

The
JACQUARD
INDUSTRY

THE JACQUARD INDUSTRY

**AN ECONOMIC SURVEY OF FUNDAMENTAL FACTORS
IN THE LOCAL INDUSTRY AT PATERSON, NEW JERSEY**

**BY HERBERT S. SWAN
Industrial Consultant**

**THE INDUSTRIAL COMMISSION
CITY OF PATERSON, NEW JERSEY**

Copyright 1938

MEMBERS OF COMMISSION

BERNARD L. STAFFORD, Mayor

CHARLES H. ROEMER, President

WILLIAM R. LAMBERT, Secretary

GEORGE A. SCHULTZE, Treasurer

MEYER BARNERT

HERMAN BENZ

DAVID MacGREGOR

ALEXANDER WILLIAMS

Address all inquiries to

HERBERT S. SWAN, Industrial Consultant

The Industrial Commission

City Hall, Paterson, N. J.

SHerwood 2-3169

Acknowledgments

Such merit as this report may possess is due to the generous cooperation extended by the industry itself in its preparation. Both management and labor have collaborated unstintingly with The Industrial Commission in collecting the necessary data. Nor was help extended confined to those within the industry itself; manufacturers of machinery,—of looms, of jacquard machines, of jacquard harnesses, of warpers, of winders, and other equipment, as well as skein dyers, textile designers, card cutters, accountants, and lawyers,—each in his own way extended assistance and counsel in numerous ways. Our thanks are especially due to the following persons of Paterson:—George R. Meyers; William R. Frick; Samuel A. Barbour; James Cerutti; A. J. Barston; Charles Rosenstein; John W. Barrett; Stanley Hand; Morris Elkins; Lawrence A. Van Riper, Jr; Noel Bequie; David V. Jones; Rudolph J. Muller; Ernest Birgels; Edwin N. Horne; William J. Reardon; David Perlman; Baptiste Lanza; David Cole; Albert J. Wiley; Alexander Williams; Harry Ross; and Harry Barr.

Non-residents who helped included Mr. Irving H. Verry, Crompton & Knowles Loom Works, Worcester, Mass.; Mr. H. F. Phelps, Crompton & Knowles Loom Works, Philadelphia, Penna.; Mr. T. H. West, Draper Corp., Hopedale, Mass.; Thomas Haltons' Sons, Philadelphia, Penna.; Mr. Isaac D. Bachmann, Bachmann-Emmerich Factors, New York; Mr. Herbert M. Gorfinkle, Shapiro Bros. Factors, New York; and Miss I. L. Blunt, Director, The Industrial Design Registration Bureau, National Federation of Textiles, Inc., New York.

The photographs, affording an intimate view of manufacturing processes in the industry, are the work of Mr. Isadore Janowitz. Individuals who inconvenienced themselves in extending Mr. Janowitz every facility in taking photographs have our thanks.

Special acknowledgments and thanks are due Mr. S. Hearn, textile designer, who most generously designed the Persian floral necktie pattern used as the cover of this booklet. For those who would know, the execution of this pattern, with 240 ends and 128 picks to the inch and a $6\frac{1}{4}$ inch repeat, would require 800 jacquard cards.

Finally, I wish to express my gratitude to Mr. Charles Stocker who has aided me with unfailing loyalty in collecting data embraced in the tables depicting the mechanical equipment and personnel of the local industry.

Although numerous friends have extended every help in the preparation of this study, the author alone assumes responsibility for the opinions expressed.

Table of Contents

I. Description of the Local Jacquard Industry	-	-	-	-	5
II. Mechanical Equipment	-	-	-	-	17
III. Labor, Wages and Labor Policies	-	-	-	-	37
IV. Production	-	-	-	-	51
V. Marketing	-	-	-	-	67
VI. Improvement of Competitive Conditions	-	-	-	-	83

Beaming warp.



I. Description of the Local Jacquard Industry.

This is a factual story of a glamorous and romantic industry which started in a small way in Paterson 74 years ago, waxed strong and prosperous with the increasing growth and wealth of the country until it reached the zenith of its competitive strength about 1917, when, due to the inventive genius of the chemist, the engineer and the style expert, a situation was created which brought about a decline in the industry so that today it is but half as large as it was 20 years ago. The development of new fibres, new dyes and new processes in dyeing; the introduction of automatic looms in the plain goods division of the industry, thereby diminishing the cost of weaving competing fabrics; the production of plain goods in the greige which permitted their styling and design at the psychological moment of the style cycle and thereby reducing the speculative risks assumed by the converter in marketing goods to the cutting up trades; the perfection of huge printing machines capable of printing mass quantities of griege goods in multicolored designs within a brief space of time thereby displacing a considerable volume of demand for jacquard fabrics; the general acceptance of new styles and fashions in women's apparel,—all of these factors combined have left such an impact upon the jacquard industry that it has forfeited a large part of its former production to other divisions of the textile industry.

In Paterson, this confused state of affairs has been further complicated by the fact that local labor has been highly organized with a comparatively high wage scale so that the city has lost to other communities not only the manufacture of certain fabrics, but certain plants, with the result that the local industry has become increasingly vulnerable to regional differentials in the cost of manufacture.

I. POSITION OF JACQUARD INDUSTRY IN PATERSON.

The position occupied by the jacquard industry in the economic and civic life of Paterson can perhaps be best presented by a few salient facts epitomizing its present situation. Among outstanding data are the following:

1. Number of local mills—51.
 - Smallest mill 8 looms.
 - Largest mill 240 looms.
 - Average mill 68 looms.

2. Number of looms with jacquard machines—3486.
3. Number of looms operating at present—2239.
Percent to total 64.2%.
4. Number of employees required on one full shift 100% capacity—3048.
5. Average number of employes—2440.
Percent to employment one shift 100% capacity 80.0%.
6. Present number of employes—1941.
Percent to a single full shift 63.7%.
7. Estimated average annual payroll—\$3,000,000.
8. Estimated present value of machinery—\$5,765,000.
9. Estimated liquid capital required for one full shift—\$5,225,000.
10. Estimated value of local real estate used at \$2.00 per square foot of floor space—\$1,050,000.
11. Estimated total capital investment—\$12,040,000.

The well-being of an industry which affects the livelihood of over 3,000 local wage earners who with their dependents represent a population of 10,000, is a matter of such vast social importance that it merits careful study. The object of this survey, made as of September 15, 1937, is to analyze the condition of the industry, appraising its problems with a view to determining how it may attain a greater prosperity and, as a consequence, assume a greater roll in the economic structure of the community.

II. JACQUARD FABRICS.

The jacquard industry in Paterson is not so much an industry as it is a collection of four or five different and more or less non-competitive industries. Manufacturing neckwear fabrics, dress goods, tapestries, draperies and upholsteries,—fabrics widely different from each other in construction and use and marketed to the ultimate consumer through entirely different trade channels, the plants constituting the several divisions of the local industry have one thing in common,—they all utilize the jacquard machine, a machine which, when harnessed to a loom, can be made to weave practically any desired pattern or design into the construction of the fabric. The pattern may, as is usually done, through the use of skeined dyed yarns, be incorporated in different colors into the texture of the finished cloth as an integral part of the cloth. Or the pattern may, as is less often done, when different colors are not desired in the cloth, be woven with undyed yarns into the fabric and this greige cloth when completed is dyed in the piece. The pattern is brought out in such a case, only by the weave and not by both weave and color. Jacquard patterns may also be woven in the greige utilizing different fibres,—silk, acetates, rayons, cottons,—for the several respective parts of the design, and the fabric, when finished,

cross-dyed as each fibre takes a separate dye. This method is, however, not so often used in jacquard fabrics; the several colors are apt to “bleed” and thereby compromise the quality of the product.

Jacquard Patterns

With a jacquard machine any kind of design,—geometric, animal, floral, pictorial,—may be woven into a fabric. Complexity and range of the figure are limited only by the flexibility and scope of the particular machine used. A loom without the jacquard machine is limited to lines, squares, oblongs and triangles,—small patterns confined to the filling; it cannot execute circular motives or large designs. The jacquard machine, invented in 1801 by Joseph Marie Jacquard of Lyons, France, extended the weaving of textile fabrics into intricate designs theretofore woven only by hand or approached within narrow limits by the dobbie.

Jacquard machines contain 600, 1304 or 2608 spaces for holes on the card or as many as the number of lashes or the threads in a repeat of the pattern. More warp threads may be handled by joining two or three cords before they pass through the machine. This doubles or triples the pattern in one width of the goods. There are as many jacquard cards in the set as there are threads of the filling required before the pattern is

Jacquard fabrics.



completed. To repeat the pattern lengthwise, the endless chain of cards looped above the loom is simply run over and over. The designs to be transferred to the cards are on paper ruled into small squares, each of which represents a thread, and the cards are punched by machine, directed by hand, in accordance with this pattern.

III. GEOGRAPHICAL DISTRIBUTION OF JACQUARD SILK LOOMS.

The first jacquard machine in Paterson was installed in 1874. From that time an increasing number of jacquard silk looms was introduced into the city until a peak of 9946 looms was reached in 1917, whence it declined until now there are only 3300 looms divided among 46 plants within the city. Scattered among different suburbs are 5 other plants embracing an additional 186 jacquard looms, so that the jacquard industry in the Paterson area totals 51 plants with 3486 looms.

In contrast to this number of jacquard looms within the city there are according to the National Federation of Textiles, as of October 1, 1937, an estimated total of 9,864 jacquard looms in the nation as a whole. This estimate gives the loomage within the city as 3,018. Taking these figures as a basis the mechanical equipment within the city embraces about 31% of the total looms of the whole country. The data compiled by the National Federation of Textiles distributes the looms in the jacquard industry among the several states as shown in Table I.

Proportion of Jacquard Industry in Paterson

Although there are reasons for suspecting their strict accuracy, the above figures are the best available. They understate, for example, by 282 the number of jacquard looms in Paterson. But accepting these figures, it will be seen that the looms in the Paterson area represent 54.1% of the looms in the neckwear industry; 15.2% of the looms in the tapestry, drapery and upholstery industry; and 13.2% of the looms in the dress industry. Care should, however, be exercised in interpreting these figures as distribution of loomage does not necessarily accurately reflect distribution of relative production in different localities. They do, however, represent the potential machine competition of different regions. There are good reasons for believing that Paterson's proportion of total production is considerably less than its proportion of total looms in the industry. Unorganized mills out-of-town run two and three shifts; Paterson never runs more than two and is committed in principle to one. There are no data available to show distribution of production.

TABLE I. GEOGRAPHICAL DISTRIBUTION OF JACQUARD LOOMS, OCTOBER 1, 1937

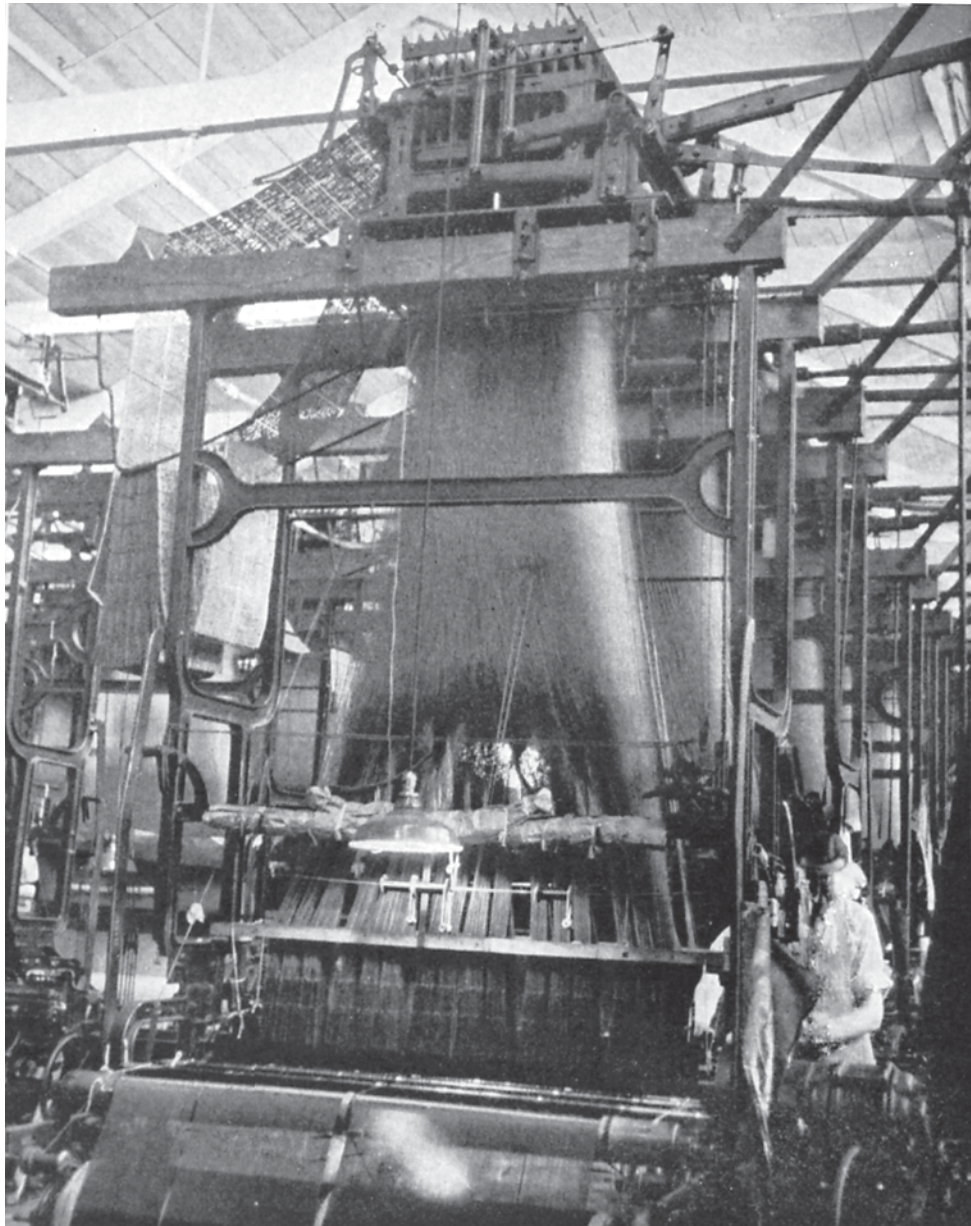
	Total looms	Dress Silks	Tie Silks	Tapestry, Upholstery & Drapery
Paterson	3,018	418	2,198	402
New Jersey excl. of Paterson	1,181	506	386	289
New Jersey, total	4,199	924	2,584	691
Connecticut	130	25	75	30
Massachusetts	882	882	—	—
Rhode Island	43	43	—	—
New Hampshire	70	—	70	—
New York	780	218	170	392
Pennsylvania	2,055	426	1,084	545
Virginia	124	—	—	124
North Carolina	1,249	635	80	534
Alabama	249	—	—	249
Mississippi	83	—	—	83
TOTAL	9,864	3,153	4,063	2,648

Of the total jacquard looms, 8159 or 82.7%, are situated in the North, and 1705 or 17.3% in the South. But four Southern states are represented in the industry, Alabama, Mississippi, Virginia and North Carolina. Two thirds of the looms in the South are in North Carolina which has in the aggregate 1249 looms with 80 making tie silks, 534 upholstery and drapery, and 635 broad silks.

With the exception of New Jersey, there are more jacquard looms in Pennsylvania than in any other state. Altogether Pennsylvania has 2,055 looms,—426 making broad silks, 545 upholstery and drapery, and 1084 tie silks. Approximately 21% of the total looms are located in Pennsylvania. Pennsylvania is by all odds Paterson's strongest competitor, having almost as many looms as Massachusetts and North Carolina combined.

Competitive Conditions Within the Industry

The different divisions of the industry are to a degree competitive with each other as the looms, weaving one fabric may in many instances be equipped with the appropriate cards to produce another type of fabric. Looms making tie fabrics are readily adaptable for making dress fabrics, looms making tapestries, draperies and upholsteries are also easily switched, according to market conditions, from one fabric to another. Although the several products of the jacquard loom are in the popular mind non-competitive fabrics, they nevertheless in actual fact do sometimes invade each other's territory. Thus tie silks are on occasions used as trim for dresses, cloth for ladies' jackets and men's lounging robes and even as fabrics for ladies' handbags and men's tobacco pouches. Draperies, ordinarily used for window hangings, lambrekins, lounge coverings and bed spreads, are once in a while cut up for lounging robes; upholstery has been known to be used for women's coats. Even within a division of the industry such as the dress goods division, looms produce fabrics for widely different trade outlets, outlets which might for long periods of time be



Jacquard loom.

non-competitive with each other such as suit linings, fur linings, casket cloth, smoking jackets, lounging robes, kimonos, pajamas and ladies' underwear. But should a mill be able to make a profit in producing such goods, its looms may be changed over to weave these fabrics, taking business away from and competing with looms which for months or even years have had

this particular business to themselves. The distribution of looms among different types of fabrics produced locally is shown in Table II.

Growth of Jacquard Industry in Paterson

Practically without exception the management of the different plants is made up of high class, well educated men thoroughly trained in the industry, men who have passed the better part of their lives in active plant management. In instances, especially among older plants, managements are today made up of sons or grandsons of original founders.

The oldest jacquard mill now in Paterson was started in 1890. Present jacquard plants in Paterson have an average age of 16 years. Six plants were started before 1900. Since that time new plants have been constantly organized. No less than 16 of the present mills were organized between 1931 and 1937. The date of organization by decade of present plants in the Paterson area is shown below:

Period of Organization	Number of Plants
-1890	1
1891-1900	5
1901-1910	2
1911-1920	14
1921-1930	13
1931-1937	16
Total	51

These figures suggest that the jacquard industry is still vibrant with life and energy. Old plants persist in living and becoming older; new plants keep appearing on the scene.

Though the average plant is modestly financed, its management has always been identified with scrupulously honest men, honorable in transactions and prompt in meeting financial obligations. Several mills are in organizations with estimated invested capital of more than \$1,000,000. But an investment of \$100,000 to \$250,000 constitutes a fairly substantial investment for a local mill. Some smaller plants, especially new ones, have a capital ranging down to thirty, forty and fifty thousand dollars.

TABLE II. NUMBER OF LOCAL JACQUARD LOOMS WEAVING DIFFERENT FABRICS

No. of Looms in Mill	No. of Mills	Total Looms	Tie Goods	Dress Goods Skein Dyed	Dress Goods Piece Dyed	Upholstery, Tapestries and Draperies	Miscellaneous
-20	6	92	14	4	11	29	34*
21-40	18	480	238	60	...	136	46x
41-60	6	312	176	...	...	136	...
61-80	7	526	270	36	11	160	49n
81-100	2	180	92	...	...	88	...
101-150	6	748	518	94	44	92	...
151-	6	1148	1048	48	52	...	...
TOTAL	51	3486	2356	242	118	641	129

(*) 16 on Metal Brocade; 18 on Casket Cloths.

(x) 24 on Church goods; 11 on shoe goods; 11 on Tinsel goods.

(n) 31 on Metal Brocades and shoe goods; 10 on carriage curtains; 8 on umbrella goods.

Size of Local Mills

Most of the jacquard looms in Paterson are situated in mills of fair size. One-third of the looms are in mills of over 150 looms, three-fifths in mills of over 80 looms. The largest mill contains 240 jacquard looms. But the average local jacquard mill contains 68 looms. The considerable number of small mills, representing a small loomage, brings down the average so that it gives a very inadequate picture of the real situation. The 6 smallest mills contain, for instance, a total of but 92 looms, an average of but 15 looms each. Another group of 18 mills, ranging in size between 21 and 40 looms, contain but 480 looms, an average of but 27 looms each. Altogether there are but 884 jacquard looms divided among the 30 smallest plants containing not over 60 looms each. The 21 plants, possessing 61 and more looms, contain on the other hand, a total of 2602 looms or an average of 124 looms each. These figures bring out the fact forcibly that the industry contains a number of small plants manufacturing specialties, having in the aggregate a small loomage, and about a score of large plants equipped with a large number of looms and set up for quantity production. The number of mills according to size is indicated in Table III.

TABLE III. SIZE OF LOCAL JACQUARD MILLS.

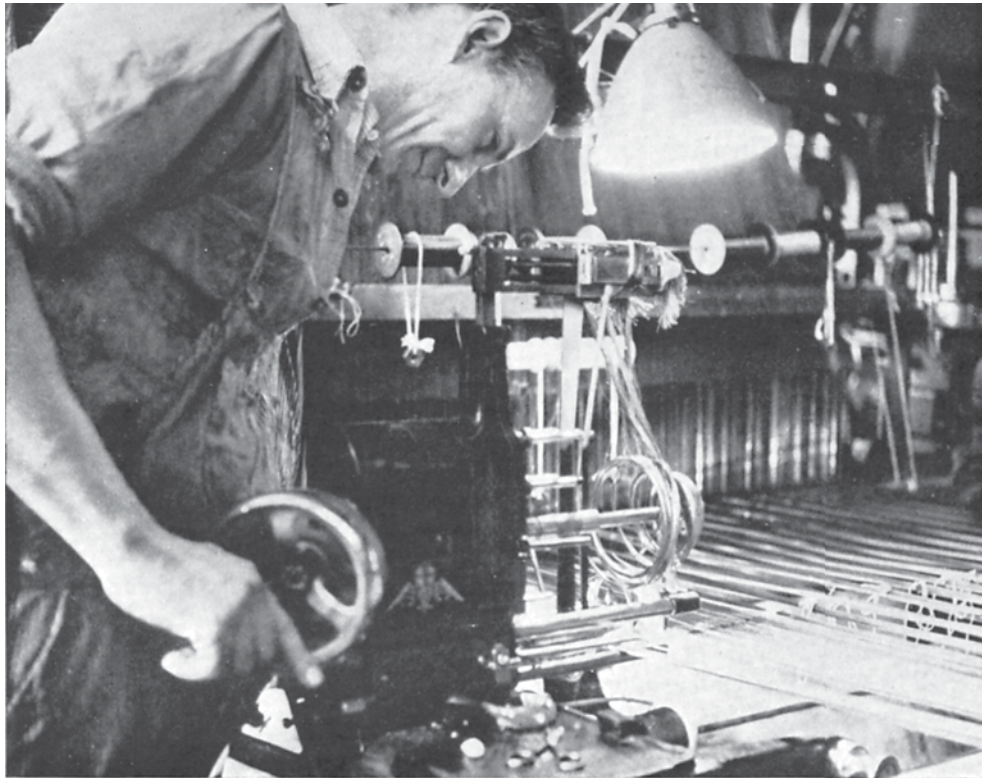
No. of Looms in Mill	Total Mills	Total No. of Looms	Cumulative No. of Looms
-20	6	92	92
21-40	18	480	572
41-60	6	312	884
61-80	7	526	1410
81-100	2	180	1590
101-150	6	748	2338
151-	6	1148	3486
TOTAL	51	3486	3486

IV. CAPITAL INVESTMENT IN INDUSTRY.

The manufacture of jacquards demands a considerable investment per loom. The cost of machinery, if bought new today, varies for different

TABLE IV. INVESTMENT IN EQUIPMENT PER JACQUARD LOOM.

	French Index 600 Hooks	Fine Index 1304 Hooks	Double Index 2608 Hooks
PRIMARY MACHINERY			
Loom 4x4 56-in. between swords	\$878.50	\$878.50	\$878.50
Reed	18.00	18.00	18.00
3/4 H. P. Motor with brackets	65.00	65.00	65.00
Harness double width, Single scale 12M ends	336.00	348.00	372.00
Jacquard machine double lift	231.00	358.00	715.00
Gantry	100.00	100.00	100.00
Comberboard	25.00	25.00	25.00
Adjusting shoes	28.50	28.50	28.50
Randall joints	10.50	10.50	10.50
TOTAL	\$1692.50	\$1831.50	\$2212.50
AUXILIARY MACHINERY			
1/20 Sipp-Eastwood Warper (1 warper per 20 looms) Price \$1600.00	\$ 80.00	\$ 80.00	\$ 80.00
1/7 Sipp-Eastwood Winder (1 winder of 130 spindles per warper and 10 spindles per quiller—140 spindles to care for 20 looms) Price \$630.00	31.50	31.50	31.50
1/10 Universal Quiller (2 spindles per loom) Price \$575.00	57.50	57.50	57.50
TOTAL	\$ 169.00	\$ 169.00	\$ 169.00
GRAND TOTAL	\$1861.50	\$2000.50	\$2381.50



Warp twisting in machine.

types of equipment, according to whether a French index, a fine index or double index jacquard machine is used, from about \$1900 to \$2500 per loom. A schedule of the costs involved in equipping a plant on a loom basis for different types of equipment appears in Table IV.

