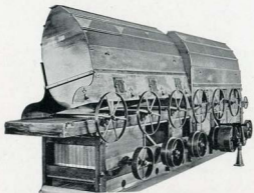
UPRIGHT CROWN POUNCER  
For soft hats



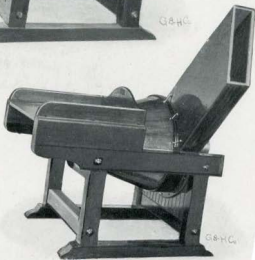
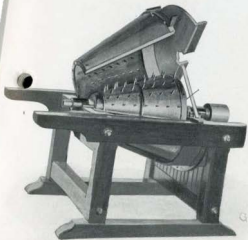
DAG TEARING MACHINE  
Also used for tearing roundings



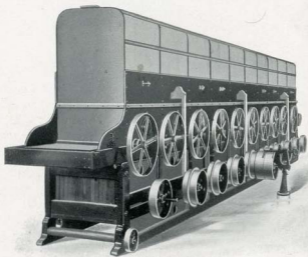
8 SECTION BLOWER



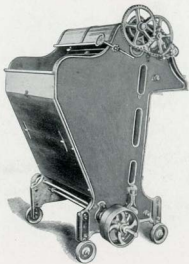
6 SECTION BLOWER



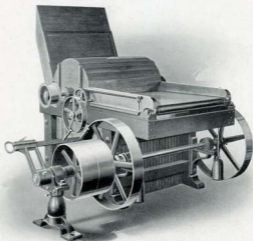
CONICAL MIXER OR DEVIL



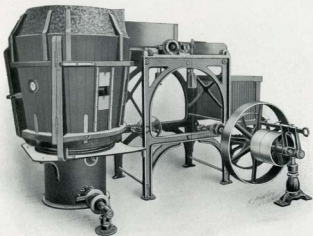
10 SECTION BLOWER



FUR FEEDER (Regular)

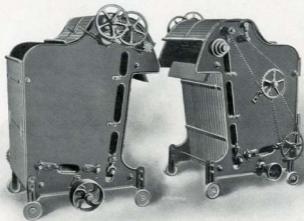


FUR MIXER  
Built 30" and 36"

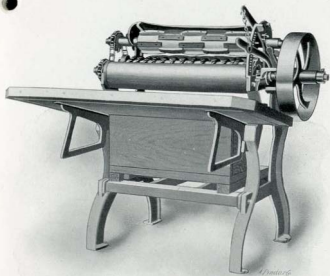


FUR HAT FORMER

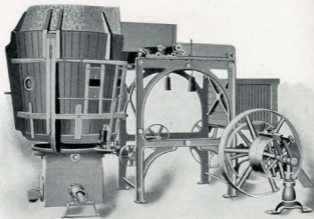




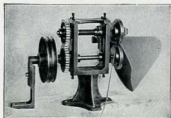
FUR FEEDER  
Bottom apron style



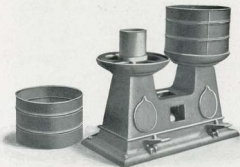
"TAYLOR" SIZER



SPRAY FORMER

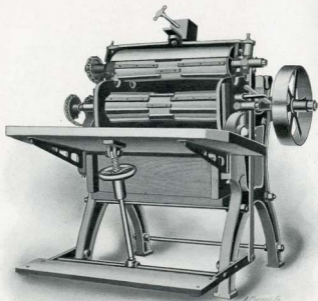


BODY ROUNDER

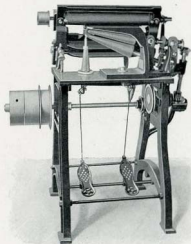


DOUBLE WHIZZER

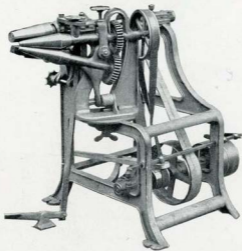
One surrounding case removed to show basket



