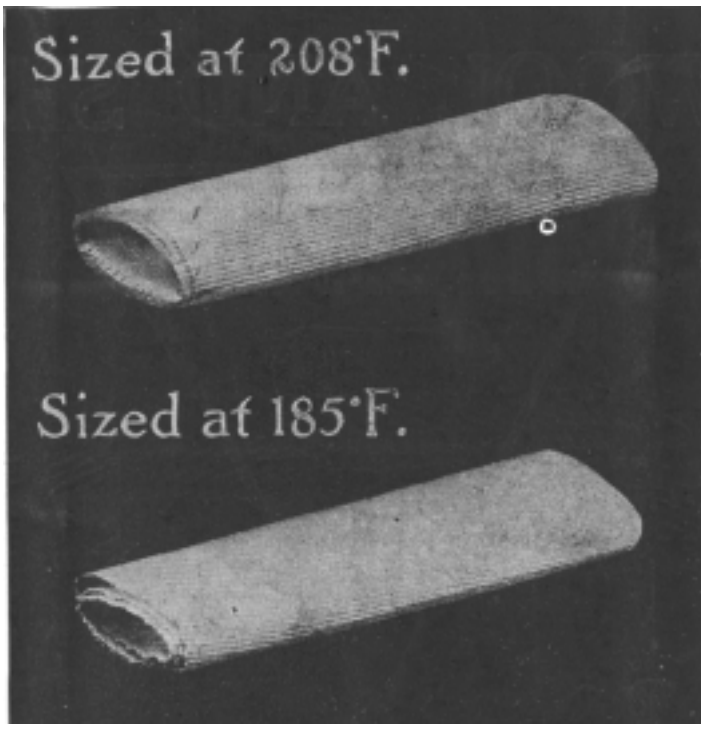
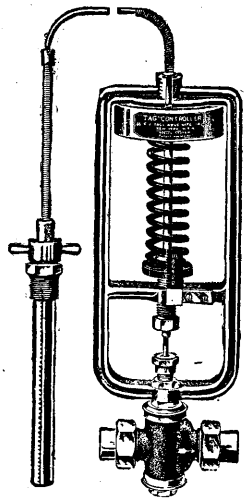


"A Better Product With Less Loom Breakage"

THE above illustration is a photographic reproduction of two pieces of cloth (woven at the same mill) before they were boiled out, scoured or bleached. The "size" mixture, yarn, etc., were identical except that each piece of cloth was sized at *different* temperatures.

Note the difference in texture—how much softer and more uniform in appearance the texture is where the warp has been sized at a lower temperature and *uniformly* maintained at 185° F. by having the size box equipped with

"TAG" Self-Operating Size Box Temperature CONTROLLERS



"SET IT AND FORGET IT"

Moreover, the mill superintendent reports that "the warps are now woven easier with *less breakage* of yarn and the cloth is *superior* in feel and cover".

You, too, can secure this decided advantage by determining the *exact* temperature at which your "size" mixture will produce the best weaving results and then be sure to avoid *harmful temperature fluctuations* by equipping your size boxes with "TAG" Self-Operating Temperature Controllers. No compressed air or other auxiliary motive power is required.

For further information write for Bulletin T-387 and include details of your specific requirements.

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TEXTILES

A MONTHLY TECHNICAL JOURNAL OF THE TEXTILE TRADE

Published by

THE TEXTILES COMPANY

Post Office Square Building : : 79 Milk Street, Boston, Mass.

Telephone Main 19

EDWIN B. PILLSBURY, Business Manager SAMUEL S. DALE, Editor

Cable Address, "Textiles, Boston"

New York Office: 42 West 39th Street. Telephone Greeley 4295

J. CARLISLE LORD, Manager

SUBSCRIPTION

In the United States	$1.00 per Year
To Canada and Foreign Countries .	$1.50 per Year
Single Copies	15 Cents

REMIT TO "TEXTILES" BY EXPRESS OR POSTAL MONEY ORDER, CHECK OR BY ENCLOSING CURRENCY WITH ORDER AT OUR RISK. ADVERTISING RATES SENT ON APPLICATION

Entered as second-class matter January 14, 1916, at the post office at Boston, Massachusetts, under the Act of March 3, 1879,

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TEXTILES

VOL. XV AUGUST, 1919 NO. 2

EXPORT TRADE AND THE BOLSHEVIKI

Last April we received a letter dated April 25, signed "A. A. Heller, Director, Russian Socialist Federal Soviet Republic," 110 West 40th St., New York, enclosing an article for publication in TEXTILES. Publication of the article was promptly refused in a letter mailed to the New York address. When a second letter, dated May 7, was received signed "Santeri Nuorteva," from the same address, we replied that we did not care to discuss the matter any further.

Seven weeks later, on June 13, the rooms of the Russian Soviet at 110 West 40th St., New York, were raided by the State authorities and all the records and correspondence seized and turned over to the Lusk Legislative Committee investigating anarchistic and socialistic activities in New York State. Two weeks later, at the public hearing on June 26 the results of an examination of the papers were reported to the committee. Among the documents presented was our correspondence with Heller and Nuorteva. As these letters have been published in part in the New York papers we give them below in full along with extracts from the Bolshevist article. Heller's letter was as follows:

Russian Socialist Federal Soviet Republic.

110 West 40th St.
New York, April 25, 1919.

TEXTILES,
Boston, Mass.

Dear Sirs:

We beg to hand you herewith a statement prepared by the writer which, if published in an issue of your journal, would doubtless prove interesting to many of your readers, and be mutually helpful to them and to the Commercial Department here of the Russian Soviet Republic.

Our department is at your disposal for such additional information as you and the readers of your publication may desire.

Very truly,
(Signed) A. A. HELLER, Director.

The textile trade is somewhat familiar with the article Heller enclosed, for it is practically identical with the address made by Nuorteva about six weeks later, on June 4, at Philadelphia before the National Association of Hosiery and Underwear Manufacturers and published at that time in a number of trade journals. The following extracts from it will make its import clear:

"The Commercial Department of the Representative of the Russian Soviet Government is organized for the purpose of making purchases in the United States of all materials required by the Russian Soviet Republic, and for the sale of Russian materials in the United States.

"As soon as trade relations with Russia are resumed, our organization here will easily become the biggest import and export institution in the world.

"The quality of our products should not reflect improper working conditions. We shall not buy, for example, anything made by child or convict labor. If the cost of goods manufactured under proper working conditions is going to be higher than those made under sweat-shop conditions, we are willing to meet it.

"The Russian Soviet Government is prepared to pay for its purchases in a manner which will make the trade independent of the depreciated value of the ruble. Firstly, it is ready to place $200,000,000 in gold in banks abroad as soon as trade relations are established. Secondly, there are large stores of raw materials in Russia, such as flax, hemp, bristles, hides, furs, platinum, precious stones, etc., ready for shipment to the American market. The value of these exports will go toward balancing the imports into Russia. Nor will the Russian purchases be limited to $200,000,000."

Our reply to Heller, dated April 29, was as follows:

"Yours of the 25th inst. is at hand enclosing for publication in TEXTILES an article on trade with Russia, in which the statement is made that 'the Russian Soviet Government is ready to place $200,000,000 in gold in banks abroad as soon as trade relations are established' to pay for American goods which, your statement adds, 'should not reflect improper working conditions, for example child or convict labor.'

"While the information is confused regarding conditions in Russia and the movement that has resulted in the control of a part of that country by what is known as the Bolsheviki or so-called 'Soviet Republic,' there are certain facts that have been well established. These I will summarize, being careful to exclude reports, apparently well authenticated, as to massacres and outrages by the Bolsheviki in that part of Russia under their control:

"First, the Trozky-Lenine regime obtained power by the aid of Germany at a time when the United States was at war with that nation.

"Second, the Bolsheviki immediately withdrew the Russian army from the German front and made a peace with Germany by which Russian territory was surrendered, Russian resources placed at the disposal of the enemies of the United States, and a large German and Austrian army released for operations against the United States and our Allies.

"Third, the Bolsheviki resorted to wholesale repudiation of the debt of Russia.

"Fourth, the Bolsheviki disregarded the rights of property, have been engaged in an attempt to establish a Socialist government, and have succeeded in establishing anarchy in a section of Russia surrounding Petrograd.

"Fifth, supporters and apologists of the Bolsheviki have been engaged in a propaganda in the United States, in which they have shown not only lack of sympathy, but unconcealed contempt, for American institutions and have denounced our form of government as a plutocracy, scoffing at the idea that it is a democracy.

"In the face of these facts your request that we publish an offer from the Bolshevist regime to deposit $200,000,000 of the gold it has seized as security for the purchase of American goods is a piece of effrontery that demonstrates the wide gulf that separates the Bolsheviki from Americans.

"There is evidently no provocation for your offering me an insult and so I am compelled to conclude that your letter is due to ignorance of American character. I am strengthened in this conclusion by your having attached to your proposition a statement which, if not due to ignorance, would be a piece of hyprocrisy that would make Pecksniff himself green with envy. I refer to your statement that the American products you purchase 'should not reflect improper working conditions,' that you 'will not buy anything made by child or convict labor.'

"Really you should confine your purchases to goods made by followers of Lenine and Trozky, paying for them exclusively in the paper money issued by the Bolsheviki."

Ten days later Nuorteva came back with this letter dated May 7:

"We have received your letter of April 29th replying to the letter sent by our Commercial Department on April 25th. We regret to find that your prejudice against the government of Russia prevents you from publishing the statement of our Commercial Department, and of course we do not expect you to act against your inclinations.

"You admit yourself that 'the information is confused regarding conditions in Russia.' The statements you make in your letter bear witness to this fact, because your bitterness,

if not founded on incorrect information, would be altogether inexplicable.

"We venture to correct some of your statements as follows:

"1) The Soviet Government did not obtain power by the aid of Germany. Alleged proofs in the form of certain documents circulated to maintain this fiction are nothing but forgeries, as has been proved conclusively several times.

"2) The Bolsheviki made peace with Germany because the Russian army was absolutely unable to fight. They made it only after they had been waiting without results for a reply from the Allies to a proposition made by them to the American representative of the Red Cross, suggesting a continuation of the war against Germany on the condition of military support by the Allies.

"Russian resources never benefited the German army. Notwithstanding the fact that the Soviet Government was compelled to sign a peace treaty whereby the Germans theoretically were entitled to buy supplies in Russia, they actually got nothing from the territory controlled by the Soviets because of the determined disinclination of the Soviet authorities to aid German interests. The only place where the Germans got some aid from the former empire of Russia was from the reactionary governments of Ukraine and Finland, both of whom have been favored by the Allies.

"3) The Soviet Government repudiated the Russian debts only after having waited in vain, for a long time, for a reply to a proposition made by them to the Allies in which they offered a settlement of the Russian debts by mutual agreement. Later, on various occasions, that same offer was repeated, and they stand today ready to reach such an agreement.

"4) It is true that the Soviet Government is a Socialist government. The Russians justly believe that they have a right to determine their own form of government without foreign interference. Other nations, as for example, the United States, did not deny this principle even at the time when Russia was ruled by the bloody autocracy of the Czar.

"It is not true that the Soviet Government has established anarchy in Russia. On the contrary, it is suppressing anarchy and according to the best evidence available—and it is admitted, for instance, by Mr. W. A. White in the New York World of a recent issue—the Russian Soviet Government is the most stabilized government on the European continent east of the Rhine.

"I am sure that you are fair enough to admit that there are two sides to many questions. I do not write this letter in order to change in any way your present attitude toward Soviet Russia. I only feel convinced that within a short time you yourself will find that the views you expressed in your letter, and the attitude you are taking now on the Russian situation are not warranted by actual facts, and that you then will revise your attitude."

Our reply to Nuorteva was as follows:

"Replying to yours of the 7th inst., it is useless for you to continue the correspondence with me regarding Russia, for our differences are fundamental. You are out of sympathy with American institutions. Because of the liberty accorded to the individual under our form of government, which you do not understand well enough to appreciate, you are able to do the work you are now engaged in.

"If you should return to Russia you can tell your associates there that you found at least one man in the United States who could not be fooled by either German or Bolshevik propaganda."

While we refused then to have any further discussion with the Soviets in New York, now that the letters have been published it may be well to refer to the shallowness of their reply.

1. It is well known that the German Government gave Lenine free passage across Germany from Switzerland to Russia just before the Bolsheviki seized power at Petrograd. Madame Aino Malmberg, a Finnish agitator and a defender and apologist for the Bolsheviki, when asked if Germany had not given Lenine free passage, boasted of it in an address before the Brookline Civic Forum on Nov. 18, 1917, and brazenly asked her audience: "What of it?" And this at a time when the United States was at war with Germany and devising means to feed the starving Finns. Every move made by the Bolsheviki culminating in the peace of Brest-Litovsk, was calculated to help Germany crush the United States and our Allies. Germany came very near winning the war. If the Bolsheviki had gained power a little earlier the added help might easily have turned the scale and given us a peace dictated by Germany instead of to Germany.

2. The fact that Russians are still fighting disproves the second assertion. If Russian resources did not benefit the Germans that was due to the fact that the Allies did not give the Germans and the Bolsheviki time to benefit.

3. This needs no comment.

4. The Russians are now determining their form of government, not only without foreign interference, but part of them with foreign resources which they have asked for.

We welcome the opportunity afforded by the raid of the Bolshevist headquarters in New York to point out the duty of every American citizen in these critical times. There can be no common ground between Americanism and Bolshevism. One represents nationalism; the other, internationalism. One is based on order; the other on disorder. One stands for the honorable discharge of obligations and the payment of debts; the other, for repudiation. One means protection to property rights; the other, the destruction of property rights. One is government by the people; the other, by an irresponsible autocracy. One is for America; the other is against America.

The two irreconcilable forces of order and disorder face each other, not only in Russia and throughout Europe, but here in the United States. We have watched this Bolshevist propaganda in various forms since its rise a few years ago. But whether it comes in the form of violence and anarchy as in Russia, is taught in the oily and guarded language of college graduates, or appears as a crude and clumsy bribe in the form of export trade, it everywhere means the destruction of all that makes life worth living. Bolshevism is a thing which it is the duty of every American to fight to a finish in private and in public.

PROTECTION OR FREE TRADE.

In an interview with a representative of the Daily News Record, published on July 23, which included an extract from a letter to "a diplomatic representative of a neutral power," Secretary of Commerce Redfield discussed living costs, reconstruction and foreign trade:

"An enormous commodity vacuum, if I may coin a phrase, has been caused by the destruction incident to war and by the simultaneous withdrawal of millions of men from production. Side by side with this there have been in many countries excessive issues of currency, arising from war necessities, and having no normal relation to usual commercial requirements.

"The result has been that the units comprising the reduced volume of commodities, when stated in terms of units comprising the increased volume of currency, have been greatly enlarged. In other words, high prices have come into being not because commodities are worth more but because the currency used as a medium of exchange is relatively worth less.

"Until, therefore, by production of commodities and by saving in expenditures, the normal relative proportion of commodities to currency is re-established, we are not likely to have any normal expression of the value of commodities in terms of money."

Referring to the resumption of trade with Germany, which he said "was the heart of the question," Secretary Redfield made this statement:

"The treaty of peace is a treaty of peace, and means that the war has ended. There is no doubt but that the German nation will suffer and suffer terribly. . . .

"No sound business man, however, wants to see a commercial war or blockade waged against Germany. None wants to see her reduced to commercial bankruptcy and become a poverty-stricken sore which would do harm to the rest of the world. We must send her goods, at present

(Continued on next page.)

Power Transmission in Textile Mills

By Charles L. Hubbard

FLEXIBLE COUPLINGS.

These are especially adapted for transmitting power and connecting two shafts which are not in perfect alignment, absorbing sudden shocks between driving and driven members and maintaining provision for slight end play or longitudinal movement. While largely used between direct-connected outfits of generators, fans, blowers, pumps, etc., with steam and gas engines, and electric motors, they are also employed in dividing line-shafts where expansion and

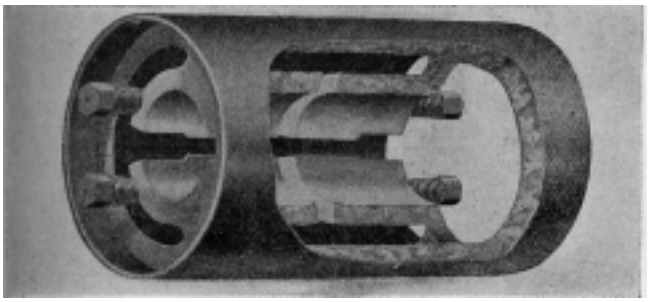


FIG. 23. INTERNAL CLAMP COUPLING

contraction have to be contended with, and in connecting shafting or machinery which requires perfect alignment not easily maintained with various types of bearings.

A flexible coupling of the disc type, shown in Fig. 24, consists essentially of a flange coupling of the general form illustrated in Fig. 20, but having the flanges separated for a short distance with a number of thin steel discs, as indicated in the cut. Collars or washers on the connecting bolts spring the discs slightly out of true and thus provide the necessary tension or rigidity.

The single coupling shown in Fig. 24 permits a deflection of 3 degrees in the alignment of the shaft. The heavy pattern, double coupling, shown in Fig. 25, permits a deflection of 6 degrees in shaft alignment and a displacement of 1-32 to ½ inch in shaft centers. The various patterns are made in sizes ranging from ¾-inch up to 16-inch, having a power transmitting capacity up to 10,000 h.p.

Another form of flexible coupling is shown in Figs. 26, 27 and 28. This is of the flange type, but the usual bolts are replaced by flexible pins, shown in Fig. 28. The action, when the shafts are out of line, is indicated in Fig. 26, the pins sliding in slots provided for this purpose. When the shafts are out of line part of the flexible pins pivot about

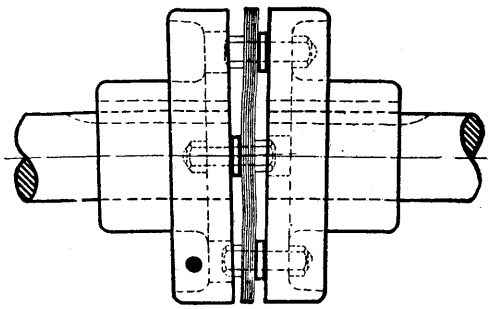


FIG. 24. SINGLE FLEXIBLE COUPLING

the others, a slight bending of the springs allowing for the misalignment. In either case each shaft runs independently of the other upon its own bearings and center.

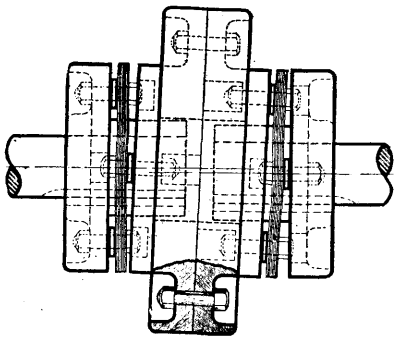


FIG. 25. DOUBLE FLEXIBLE COUPLING

A flexible coupling known as the "link coupling" is shown in Fig. 29, the construction and operation of which being clearly indicated in the cut.

Another coupling making use of an endless belt wound

PROTECTION OR FREE TRADE.

(Continued from previous page)

principally foodstuffs and raw materials. She must pay large indemnities. To do that she must have commerce. *We must buy her goods.*"

Coming to remedies for the difficulties the "Record" reports Secretary Redfield as follows in connection with the financing of export trade as proposed by the Owen and Edge bills:

"Some plan must be devised for providing the necessary credit to foreign countries for the purchase of American goods, Secretary Redfield said.

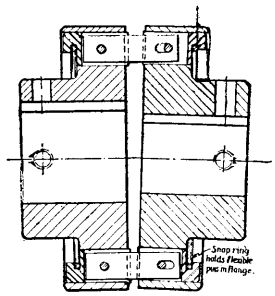
"He believes that some such method will be necessary if international commerce is to continue in the volume necessary to supply the world needs. Congress should devote a greater amount of thought to this question than has been given it heretofore, he said."

That interview is a fair sample of the free trade statesmanship that now governs at Washington. This summary of the Redfield policy tells its own story:

1. Admits world scarcity of commodities.
2. Admits inflation of currency.
3. Admits high cost of living is here to stay for a long time.
4. Says "resumption of trade with Germany is the heart of the question," and urges the following remedy:
5. Further inflation of credit under some plan like the Owen or Edge bills for financing exports to Germany.
6. Ignores domestic perils in the high cost of living in the United States.
7. Ignores the certainty that his scheme for financing exports will increase both the high cost of living and the perils that accompany it.
8. Ignores the certainty that the importation of manufactured goods from Germany or other foreign country will deprive American labor of employment and thus reduce the power of the American consumer to purchase the necessities that are to be made still more expensive by the Redfield-Edge-Owen plan for promoting exports.

"We must buy Germany's goods," says Secretary Redfield. That is the free trade doctrine. By buying German goods and by lending Germany money to pay her indemnity and to buy our raw materials and foodstuffs the United States will be able to put Germany on her feet again. The present United States Secretary of Commerce apparently can think of nothing but foreign commerce. How long before there will be enforced at Washington the doctrine of protection to American industry, based on the principle that the people of every country have the first right to the consumption of what they produce and to the production of what they consume? How long before nationalism, based on America First, will take the place of internationalism at Washington?

over pins, which alternate first on one flange and then on the other, is shown in Fig. 30. This coupling is made in standard sizes to fit shafts up to 8 inches in diameter.