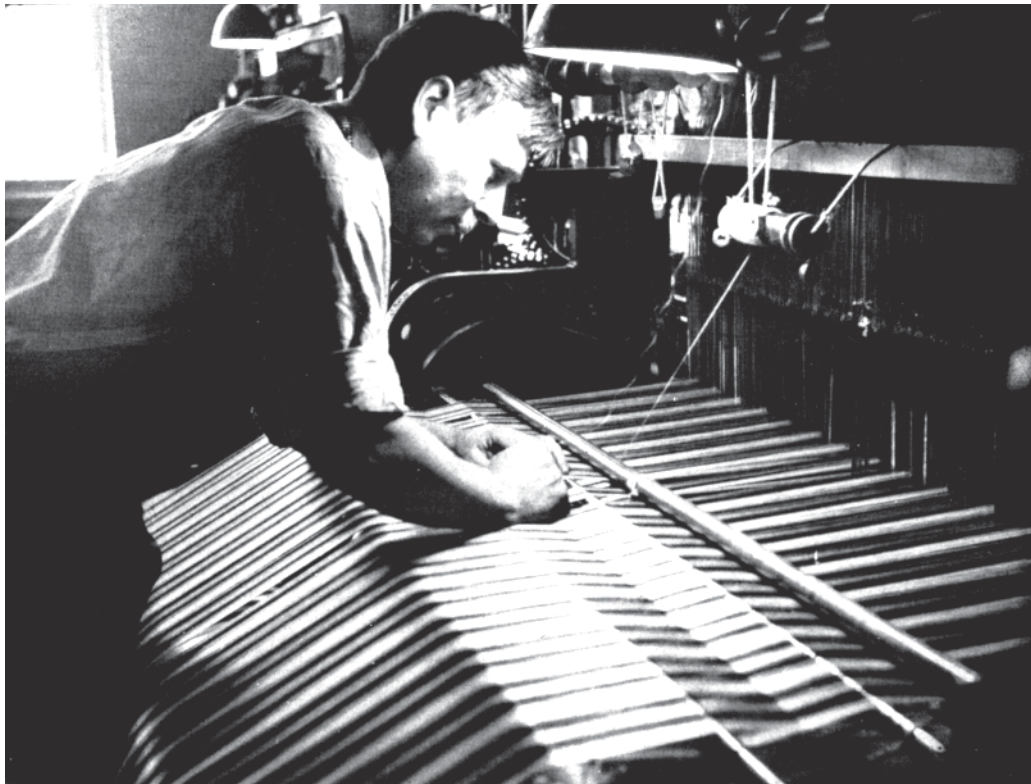
Most jacquard plants, and especially the smaller jacquard plants, in Paterson are located in rented premises so that they have no funds invested in real estate. Only 13 local plants own the buildings they occupy. A jacquard loom occupies a net floor space of about 5½ feet wide and 8 feet long. This is without aisles, space for auxiliary machinery, storage space or plant office space. When allowance is made for these requirements the space needed for a jacquard mill runs about 150 square feet per loom. In an owned mill, (new buildings erected today cost from \$3.00 to \$3.50 a square foot)—assuming a used building were purchased at \$2.00 per square foot,—the permanent capital invested in a jacquard mill would be increased by an additional \$300 per loom. Fixed capital invested in a jacquard mill for plant and machinery therefore runs from about \$2200 to \$2800 per loom. This amount multiplied by the number of looms in a mill would give a pretty close approximation of its investment in machinery, if purchased new, plus the value of the real estate occupied.

Liquid Capital Requirements

The amount of liquid capital required by a manufacturer in the jacquard industry varies considerably according to the character of business conducted. A manufacturer who produces cloth for stock, carries a full inventory of different kinds of yarns, and finances his own receivables, requires a larger capital than one who manufactures only on orders, one who factors his receivables, or one who does only commission work. In either case total capital demanded to finance current requirements of the industry are, under like conditions, approximately the same but the burden is shared in different proportions between the several collaborators in the industry. Manufacturers all agree that to finance current operations satisfactorily, requires for the purchase of raw materials, consisting mostly of warp and filling yarns, and jacquard designs and cards, about \$500.00 per loom; for the payment of salaries and wages, rent, power and taxes about another \$500.00 per loom; and for carrying of a satisfactory stock of finished goods and financing of sales and receivables about still another \$500.00 per loom,—altogether a liquid capital of about \$1500.00 per loom or a total of \$5,250,000.00 for current purposes of the whole local industry.

A commission mill weaving materials supplied by either jobbers or

View of warp in loom.



other manufacturers would, of course, need to finance only such expenses as payrolls, rent, power and taxes as it needs no supply of yarns or warps. Nor does it need to finance sales and receivables. Its required liquid capital could, therefore, drop to about \$500.00 per loom.

A mill which manufactures only on orders escapes, on the other hand, the necessity of financing an inventory of finished materials. The liquid capital needed by such a mill tends to approach, especially if it ships goods on a C. O. D. basis, a low limit of about \$1000.00 per loom.

A mill which manufactures for stock and factors its receivables likewise reduces its current capital requirements to approximately \$1000.00 per loom.

The self-sustained, independent mill, manufacturing for stock and carrying its own receivables demands, however, in round figures about \$1500.00 per loom in order to finance its operations conveniently. From the foregoing discussion it appears that the total capital investment per loom in machinery, real estate and liquid capital requirements aggregates from \$3700.00 to \$4300.00.

The supply of raw materials carried in any particular case depends both upon the fibres used, the quality of the yarns and the length of the warp. The smaller shops tend to run shorter warps. What they save in tying up a longer warp for the longer period is, however, often more than offset by the extra expense incurred in additional entering and twisting. A mill which spreads its activities over a broader field, covering all ranges from low to high quality goods, must naturally carry a larger inventory in raw materials than one which restricts its work within narrower limits.

Fixed Annual Overhead

Rents in Paterson, taken at \$0.25 a square foot per annum run about \$37.50 per year per loom. This estimate is based upon the assumption that a loom occupies with aisles and auxiliary machinery about 150 square feet of floor area. Power costs run on the average about \$2.25 per eight hour shift per loom per month. Taxes for all purposes,—city, schools, county and state,—average during the year about \$6.50 per loom for each loom installed, including the taxes paid on auxiliary equipment, raw materials and merchandise as part of the tax paid on the loom. Interest on machinery with a value varying between \$1900.00 and \$2500.00 would at 6% per annum total from \$114.00 to \$150.00 per loom. The annual depreciation on this investment taken on a straight line basis for 10 years would vary, according to the equipment, from \$190.00 to \$250.00. Interest on the liquid capital required to finance raw materials, payrolls and receivables equal to \$1500.00 per loom would at 6% total an additional

\$90.00 per year. Adding these amounts we have as the annual overhead the following amounts:

	Low	High
Rent	\$ 37.50	\$ 37.50
Power (basis single shift)	27.50	27.50
Taxes	6.50	6.50
Interest on machinery	114.00	150.00
Interest on liquid capital	90.00	90.00
Depreciation of machinery	190.00	250.00
TOTAL	\$465.50	\$561.50

Summed up our estimates show the out-of-pocket overhead per jacquard loom totals from \$465.50 to \$561.50 per year. These figures suggest in a general way the volume of work that each loom must do annually in order to earn a profit for the manufacturer. On a two shift basis, assuming a mill operates at full capacity, the proportionate overhead per yard of fabric is, of course, only about one-half that with a single shift.

V. PURPOSE OF PRESENT SURVEY.

Such, in brief, are a few of the salient facts relative to the local jacquard industry. The industry requires a large capital outlay both per employe and per plant. The capital demanded to equip even a comparatively small plant with new machinery runs into a substantial amount. This fact has been a potent factor in restricting the number of plant units within the industry. It has also limited the size of plants to a comparatively small loomage.

That the nature of the industry does not lend itself to satisfactory large scale operations has also been an influential factor in keeping the average plant down to a comparatively small size. Rapid changes in styles and seasons alternate in quick succession which make it impossible to manufacture certain fabrics for stock with safety. Small organizations being more easily mobilized on new departures have been better adapted than large organizations to make abrupt changes in manufacturing operations. Both small plants and large plants have their manufacturing and marketing problems. It will be the purpose of succeeding pages to study some of these problems, to ascertain, if possible, answers to these questions in order that local industry may not only be placed upon a better competitive plane but cemented more solidly into the industrial structure of the city.

II. Mechanical Equipment

Its mechanical equipment determines today as never before the productive and financial strength, not only of each individual plant within an industry, but of each industry within its competing group of industries. Let an industry fail to support a challenging position in the absorption of new processes and modern up-to-date machinery and it will soon fall a paralyzed victim to obsolescence. Failure to keep in step with changes in current technology is penalized with increasing costs of manufacture, decline in relative output, deterioration in comparative quality of product, and a diminishing market. Growing obsolescence in plant is, moreover, sooner or later accompanied with breakdown in high executive ability of management as well as in morale and skill of technically trained labor employed in industry. In other words, obsolescence of plant breeds senescence and decay in all branches of industry and finally in the community itself for such factors have a way of tragically reflecting themselves through reduced pay envelopes of workers, in diminished spending power and a lowered standard of living for all the people in a city. Modernization of plant and equipment are, therefore, something more than technological problems affecting individual industries; they are nothing less than continuing means of regenerating and advancing the civilization of a community.

For these reasons cities must take an increased interest in the plant and equipment of their industries for after all it is the tools used in an industry which make the industry. An industry which has, in effect, lost its tools is not much of an industry. Similarly, a city which is the home of industries equipped with obsolete machinery cannot long remain an efficient city. Either the industries must be revived with competitive machinery or the city must languish and gradually die.

To avoid misunderstanding, let it be said at the outset that the jacquard industry in Paterson is on the whole equipped with well-diversified and efficient machines. The machines are, generally speaking, well designed to perform the functions expected of them. There is no community equipped with better machines, machines able to turn out better fabrics, machines more readily changeable to weave different classes of fabrics, or machines better calculated to produce fabrics of more beautiful, or more varied, or more artistic patterns. Yet there are particulars in which mechanical equipment of the local jacquard industry might be improved. It is the purpose of this survey to review the present status of the mechanical equipment in the local industry and to point out ways wherein its plant and machinery, though now generally good, may through

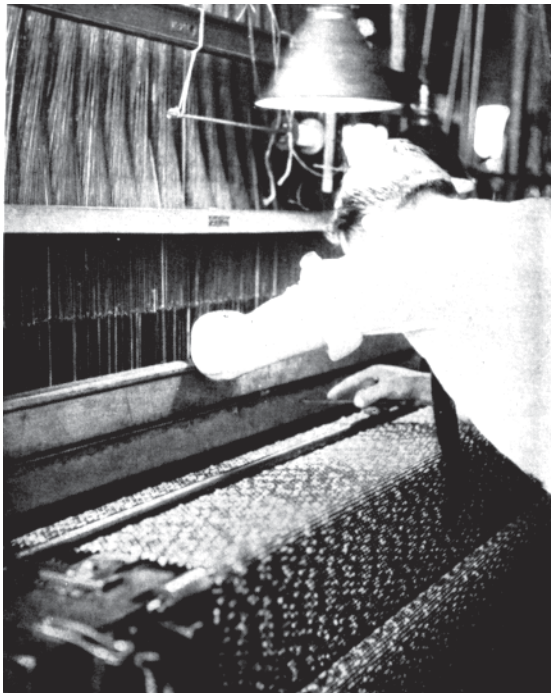
a process of modernization be made still more capable to compete with outside mills.

I. JACQUARD MACHINES

When complicated patterns are to be woven requiring the raising and lowering of individual ends, they must be made on a jacquard loom. To effect this control each thread is passed through a mail eye in a heddle, at the lower end of which is a weight or lingo to draw it down. The upper end of the cord attached to the heddle is passed through a board above the warp in which holes are drilled so that the cords are held in proper locations. Where the pattern repeats itself across the goods, the similar cords from each pattern are brought together into one neck cord passing to the jacquard machine above the loom. Here the cords are attached to the lower ends of upright wires, a hook being formed in the upper end of each wire. These hooks are arranged in rows and in front of each row is a knife or griffe which is constantly moving up and down in proper time with the motion of the lay. Normally the hooks are in position to engage the griffes.

Near the top of the vertical hooked wire is a horizontal wire carrying a projection which bears against the upright wire in such a manner

Drawing end through reed.



that if the horizontal wire is moved lengthwise, it will move the hooked end of the upright out of the path of the rising griffe. The ends of these horizontal wires project uniformly and directly towards a rectangular cylinder mounted so that it can be revolved and moved to and from the ends of the wires. Holes are drilled in this cylinder corresponding with the ends of each wire. A series of cards pass over the cylinder and one card is presented to the wires at each pick. The card is pressed against

the ends of the wires and if there is a hole in the card the wire is not moved lengthwise, causing the upright to engage the griffe, which in moving upward raises the cord and its corresponding warp thread or threads as the case may be. Holes are punched in the cards so that only the wires which are selected will move lengthwise, and the holes punched in such an arrangement that they will weave the desired pattern.

Types of Jacquard Machines

There are three types of jacquard machines,—the French index or 600 hook machine; the fine index or 1304 hook machine; and the double index or 2608 hook machine. The local machines as shown in Table V. are, insofar as the several types are concerned, almost evenly divided between the two makes prevalent in the industry, Crompton & Knowles having in the aggregate 1867 machines, and Thomas Halton's Sons, 1619 machines.

The French index machine is used for the smaller and simpler patterns. There are 2932 of these machines in Paterson, 80% of which, or 2356, are engaged in the weaving of neckwear fabrics. Indeed all of the machines in the tie goods division of the industry are 600 hook machines. The remaining 576 machines are devoted to making various kinds of dress fabrics, metallic cloth, shoe brocades, church cloth, upholstery, tapestry, drapery and miscellaneous goods.

The fine index, or 1304 hook machines, of which there are 457 in the city are for the most part allotted to the upholstery, drapery and tapestry division of the industry. About three-fourths of the machines, 336 altogether, work on these fabrics. The remainder are divided between dress goods and miscellaneous fabrics. The double fine index machines, 97 in number, are all devoted to tapestry, drapery and upholstery fabrics. How the several types of machines are distributed in making different fabrics is shown in Table VI.

Manufacturers usually do not buy the fine index or double index machines unless conditions warrant their purchase. Assuming that a fabric can be woven on either a French index or on a fine index machine,

TABLE V. JACQUARD MACHINES.

No. of Looms in Mill	No. of Mills	Total Jacquard Machines	C&K 600 Hooks	Halton 600 Hooks	C&K 1304 Hooks	Halton 1304 Hooks	C&K 2608 Hooks	Halton 2608 Hooks	C&K Single Lift	Halton Single Lift	C&K Rise and Fall	Halton Rise and Fall	C&K Double Lift	Halton Double Lift
-20	6	92	20	38	16	18	..	..	..	..	16	26	20	30
21-40	21	480	219	157	48	56	..	..	43	16	30	183	98	110
41-60	6	312	134	75	..	95	4	4	50	71	16	36	139	..
61-80	7	526	241	106	118	..	37	24	94	..	43	118	173	98
81-100	2	180	73	42	37	..	..	28	..	..	50	42	60	28
101-150	6	748	320	374	..	54	..	..	30	65	270	261	20	102
151-	6	1148	585	548	15	..	..	..	520	90	80	5	105	348
TOTAL	51	3486	1592	1340	234	223	41	56	737	171	560	651	512	855

TABLE VI. JACQUARD MACHINES ON DIFFERENT FABRICS.

Fabrics	Total Machines	Type of Jacquard Machine			Single Lift	Rise and Fall	Double Lift
		600 Hooks	1304 Hooks	2608 Hooks			
Dress Goods ..	360	273	87	..	66	162	132
Tie Goods	2356	2356	...	..	717	933	706
Upholstry Tapestry &							
Draperies	641	208	336	97	85	62	494
Misc.	129	95	34	..	40	54	35
TOTAL	3486	2932	457	97	908	1211	1367

production, it is said, is better and the upkeep less when the fabric is woven on a French index jacquard than on a fine index jacquard. The close spacing of the cylinder perforations and the correspondingly close proximity of the wire work in a fine index jacquard mean increased vigilance and labor on the part of both the loomfixer and the weaver. The card cutting and the weaving rates are, moreover, both higher on the fine index machines. The greater initial capital investment as well as the subsequent increased overhead also make it more economical to use the French index machine wherever possible.

Single Lift Machines

More than one-fourth of the jacquard machines in Paterson (908 out of 3486) are single lift machines. Although every division of the industry has single lifts, a concentration of single lifts is found in the tie goods division where one-third of the machines (717 out of 2356) are of this type. As this machine is driven at the speed of the crank shaft, the shed closes quickly giving the shuttle no surplus time for its flight through the shed. Since a high speed cannot be obtained with this style of jacquard, the machine is practically obsolete today.

Rise-and-Fall Machines

The rise-and-fall jacquard is a development of the single lift yet it has several advantages over that type of machine. The griffes and the bottom plate move up and down. With this arrangement the lay beats up upon a closed shed, i.e., all the warp threads lie parallel with each other. This is an advantage in weaving heavy goods or when a poor quality warp yarn is used. As with the single-lift machine, the speed is that of the crank shaft, but the warp threads are not moved as much and, as a consequence, the strain on the yarn is less. But the shuttle has no extra time for passage through the shed, a feature to be considered particularly in wide looms. The rise-and-fall, though not capable of high speed, is nevertheless a popular machine where reasons other than the jacquard make high speed impossible. For certain specialties, it is not supplanted by the double-lift machine. It is, moreover, of simpler construction, more easily cared for, and cheaper, though subject to greater wear and tear, than the double-lift type of machine. There are 1211 rise-and-fall machines in Paterson.

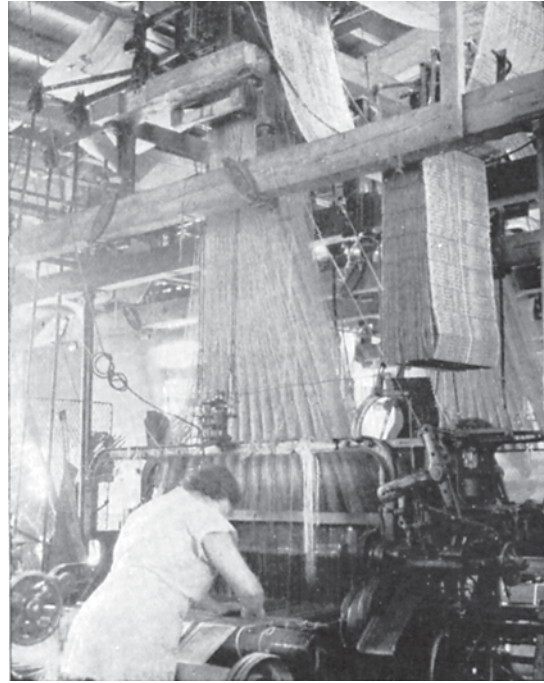
Double-Lift Machines

The double-lift jacquard has two uprights controlling the same warp ends; the bottom plate is stationary. The griffes controlling the warp move up and down alternately which makes an increased speed possible. The double-lift has two outstanding advantages:—the shed stays open longer for the shuttle to pass; and the wire arrangement makes it possible to drive the jacquard at one-half the speed of the crankshaft. Both facts permit the machine to operate at a higher speed. The double-lift operates once for every pick. This method of handling the warp threads is easier on the yarn than raising and dropping the ends the full distance of the shed at every pick. This method of handling the warp threads is much easier on the yarn than raising and dropping the ends the full distance of the shed at every pick. Having two lever bars, the machine works with an easier flow than the single lift. The double-lift is capable of producing practically any kind of a woven fabric. It is constantly gaining in popularity. At present nearly 40% (1367 out of 3486) of the jacquard machines in Paterson are double-lift machines.

One manufacturer states that on heavy goods he obtains on the single lift 100 picks per minute; on the rise and fall 108 picks; and on the double lift 118. On light weight fabrics he obtains on the rise and fall 120 picks; on the double lift 140 picks. He prefers the rise and fall for quality goods and the double lift for mass production.

II. JACQUARD HARNESSSES.

The harness transfers the operation of the jacquard machine to the loom transmitting the design in the cards into the fabric. The size of



Straightening warp at rear of loom.

pattern capable of being made by a machine depends upon the number of hooks in the machine, the number of ends to the inch in the warp and the scale of the harness.

Jacquard Scales

Jacquard harnesses come in different scales,—single scale, double scale, four scale, eight scale,—they are tied up according to the control of the yarns required in the construction of the fabric to be woven. A French index jacquard machine working on a single scale harness would normally use no more than 576 hooks. Through a double scale multiplier, this can be stepped up to 1152 hooks, and through a four scale multiplier to 2304 hooks. A single scale harness lifts one warp thread, a double scale two warp threads, a four scale four warp threads, and an eight scale eight warp threads. The different scales effect only the warp,—they have nothing to do with the filling. The different characteristics of the jacquard harnesses in use in Paterson are shown in Table VII.

A French index machine using 576 hooks operating on a single scale harness and using 240 ends to the inch, which is standard for dress goods, will produce a pattern 2.4 inches in size. The same machine operating on a double scale harness using the same number of ends per inch will produce a pattern 4.8 inches in size. A fine index machine using 1152 hooks operating on a single scale and using 240 ends to the inch would produce a pattern also 4.8 inches in size. The difference in the two patterns would be this;—the fine index machine on a single scale would pick up a single warp thread each time while the French index machine on the double scale would pick up two warp threads each time. As the scale is increased the number of threads picked up each time increases, double scale 2 threads, four scale 4 threads, eight scale 8 threads. A pattern made on a small scale harness has, therefore, a smoother and straighter edge. A pattern made on a large scale harness has, on the other hand, something approaching a sawtooth edge as is the case in brocatelles. Although a French index machine on a four scale harness can, through its multipliers, be stepped up to do the work of a double index machine on a single scale using 2304 hooks, the pattern produced by it will have a ragged edge giving

TABLE VII. JACQUARD HARNESSSES.

No. Looms in Mills	No. of Mills	Harn-esses	Single Scale	Double Scale	Four Scale	Eight Scale	Single Width	Double Width	Steel Handle	Cotton Bottom	Steel Lingoes	Brass Lingoes
-20	6	92	74	8	6	4	34	58	80	12	78	14
21-40	18	480	411	53	9	7	1	479	384	96	327	153
41-60	6	312	249	51	12	..	94	218	186	126	292	20
61-80	7	526	407	70	22	27	148	378	258	268	281	245
81-100	2	180	140	18	12	10	..	180	180	..	150	30
101-150	6	748	663	75	10	..	292	456	534	214	638	110
151.	6	1148	1118	30	..	..	390	758	704	444	782	366
TOTAL	51	3486	3062	305	71	48	959	2527	2326	1160	2548	938

a coarser effect since changes in direction are marked by steps of 4 threads, while the pattern woven by the double index machine would be clean cut, sharply defined and more graceful at the border, changes in direction being marked by but a single thread at a time. A small pattern should generally be defined with a fine edge but a big design is spoiled if it has too fine an edge. In a word, the edge should conform with the size of the pattern and the weight of the cloth.

The number of ends to the inch in tie silks varies all the way from 180 ends in cheap ties to upwards of 480 ends in high quality ties. Being made on single scale French index machines using 576 hooks, ties may have a pattern varying all the way from 3.2 inches to 1.2 inches in size.

Tapestry and brocade are often made in two and three inch patterns. But upholstery and drapery come in $6\frac{1}{4}$, $12\frac{1}{2}$ and 25 inch patterns. The smaller patterns are usually produced on the French index machine using a double scale; the larger patterns are woven on fine index and double index on single scale, double scale, four scale and even eight scale harnesses.

The vast majority, over 88%, of jacquard harnesses in Paterson are, as evidenced by Table VII, single scale harnesses. About three-fourths of the multiple-scale harnesses are double scale; and one-fourth four scale or eight scale. There are altogether 424 multiple scale harnesses in Paterson. Of these 305 are double scale; 71 four scale; and 48 eight scale.

Fixing ends.



Analyzed by fabrics made, the facts show that the single scale harnesses in tie silks are 99% of the total; on dress goods 83% of the total; on upholstery, drapery and tapestry 61%; and on miscellaneous fabrics 24%. There are only 18 double scale and no four or eight scale harnesses on tie goods; 44 double scale and 14 four scale on dress goods; 173 double scale, 39 four scale and 37 eight scale on upholstery, drapery and tapestry; and 70 double scale, 18 four scale and 11 eight scale on miscellaneous goods.

Too much stress can, however, be laid upon the machines engaged upon different fabrics as it is possible to disconnect a harness and tie in a different one should market conditions make it profitable to do so. During the past year or so quite a few machines formerly engaged in weaving neckwear have for this reason been changed over to produce upholstery goods. Harnesses have, moreover, shorter life than either the jacquard machine or the loom. When replaced one type of harness may, therefore, be replaced with another type suited for the desired goods. It is impossible to predict the life of a harness as it depends almost entirely upon local conditions. Certain fine harnesses equipped with heavy lingoes and controlling very tight warps, may do very well if they stand up for two years. On the other hand, a harness where the angle is not too severe at the selvages and the work of which is light, may be in good shape at the end of five, six years.

Single and Double Width Harness

The cost of a jacquard harness varies more or less in proportion to the total number of ends cared for by the machines. Thus a harness 50 inches wide equipped to handle 72 ends per inch, making 3600 ends in all, will cost considerably less than one of the same width, equipped to handle 300 ends to the inch or a total of 15,000 ends.