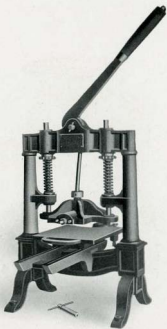
"JENNINGS" SIZER



LAWN MOWER SHAVING MACHINE.  
Front view



REID & STEVENS POUNCER

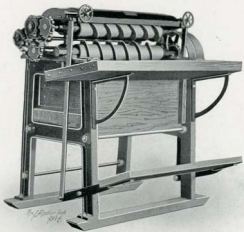


TIP PRINTING PRESS





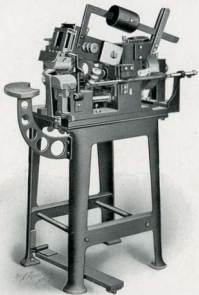
LAWN MOWER SHAVING MACHINE  
Back view



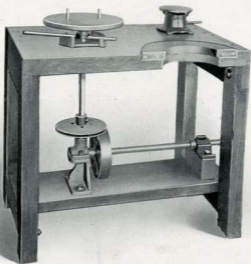
SECOND SIZER



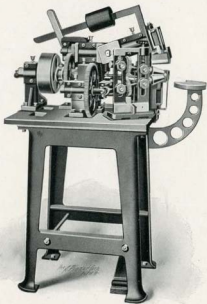
SKIN DUSTER



BRUSH BRIM POUNCER  
Front view



UPRIGHT LATHE



BRUSH BRIM POUNCER  
Back view

# Turner Turrets




Founded  
1859


MODEL "F"  
AUTOMATIC TURNER  
TORREY VERTICAL

Manufactured by  
**TURNER MACHINE COMPANY**  
Danbury, Conn. U.S.A. and Newark, N.J.  
Incorporated with  
**TURNER, ATHERTON & Co. Ltd.**  
Denton, Manchester and Stockport, England.

Cable Address: MACHINES, DANBURY  
Codes A.B.C. Western Union Premier



# TURNER TURRETS

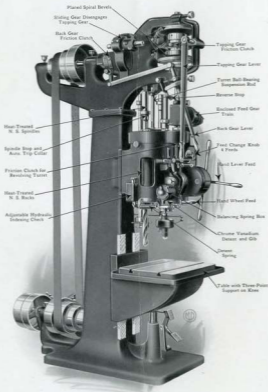


## STATEMENT OF PARTICULARS

TURNER TURRETS	Are designed to complete a series of operations, without shifting the position of the work or changing the tools. Each spindle carries a different tool which successively and automatically registers in precisely the same position. The automatic feature is not complicated; machine can be operated by the average workman at full capacity and with extreme accuracy.
TURRET	Is vertical, revolving horizontally. The rotation is automatic. When the operator returns the spindle to its full height, the spindle automatically indexes to the next spindle.
TURRET CASE	Rigidly holds the turret against any side play, and the detent locks it positively against rotation.
DETTENTS AND SOCKETS	Are adjustable both for wear and accuracy; they are made of special Chrome Vanadium Ball Race Steel, heat-treated, and have a compressive strength of over 400,000 lbs. per square inch. The detent sockets are located in the extreme periphery of the turret, and the detent is located in the turret case. The turret is completely surrounded by an accurately fitted rigid case. As the detent is located further from the center of rotation than are the working spindles, the most extreme accuracy and rigidity is obtained. The detent is withdrawn and inserted automatically.
FEEDS	The feed mechanism is driven from the vertical shaft which drives the spindle. Feed may be engaged and disengaged without stopping the machine, an automatic trip being provided to throw the feed at a predetermined travel of the spindle, which may be set as desired. The feed gears are enclosed in a dust-proof case, and provide four feed changes, with direct drive on coarsest feed. The feed gears in connection with the two different spindle speeds give a possibility of eight feed changes for the machine. The feed is actuated by helical gears, resembling worms and worm gears. The worms are made of Chrome Nickel steel heat-treated; worm gears are special hard gear bronze. The spur gears for the gear changes are of stub tooth form, cut by the Fellows process. The feed gears do not run except when in use. The spindles may be fed by hand, either by the hand lever or hand wheel; the latter is more sensitive, thereby adapting the machine for profiling and similar milling jobs.
SPEEDS	Have an extremely wide range by the use of minor gear changes; speeds may be different for each spindle, and all may be easily changed, to meet special conditions of stock or tools. Two different speeds are possible without the attention of the operator, and unless otherwise specified all machines will be furnished with one slow spindle.
SLEEVE	Is twelve and eleven-sixteenths inches long, and the spindle has a bearing within the sleeve of four inches at each end, with an oil chamber in the center. The racks are made of Chrome Nickel steel.