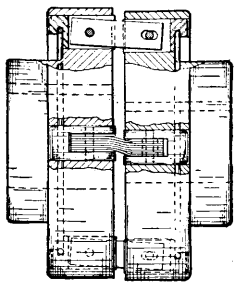


FIG. 26.—FLANGE FLEXIBLE COUPLING FIG. 27

In case of direct motor drives and in the connection of electric generators with the shafts of engines and turbines,

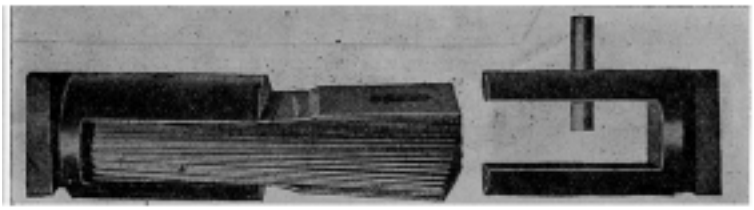


FIG. 28.—FLANGE FLEXIBLE COUPLING.

it is desirable to use an insulated coupling in order to prevent any possibility of the electric current passing through the shafting. A coupling of this type is shown in Fig. 31, the insulation consisting of a heavy rubber plate between the flanges, rubber bushings around the bolts, and fibre washers under the nuts.

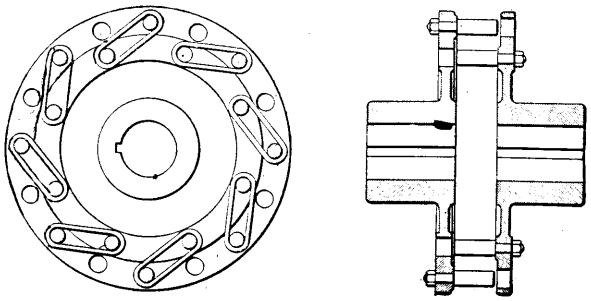


FIG. 29.—FLEXIBLE LINK COUPLING.

CLUTCH COUPLINGS.

These are used for sub-dividing a line-shaft into sections so that parts may be easily cut out for repairs or other purposes without stopping the remainder of the shaft. It sometimes happens that certain departments in a mill do not need to run continuously to keep up with the others, or may be shut down temporarily for one reason or another. In cases of this kind the shafting may be so arranged that the portion of the line operating a special department may be cut out, thus saving the power which would otherwise be expended in driving a long line of shafting which is doing no useful work.

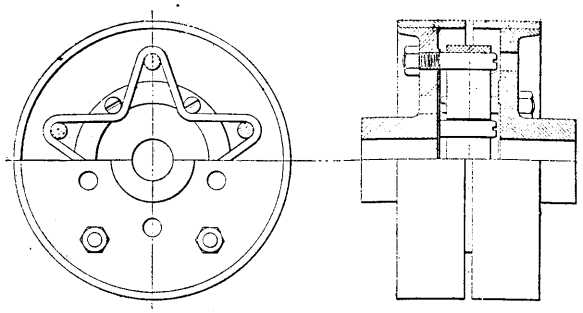


FIG. 30.—FLEXIBLE BELT COUPLING.

Clutch couplings are of two general kinds,—those which can only be thrown in or out when not in motion and those which may be operated without shutting down the line shaft.

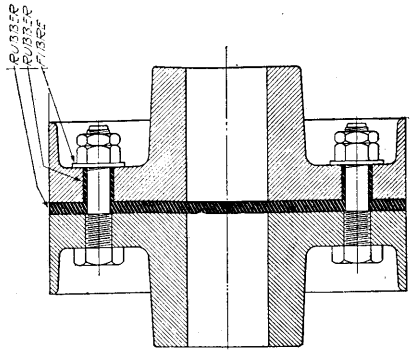


FIG. 31.—INSULATED COUPLING.

The first of these is usually of the form shown in Fig. 32, the jaw at the right being attached solidly to the shaft upon which it is placed, while that upon the other shaft at the left, slides upon a keyway so that it may be thrown in or

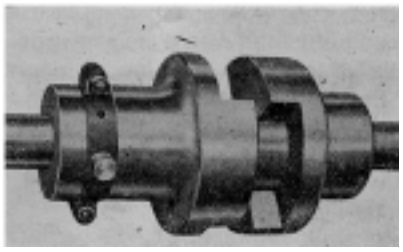


FIG. 32.—CLUTCH COUPLING.

out of mesh with the other jaw. A lever, not shown in the cut, is attached to a loose collar for making the shift.

When it is desired to throw the coupling in and out frequently, as may be the case under certain conditions, it is best to employ one of the friction type, which may be operated while the shafts are in motion. A device of this

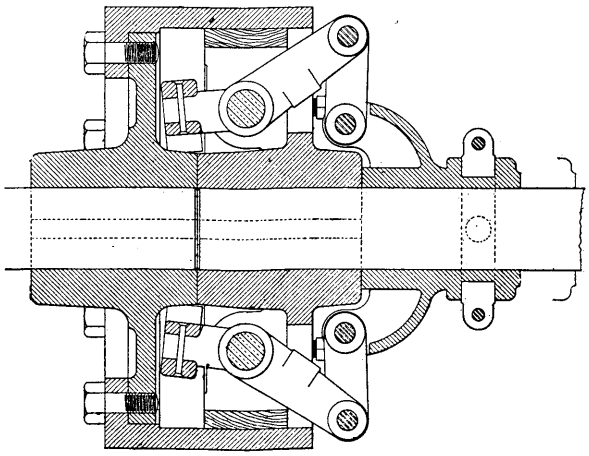


FIG. 33.—FRICTION CLUTCH COUPLING.

type is shown in Fig. 33, which clamps the two parts of the coupling together by means of wooden-faced jaws pressed tightly against the inner surface of a shell or rim. Clutches of this kind and other applications will be described later in some detail.

French Worsted Drawing

By Leon Faux

(A Series of Articles on French Worsted Spinning)

GRUEN INTERSECTING GILL-BOX.

Each of the two sets, upper and lower, consists of 22 fallers, of which 14 are constantly working on the wool. There are consequently 28 rows of pins in the wool, with a working height of .72 in., set 13.7 pins per lineal inch for merino wool. The fallers are .32 in. thick, and the two screws have a pitch of .36 in. and .72 in. respectively.

The slides being inclined as are those of the N. S. C. gill-

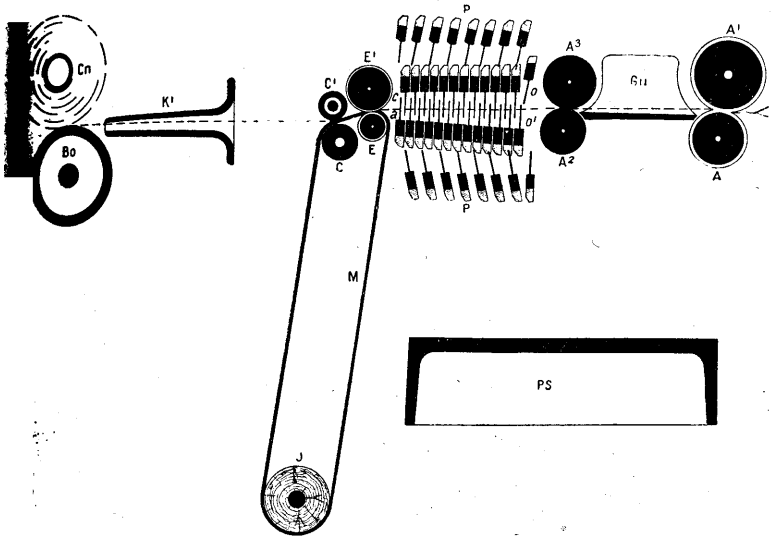


FIG. 111.—GRUEN INTERSECTING GILL-BOX.

box, the pins operate under the same conditions, that is with a progressive penetration.

To facilitate the removal of the wool from the drawing rolls and avoid the cutting of the leather apron M by reason

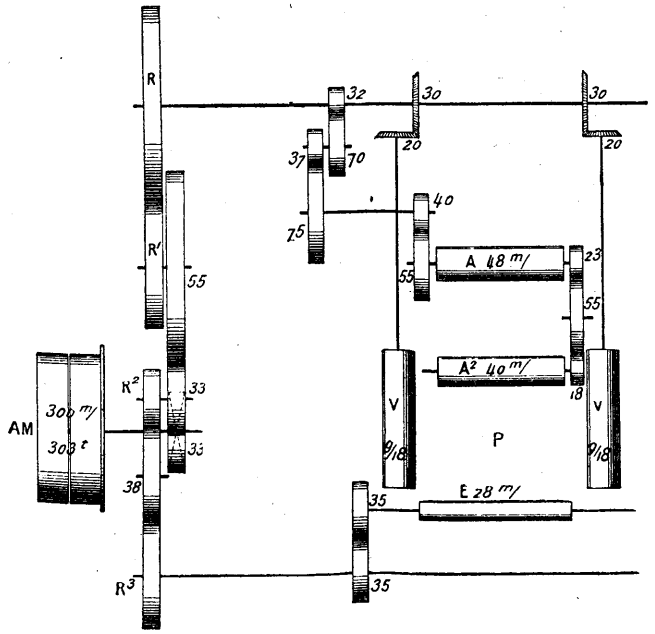


FIG. 112.—GRUEN INTERSECTING GILL-BO .

of the high pressures used and the small diameter, 1.12 in., of the drawing roll E, the apron M is guided and supported by the auxiliary roll C. This permits the removal of the fibers which remain stuck in the corrugations of the leather, and their normal delivery to the tube K^1. A stripping roll C^1, pressing lightly on and revolved by the apron M, keeps the upper roll E^1 free from wool.

DRIVING THE GRUEN GILL-BOX.

The drives for the feed rolls, drawing rolls and fallers are independent, this arrangement giving a wide capacity for adjustment.

The machine is run at a speed of 300 to 600 strokes of the fallers per minute, the screw turning 150 to 300 revolutions in the same time.

Referring to Fig. 112, the formula for the draft between the faller and the drawing roll is:

$$([d\,E + 2\,M]\ 3.14 \times 20 \times R \times 55 \times R^2) \div (.72 \times 30 \times R^1 \times 33 \times R^3), \text{ or}$$

$$(1.36 \times 3.14 \times 20 \times R \times 55 \times R^2) \div (.72 \times 30 \times R^1 \times 33 \times R^3)$$

The different drafts obtainable are given in Table XXIV. They vary from 3.37 to 13.4.

The surface speed of the drawing rolls per minute varies from 800 to 1250 inches per minute and is found by the following formula, assuming a speed of 303 r. p. m. for the driving shaft A M:

$$303 \times (R^2 \div R^3) \times 1.36 \times 3.14$$

The speed of the screws is found by this formula:

$$303 \times [(33 \times R^1 \times 30) \div (55 \times R \times 20)]$$

The lineal speed of the fallers is equal to the speed of the screw (r. p. m.) multiplied by the pitch (.72) of the working screw.

Table XXIV.

R	R^1	R^2	R^3	Draft
Fixed Speed for Drawing Rolls.				
52	25	33	24	13.40
"	26	"	"	12.82
"	27	"	"	12.40
"	28	"	"	11.90
"	32	"	"	10.40
"	35	"	"	9.58
"	36	"	"	9.30
"	37	"	"	9.05
"	38	"	"	8.80
"	39	"	"	8.60
"	40	"	"	8.35
"	41	"	"	8.19
40	44	"	"	7.60
"	35	"	"	7.40
"	36	"	"	7.20
"	37	"	"	7.00
"	38	"	"	6.80
"	39	"	"	6.63
"	40	"	"	6.49
"	41	"	"	6.30
"	44	"	"	5.10
Fixed Speed for Fallers and Feed Rolls.				
40	44	25	40	3.37
"	"	26	"	3.94
"	"	27	"	4.10
"	"	28	"	4.25
"	"	32	"	4.85
"	"	35	"	5.30
"	"	36	"	5.47

NORTH CAROLINA TEXTILE SCHOOL.

J. H. Shuford of Charlotte, N. C., has accepted a position with the National Aniline and Chemical Company. Mr. Shuford is a graduate of the Textile Department of the North Carolina State College, which is the North Carolina Textile School, and was for a number of years with Southern manager for the Berlin Aniline Works, holding that position when he resigned to go with the Atlantic Dyestuff Company.

Capt. J. E. McDougal, who has just returned from France, has accepted a position with the Atlantic Dyestuff Company, with headquarters in Charlotte, N. C. Capt. McDougal is a graduate of the Textile Department of the N. C. State College, class of 1917. Another graduate of the same class, Mr. W. C. Dodson, is also connected with the Atlantic Dyestuff Company.

The Identification of Textile Fibers

By Dr. Louis J. Matos

The peculiar characteristic of wool is the scales on the outer surface which, when once seen and understood, serve to identify wool fibre whenever found and make specific chemical tests unnecessary.

To identify certain other vegetable fibres, chemical tests are necessary in conjunction with their microscopic peculiarities.

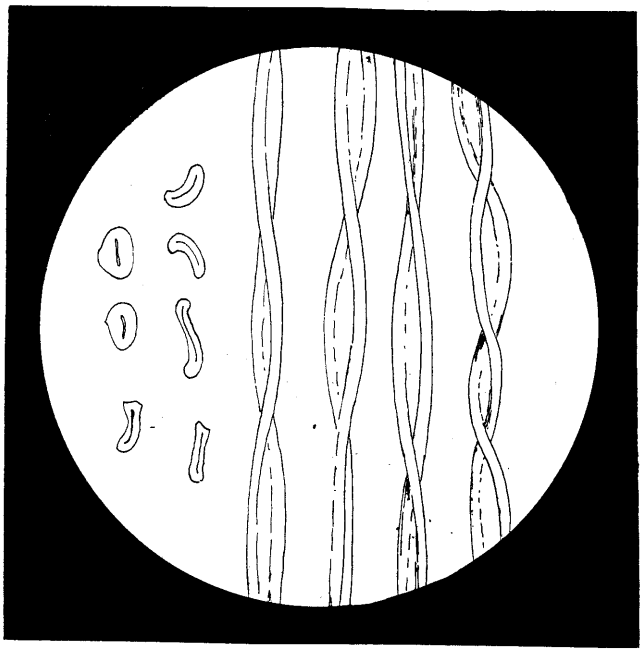


FIG. 9.—COTTON FIBRES UNTREATED.

Of the vegetable fibres cotton is the most important. The cotton fibre is separated from the seed by the process known as "ginning." The open end of the fibre is the end nearest the seed hair, while the pointed end is the growing tip. In form the cotton fibre is rather flat and for almost its entire length is twisted upon itself, resembling an empty fire hose that has been twisted. The fibre is likewise hollow for its entire length.

Fig. 9 shows the normal appearance of ordinary cotton fibres as viewed under the microscope. The twists in the fibres distinguish cotton from every other fibre. At the right are cross sections of individual fibres, showing the hollow, though flattened structure of each fibre.

Fig. 10 shows the appearance of the same fibres on the microscope slide, after they have been acted upon by a solution of ammoniacal copper hydroxide (No. 4). This reagent acts upon cotton by first causing it to swell considerably, the fibre becoming much distorted, as if in pain, ultimately quieting down. If the solution is strong enough the fibre finally dissolves.

It is well to carry in mind the leading characteristics of the more important fibres.

The peculiar twists determine the identity of cotton under the microscope without recourse to any chemical test. A table to appear later will give the parallel tests with reagents, showing the reactions of the different vegetable fibres.

The other commercially important fibres, known as *bast fibres,* are not seed hairs, but are fibres obtained from the stalks of plants, such as flax (linen), hemp, jute and ramie (china grass). The bast fibres constitute that portion of the seed which gives the plant strength and occur in bundles extending for the entire length of the plant. Unlike cotton, they are not isolated, but each fibre is bound or cemented to its neighbor by a natural cement or binding material known as lignin. The most important bast fibre is flax, otherwise known as linen. To isolate the flax fibre the plant must be subjected to a wetting process called "retting," the object of which is to loosen the soft portions of the stalk and to dissolve the lignin, thereby setting free the fibres. Flax of commerce consists, not of isolated fibres, but of the separated bundles, consequently in examining flax and other bast fibres the preliminary operations of testing should be to remove the lignin completely by boiling bundles in a weak solution of caustic soda, which still further loosens the fibres and enables the operator to isolate them. The characteristics of flax and other bast fibres will be fully illustrated later.

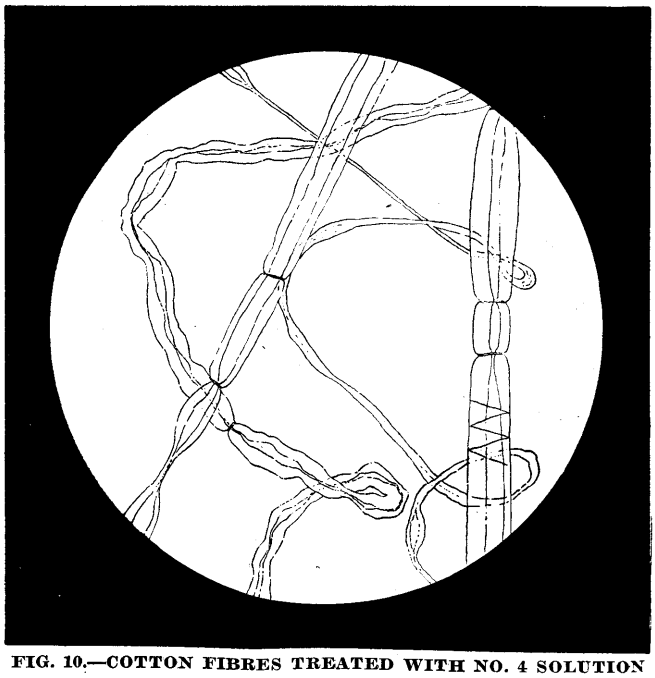


FIG. 10.—COTTON FIBRES TREATED WITH NO. 4 SOLUTION

For carrying out both the microscopic and chemical tests for fibres, the total equipment is not extensive nor expensive. The work may be conveniently done upon a small table which should be sufficiently stable so as not to shake. The chemical reagents and other accessories may be kept conveniently in a small closet or box to protect them from dust, or set in holes bored in a block of wood, as shown at Fig. 3.

The next article will give specific methods for testing vegetable fibres both microscopically and chemically.

The Construction of Weaves

By E. Bittner

COLOR EFFECTS

By introducing light colored threads in warp and filling the appearance of the goods can be greatly changed, very attractive effects being obtained with simple weaves. Colored threads are commonly used for fancy goods and their arrangement in the fabrics is of special importance in determining the appearance of the pattern.

The effect produced with a given weave by different colors in warp and filling can be determined in advance of weaving by the following method:

The draftsman selects:

(a) The weave to be used.

(b) The arrangement of the colors in the warp.

(c) The arrangement of the colors in the filling.

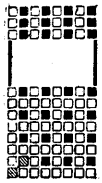


FIG. 517.

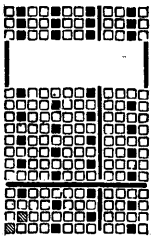


FIG. 518.

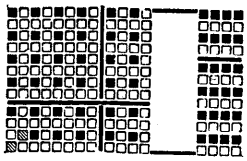


FIG. 519.

(d) Size of the pattern; this depends on the number of warp threads in the weave pattern and the number in the color pattern, and is the least common multiple of these two numbers. For example:

Weave, 4 warp threads; color pattern, 14 warp threads. The number of threads in the pattern in the cloth is then found as follows:

$2 \times 7 = 14$

$2 \times 2 = 4$

$2 \times 2 \times 7 = 28$ warp threads in pattern.

Weave, 6 picks; color pattern, 14 picks. Then:

$2 \times 3 = 6$

$2 \times 7 = 14$

$2 \times 7 \times 3 = 42$ picks in pattern.

(e) After the size of the pattern is found the weave is drafted on cross section paper for the corresponding number of warp and filling threads, the arrangement of the threads

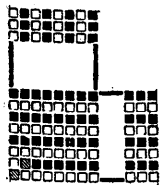


FIG. 520.

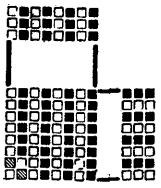


FIG. 521.

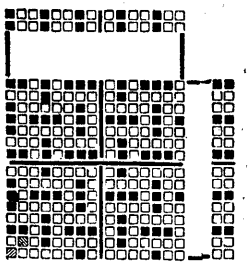


FIG. 522.

being indicated at top or bottom for the warp, and at right or left side for the filling. If colors are used for the draft the weave is then inserted by marking the risers of the warp with the same color as has been used at top or bottom of the sketch; and by marking the warp sinkers (filling risers) with the respective colors at the right or left of the sketch. In order to show the weave plainly, it is drafted without colors in the lower left-hand corner of the sketch.

An unlimited number of effects can be produced by color and weave combinations.

COLOR EFFECTS ON A PLAIN WEAVE.

Figs. 517 to 533 illustrate the production of color effects on the plain weave.

Moving the plain weave, one warp thread or one pick on the color pattern always changes the effect in the cloth, for which reason the warp and filling colors must be brought into exactly the same position as marked on the draft when the cloth is woven.

The scale of the cross section paper must correspond with the threads per inch in warp and filling in order to show the same effect as in the cloth.

Fig. 517. Warp, 1 light 1 dark. The black squares indicate the light colored warp risers. The plain weave in this and following drafts is marked in the lower left-hand corner.

Fig. 518. Warp, 1 light 1 dark 1 light. Warp pattern, 6 threads.

Fig. 519. Color pattern in filling, 1 light 1 dark.