Densely woven fabrics are more often made on looms equipped with single width harnesses and lighter woven fabrics on looms equipped with double width harnesses. To illustrate:—say the reed count in a certain fabric is 480 ends to the inch. For a 24 inch width that would make a total of 11,520 ends; for a 48 inch width, 23,040 ends. The double width would be more than the machine could conveniently carry. The loom would operate in an unsteady manner and as a result produce imperfect cloth. For these reasons the finer and more expensive goods are woven on looms equipped with narrower harnesses. Yet the single width harness is, because of its restricted usefulness, considered by many to be obsolete. There are 959 looms equipped with single width harnesses in Paterson.

Steel Heddles and Cotton Bottoms

Some manufacturers, who have used both, state that they cannot say which is to be preferred,—steel heddles or cotton bottoms. The cotton

bottom will rot while steel will last indefinitely. Because cotton is softer, some mills prefer it for certain types of yarns, especially yarns of lighter shades, light pinks, pale blues, pastel colors. It is said that the steel heddle, in condensing the humidity in the air, occasionally stains the cloth with a black streak. A cotton bottom is free from this fault.

The cost of installing a cotton bottom is, moreover, only about half that of installing a steel heddle. About one-third of the local jacquard harnesses are equipped with cotton bottoms, and two-thirds with steel heddles.

Steel and Brass Lingoos

Some mills prefer brass to steel lingoos; they say steel because of the static electricity generated through the operation of the loom, creates magnetism with the result that the lingoe sticks and doesn't slide down before the shuttle passes through again. Brass lingoos, being non-conductors, are not subject to this disability. For this reason, some mills prefer the brass lingoe, especially in production of finer fabrics. The brass lingoe is, however, considerably more expensive than the steel lingoe. Steel lingoos cost but 16 cents per lb.; brass lingoos 34 cents per lb. Since lingoos may weigh between 300 and 400 lbs. this difference in price runs up to a substantial amount. This is probably the reason why only 938 out of 3486 jacquard harnesses in Paterson are equipped with brass lingoos.

III. LOOMS

All looms in the local jacquard industry are Crompton & Knowles looms. With the exception of 8 plain looms and 8 2x2 looms, all of the looms are 4x4 looms. These looms permit of as many as seven types or colors of filling yarn to be used in making a fabric. Usually a 15 inch shuttle is used, but one or two firms report using a 17 inch shuttle. A general description of the looms in the local jacquard industry is found in Table VIII.

Fibres

The looms weave silk, rayon, acetates, cotton, linen, wool and metallics. No fibre is used either consistently or exclusively in different mills; the fibres vary according to the price range and character of fabric. Thus

TABLE VIII. DESCRIPTION OF LOOMS IN LOCAL JACQUARD INDUSTRY.

No. of Looms in Mill	No. of Mills	No. of Looms	Width of Reed Space					Stop Motion	Pick Counter	Belt Drive	Ind. Motor
			Up to 36-in.	37-in to 44-in.	45-in. to 50-in.	51-in to 60-in.	Over 60-in.				
-20	6	92*	...	...	34	32	26	18	18	64	28
21-40	18	480	...	...	14	278	188	32	32	104	376
41-60	6	312	84	...	30	80	118	54	...	154	158
61-80	7	526	80	68	...	40	338	...	80	160	366
81-100	2	180	...	...	...	150	30	92	...	92	88
101-150	6	748	130	52	106	404	56	...	110	264	484
151-	6	1148	402	30	...	716	...	200	638	708	440
TOTAL	51	3486	696	150	184	1700	756	396	878	1546	1940

(*) 8 plain looms; 8 2x2 looms. All other looms 4x4 looms.

cheaper neckwear may be made entirely of artificial fibres; the intermediate price range of neckwear of rayon warp and silk filling; while the highest quality of neckwear, is pure silk, both warp and filling. A similar situation prevails among dress goods. Tapestry, upholstery, and drapery utilize an assortment of mixed fibres,—cotton, linen, wool, silk, artificials, according to quality and kind of fabric made.

Reed Width

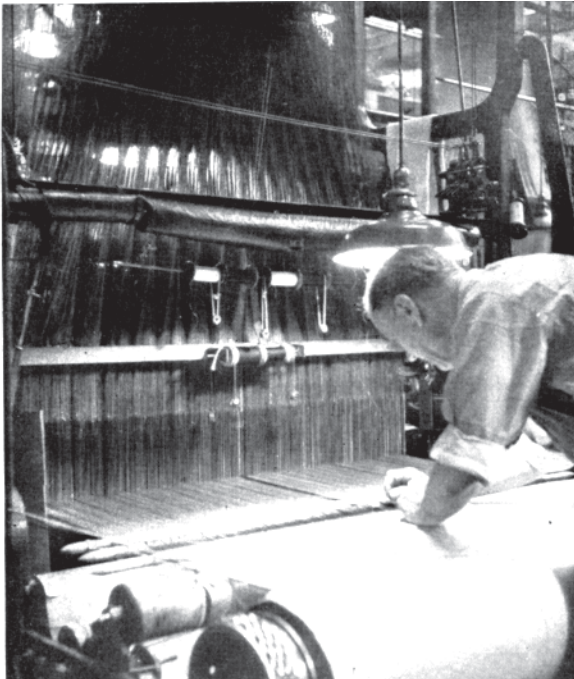
The reed width between swords determines the maximum width of the fabric woven. Prevailing reed width creates, therefore, a certain rigidity in the industry especially in light of the fact that width of loom determines, not only the width of the cloth it may make, but also, because of trade practices and economic considerations, its availability for making different kinds of fabrics.

Thus tie goods are made in widths of 24 inches. A loom weaving two widths of tie goods should be at least 54 inches wide. A loom of less than this width can produce only a single width of tie goods. Because of increased overhead, capital costs, as well as labor costs, it is normally uneconomic to produce a single width of neckwear fabrics. As only a very exclusive piece of merchandise can bear these charges, a loom of less than 54 inches is generally considered unavailable for tie silks, especially for cheaper tie silks. Novelties, church goods, tinsel, and shoe brocades may,

however, be made on narrow width looms. And so, too, may certain dress goods and kinds of metallic cloth. Upholstery, drapery and tapestry goods, however, require wider looms, looms 60 inches and upwards in width as these fabrics are said to cut "better" when they have a minimum width of 54 inches.

Since owners of narrow looms experience difficulty in finding sufficient work of a character that might be done on this equipment, their retention in the industry necessitates a disproportionate amount of idle machine time and, as a con-

Piecing end in warp.



sequence, artificially swollen overhead in production costs. Replacement of this equipment with wider machines should, therefore, be contemplated as occasion demands in mills owning these narrow looms.

Warp Stop Motion

Jacquard looms in Paterson are not generally equipped with warp stop motion. Many of the mills use double warp with two ends treated as one; should one end break, the other will still hold. For this reason these manufacturers see no need for warp stop motion. Only 11.3% of the total jacquard looms are provided with this equipment.

Objections to the use of warp stop motion on the ground that the great number of ends in the warp, and that two or three ends handled as one would prevent its operation, it is alleged, have no foundation in fact. Where there are a great many ends in the warp, banks of stop wires are used, and where two or more ends are treated as a single end, each one is covered with a separate wire.

Pick Counters

Only about one local loom in four is equipped with a pick counter. Yet some of the manufacturers who have installed counters insist that they have been worth more than their cost in stimulating increased production by weavers through eliminating lackadaisical work and idle gossip. Confronted with a clock measuring his effort, each weaver puts forth his best and keeps steadily at work. What this increased output may amount to is suggested by the experience of a certain mill which had always considered 80% satisfactory efficiency for weaving a particular type of fabric. Upon the installation of pick counters, weaving efficiency on this fabric increased to 95%. Increased production means, of course, increased pay to the weaver, but by reducing idle machine time, it also means increased returns to the manufacturer by enabling him to get the same results with smaller capital investment in machinery, decreased carrying charges, and diminished overhead in rent and taxes on smaller machine inventory. The recent contract signed between the Master Weavers' Institute and the Committee on Industrial Organization provides for the installation of pick counters on all jacquard looms.

Belt and Motor Drives

The tendency is to equip each loom with an individual motor drive. That manufacturers appreciate the advantages of a motor drive is evidenced by the fact that 55% of the looms already have individual motor drives.

A belt drive cuts off illumination; it is a source of danger; it necessitates a needless wear and tear on machinery; it loses production

through stoppage; it wastes power; and in instances where solid construction is not used, it causes such vibration in the looms that "shiers" are produced in the cloth. Looms on a line drive are all out of commission whenever something happens to the line, thus frequently eliminating four, six or eight looms from operation. And when only one loom is operated, all of the machinery hooked up on that line rolls on an empty load wasting power.

Belt drives may, as a matter of economy in power costs, have the edge in competing with motor drives when the whole plant operates. But when production drops below a certain level, say 80%, the cost of power increases and the differential lies with the individual motor drive. The usual motor drive is equipped with a three-quarter horse power motor. Some motor drives are, however, operated with a one-half horse power motor. The power cost per shift per horse-power, per month is estimated roughly at \$3.00 per loom.

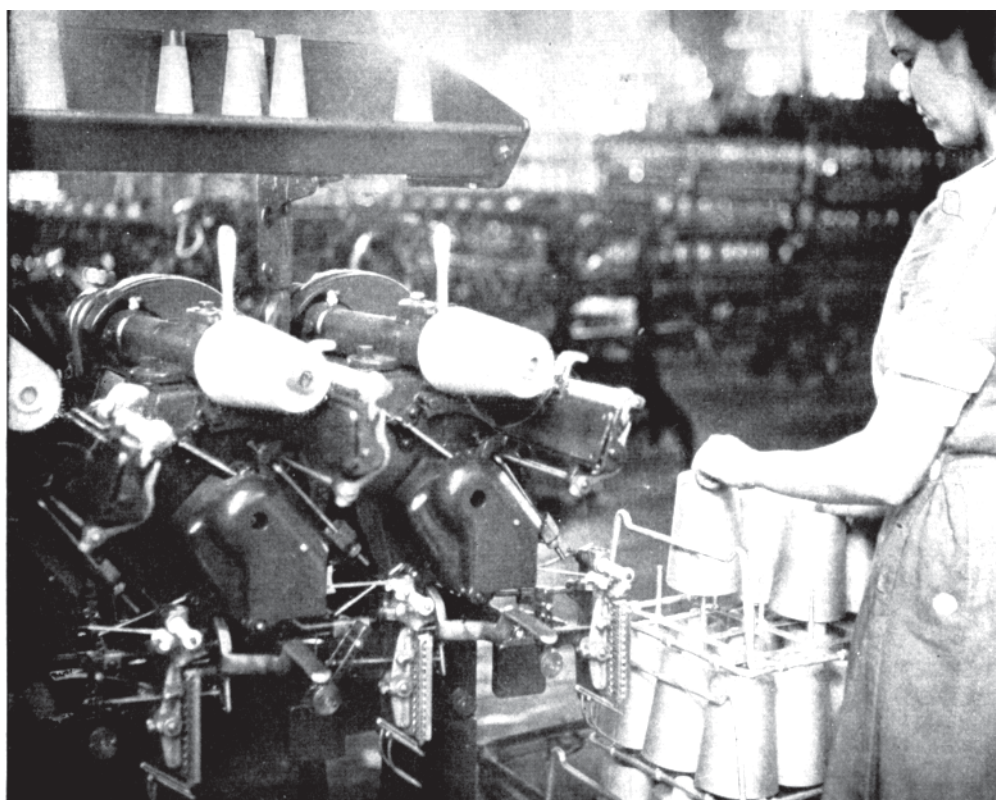
Speed

The speed of the looms varies usually from about 96 picks to 140 picks per minute. A normally efficient and satisfactory speed is about 116 picks per minute. It must be remembered that there is no hard and fast rule with which machine speed may be tested; the most efficient speed must in each case be determined by the desired character and quality of the cloth. In some instances where complex and high quality fabrics are involved speed may drop to 27 or 30 picks per minute without reflection upon either mechanical equipment or skill of worker for such weaves involve more craftsmanship than machine production. To attempt higher speed on such cloth simply results in fabrics ruined by imperfections. High speed does not always mean increased yardage; sometimes greater output is obtained with slow than with high speed.

Automatic Looms

There are no automatic looms in the local jacquard industry. Automatic looms have a restricted field of usefulness. Although used in producing jacquard weaves, automatic looms are confined to fabrics made in mass quantities, such as linings, piece dyed dress goods, and bed spreads made of a cotton warp and rayon filling. The automatic loom has not as yet invaded,—and there seems to be small likelihood that it will invade,—the field of fancy, quality fabrics containing woven patterns of two or more colors in the filling.

An automatic loom cannot be used for jobs requiring multiple shuttle work. In jacquard fabrics one shuttle follows the other from the box on one side to the box on the other side, pick over pick. On an automatic loom, two shuttles are automatic and two non-automatic, the last two stop from the feeler motion but won't change the shuttle. Each



Conning silk.

shuttle has, moreover, to go over and come back, making two picks, a right twist and a left twist, instead of pick over pick as with the non-automatic loom. An automatic jacquard loom cannot be speeded up. The advantages resulting from the introduction of automatics into jacquard work consists, therefore, wholly in increase of loom load. For practical reasons this advantage is confined to piece-dyed goods, goods woven in the greige and then dyed. Such goods, linings and dress goods, are made, it is said, on a basis of 6 and 8 looms to the weaver.

The best thought in the industry seems to be that automatic looms are not adapted for yarn-dyed jacquard work. The practical purpose to be gained from their installation, as there could be no appreciable increase in the speed of machine operation, would consist in increasing the loom load to six or eight looms to the weaver. With yarn-dyed fabrics such an increase in the work load would, because of the type of fabric and colors involved, defeat its own purpose; the increased output would be more than counterbalanced by the increase in inferior made merchandise.

IV. AUXILIARY EQUIPMENT

The local mills are well equipped with all kinds of auxiliary equipment. This is notwithstanding the fact that there is a substantial outside

TABLE IX. QUILLING EQUIPMENT IN LOCAL JACQUARD INDUSTRY.

No. of Looms in Mill	Number of Quillers						Number of Spindles					Motor Driven
	Total	Uni-versal	East-wood	Oswald	Swiss	Total	Uni-versal	East-wood	Oswald	Swiss	Belt Driven	
-20	6	12	11	..	1	240	220	...	20	...	6	6
21-40	18	42	36	3	..	960	720	120	...	120	11	31
41-60	6	17	10	4	...	480	200	160	...	120	14	3
61-80	7	41	37	..	4	820	740	...	80	...	22	19
81-100	2	22	22	..	..	440	440	...	...	...	8	14
101-150	6	59	34	25	..	1680	680	1000	...	...	53	6
151-	6	70	70	..	..	1400	1400	...	...	...	56	14
TOTAL	51	263	220	32	5	6020	4400	1280	100	240	170	93

industry, independent of local mills, ready to do all kinds of warping, quilling, winding, entering and twisting on commission at hand in Paterson. The character of the mill owned equipment in these auxiliary lines is shown in accompanying tables. It is a source of considerable satisfaction to Patersonians that the larger part of this machinery is made in two local machine plants, the Sipp and Eastwood plants, now merged into one organization, the Sipp-Eastwood Company, a company which today makes, and for years past through its consolidated companies has made, the best auxiliary equipment in the industry.

The reason given for owning and operating this machinery is the desire to control not only the time of obtaining the finished work but the type of work itself so that there can be no question as to the quality of the workmanship. Since all jacquard fabrics are highly competitive in their marketing, the deferred delivery by a commission warper, for instance, might result in the loss of an order. For a mill to be equipped with its own auxiliary equipment might cost more than to have the work done on the outside, but the work is done when needed and in a more strictly supervised manner. The most economical use of auxiliary equipment would predicate that a jacquard plant be increased in size in steps of approximately 20 loom units.

There are, according to Table XI, 180 horizontal warpers owned by 43 different mills in the local jacquard industry. There are also some direct warpers used in making edges. The horizontal frame is used in making warps where a great amount of ends are needed and the size and number of pins on a creel are regulated by the material used in making the warp. Thus in a crepe natural silk warp the creels run from 600 pins to 1000 pins on a creel. In the artificial and georgette warps the creels run from 400 to 600 pins owing to larger size of spools necessary for artificial silk. The 400 and the 600 pin artificial creel is as large as the 600 and 1000 pin raw silk creel.

The Hi-speed warper is used on artificial silk exclusively. It runs at a fast speed and is 90% automatic. The creels are 400 ends, 816 ends and 1008 ends. These are called running ends, as a matter of fact, they are just double this amount. Thus a 400 creep warper has really 400 ends

TABLE X. WINDING EQUIPMENT IN LOCAL JACQUARD INDUSTRY.

	No. of Looms in Mill	No. of Winding Frames				No. of Spindles				No. Belt Driven	No. Motor Driven
		Total Frames	Sipp	East-wood	Atwood	Total Spindles	Sipp	East-wood	Atwood		
-20	4	6	6	..	..	472	472	....	....	3	3
21-40	18	55	42	13	..	4748	3540	1208	....	6	49
41-60	6	22	14	8	..	1516	924	592	....	10	12
61-80	7	40	33	7	..	3720	3160	560	....	25	15
81-100	2	20	20	..	..	1600	1600	....	....	15	5
101-150	6	46	24	12	10	3648	1920	908	820	24	22
151-	6	73	13	42	18	5536	924	3476	1136	63	10
Total	49	262	152	82	28	21240	12540	6744	1956	146	116

running and 400 ends in reserve. The running end is attached to the reserve end and when the running is used up, the reserve end which is fastened to the end of the running thread continues on. The creel tender then removes the empty cone and fastens the new cone to the former reserve cone which is now the running end and the new cone becomes the reserve. The Hi-speed frame can only be used in a large plant where there is a considerable number of warps to be made as the frame runs at a speed of 500 yards per minute. Using 2 lb. cones on 816 creels, it takes 1632 lbs. or 150 denier artificial to get up the warper. This initial supply makes about 12 warps of 4000 ends 150 denier 1000 yards long. It does not pay a manufacturer or a commission warper to start one of these frames unless he has an order for at least a hundred warps. The hi-speed semi-direct warper does away with the horizontal frame or reel. It uses only the hi-speed creel. Silk, instead of being put on a frame one warp at a time and then being beamed off, is put on about 9 or 10 warps on a drum. After the warps are put on, the drum is removed to the sizing frame and the warps sized, thus eliminating the beaming.

Winders

There are, according to Table X, a total of 262 winding frames with 21,240 spindles, owned by 49 different mills in the local jacquard industry. Quite a few of these frames are old frames. With dyed silk, however, these frames do just as efficient work as the latest improved frames for the reason that they operate at slow speed on skein dyed yarns. With rayon there is not so much winding as it is, for the most part, delivered on cones direct from the manufacturer.

TABLE XI. WARPING EQUIPMENT IN LOCAL JACQUARD INDUSTRY.

No. of Looms in Mill	No. of Mills	Number of Warpers						
		Total Warpers	Sipp	East-wood	Ather-ton	Belt Drive	Motor Drive	
-20	3	3	3	..	.	1	2	
21-40	14	27	14	13	.	6	21	
41-60	6	13	4	9	.	9	4	
61-80	6	28	24	4	.	13	15	
81-100	2	13	8	5	.	8	5	
101-150	6	32	26	6	.	17	15	
151-	6	64	18	40	6	56	8	
TOTAL	43	180	97	77	6	110	70	

V. CARD CUTTING MACHINERY.

Cards are perforated by special machinery from a painted design, after which they are laced into a chain and passed over conical pegs upon the cylinder. The number of cards required to weave any pattern equals the number of weft threads in that pattern. The cylinder is generally drawn out and turned by each upward movement of the griffe and restored to the needles by each downward movement so that each face in succession is presented to the needles, and each rotary movement brings forward a fresh card, as the griffe rises with vertical hooks a shed is formed and a thread of weft is passed across the warp. The griffe then descends and the operation is repeated but with a new combination of lifted threads for each card.

Most of the local jacquard mills have their cards cut outside of the plant. Only the larger manufacturers, and not all of these, maintain their own card cutting machinery. Such equipment representing 13 French scale card cutters, 7 repeaters and 2 lacers, altogether 22 machines, is distributed among 7 manufacturers.

Card Cutting

The local card cutting industry, servicing all mills desiring to use it, appears to be mechanically well equipped and exceptionally prepared to render any kind of service. Altogether there are, as shown in Table XII, 107 card cutting, repeating and lacing machines in this outside auxiliary industry. This does not include the 22 additional machines owned by local manufacturers. All but 9 of these machines are made by a local manufacturer, John Royle & Sons. The older machines, embracing about one-half of the total number are operated by foot power. The newer machines are, however, power machines. Power machines, in relieving the operator of the labor of pressing pedals, permit him to produce at a more uniform rate, reduce the likelihood of errors due to fatigue, and also increase production conservatively estimated at 25 per cent.

The local card cutting industry is a great convenience to Paterson mills. What the proximity of this industry means in the way of increased efficiency to manufacturers may be suggested by the experience of an out-of-town mill situated in a neighboring state. Suppose a card breaks at 5

TABLE XII. MECHANICAL EQUIPMENT IN LOCAL CARD CUTTING INDUSTRY.

	Total	Card Cutting Machines			Repeating Machines			Lacing Machines			
		Fine Index	French Scale	Lace Index	Total	Fine Index	French Scale	Lace Index	Total	Fine Index	French Scale
Royle	64	19	45	.	17	5	12	.	19	5	14
G. & V.	5	..	3	2	..	.	..	.	..	.	..
Imported ....	..	..	..	.	2	1	..	1	..	.	..
TOTAL	69	19*	48**	2***	19	6	12	1	19	5	14

(*) 10 Foot power.
(**) 43 Foot power
(***) 2 Foot power.

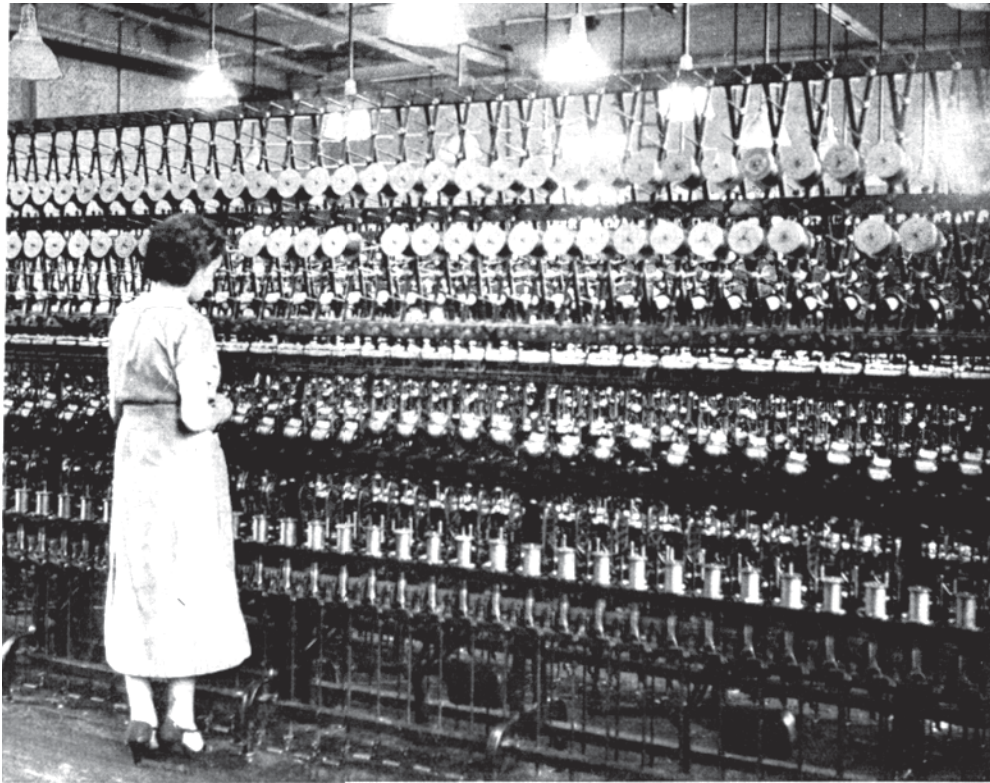
o'clock in the afternoon at this mill. The evening mail in this town closes at 5:15 P. M. Unless the order for the new card is in the post office before this time, it doesn't leave town until the following day. That means the card cutter in Paterson does not get the card until the morning of the third day. The new card does not reach the mill, therefore, until the fourth day. Three full working days with six shifts are lost. Two sets of weavers have each lost three days pay. And the mill has lost three days of production on the loom in question. Yet overhead of the mill has gone on without interruption. If located in Paterson, the mill would have been spared this annoyance and loss. The new card would have been made and delivered within a few minutes.

VI. USED MACHINERY.

Neither the jacquard industry nor manufacturers of textile machinery have elaborated a program providing for retirement of, or the trade in of old machinery. The result is that a portion of the machinery used in the industry is unconscionably old and also inefficient.