# TURNER TURRETS



**MODEL "P"**

**AUTOMATIC TURNER TURRET VERTICAL**

**REDUCES COST, INCREASES OUTPUT, IMPROVES QUALITY.**

**TURNER MACHINE COMPANY, DANBURY, CONN., U. S. A.**



# TURNER TURRETS



## STATEMENT OF PARTICULARS

<b>SPINDLES</b>	Are made of Carpenter Steel Co.'s Samson No. 3A Nickel steel, heat-treated, and ground their entire length. The spindle projects approximately one and one-half inches beyond the sleeve, a ball thrust bearing being interposed between the nose of the spindle and the end of the sleeve, the bearing being packed in grease and surrounded by a dust-excluding brass collar. The method of supporting the spindle close to the nose, together with the long bearings placed far apart, gives exceptionally rigid support and guidance. The absence of universal joints and consequent intermittent motion and angular pressure, obviates much wear, chatter and breaking of tools.
<b>INACTIVE SPINDLES</b>	Are positively locked in their extreme upper position, and as each spindle is automatically brought into its working position, its positive lock releases and its weight is carried by an adjustable spring; one spring only being used for all the spindles.
<b>SPINDLE GEARS</b>	Are made of Trojan Chrome Nickel steel, heat-treated, are special stub tooth, 10-12 pitch, cut by Fellows process. These gears rest upon F. & S. thrust ball bearings.
<b>BACK GEARS</b>	Are operated by Carlyle Johnson friction clutch, may be rocked out of engagement when not in use. May be engaged and disengaged without stopping the machine, and positively without shock. They are proportioned for low peripheral speed, teeth 8-8 pitch, stub tooth, cut by Fellows process.
<b>TAPPING GEARS</b>	Operate the reverse of the tap or die at a ratio of one and six-tenths to one and may be disengaged by means of an intermediate gear when not in use. They have spiral bevel teeth, cut by Bilgram process, and are operated by a Carlyle Johnson friction clutch; this construction insures silence and smoothness of drive.
<b>CONTROLS</b>	Are conveniently located for efficiency in operating the machine.
<b>SPIDER</b>	Is keyed to the shaft and has a sliding fit on the shaft. Between the spider hub and the gear is a positive jaw clutch made of Trojan Nickel steel, heat-treated. The purpose of this clutch is to permit instant engagement and disengagement of the feed, by means of the spider handle, for rapid traverse of the spindle in either direction.
<b>COLUMN AND BASE</b>	Are cast integral, column rectangular; at the bottom, 8x18 inches, at the top, 8x11 inches, internally ribbed and cross beaced.
<b>KNEE</b>	Is of a form designed for maximum strength and heavily ribbed, and is separate from the table. The bearing on the ways is 19½ inches long and 10 inches wide.
<b>TABLE</b>	Is slotted, strong and well ribbed; the oil channel is of ample dimensions to prevent its overflowing. The table is separate from the knee, and has a three-point support thereon; this permits easy levelling of the table if the same has been redressed and planed to correct errors caused by abuse.
<b>SHAFT BEARINGS</b>	Are renewable special bronze bushings.
<b>LUBRICATION</b>	Wherever possible by compression grease cups, which insures clean, positive lubrication.
<b>OIL SYSTEM</b>	A gear-driven oil pump with ample oil tank, and flexible oil supply pipe, together with proper fittings.
<b>SAFETY</b>	All gears are incased, to meet the requirements of the recently enacted liability laws.

REDUCES COST, INCREASES OUTPUT, IMPROVES QUALITY.