Fig. 520. Warp and filling, 1 light 1 dark. The color effect is marked as on Figs. 517 and 519, producing a distinct cross stripe in the cloth.

Fig. 521. A distinct stripe warpways with the same color pattern in warp and filling as in Fig. 522. The change results from moving the weave one warp thread to the right or left, or one pick higher on lower.

FIG. 523.

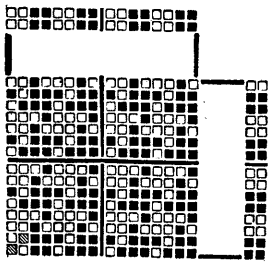
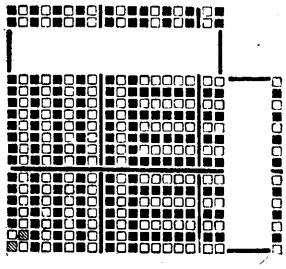


FIG. 524.



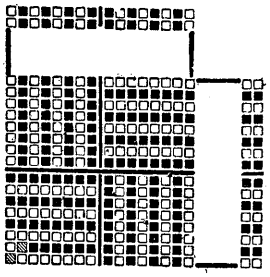


FIG. 525.

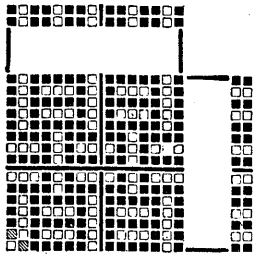


FIG. 526.

Fig. 522. Warp, 1 dark 2 light. Filling, 2 light 2 dark. Pattern 6x6.

Fig. 523. Warp, 2 light 2 dark. Filling, 2 dark 2 light. Pattern, 4x4. Extensively used for coarse goods.

Fig. 524. Combination of warp and filling stripes. Warp, 1 dark 1 light 5 times, 1 dark, 1 dark 1 light 5 times, 1 dark. Filling, 1 light 1 dark.

Fig. 525. Combination of warp and filling stripes in both directions, producing a block effect.

Fig. 526. Warp, 1 dark 1 light 1 dark. Filling, 1 dark 1 light 1 dark 1 light 1 dark. Pattern 6x10.

FRANCO-BRITISH TEXTILE AGREEMENT.

The Franco-British arrangement of May 15, provides that the British Government shall furnish France with 50,000 bales of Australian wool per month, and from June to December a total of 70,000 bales per month shall be furnished. In return France will grant import licenses for 2,000 tons of British woolen fabrics contracted for before thte armistice.

Practical Fixing of Cotton Looms

By John Reynolds

LINING UP THE 4 AND 1 MOTION.

Half of a revolution of the eccentric I corresponds to the distance of one box either up or down. Half of a revolution of the box crank corresponds to the distance of two boxes. The eccentric I is not adjustable. It is built to move the distance of one box, but after running for some time it wears a very little. The distance lost through wear is made up by moving the stud in the slot G nearer to the end of the box lever, giving a slightly greater movement of the boxes up and down. Under no circumstances move the stud in the slot J on the opposite end of box lever away from a center with the box crank adjuster K.

After leveling the boxes as explained for the 2 and 1 box motion, turn the eccentric crank I half way around, bringing up box 2. If this box is too high or too low, make adjustments in slot G. Then come back to box 1, with this box exactly level. Turn the loose crank half way around. This will give box 3. If box 3 is too high, make all the adjustments by the box crank adjuster K, as explained for the 2 and 1 box. The movement from box 3 to box 4 is made by the eccentric I, which has already been adjusted for a movement of one box. The motion moves the boxes as follows:

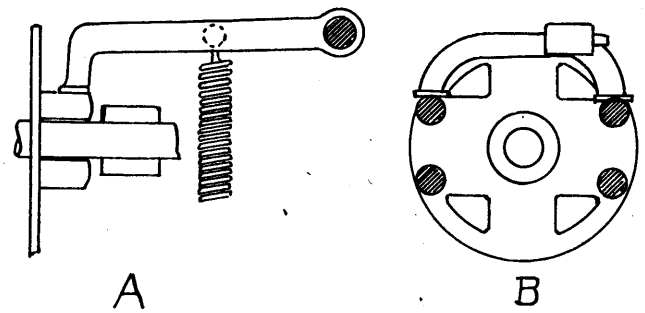


FIG. 103.—BOX CRANK, SIDE AND END.

From 1 to 2, one-half turn of eccentric I.

From 2 to 3, one-half turn of box crank L, which raises 2 boxes; and one-half turn of eccentric I which lowers 1 box at the same time.

The eccentric I is again in neutral position.

From 3 to 4 turn the eccentric one-half turn again, starting from the first or top box. The box crank attached to the eccentric I can be turned by hand. Turn this half way around and make the adjustments as described above. This completes all the adjustments for the movement from 1 to 2 and 3 to 4.

The movements from 1 to 3 or from 3 to 1 are made by the box crank L and all adjustments must be made by the adjuster K.

Keep the shuttle on the 4-box or dobby side of the loom when making these adjustments or when fixing any part of the motion.

Fig. 103 shows the circular plates or studded disks which are called the box-cranks. A is a side view; B, an end view. The two fingers which can be seen lying on the studs at B are kept in position by the spring shown at A. One-half turn of the crank sets the fingers on the two lower studs. The spring at A must be strong enough to allow the fingers to assume the different positions without rebounding.

The springs are adjustable for tension. The box cranks, segment gears and eccentrics are fastened to the respective shafts by pins driven through the gears and shaft. These pins often work loose, causing the cranks to be late in turning. This causes the picker or boxes to appear out of line. The shuttles frequently become chipped and fly out. The only way to locate the cause of the difficulty is to take the springs and fingers, Fig. 103, away from the box cranks. Everything now being free, it is easy to determine whether the box crank, segment or eccentric is loose on the shaft.

If either is found loose, the machinist should put in a new pin. Most all these parts are made from malleable iron which often wear inside, necessitating a new hole, as well as a new pin. The life of a new pin is not very long if the hole in the gears or eccentric is worn.

The initial move is given to the boxes by the first tooth of the star wheel striking the sliding tooth. The other teeth have comparatively little work to do, merely assisting in the further movement of the boxes. The first tooth becomes worn, causing a tendency for it to slip over the sliding tooth. New teeth made from steel wire can be put in but they do not last very long. The wise fixer will change the star wheels from a right to a left-hand loom, or from left to right, bringing the good tooth of the star wheel facing the sliding tooth. Time and money are saved by this method. A new star wheel is expensive and needs a lot of fitting to the older and worn parts of a motion. One of the most difficult parts to replace is a box-lever, as the slightest bind on the eccentric causes trouble. There must be no lost motion between the eccentric and the box-lever. If the casting has been made by some indifferent moulder and finished by an equally indifferent machinist, there will be trouble for the fixer. These parts should be bought from the loom builders, who have special machinery for making the castings. The extra cost is more than offset by the saving of the fixer's time and by increased production.

BOXING THE COLORS.

The method used in most gingham mills is to give the fixer a blank form showing the filling pattern, the boxing of the colors being left to the fixer. There is much difference of opinion as to whether it is advisable to lift the boxes or lower them when weaving a skip-box pattern. Suppose, for example, that the pattern is laid out so that a movement from box 1 to box 4 or from box 4 to box 1 cannot be avoided. Some fixers claim it is better to lower the boxes because gravity helps the motion, others claim it is better to raise the boxes because in this way they become settled quicker. There is force in both claims and that is the reason why looms will be found with boxes changing in different ways, but making the same pattern.

A form for the filling pattern and chain draft, which is used in many gingham mills, is arranged as follows with a space left for a sample of the cloth to be duplicated:

Picks	Color	Wrong	Wrong	Right
48	White	1	2	2
24	Blue 2	2	3	1
48	White	1	2	2
10	Red 6	3	1	3
10	Yellow 4	4	4	4
10	Red 6	3	1	3
10	White	1	2	2
10	Blue 2	2	3	1
6	White	1	2	2
6	Blue 2	2	3	1
6	White	1	2	2
6	Blue 2	2	3	1
6	White	1	2	2
10	Blue 2	2	3	1
10	White	1	2	2
10	Red 6	3	1	3
10	Yellow 4	4	4	4
10	Red 6	3	1	3
250				

(Continued on next page)

The Mechanics of Textile Processes

By W. Scott Taggart, M. I. Mech. Eng.

Pressure: Top rollers = 968 + 70 = 1038 lbs.
Second rollers = 1038 + 78 = 1116 lbs.
Third rollers = 1116 + 82 = 1198 lbs.

The levers shown in the last two examples are used for consolidating the opened and fluffy cotton, so that the sheet thus formed can be rolled up as a lap and readily unrolled without the surfaces of the cotton adhering.

Ex. The dish feed-roller on the carding machine is weighted as shown in Figs. 142 and 143. The distance $x =$

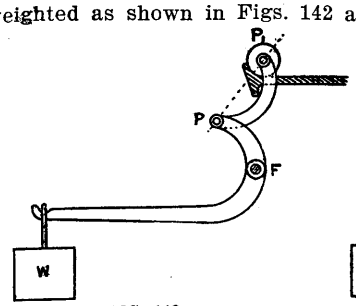


FIG. 142.

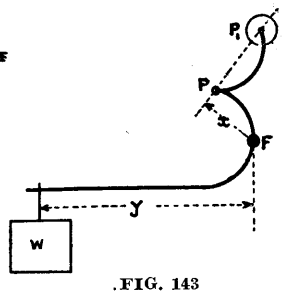


FIG. 143

12 in. and the distance $y = 2$ in. The weight $W = 13$ lbs. What pressure is exerted on the end of the feed-roller?

This is an interesting example of a bent lever. By joining

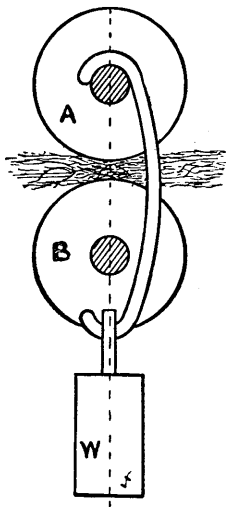


FIG. 144.

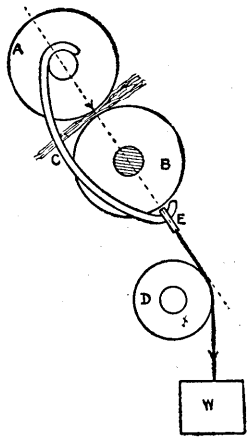


FIG. 145.

P and P_1 we obtain the direction in which the pressure acts. The actual connection is made by a curved link. The distance x is the perpendicular distance to the fulcrum from the direction in which the weight acts. The distance y is the perpendicular distance of the fulcrum from the direction in which the pressure acts.

$$Wx = Py$$
$$Wx \div y = P$$
$$P = (13 \times 12) \div 2 = 78 \text{ lbs.}$$

Fig. 143 is a diagram of the lever.

Fig. 144 illustrates what is termed a dead weight arrangement. Clearly the pressure on the cotton between A and B will be the weight of W.

On the other hand, the application of a dead weight in the way shown may not be practicable, and in such a case the weight may be arranged as in Fig. 145. The pressure on the material between A and B will be practically equal to the weight W, as the tension in the connecting chains from W to E is uniform.

Another type of direct weighting is shown in Fig. 146. The weight W acts vertically, but the pressure acts along the line joining the centers of A and B. Fig. 147 shows how this pressure is found. Draw W to scale equal to half the weight

FIG. 147.

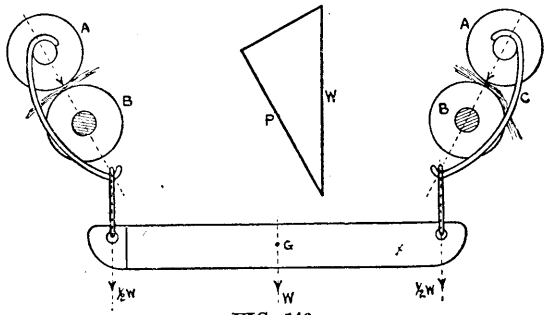


FIG. 146.

of W in Fig. 146, and from one end draw P parallel to the pressure line. From the other end of W draw a line at right angles to P, then the line P will equal the pressure between the two rollers. This type of weighting is common in some textile machines.

A form of lever, often used for textile purposes in the weighing of yarn, is shown in Fig. 148. It consists of a bent lever fulcrumed at F, one end or arm carrying a pivoted hook or pan on which the yarn is placed; the other arm is weighted and acts as a pointer on a circular scale. This scale is usually a quadrant of a circle, and is divided so that the weight of the yarn can be read off.

This yarn balance is shown in Fig. 149. When the apparatus is in a state of equilibrium, the long arm pointer is at

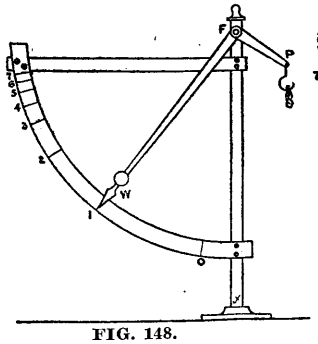


FIG. 148.

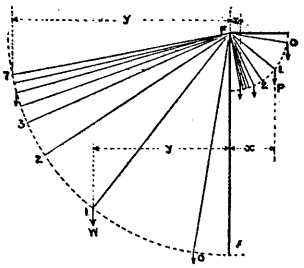


FIG. 149.

zero on the scale, this point being some little distance to the left of the stand. The yarn placed on the hook depresses the arm FP and raises the pointer FW. The effect has been to alter the leverages or moments of the arms; for when the arms come to rest, it is seen that the weight in P is nearer to the vertical line through F, while W is farther away. As P increases its moment decreases, while the moment of W increases. W itself is a constant quantity. The result of

(Continued on next page)

PRACTICAL FIXING OF COTTON LOOMS.

(Continued from previous page)

A space is left in the form for the fixer to insert the order for boxing the colors. A good method is to start with box 1 and work up. If this does not avoid skips, then start with box 2 and work up. If skipping boxes still occur then start with box 2 and work down. The form given above shows how this method works out. The third order of boxing colors is right.

The order of boxing colors for a 3-box pattern is shown in the following table:

Picks	Color		Wrong	Right
60	White		1	2
6	Pink	5	2	1
60	White		1	2
6	Tan	8	3	3
132				

Boiling-Off Silk

By J. L. Girard, Chemical Engineer

THE TREATMENT OF SPECIAL FABRICS.

The methods of handling silk which have been explained above are not suited for certain very delicate fabrics which are easily disarranged and frayed during the degumming operation. Among such fabrics are the Alencon tulle made of fine thread and a loose net, called "Illusion," the silk lace known as "Islende," and in general all the goods in which the threads have few points of contact or interlacing with each other and are liable to be disarranged and frayed by the slightest tension in the degumming bath at the moment when the gum becomes soft.

Various methods of manipulating these fabrics have been tried without satisfactory results. Among these has been the use of the circulating system by which the goods remain stationary and the liquor is forced through them either by a pump or by a hydro-extractor moving at a slow speed. The difficulty with this method, however, is that the silk saturated with the soap solution becomes so compact as soon as the gum is softened that the circulation of the liquor becomes impossible. Furthermore, by reason of the goods not being moved freely in the liquor, the cleaning action is completely paralyzed.

In practice a method is used for handling these fabrics which is imperfect, but which gives fairly good satisfaction. It is called the cushion process and is carried out as follows: It has been found that the "illusion" fabric does not become displaced as easily when the tension is crossways of the fabric instead of lengthways, this being due to the hexagonal form of the aperture in the net. The object of the new method therefore is to bring the tension crossways of the fabric. This is accomplished by winding the piece by a windlass, keeping it spread out in the open width which varies from 80 to 120 in. and even more. When the piece is unwound from the roll and folded it forms a sort of cushion about 20 inches wide, and from 40 to 120 inches long, the latter being the width of the goods. The two ends of this cushion are then joined by fastening with strong cotton and twine, thus forming a sort of ring or skein of large size which can be hung on a stick and manipulated like a skein of yarn in the liquor. It is clear that the tension thus brought on the skein or ring of cloth will be crossways of the piece, thus producing the most favorable conditions possible for preventing a displacement of the fabric structure. By an excess of precaution the cushions are often boiled off in a cloth sack, as has already been described in the case of skein yarn. This slightly retards the dissolving of the gum and the circulation of the liquor, but it effectively protects the fabrics. The difficulties with the latter method are partially remedied by using a stronger solution of soap for the bath and by rinsing thoroughly after the degumming operation.

THE MECHANICS OF TEXTILE PROCESSES.

(Continued from previous page)

these changes in the moments of the arms is to cause the scale to have unequal divisions, the readings contracting as they ascend the scale.

The lea strength tester is a bent lever of a special type. Fig. 150 gives a diagrammatic view of its features. One end of a chain or cord is attached to a small drum; the other end carries a hook, to which the yarn is attached. On the axle of the drum is fixed a weighted pointer W. As the yarn is

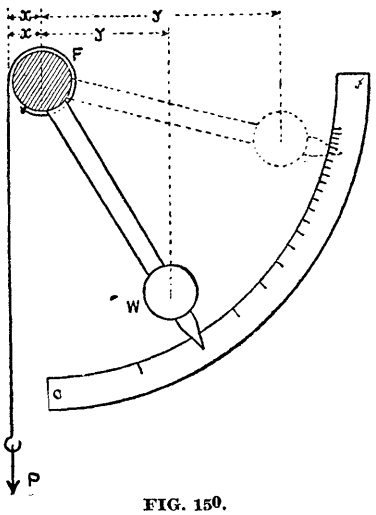


FIG. 150.

pulled at P, the drum F is turned, and the pointer rises along a quadrant scale which is graduated to indicate the force P in pounds. The pull of the yarn has a constant leverage or moment, but the weight W has a varying leverage as it moves upwards.

PROTECTION IN AUSTRALIA.

The Melbourne Age of April 7 contains an interview with the retiring Director of Munitions, in which he pointed out in regard to the linseed-oil industry that while the oil was a key to other industries, yet its production was in a sense a secondary industry, the key to it being the growing of linseed in the Commonwealth. The growing of linseed was therefore the key of the linseed-oil industry, which was itself the key of other industries. Referring to other "keys," of which Australia holds many, he instanced coal production, from which springs the coal-tar industry, with its many ramifications. Coal tar was not distilled in Australia before the war, and its valuable by-products were wasted. Its distillation in Australia has been undertaken since war broke out, however, and, in the opinion of the director, is never likely to cease. The production of wolfram ore provides another key industry leading to the manufacture of tungsten steel for all sorts of modern machine tools. Tungsten is also used for electrical purposes, such as contacts for magnetos, while tungsten alloys are used, among other things, in propellers and automobile parts.

The treatment of zinc concentrates, now undertaken in Australia, is another key industry; from it springs the production of zinc and many valuable zinc alloys used in industry. The zinc industry is also vitally concerned in the building industry, in the production of galvanized iron, and from it spring chemical and paint industries. The production of manganese ore is carried out in Australia, and is the key to the production of ferromanganese alloys and manganese steel, now being undertaken in Australia. Among secondary industries dependent upon this key are the making of hard steel tools and bullet-proof plating; the nonferrous alloys are also of much importance in various industries, while manganese is used in still other directions —in connection with the coloring of glass, as a basis for disinfectants, and in making bleaching powder.

At a recent British "key industries" exhibition the manufacture of magnetos was treated as a key, since without the magnet the gasoline engine, used in countless branches of manufacturing work, was useless. In the case of Australia, the manufacture of magnetos is to be undertaken by a firm in the near future.—(Commerce Reports.)

BRITISH COTTON TRADE.

Lancashire Chambers of Commerce and employers and operatives associations are planning, under government auspices, a Cotton Trade Commission to visit the Far East and study the prospects of trade in British cotton goods. The plan provides for a commission to represent employers, operatives and distributors.

Air Moistening in Textile Mills

In continuation of the series of charts showing the fluctuations in moisture regain for silk in process of manufacture, the accompanying chart shows the regain for the fall months September, October and November. As explained in connection with the spring and summer charts, this record of moisture regain is based on Schloesing's tables and the U. S. Weather Bureau observations at New York for the year ending February, 1918.

The moisture regain is given for the two observations each day. The dot at the left of the space between the perpendicular lines indicates the regain based on the weather observation at 8 A. M.; that at the right showing the regain at 8 P. M. The two are connected by a broken line which shows the difference of moisture between the regain at 8 A. M. and at 8 P. M. The horizontal lines and figures at right and left of the chart indicate the regain or number of parts of moisture in 100 parts of bone-dry material by weight.

By comparing this fall chart with the spring record in the June issue it will be seen that the average regain and the extent of the daily and monthly fluctuations are about the same, the only noteworthy difference being that, while the spring record shows a slightly rising tendency from March 1 to May 31, the tendency during the fall period from Sept. 1 to Nov. 30 is slightly downward, the first indicating the approach of the high humidity of summer; and the second the coming of the dry atmosphere of the winter months.

On Sept. 1 and 2 the regain rose to 14.2 and 18.8 parts per 100 parts of dry silk, but these two days are exceptional for the fall period and mark an overlapping of dog-day weather into September. Excluding these two days the highest regain during the three fall months was 12.8, which was reached on four days, Sept. 6 and 12, Oct. 19 and 30. The lowest point was reached on Nov. 27 with a regain of 2.3. The widest fluctuation in any one day occurred on Oct. 30, the difference being 7.1 between the forenoon regain of 12.8 and the afternoon record of 5.7. In the next issue we will give the record of moisture regain for silk for the three winter months, November, December and January.