There is no accurate data available to show the age of present machinery in Paterson but a recent estimate was to the effect that 30% of the jacquard machines are not more than 10 years old; that 40% of the jacquard machines are over 10 but not more than 20 years old; and that 30% of the jacquard machines are over 20 years old. The looms in use are probably as old, if not older, than the jacquard machines. Should this be true, it is obvious that the local industry owes itself a considerable quota of new equipment.

Some years ago manufacturers of looms agreed to allow a small amount on old looms in the purchase of new looms but the trade-in value allowed was scarcely equal to the junk value of the machinery for scrap. As the program provided no satisfactory plan of inspecting or checking turned-in machinery, the owners stripped it of parts having either replacement or sales value for stock purposes before surrendering it to the loom manufacturers. When the loom manufacturers observed that they stood in a fair way of losing their business in parts, they promptly abandoned the plan. The trade-in allowances made by the manufacturers of new machinery on used machinery today are so small that the manufacturers might just as well allow nothing, for practically all used machinery, when disposed of, finds its way into the hands of either used machinery dealers or dealers in junk and scrap. When retained by owners because it has, practically speaking, no market value, it acts as a drag upon efficient manufacture. And, when purchased by used machinery dealers this second hand, worn out and, in most instances, obsolete equipment is again re-absorbed by the industry so that the result is practically the same in threatening the stability and profitable operation of the industry, for such



Spinning.

equipment is purchased by either new persons entering the industry or by financially weakened members of the industry. No matter where or how the machinery is restored to manufacture of goods, results are prejudicial to the highest economic success of the industry.

A survey of the old equipment on hand at used machinery dealers in Paterson showed that the second hand material for sale included the following:

- 61—600 hook jacquard machines.
- 18—1304 hook jacquard machines.
- 84—4 x 4 looms.
- 115—quillers.
- 53—winders.
- 23—warpers.

Most of the used machinery dealers, of whom there are nine in Paterson, buy up old machines, pick out the best parts and recondition them as rebuilt machines, supplying new parts for unusable old ones. In that way, a fairly good machine is produced for from 10 to 60% of the cost of a new machine. Normally dealers sell looms on a contract sale, secured by chattel mortgage on the property, with a 25-33 $\frac{1}{3}$ % down pay-

ment and the balance payable in 12 to 18 equal monthly installments. Today, however, because of the low price obtained for second hand machinery, they are insisting on full cash payment.

A common practice among used machinery dealers is to buy plants from landlords who have taken over equipment for unpaid rents. They get the landlord to give them 60 to 90 days in which to remove the material. In that way they have free storage place for 2 to 3 months. This enables them to do their selling with minimum overhead.

Until recently there was an association of used machinery dealers which, it is alleged, worked in the following manner: When the dealers heard of a plant to be disposed of they would meet and set the price they would pay for it. If it were refused they would attend the auction. At public auctions held to settle claims of creditors in New Jersey, the goods were first auctioned in individual parcels, and then in bulk. The highest aggregate bid determined whether the goods were sold in individual parcels or in bulk. When the large dealers went to an auction they tallied the amount of the individual sales and when the goods were put up for auction in bulk they would raise the price a little above the aggregate price of the individual parcels. Having bought the goods, they would go to the bidders of the individual lots and offer to sell them the things they had bid on. In this way they controlled the market in used machinery.

With the steady fall in the price of second hand machinery, and the steady rise in price of junk, looms have a higher value as junk than as machinery with the result that today the junk dealers are in competition with second hand machinery dealers for offerings of old equipment. As a consequence, both dealers and junk men are smashing up looms for scrap junk. In fact dealers state that if prices remain as at present, they will junk all their material.

From what has been said, it is obvious that the industry will never attain its highest mechanical efficiency until some effective means are found to cope with the used machinery problem. The permanent retirement of worn-out and obsolete machinery is essential to the maintenance of the reputation and marketing outlets of the fabrics produced by the manufacturers. So long, moreover, as this surplus equipment is either actually or potentially productive, there can be no such thing as the maintenance of a satisfactory price base for the products of the industry. Nor can the manufacturers of new machinery enjoy a remunerative business so long as economically outmoded machinery can be reconditioned into rebuilt machinery and sold at such levels as to rob new machinery of its market. Concerted action by manufacturers of textile machinery as well as by members of the jacquard industry is essential in order to solve this problem in a statesmanlike manner.

VII. CONCLUSIONS.

Since inventive genius has for several generations past not been particularly fertile in devising new mechanical improvements in the jacquard industry, there is comparatively little diversity in the equipment of different mills. Machines may vary in age and be of different degrees of desirability, but they are, broadly speaking, of the same general type. There is no such great range in degree of varying mechanical efficiency separating, the modern up-to-date machinery from the old, outmoded and obsolete machinery as is found, for example, in the plain goods division of the silk and rayon industry. Though differing in important respects, the machines in the jacquard industry are more nearly of the same age and species. Outmoded machinery constitutes, moreover, a comparatively small percentage of total equipment in the industry.

Considering present competitive conditions, the industry appears to be over-machined. Mechanically, the vulnerable points in the jacquard industry revolve principally about the possible retirement of such equipment as:—

1. Single lift jacquard machines;
2. Single width jacquard harnesses;
3. Narrow width looms; and
4. Belt drives.

If this surplus machinery were retired and withdrawn from production, the remaining machinery, if not strictly up-to-date, could be modernized and gradually replaced with new machines fitting conditions within the industry as soon as business warranted it.

The mechanical equipment in the local jacquard industry constitutes the largest assembly of such machinery in any single community within the United States. Distributed among 51 plants, each set up to weave either different types or grades of fabrics, the industry is mechanically equipped to produce every kind of quality cloth woven on jacquard looms. More than this,—the industry is strongly buttressed by the presence of well-organized auxiliary trades,—designers, card cutters, commission warpers, quillers, winders and sizers, harness manufacturers, textile machinery manufacturers, skein yarn dyers, piece dyers, warp printers, and all kinds of supply stores. In this respect, no community can compare with Paterson. The jacquard industry in Paterson is, viewed as a whole, both a vertically and a horizontally integrated industry. The various mills established in the city articulate with and supplement each other in a manner to constitute a well-rounded and coordinated industry.

III. Labor, Wages and Labor Policies.

The development of the jacquard industry in Paterson is a direct result of its large supply of skilled textile workers. In only a place weaving all kinds of fabrics is it possible to obtain the skill, the technical knowledge, and the sympathetic understanding needed in weavers to produce the high quality and the exclusively styled merchandise manufactured by a community turning out all sorts of jacquard fabrics,—tie silks, fancy dress goods, tapestries, draperies, and upholsteries. Only when a weaver has graduated, as it were, in all other kinds of weaving is he ready to begin his apprenticeship in the finer divisions of the jacquard industry. It takes years to produce an able jacquard weaver. Indeed some manufacturers say that it is not until a weaver is 35 years old that he has had the requisite training and experience to be put on a jacquard loom weaving the finer fabrics. Ribbons, hatbands and woven labels, divisions of the textile industry well represented locally, demand and obtain exceptionally skilled and responsible help. The jacquard mills recruit their weavers from the finest and ablest in these industries.

I. LABOR SUPPLY.

Thoroughly disciplined before entering the jacquard industry, every local weaver has, because of the broad assortment of fabrics made within the city, an opportunity to broaden his understanding and technique in textile problems still further. Not only does he weave different types of fabrics within each employing mill, but occasionally he shifts mills. The added experience he gleans thus makes him a still better weaver. The local jacquard weaver, everyone admits, stands without a peer among his fellow workers throughout the nation. In no other community is he graduated from among 10,000 skilled textile workers, themselves engaged in diversified lines, into a highly specialized industry embracing 51 different plants making practically every kind of yarn dyed jacquard fabrics. It is upon the foundation of this well-educated and thoroughly disciplined labor that management and capital have built the present industry.

Jacquard Industry Highly Organized

The jacquard industry in Paterson is a highly organized industry. Indeed, every plant but one is a union shop. The contract with the Textile Workers Organizing Committee of the C. I. O. creates a closed union shop; it provides for a five-day, forty-hour week; it regulates and fixes the wage scale; it establishes the check-off. Since management has, practically speaking, accorded the unions full authority to police and discipline labor, the manner in which the unions discharge this responsibility is of the utmost consequence to everybody concerned,—to the worker himself most

TABLE XIII. NUMBER OF EMPLOYEES REQUIRED TO WORK A SINGLE FULL TIME SHIFT.

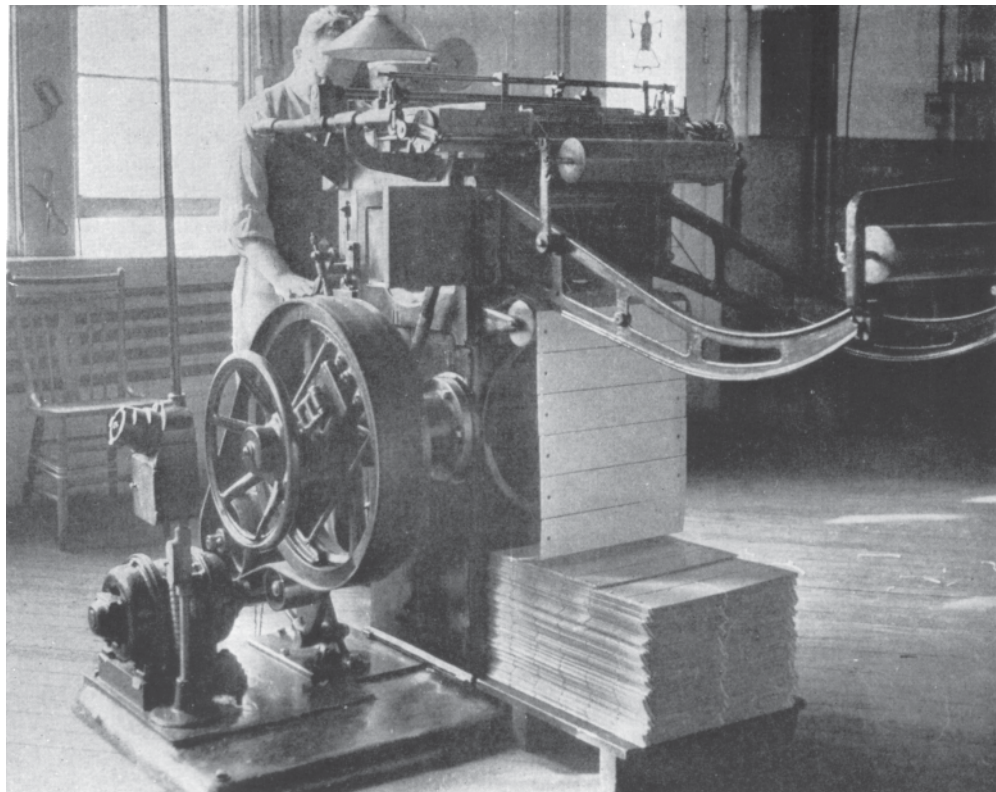
	No. of Looms in Mill	No. of Mills	No. of Looms	Total Workers Employed	Weavers	Warppers	Winders	Quilters	Loom-fixers	Twisters	Designers	Card Cutters	Pickers	Misc. Help
	-20	6	92	92	48	3	5	9	6	6	1	..	5	9
	21-40	18	480	443	254	27	42	29	18	18	5	1	21	28
	41-60	6	312	261	156	13	36	13	9	7	1	..	11	15
	61-80	7	526	450	263	29	44	28	17	14	10	1	17	27
	81-100	2	180	172	90	13	24	16	6	6	2	..	5	10
	101-150	6	748	582	374	32	40	37	25	25	4	..	18	27
	151-	6	1148	1048	574	64	71	66	42	47	24	13	40	107
Total	51		3486	3048	1759	181	262	198	123	123	47	15	117	223

of all, because his job and livelihood are at stake; to the employer because limitations are imposed upon the profitable employment of capital; and to the community because the local permanence of the industry may be involved.

Local Union Leaders

At the very start, let it be said, that the local representatives of the T. W. O. C. are for the most part experienced men in the textile industry who worked for years in various capacities and then graduated into positions of union leadership. These men are familiar with the technical problems presented by the industry; they are also seasoned labor leaders with many years of responsible association with trade unionism.

Translating a design onto jacquard cards.



Number of Workers

The local jacquard industry on the basis of one full time shift working to capacity employs 3048 workers. The weavers, as evidenced in Table XIII, embracing 1759 workers, constitute 57.7% of the total number of employees. The winders are the next most numerous group, numbering 262 employes; the quillers next, 198 employes; the warpers next, 181 employes; the loomfixers and twisters next with 123 each, and last the pickers with 117.

But the industry, as shown in Table XIV, is not operating on the basis of one full shift 100 per cent capacity. Due to depressed conditions in the textile field, the industry is operating but 64.2% of its machine load, there being at present 1247 idle looms. As a consequence the industry is at present giving employment to but 63.7% of the full complement necessary to operate the equipment in the local industry. Put in other words, over one-third of the workers and over one-third of the machines are both idle.

Second Shift

Despite the depressed state of business which forced 1247 looms into complete idleness, 908 looms, as shown in Table XV, were operating nights.

The looms operating two shifts constituted 26% of the total looms and 40.5% of the employed looms. Had it been possible to transfer the work on the second shift looms to looms entirely unemployed, the latter number would have fallen from 1247 to 339 or from 35.8% to 9.7% of the total looms in the industry.

A similar situation prevailed in employment conditions. Altogether the industry in September 1937 was employing 1941 persons. But 650 of these were persons working on the second shift. The number in the first shift was, therefore, only 1291. Daytime workers, as a consequence, constituted but 42.3% of a full single shift. Although 57.7% of the daytime workers were out of work, one-third of the workers working were on the night shift.

TABLE XIV. EMPLOYMENT IN LOCAL JACQUARD INDUSTRY ON SEPT. 15, 1937.

No. of Looms in Mill	No. of Mills	No. of Looms	Looms Running at present	% of total looms op. at present	Employment 1 shift op. 100% cap.	Present employment	% present employment to 1 shift operating 100% cap.
-20	6	92	74	80.4	92	69	58.5
21-40	18	480	342	71.2	443	287	64.7
41-60	6	312	128	41.0	261	98	37.6
61-80	7	526	292	55.5	450	280	62.2
81-100	2	180	120	66.6	172	97	56.4
101-150	6	748	413	55.2	582	344	59.1
151-	6	1148	870	75.6	1048	766	73.0
TOTAL	51	3486	2239	64.2	3048	1941	63.7

II. PRESENT UNION CONTRACT.

In the contract entered into June 11, 1937, between the Master Weavers' Institute and the Textile Workers Organizing Committee of the Committee on Industrial Organization, the manufacturers recognize and acknowledge the union as the sole collective bargaining agency for all employes. All employes not members of the union were under this contract obliged to become members within two weeks or be replaced by members of the union. Employes who may hereafter be hired must within four weeks after they are hired become members of the union or be replaced by members of the union.

Right of Hire and Discharge

Under the contract the employer has the free right to employ or discharge any worker in accordance with the necessity of his business. Discharge from employment must, however, be in good faith, without discrimination because of union activities.

A discharged worker may appeal his case to the union committee in his shop. If not satisfied with the decision of the shop committee, he may bring his case before the executive board of the union. Should the executive board after due hearing feel that the discharge was discriminatory or unfair, it may place the matter before the impartial chairman. If the latter decides in favor of the discharged worker, the employer must reinstate him with back pay. Appeals to the impartial chairman must be brought within two weeks of the employe's discharge. The back pay of any reinstated employe is limited to 17 days pay.

Newly engaged employes are regarded as on trial for a period of four weeks. During this interval they may be discharged for any reason whatever.

Employment of Learners

Manufacturers may, when necessary, employ learners. Where the employer and the union cannot agree as to the necessity for learners, decision is left to the impartial chairman. Learning periods are as follows:—weavers 8 weeks, warpers 12 weeks, other employes 4 weeks. During the learning period a wage of \$8.00 per week is permitted to learners. During

TABLE XV. NUMBER OF EMPLOYES ON SECOND SHIFT ON SEPT. 15, 1937.

No. of Looms in Mill	Mills with 2 shifts	Looms in 2nd shift	Total workers	Weavers	Warpers	Winders	Quillers	Loomfixers	Twisters	Misc. Help
-20	4	58	40	29	2	2	3	2	2	1
21-40	9	170	112	85	3	2	5	6	4	2
41-60	3	48	34	24	3	3	3	1	1	1
61-80	5	276	196	138	9	13	12	8	9	7
81-100										
101-	5	356	268	178	16	23	23	10	10	8
TOTAL	26	908	650	454	33	48	46	27	25	17

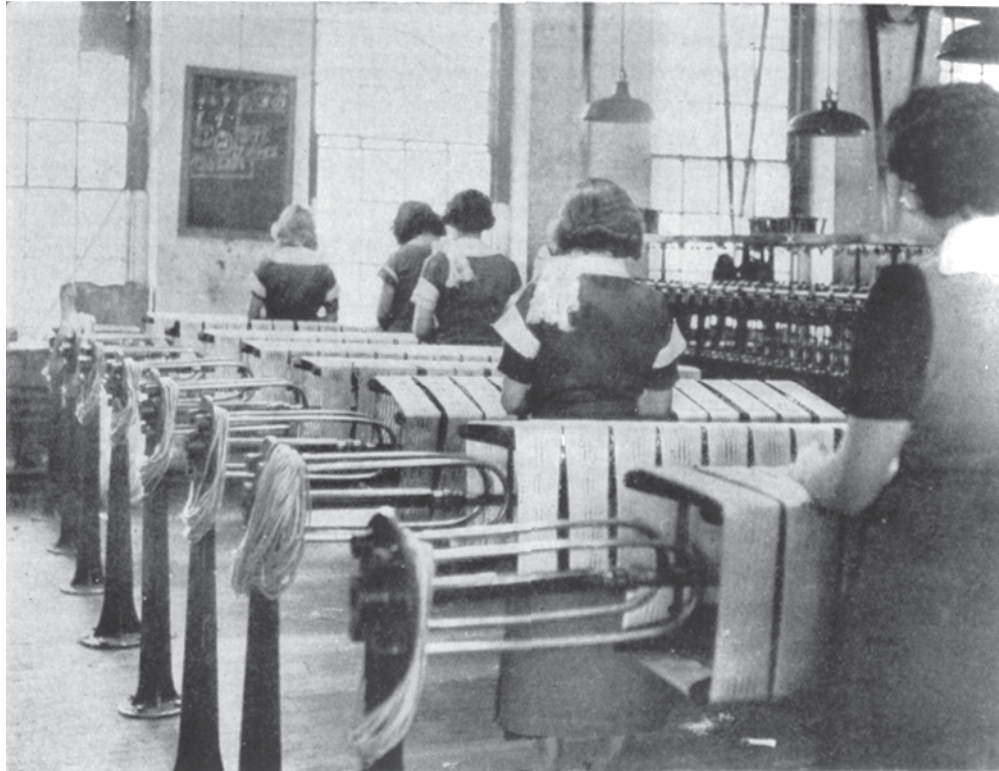
the learning period, learners need not be members of the union but within two weeks after expiration of the learning period, learners must become members.

"Fair Wage"

The contract between employers and employes protects the weaver against the use of imperfect warp, damaged yarn or other conditions, except weather conditions, beyond his control which might prevent him from earning a "fair wage" in accordance with the piece rate schedule attached to the contract. The term "fair wage" is interpreted as meaning an average earning on double-wide looms of \$0.70 per hour on two looms and \$0.40 per hour on one loom, and on single looms \$0.60 per hour on two looms and \$0.35 per hour on one loom. This provision also applies to making samples up to 2½ yards in length.

The "fair wage" rule is merely intended to protect weavers from being abused by indifferent or unscrupulous employers. Should they buy insufficiently sized warp or poor filling yarns, maintain bad harnesses, or run a construction which consumes an inordinate amount of time and prevents the earning of a decent wage, they should obviously not be allowed to do so at the expense of the weavers. It is said that this rule has up to date been applied only two times. It should probably be pointed

Preparing skeins preliminary to dyeing.



out that the rule does not guarantee the weaver a minimum wage. If the weaver cannot under normal conditions earn more than this schedule provides, that is his misfortune. Weavers average between \$25.00 and \$28.00 weekly.

Check-off

The contract provides for the check-off. The union delivers to each manufacturer a list showing the amount of union dues payable by each member of the union. This list is accompanied by a written order from each employe whose wages are subject to deduction, authorizing the manufacturer to deduct from his wages and pay over to the union the specific amount which the union requires to be deducted each month.

Impartial Chairman

An impartial chairman, named by employes and the union jointly, has general supervision over the performance and enforcement of the agreement. All matters of dispute, controversy or interpretation, not otherwise provided for in the contract, shall be heard, arbitrated, determined and settled by the impartial chairman and his decisions and rulings shall be final and binding.

Single Shift

The contract subscribes to the advisability of the single shift in the industry as and when this may be accomplished on a national basis. Pending the national attainment of the single shift, the contract limits work to two shifts.

III. SHOP RULES.

The shop rules, which are not included in the contract, are in some respects as important as certain provisions of the contract itself. These rules evolved by the workers themselves in conjunction with their employers, over a long period of years are aimed at clarifying the rights of workers to their jobs.

Right to Daytime Work

Labor is committed to single shift operation; night shifts are considered extra help. This policy has several implications:—a day worker has a right to a daytime job; he cannot be shifted at will by the employer to the night shift. Moreover, when work falls off the employer has the option either to share work between day and night shifts or to lay off the second shift entirely.

Right to Steady Looms

The employer is expected to recognize insofar as possible the right of a weaver to steady looms. When the warp on a loom weaving a certain construction runs out, the first order of the construction coming into the mill must be produced on the last loom which worked on this type of fabric.

The "Construction" Rule

Construction, and not seniority, is, therefore, the rule. Construction involves ends and machines, not picks and patterns. A job requiring a loom with a fine index machine, cannot, of course, be given to a weaver operating a French index machine nor to one operating a double index machine.

The construction rule is often modified by the color of the warp in the looms. If an order comes in specifying a certain color, the job goes to the weaver or weavers having looms equipped with that color of warp. Although there may be several weavers on similar jacquard looms set up with warps of the same number of ends and types of fibre, the work must be assumed by the weaver or weavers having looms provided with warps of the right color. When an order is not sufficient to afford work for two looms per weaver, the weavers having looms set up for that construction and color share the work. There must be equal distribution of work wherever possible.

Neither picks, fibre, color of filling, nor pattern make a change in construction. Any number of picks, change of color and pattern may be put into a loom without effecting the construction for construction concerns only ends and machines.

The application of this rule may bear unequally on different weavers. This is especially true where both looms tended by a weaver are of the same construction. To obviate this situation, a weaver usually tends looms with different constructions. This balances matters and gives all weavers more of an equal chance to work, even though it be work at only a partial work load. A weaver may be out-of-work for weeks at a time but whenever a job comes in involving the construction on his looms he is sent for even though the order may be for only 5 or 10 yards.

Hiring New Weavers on First Shift

In putting on new daytime workers, the employer is expected to take them from the second shift according to seniority rule, giving preference to employes on the second shift in order of length of service, but there is no iron-clad rule on the subject. The shop is permitted to handle the matter in its own way by the employer and employes getting together on the subject.

IV. WAGES.

The minimum wage schedule entered into between the Institute and the union is indicated below.

AUXILIARY WORKERS

Winders	\$16.00 per week
Quill Winders	15.00 per week
Pickers	15.00 per week
Stick Folders	15.00 per week
Edge Warpers	15.00 per week
Draw Siders	15.00 per week
Loomfixers	38.00 per week
Twisters	35.00 per week

Twisters—transient 1.00 per hour
 Handers in50 per hour
 (No piece work permitted for twisters)
 Male Warpers 33.00 per week
 Female Warpers 30.00 per week
 The maximum load for fixers shall be:
 24 two wide 4 x 4 box looms not to exceed
 64 inch reed space.
 36 single wide 4 x 4 box looms not to ex-
 ceed 30 inches of cloth.
 Double fine index machines to count as
 loom and a half.

**WEAVERS
 TINSELS**

Tinsel work to 42 inches, Jacquards, 60
 dents or less Reed. 4 Shuttles or less.
 80 Picks, 22 cents per yard established
 base.

PICK SCALE
 Add 1 cent for every 4 picks above 80.
 Deduct 1 cent for every 4 picks below 80
 to 52 picks.
 Deduct ½ cent for every 4 picks below
 52 picks.
 Add 8% on Georgette twist warps with
 more than 60 to 65 twist.
 1 cent additional for each extra beam.
 Width Scale 2% per inch above 42 inches.

**JACQUARD PRICE SCHEDULE
 Base 24 inches**

Warp Ends	Picks	Beam	Shuttles	Price
2,880	80	1	1	.13

Add or deduct 1/20 cent or .0005 for every
 48 ends in warp.