# TURNER TURRETS

## DIMENSIONS

### MODEL "F"

#### AUTOMATIC TURNER TURRET VERTICAL

Machine number .....	1	2	3
Height overall .....	8', 4"	8', 4"	8', 4"
Overheight .....	12"	12"	14"
Working space between table and spindle .....	22½"	22½"	22½"
Working space between base and spindle .....	43"	43"	43"
Drills to center of .....	24"	28"	28"
Traverse of spindle .....	7½"	7½"	7½"
Traverse of table .....	8"	8"	8"
Spindles are fitted with Morse taper .....	No. 3 standard No. 2 if desired	No. 3 standard No. 2 if desired	No. 3 standard No. 2 if desired
Diameter of spindles .....	1¼"	1¼"	1½"
Diameter of spindle nose .....	2"	2"	2"
Diameter of spindle through the sleeve .....	1¼"	1¼"	1½"
Diameter of sleeve .....	2½"	2½"	2½"
Diameter of column .....	15x8" base 11x5" top	15x8" base 11x5" top	15x8" base 11x5" top
Size of table working surface .....	37" thick	37" thick	37" thick
Size of table overall .....	18x27"	18x27"	18x27"
Tight and loose pulleys .....	tight 12" loose 11¼"	tight 12" loose 11¼"	tight 12" loose 11¼"
Face of cone pulleys .....	2½"	2½"	2½"
Change of step cone driving pulleys .....	6", 8", 10", 12"	6", 8", 10", 12"	6", 8", 10", 12"
R. P. M. driving shaft .....	330	330	350
Drills standard .....	to 1½"	to 1½"	to 1½"
Floor space .....	No. 4 taper to 2" 26"x35½"	No. 4 taper to 2" 26"x35½"	No. 4 taper to 2" 26"x35½"
Floor space with oil tank .....	30½"x35½"	30½"x35½"	30½"x35½"
Size of oil tank .....	24x18x10"	24x18x10"	24x18x10"
Back gear ratio .....	4½ to 1	4½ to 1	4½ to 1
Tapping gear ratio .....	15½ to 1	15½ to 1	15½ to 1
Driving shafts .....	17½"	17½"	17½"
Width of ways for table .....	10x19½"	10x19½"	10x19½"
Distance between centers of spindles .....	3½"	3½"	3½"
Distance from center of turret to center of spindles .....	4"	4"	4"
Distance from column to center of nearest spindle .....	4½"	5½"	4½"
Net weight .....	2,900 lbs.	2,950 lbs.	2,800 lbs.
Gross weight .....	3,450 lbs.	3,500 lbs.	3,350 lbs.
Crates dimensions .....	8', 7" long 6', 3" high 3', 4" wide	8', 7" long 6', 3" high 3', 4" wide	8', 7" long 6', 4" high 2', 4" wide

**REDUCES COST, INCREASES OUTPUT, IMPROVES QUALITY**

MODEL "F" IS ALSO FURNISHED WITH FOUR, FIVE, OR SIX SPINDLES



TURNER MACHINE COMPANY, DANBURY, CONN., U. S. A.

TURNER TURRETS



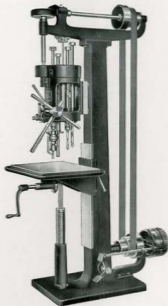
MODEL "F"

AUTOMATIC TURRET VERTICAL

REDUCES COST, INCREASES OUTPUT, IMPROVES QUALITY.

TURNER MACHINE COMPANY, DANBURY, CONN., U. S. A.

# TURNER TURRET



VERTICAL BORING AND CHUCKING MACHINE  
MODEL "B" No. 2

Model B No. 2, hand feed, 4 spindles.  
Fitted with Morse taper No. 2.

Drills to 29-32 in.  
Overhang 10 in.

Will tap up to 1-2 in.  
Square Table 16 1/2 x 21 in.

**TURNER MACHINE COMPANY**

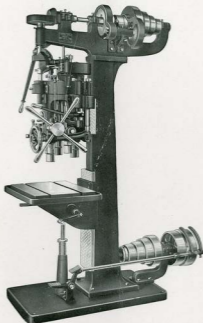
Danbury, Conn., U. S. A., and Newark, N. J.

Incorporated with

TURNER, ATHERTON & CO., LTD.

Denton, Manchester and Stockport, England

# TURNER TURRET



VERTICAL BORING AND CHUCKING MACHINE  
MODEL "C" No. 1

Model C No. 1, power feed, 4 spindles.  
Fitted with Morse taper No. 3.

Drills to 1.3-4 in.  
Overhang 12 in.

Will tap up to 7.8 in.  
Square Table 18 x 24 in.

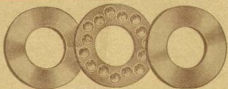
## TURNER MACHINE COMPANY

Danbury, Conn., U. S. A., and Newark, N. J.

Incorporated with

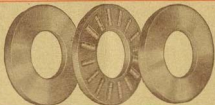
TURNER, ATHERTON & CO., LTD.