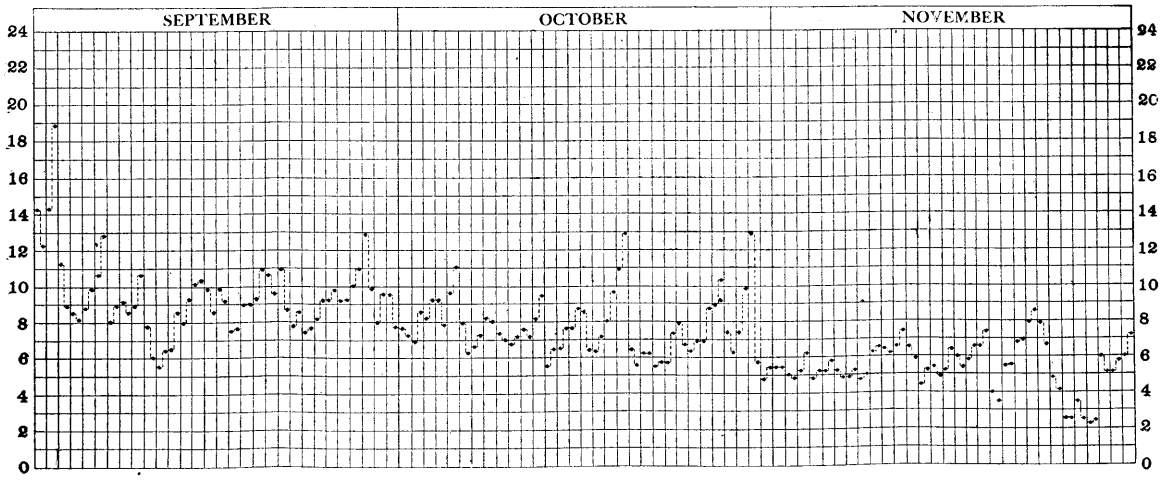
In the June and July issues we gave the tabulation of moisture regain for cotton and silk at different degrees of temperature and humidity, as determined by Schloesing. The table which follows gives the tabulation of the Schloesing data for wool, the figures being given for each degree of humidity from 1 to 95 per cent. at three temperatures, 54°, 75°, 95°. As in the case of cotton and silk, relative humidity is the chief factor is affecting the moisture regain for wool, the change of temperature having a comparatively slight effect. With a relative humidity kept at 60 per cent., for example, the moisture regain for wool is 13.87 at a temperature of 95° and 15.45 at 54°, an increase of only 11 per cent. On the other hand at a constant temperature of 75° the moisture regain for wool is 23.6 at a relative humidity of 90 per cent., and only 4 at a relative humidity of 10 per cent., an increase of 490 per cent. as a result of this change in atmospheric humidity.

(Continued on next page)

Moisture Regain for Wool.

At 54°, 75° and 95° F. and Relative Humidity from 1 to 95%.

%	54°	75°	95°	%	54°	75°	95°	%	54°	75°	95°	%	54°	75°	95°	%	54°	75°	95°
1	.58	.52	.45	20	7.79	7.20	6.85	39	11.78	11.07	10.53	58	14.90	14.08	13.40	77	19.	17.88	16.85
2	1.09	1.	.92	21	8.14	7.52	7.15	40	11.93	11.23	10.68	59	15.08	14.25	13.55	78	19.28	18.10	17.08
3	1.32	1.40	1.30	22	8.43	7.78	7.40	41	12.08	11.40	10.85	60	15.25	14.40	13.70	79	19.58	18.40	17.35
4	1.95	1.80	1.69	23	8.68	8.	7.60	42	12.23	11.58	11.	61	15.45	14.60	13.87	80	19.92	18.70	17.60
5	2.37	2.20	2.07	24	8.93	8.22	7.81	43	12.38	11.72	11.15	62	15.65	14.78	14.	81	20.25	19.02	17.95
6	2.75	2.55	2.41	25	9.20	8.47	8.04	44	12.55	11.88	11.30	63	15.82	14.95	14.18	82	20.60	19.40	18.28
7	3.18	2.95	2.79	26	9.40	8.70	8.26	45	12.73	12.05	11.45	64	16.	15.12	14.33	83	21.	19.78	18.65
8	3.56	3.30	3.13	27	9.65	8.90	8.44	46	12.88	12.20	11.60	65	16.20	15.32	14.50	84	21.40	20.20	19.05
9	3.94	3.65	3.46	28	9.85	9.10	8.63	47	13.05	12.32	11.73	66	16.40	15.50	14.67	85	21.85	20.65	19.48
10	4.31	4.00	3.80	29	10.05	9.32	8.83	48	13.20	12.50	11.88	67	16.60	15.68	14.87	86	22.30	21.20	20.
11	4.69	4.35	4.13	30	10.25	9.50	9.	49	13.35	12.68	12.02	68	16.80	15.88	15.	87	22.80	21.75	20.42
12	4.07	4.70	4.47	31	10.45	9.70	9.20	50	13.52	12.80	12.18	69	17.	16.08	15.20	88	23.35	22.30	21.
13	5.42	5.02	4.77	32	10.64	9.88	9.40	51	13.68	12.98	12.32	70	17.22	16.28	15.40	89	23.90	22.95	21.60
14	5.78	5.35	5.09	33	10.80	10.07	9.58	52	13.85	13.12	12.48	71	17.48	16.50	15.60	90	24.50	23.60	22.30
15	6.15	5.70	5.42	34	10.97	10.22	9.75	53	14.00	13.30	12.60	72	17.72	16.70	15.80	91	25.30	24.30	23.07
16	6.48	6.	5.71	35	11.15	10.40	9.92	54	14.18	13.45	12.78	73	17.95	16.92	16.	92	26.08	25.10	23.95
17	6.83	6.32	6.01	36	11.32	10.58	10.08	55	14.35	13.60	12.92	74	18.18	17.18	16.20	93	26.85	26.	24.80
18	7.16	6.62	6.30	37	11.48	10.73	10.20	56	14.55	13.78	13.08	75	18.42	17.40	16.40	94	27.60	26.90	25.80
19	7.49	6.92	6.68	38	11.62	10.90	10.38	57	14.63	13.92	13.23	76	18.70	17.60	16.62	95	28.40	27.72	26.90



DAILY FLUCTUATIONS OF MOISTURE IN SILK IN PROCESS OF MANUFACTURE.

"STRAIGHT LINE" TEXTILE CALCULATIONS.

BY SAMUEL S. DALE.

WOVEN AND FINISHED WEIGHTS

The following formulas for finding the *Woven and Finished Weight and Length* of cloth, although applicable to all fabrics, are especially useful in the manufacture of woolen and worsted goods, which undergo important changes in length and weight during the finishing process. These formulas and those for calculating the effect of changes in weight or length on yarn counts are based on the same principle.

There are six factors to be taken into consideration in connection with the shrinkage of wool goods in finishing:

Yards woven	Ounces per yd. woven
Yards finished	Ounces per yd. finished
Yield in length	Yield in weight

The relations between these factors are illustrated by the following formulas:

Ex. A cut of woolen cassimere measures 40 yards woven and 36 yards finished. It weighs 18 ounces per yard woven and 16 ounces per yard finished.

(1) Yds. fin. ÷ yds. wov. = yield length
36 ÷ 40 = 90 per cent.

(2) (Yds. fin. × ozs. fin.) ÷ (Yds. wov. × ozs. wov.) = yield weight
(36 × 16) ÷ (40 × 18) = 80 per cent.

(3) (Yield length × ozs. fin.) ÷ ozs. wov. = yield weight
(.90 × 16) ÷ 18 = 80 per cent.

(4) (Yield length × ozs. fin.) ÷ yield wt. = ozs. woven
(.90 × 16) ÷ .80 = 18 ozs.

(5) Yield wt. × ozs. wov.) ÷ yield length = ozs. fin.
(.80 × 18) ÷ .90 = 16 ozs.

(6) (Yield wt. × ozs. wov.) ÷ ozs. fin. = yield length
(.80 × 18) ÷ 16 = 90 per cent.

(7) (Yds. wov. × ozs. wov. × yield wt.) ÷ ozs. fin. = yds. fin.
(40 × 18 × .80) ÷ 16 = 36 yds.

The use of these formulas is illustrated by the following examples:

Ex. Find shrinkage in length for a piece woven 48 yds. and finished 44 yds.

(1) 44 ÷ 48 = 91.6% yield = 8.4% shrink.

Ex. Find loss of weight for a piece woven 51 yds. 14 ozs., and finished 48 yds. 12 ozs.

(2) (48 × 12) ÷ (51 × 14) = 80.7% yield = 19.3 loss in wt.
The yield in length is (48 ÷ 51) 94.1%. Then:

(3) (94.1 × 12) ÷ 14 = 80.7% yield = 19.3 loss in wt.

Ex. Find woven weight per yd. of a piece that shrinks 10% in length, loses 15% in weight and weighs 12 ozs. finished.

(4) (.90 × 12) ÷ .85 = 12.7 ozs. woven.

Ex. Find finished weight per yd. of a piece that weighs 18 ozs. woven, shrinks 8% in length and loses 20% in weight.

(5) (.80 × 18) ÷ .92 = 15.6 ozs. finished.

Ex. Find shrinkage in length of a piece that weighs 15 ozs. per yd. woven, 13 ozs. per yd. finished and loses 18% in weight.

(6) (.82 × 15) ÷ 13 = 94.6% yield = 5.4% shrink in length.

Ex. Find finished yds. of a piece woven 42 yds. 17 ozs. per yd., which loses 22% in weight.

(7) (42 × 17 × .78) ÷ 12.5 = 39.7 yds. finished.

AIR MOISTENING IN TEXTILE MILLS.

(Continued from previous page)

These three tables in the June, July and August issues of TEXTILES are the first complete tabulation of moisture regain for cotton, silk and wool at different degrees of temperatures and relative humidity that has ever been published. Based on the most complete and scientific investigation of the subject of which there is any record, these tables and the series of charts showing the moisture regain for cotton, silk and wool in process of manufacture are an important addition to the technical literature of the textile industry and will be found of great value for reference by mill men and all interested in this important subject.

SYSTEM FOR SPOOLING AND WARPING.

The accompanying form is used for reporting weekly the production of the spooling and warping department of a cotton mill, also the waste made and oil and supplies charged up. It shows the weight of each kind of yarn,

SPOOLING AND WARPING

PRODUCTION AND WASTE

Hours Run 55

Hands Employed 50 Week Ending May 3 19____

YARNS	POUNDS SPOOLED	POUNDS WARPED
13s	70,875	69,897
15s	18,325	18,968
21s	12,075	13,148
Total	101,275	102,013

WASTE

Spooling 210 lbs.

Warping 123.

Sweepings 150.

Total 483.

Oil Used 7 galls.

Supplies $6.75

spooled and warped, also the total. The report is sent to the office by the overseer at the end of each week, and is filed for reference after the figures have been entered in the production books.

GERMAN PLANS FOR THE FUTURE.

The general assembly of the mechanical cotton spinners and weavers in Augsburg declared dividends of 14½ per cent., elected Kommerzienrat (business adviser) Max Lehmann, director of the Dresdener Bank, Augsburg branch, to the managing board, and resolved upon a number of changes in the by-laws, among which the most important was that the managing board and board of directors may consist only of German citizens who reside continuously in Germany, and, further, that this decision of the general assembly can be changed only by a vote of nine-tenths of the members present.

The same percentage of votes shall be necessary to reach decisions which might result in the loss or limitation of the company's independence because of foreign enterprises. It was stated at the meeting that the company would be busy for some months, that because of its great water power it will be only to a small degree dependent upon the coal supply, and that on account of its sound technical and financial condition the undertaking may look to the future with confidence.

In the speech of the chairman, Geheimer Kommerzienrat, von Schmid, of Augsburg, on the future of the German cotton industry, the following is worthy of particular notice:

"In case of an agreement being reached looking to a more or less free importation of raw cotton, the condition would most certainly be imposed upon us, that we should not put any obstacles in the way of the importation of finished products. On account of the large foreign supplies of merchandise, offers of which, at astonishing low prices, have already been received, a destructive drop in prices must be looked for. Though this might very well be desirable on account of the general economic and social situation, still it would endanger the existence of the German textile industry for a considerable period of time.

"It is probable, nevertheless, that this drop in prices might be the beginning of a general decrease in the cost of living, which would have a healthful effect on the wage demands of labor and thereby bring about a solution of the labor question for German industry. Payment for imported cotton could only be made by means of long-time credit arrangements with American banks, to obtain which either the whole German industry, with the co-operation of the Government, will have to join in depositing securities, or each individual firm for its own credit. The fear that America will not only try to deliver raw materials, but attempt to invade German industry with its capital is not to be ignored."—Frankfurter Zeitung.

ENGLISH WOOL COMBING CHARGES.

Charges for combing wool in England have again been advanced, the new rates marking advances of 120 to 140 per cent. since 1915. The new list with prices in pence (1d. = 2 cents) is as follows:

	Per lb.
Merinos:	
Tearing 5 to 1 and over	6¾d.
Tearing 4 and under 5 to 1	7¼d.
Tearing 3 and under 4 to 1	7¾d.
Tearing 2 and under 3 to 1	8¼d.
Tearing under 2 to 1	8¾d.
Burring	¾d. extra
Gilling in	⅜d. extra
Dry combing	½d. extra
Cape Wools	½d. extra
58s:	
Tearing 12 to 1 and over	6¼d.
Tearing 8 and under 12 to 1	6½d.
Tearing under 8 to 1 same as Merinoes	
Burring	¾d. extra
Gilling in	⅜d. extra
Dry combing	½d. extra
56s:	
Tearing 7 and 1 and over	5⅛d.
Tearing 5 and under 7 to 1	5¼d.
Tearing under 5 to 1	5⅜d.
Slipe and Skin Wools	⅜d. extra
Burring	½d. extra
Gilling in	⅜d. extra
Dry combing	¼d. extra
48s and 50s:	
Tearing 7 to 1 and over	4⅞d.
Tearing 5 and under 7 to 1	5d.
Tearing under 5 to 1	5⅛d.
Slipe and Skin Wools	⅜d. extra
Burring	½d. extra
Gilling in	⅜d. extra
Dry combing	¼d. extra
30s to 46s:	
Tearing 8 to 1 and over	4⅜d.
Tearing 6 and under 8 to 1	4½d.
Tearing under 6 to 1	4⅝d.
Slipe and Skin Wools	⅜d. extra
Burring	½d. extra
Gilling in	⅜d. extra
Dry combing	¼d. extra
Carding, Backwashing and Gilling only	3¾d.
Slipe and Skin Wools	⅜d. extra
Preparing:	
32s, 36s, 40s	3⅝d.
44s and 46s	3¾d.
48s and 50s	3⅞d.
Slipe and Skin Wools	⅜d. extra
Burry and Seedy Wools	¾d. extra
Gilling in	⅜d. extra
Dry combing	¼d. extra
Scotch Wools	4d.

In the schedule which came into operation on October 1st, 1915, the charges for 58s and merinoes were from 3d. to 3¾d. (compared with 6¼d. to 8¾d. in the new schedule); for 56s, 2¼d. (compared with 5⅛d. and 5¼d.); for 50s, 2⅛d. to 2⅜d. (compared with 4⅞d. to 5⅛d.); for 30s to 46s, 1⅞d. to 2⅛d. (compared with 4⅜d. to 4⅝d.); and for preparing 32s, 36s and 40s, 1½d. (compared with 3⅝d.).

WOOL GROWING IN NEW ZEALAND.

Sheep and wool are the most important and profitable products of New Zealand. The industry is growing rapidly. During 1918 wool was exported to the value of $36,631,440, frozen mutton to $9,357,992, frozen lamb to $5,941,179, and frozen mutton and lamb joints to the value of $161,893, being a total of $52,092,504, out of a total export of $138,566,323. The industry is doubtless more remunerative than in any other part of the world, since sheep can live the year round in most all parts of the Dominion on the open pastures without serious damage to them, save in the cases of occasional severe winters in the South Island, such as was experienced last winter, when a few thousand sheep perished because of severe snowstorms.

Good sheep grazing lands in the Dominion are valued at from $75 to $150 per acre, and will carry from 3 to 4 sheep per acre, while improved timber or bush land, that will keep from 1½ to 2½ sheep per acre, can be had at from $45 to $80 per acre. There are also wide ranges of Government land where sheep are pastured at a few cents per head per annum.

There were 26,538,302 sheep in New Zealand on April 30, 1918, as compared with 23,480,707 in 1909. These were divided so far as breeds are concerned as follows:

	Number.
Merinos	1,100,973
Lincoln	420,193
Romney	3,062,921
Border Leicester	230,574
English Leicester	180,247
Shropshire	22,696
Southdown	58,936
Corriedale	499,196
Halfbreds	912,345
Crossbreds and others not otherwise enumerated	20,050,221

On the above date there were 24,168 different persons and companies raising sheep in the Dominion, of whom 11,562 had fewer than 500 sheep; 5,603, from 500 to 1,000; 4,747, from 1,000 to 2,500; 1,407, from 2,500 to 5,000; 439, from 5,000 to 7,500; 183, from 7,500 to 10,000; 187, from 10,000 to 20,000; and 40 over 20,000.—(Consular Report.)

SECRETARY CHERINGTON.

Winthrop L. Marvin, who has been the efficient secretary and treasurer of the National Association of Wool Manufacturers since 1908, has resigned to accept an official position with the American Steamship Corporation at New York. Mr. Marvin is an authority on the merchant marine, having been secretary of the Merchant Marine Commission during the administration of President Roosevelt. He is the author of a standard history of the American merchant marine published by Scribner's. He is now returning to a field with which he is thoroughly familiar and we extend to him our best wishes for his success.

Mr. Marvin will be succeeded as secretary and treasurer of the National Association of Wool Manufacturers by Prof. Paul T. Cherington, who, since 1908, has been with the Graduate School of Business Administration at Harvard University. Previous to accepting that position Prof. Cherington was editor of the publications of the Foreign Trade Bureau of the Philadelphia Commercial Museum, and also editor of "The Manufacturer," published by the Manufacturers' Club of Philadelphia. Born in Kansas, Prof. Cherington was graduated from the University of Pennsylvania. He is the author of several books, including "The Wool Industry," published in 1916 and dealing with the commercial side of the industry. During the war Prof. Cherington was connected with the Division of Planning and Statistics of the United States Shipping Board, also with the clothing section of the War Industries and War Trade Boards. He is specially fitted by experience and training for the position with the National Association of Wool Manufacturers, and we wish him success.

SODAMMONIUM SULPHATE FROM NITRE CAKE.

Sodammonium sulphate can be prepared from nitre cake or other acid sodium sulphate by dissolving the nitre cake in water or in mother liquor obtained in a later stage of the process, with the addition of sulphuric acid, neutralizing the free acid by absorption of ammonia, evaporating or adding water to adjust the concentration of the resulting hot solution which should contain ammonium sulphate in excess of sodium sulphate and cooling. This will result in the separation of sodammonium sulphate crystals. Equal quantities of sodium sulphate and sulphuric acid are added to the mother liquor. The free acid is neutralized by ammonia and the concentration of the resulting hot solution is adjusted as above and separation of the crystals proceeded with.—(Dyer and Calico Printer.)

QUESTIONS AND ANSWERS

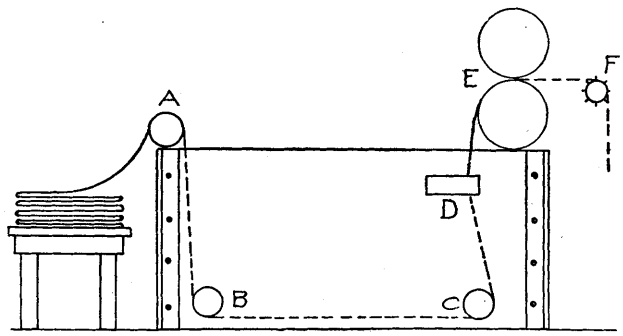
We invite subscribers to submit any questions they desire answered regarding the manufacture or sale of textile products. Any question sent to us will be answered at once if the information is in our possession. If it is not, we will submit the question to experts and their replies will be published promptly. In urgent cases we will, if practicable, send the inquirer an advance copy of the reply. Inquirers are requested to state their questions as clearly, concisely and fully as possible. This will save time and misunderstanding. The names of inquirers are held in confidence.

CARBONIZING FLANNEL

Editor of TEXTILES:

Please inform me how white flannel should be carbonized when it is to be piece-dyed afterwards. I enclose two samples showing our goods as they come from the loom and also when finished. We are carbonizing the pieces with aluminium after weaving. Should they be carbonized before fulling? If so, should the goods be scoured before carbonizing? Should we use soap or alkali for washing? Any information regarding the carbonizing or finishing of these goods will be greatly appreciated. MACASSAR (207).

For carbonizing goods like the sample, a wooden tank should be provided, about 6 ft. long, 4 ft. deep and 3 or 4 ft. wide, with a roll at one end and a set of squeeze rolls at the other. Inside the tanks far enough from the end and bottom for the cloth to pass under, there are two rolls, as



shown in the illustration. There is also a guide through which the cloth passes before entering the squeeze rolls. The opening in this guide should be 4 or 5 in. wide so as to bring the cloth into small compass for squeezing.

The speed of the squeeze rolls should be slow enough to allow the cloth to become thoroughly saturated while passing through the bath. This bath should be prepared by filling the tank nearly full of water, and adding sulphuric acid to bring the solution to 6° Be.