PICK SCALE
 Add 1¼% per pick above 80 picks.
 Deduct 1% per pick from 80 to 68 picks.
 Deduct ¾% per pick from 68 to 56 picks.
 Deduct ½% per pick from 56 to 44 picks.
 Deduct ¼% per pick from 44 and below.

WIDTH SCALE
 Add or deduct 2% per inch on one width
 cloth.
 Double width cloth to be paid price and
 one-half or 50% above single width cloth.

BEAMS
 ½ cent extra on 24 inch warps.
 ¾ cent extra on 48 inch warps.
 Split edge or Doupe ½ cent extra.

SHUTTLES
 1 cent extra for second shuttle.
 ½ cent extra for each additional shuttle.

MACHINE 1200 Fine Index Machine
 ½ cent extra on Draperies, Linings, Da-
 masks, etc.
 1½ cent extra on Tie Goods.
 On Looms operating two machines 2
 cents extra.

FILLING
 1 cent extra for 300 denier Rayon.

DOUBLE END WARPS
 If more than 5 spools on each 24 inch
 section 1 cent extra.
 Weaver to be permitted to twist broken
 ends on dark colored warps.
 Deduct ten per cent (10%) from foregoing
 weaving price list for raw silk warps.

V. CURRENT LABOR PROBLEMS.

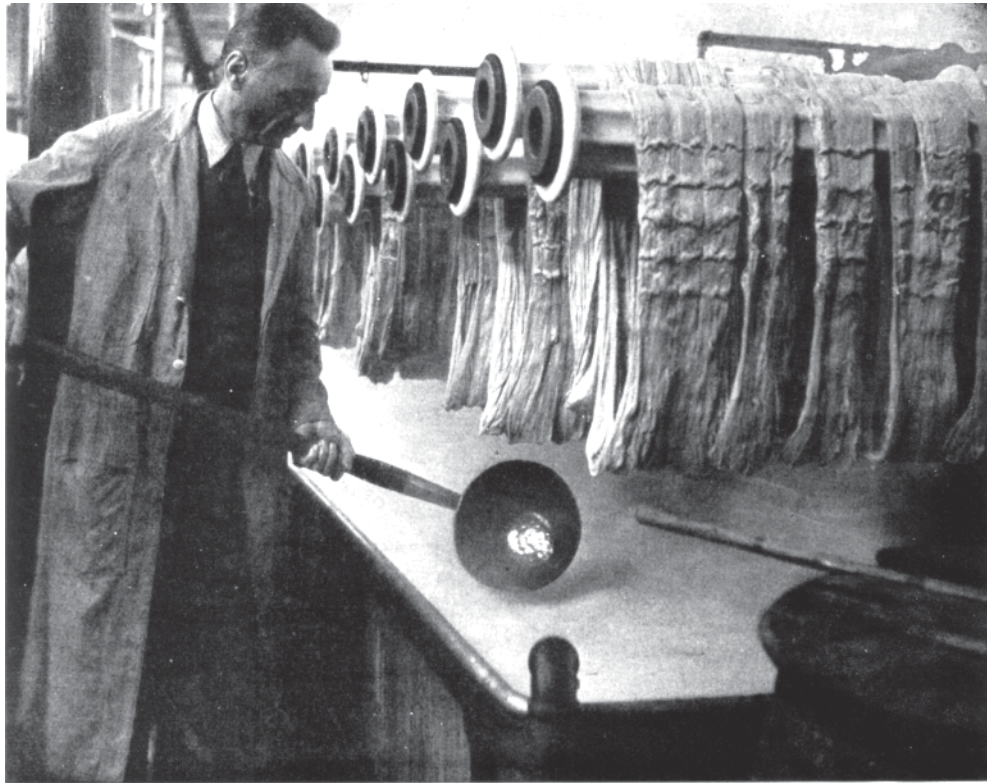
Commission Warping

The agreement between manufacturers and unions provides that no manufacturer may give commission work to an outside warper if the work can be practically done within the manufacturer's own mill. In other words, only when a manufacturer has all of his warping frames filled can he give out work to commission shops. Letting work to commission warpers enables a mill to have work done more economically than is possible within its own plant as the result of curiously conflicting provisions in regard to wages for warpers in two different union contracts, that of the plain goods agreement and that of the jacquard agreement. The plain goods agreement calls for a wage for warpers of \$22.50 per week or its equivalent in piece work; the jacquard agreement calls for a straight wage of \$33.00 per week with piece work prohibited. Under these conditions it is evident that a manufacturer can have his warping done cheaper outside than inside the plant as the commission shop has not only a wage bill of 32% less but usually more efficient equipment for this purpose, than the average jacquard mill. The fact that a jacquard mill having no or insufficient warping equipment may have its work done by a commission warper at the rates charged for warps used by the plain goods division, gives it an advantage over the jacquard mill doing all of its own warping. It is questions like this which the impartial chairman is expected to settle.

Piece Dyed Dress Goods

When it comes to "bread and butter goods," one shuttle jobs, raw silk, double ends in the warp, 72 picks, three looms are, in the opinion of practically every local manufacturer, easily handled by a weaver. "Bread and butter" lines, being staples and not subject to rapid style changes, consisting principally of piece dyed dress goods, are particularly desirable in Paterson to fill in slack seasons. Their production is, moreover, easy for the weaver as they usually come in orders of from 250 to 500 pieces of 80 yards of one design by the suit and dress manufacturers. The weaver, having no frequent changes in cards or filling, gets into quantity production and therefore earns a fair wage during several months of the year when otherwise he would have no work at all.

The answer of the unions to this plea of the manufacturers is that the contract provides that manufacturers who wish to run "bread and butter" lines in off seasons may appeal to the impartial chairman to set competitive price rates for the kind of work contemplated. Now that the impartial chairman has been appointed, it is to be hoped that the employers will take this appeal and have the matter settled at an early date. Apparently local labor is not contesting the position taken by the manufacturers; it merely wishes the problem disposed of in regular routine manner.



Preparing dye for skeins.

Training of New Workers

With the decline in the local plain goods division of the textile industry, the time has probably come when the jacquard industry, instead of relying upon the mills producing plain fabrics to train its workers, must take steps to drill its own help. Occasional grumblings are heard now from various sources that weavers in Paterson, though still the most skilled in the industry are not as skilled as they once were. Comment is also to the effect that the average age of local jacquard weavers has risen to a marked degree in recent years; that new skilled jacquard weavers are not produced as rapidly as their present ranks are depleted through retirement and death. The younger generation, it is said, is seeking jobs in other fields than the textile industry.

Obviously the maintenance of the local jacquard industry predicates a supply of skilled weavers. These weavers must be trained either in the vocational school or in the mills, perhaps through the collaboration of the vocational school and the several mills. This is a matter of such fundamental and urgent importance to the industry that the immediate attention of the best minds in both labor and management should be given to the subject. For the moment there may be no special cause for alarm as the

present supply is considerably greater than the current demand for weavers but a farsighted industry will take pains to keep the present supply of skilled workers constantly replenished with new help.

Out of Town Union Contracts

The contract contains a provision that no agreement containing more favorable terms or different terms from those of this agreement will be made by the union with any manufacturer in this industry without first obtaining the approval therefor from the Institute. The charge is made by the manufacturers that the unions signed contracts with various mills in direct violation of this pledge. Not a single contract with outside plants has, it is said, been signed on the Paterson basis; every one gives the distant plant some advantage not accorded the Paterson manufacturer. Thus one or two concerns which specialize in light jobs, principally materials for the chain stores, fabrics having not more than 112 ends to the inch have been permitted to operate 3 looms to the weaver. Certain other mills have been permitted by labor to operate 4 looms to the weaver, 3 looms on crepe goods and 1 loom on jacquard goods to each weaver, the weaver being paid for all the goods, both plain and jacquard, at the pick rate for plain goods.

VI. CONCLUSION.

Labor may not in the past have been duly attentive to the fact that sound labor policy demands that the local industry for its own success must be at all times strongly and aggressively competitive with the industry in outside communities. To establish a wage scale which as its effect drives industry out of the city is as fatal to the best interests of labor as to management. Indeed such a wage scale, instead of benefitting the local worker, only robs him of his job. In this respect it may not be amiss for labor to indulge in a little self-examination as to the wisdom of its past wage policies.

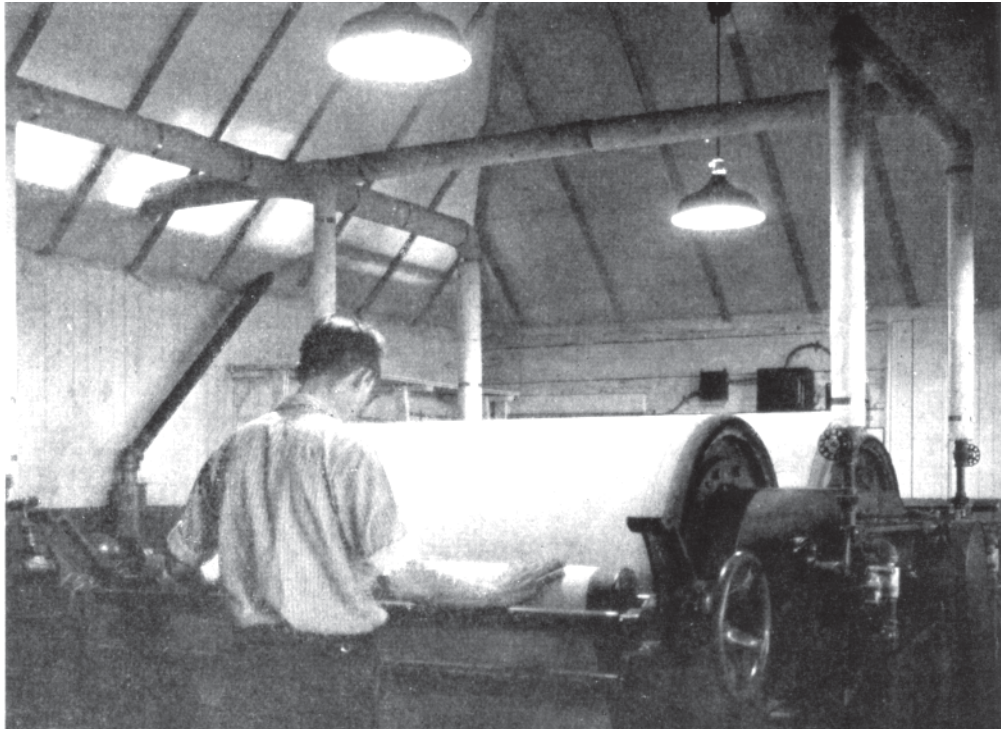
Inflexible wage scale policies have, it is alleged, had the effect of making the manufacturer indifferent to the condition of his machinery. Paying the same wages on a piece rate basis whether the machinery is new or old, some manufacturers have asked themselves why they should install improvements when they derived no benefit from so doing. As a result the machinery in some plants is said to be deteriorating. That there is certain old machinery in the industry which should economically speaking be replaced is no doubt true but to blame labor for its non-replacement with new machinery is probably imputing too much responsibility to labor for by all accounts Paterson has the best machinery in the industry.

Whatever one may think of the wisdom or unwisdom of its provisions, the contract between manufacturers and labor, in providing for the

arbitration of disputes, the outlawing of strikes and lockouts, and for the administrative adjustment of its terms by the impartial chairman, is a very practicable and workable sort of document. It lays down the procedure by which either side, acting in good faith, may in an amicable and an entirely friendly manner bring up for review any new condition or situation not contemplated at the time the contract was entered into. Indeed, the contract provides, in the event of new national occurrences, even for the revision of the wage rate schedule. Insofar as a contract can assure peace and tranquillity to the industry, the present contract does so. It is to the credit of those who drew up the contract that they recognized that there will always be differences between the two signatories to a contract and that these differences, instead of being allowed to accumulate and gather rancor, should be settled currently in a spirit of mutual forbearance and fair play. The main labor problems at present disturbing the local industry are:—

1. Regional wage differentials discriminating against local production; and
2. Work load assignments favoring production of piece dyed goods in out-of-town mills.

Beaming.



With 85% of labor in the jacquard industry organized today, and with contract gains being effected by the unions, in signing up more out-of-town plants as closed shops, these differentials will be gradually reduced if not eliminated. A few years ago, only 55% of the industry was organized.

Since labor costs must be equalized throughout the industry for the well-being of labor no less than for the industry, it is to be hoped that wage rates and work loads may soon be removed as competitive factors in fixing manufacturing costs.

Manufacturers are quite generally of the belief that if wages and work conditions in Paterson could be placed on a comparable basis with out-of-town mills, the result would be such increased orders for local mills that the average man and woman in the industry would be earning considerably more than now.

The new contract entered into between the T. W. O. C. and the Master Weavers' Institute, in granting practically every major demand of organized labor,—union recognition, the closed shop, the five day 40 hour week, a standard piece rate wage scale and the check-off,—places the responsibility for the well-being of the industry, insofar as it concerns labor, directly upon the representatives of labor. Heretofore the disciplining of labor has been divided between management and unions. Now this function is assumed in full measure by the unions alone.

In the past, representatives of the union have been obliged to devote a major portion of their time to elementary measures of organization and administration, securing members, collecting dues, investigating complaints of unfair discrimination against members, etc. Now all these time consuming chores have been removed from their shoulders. The performance of these various activities was difficult under the old set-up without interfering or appearing to interfere with the functions of management, of harassing and obstructing management. But now that management has frankly surrendered control over these matters to the unions, the question arises, what will the unions do?

Having obtained full jurisdiction over workers, it would seem that the old differences between labor and management should no longer arise, that labor would henceforth be able to work in closer harmony and more cooperatively with management, and that as a result, the energy and time which has heretofore been expended at cross purposes and in large part destructively between the two partners in industry might hereafter be merged and directed in unison by both sides to the constructive improvement of the competitive position of the industry. Reduced costs, increased output, qualitative production, modern machinery,—these should now be as important objectives to labor as to management. Only through unswerving loyalty and unlimited devotion on the part of its workers will



Making up dyed skeins.

the local management be able to continue in its compliance with present contractual obligations. Nor can the mills in Paterson continue indefinitely to accede in a contract which establishes a differential against local manufacture. In all fairness labor must either make good in its repeated promises of bringing wage scales, working conditions, etc. in outside communities up to the standard in Paterson, or gracefully acquiesce in lowering the standards in Paterson to those in outside competitive standards.

The permanent interest of the workers themselves demands this; if it is not done the local workers will either suffer long periods of enforced idleness each year, receiving employment only at peak times, or lose their jobs to workers employed in outside mills possessing more favorable labor conditions. Since nobody, not even the local employers wish to see the working standards in Paterson lowered, it is plainly up to labor to exert its full power in levelling up outside conditions to the Paterson standard.

IV. Production.

Production in the jacquard industry is both a manufacturing and a styling problem. Indeed it is often more of a styling problem than a manufacturing problem for the producer of yarn dyed jacquard fabrics must, before he starts manufacture, commit himself irrevocably to a certain coloring and design of his goods in anticipation of the impending style season. The manufacturer of greige goods may produce his fabrics, place them in storage and not have them dyed or printed until he is practically sure of the demands of the current style season. In this respect the greige goods producer has a distinct advantage over the jacquard manufacturer. But an erroneous forecast of next season's styles and colors by the jacquard manufacturer will leave with him an accumulated stock of unsalable merchandise, sometimes not even worth the price of the raw material.

I. MILLS WORKING ON COMMISSION.

Every mill would probably prefer to weave on orders or on stock if it had the resources to do so but as a result of the lack of sufficient capital to finance the purchase of raw materials, finished materials in stock, and the carrying of due accounts on sold merchandise, about one mill in five has been forced into commission weaving. Most of the mills working on commission are small mills, but of late there is a tendency for even some of the larger mills to do some work on commission. But commission work among the larger mills is still rare. Thus among the 14 mills with 81 looms or more containing in the aggregate 2076 looms, only 90 were at the time of the survey on commission work. Only 374 or 10.7% out of 3486 looms distributed among 11 mills in the industry are at present devoted to weaving fabrics on commission.

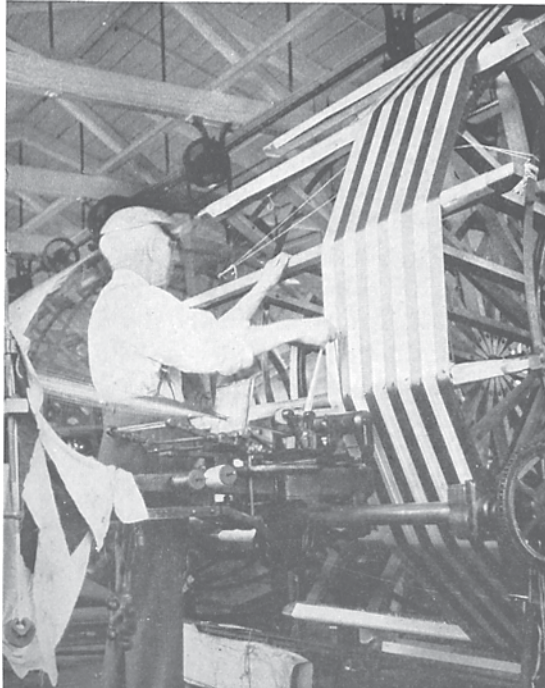
The commission mill constitutes, no doubt, one of the weak links in the local jacquard industry. In the first place it is usually forced because of financial limitations to do commission work. It is therefore not able to exercise deliberate choice over the work it does; it has to do what work is offered to it. Doing no work for stock its operation fluctuates violently, the busy seasons being characterized by feverish activity and between seasons by almost complete unemployment. It has to do what work it does when it gets it and such work as it gets is usually a rush order. Since commission work is, moreover, highly competitive, there is reason for believing that the rate at which work is done is usually the lowest or near the lowest price at which the work can be let out for within the industry. By the very nature of their setup, commission mills always accentuate price competition. They are, as a consequence, apt to be one of the great unsettling forces to the stability of the industry, to the stability of the price structure no less than to the stability of established wage scales.

Some of the commission manufacturers are new men who have set themselves up in the industry within the past few years. A few of them were formerly in the plain goods division of the industry and when it declined transferred to the jacquard field. Others, unfortunately, are men who until a few years ago had jacquard mills producing for stock or order but, who because of financial reverses, have had to resort to commission weaving in order to stay in business.

Much of the demoralization which occasionally occurs within the industry is traced by some persons directly to the factors which created the commission mill. Whether these mills operate for the New York converter or for other manufacturers who farm out a portion of their work, one commission mill is played against another commission mill, the financial need and distress of one mill against the lack of employment and hunger for work of another mill and the low wage scales of a region with low standards of living against the high wage scales of the region with higher standards of living. That this situation should result in cut throat competition, chiselling and price cutting and a constant pressure for lower wages and heavier work loads is altogether natural. It will probably continue just so long as price is the sole standard set up for awarding contracts for a substantial volume of jacquard fabrics, in other words, just so long as commission mills are pitted against stock or order mills in their competition for work. Anything which would lead to the elimination

of commission work and the concentration of all production in stock or order mills would be a constructive move for the whole industry. But it is a difficult problem for a commission mill to get work as a stock mill. It usually has no auxiliary machinery as its converter normally supplies all auxiliary services. To provide itself with warpers, winders, quillers and other equipment would demand substantial capital. And then it has no independent outlet for its product, for doing commission work means that the converter and not the manufacturer has all the contacts with jobbers, wholesalers and manufacturers.

Running warp onto a horizontal frame.



Regrettably but nevertheless true, some of this confusion in the industry is attributable directly to a few local manufacturers who either have branch plants or have work done on commission out of town. These mills must share with the New York converter the responsibility for emphasizing regional differentials in competitive conditions and keeping a portion of the industry in a constant turmoil. The experience with commission weaving in the plain goods industry should be sufficient warning to the local jacquard mills of the fate that awaits them if they permit commission weaving to grow within the industry. The local manufacturer has every interest not only to place and keep his own business on a stock or order basis but to do everything within his power to eliminate commission weaving from the entire industry.

II. INVENTORIES IN RAW MATERIALS.

The chief inventories of raw materials consist of yarn dyed warp and filling. In some cases these stocks are nominal; in other cases substantial. Mills running all silk fabrics have the larger inventories; those running artificial and cotton fibres the smaller inventories. A mill manufacturing for stock must carry a fair store of yarns of different fibres and different colors. If it does not, its manufacturing operations will be unduly delayed while purchasing materials.

Violent fluctuations in the price of raw silk have always emphasized the need of a rapid turnover in the local textile industry, especially among mills in the cheaper lines of staple merchandise the price of which varies more or less closely from day to day with the price of the raw material. Slow turnovers in such goods have in past years caused local mills untold loss. Mills committed on the long side with either large stores of raw silk or volumes of finished merchandise carried in stock have time and again taken substantial losses when the price of raw silk has taken a precipitous drop. In some cases they have had their working capital seriously depleted; in other cases, they have been rendered bankrupt and completely eliminated. For this reason many manufacturers, instead of carrying a stock of finished merchandise, like to do a business based solely on orders in hand so that they might minimize the speculative element of raw material prices as far as possible in their production costs.

Mills making close-out sales at the end of a style season usually dispose of their goods at from 40 to 50% less than regular sales price. Out-of-town manufacturers are able, because of lower wage scales and larger work loads, it is said, to absorb these losses and yet operate at a profit. Most local manufacturers, in order to avoid speculative losses incident to close-out sales, which they could ill afford to take, have ceased producing for stock and confined production to a strict order basis.

Other mills, to protect themselves from speculative fluctuations in



Close-up of spinning.

the price of raw silk, have attempted to develop the manufacture of novelties and high grade specialties in which the value of the raw material constitutes but a small part of the sales price of the finished fabric. Though they have succeeded in a measure in achieving this end, There is usually such limited demand for such items that the mills must remain small specialty mills.

Introduction of rayon has tended to minimize these fluctuations in the price of raw materials. Being made from low priced raw materials, cotton linters or wood sulphide, it is manufactured practically to a predetermined price.

It is therefore not only itself less speculative in price than silk, but being competitive with silk, it narrows the price spread in silk yarns. Rayon has proved a strong stabilizing influence in the industry.

Manufacture of rayon in this country did not begin until 1911. The first rayon had many defects; it was shiny and harsh when dry; weak and coarse when wet. Being of a low tensile strength it was originally mixed with cotton which supplied both strength and softness.

Through continuing research, various improvements were effected in the fibre, particularly improvements in strength, luster, and size of filaments. Bright acetate rayon had 80% luster and viscose rayon 70% luster as compared to silk with 40% luster and cotton with 4% luster. The chemist found means of varying luster to any desired level with the result that artificials in use today have a luster ranging all the way from 1½% to 80%. At first the standard size yarn contained only twelve separate filaments. Gradually the number increased to 18, then to 24, 30, 40, 60, 90 and finally to 150. Each increase in number of filaments and decrease in size afforded the possibility of richer, finer and more luxurious fabrics until it has become possible to make fabrics of rayon which it is impossible to duplicate in silk. In light of these improvements in the

manufacture of rayon, there should be small wonder that it has in large measure, if not entirely, displaced silk in many fabrics. Some of the local mills have already completely abandoned silk. An important phase of seasonal production lies in the credit situation. Weaker manufacturers have little, if any, credit facilities. They are, therefore, in no position to finance purchase of raw materials, to defray payrolls, and to finance the carrying of inventories between seasons. Manufacture by them can not take place much in advance of the sales which reimburse them for their expenditures. Stronger concerns with ample credit facilities, show, however, more of a pronounced tendency to produce goods in off seasons.

Capital Turnover

The length of time of a capital turnover is more a matter of trade conditions and seasonal cycles than a problem of manufacturing methods. The time elapsing from the purchase of raw materials up to the completion of the finished goods need exceed one month for few jacquard fabrics. But because of style, trade and climatic seasons and the length of time accorded to collections, probably few manufacturers, taking it year by year over a long period, get more than one turnover per year in tapestries, draperies and upholsteries, two or three turnovers per year in metallic cloth, and four or five turnovers per year in dress and tie fabrics.

The question has been raised whether manufacturers would not succeed in securing more rapid turnover and greater profits if they confined operations to a few fast moving patterns instead of tying up a considerable number of looms and equipment as well as warp in trying to make a long line of goods. This is a matter which deserves serious consideration of many local mills.

Yardage **III. PRODUCTION PROBLEMS.**

The yardage per loom produced by a weaver in a day varies according to the construction, the quality of yarn and the pickage. The usual yardage on double width looms appears to vary for different materials between 10 and 15 yards per day. This means from 40 to 60 yards of fabric per day on the two double width looms operated by a weaver. The fewer the picks per inch, the greater usually is the production.

As the number of picks in a fabric increases, the efficiency of the weaver, also, increases. Working on short orders, the weavers must change cards more often in case of fabrics with the smaller pickage. Time studies, for instance, show that weavers in tie silks with 64 picks have an efficiency of 65%, while those in tie silks with 128 picks have an efficiency of 75%. In the first case they must change cards once every 2½ hours; in the other case only once every 5 hours. The harness is not changed. To save expense, a new warp is twisted on the old and then drawn through the harness.