Denton, Manchester and Stockport, England



THE  
BALL AND ROLLER  
BEARING CO.

Danbury, Conn., U. S. A.



## PLEASE NOTICE.

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Destroy others. If you have no use for it at this time, you will most likely need it in the future, and would appreciate your placing the same on file. If, however, you do not care to do this, we will be pleased to refund postage if you will kindly return it to us.

THE BALL AND ROLLER BEARING CO.,  
DANBURY, CONN., U. S. A.





The Ball and Roller Bearing Company's Plant  
Danbury, Connecticut  
Established 1904

CATALOGUE No. 8

# The Ball and Roller Bearing Co.

Danbury, Conn., U. S. A.

Manufacturers of

## SUPERIOR

BALL THRUST BEARINGS  
With Flat Ball Race

BALL THRUST BEARINGS  
With Grooved Ball Race

BALL THRUST BEARINGS  
With Grooved Ball Race & Spherical Seat

ROLLER THRUST BEARINGS

JOURNAL ROLLER BEARINGS

ANNULAR ROLLER BEARINGS

ANTI-FRICTION BEARINGS TO SPECIFICATIONS

CYLINDRICAL ROLLERS TO SPECIFICATIONS

SCREW MACHINE WORK

CARBONIZING AND HEAT TREATING OF STEEL PARTS

## INTRODUCTION

We believe in the merits of our line of manufacture, and for that reason can approach the public with a clear conscience; and, without reserve, recommend our product. Not only are we sure that Ball Bearings and Roller Bearings possess merit and for that reason should receive consideration by manufacturers, but the severe tests to which Ball and Roller Bearings have been subjected have proven beyond a doubt their practicability and durability over the Plain Bearing not only because of their Anti-Friction quality and great saving of power but also because of the elimination of wear which is present in the Plain Bearings as well as overcoming the troublesome feature of over-heating of high speed journals.

There is much that can be said in favor of Anti-Friction Bearings without exaggeration, and it only remains for the purchaser to see that he gets the best that the market affords. We manufacture a superior line of Ball and Roller Bearings and use high grade steels best adapted for the different types, and our supreme efforts during the years which we have been manufacturing them has been to the end of furnishing bearings of superior quality. Not only do we use high grade steels, but we have provided modern facilities for heat treating of the steels entering our line of Ball and Roller Bearings; this being of vital importance as the life of the bearing is entirely dependent upon its being properly heat treated.

Precision in Ball and Roller Bearings is also of primary importance. If the raceways and surfaces are not properly ground you cannot expect the maximum amount of work out of the bearings. This we have also given very careful attention and have designed special machinery for machining and grinding them which enables us to attain a very fine degree of accuracy and superior finish.

The balls and rollers used in our bearings are made from a special alloy steel. They are strictly high grade and guaranteed to be extremely accurate to size.

**THE BALL AND ROLLER BEARING CO.**

**THE BALL AND ROLLER BEARING CO.****GUARANTEE**

We guarantee our bearings against imperfection in material and workmanship, and undertake to replace any that may show defects within one year from date of supplying them, provided, they are returned to us carriage prepaid for our inspection and decision. This guarantee covers bearings only which are used under loads, speeds, and in mountings sanctioned by us, but does not cover bearings which have failed by reason of misapplication, misuse or neglect.

**SHIPPING DIRECTIONS**

Unless shipping instructions are given we will use our best judgment as to route and conveyance.

**SAMPLES**

We will be pleased to furnish samples of any standard size bearing listed in this catalogue.

We will also be pleased to design and furnish blue print of any special size or design, providing quantity required is reasonably large, which must be specified.

**QUOTATIONS**

All prices quoted are F. O. B. Danbury, Conn.

The prices listed in this catalogue are subject to a discount; which may be changed without notice. Send for latest discount sheet.

All agreements are contingent upon strikes, accidents or other reasonable delays beyond our control.

**TERMS**

Terms are net 30 days from date of invoice, unless otherwise specified.

Orders for stock bearings from parties not having a satisfactory commercial rating must be accompanied by cash or money order, or will be shipped C. O. D. and return charges.

**THE BALL AND ROLLER BEARING CO.**

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The Ball and Roller Bearing Co.  
Danbury, Conn. U. S. A.