The cloth passing over the roll A and under the rolls B and C, through the guide D and squeeze rolls E becomes thoroughly saturated with the acid solution. For heavy goods it might be necessary to arrange an extra set of rolls above B and C so as to allow the cloth to remain longer in the liquor. A carrier roll F is placed in front of the squeeze rolls to deliver the cloth to a truck. Pressure should be applied to the squeeze rolls to force as much of the liquor as possible back into the tank. After passing through this process, the cloth is extracted, then taken to a dryer arranged to pass the pieces slowly through a chamber heated to 240°. Following this process the goods are run dry in a rotary fulling mill to crush the carbonized burrs.

The cloth should first be scoured, then carbonized, thoroughly in a 4° Be. alkali solution, neutralized and dried before fulling. Time and labor are saved by fulling and scouring and then carbonizing. Any attempt to carbonize the goods in the grease or to full them without thoroughly removing the acid is likely to cause serious trouble. The goods should be fulled and scoured in the usual way with suitable soap for each process. If the goods are to be given an "acid dye" they may go forward without neutralizing; otherwise, a thoroughly removal of the acid before drying is essential. All parts of the soaking tank must be of wood. MEDIDA.

TEMPERATURE FOR SIZING.

Editor of TEXTILES:

1. What is the proper temperature for the size when running No. 9 indigo dyed warps?
2. What should be the percentage of gain in weight due to sizing?
3. What should be the percentage of gain in breaking strength?
4. For best results in weaving, should the warps be run damp or dry on slasher? Please explain fully.
5. What percentage of moisture should a warp contain, when taken off from slasher?
6. If a warp is taken from the slasher damp, how long does it remain in this condition?

ALENCON (205).

I see no reason to state other than 185° as the proper temperature. Indigo dyed warps are liable to contain considerable quantities of chemicals that act upon the starch causing it to grow thin, so it might be possible to run at 170° on such a warp. The determining factor would be the thickness of the size. If the size is not too thick at 170°, thus making the top roll slip, that would be the best temperature.

The answer to the 4th question is that the warps should be run from the slasher just dry. They should not be at all moist, nor should they be so dry as to be crisp. As you will understand, such a condition as this can be obtained only when the temperature of the size in the size box is regulated.

The answer to the 5th question is the percentage of moisture should be about normal for cotton, say 5 to 6 per cent.

It is difficult to reply to question 6. I do not know what "Alencon" means by "damp." This might be most anything from a warp practically dry to one quite wet. A warp would retain dampness for weeks or months as it is in such a dense package. EVERETT H. HINCKLEY.

MATTING OF WARP YARN.

Editor of TEXTILES:

How can I overcome the matting together of colored cotton warps? CORNING (206).

I am in some doubt as to what is meant by matting of colored yarn in warps. Yarn in the warp will stick together because of the presence of size which was not properly dried on the cylinders before being wound on the beam. I will assume that "Corning" refers to the ends becoming stuck together after leaving the warp beam. Sometimes, owing to improper sizing, the fibers will curl up together behind the drop wire and harness. On a plain weave the 2 ends that rise and fall together will knit into each other and break the end that works between them. If this is "Corning's" trouble the only relief is a 2 and 2 lease. See Practical Fixing of Cotton Looms. JOHN REYNOLDS.

TESTING STRENGTH OF FIBERS.

Editor of "Textiles":

Please let us know where we can get a machine for testing the strength and elasticity of fibers. We have had an inquiry for this machine from a Japanese correspondent who advises us that they have been informed it was manufactured in the United States. YORK (204).

The machine which the Japanese correspondent refers to is evidently the fiber testing machine built by A. S. MacKenzie, 11th street and Ridge Avenue, Philadelphia, Pa.

Knitting Department

THE MANUFACTURE OF KNIT GOODS.

By JOHN CHAMBERLAIN

STRAIGHT BAR MACHINE

As the fashioning course requires a totally different manipulation of the looping elements from that of the knitting course, two cams are attached to each circular boss on the main camshaft. The cams are detachable, and their removal does not affect the timing, which is made by the circular adjustment of the bosses on the shaft.

The path of the needle head during the knitting course is shown in Fig. 14 at A. At the commencement of the course the needle head occupies the position 1, and stays in this position during the loop formation. The loop-division position of the needle head is shown at 2, the pressing position at 3, the casting-off position at 4, from which the return movement is made to the original position.

The path of the needle head during the fashioning course is shown in Fig. 14 at B. At 1 an outward move is made in order to allow the narrowing points to descend on the beard side of the needles. At 2 the needles are covered by the points; at 3 the loops are transferred from the needles, and left suspended on the points. At 4 the racking of the points is effected; at 5 the needles are again covered by the points; while at 6, through the aid of the sinkers, the loops are transferred again to the needles. Afterwards the latter rise to position 7, the camshaft is moved endwise, and the needles are now controlled by the knitting-course cams, and rise to their original knitting position.

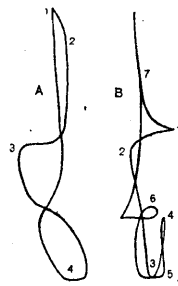


FIG. 14.

FIG. 15.—END VIEW OF MACHINE.

Fig. 15 shows an end view of the machine, the black circles denoting shafts and rods which extend the full length of the needle divisions. The needle bar 1, the jacks 8, slur bar 9, sinkers and dividers 10, as well as the rest of the immediate looping elements, have been shown previously in Fig. 11, but are reproduced in Fig. 15 to show how their control is effected.

NEEDLE BAR CONTROL

The vertical movement of the needle bar is obtained through the agency of the arms 2, the rocking shaft 3, and levers 4, from the main camshaft 6. The cam levers 4 carry rollers 5 through the medium of which the motion is transmitted with a minimum of friction. Rocking shafts, an outstanding feature of the machine, are used so that the connections from the intermediate oscillating shafts to the main shaft and to the parts operated may be made in any convenient position.

The horizontal movement of the needle-bar is obtained through the agency of the connecting bars 11, cam levers 12, rollers 13, rocking shaft 15, and rocking-shaft levers 16. The levers 12 are connected to the levers 16 on the spindles 14, so that they can be released when any of the sectional needle bars are to be put out of action, as is necessary when a needle breaks or when certain operations are being performed. The rocking-shaft levers 16 are pulled towards the main camshaft by means of strong spiral springs 17, and the rollers of all the cam levers are caused to follow the contour of their cams by means of similar devices.

The loop-forming position of the needles would ordinarily be decided by the setting of the foregoing levers, but in common practice additional cams and levers are provided, so that the rollers Z of the levers 16 are not in contact with their cams during the stitch formation, it being possible to adjust the stitch length by means of set-screws with milled heads to exceedingly fine limits without altering the horizontal component of the needle bar movement.

SINKER CONTROL

The sinker action is controlled through the agency of the catch-bar, catch-bar arms 22, 23, rocking shaft 21, catch-bar levers 20, and rollers 18, from cams on the main camshaft 6. The rollers 18 have a set-screw adjustment, so that any regular wearing of the cams may be compensated by roller adjustment. In a like manner the other rollers have also set-screw adjustment.

In order to release the catch-bar from the slots in the sinkers and dividers during the loop formation a vertical movement is given to the catch-bar at the completion of each course. For this purpose the catch-bar arms 23 have extensions 24, which are lifted through the agency of the vertical rods 25, rocking shaft 27, lever 26, and rollers A, from cams on the main shaft 6. At the completion of the loop formation and division the catch-bar is allowed to fall so that the sinkers and dividers make a collective movement during the rest of the course.

The narrowing mechanism is carried from the rocking shaft B by means of arms C. Brackets are attached to the front ends of these arms, which carry the shaft D. At intervals on the latter other brackets are placed in which slide the narrowing rods F, G, which carry the narrowing fingers. The movement of the narrowing mechanism is a simple oscillating one about the rocking shaft B, and is obtained from the main camshaft through the agency of the vertical levers E attached to the shaft D. During the knitting course the rollers of the levers E rotate idly on a circular flange so that no movement is given to the narrowing mechanism.

The bobbin stand P and snapping mechanism are arranged around the vertical brackets N. The yarn J is drawn from the bobbins H, and passes through guide holes in the bars Q, over wicks in the lubricators K, under the snapping springs L, which are attached to brackets carried on the snapping rod R. This rod is oscillated through the agency of the connect-

ing rod S from a cam on the main shaft. During the loop formation the snappers L are held away from the yarn by the front rod M so that the yarn may pass freely through the thread guides to the sinkers, but when the draw has been completed the rod R is oscillated in an upward direction so that the yarn is trapped and lightly held between the snappers and the brackets. In this manner the yarn is held taut so that it will pass correctly between the needles and sinkers when they are returned to their position after casting-off or narrowing. This ensures good selvaging, an important point in the making of wrought goods.

MANAGEMENT, CARE, AND ADJUSTMENT

Advantages will be gained by keeping a machine knitting from similar yarns as far as is consistent with the orders obtainable. Changing from one yarn size to another often necessitates overhauling and adjusting the machine, as also does changing the character of the yarn used. Different classes of yarns require different adjustments of carrier-rod stops and snappers if good selvages are to be ensured. These machines are noted for their longevity of wear if kept in good condition by careful attention to details. A good operator will keep the needles, sinkers, and points as straight as if the frame were new.

The alignment of the needle bars, catch-bar, and jack-bars is of the utmost importance. Sometimes, in case of a mishap, the sectional needle bars may become disturbed, and before restarting, the machine should be turned by hand until the needle heads are just disappearing between the sinkers. If the needle bar is level, the needle heads will become invisible as a whole; if not level one side will disappear first.

In keeping the sinkers, knocking-over bits, needles, and points in good order, the knocking-over bits should be lined up to the sinkers and the points adjusted so that they pass between both sinkers and knocking-over bits without any sideway deflection.

Finally, the needles may be pliered to the points. It is useless pliering needles to wrongly set points, as both needles and points must work between the sinkers and knocking-over bits without visible contact.

It is better to avoid the use of too much drawing-off weight, as this has a tendency to pull the selvage loops and needles inwards so that the points do not cover properly in the fashioning operations.

Tucking and throwing-off at the selvages may be due to incorrect vertical setting of the needle bar, as well as to incorrect horizontal positioning. If the complete loop is not below the beard when the latter is closed, a tuck stitch will result, as the loop cannot be cast off. If the new loop is below the beard, the stitch will be cast off at the same time as the finished loop. These imperfections may not necessarily appear all across the fabric, as it is evident that the new loops are only directly connected to the finished loops at the selvages from which the carrier guides are drawn, and it is here that the results of imperfect adjustment will be made manifest.

Each slur-cock should be carefully adjusted to push the sinker through the agency of the jack precisely up to the bar on the sinker plate, the catch-bar then adjusted to take the dividers up to the same bar, and the cam timed so that the catch-bar immediately drops into the sinker slot. Wrongly set catch-bars will cause the sinker loop to be greater than the divider loop or vice versa, and if badly set, will not fall into the slots at all.

It is necessary to avoid the use of needles which vary slightly in length of beard, thickness of the wire, or needles possessing opened-out eyes. All needles should be cast out exactly the same length, and the beards set so that the yarn can pass safely under them. Partially closed beards will split the yarn and cause pin-holes, or throw stitches off completely. Raised beards will mispress and cause tuck stitches. Beards not parallel with the needle stem will be pressed outside the needle, and also cause tuck stitches as well as bent sinkers, while in time the beard will be sheared off.

To produce good selvages the carrier guides must be set to suit the character of the yarn used. The snapping springs must be examined, and their relative strength tested by the feel. All guide holes through which the yarn passes should be clear of lint and be perfectly smooth. The bobbin should occupy an exactly central position with reference to the first guide hole, so that no drag caused by the yarn pulling off hard on one side of the bobbin occurs, for if the yarn does not run freely, cuts will result. On the other hand, tensionless yarn may cause drop stitches through the necessary long lead of the thread guide. There should be no end play in the screw-box connection to the narrowing fingers. Hard yarns should be lubricated during winding as well as during knitting, but yarns lubricated in the winding process should be worked immediately, or drag is bound to ensue.—*The Textile Manufacturer, Manchester, England.*

POINTS ON SILK HOSIERY.

PURE DYE.

The almost invariable method of manufacturing seamless silk hosiery is to knit the raw silk. The goods are then finished by first boiling to remove the gum from the silk, then bleached or dyed. A little sizing is generally used to harden the silk, this disappearing on subsequent washings. As no loading or weighting is used in this grade, it is termed "pure dye." The method of knitting is very simple, it being almost as easy to make "pure silk" hosiery as to make mercerized cotton goods. Were it not for the tendency for pure dye hosiery to rough up when subjected to the slightest chafing or to catch on almost everything it touches, it would outwear the higher grades of silk stockings.

Pure dye hosiery can be readily distinguished by burning a strand of the silk. It will burn away instantly like a human hair unless it has been subjected to mineral weighting, in which case the strand will remain intact in the form of ash which crumbles when handled. The heavier the weighting the slower will be the burning and the greater the amount of ash. When weighted silk is applied to a flame, the ash becomes red hot and blackens again without crumbling when removed.

Seamless hosiery machines knit pure silk in the gum without special preparation, but on full fashioned machines the silk must first be moistened. Knitting dry silk on fashioned machines invariably results in a poor fabric because of the wirey nature of the thread. The loops run together and cause uneven knitting. There is little difference in the results obtained by applying the moisture by rewinding over a leather roller and by drawing the silk thread directly through clear water as it is being knit.

"Pure dye hosiery" sounds good, but in reality it is, of the three distinct grades, decidedly the inferior. Pure dye goods would not be made in such quantity if it were possible to weight the silk in the stockings easily without affecting materially the cotton in the goods.

"DIPPED" SILK.

This grade of silk hosiery comes next in respect to quality and the difficulty in handling during the processes of manufacture. It is made from silk that before being knit has been boiled off and weighted, but not dyed. The operations on silk treated in this manner are more difficult than on gum silk. The moistening must be more carefully carried out and the handling of the fabric in all operations up to the dyeing requires more care. When the gum has been removed from silk the tendency for running stitches and the

liability of seriously damaging the goods increases materially.

Moistening makes gum silk slippery and causes the loops to knock over more easily. This advantage is lost when the gum is removed before knitting. The weighting of the silk adds to the difficulty in making the needles pull the new loops through the old ones. An excessive amount of moisture makes the silk stick to the needles. Even the moisture in the air at times settles on the needles of a full fashioned frame, causing difficulty in clearing the loops when working weighted silk and making a "cloudy" fabric.

If the silk becomes a little dry, partial tucks form, the frictional electricity drawing and splitting the silk when passing over the heads of the needles. Movable, knocking-over bars are a great help in overcoming these difficulties, as they provide a constant and not too rigid tension on the yarn during the moving of the new loops over the needle heads. Machines require closer adjustments on this kind of silk knitting. Under favorable conditions the production can be as large as on gum silk. As all operations are performed with undyed materials, the highest skill is not essential. When completed, this grade of hosiery is dyed in the same manner as gum silk except that it does not have to be boiled off. Weighted silk differs from pure silk in its affinity for coloring matter, and does not blend as well with the cotton parts. This hosiery is generally termed "dipped."

Because of the weighting there is less tendency to rough up when worn than is the case with pure dye hosiery. The finished product has a heavier and more solid body than pure dye hosiery, and does not become fluffy and sleazy on laundering as is the case with pure dye goods.

INGRAIN HOSIERY.

The best grade of silk hosiery is called ingrain. This is knit from silk that has been boiled off, weighted and dyed in the yarn. Only knitters of great skill and long experience are successful in operating full fashioned machinery on ingrain work. The difficulties in making dipped hosiery are several times multiplied in producing ingrain goods. Besides having the mineral weighting in the silk, there is also the color or dye to contend with together with the scroop which is always acid and adds to the difficulty of obtaining good knitting. On light colors, scrupulous cleanliness must be observed. The winding preparation of silk, correct moistening methods and constant attention required in order to keep the silk and cotton in the right condition for good work call for men of long experience who have grown up in the business.

Ingrain silk hosiery is generally looped with white thread or silk, this being one of the best means of distinguishing ingrain from dipped hosiery if the colors are solid. There are, however, all silk goods which are knit in the gum and afterwards boiled off, weighted and dyed in the piece. Such goods have even been relooped with white silk, but these goods do not stand out as a specific grade.

MONACO.

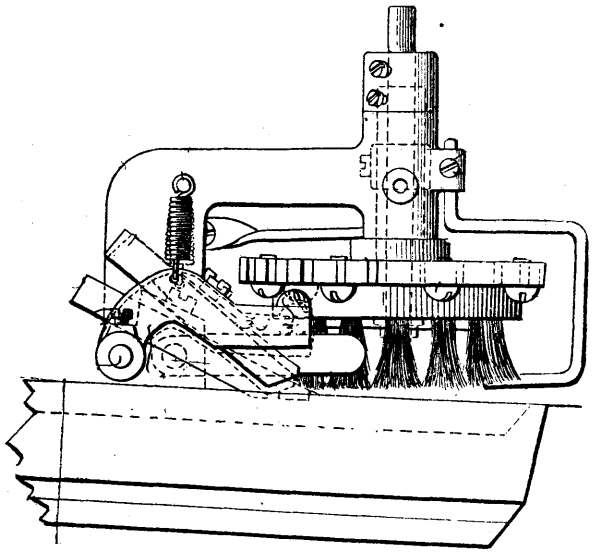
INDUSTRIES WANTED.

A joint industrial development campaign of countrywide magnitude for the Petersburg-Hopewell district in Virginia, is to be undertaken by the business men and Chamber of Commerce of that section and the Du Pont Chemical Company. This district is the site of the famous war plant of Hopewell where more than a billion pounds of guncotton were turned out for the United States and the Allies during the four years of the world war.

According to arrangements now made, the Du Pont Chemical Company, owner of the property, has joined hands with the business interests of that section and will bring to the attention of manufacturers throughout the world, the advantages of the location of this great war plant and the surrounding district for manufacturing purposes.

ATTACHMENT FOR LOOPING MACHINES.

The illustration shows an attachment for a looping machine, recently patented, and designed for closing the gap in the toe portion of a seamless stocking. The object of the device is to cut the chain thread made by a looping machine at the vacant intervals where no fabric is attached to the looper points for the needle to sew. Much time is lost by the operator in breaking this chain by hand, and frequently there is a long length of chain left inside of the stocking.



LOOPING ATTACHMENT.

A rotary brush is attached to the lower end of vertical shaft, and secured to the top of brush is a ratchet plate, which is provided with teeth, secured to the under face of the ratchet plate, and evenly spaced around the same, is a plurality of round-headed screws, as shown.

A single round-headed screw is carried near the inner end and upon the top of the cutter-carrying bracket. This screw is adapted to be engaged by the heads of the screws carried by the ratchet plate, as the screws come in engagement, they will ride over each other, but by reason of the cutter-carrying bracket being able to swing downward, the bracket will be forced downward, as the heads of screws 9 pass over the head of screw 38, causing the cutter blade to move down for cutting a thread that is moved by the bristles of the brush in between the blades of the cutter.

A coil-spring is secured, at its lower end, to the bracket, and at its upper end to the outer end of a horizontal fixed pin. This spring exerts an upward pull upon the cutter-carrying bracket for holding the head or extension of the screw in the path of the heads of screws, so that at certain intervals, by reason of the heads of screws coming into engagement, the movable blade of the cutter is operated for causing the cutting action for severing the strand.

RECENTLY BROUGHT OUT.

Suede Finishing Machine for Glove Fabrics. Tomlinsons, Ltd. A machine for producing a suede finish on warp-knit fabrics for gloves and on other fabrics. It is equipped with six raising rollers, dust proof ball bearings, and has a very high production.

Peroxide Bleaching Plant. Guthrie & Co., chemical engineers, Accrington, Eng'and. A process of bleaching with peroxide of sodium, which, it is claimed, gives results greatly superior to those hitherto obtainable. All metallic contact is avoided, the pumps used being made of ceramic material.

Wool Washing Machine. John Petrie, Ltd., Rochdale, Eng. An improved wool washer, which can be run continuously without stopping for washing out the tanks and changing liquors. This result is accomplished by means of a spiral conveyor at bottom of the tank.

Dyeing, Bleaching and Finishing

THE PROCESS OF CARBONIZING.

BY A. GANSWINDT.

Another machine for drying and carbonizing loose stock, shown in Fig. 17 and 18, is built on the same principle as machine last described. The stock is carried by endless aprons through a single chamber. The first model, Fig. 17, is built entirely of iron and provided with a short feed apron. The second model, Fig. 18, is enclosed in mason work and

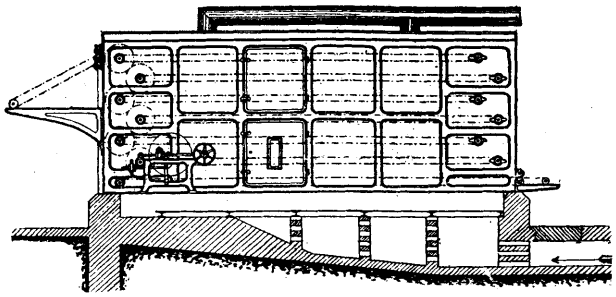


FIG. 17.—CARBONIZING MACHINE.

has a long feed apron. Each model is built with from seven to nine aprons. The operation of the machine will be clear from the illustration without further explanation.