Each end of the new warp is literally twisted to an end of the old warp in the loom in order to obviate the need of passing the threads of the new warps through the mail or harness eye by hand. Most of the smaller plants still have all their twisting done by hand. Fancy jobs are said to require hand twisting. Yet mechanical twisting, where it can be used, is coming in as it effects savings in both time and expense. Mechanical twisting is said to save one-third of the cost of hand twisting.

The desirability of using large warps becomes evident when it is recalled it frequently takes a twister a day to install a new warp. Then there is the additional expense of fixing the harness. Very often the cost of putting in a new warp runs to \$12.00-\$15.00, or an amount equal to \$0.03 or \$0.04 per yard on 400 yard warp. Where only a one hundred yard warp is used the pro rata yardage cost for twisting would be four times the above figures, or from \$0.12 to \$0.16 per yard.

When the warp for neckwear is once placed on a loom it cannot be allowed to stand for any great length of time before being woven. A warp left on a loom deteriorates; the vibration of the plant fills it in a short time with broken ends. To avoid such damage the warp, during the periods it is not worked, must be slackened. The neckwear manufacturers have, like other jacquard manufacturers, been forced to use shorter warps. Ten years ago under thriving business conditions warps 500 yards long were used; now warps of but 150 yards are put on the beam. Needless to say, the shorter warp increases overhead, warping expense and labor.

Width of Cloth

Every division of the industry has its narrow looms. About one-third of the looms making tie silks have a width which restricts them to a single width of tie goods. A similar condition prevails among the looms producing dress goods. In the upholstery, tapestry and drapery field, however, the situation is somewhat better; there nearly all the looms have a width in excess of 50 inches. Although no local tie goods are woven in more than double widths, they are woven in one mill in Pennsylvania in three widths to the loom.

The narrow loom, besides being limited to narrow fabrics and thereby excluded from producing goods for certain trade outlets, is also penalized by prevailing wage scales. Thus double width cloth, cloth 48 inches in width, is subject to a weaving rate only 50% above that paid for single width cloth 24 inches wide. For example: The weaver for a certain type of tie goods gets 16 cents a yard for every yard he weaves of single width cloth. For the same quality of double width cloth he gets 24 cents a yard, or an equivalent of 12 cents a yard for the same quantity of cloth. In other words, the mill producing tie silks in single width cloth pays 16 cents as against 12 cents per yard, 33½% more in weaving costs than the mill producing the same goods as double width cloth.

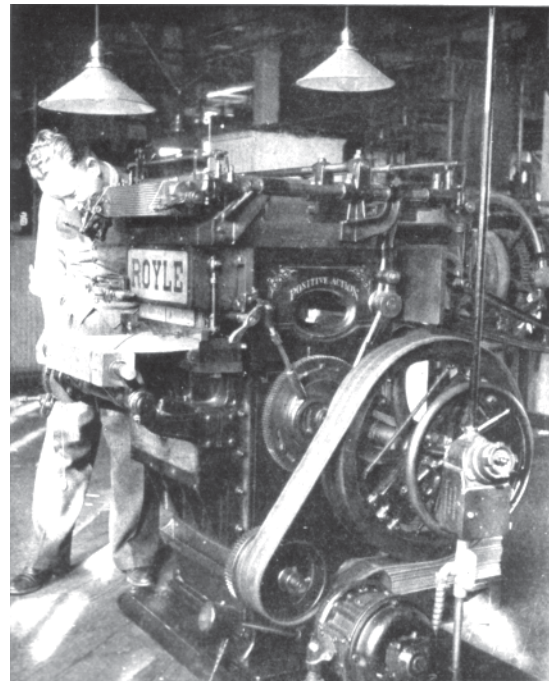
This differential in piece rates and work load limitations restricting the operation of narrow looms, it is rumored, was connived at by mills with wide looms; not having narrow looms themselves, they were interested in reducing competition from owners of narrow looms. As a consequence, they gladly consented to a work load of two narrow looms to the weaver and a differential weaving piece wage rate one-third higher on the narrow than on the wide looms.

Neckwear

As an offset to this differential, it may be said, that some of the highest grade goods, especially tie fabrics, are made in single widths. A single width cloth gives two clean edges while a double width cloth always has one frayed edge. The clean edge commands a premium in price. Some of the highest quality goods produced to compete with the best grade English importations are, moreover, made in squares 19 x 21½ and 32 x 32 inches. These squares made for ties to sell for \$2.00 to \$2.50 each, on especially equipped harnesses, sell for more and they do not require any extra effort to make. Such goods, when they can be sold, obviously give the manufacturer a little more leeway but there are strict limitations upon the volume output of quality goods.

Necktie fabrics are sold on order in sets of six pieces, each piece having a different color, but the same pattern. A few years back orders of 50, 60, and 100 yards of each piece, that is, aggregate orders of 300, 360, or 600 yards of the six different colors, were quite common. These, when assembled from different customers, enabled mills to weave warps of a length running up to 500 yards. Now, due to changes in styles, hand to mouth buying and more conservative purchasing policies, orders for each of the six different colors run as low as 10, 15, 20 or 25 yards, i.e. total orders of from 60 to 150 yards.

Repeating jacquard cards.



Domestic necktie fabrics contain generally from 60 to 160 picks per inch. Local manufacturers protest that they have difficulty, because of unfavorable wage differentials, to make goods of the higher counts. Occasionally a local fabric is made containing 150 picks but most of the neckwear cloth made in Paterson contains 112 picks to the inch.

Dress Goods

Piece dyed goods are used for dress goods, coat linings, necktie linings, casket cloth, underwear, trim, corsets, brassieres, lingerie, pajamas, lounging robes, smoking jackets, and various miscellaneous purposes. Such goods formerly constituted a substantial production in Paterson but at present there are comparatively few local looms working on these fabrics. At the time of the survey there were only 118 looms engaged in weaving piece dyed dress goods while there were 242 looms engaged in weaving skein dyed dress goods.

That the production of piece dyed dress goods has all but completely stopped here is attributed unanimously by manufacturers to unfavorable wage and work differentials prejudicing their local manufacture. These goods are produced in outside competitive centers, especially in Pennsylvania and the South on a basis of four non-automatic looms, sometimes six or eight automatic looms, to the weaver and at piece rates so much lower than those paid by the local industry that the Paterson manufacturers lose practically all of this work. Even if work conditions and wages were modified so that some of this work might be brought here, local mills maintain that it would be simply a bread and butter proposition, i.e., there would be no profit in it. It would merely afford an opportunity to keep several hundred looms busy during slack seasons and thus give employment to a considerable number of persons now unemployed during portions of the year. The unions remain unmoved by this appeal apparently feeling despite the emphatic denial of manufacturers that this is an entering wedge to place the whole local industry on a four loom to the weaver basis. In the meantime out-of-town mills are frequently busy making these goods while local weavers do nothing.

Because of the lower wages paid, out-of-town mills can afford either to put more picks into a cloth producing a better fabric and sell it at the same price or put in the same number of picks and produce the same quality of cloth at a lower price than the local manufacturers. With improved qualities of fabric, since they require increased labor in their production, the differentials against Paterson become greater making it more difficult to compete in the production of high quality goods. These differentials are of such moment to the local industry that many manufacturers are frankly concerned over the competitive permanence of the city as a producer of high quality fabrics.

Metallic Cloth

The bulk of the jacquard metallic cloth made in this country, is made in Paterson. To make metallics right is more of an art than a manufacturing process. The fabric which sells at the mill all the way from \$2.50 to \$20.00 per yard goes to the dress trade to be made into afternoon dresses, cocktail dresses, evening dresses, theatrical and motion picture dresses. A weaver running a 120-160 end construction with 64-68 picks it is said, can produce about 25 yards of materials 40 inches wide per day. The highest priced metal cloth in the United States is made in Paterson.

Most of the metal cloth and metallic dresses, it is said, are sold east of Chicago as women in the West do not go in for glitter to the same extent as those of the East.

The metal thread, all of which is imported from France, is the most expensive of the raw materials entering into the fabric. This thread comes in different sizes numbered according to the number of thousand meters of thread in a kilo,—17-18, 24-26, 30-33. The cost of thread varies according to the metal it is made of, copper thread being the cheapest, then silver, and then gold. The cheapest metallic thread having a copper core, the 17-18 sells now at about \$5.00 per kilo. With 12 kilos of thread used to weave 100 yards of 72 pick fabric 50 inches wide, the cost of metal thread entering into the fabric is \$0.62 per yard. But when 30-33 gold thread costing \$32.00 a kilo with $6\frac{1}{2}$ kilos to the 100 yards is used, the cost of the thread in each yard of 72 pick fabric 50 inches wide mounts to \$2.08 per yard. The earlier metallics were subject to tarnish, but recent processes make them tarnish proof. The best grades of metallic cloth are used in dresses retailing upwards of \$200.00 each. The season for their manufacture is the three months between July and September.

Though some metallics are imported into this country, their im-



Lacing skeins.

portation is, because of rapidly changing style cycles, highly hazardous. It takes from 6 to 8 weeks, perhaps longer, for the importer to get deliveries on orders from abroad. By that time styles may have changed. An order given to a Paterson manufacturer results, on the other hand, in the finished goods being delivered to the New York cutting-up house within 10 days of its reception. This differential in the time element of deliveries constitute a more effective protection to the local manufacturer than the tariff. But because metal cloth costs so much and is so highly styled that it has practically no value if not sold well within its style season, its manufacture is always risky. A comparatively few manufacturers have, therefore, the field more or less to themselves.

Shoe Brocades

Shoe fabrics are made in some instances of all silk, warp and filling. In other cases they are made of a silk warp and of either a cotton or rayon filling.

Only the more expensive cloth shoes are made of jacquard weaves. The cheaper cloth shoe for ladies, the type which runs into quantity production, utilizes satin and taffeta fabrics made on ordinary looms.

Most of the jacquard cloth made especially for the shoe trade consists of 24 inch brocades. Such production is, however, small in quantity as the shoe manufacturers and the jobbers serving the shoe manufacturers usually pick up odd yardage lots here and there of discontinued jacquard designs originally intended for other trade outlets, but suitable for the shoe trade.

A pair of low shoes requires but 1/20 to 1/12 of a yard of 24 inch fabric. The yardage produced directly for the shoe trade is therefore so small that it is scarcely noticeable in the large volume turned out by the local mills. Yet it does afford a little work for a few small shops interested in weaving small specialty orders.

Drapery, Tapestry, and Upholstery

There are two types of mills in Paterson making drapery, tapestry and upholstery fabrics,—the small mill making specialties, and the mill making staple fabrics. The specialty mill works to a considerable extent upon special jobs; it may be on the fabric used in furnishing or refurnishing an exclusive home or public building, or on fabrics ordered in small quantities by jobbers serving the most exclusive trade. In either case the trade is a quality trade and practically non-competitive. The mill making staple fabrics, on the other hand, attempts whenever possible to get into quantity production on a comparatively few standardized patterns. Here the competition is keen and is based to a considerable degree upon price.

The specialty mill may make a small order of a confined pattern and when the goods are finished the pattern is destroyed. The goods may

be used to furnish a single room in some palatial home, or the goods may be used to replace the fabrics sold to such a home years ago and now worn out. The patterns in such cases may be based on pieces in the Metropolitan Museum of Art or the Louvre. But in either case the product is a quality fabric made in small quantity, and sold at a fair price; sometimes upwards of \$40.00 per yard. Warps only 15 yards long are frequently set up for these goods and they are woven in some cases on the basis of one loom to the weaver. The material may contain as many as 450 picks to the inch. The weaver may on certain difficult jobs produce only a yard or two per day; he seldom produces more than 15 yards per day. None of the work done by these mills is on what one might call a production basis.

The upholstery, drapery, and tapestry mill manufacturing staples would like to be on a production basis but usually isn't. It generally has warps on its looms ready to weave whenever orders come in. Each loom is equipped with a warp different in fibre, color or ends per inch from the warps upon other looms. Thus a plant, for example, with 60 looms may be equipped with warps of ten different constructions and six different colors. The filling fibre, the color of filling, and the picks per inch and the pattern woven into these warps may vary for each order. Each order is woven as it is received. When the required amount is worked out it is cut off and the warp stands idle until the next order comes in. Should each order woven on a loom involve a different pattern, then the cards used in the jacquard machine must be changed to that pattern before the weaver starts production on the order. During the busy seasons, orders may come in for an entire warp, or accumulate so rapidly that the entire warp is used up within a short time, but sometimes many months, even a year may elapse before some warps are woven out.

Warps in upholsteries, as in other fabrics, vary in length. Today probably few warps are over 200 yards long. Some manufacturers refuse to sell less than a whole warp to a customer. Other manufacturers will take orders of 20 or 30 yards. Some of the cheaper fabrics are woven with very coarse yarns, yarns so heavy that the fabric contains only 16 picks to the inch. The finer fabrics have, however, a higher pick count. Every kind of fabric is made,—some all silk, warp and filling; others with a silk warp and rayon filling; still others with a rayon warp and cotton filling; still others, all rayon, warp and filling; and yet others with various combinations of warp and filling.

Upholstery, drapery and tapestry materials in the staple mills are woven on a basis of two looms per weaver. Production per loom per 8 hour shift varies considerably, all the way from 4 yards on difficult patterns of high quality material to 30 yards on simpler designs made of coarser yarns. Average production would probably run in the vicinity of 15 yards per loom per 8 hour day.

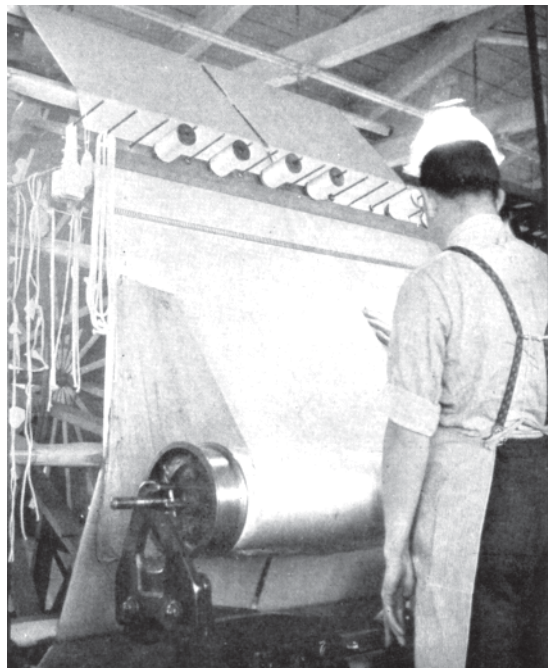
The local industry in these fabrics is competitive with Philadelphia. But there is a big difference in the character of fabrics produced in Philadelphia and Paterson. Philadelphia makes mainly heavy upholsteries of pile fabrics, friezes, velours and velvets of cotton, mohair and wool. Paterson makes no pile fabrics. The fabrics made here are chiefly brocades, brocatelles and damasks.

IV. REGISTRATION OF DESIGNS.

The registration of jacquard fabrics was commenced by the Industrial Design Registration Bureau of the National Federation of Textiles in 1934. The only fabrics subject to registration are dress fabrics, including metallic cloth, and such drapery materials as are ordinarily handled by manufacturers of dress fabrics. Tie fabrics, tapestries, upholsteries, and draperies as such, are not registrable. The importance to manufacturers of having designs registered lies in the fact that dress manufacturers, both members and non-members of the Fashion Originators' Guild, have pledged themselves in writing to use only registered designs. In 1935, 618 designs were registered; in 1936, 1648. As designs are not classified according to distribution or use, it is not possible to state how many applied to different types of fabrics.

Designs are protected for one year. Since it is intended that registration applies only to designs in actual use, registration is subject to cancellation unless manufactured by the applicant within three months of registration. Only those designs sufficiently different from other registered designs so as not to be mistaken by the lay public for registered design in the finished material is registrable. Whenever the effect of a registered design in the finished material has a tendency to mislead or deceive the public, whether as a result of alteration of the design registered, application of a particular distribution of color, combination with another design or

Finishing goods.



through mistake, oversight or omission by the bureau in clearing the design through its files, registration may be cancelled.

The privilege of registration is open to everyone upon identically the same terms. The fee for each registration is \$4.00; for rejection \$2.00; and for each renewal at the end of the year \$1.00. The method of registration is similar to that for prints. Registration is granted upon the submission of a sketch accompanied by information as to place of manufacture. It should be applied for prior to manufacture in order to spare the mill unnecessary expense and embarrassment. Attached to the drawing should be a sample of the type of fabric,—whether it is a damask, a matelasse, etc.,—but this sample need not be that of the proposed fabric. The drawing submitted may be the one submitted for jacquard use or a pencil sketch, something to show the general effect of the design.

Jacquard Designs

There are three stages to the development of a jacquard pattern;—(1) the sketch; (2) the design; and (3) the cards. A jacquard pattern starts with a sketch. The sketch may be purchased from a professional artist. Or it may be evolved by a specialist on the staff of the mill. But wherever it is obtained, it is handed over to a designer who transcribes the sketch onto design paper showing the construction of the proposed fabric to scale, every end, every pick, and their structural relationship when woven to the figure to be incorporated into the weave of the cloth. When completed the work of the designer is sent to a card cutter who follows the drawing in cutting the jacquard cards.

An individual jacquard design must be worked out for each pattern, each construction, each type of machine. If the size of the pattern is changed, a new set of cards must be made; a set made to secure a two inch repeat cannot be used to obtain a three inch repeat. Should it be desired to add or drop a few ends, the cards, too, must be changed. A pattern worked out, moreover, on one type of machine cannot be used on another type of machine. As a consequence jacquard designs and cards in a mill are always being re-made.

Designs must be made to conform to desired quality of goods. In other words, the design must be adapted to meet competitive market conditions. Strict attention must, moreover, be paid to what is called “balancing the lift,” i.e., the probable shrinkage both crosswise and lengthwise in the finished fabric, else the pattern may when the finished cloth is used, be distorted by the fabric shrinking more in one direction than in the other. The shrinkage in skein dyed tie silks is very little, about 7% in the warp and about 2% in the woof.

The design of patterns and cutting designs into jacquard cards con-

stitute a substantial expense to mills. The larger mills may each prepare as many as 1200 patterns in a single year. One mill claims to have the cut cards on file for 36,000 different jacquard designs. A small fortune must be invested each year in patterns. Although these cards may possibly possess some future usefulness, they must be written off as a manufacturing expense year by year. A design may cost all the way from \$20.00 to \$800.00.

Some mills, especially the bigger ones, have their own designing and card cutting departments; others have this work done for them by outside designers. In Paterson there is no difficulty in getting this work done outside the mill for there are no less than 16 local firms engaged in textile designing and 6 firms in jacquard card cutting. These firms service not only the local industry but mills in all parts of the United States. It is estimated that two-thirds of the local designing is done on behalf of outside mills.

Cost of Designs

The current price list for making jacquard designs is as follows:—

TIE SILK DESIGNS		
	Half Pattern Designed	Full Pattern Designed
Any part of 400 and 600 Machines plain ground weaves or satin grounds...	7c	10c
Pick and pick designs satin ground	8c	12c
Fancy weaves comprising Frosts, Velvos, Armures and Persian designs	9c	13c
End and end and reinforced warps	10c	15c
Sketches made on order to be charged for at minimum rate of \$4.00 per sketch; charge to be deducted when design is or- dered made. All sketches not returned will be charged for at minimum rate of \$4.00.		
DRAPERIES, SCARFS, TABLE COVERS, BED SPREADS, ETC.		
	Half Pattern Designed	Full Pattern Designed
Any part of 400 and 600 Machines 600 Machine single scale, double and 4 scale, plain or reversed satin 40 picks or more ..	7c	10c
600 Machine single scale, double and 4 scale under 40 picks	8c	12c
600 Machine pick and pick, 40 picks or more	8c	12c
600 Machine pick and pick, under 40 picks	9c	13c
1200 Machine double and 4 scale, plain weaves ...	10c	15c
1200 Machine single scale, fancy weaves	13c	19c
1200 Machine pick and pick, single scale 60 picks or over	14c	21c
1200 Machine pick and pick under 60 picks	15c	22c
End and End and reinforced warps, 50 per- cent added to above prices.		
Sketches 6½ inches wide..	\$15.00 for 1 color	
Sketches 12½ inches wide..	\$20.00 for 1 color	
Sketches 25 inches wide..	\$30.00 for 1 color	

DRESS GOODS AND LINING, ETC.

	Half Pattern Designed	Full Pattern Designed
Any part of 400 and 600 Machines 600 Machine single scale, plain weaves	7c	10c
600 Machine single scale with satin ground weaves	8c	12c
End and end or matelasse weaves or reinforced warps	10c	15c
600 Machine double and 4 scale	7c	10c
1200 Machine double and 4 scale	10c	15c
1200 Machine single scale plain weaves	10c	15c
1200 Machine single scale satin ground weaves	12c	18c

All the above are minimum prices.
The prices quoted in the above list are for
the full amount of cards in complete de-
sign.

All the sketches made on order to be charged
for at minimum rate of \$15.00 per sketch;
charge to be deducted when design is or-
dered made. All sketches not returned will
be charged the minimum rate of \$15.00.

A deduction of 2% if paid on or before the
tenth of the month following the sale. Pay-
ments made after the tenth of the month
following invoice date shall be for the net
amount of the invoice.

Card Cutting

Local mills may in a few instances find it an economy to operate their own card cutting machinery but it is more likely that they operate it in order to be self-sufficient and independent of outside concerns than in order to save expense. In all likelihood the work they have done would cost less in a commercial shop than on their own machines. At any rate 44 of the local jacquard mills find no necessity for cutting their own cards. There are six firms, employing normally about 60 persons, in the local card cutting industry.

All prices for cutting cards are quoted on regular grade of card board F. O. B. Paterson, 2% e.o.m. The current price scale for different kinds of service is given below:—

Cutting 400 and 600 machine	\$3.25 per 100
Cutting filling in 2 bar grounds	3.60 per 100
Cutting filling in 3-6 bar grounds	4.20 per 100
Cutting designs not repeating in twelves	5.00 per 100
Cutting end and end designed single	3.75 per 100
Cutting all designs one end over	4.00 per 100
Cutting all cards on designs to be charged for cutting	
Cutting end and end 2 for 1; 2 effects	4.50 per 100
Cutting end and end 2 for 1; 3 and 4 effects	4.75 per 100
Cutting 800 and 900 machine, 3 laces	5.60 per 100
Cutting 800 and 900 machine, 4 laces	5.75 per 100
Repeating (making duplicate sets)	1.60 per 100
Laced blanks 400s and 600s	1.00 per 100
Unlacing 400s and 600s .....	.50 per 100
Lacing 400s and 600s .....	.60 per 100
For repeating anything on 400s and 600s the second time	.50 per 100
For fine index .....	.60 per 100

FINE SCALE

Cutting	5.50 per 100
Repeating	2.25 per 100
Cutting end and end	6.50 per 100
Cutting one end over	6.75 per 100
Cutting designs not repeating in sixteens	7.00 per 100
Cutting end and end 2 for 1	7.00 per 100
Wiring .....	.35 per 100

To stimulate business some firms appear to have increased the number of their patterns unduly. This has increased designing and card cutting costs. It has also probably had the effect of reducing the size of orders they receive for different fabrics. Indeed some persons go so far as to think that multiplicity of patterns breeds the short order, ties up looms with standing warps, and as a consequence, reduces production to an absurd degree.

V. CONCLUSION.

The local mills are competitive in part with each other and in part with outside mills. They are also in competition in varying degrees with substitute fabrics. Each mill has, therefore, its own peculiar problems in production. Yet many of these problems are in modified form common to a large number, if not to all of the mills. Heretofore, local mills have recognized only one common problem,—labor. Though labor is perhaps the most important problem, it is nevertheless but one of many important problems confronting the industry. Among the most acute problems at present unsettling efficient and continuous production within the industry are:—

1. Commission weaving;
2. Highly seasonal work;
3. Short orders;
4. Multiplicity of patterns;
5. Length of capital turnover time;
6. Inadequate manufacturing for stock;
7. Need for greater diversity in products manufactured; and
8. Protection of designs.

The sooner each mill recognizes that it is unable to solve these problems by itself and, as a result, resolves with other mills to work in an industry wide organization for a solution of these problems, the sooner will the industry as a whole be placed on a solid economic foundation in a healthy, competitive condition both with itself and with other industries.

V. Marketing.

The time, volume and regularity of its sales determine the production schedule of an industry. For this reason it may be well to examine some of the subtle factors which though frequently in the background nevertheless limit and restrict operating programs.

Some manufacturers of neckwear and dress fabrics sell only to the converter or jobber; others sell direct to cutting up trades and department stores. Some of the manufacturers of upholstery and drapery fabrics sell only to jobbers; others sell to furniture manufacturers and the retail trade but not to jobbers. Still others sell to jobbers as well as furniture manufacturers and retailers. The jobber generally resents having mills sell to his customers,—the necktie manufacturer, the dress manufacturer, the furniture manufacturer, the small upholsterer, the decorator, and the department store. He feels that the mill he buys from should not compete against him among his own customers. The mills which sell to both jobber and retailer must, therefore, as a rule, give the jobber a preferential price in order to keep his business.

Sales of upholstery are in part for replacement purposes and in part for new furnishings. Purchases of new furniture follow pretty closely the trend in new building construction; persons building new homes are inclined also to buy new furniture. The low and more moderately priced furniture is, of course, made in the great furniture centers of the country,—Grand Rapids, Michigan; Jamestown, New York; Rockford, Illinois and High Point, North Carolina. The high priced custom made furniture, being a made to order product, is usually made in the wealthier metropolitan centers,—New York, Chicago, Philadelphia, Pittsburgh, San Francisco and Los Angeles. Goods for both these sources are marketed in part via the converter and in part via the fabric manufacturer. Many textile manufacturers do not feel that they can concern themselves with direct sales even to the large furniture manufacturer, much less to the custom manufacturer or local decorator and upholsterer. In either case, the purchases are usually small, 15 yards of fabric being all that is needed for the average living room suite of two chairs and lounge. The custom manufacturer and local upholsterer invariably buy their merchandise in small quantities. The large manufacturer, though buying in larger quantities, is in turn controlled by the desires of his customers,—the retail furniture stores and department stores handling his furniture. These distributors want but one living room suite upholstered in a given color and pattern. That means the large furniture manufacturer wants small quantities of a large number of patterns rather than large quantities of a small number of patterns. In the larger cities, department stores, in order to

give the home owner the exact upholstery he wants, sells furniture from samples and gives the buyer the opportunity to select the fabric with which he wishes it upholstered.

I. STYLE CONSCIOUSNESS.

Style consciousness has in recent years become one of the most important elements in marketing. Not only have people become more heedful to colors in dress and furnishings, but they are more alert to the artistic blending of colors.

Machine production of textile prints, the perfection of new fibres and the development of new dyes and dyeing processes in permitting goods to be cross-dyed, have all combined to introduce a variety of color and design into moderately priced fabrics undreamed of a few years ago. These developments have had an impact little short of revolutionary upon the weaving industry, especially upon the jacquard industry which, for over a hundred years, was the principal division of the textile industry producing varied colored fabrics. The production of multi-colored, pattern-designed fabrics was a field occupied exclusively by the jacquard industry; today, prints and cross-dyes have out-manouvered jacquard fabrics so that these occupy a subordinate position in a field where they were once supreme. Step by step jacquards have been pushed out of cheaper lines, involving mass production, into highly styled quality products, more or

less exclusive, and of a specialty character. In the field of luxury fabrics, where delicate gradations of shade and color combined with fancy textures in weave are appreciated for their art and craftsmanship, jacquards are, however, still supreme.

The demand for new designs is highest in proportion to output in the case of products with the shortest life—dress goods and neckwear. Not only are these fabrics most frequently replaced by the purchaser,

Quilling.



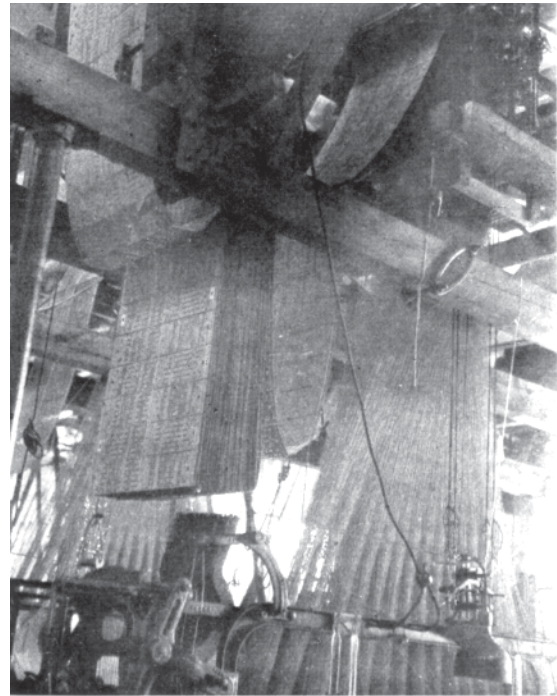
their styling and design are also the most sensitive to the vagaries of fashion. A dress or a necktie is usually out-of-date within a period of a few months. Such fabrics as tapestries, draperies and upholsteries, which are expected to last many years, are, however, less exposed to abrupt changes in the style cycle. Yet their construction, design and coloring are like those of all art productions, subject to the movements of style, although slower movements of style. Fabrics for dress goods and neckwear always have their styling and designs determined by the needs and

fancies of the present moment; radical and revolutionary changes may occur in their design. The design of upholsteries, tapestries and draperies have their character, however, governed to a much larger extent by past traditions and style "periods."

The women's apparel industry is one of the most seasonal industries. It is also one of the most highly styled industries. The interlocking character of style and seasonality, wherein each reacts upon and emphasizes the other, makes for a very high rate of style turnover. If style could be controlled, it is probable that a great measure of control could also be obtained over seasonality. Certainly anything that diminished the style turnover rate would also help to spread the seasons over a greater length of time. Could satisfactory control be evolved over seasonality and style in women's dress, the effect upon the regularization of work in the jacquard mills would go a long way in creating more uniform employment throughout the year.

II. PRICE COMPETITION.

The specialty mills always try to seek out sheltered corners in the trade where there is little or no competition. The moment keen competition is threatened they drop what they have been doing to get into some other new non-competitive fabric. Generally speaking, they encounter



Close-up view of jacquard cards and harness.

comparatively little competition in the higher price goods. Such competition as exists there is a competition, not of price, but of quality.

With manufacturers in the more staple lines, competition tends to be more one of price than one of quality; sales resistance increases sharply with price. Quality as such does not sell merchandise. Quality may have to be there, but first of all price has to be in line with the restricted means of customers. As a result, there is temptation to sacrifice quality to price in the case of the more staple fabrics.

Short Orders

In their scramble to win and retain customers, jacquard mills have bid so wildly against each other that much of the business they have today is unprofitable. No phase of this competition has been more vicious than that for short orders. The abbreviation of orders has reached a point where the order has been shortened to so short a length that it cannot well be shortened any more. Thus neckwear manufacturers take minimum orders of 60 yards; i.e., orders for 6 pieces of different colors having 10 yards each; manufacturers of upholstery, drapery and tapestry take orders for as little as 20 yards; and manufacturers of dress goods and shoe fabrics have been known on occasion to take orders involving less than a yard of cloth. The effect of the short order is gradually making retailers of many manufacturers.

The necktie manufacturer, the furniture manufacturer, and the jobber seem to have outwitted the jacquard manufacturer. By forcing the local mill to accept shorter and shorter orders, they have in turn been able to lessen their own inventories of stock. By buying a quarter of a piece of upholstery, where formerly they bought a whole piece, they can reduce their inventories 75% and yet offer their customers the same choice of merchandise. Or they may, if they so choose, carry a proportionately larger assortment of merchandise without an increase in inventory. In different instances, both of these results occur. Another consequence of the short order, abetted by too liberal discount terms, has been the development of a new crop of small jobbers and product manufacturers, many of them none too well financed, to compete with the old.

The short order has, moreover, no doubt, had the effect, in a measure, of forcing labor to pay part of the manufacturing costs. In many cases the short order has seriously reduced the efficiency of the weaver, and as a consequence, his pay. The amount by which wages are reduced through unconscionably short orders represents the toll levied by present sales practices upon labor.

Discounts

Price competition sometimes takes the form of competition on discounts rather than on list prices. Thus the usual discount is 2%/10/net 60,

but of late some firms have been granting discounts of 2/10 net 60/30 extra net, in other words a discount of 2%/10/ net 90. Such a discount would appear sufficiently liberal for anybody, but during the early summer it was rumored that neckwear firms, in order to move merchandise, were dating goods bought in July as of September 1st and then granting either 60 or 90 days in which to pay for goods purchased. Under the most extreme case, this was equivalent to granting buyers free credit for 150 days. To put the matter in another way,—the Paterson mill not only financed the raw material costs of the necktie manufacturer, but by extending credit for a longer period than there was any reason for, in effect, also advanced money on his receivables.

That such practices pervert the proper purpose of discounts is evident to everybody. Properly understood, a discount constitutes a premium for prompt payments or anticipations of payments. They should never be a means of financing current capital requirements of the purchaser of raw materials in his own manufacturing operations. Necessity, however, knows no law. The only satisfaction that can be gleaned from the situation is that these preposterous datings have been granted by only a few mills. Mills selling goods on such terms will no doubt sooner or later through their own self-elimination correct the situation. In the meantime, some manufacturers, aroused by the practice, are beginning to discuss tightening sales terms to a 2% e.o.m. basis.

III. PIRACY OF DESIGN.

The piracy of design has the most disturbing effect upon the "creative" manufacturers. The manufacturer who sponsors novelties and fancies, the manufacturer who leads in the fashion movement and who produces high priced, quality goods of distinctive design is the most vulnerable to the insidious competition offered by imitations of an original



Spinning.

but made of cheaper materials, inferior workmanship and sold at a lower price. Copies sold at a lower price than the original soon destroy the distinctive character of the original. Finding his once exclusive pattern unsalable at a profitable price, the original manufacturer must turn to something else before his merchandise is "out-of-style," i.e., before it has run its normal course in consumer acceptance.

Because of the copying evil, there is a tendency to divorce quality from high styled merchandise; the mill which expends unnecessary amounts to maintain quality standards makes it just that much easier for an unscrupulous competitor to copy and sell his design in a cheaper merchandise. The manufacturers who are the most conscientious in maintaining quality standards and superior workmanship are forced in self-defense to produce inferior goods. Competition tends more and more to be placed purely on a price basis, and the greatest travesty on the present situation is found in the fact that the copyist, who spends nothing in promoting and who does everything he can to make it unprofitable for others to introduce new designs, in copying only successful designs is often the only one to make money on the leading designs in a style cycle.

Nearly every "creative" manufacturer in Paterson has at times suffered loss as a result of the piracy of his designs. If this evil could be effectively dealt with, it would in the minds of many people prove of inestimable value in establishing and maintaining Paterson as the profitable manufacturing center for superior quality, highly styled merchandise. With the elimination of the piracy evil, production would tend to be confined to mills originating styles. Whether this problem should be assumed by the Industrial Design Registration Bureau or by some other agency is a matter for the industry to determine.

IV. INTEGRATING MANUFACTURE OF SECONDARY PRODUCTS WITH WEAVING.

Although local mills make probably 50% or more of the jacquard tie fabrics made in the United States, there are no neckties made in Paterson. Some individuals have expressed the view that a Paterson location for necktie manufacturers would offer many opportunities for collaboration between the fabric and necktie manufacturer; others have suggested that the local mill making neckwear fabrics might also assume the function of manufacturing neckties. Integrating weaving of the fabric and the manufacture of the ultimate product made from the fabric would appear to have distinct possibilities. One textile manufacturer in Connecticut and two or three in New York and Brooklyn are said to have combined the two tasks. More recently a woolen mill in New Jersey inaugurated the manufacture of wool ties made from its own fabrics. There are now one or two local mills which make window hangings from their own fabrics. These are sold to jobbers and department stores.

TABLE XVII. TOTAL IMPORTS OF JACQUARD-FIGURED BROADSILKS FOR CONSUMPTION FROM ALL COUNTRIES CLASSIFIED BY CONSTRUCTION, WIDTH AND STATE OF FINISH.*

Year	Over 30 inches wide			Not over 30 inches wide			Total
	In the grey	Bleached, piece dyed & yarn dyed	Sub-Total	In the grey	Bleached, piece dyed & yarn dyed	Sub-Total	
	Pounds						
1931	7,256	188,300	195,556	125	120,030	120,155	315,711
1932	1,004	46,332	47,336	16	67,309	67,325	114,661
1933	63	53,819	53,882	..	84,389	84,389	138,271
1934	522	49,247	49,769	186	50,206	50,392	100,161
1935	861	56,772	57,633	9	56,923	56,923	114,565
1936	1,273	63,656	64,929	1,462	78,685	80,147	145,076
	Square Yards						
1931	51,977	719,425	771,402	809	569,750	570,559	1,341,961
1932	7,161	204,419	211,580	78	307,622	307,700	519,280
1933	583	283,164	283,747	..	392,738	392,738	676,485
1934	5,054	250,863	255,917	2,292	233,761	236,053	491,970
1935	7,065	298,451	305,516	22	284,732	284,754	590,270
1936	8,222	329,724	337,946	8,602	412,524	421,126	759,072
	Value						
1931	\$17,505	\$1,106,249	\$1,123,754	\$608	\$848,368	\$848,976	\$1,972,730
1932	2,697	229,190	231,887	32	394,887	394,919	626,806
1933	266	255,570	255,836	..	511,409	511,409	767,245
1934	644	271,851	272,495	156	401,633	401,789	674,284
1935	1,973	272,242	274,215	42	381,317	381,359	655,574
1936	3,167	280,295	283,462	3,973	498,106	502,079	785,541

*United States Tariff Commission.

The textile mill is usually interested in volume production. But because a mill produced secondary products would not necessarily imply that it could not sell a portion of its fabrics in the piece. Such manufacture might prove an additional outlet for a portion of its fabrics and thus increase primary production. Without expressing an opinion as to the possible results, it might well be a matter to merit closer consideration of local manufacturers.

V. FOREIGN IMPORTATIONS.

Foreign importations are to a great extent confined to most exclusive fabrics, fabrics of such a high pickage count and so expensive to manufacture under prevailing high wage scales in this country that it would be uneconomic for our mills to produce the limited quantities of such merchandise capable of being marketed to our people. Much of this goods is purchased by persons who would prefer imports even if domestic goods of as high a quality and as exclusive a pattern were available.

Yet the impact of importations from abroad is nevertheless felt by local mills. When the armies of Mussolini invade Abyssinia and the textile mills of Italy are commandeered for manufacture of war supplies, exports to this country are restricted and the mills manufacturing upholstery and draperies in Paterson feel a real stimulus in the rise of new orders. But, on the other hand, when France devalues the franc and the purchasing power of the dollar in terms of francs rises, more French goods are imported to compete with those of our local manufacturers of neckwear and metallic cloth. And when the armies of the Mikado push into

Manchukuo and China, exports from Japan are dumped in this country to such an extent that local manufacturers of cheap grades of neckwear experience difficulty in disposing of their merchandise at a fair profit.

Importations today are not dangerously high. Indeed, kept within present limitations, the goods coming in from abroad may perhaps be viewed as serving in a mild sort of way to keep home manufacturers more alert, to awaken them to the need of keeping abreast of the times, especially in the production of highly styled goods and the best quality merchandise. Present tariff rates need, however, to be closely watched, especially in these days of international competition in successive devaluations of the monetary standards. Unless importations are kept within close bonds, they might overnight ruin the jobs and fortunes of thousands of our townsmen.

It is unfortunate that the national officials do not report imports with sufficient detail that the effect of foreign competition in domestic markets might be accurately appraised. The most recent data in regard to foreign importations are, however, presented in accompanying tables to shed such light as they may upon one of the most competitive problems constantly threatening local industry. Tie silks imported into this country come mainly from Czecho-Slovakia, Italy, Austria, Switzerland, England and Japan; tinsel, metallics and dress goods from France; and upholstery and drapery from France, Italy and Japan.

The aggregate volume of imports from all countries has declined, but the distribution of importations from different countries has undergone marked change during the past six years. During the depression

TABLE XVII. IMPORTS OF JACQUARD-FIGURED BROADSILK FABRICS 1/ INTO THE UNITED STATES FOR CONSUMPTION IN 1936 CLASSIFIED ACCORDING TO RATE OF DUTY.*

Country	Pounds			Square Yards			Value		Total 3/
	Dutiable at statutory rate of 65%	Dutiable at 45% 2/	Total 3/	Dutiable at statutory rate of 65%	Dutiable at 45% 2/	Total 3/	Dutiable at statutory rate of 65%	Dutiable at 45% 2/	
Japan	35,179	143	35,322	251,995	1,095	253,090	\$100,215	\$ 978	\$101,193
France	14,939	7,440	22,379	59,925	37,175	97,100	79,802	70,802	150,607
Italy	27,396	10,043	37,439	95,508	42,069	137,577	112,831	70,337	183,168
United Kingdom	1,236	5,187	6,423	4,852	29,152	34,004	12,041	53,285	65,326
Switzerland	3,338	2,740	6,078	16,356	15,962	32,318	27,074	23,900	50,974
China	10,152	68	10,220	67,600	292	67,892	28,929	383	29,312
Austria	11,170	7,032	18,202	51,374	41,686	93,060	75,040	64,288	139,328
Germany	1,370	...	1,370	5,873	...	5,873	9,924	...	9,924
Belgium	73	...	73	165	...	165	254	...	254
Czechoslovakia	3,142	3,882	7,024	16,629	18,748	35,748	19,678	31,631	51,309
Canada .....	...	8	8	...	32	32	...	119	119
Other	288	250	538	874	1,710	2,584	2,102	1,925	4,027
TOTAL	108,283	36,793	145,076	571,151	187,921	759,072	\$467,890	\$317,651	\$785,541

1/ Includes fabrics in the grey bleached, printed and yarn-dyed, in all widths.

2/ On all-silk fabrics valued over \$5.50 per pound, duty was reduced under terms of French trade agreement, effective June 15, 1936 and under Swiss trade agreement, effective February 15, 1936, if all-silk, yarn-dyed, not over 30 inches in width, valued over \$5.50 per pound.

3/ The grey-woven Jacquard-figured included in the grand total amounted to 2,735 pounds or 16,824 square yards valued at \$7,140 and were mainly from Japan and China.

*United States Tariff Commission.

TABLE XVIII. DOLLAR VALUE OF IMPORTS OF JACQUARD-FIGURED FABRICS BLEACHED, PRINTED, PIECE-DYED AND YARN-DYED, CLASSIFIED BY WIDTH AND COUNTRY OF ORIGIN, 1931-1936 1/.

Year	Japan	France	United Kingdom	Italy	China	Switzerland	Germany	Austria	All Others	Total
Over 30 inches wide.										
1931	\$ 4,970	\$501,134	\$57,462	\$383,190	\$24,956	\$ 40,144	\$19,150	\$ 64,147	\$11,096	\$1,106,249
1932	2,599	94,221	11,938	80,646	13,227	8,125	5,183	12,820	431	229,190
1933	9,527	99,466	13,170	91,179	10,758	14,582	3,754	12,792	342	255,570
1934	21,195	113,786	17,628	73,250	9,770	9,504	9,012	16,805	901	271,851
1935	31,906	110,848	14,047	66,573	17,849	6,138	615	7,991	16,275	272,242
1936	46,049	78,582	14,691	77,603	19,900	4,938	2,136	27,766	8,630	280,295
Not over 30 inches wide.										
1931	\$ 1,406	\$114,447	\$25,332	\$192,008	\$19,109	\$282,542	\$69,231	\$137,786	\$ 6,507	\$ 848,368
1932	716	33,564	14,697	126,458	2,636	146,677	16,288	52,980	871	394,887
1933	398	52,893	27,492	132,665	4,399	183,241	8,577	101,627	117	511,409
1934	2,242	\$74,214	30,954	142,916	8,214	90,697	663	51,705	28	401,633
1935	20,102	74,699	31,402	97,839	5,685	44,549	4,082	74,092	28,867	381,317
1936	50,606	72,025	50,635	105,565	6,884	46,036	7,788	111,562	47,005	498,106
Total.										
1931	\$ 6,376	\$615,581	\$82,794	\$575,198	\$44,065	\$322,686	\$88,381	\$201,933	\$17,603	\$1,954,617
1932	3,315	127,785	26,635	207,104	15,863	154,802	21,471	65,800	1,302	624,077
1933	9,925	152,359	40,662	223,844	15,157	197,823	12,331	114,419	459	766,979
1934	23,437	188,000	48,582	216,166	17,984	100,201	9,675	68,510	929	673,484
1935	52,008	185,547	45,449	164,412	23,534	50,687	4,697	82,083	45,142	653,559
1936	96,655	150,607	65,326	183,168	26,784	50,974	9,924	139,328	55,635	778,401

1/ Does not include jacquard fabrics in the grey, imports of which are negligible and mainly from Japan and China. Data by United States Tariff Commission.

imports from every country but Japan, speaking generally, declined. Whether volume of incoming goods is measured in pounds, square yards or dollar value, their amount in 1936 varied in the aggregate between 50 and 60 percent of that for 1931. The most severe decline measured by dollar value for all jacquard goods took place in German shipments; these decreased during the period almost 90%. The decrease in Swiss imports was almost as great, about 85%; those from France almost 75%; those from Italy practically 65%; those from Austria 30%; and those from the United Kingdom 20%. In the face of these precipitous declines, the Japanese importations increased no less than 1500%! The volume of increasing goods from Japan is, however, still comparatively small as in 1931 total shipments were valued at only \$6,376. Valued at \$96,655 in 1936, they are today exceeded only by imports from Italy, France and Austria.

VI. ADVERTISING.

A comparatively high sales expense is required to move products of the jacquard industry. Some of the larger mills in the local industry have from time to time advertised products in trade journals but they have never attempted through a carefully-planned, consistent, follow-up, national advertising campaign to bring the merits of their merchandise to the direct attention of the ultimate customer. In other words, mills have never really tried to make the buying public jacquard conscious. The consequence is that many jacquard fabrics, especially in the dress and neckwear fields, are price-sold products which have no standing of their own in the mind of the purchaser. To put it in another way,—the

customer frequently buys dyed or printed plain goods in lieu of skein-dyed jacquard merchandise simply on the basis of comparative prices because he has never been made aware of the superior quality and styling of jacquard fabrics.

So long as a buyer purchases a plain dyed or printed tie as readily as a jacquard figured tie, the retailer will no doubt persist in selling the merchandise which carries the largest margin of profit. But were the jacquard manufacturers to advertise their products in national magazines and over the radio with a view to forming a national buying habit and creating country-wide acceptance for their merchandise, it would unquestionably stimulate volume output in local mills. Chain stores and retailers push well-known kinds of merchandise since they experience a faster turnover, less sales resistance and greater profits in selling these goods. Being nationally advertised, these goods are "pre-sold" to the consumer. Stores handling such merchandise are able, because of more rapid turnovers, to carry a broader assortment of quick selling goods. Jacquard mills have been somewhat belated in recognizing that the modern retail establishment considers its inventory not merely as an investment but as its most important tool in selling. Discriminate advertising on a national basis by jacquard mills, in aiding the retailer to use this tool more effectively will redound to the advantage of the mills themselves by increasing their sales volume.

The suggestion has been made that the Master Weavers' Institute broaden its scope to include national advertising as one of its functions in order to secure a more general acceptance by the buying public of jac-

TABLE XIX. VOLUME OF IMPORTS IN SQUARE YARDS OF JACQUARD-FIGURED FABRICS BLEACHED, PRINTED, PIECE-DYED AND YARN-DYED, CLASSIFIED BY WIDTH, AND COUNTRY OF ORIGIN, 1931-1936. 1/.