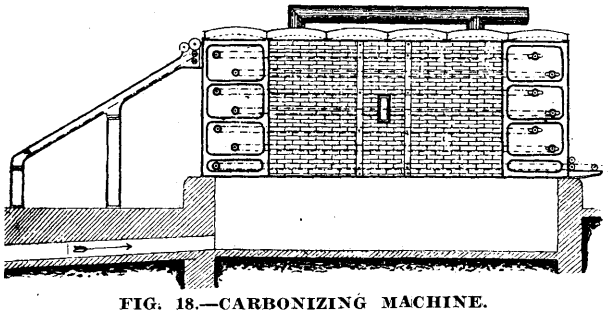


FIG. 18.—CARBONIZING MACHINE.

The Lekeux carbonizing machine, Fig. 19, is based on the principle of a traveling apron. It consists of balanced shelves F attached to a chain work which moves up and down in an enclosed chamber. These shelves take the stock

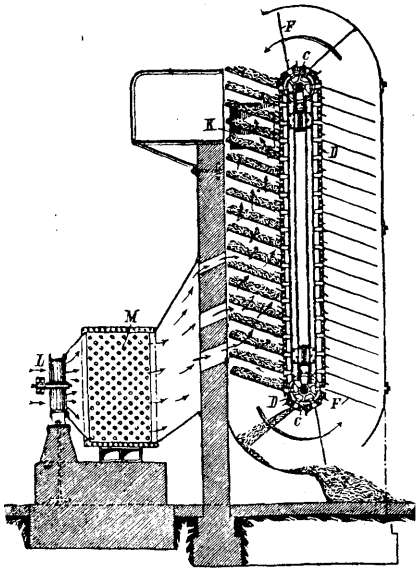


FIG. 19.—CARBONIZING MACHINE.

at the top of the chamber and carries is slowly down to the bottom, where the material is automatically discharged. During this passage a current of air generated by the fan L and heated by the heater M passes upward through the stock and escapes through the opening K. This current of air is divided so that it is strongest at the bottom of the carbonizing chamber and weakest at the top. The shelves are carried by the chain D, which passes over the sprocket wheels C.

A special machine for carbonizing with a mixture of muriatic acid gas, coal gas and air forced through a revolving drum in which the material is placed will be described in detail when we take up the carbonizing of rags.

THE ALKALI BOIL.

BY LOUIS M. TAILFER.

There are two methods of boiling-out cotton goods. The older process is done in open boilers, using a large quantity of lye in relation to the weight of the goods in view of the necessity of keeping the cotton submerged. Later closed kiers were adopted in order to keep the heat in better and to boil under pressure at a higher temperature. The lye is circulated by means of steam injectors which heat the lye but at the same time dilute it. To obtain a more active circulation centrifugal pumps are used. The quantity of lye used is very large in order that the material shall be always immersed.

About 1885 Mather and Platt recommended another method of boiling-out. This consists in using a relatively small quantity of lye, but much more concentrated, and giving it a forced circulation through the goods. They invented a system of kiers which bear their name. They have a large output and give excellent results.

Koechlin also suggested a process using a small quantity of lye. Thies worked out a similar process but with a variation, and made a very complete study of the phenomena of boiling-out with a short lye.

The Thies process differs from those already known and particularly from Koechlin's in the fact that the treatment with carbonate of soda and that with caustic soda are given separately. The result of this is that the caustic lye can be used at a temperature and degree of concentration hitherto unattainable because there were no means of protecting the cotton fiber, whereas in the Thies process this preventive action is furnished by the preliminary treatment with soda and steam. By this preliminary treatment the use of very concentrated caustic lye is rendered possible and without danger to the fiber. It has an energetic action of short duration. Moreover, the use of boiling caustic soda lye diminishes the mercerizing effect on the fiber and the contraction that would be the result of the use of cold lye. A third distinctive feature of the process of Thies as compared with preceding methods, and in particular that of Koechlin, is that the action of the boiling caustic lye is kept up almost constantly during the boil. Thus the tendering action of the lye is prevented by its saponification as a result of drawing off the steam in the course of the operation. This evacuation of the steam not only gives a rapid circulation but keeps up the concentration of the lye. The process is in four complementary stages:—

(1) Separate treatment of the fibers with alkalis (carbonate of soda).

(2) Treatment with steam after No. 1.

(3) Treatment of the fibers, after they have been freed from imprisoned air, with boiling caustic soda lye.

(4) Concentration of the caustic soda lye by means of a special device giving constant circulation.

The actions of these successive steps complete the process reciprocally, and are justified by the following considerations:

(*a*) The fibers contract in cold caustic lyes according to their degree of concentration, and if the lye is very strong mercerization results. This contraction does not take place in the boiling solution. In the cold bath even diluted caustic soda solutions act in the same way in filtering through the layers of cotton. These are not mercerized by the boiling lye.

(*b*) By the presence or introduction of air into the kier, or if it is imprisoned in the fibers or introduced with the steam the boiling lye has a destructive action on the fiber in the presence of oxygen.

(*c*) The alkalies precipitated on the fiber by the alternate action of caustic alkali and alkaline carbonate cannot be removed by boiling water and steam. They cling to the fiber during steaming and give strong indications of catalytic action.

(*d*) By greatly diminishing the volume of the lye a uniform circulation is set up if the lye and the steam traverse the material rapidly and together and can be separated below the goods.

The liquids collect by gravitation in the lower layers of the goods and are drained out. Only a pump can put these filtering liquids into circulation, whereas the boiling liquids cannot be aspirated because of their vaporization.

The rapid circulation of the lye is set up by the extraction of the steam at the bottom of the kier and by the removal of the lye by means of a pump, and by the addition of lye at the top of the kier over the goods under treatment the uniform division of the lye is thus obtained and also the mixed circulation of the lye and the steam and the uniformity of their action.

In the boiling kiers the fibrous materials impregnated with liquid fill a space which is four times that of their specific bulk. For instance, if the density of cotton is 1.5 then 1,500 lbs. occupy a volume of 300 British gallons of which 300 gallons is liquid. In the old processes of boiling-out therefore it needed 300 gallons of lye for 1,500 lbs. of cotton, and if for instance 50 lbs. of Solway soda were used hardly a one per cent. solution was obtained. In the Thies process only 50 to 60 British gallons of lye were used, which by boiling with resin soap gives a concentration corresponding to a 6 to 7 per cent. soda solution.

For the caustic soda boil and steaming a cylindrical autoclave is used, similar to those ordinarily employed for boiling under pressure. The material rests on a perforated false bottom. Over this the cylinder slightly diminishes in diameter and the height of the part over the false bottom is about a quarter of that of the part below.

At the top of this smaller part is a pipe pierced with holes and this communicates with the atmosphere or with a condenser. Thus the steam from the lye which has gone through the goods is evacuated, whereas the lye falls to the bottom of the kier. It is drawn from here by a pump with a reheater and is forced again into the kier over the material. The reheater is a vertical tube containing a steam coil which heats the lye without weakening it. This arrangement quickens the circulation because all the pressure is from the top of the kier and the liquor falls to the bottom by gravity, by the aspiration of the pump, and by the depression caused by the escape of steam.

The saponification of the fats and resins in the cotton is effected by the energetic circulation of the lye at a high temperature. In proportion as the saponification proceeds its detergent action is weakened. The arrangement of the the strength of the lye is diminished, and in consequence kier remedies this as the steam is drawn off continuously and the lye is thus concentrated.

As an example take the treatment of printing cloths. The dry fabric is steeped in a solution of acid equal to its weight: 10 parts by weight sulphuric acid, 60 per cent., or 16 parts hydrochloric acid, 30 per cent. and ½ part hydrofluoric acid, 75 per cent.

The goods are left in this solution for four hours, then steamed for half a minute and then washed in the open washer. They are next given a bath of soda, one-half per cent., at 122° F., and left in this bath twelve hours or over night. For this bath old saponified lye which has served for boiling-out under pressure can be used.

If the goods are very hard, for instance if they are loaded with pectic matters, this operation is repeated several times. In the washing machine 1 part of chloride of magnesium is added per 1,000 20,000 of water.

The pieces are whizzed so that they retain their own weight of water and are put into the kier with a sufficient free space left above them. The lid is closed down and the steam is turned on from the system of pipes in the reheater. This treatment is with the aim of bringing the goods to a temperature of 212°, and its duration depends upon the capacity of the kier. It may require two hours and a half. The water and the air are drawn off from time to time at the bottom of the kier. In this way the material is well prepared; it is free from air, spongy, and can be uniformly impregnated with caustic soda.

The boiling lye is forced in so that all the material is evenly impregnated. For 1,500 lbs. of cotton 50 lbs. of Solway soda are used, which mixed with quick lime give 60 British gallons of caustic soda lye. Before introducing this mixture 10 lbs. of rosin are put in for the purpose of saponification. The lye is heated by means of the steam coil in the reheater and circulated, keeping the temperature at about 260° F. This circulation and reheating is kept up for about five hours, and by constantly expelling the steam the lye becomes more and more concentrated. Then the goods are washed in boiling water.

The chloring is done with a third of the chloride of lime hitherto necessary. The goods are then washed, soured and the process finishes with a thorough washing.

The process and the arrangement of the kier allow a very strong caustic lye to be used without fear of mercerizing or tendering the cotton. By this means chemically pure cellulose is obtained. The preliminary treatment with acid is not absolutely necessary, it can be suppressed in the case of easily bleached goods. The addition of a little hydrofluoric acid makes the action more energetic. By steaming the goods treated in a cold acid bath an economy in acid is effected. The acids destroy the inorganic compounds in the fiber, and if these are not present this step of the process can be left out, leaving any souring for the final operations.

In this case the first step is the treatment with alkaline carbonate or a weak lye which is sufficient to free the goods from lightly adhering or easily soluble matter. Moreover the alkaline carbonate not being easily soluble remains in the fiber in spite of the washing, and on the steaming which precedes the caustic soda it absorbs the oxygen from the air imprisoned in the fibers, and the goods thus freed from air are able to stand the strong lye.

To sum up, the ordinary process is reversed; a weak lye is first used to remove the easily soluble matters, followed by a strong lye to remove the remaining matters, and this is a more rational procedure.—*L'Industrie Textile.*

RECENT TEXTILE PATENTS.

Braiding-machine. 1,305,490. A. Peterson, Boston, Mass.

Compound fabric. 1,306,518. J. N. Briones, Cuenca, Spain.

Cloth-reed, Collapsible. 1,307,175. F. T. Bailey, Dudley, Mass.

Cloth-measuring machine. 1,303,971. L. L. Scott, St. Louis, Mo.

Cloth renapping and refinishing machine. 1,304,281. E. J. Dunklee, Hackensack, N. J.

Cloth-cutting machine. 14,654. A. Rubin, St. Louis, Mo.

Drying and conditioning machine. 1,304,645. T. Allsop and W. W. Sibson, Philadelphia, Pa.

Fabric, Apparatus for impregnating fragile. 1,306,650. E. Weinheim, New York.

Fabric-treating machine. 1,306,29. H. M. Dudley, Philadelphia, Pa.

Fabrics having the property of invisibility, Production of. 1,306,213. F. Cochrane, Cheadle Hulme, England.

Fiber-treating device. 1,304,862. H. M. Dudley, Philadelphia, Pa.

Fiber-treating device. 1,304,863. H. M. Dudley, Philadelphia, Pa.

Fabric and making same, Double-pile. 1,307,008. G. F. Hutchins and G. Grossland, Worcester, Mass.

Fabrics or the like, Seam-detector for. 1,306,713. F. A. and W. F. Papineau, Webster, Mass.

Fiber-bearing plants, Process and apparatus for treating. 1,307,250. L. N. Gillis, Washington, D. C.

Fabric-cutting machine. 1,305,480. H. Maimin, New York.

Humidifier. 1,305,943. R. D. Smith, Arlington, Mass.

Humidifier. 1,305,945. W. G. Smith, Scarsdale, and J. P. Lisk, Brooklyn, N. Y.

Humidifier apparatus. 1,305,944. R. D. Smith, Arlington, Mass.

Knitted fabric body. 1,305,446. G. Davidson and H. C. Doctor, Fort Wayne, Ind.

Knitting-machine latch-opener. 1,303,823. R. W. Scott, Boston, Mass.

Knitting-machines, Beard-opener for spring-beard-needle. 1,305,575. F. Wilcomb, Norristown, Pa.

Knitting fabric sections and making fabrics having transferred sections, Machine for. 1,306,523. W. H. Childrey, Haw River, N. C.

Knitting-machine. 1,306,321. J. Waterfield, Providence, R. I.

Looms, Box-operating mechanism for. 1,302,670. J. T. Kennedy, West Patersonborough, N. J.

Looms for weaving pile fabrics, Pile-cutting device for use in. 1,303,620. A. Veluard, Philadelphia, Pa.

Looms, Shuttle for side-motion feeler. 1,303,583. D. Osgood, Hopedale, Mass.

Looms, Stop-motion for. 1,307,012. H. Le Doux, Worcester, Mass.

Looms, Yarn-feeding mechanism for. 1,307,241. B. A. Clark, Slocum, R. I.

Looms, Filling-end-extracting mechanism for. 1,303,886. H. H. Gove, Biddeford, Me.

Looms, Shuttle for side-motion feeler. 1,302,629. T. F. Brazell, New Bedford, Mass.

Looms, Picking apparatus for weaving. 1,306,190. M. T. Pickstone, Hampstead, England.

Looms, Reed for weaving. 1,306,189. M. T. Pickstone, Hampstead, England.

Loom, Pile-fabric. 1,304,879. H. J. Hope, Sanford, Me.

Loom for weaving pile fabrics. 1,305,373. G. Koch, Paterson, N. J.

Loom Picker-stick ch[illegible] 1,305,799. J. W. Herbert and J. A. Andrews, Biddeford, Me.

Puttee and making the same. 1,307,235. J. Boyd, Clonbur, Ireland.

Picker-strap. 1,304,764. M. B. Griffin, Pascoag, R. I.

Spinning Machines, Means for stopping the delivery of roving in. 1,304,610. P. Sharp, Perth, Scotland.

Spinning-mules, Ease-up motion for the tension-fallers of. 1,304,664. J. Davidson, Toronto, Ontario, Canada.

Spinning or winding machine. 1,304,893. H. A. Leonard, Hopedale, Mass.

Spinning-rolls, Calendering machine for. 1,304,582. S. J. McCaughrin and E. W. Bullard, Birmingham and Anniston, Ala.

Spinning imitation-mohair yarn. 1,303,302. W. R. D. Hall, Narborth, Pa.

Thread-spinning mechanism. 1,302,626. B. L. Bloom, Brooklyn, N. Y.

Twine-holder. 1,307,062. A. E. Osterberg and G. A. Oberg, Norway, Mich.

Textile fabrics, Attachment for unravelling. 1,305,586. J. Brown, Philadelphia, Pa.

Thread-uniting machine. 1,305,706. E. F. Hathaway, Boston, Mass.

Union-undergarment. 1,306,771. J. K. P. Pine, Troy, N. Y.

Warp stop-motion. 1,307,022. J. Reagan, New Bedford, Mass.

Weft-replenishing mechanism. 1,307,024. E. H. Ryon, Waltham, Mass.

Weaving machine, Mat. 1,304,216. J. H. Stanfield, Muskegan, Mich.

Warp-replenishing machine, 1,304,875. E. F. Hathaway and C. Lea, Boston, Mass.

Woven pile fabric. 1,305,066. J. Coley, Worcester, Mass.

Warp-handling machine. 1,306,138. H. D. Colman, Rockford, Ill.

Warps, Machine for operating. 1,306,097. T. E. Bingham, Manchester, England, and E. D. Parker, Rockford, Ill.

Waterproofing fabrics. 1,306,274. J. E. Paquet, Montreal, Quebec, Canada.

Winding-machine, Spindle or holder for cones for. 1,306,256. H. Holt and A. Seeley, Rochdale, England.

Warp-uniting mechanism. 1,303,705. M. F. Field and C. D. Lanning, Boston, Mass.

Winding and measuring mechanism, Fabric. 1,305,740. J. Overbake, Cleveland, Ohio.

Yarn-tension device. 1,303,320. L. T. Houghton, Worcester, Mass.

Yarn-reclaiming machine. 1,302,906. H. E. Fish, Chicago, Ill.

Yarn-tension device. 1,303,202. L. T. Houghton, Worcester, Mass.

NEW PUBLICATIONS.

Cordage Fibers; by H. R. Carter; 107 pages 5½x8¼; John Bale, Sons & Danielsson, London; price, $1.50.

The volume deals with the cultivation and preparation for market of long fibers, the contents being arranged under the following heads: jute, soft hemp, manila hemp, sisal hemp, East India hemp, aloe and agave fiber, New Zealand hemp, ramie, rhea and China grass, coir, flax, some lesser known fibers, decortication, cotton, chemical characteristics of cordage fibers, physical structure of vegetable fibers as seen under the microscope.

An appendix contains an account of the Russian flax trade and the cordage fibers of Queensland, also directions for distinguishing fibers.

Cotton; by George Bigwood; 199 pages 4¾x7¼, illust.; Henry Holt & Co., New York; $1.60.

This is a general sketch of cotton and the cotton trade, and has been made as free from technicalities as possible. Nevertheless, the technical man, as well as the general student and reader, will find in it much valuable information. The subject is treated under the following heads: History of the Cotton Plant; The Development of Spinning; The Cotton Fields; Triumph of Mechanical Invention; Cotton Growing under the British Flag; Classification of the World's Crop; Modern Spinning and Weaving; "Where Merchants most do Congregate"; Gambling in Cotton; Cotton Fabrics; An Art Manufacture; Cotton Organizations and Strikes; A General Utility Plant.

Application of the Coal Tar Dyestuffs; by C. M. Whittaker, B. Sc.; 210 pages 5¼x8½; D. Van Nostrand Co., New York, $3.00.

The author of this book was for seventeen years head of the experimental dye house of Read, Holliday & Sons, Ltd., Huddersfield, Eng., now British Dyes, Ltd., in which position he was brought in contact with the practical details both of the manufacture of dyestuffs and their practical application in the industries. The extensive and valuable knowledge thus gained has enabled him to write this book, which is adapted for the dyer, chemist and student. The contents are arranged under the following heads: General Survey of Dyeing; The Various Uses of the Basic Dyestuffs; The Application of the Acid Dyestuffs; The Turkey-Red Industry, and other uses of the Alizarine Dyestuffs; The Application of the Direct Cotton Dyestuffs, including those which develop on the fibre; The Azo-coloring Matters and their special use in Dyeing; The Properties of the Resorcine Dyestuffs; The Application of the Sulphur Dyestuffs; The Application of the Vat Dyestuffs; The Dyeing of Union Materials, including Garments; Colors produced on the fibre by the oxidation of Coal Tar Products; Other uses of Coal Tar Dyestuffs; Dyestuffs other than Coal Tar Dyestuffs still in use; The Valuation and Detection of Dyestuffs.

DRY DYEING.

Dyeing in gasoline solution is a process that comes under the general head of dry dyeing. This is not a new process, but has been in use in one form or another for many years. The solvents chiefly used are: 1. Alcohol. 2. Benzine, Gasoline and Benzol. 3. Carbontetrachloride, tetrachlorethane, etc.

Colors are selected which dissolve in these solvents with or without addition of benzine soap, acetic acid, etc., and the fabric is worked in the color bath until saturated, and is then whizzed and dried.

Dry dyeing is used for dyeing delicate fabrics and other articles which would suffer through the action of water. Light tints only are produced to any extent.

Fire danger with dry dyeing is about the same as with dry cleaning. Where carbon tetrachloride, or tetrachlorethane are used, alone, the fire risk is negligible.

Mixtures of the latter oils with 25 to 35 per cent. of kerosene, gasoline and benzol can be made to reduce the cost of dyeing. These mixtures are very much less inflammable than gasoline, benzine or benzol alone, and if handled with a reasonable amount of care do not constitute a serious fire risk.

FAST COLOR.

THE ART BRAID CORPORATION.

Michael Gerson has become interested in the Art Braid Corporation, 21 Bond St., New York, and will act as manager of that company. They manufacture braids, fringes, tassels, ornaments, passementrie and novelties. The Art Braid Corporation operates 10 flat knitting machines, one jacquard and twenty-four flat and soutache braiding machines. They make a specialty of tinsel thread and knitted and braided trimmings and novelties, in gold, silver, antique and steel varieties. Mr. Gerson is a thoroughly practical manufacturer and a valuable contributor to TEXTILES. We wish him success.

WITH ATLANTIC DYESTUFF CO.

C. S. Fuller, of Manchester, N. H., has joined the sales force of the Atlantic Dyestuff Company, and will visit the textile mills located in the Northern New England territory. Mr. Fuller is a graduate of Bowdoin College, and has for many years been connected with the Amoskeag Manufacturing Company. He will make his headquarters at the Boston Office of the Atlantic Company, continuing his residence in Manchester.

BRITISH DYESTUFFS.

A Central Importing Agency has been formed for controlling imports of dyestuffs into the United Kingdom. Except in the case of German dyes, the Agency will now undertake purchases of dyestuffs abroad on behalf of consumers, but when it is desired to make purchases direct or through recognized merchants goods will merely require to be consigned to the Agency or the account of a particular consignee and the shipping documents made out accordingly.

BUSINESS LITERATURE.

Bobbins, Spools, Skewers: The David Brown Co., Lawrence, Mass.

A finely illustrated and most interesting catalogue of bobbins, spools, skewers. The illustrations show a speeder bobbin with metal shield top and bottom, 6" to 12" traverse; a speeder bobbin, which is enameled any color; a slubber bobbin, with steel ring top and bottom, and suited to any frame; a speeder bobbin with a special head, also warp, filling, twister and automatic loom bobbins of various kinds. There are also illustrations of cap spinning, cotton braider, and duck filling bobbins. A large cone knitting bobbin, a variety of spools, a special worsted cone, a bottle type knitting bobbin, winder rolls, shuttles, etc., are also illustrated.

Loom Picker. R. G. Pierpont, Latchford, Warrington, Eng. An improved picker called the "Vespa," in which a cushioning medium, consisting of a pad of chrome leather, is introduced to soften the impact between the picker and shuttle. The claims are greater durability of the picker and reduction of filling waste.

THE JENKS BUBBLER.

The H. F. Jenks Co., an old and reliable Pawtucket, R. I., concern, has lately perfected and placed on the market what is called "the Jenks Bubbler," which enables manufacturers to have an absolutely sanitary drinking system for employees at a minimum of cost.

The accompanying illustration shows how the bubbler is attached and used, in connection with sinks. A peculiarity of the bubbler is that squirting is done away with and there are no springs or anything else to get out of

SHOWING HOW JENKS' BUBBLER IS USED.

order. The flow of water is regulated as desired. The bubblers are made in bronze and nickel-plate.

The bubblers are carried in stock by large numbers of plumbing houses and they may be ordered through them or direct from the H. F. Jenks Co.

The same bubbler is used on a variety of drinking fountains, also made by the same company, which is pleased to send illustrated circulars on request.

The H. F. Jenks Co. has made a specialty of drinking fountains for a great many years, and thousands of school houses, public buildings, hospitals, etc., are equipped with its apparatus. Inquiries simply addressed to the company at Pawtucket, R. I., will receive prompt attention.

MR. DUFFY'S LIBERALITY.

George E. Duffy, president of the George E. Duffy Manufacturing Co., Worcester, Mass., has presented Dartmouth College with $5,000, to be used for scholarships. Boys in Franklin, N. H., Mr. Duffy's native town, and Worcester, in which city Mr. Duffy has long been a prominent and successful business man, are to receive the scholarships.

U. S. HOFFMAN CO.

The United States Hoffman Machinery Co., Syracuse, N. Y., has awarded contracts for a new concrete and steel building, with 15,000 square feet of floor space, also for a separate power house. These additions are made necessary by the growth of the business.

I. LEVINSTEIN & CO.

I. Levinstein & Co., Inc., well-known in the dyestuff trade, have moved to attractive and commodious quarters at 287 Franklin St., corner of Batterymarch St., Boston.

The work of rebuilding the B. B. & R. Knight cotton mill at River Point, R. I., which was destroyed by fire a few months ago, is progressing.

BOGER & CRAWFORD.

Boger & Crawford, well-known spinners, bleachers, mercerizers of Philadelphia, have purchased a ten-acre plot of ground on Tioga Street, where they will soon erect a fine new plant, to consist of several steel and concrete buildings and a large power plant. The growth of this company has been phenomenal, they having begun business in a very small way only 11 years ago.

CHARLES MORNINGSTAR & CO.

Charles Morningstar & Co., Inc., well-known manufacturers of starch and sizing products, have removed their offices in New York City, to fine quarters at 349 Broadway.

JOHN CAMPBELL & CO.

John Campbell & Co., dyestuff manufacturers, 75 Hudson Street, New York, have lately opened a Boston branch at 33 India Street, opposite the Boston Chamber of Commerce. The office is in charge of Edward G. Quinn. A laboratory is to be maintained in connection with the Boston office.

WOOLEN AND WORSTED.

The Shirley Mills, manufacturers of reworked wool, with plant at Shirley and offices in Chelsea, Mass., are making extensive improvements.

Gumbinsky Brothers, of Chicago, Ill., have purchased a building and will equip it with machinery for the manufacture of woolens for men's wear.

The International Worsted Mills, of Methuen, Mass., have just completed their new weave shed, in which they will house sixty-four looms.

The Brickner Woolen Mills Co., Sheboygan Falls, Wis., are erecting an addition to their plant.

The Kinney Worsted Yarn Co., of Pittsfield, Mass., are constructing an addition to their plant.

The French Worsted Company, the Philmont Worsted Company and the Cumberland Worsted Mills are planning additions to their Woonsocket plants.

The La Porte (Ind.) Woolen Mills have let contracts for several considerable additions to the plant. There will also be a considerable addition to the picker house, practically doubling the present capacity.

A. Marshall, formerly with the Blackstone Woolen Mills at Chepachet, has become general manager of the U. S. A. Woolen Mill, spinning, weaving and finishing, Providence, R. I.

The Cranston Worsted Mill of Bristol, R. I., has recently installed machinery on the two upper floors of the Namquitt Mill.

The Huntington Manufacturing Co., of Westfield, Mass., have begun erecting an addition to their mill.

The James J. Reagan Manufacturing Co., Rockville, Ct., manufacturers of woolen goods, have commenced work on a three-story stone and wood story factory building, to be used for carding and spinning wool yarn.

The Uxbridge (Mass.) Worsted Co., manufacturers of worsted goods, have purchased the plant of the Brighton Worsted Co., North Uxbridge, Mass.

The Goodall Worsted Co., of Sanford, Me., will in the near future erect an addition to their plant.

The Rhode Island Worsted Co., of Stafford Springs, Ct., have begun the construction of a new weave shed, which will increase the weaving capacity 50 looms. The building will be erected in the rear of the present weave shed of the company. Other machines used in the manufacture of cloth will be installed by the company later.

The Bellingham (Mass.) Woolen Co. has had plans prepared for the erection a brick building and mill construction storehouse.

The American Metal & Waste Co., of Bessemer City, N. C., will in the near future erect a cotton waste mill and a warehouse.

OIL IN PLACE OF COAL.

The power boilers of the French River Textile Manufacturing Co., at Mechanicsville, Conn., are being equipped to burn oil rather than coal. The oil is to be sprayed under the boilers in much the same way as oil is used in some American naval vessels. Manufacturers in Eastern Connecticut are watching the change with much interest and there is to be a trial of the fuel very soon. It is claimed that a large saving will be effected, one report putting it as high as a saving of 400 tons of coal per month.

TEXTILES IN THE PEACE TREATY.

The full text of the Peace Treaty is such a portentous document that few appear to have observed that certain clauses relate to wool textiles, and it will doubtless be noted with interest what they declare. Under the heading "Economic Clauses," Article 268 states:—"Further during the period above mentioned (five years from the coming into force of the Treaty) the German Government shall allow the free export from Germany and the free re-importation into Germany, exempt from all customs duties and other charges (including internal charges), of yarns, tissues, and other textile materials, or textile products of any kind and in any condition, sent from Germany into the territories of Alsace or Lorraine, to be subjected to any finishing process, such as bleaching, dyeing, printing, mercerization, gassing, twisting, or dressing."

In the next Article, 269, there is a reference to wool. It states: "During the first six months after the coming into force of the present Treaty the duties imposed by Germany on imports from Allied and Associated States shall not be higher than the most favorable duties which were applied to imports into Germany on July 31, 1914. During a further period of thirty months after the expiration of the first six months this provision shall continue to be applied exclusively with regard to products which, being comprised in Section A of the First Category of the German Customs Tariff of December 25, 1902, enjoyed at the above-mentioned date (July 31, 1914) rates conventionalized by treaties with the Allied and Associated Powers, with the addition of all kinds of wine and vegetable oils, of artificial silk, and of washed or scoured wool, whether or not they were the subject of special conventions before July 31, 1914."—*Textile Mercury.*

ASBESTOS IN SOUTH AFRICA.

Since the outbreak of the war greater interest has been shown in the mining of asbestos in South Africa than ever before. Both blue and white asbestos is obtained in varying quantities, and it is believed that supplies are available for many years. Previous to the war Germany took most of the asbestos shipped from the Union. England and the United States are now taking the output of the partially developed fields, as well as that of newly opened areas. Small shipments are also being made to Japan. Shipments of asbestos mined in the Lydenburg (Transvaal) district have been made to America to extent of freight space available. Although reported to be unequal in quality to deposits in other districts, the Lydenburg fiber is of great length, in some cases reaching 18 inches, and mining conditions are exceptionally favorable, thus ensuring a large output at small working cost.—*Textile Mercury.*

SILK.

The Viscose Co. Roanoke, Va., will soon produce artificial silk manufactured from wood pulp on a larger scale. Plans for additional facilities include the erection of a one-story building.

The Rhode Island Silk Co., of New London, Ct., will in the near future erect a large factory.

It is announced that the Plymouth Silk Co., a broad silk concern, is to erect a plant at Taylor, Pa., which will contain 10,000 square feet of floor space.

A new silk mill is being erected for Thomas W. Bentley at Boyd and Gravity streets, Pittston, Pa.

The Athena Silk Co., of Honesdale, Pa., will install in a building which they are remodelling here 400 spindles and 40 to 60 looms. Broad silks will be manufactured.

The Jerico Silk Mill of Eaton, Pa., has purchased a building in which it will install a throwing plant and spinning machines.

The Hewesco Silk Co., of Shamokin, Pa., has been awarded a contract for the erection of a two-story building.

Books for the Textile Industries

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GENERAL SUBJECTS

Textiles

By Paul H. Nystrom. Gives an account of textile materials and the processes of manufacturing, including sources of raw materials, methods of distribution, tests for quality and construction, etc. Written for merchants handling textile products, schools and consumers of textiles generally. An unusually reliable work which will be found not only useful to those for whom it is specially written, but a valuable addition to the mill man's library. 335 pages, 5x7½; illustrated; cloth.
Price $2.00

Textile Design

By Fenwick Umpleby. A very instructive work, covering plain, double and three-ply cloths, pile fabrics and jacquard designs. Includes a chapter on cost finding for a cotton mill. 350 pages; 400 designs and illustrations; half leather.
Price $2.25

Textile Mechanics

By W. S Taggart. Explains in plain language and with the aid of excellent illustrations the mechanics of the various processes of the textile industry. It is intended as a preliminary course for students and is an excellent handbook for mill men, including managers, superintendents, overseers and mechanics. 117 pages, 5x8¼; 162 illustrations; cloth.
Price $1.25

Method of Determining Costs

By H. W. Nichols. Explains clearly a cost system for a cotton mill. Illustrated by an application of the method to a mill running on different styles of goods. 115 pages; cloth.
Price $5.00

Sizing Yarn

By H. Nisbet. A reliable book on a subject concerning which there is great need of information among mill men. Proper sizing of yarn means increased production, reduced cost, improved quality of goods and ability to get the best results from the lowest grade of cotton. Covers sizing ingredients, size mixing and boiling, recipes and useful formulas. 71 pages, 4½x7; illustrated.
Price $1.50

Textile Design

By Thomas Woodhouse and Thomas Milne. A very complete treatise on textile design. Nearly every important type of textile fabric is described and illustrated. Covers single, double, three and more ply cloths, damasks, pile fabrics, carpets, Turkish towelings, lenos, lappet and swivel fabrics. 509 pages, 4½x7; 307 illustrations embodying over 1400 designs; cloth.
Price $4.50

Soaps and Oils

By G. H. Hurst and W. H Simmons. The textile manufacturer finds in this book the information he needs about soaps and oils. Treats of the preparation, qualities and analysis of these materials. New edition carefully revised and enlarged. 188 pages; 11 illustrations; cloth.
Price $4.25

Silk Throwing and Waste Silk Spinning

By H. Rayner. Gives an account of silk throwing and the manufacture of yarn from waste silk. A useful book for the mill manager, overseer, student or user of silk yarn. 158 pages; 117 illustrations; cloth.
Price $2.50

Design and Color

By W. Watson Deals with textile design and color as related to single fabrics. Covers in great detail weave construction, color effects, weave and color combinations, the jacquard machine and jacquard fabrics. A handbook for the weaver, designer and student. An introduction to "Advanced Textile Design" by the same author. 349 pages, 4¾x7¼; 413 illustrations; cloth.
Price $2.75

Ramie (Rhea),

By H. A. Carter. Gives much valuable information on the ramie fiber and its manufacture into goods. Written for the manufacturer, merchant and planter. 140 pages; illustrated.
Price $3.00

Textiles

By Mary S. Woolman and Ellen B. McGowan. Written for the general student and consumer. Treats of the materials and processes of manufacturing, laundering of textile fabrics, hygiene of clothing and economy in purchasing and wearing clothes, including budgets for persons in different occupations and stations. 415 pages, 4½x7½; 136 illustrations; cloth.
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Cotton Mill Superintendent. 20 years' experience. Sheeting, drills and duck. Married. Age 45. Address Box 286, TEXTILES, 79 Milk St., Boston, Mass.

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Cotton Spinning Overseer. Eight years' experience as grinder and second hand, 4 years as overseer. White and colored from 8s to 60s. Age 37. Married. Address Box 205, TEXTILES, 79 Milk St., Boston, Mass.

Cotton Carder. Fourteen years' experience. White and colored yarns up to 40s. Age 39. Married. Address Box 212, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Carding. Four years' experience. Ginghams. Age 35. Married. Address Box 210, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Weaving. 6 years' experience. Automatic, fancy and plain looms. Fine lawn, umbrella, tickings, lenos, cottonade, flannelettes and denim. Age 45. Married. Address Box 297, "Textiles," 79 Milk St., Boston, Mass.

Overseer of Weaving. 22 years' experience. Plain and check work. Age 42. Married. Address Box 247, TEXTILES, 79 Milk St., Boston, Mass.

Superintendent. 32 years' experience as overseer of carding and 12 years' experience as superintendent. Plain weaves. Age 50. Married. Address Box 248, TEXTILES, 79 Milk St., Boston, Mass.

Hosiery Mill Superintendent or Hosiery Finisher. 26 years' experience on all kinds of goods except full fashioned work. Would accept a good position as boss finisher or general foreman. Age 44. Married. Address Box 233, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Card Room. 7 years' experience. Coarse yarns from No. 5 to 20. Age 34. Married. Address Box 255, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Weaving. 6 years' experience. Plain and fancy. Age 33. Married. Address Box 254, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Carding. 25 years' experience. Age 48. Widower. Address Box 300, TEXTILES, 79 Milk St., Boston, Mass.

Cotton Yarn Mill Overseer. Thirty years' experience. Two, three and four-ply yarns (30s to 90s). Age 50. Married. Address Box 214, TEXTILES, 79 Milk St., Boston, Mass.

Cotton Mill Superintendent. 20 years' experience. White and colored ginghams and denims. Age 42. Married. Address Box 203, TEXTILES, 79 Milk St., Boston, Mass.

Woolen Mill Superintendent. 35 years' experience on all grades of woolens, 3 quarter and 6 quarter. Cassimere melton uniform goods. Age 50. Married. Address Box 227, TEXTILES, 79 Milk St., Boston, Mass.

Cotton Mill Superintendent. Twenty years' experience. Hosiery and knitting yarn 4s to 60s. Age 42. Married. Address Box 201, TEXTILES, 79 Milk St., Boston, Mass.

Bleacher. 6 years' experience. Knit underwear. Age 25. Married. Address Box 269, 79 Milk St., Boston, Mass.

Hosiery Mill Superintendent. Five years' experience. Age 26. Married. Address Box 211, TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Weaving. 18 years' experience in weave room and 8 years as overseer. Checks, chambray and bedspreads. Age 36. Married. Address Box 294, TEXTILES, 79 Milk St., Boston, Mass.

Boss Knitter. Ten years' experience; knit underwear; age 33; married. Address Box 289, TEXTILES, 79 Milk St., Boston, Mass.

Hosiery Mill Superintendent. Eighteen years' experience; fine yarns; age 40; married. Address Box 290, TEXTILES, 79 Milk St., Boston, Mass.

Superintendent. Fifteen years' experience; any class of goods; age 46; married. Address Box 291, TEXTILES, 79 Milk St., Boston, Mass.

Superintendent of Cotton Mill. 9 years' experience overseer of carding, 18 years in mill. Hosiery and tire yarns, also weaving yarns. Age 36. Married. Address Box 295, TEXTILES, 79 Milk St., Boston, Mass.

Overseer or Fixer. Non-elastic narrow fabric looms. 12 years' experience. Address Box 256 TEXTILES, 79 Milk St., Boston, Mass.

Overseer of Spinning, Winding, Twisting and Spooling. 3 years, experience as second hand; 4 years as overseer; any class of goods. Age 27. Married. Address Box 305, TEXTILES, 79 Milk St., Boston, Mass.

KNITTING.

The Lehman-Williams Knitting Co., Peoria, Ill., has had plans prepared for the construction of a four-story and basement knitting mill, in order to provide for increased capacity.

Taubel Brothers, Cedar and Huntington streets, Philadelphia, Pa., manufacturers of seamless hosiery, will soon erect an addition to their plant.

An additional building has been purchased by the Sunshine Hosiery Company, Murfreesboro, Tenn., which will install machinery to double capacity.

The Sellers' Hosiery Mills, of Burlington, N. C., will erect a plant to replace its plant recently burned.

The West Branch Knitting Co., of Milton Pa., will install forty-five knitting machines when the addition to their plant is completed. They will manufacture women's hosiery.

The Rensselaer & Valatie (N. Y.) Mills have just completed the installation of new equipment.

The Rogers Hosiery Company, of Philadelphia, Pa., has recently installed 125 spring needle knitting machines for manufacturing fine gauge hosiery for women.

F. M. Boyd, of Johnston, S. C., is planning to build a hosiery knitting mill.

COTTON.

The Roxboro (N. C.) Cotton Mills will soon erect a mill construction addition and 30 cottages. The mill will have 10,000 spindles, with electric power drive.

The Georgia Cotton Co., of Macon, Ga., will soon begin operations in their new mill which has just been completed. The concern has installed 7400 spindles and 160 looms.

C. E. Webb and J. E. Sirrine, of Greenville, S. C., have purchased the Pelham Mill, a yarn mill of 10,000 spindles.

The Globe Thread Co., of Long Island City, N. Y., will in the near future erect a new building.

The Nightingale-Morse Mills, Inc., of Putnam, Ct., has awarded the contract for the erection of a new hydro-electric power house.

The Opelika (Ala.) Cotton Mills are contemplating doubling their capacity.

The Elk Cotton Mills, of Dalton, Ga., will erect an addition to their plant to furnish room for 2,200 additional spindles.

C. E. Neissler of the Pauline Mills, Kings Mountain, N. C., is planning to erect another cotton factory.

The Shelby (N. C.) Cotton Mills will erect an addition to their plant. This is to be two stories high, to accommodate 5,000 additional spindles, eighty looms and some additional carding machinery. Work is to start at an early date.

MILL NOTES.

The Providence (R. I.) Dyeing, Bleaching and Calendering Co. are erecting an addition to their plant on Valley street.

The Hemphill Co., 131 Clay street, Central Falls, R. I., are erecting additions to their machine shop.

WOOLEN AND WORSTED.

The Strathmore Worsted Company of Concord Junction, Mass., will in the near future open a branch plant which will run on two shifts, night and day, and employ forty to fifty operatives.

Thomas S. Pursel, Jr., and Dr. F. A. Wolf are to start a mill for the manufacture of woolen blankets and covers. Ten looms will be installed.

The Barnard Worsted Co. of Woonsocket, R. I., will in the near future erect a dyehouse and a boiler house on the rear end of the property on South Main Street recently acquired from the H. T. Wales Company.

Frank E. Fitzpatrick, wool specialist for the United States Department of Agriculture, is returning to the commercial wool business. He has just completed the selection and assembling of a comprehensive collection of wool samples composed of all the various kinds of wool produced in the United States and foreign countries, and shows the various grades, characteristics and conditions of raw wool.

The Bell Company, manufacturer of fancy worsteds, Worcester, Mass., has nearly doubled its space and will increase its force of operatives. Part of its new space is to be used for a twisting department. New English twisting machines have been installed. The old twisting plant in the Riverside Mills has been abandoned.

The Huntington (Mass.) Manufacturing Co., manufacturers of fine fancy worsteds, is proceeding with its plans for expansion.

The Star Worsted Co., 42 West Street, Fitchburg, Mass., will in the near future erect a storehouse on Sheldon Street.

PERSONALS.

Joseph Castleberry, formerly of the Manchester Cotton Mills, Macon, Ga., has accepted the position of overseer of carding at the Georgia Cotton Mill, No. 2.

L. A. King, formerly at the Erlanger Cotton Mill, Lexington, N. C., has been appointed overseer at the Monroe (Ga.) Cotton Mills.

R. H. Dallas, formerly at the Harmony Grove Mills, Commerce, Ga., has become overseer of spinning, twisting, winding and spooling for L. H. Gilmer Co., Millen, Ga.

B. W. Koontz has recently accepted the position of superintendent of the Bedspread Mill of the Carolina Cotton & Woolen Mills, Leaksville, N. C.

Jay Seelye, formerly boss knitter at the Eaton Rapids (Mich.) Woolen Mills, has accepted the position of assistant superintendent of the Reed City (Mich.) Woolen Mills.

O. J. Mooney is moving the New Way Knitting Co. from Williamston, Mich., to Ypsilanti. He is installing 100 additional new knitting machines. The product will be high-grade ladies' hosiery.

C. H. Tappin has taken the position of overseer of the weaving department at the Tilton (N. H.) Mills.

George W. Bieber, formerly of Springfield, Mass., has accepted the position of overseer of weaving at the North Adams (Mass.) Manufacturing Co.

MILL ADDITIONS AND EXTENTIONS.

In numerous textile mill districts additions to plants are being planned in spite of the very high cost of building. Various New Bedford and North Adams mills are planning additions and the Stark Mills, Manchester, N. H., are to erect a large six-story warehouse at a reported cost of $200,000.