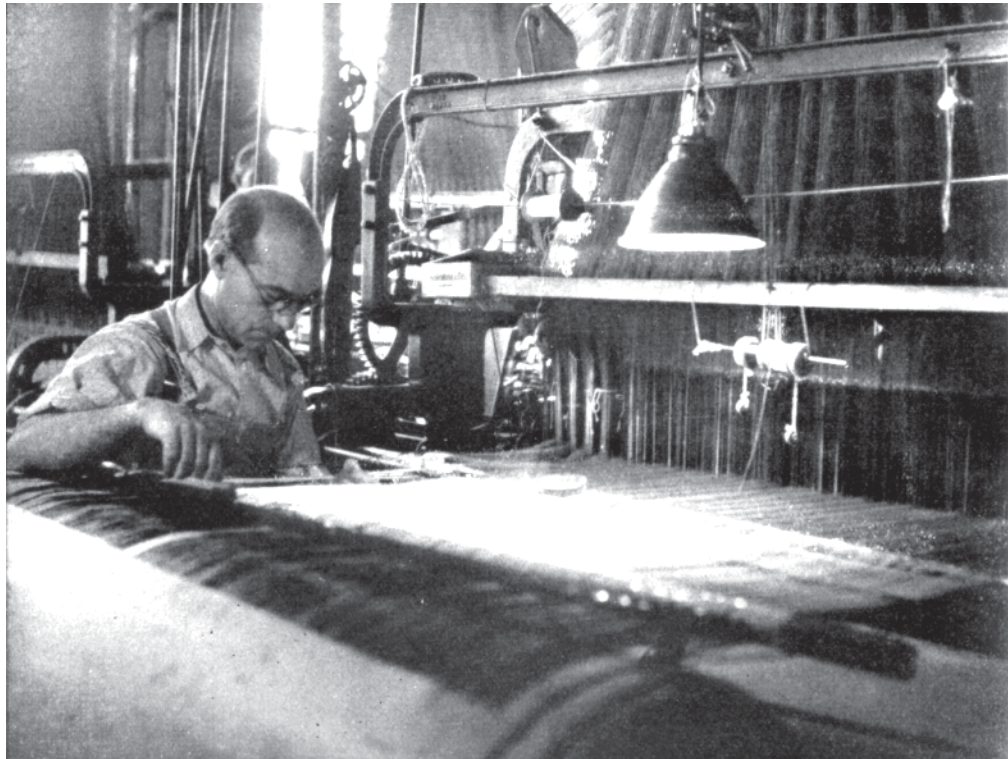
Year	Japan	France	United Kingdom	Italy	China	Switzerland	Germany	Austria	All Others	Total
Over 30 inches wide.										
1931	6,492	295,930	25,812	244,612	47,968	22,694	16,813	49,497	9,607	719,425
1932	6,724	78,929	6,898	56,665	33,456	6,472	4,853	9,848	574	204,419
1933	42,414	101,493	9,967	70,113	31,760	15,183	3,354	8,261	619	283,164
1934	51,626	82,795	10,982	54,269	24,690	7,211	5,156	13,586	548	250,863
1935	99,296	79,045	6,952	52,673	40,955	3,082	318	5,058	11,072	298,451
1936	119,098	54,065	11,328	66,321	47,433	3,231	1,565	18,620	8,063	329,724
Not over 30 inches wide.										
1931	2,304	55,022	8,039	128,236	46,397	176,392	66,005	82,915	4,440	569,750
1932	3,789	23,686	6,342	100,261	6,445	112,968	14,402	38,303	1,426	307,622
1933	595	44,568	16,053	109,670	11,888	129,461	8,941	71,543	19	392,738
1934	6,420	28,636	12,488	91,890	16,406	49,776	565	27,568	12	233,761
1935	48,755	38,559	14,293	70,905	14,036	24,822	3,026	48,355	21,981	284,732
1936	124,335	43,035	22,676	71,256	13,542	29,087	4,308	74,440	29,845	412,524
Total.										
1931	8,796	350,952	33,851	372,848	94,365	199,086	82,818	132,412	14,047	1,289,175
1932	10,513	102,615	13,240	156,926	39,901	119,440	19,255	48,151	2,000	512,041
1933	43,009	146,061	26,020	179,783	43,648	144,644	12,295	79,804	638	675,902
1934	58,046	111,431	23,470	146,159	41,096	56,987	5,721	41,154	560	484,624
1935	148,051	117,604	21,245	123,578	54,991	27,904	3,344	53,413	33,053	583,183
1936	243,433	97,100	34,004	137,577	60,975	32,318	5,873	93,060	37,908	742,248

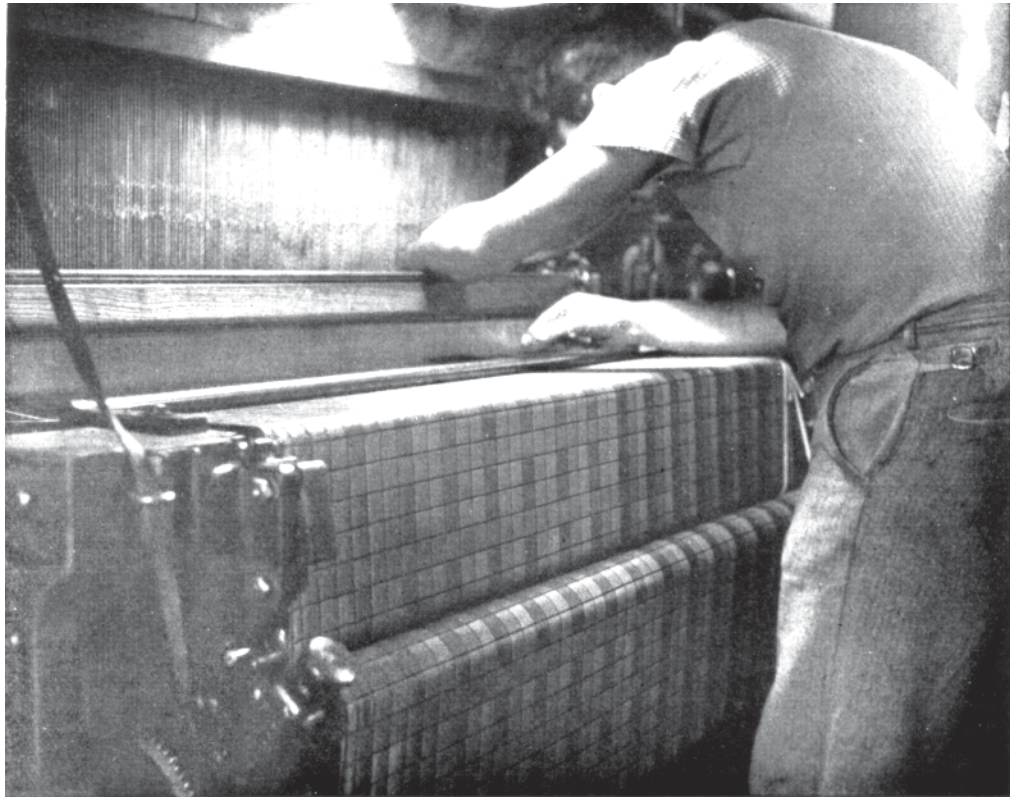
1/ Does not include jacquard fabrics in the grey, imports of which are negligible and mainly from Japan and China. Data by United States Tariff Commission.

quard fabrics. Under this proposal the producer of each type of fabric would contribute his proportionate quota based either upon yardage output or dollar volume towards a fund to advertise that general type of fabric, whether it were dress goods, neckwear, metallic cloth, or tapestry. Such an advertising campaign coupled with the use of a label owned and licensed by the institute to approved manufacturers certifying to the construction, fibre and quality of the merchandise, it is thought, would not only stimulate sales of merchandise made of jacquard fabrics by haberdasheries, department stores and decorators, but encourage the development of higher standards in design and production than have heretofore characterized the industry.

Local manufacturers would do well to recognize that their own success is indissolubly linked with that of retailers handling their goods. Retailers naturally do not care to handle goods with slow turns, small volume and strong sales resistance. Anything that the jacquard manufacturer can do to help the retailer in moving volume merchandise in minimum time will help the jacquard industry itself. Experience has shown that the manufacturers who adopt national advertising tend in many instances to gain the major portion of a market. Retailers, moreover, who join their selling effort to the advertising campaign of the manufacturers

Hand twisting.





View of finished cloth on loom.

tend to win the major portion of the retail market. Thus a properly planned advertising campaign coupled with appropriate cooperation between manufacturer and retailer strengthens both the manufacturer and retailer. Such collaboration between manufacturer and retailer is especially important in order to widen the markets of a rapidly changing style industry such as the jacquard industry.

VII. FACTORING OF RECEIVABLES.

Because of the administrative and legal restrictions surrounding the use of bank loans for financing receivables, different types of service have been developed by New York factors to finance the current requirements of mills. No less than fourteen factors with practically unlimited financial resources are at present serving the local jacquard mills in Paterson. The kinds of services rendered by the factor to different mills merits discussion.

1. Guarantee of accounts. When a mill receives an order, it may before proceeding with manufacture, call the factor to guarantee the account. If the credit department of the factor passes the account, the factor assumes full risk for its payment. The mill must, however, have the factor recheck the account before shipping the merchandise. If the buyer

does not pay his bill by the due date, the factor reimburses the mill and charges the delinquent customer interest on the overdue account. The service charge for guaranteeing accounts varies from about $1\frac{1}{4}\%$ to $2\frac{1}{2}\%$.

Through a guarantee of accounts, the local mill, though it receives no advances on receivables until the expiration of the discount period, is able to protect itself against bad accounts, spares itself embarrassment in collecting overdue bills, and places its current finances on such a basis that it is able to go ahead with future commitments. No less than 8 of the local mills utilize the service of factors to guarantee customers' accounts.

2. Advance on receivables. The local mill may desire an immediate advance on receivables. In that event the factor will make available immediately to the manufacturer, say up to 75% of his total receivables. Copies of all invoices are sent to the factor at the same time as they are sent to the customer. To be eligible for advances on its receivables, a mill must turn all of its receivables over to the factor. The service charge for the privilege of borrowing on receivables is usually $1\frac{1}{2}\%$ of the aggregate amount of receivables. This fee is charged whether or not any advance is made on receivables. Interest on advances is charged at the rate of 6% per annum; interest on balances is likewise credited at 6%. The amount held back by the factor, usually 25% of the receivables, serves as a cushion to protect him against loss. Remittances on this amount are made to the mill as, if and when collections are made beyond the 75% originally advanced by the factor. An account is, however, usually cushioned beyond 25% of its original invoice value as the mill continues to submit to the factor all current receivables collectable in 30, 60 or 90 days, many of which are probably discounted by the customer. Since the mill asks for advances from the factor only every week or two the current collections cushion the account with the factor well above the 25% margin. Should accounts in excess of the 25% held back by the factor default in payment, something scarcely believable, then these current accounts on which no advances have been made serve to reimburse the factor.

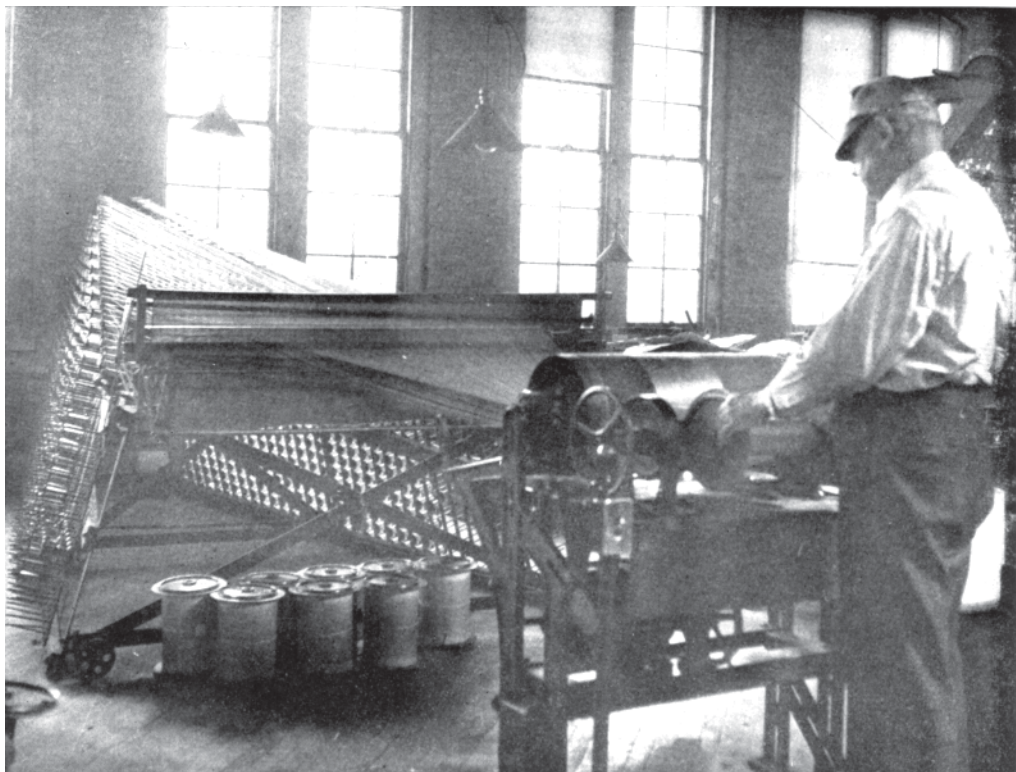
Accounts passed by the factor are usually good risks. The factor takes no chances on questionable accounts in any advances. Should he by chance be stuck with a bad account, it would, of course, not again be passed by his credit department. All told, the credit losses experienced by the mills factoring their accounts are probably nominal. Such losses as occur are assumed by the mill unless the mill pays an additional service charge for a guarantee of all receivables.

The financial service rendered by the factor to industry in making advances on receivables is a very substantial service. It permits a plant with limited capital to continue normal manufacturing operations while receivables are in process of collection. As a result, a mill factoring re-

ceivables is able to obtain additional turnover on its liquid capital which, but for this service, would to a considerable degree be frozen during a longer or shorter collection period. During this period, it may, through factoring receivables, discount bills, purchase materials, finance payrolls and continue usual production schedule without undue financial worries. Factoring, in other words, frequently enables a mill to make one dollar of liquid capital do the work of two dollars in the financing of current operations. Some 15 local mills utilize the service of factors in obtaining advances on receivables.

3. Guaranteed payment at maturity coupled with current advances. A mill may desire the factor to make current advances on receivables and also guarantee full payment at maturity. In such case the factor guarantees full payment at maturity whether the account has or has not been paid at that time provided the customer accepts the purchased merchandise without dispute. Some customers, unfortunately, make spurious complaints against the quality of purchased merchandise in order to obtain a preferential price. Factors do not ordinarily guarantee a mill against such complaints but they are said to have their own method of dealing with chisellers. Such an account perhaps does not pass the credit department of the factor a second time. Some claims for imperfect or faulty merchan-

Direct warping.





Examining cloth for imperfections.

dise are, of course, legitimate. Factors usually insist upon a factored mill setting up a sufficient reserve to meet proper allowances for such claims.

The charge for this type of factoring service usually runs from $2\frac{1}{2}$ to $3\frac{1}{4}\%$ of the total receivables. Immediate advances are allowed up to about 75% of the total factored account. An interest rate of 6% is charged for advances and credited on balances. Guaranteed payment at maturity coupled with current advances on receivables affords the factored mill a pretty comprehensive sort of financial service. It not only provides funds for current financial requirements but guarantees against bad debts on receivables.

Factors are prepared at a price to render almost any kind of a reasonable financial service that a mill may demand in financing sales. Thus some factors will in addition to the service discussed above, not only bill invoices to all customers but ship the goods sold from their own warehouse and provide New York office space for the sales agents of the mill. Some mills have availed themselves of all these services with the result that they have eliminated their accounting departments. The charge for an all inclusive service of this character may, aside from interest charges and credits, run up to 8 or 10% of the total receivables factored.

VIII. PRESENT TREND TOWARD JACQUARDS.

The last 20 years, due to the tremendous development in textile printing and the introduction of both new fibres, new dyes and new dyeing processes, have been years of re-adjustment in the jacquard industry. The combined impact of these forces was to bring about a decline in the use of jacquard fabrics.

Today, however, many manufacturers feel that the industry will henceforth not only retain its present business but recover some production lately lost to the plain goods industry. No matter how much color and pattern are printed upon a plain weave, it is still not a yarn-dyed jacquard fabric. Some prints turned out during the past few years have had more money spent upon their printing than upon their yarn and weaving combined. Customers have, in other words, often bought a gayly colored pattern printed on a fabric made of cheap yarn, poor construction and inferior workmanship, rather than a piece of high quality merchandise harmonizing delicate texture and colors with a beautiful pattern. This fact is apparently beginning to dawn upon a part of the buying public with the result that there is a trend back towards the use of jacquard yarn-dyed fabrics. To say how far this movement is likely to go would lie in the field of prophecy but that the trend has changed is in itself a source of new faith and confidence to jacquard manufacturers.

VI. Improvement of Competitive Conditions.

The future development of the textile industry in Paterson appears to lie, not so much in mass production of staple fabrics, as in the manufacture of specialties, fancies, novelties and highly styled fabrics. Such products, not being so keenly competitive as more staple merchandise, affords, despite higher labor costs, a more satisfactory margin of profit.

Unless wage scales and working conditions are to be rigidly standardized at a dead level throughout the nation, the textile industry in Paterson will probably not successfully engage in the competitive manufacture of staple fabrics. Such fabrics are today being produced in mass competitive quantities on automatic looms by cheaper labor in the South. Paterson has neither cheap labor nor automatic looms. Although automatic looms might be obtained provided labor costs were no greater here than in centers with cheaper labor, candor forces supporters of such expansion to admit that industrial development based upon a deliberate policy of wage cutting may be bought at a price too dear. The main effort in local textile development should, therefore, consist in rounding out and consolidating the gains already achieved in the hatband industry, the woven label industry, the ribbon industry and, above all, the jacquard industry.

I. NEED FOR A NATIONAL TRADE ORGANIZATION.

The need for an industry-wide trade organization has for sometime been apparent to leading jacquard manufacturers. The suggestion has been made that the Master Weavers' Institute, incorporated in 1931, which has heretofore dealt principally with problems relating to labor, be developed into an effective trade organization, embracing all members of the industry and that it act as a clearing house for all kinds of problems effecting the industry. At present all but three or four of the mills in Paterson are members of the Institute. Outside of Paterson, however, the Institute is almost unrepresented as only two or three of the out-of-town mills are members. The reason for the practical non-representation of out-of-town mills is attributed to differences relative to labor policies between the two sets of mills. The dues of members of the Institute are very reasonable, being only \$0.40 per loom single width and \$0.60 per loom double width.

An industry-wide trade organization could be useful in many different lines of activity. It could collect and disseminate statistics showing the current state of the industry; it could take a position of leadership in reducing and eliminating waste and inefficiency; it could stimulate the introduction of sound policies in production, distribution and price-



Putting skeins through dye bath.

making; it could wage aggressive campaign in favor of better designs and styling for jacquard fabrics; it could watch importations from foreign countries; it could serve as a forum for the discussion of technical, engineering, accounting and marketing problems peculiar to the industry.

Take the one matter of statistical data showing the current status of industry. Today each manufacturer is in the dark as to his exact relative position in the industry. He has no accurate means of knowing his present status in the industry, whether he is gaining or losing

with reference to the industry as a whole. A trade-wide organization, publishing in consolidated form the data collected from every plant on the first of each month would remedy this situation. The most valuable statistics along these lines would include data showing pertinent facts relative to such matters as the following:—

New order

Unfilled orders

Shipments

Cancellations

Capacity

Production in square yards of different types of fabrics

Price indices

Labor in loom hours

Value of raw materials on hand

Inventories of finished materials

Such information would aid each plant in stabilizing and scheduling its production program at the most profitable level by equipping it with accurate knowledge concerning changing situations within the industry. It would, moreover, enable each mill to formulate a rational business policy in both its buying and selling programs. Rumors, guesses and fallacious

reports would be relegated to a minor position in the determination of new commitments within the industry. The data relative to "new orders," being the latest up-to-date measure of activity, when added to "unfilled orders" would accurately reflect total buying demand for different products. By watching these monthly reports each manufacturer would be put in a better position to appraise general business conditions and to expand or to contract his own operations in order to keep in step with the changing trend in industry.



Doubling.

Being concerned with all of the problems effecting the industry, the Institute, remade along these lines, would enter into a new field of usefulness to every mill in the industry. Instead of struggling to keep its local membership in line, such an Institute should appeal to every jacquard plant, whether inside or outside Paterson, as an indispensable tool to manufacturing activities.

II. ACCOUNTING.

Adequate records showing cost of manufacturing and distributing products are indispensable to the successful conduct of every plant. Yet some manufacturers in Paterson have no proper system of accounts.

The local jacquard industry, it is safe to say, can never be placed on a high plane of efficient and profitable achievement until the constituent mills keep the financial data requisite to show the results of their operations. They need to establish control over materials in order to prevent loss from excessive or insufficient inventories by providing a proper correlation of goods on hand with production and sales. They need data showing the relative efficiency of day and night shifts, and of machines of different ages and types and on various fibres producing different kinds of fabrics. They need budgetary control over expenditures in order to effect savings in the cost of raw materials and supplies, to

locate excessive costs, to disclose the cost of idle plant capacity, and to reveal the comparative cost of producing different types of fabrics in orders of different lengths. The labor costs entering into manufacture of products are as important to the manufacturer as the pay roll itself. And an analysis and study of sales, selling costs and markets are as indispensable to scientific direction of a sales program as budgetary control is to a determination of manufacturing costs. Only through comprehensive information relative to these factors can the manufacturer secure a sufficiently effective control over all his activities to plan them intelligently.

The maintenance of such cost data enables plants to fix sales prices with reference to production costs, to eliminate the manufacture of unprofitable products, and to direct manufacture along economic rather than hit-or-miss lines. In an industry like the jacquard industry, manufacturing largely to order, there is great fluctuation in volume of business and in the nature of operations. If these factors are not properly provided for through careful planning and well-defined control of production, many wastes arise through inefficient use of both capital and labor. Such planning is impossible in the absence of proper accounting.

III. RESERVES FOR DEPRECIATION.

Unsound policies leading to the establishment of insufficient reserves for depreciation has in the case of a few plants resulted in depletion of capital to a point where they are unable to modernize equipment. The

financial statements of such plants reflect unsound values and afford a very inaccurate guidance for management in fixing different costs of production. As a consequence, there is uncertainty in some cases whether or not a price can be fixed which will satisfactorily represent cost of production plus a fair profit. Occasionally sales are no doubt needlessly made below cost without knowledge of the management as a direct result of inadequate charge-offs for depreciation.

Designing the fabrics for tomorrow's wear.



Depreciation is, as somebody has pointed out, the one element of cost paid ahead of use. Since investment of capital in plant and machinery is actually prepaid depreciation expense, reserves through current charges to income must be made both to maintain the original capital investment intact and to recover cost of wear and tear in machinery from the selling price of the product during the useful life of each machine used in the manufacture of the several products. Every jacquard mill would do well to examine carefully the state of its machinery at frequent intervals in order to determine whether it has charged a sufficient amount to depreciation to cover the replacement cost of equipment as and when it wears out.

This is a matter that can scarcely be emphasized too strongly for with obsolete machinery, low cost labor is a fallacy. High unit costs of production almost invariably accompany the use of outmoded machinery. To operate obsolete machinery is therefore an extravagance which not even the best managed plants can afford. Machinery should frequently be replaced, not because it is worn out, but because it is not as large a producer as newer equipment in the market. The local industry in producing a quality product must be equipped with the most modern efficient machinery. To be able to purchase such machines as they are developed, it must establish proper reserves for depreciation.

IV. MERGERS.

Some of the smaller units in the local industry are too small for either efficient production or distribution of their product. If such plants were to be correlated as to product and markets and merged into units of, say, not less than 60 looms each more stability could be given to both manufacturing and marketing functions. A consolidation of different units now too small for satisfactory operating results into well-rounded manufacturing plants would not only effect economies in operation but permit of a fuller utilization of mechanical equipment. Such plants, being better financed and managed, could take advantage of opportunities entirely closed to smaller mills.

V. CONCLUSION.

From what has been said it should be plain that the local jacquard industry, though a successful industry and now meeting competitive conditions, can meet trade rivalries of the day in a still more satisfactory manner. To achieve this objective will require considerable initiative by both management and labor. The main effort expended to make the industry more competitive should according to the foregoing discussion lie along the following lines:—

1. Improvement in the art and technique of design so that fabrics made in Paterson may become universally known as the best styled, the best colored, the finest finished, and the most beauti-

fully patterned and woven in the jacquard trade.

2. Modernization of plant and equipment; retirement of outmoded machinery from the industry.
3. Adjustment of regional wage differentials discriminating against local manufacture.
4. Elimination of discriminatory work assignments which virtually prohibit the local manufacture of certain fabrics, especially piece dyed dress goods.
5. Placement of all manufacturing insofar as possible upon an order or stock basis, eliminating commission weaving.
6. Regularization of employment through a diversification of products manufactured locally.
7. Elimination of the economically too short order.
8. Reduction in number of patterns manufactured by each mill.
9. A quickening of capital turnovers through the elimination of slow moving patterns.
10. Protection of designs.
11. A consolidation of weaker units in the industry into units of economic size.
12. Installation of a sound accounting system.
13. Exploration for, and exploitation of, new markets.
14. Setting up ample reserve for depreciation and obsolescence of equipment.
15. Development of local agencies to finance modernization as well as inventories of raw materials and payrolls necessary in order to manufacture for stock.
16. Restriction of foreign importations within reasonable limits.
17. Systematic training of skilled workers.
18. Inauguration of a national advertising campaign to stimulate the retail purchase of products made of jacquard fabrics.
19. Initiation of educational program of good will and mutual understanding between management and labor.
20. Development of the National Weavers' Institute into an all-around trade organization.

Today both employers and workers are gauging the position of the jacquard industry in the great textile industry of the nation as they have never done before. That there should be a difference of view as well as of interest in their approach to the problem augurs well for the future of the industry for it promises that all sides of the question will be considered in the settlement. The understanding and knowledge born to each side in learning the other's problem must in the end impress labor as well as management that they are joint partners in a great enterprise.

**Publications by
The Industrial Commission**

1. PATERSON AND ITS INDUSTRIES. *A Statement of Policy by The Industrial Commission.* 12 Pages. Published December, 1936.
2. THE PLAIN GOODS SILK INDUSTRY. *By Herbert S. Swan. A Survey of Existing Conditions in Paterson.* 48 Pages. Published July, 1937.
3. INDUSTRIAL ADVANTAGES OF A PATERSON LOCATION. *By Herbert S. Swan. An Economic Survey of Basic Conditions.* 72 Pages. Published July, 1937. Reprinted January, 1938.
4. THE JACQUARD INDUSTRY. *By Herbert S. Swan. An Economic Survey of Fundamental Factors in the Local Industry at Paterson, New Jersey.* 88 Pages. Published January, 1938.