A report from Putnam, Ct., is that the Manhasset Manufacturing Co., tire cloth manufacturers, will build a large addition to its weaving plant.

The Cyril Johnson Woolen Co., of Stafford Springs, Conn., has started work on a two-story brick mill building, 100 by 240 feet, thus allowing much greater facilities.

These are but a portion of the additions and improvements planned by Northern mills, while in the South there are many plans for new mills and additions and numerous new mill companies have been formed.

Gastonia, N. C., proposes to have a new $900,000 mill, according to reports.

The Pauline Mills, Kings Mountain, N. C., are to build an addition to be equipped with 5,000 spindles and 100 looms, the machinery orders having already been placed. Other late reports of additions and expansions are:

Anderson Cotton Mills, Anderson, S. C., to add 320 looms and cotton picking machinery.

Vanity Fair Silk Mills, formerly the Schuylkill Silk Mills, Reading, Pa., to erect a six-story addition 148 by 50 feet.

The Empire Silk Co., of Paterson, N. J., is building a new structure at its Scranton, Pa., plant, which will largely increase the capacity of the plant.

The Thatcher Spinning Co., Chattanooga, Tenn., will add 9,000 spindles in a new structure soon to be built.

The William H. Kilgour Silk Co., Scranton, Pa., has purchased land for erecting another plant.

The Schwarzenbach-Huber Co. will erect a one-story building 400 by 100 feet at Covington, Va., to be equipped with 200 or more silk looms.

The Cedartown Cotton & Export Co., Cedartown, Ga., will erect an addition 75 by 240 feet, to be equipped largely with twisting machinery.

The Rhode Island Textile Co., Pawtucket, R. I., is erecting a 60 by 100-foot addition which will be equipped with braiding machines.

PERSONALS.

Walter Cox, formerly of Anniston, Ala., has accepted the position of second hand in the spinning room at the Sylvan Cotton Mill, Shelbyville, Tenn.

J. B. Harris has been promoted from overseer of spinning to assistant superintendent at the Greenwood (S. C.) Cotton Mill.

J. F. Wharton has taken the position of overseer of spinning at the Roswell (Ga.) Manufacturing Co.

S. W. McLain has accepted the position of second hand in spinning at the Thatcher Spinning Mills, Chattanooga, Tenn.

George Whitten has been appointed spinning overseer at the Osprey Mills, Porterdale, Ga.

J. H. Tucker, formerly of Schoolfield, Va., has accepted the position of overseer of slashing for the Aiken Mfg. Co., Bath, S. C.

Charles Speight has been promoted from second hand to overseer in number two weaving, Rosemary Mills, Roanoke Rapids, N. C.

C. E. Neisler, of Kings Mountain, N. C., has purchased a site upon which he will build a cotton mill.

Fred Sykes, formerly of Rockville, Ct., has been appointed designer for the Adams (Mass.) Woolen Mills, Inc.

L. S. Hall has accepted the position of superintendent of the Greylock Mills, North Pownal, Vt.

William Brown, formerly of Janesville, Wis., has accepted the position of overseer of carding for Henry Klous Inc., Lawrence, Mass.

J. H. Rahmer, formerly of Auburn, Pa., has become superintendent of the knitting department at the Sylva Knitting Co., Hamburg, Pa.

Lawrence J. Smith, formerly of Middletown, Ct., has accepted the position of overseer of spinning for the Brickner Woolen Mills, Sheboygan Falls, Wis.

F. N. Valvert has taken the position of superintendent of the Trent Valley Woolen Manufacturing Co., Campbellford, Ontario, Canada.

Harris Midwood, formerly of Waterville, Me., has been appointed overseer of finishing for the Chapel Mills Manufacturing Co. Cherry Valley, Mass.

John Briggs, formerly with Joseph Benn & Sons, Inc., Greystone, R. I., has taken the position of overseer of warp dressing and spooling for the Paton Manufacturing Co. Sherbrooke, Quebec, Canada.

William McMorrow has accepted the position of overseer of dyeing for the Regent Knitting Mills, Ltd., St. Jerome, Que., Canada.

Daniel Belliveau, formerly at Hillsboro, N. H., has taken the position of overseer of spinning for the Glen Woolen Mills Norwich, Ct.

Frank H. Talcott has been appointed overseer of finishing for the Farnsworth-Pinney Co., Central Village, Ct.

Claude Fisher, formerly superintendent of knitting at the Sylva Knitting Co., Hamburg, Pa., is now associated with the Roxford Knitting Co., Philadelphia, Pa.

Thomas W. Lawton, formerly employed with the Lawton Mills Corp., Plainfield, Ct., has accepted the position of overseer of carding for the Newmarket (N. H.) Manufacturing Co.

F. C. Wood has been promoted from spinner to superintendent of the Lockmore Cotton Mill, York, S. C.

J. R. Wood of Clinton, S. C., has been appointed overseer of spinning at the Fulton Bag & Cotton Mills, Atlanta, Ga.

Frank Ware has been appointed overseer of spinning and winding at the Hampton (Ga.) Mills.

J. A. Wofford, formerly of Woodside Mills, Greenville, S. C., has taken the position of overseer of weaving at the Baldwin Mills, Chester, S. C.

Albert McLain has been appointed overseer of the spinning and twisting rooms of the American Mills Co., Atlanta, Ga.

J. A. Roland has been chosen president of the Everett Cotton Mills, Monroe, N. C.

B. L. Bumgardner has been appointed superintendent of the Majestic Manufacturing Co., Belmont, S. C.

J. S. Sides has been promoted to overseer of weaving by the Fidelity Mfg. Co., Charlotte, N. C.

J. H. Curtis, formerly with the Springstein Mill, Chester, S. C., has accepted the position of section hand in carding at the No. 1 Card Room, Schoolfield, Va.

W. D. Ballard, formerly overseer of weaving, slashing and drawing-in at the Roanoke Mills, Roanoke Rapids, has been appointed superinitendent of the Pocahontas Cotton Mills, Petersburg, Va.

J. H. Rhodes has recently taken the position of carder at the Necronsett Mills, Cumberland, N. C.

W. A. Henderson, formerly of Fayetteville, N. C., has taken the position of general overseer of carding and spinning at the Dresden Mills, E. Lumberton, N. C.

John Byrum has taken the position of second hand in the spinning room of the Roswell (Ga.) Mills.

Henry Pappa has taken the position of assistant superintendent at the Swift Mfg. Co., Columbus, Ga.

T. M. McEntire of Stanley, N. C., has become superintendent of the Kershaw (S. C.) Cotton Mills.

John Harrison has accepted the position of overseer of spooling, twisting and winding at the Perkins Hosiery Mills, Columbus, Ga.

COTTON.

The Elk Cotton Mills of Dalton, Ga., will erect an addition to their mill and install 2,200 new spindles with other addition equipment.

The Lund Textile Co., of Fisherville, Mass., manufacturer of corset cloths, are starting a new addition to be used for a weave room and winding department.

COTTON CLOTHS.

(Reported by Louis Lowinson, cotton goods broker, 72 Leonard Street, New York.)

80/80	39″	4.00	plain cloths	27½
72/76	39	4.25	″	24
68/72	39	4.75	″	22½
64/64	38½	5.15	″	19¼
64/60	38½	5.35	″	18½
64/56	38½	5.50	″	18
60/52	38½	6.00	″	16
60/48	38½	6.25	″	15½
64/60	27	7.60	″	12
48/48	37″	4.00	Sheetings	18
56/60	36	4.00	“	19½
48/40	36	5.50	″	14½
48/48	40	2.85	″	26
30″	3.25	Drills		23
30	3.00	″		24
37	3.50	″		23½
37	3.95	″		20½
88/80	40″	8.50	plain comb	29
76/82	40	9.00	″	24
96/92	40	7.50	″	31
64/112	39	4.00	sateens	32
64/104	39	4.20	″	31

RAW COTTON.

Middling, July 24 ..... .35.85

COTTON YARNS

EASTERN

COMBED PEELER

10s	76-78
16s	80-82
20s	83-85
30s	1.00-1.05
40s	1.25

CARDED PEELER

10s	62-64
16s	64-65
20s	70
26s	73-75
30s	71-74
40s	95-99

MERCERIZED

2/40s	1.05-1.08
2/50s	1.20-1.40
2/60s	1.28-1.30
2/70s	1.50-1.52

SOUTHERN

HOSIERY FRAME

10s	59-60
14s	61
20s	63-66
24s	65-67
30s	70
2/20s	41-43
2/10s	45-46

WARPS

2/10s	60
2/20s	72-75
2/24s	76-78
2/30s	90

DOMESTIC WOOL

Ohio and Pennsylvania Fleeces

Delaine washed	88-90
Fine unmerchantable delaine	86-87
XX	70-71
Delaine unwashed	82-85
Fine unwashed	61-62
½ blood combing	73-75
⅜ blood combing	68-70
¼ blood combing	67-70
½, ⅜, ¼, blood clothing	59-60
Common and braid	45-47

Southern Fleeces

Lake mediums	57-59
Georgia Mediums	58-60

Virginia, Kentucky and Similar

½ blood unwashed	75-77
⅜ blood unwashed	70-72
¼ blood unwashed	67-68
Common and Braid	45-46

SCOURED BASIS

Texas

Fine 12 months	1.60
Fine 8 months	1.35-1.40
Fine fall	1.10-1.15

California

Northern	1.60
Middle County	1.40-1.50
Southern	1.30-1.35
Fall free	1.10-1.15
Fall defective	1.00-1.05

Oregon

Eastern No. 1 staple	1.68-1.72
Eastern clothing	1.40-1.45
Valley No. 1	1.55-1.58
Valley No. 2	1.22-1.25
Valley No. 3	1.03-1.05

Territory

Fine staple	1.75-1.80
½ blood combing	1.55-1.65
⅜ blood combing	1.25-1.30
¼ blood combing	1.05-1.15
Common and braid	68-70
Fine clothing	1.40-1.50
Fine medium clothing	1.30-1.40

Pulled

AA	1.65-1.70
Extra	1.75-1.80
A supers	1.55-1.60
B supers	1.20-1.30
C supers	88-95
Fine combing	1.40-1.45
Medium combing	1.30-1.35
Coarse combing	1.00-1.05
California, finest	1.35-1.40
California, second	1.10-1.15

FOREIGN WOOL

SCOURED BASIS

Australian

Classes I and II

Sydney 80s clothing	2.30-2.40
Sydney 70s average	2.25-2.30
Sydney 64s average	2.00-2.10
Geelong 74s	2.30-2.40
Geelong 64s	2.10-2.20
Geelong 60s	1.95-2.00

SCOURED BASIS

Cape

12 months	1.55-1.65
Short combing	1.40-1.45
Clothing	1.20-1.25

SCOURED BASIS

*New Zealand

Crossbreds

36s to 40s	75-80
40s to 44s	85-90
46s	1.00-1.05
46s to 48s	1.05
50s	1.10
56s	1.25-1.30
58s	1.70-1.75

WORSTED YARNS

BRADFORD SPUN

2/20s ¼ blood	1.90-1.95
2/30s ¼ blood	2.25-2.35
2/32s ⅜ blood	2.10-2.20
2/36s ⅜ blood	2.75-3.00
2/40s ½ blood	3.45-3.70

FRENCH SPUN

1/20s ¼ blood	2.05-2.15
1/20s ⅜ blood	2.25-2.30
1/30s ⅜ blood	2.30-2.40

1/30s ½ blood	3.00
1/50s-64s	3.40
2/40s ½ blood	Nominal
2/50s ½ blood	Nominal
2/70s Australian	Nominal

FRENCH SPUN MERINO

2/40s ½ blood	3.10-3.15
1/40-50-50	1.90-2.00
1/40-70-30	2.20-2.40
1/40-80-20	2.35-2.45

OLD WOOLEN RAGS.

GOVERNMENT MAXIMUM

Merinos	
Fine	34-35
Coarse light	20-21
Fine dark	20-21
Coarse dark	14-14½
Fine black	18-19
Serges	
Light	32-34
Brown	42-46
Blue	42-46
Black	42-46
Red	42-46
Green	42-46
Flannels	
White (Fine)	55-60
Red	33-35
Blue	28-30
Knit	
White	46-47
Blue	23-24
Black trimmed	33-34
Red	24-25
Brown	30-32
Light gray	14½-15
Light hoods	33-34
Mixed hoods	18-19
Silver gray	32-34
Skirted worsteds	
Light	19-20
Black	25-26
Blue	22-23
Dark	17-17½
Brown	19-19½
Skirted cloth	
Fine light	12-13
Light	10½-11
Blue	8-8½
Dark	6½-7
Plain black	7-7½
Skirted, tan cloth	24-25

Andrew Plue, formerly employed in the No. 1 spinning department of the Berkshire Cotton Manufacturing Co., Adams, Mass., has been appointed overseer of the spinning department of the No. 4 mill of the same company.

John J. McGlinchey, formerly overseer of carding and spinning at the Worcester (Mass.) Woolen Mill Co., has been appointed superintendent of the New England Woolen Yarn Co., Clinton, Mass.

R. Lee Mahaley and others have incorporated the Diamond Cotton Mills, with $200,000 capital, at Salisbury, N. C.

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Accountants and Engineers
Cooley & Marvin Co., Boston
Ralph E. Loper, Fall River, Mass.

Air Moistening
Carrier Engineering Corporation, New York.
Parks-Cramer Co., Fitchburg, Mass.

Albone
Roessler & Hasslacher Chemical Co., New York.

Asbestos Machinery
Smith & Furbush Machine Co., Philadelphia, Pa.

Automatic Feeds
(For cotton and wool)
Smith & Furbush Machine Co., Philadelphia, Pa.
Philadelphia Drying Machinery Co., Philadelphia, Pa.

Bailing Presses
Economy Baler Co., Ann Arbor, Mich.
Philadelphia Drying Machinery Co., Philadelphia, Pa.
Smith & Furbush Machine Co., Philadelphia, Pa.

Ball Winding Machinery
Franklin Machinery Co., Providence, R. I.

Bleaching
Home Bleach and Dye Works, Pawtucket, R. I.

Bleaching Kiers
Worcester Steam Boiler Works, Worcester, Mass.
Philadelphia Drying Machinery Co., Philadelphia, Pa.

Bleaching Machinery
Delahunty Dyeing Machine Co., Pittston, Pa.

Bleaching Materials
Roessler & Hasslacher Chemical Co., New York.

Bleaching Oil
Jacques Wolf & Co., Passaic, N. J.

Blowers and Blower Systems
Philadelphia Drying Machinery Co., Philadelphia, Pa.

Boilers
Worcester Steam Boiler Works, Worcester, Mass.

Boiler Feed Purifiers
Scaife & Sons Co., Wm. B., Pittsburgh, Pa.

Boxes and Box Shooks
Jos. T. Pearson, Philadelphia.

Braiding Machinery
Textile Machine Works, Reading, Pa.

Bubblers (for sinks)
H. F. Jenks Co., Pawtucket, R. I.

Carbonizing Machinery
Philadelphia Drying Machinery Co., Philadelphia, Pa.

Chairs (for Mill Use)
H. F. Jenks Co., Pawtucket, R. I.

Chemicals
Hemingway, Frank, Inc., New York

Chrome Colors
Jacques Wolf & Co., Passaic, N. J.

Clipping Machines (shoe lace)
Franklin Machine Co., Providence, R. I.

Cloth Cutting Machines
Eastman Machine Co., Buffalo
Universal Cutter Co., St. Louis.

Cloth Testers
Scott, H. L. & Co., Providence, R. I.

Cloth Washers
Hunter, James, Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., Philadelphia, Pa.

Cones, Paper
Pairpont Corp., New Bedford, Mass.

Card Grinders
B. S. Roy & Son Co., Worcester, Mass.

Cop Skewers
Shambow Shuttle Co., Woonsocket, R. I.

Cotton Bat Heads
Franklin Machine Co., Providence, R. I.

Cotton Machinery
Philadelphia Drying Machinery Co., Philadelphia.
Smith & Furbush Machine Co., Philadelphia.
Wildman Manufacturing Co., Norristown, Pa.

Cotton Yarn Bleachers
Home Bleach & Dye Works, Pawtucket, R. I.

Cutting Machines
Eastman Machine Co., Buffalo.
Universal Cutter Co., St. Louis.
Wildman Mfg. Co., Norristown, Pa.

Drawing Frames (French Worsted)
Franklin Machine Co., Providence, R. I.

Drinking Fountains
H. F. Jenks Co., Pawtucket, R. I.

Drying Machinery
Philadelphia Drying Machinery Co., Philadelphia.

Dusters
Smith & Furbush Machine Co., Philadelphia.

Dyers, Bleachers and Finishers
Home Bleach and Dye Works, Pawtucket, R. I.
National Silk Dyeing Co., Patterson, N. J.
Providence Dye Works, Providence, R. I.

Dyeing, Drying, Bleaching and Finishing Machinery
Delahunty Dyeing Machine Co., Pittston, Pa.
Philadelphia Drying Machinery Co., Philadelphia.

Dyestuffs and Chemicals
American Aniline Products, Boston.
Atlantic Dyestuff Co., Boston
S. R. David & Co., Inc., Boston, Mass.
Du Pont de Nemours & Co., Wilmington, Del.
Dye Exchange Corp New York.
Hellenic Chemical & Color Co., New York City.
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General Electric Co., Schenectady, N. Y.
Trop Specialties Co., New York.

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General Electric Co., Schenectady, New York.

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Franklin Machine Co., Providence, R. I.

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Salades Export Publishing Co., New York City.

Extractors, Logwood
Tolhurst Machine Works, Troy, N. Y.
Worcester Steam Boiler Works, Worcester, Mass.

Feed Water Purifiers
Scaife & Sons Co., Wm. B., Pittsburgh, Pa.

Flooring
Philadelphia Mineral Flooring Co., Philadelphia, Pa.

Flyers
Southern Spindle & Flyer Co., Inc., Charlotte, N. C.

Fly Frames
Sheridan, E. L. & Fred, Winder, Ga.

Flyer Pressers
Southern Spindle & Flyer Co., Inc., Charlotte, N. C.

Felt Machinery
Smith & Furbush Machine Co., Philadelphia.

Filters (Water)
Norwood Engineering Co.
Scaife & Sons Co., Wm. B., Pittsburgh, Pa.

Grinding Machinery
Roy & Son Co., B. S.

Gums
Jacques Wolf & Co., Passaic, N. J.

Hosiery Boards
Pearson, J. T., Philadelphia.
Philadelphia Drying Machinery Co., Philadelphia.

Hosiery Machines
Brinton, H., Co., Philadelphia.
Crane Manufacturing Co., Lakeport, N. H.
Nye & Tredick, Philadelphia.
Textile Machine Works, Reading, Pa.
Wildman Manufacturing Co., Norristown, Pa.

Humidifying Apparatus
Carrier Engineering Corp., New York.
Parks-Cramer Co., Fitchburg, Mass.

Hydro-Extracters
Tolhurst Machine Works, Troy, N. Y.

Hydrometers
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

Iron Castings
Franklin Machine Co., Providence, R. I.

Knitting Machinery
Brinton, H., Co., Philadelphia.
Crane Manufacturing Co., Lakeport, N. H.
Huse & Sons, W. D., Laconia, N. H.
Hemphill Co., Pawtucket, R. I.
Nye & Tredick, Philadelphia.
Stafford & Holt, Little Falls, N. Y.
Textile Machine Works, Reading, Pa.
Tompkins Bros. Co., Syracuse, N. Y.
Wildman Manufacturing Co., Norristown, Pa.
Wildt & Co., Leicester, Eng.

Knitting Machinery, Full Fashioned
Textile Machine Works, Reading, Pa.

Knitting Needles, Etc.
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Corey, William, Co., Manchester, N. H.
Laconia Needle Co., Laconia, N. H.
M. M. McCormick & Co., Philadelphia.

Mercerizing
Home Bleach & Dye Works, Pawtucket, R. I.

Manufacturers' Agents
Levey & Blankfield, New York.

Mill Supplies
Lombard Foundry & Mill Supply House, Augusta, Ga.

Mordants
Jacques Wolf & Co., Passaic, N. J.

Oiling Machinery
Park Co., G. M., The, Fitchburg, Mass.

Oils
Borne, Scrymser Co., New York
Bradford Oil Co., Lynn, Mass.
Swan & Finch Co., New York.

Overhaulers
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Paints
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Paper Cones and Tubes
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Peroxides
Roessler & Hasslacher Chemical Co., New York.

Pickers, Rag or Shoddy
Smith & Furbush Machine Co., Philadelphia.

Pipers
Jennison Co., Fitchburg, Mass.

Pulleys
Franklin Machine Co., Providence, R. I.

Recording Gauges
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

Recording Thermometers
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

Regulators for Temperature
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

Woolen Rags
Cohen & Sons, B., Chicago, Ill.

Rings, Spinning and Twister
Southern Spindle & Flyer Co., Inc., Charlotte, N. C.

Rolls
Southern Spindle & Flyer Co., Inc., Charlotte, N. C.

Schools
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New Bedford Textile School, New Bedford, Mass.

Second Hand Textile Machinery
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Lamb, J. K., Textile Machinery Co., Philadelphia.
Edward Jefferson, Philadelphia.

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Soaps
Chemical Research Co., Denver, Col.
Electric Smelting and Aluminum Co., Lockport, N. Y.
Original Bradford Soap Works, Providence, R. I.
Warren Soap Mfg. Co., The, Boston, Mass.

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