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TEXTILE INDUSTRY'S ENORMOUS GROWTH

Now the United States is the Greatest Producer of Woollen Cloths and Silk.

PROBLEMS OF THE TRADE

Designers of Plants Must Bear in Mind Conditions of a Business That Tends to Complexity.

The importance of the textile industry in a country which, like the United States, now manufactures all the woven fabrics really necessary for the clothing of its people, hardly needs to be argued, says a writer in the *Textile Manufacturers Journal*. Yet in the case of our own country progress in the textile industry has been so rapid, and its development has had such a vital relation to other industries, that some statistical evidence of its great place may serve as an inspiration to the men, mainly the mechanical engineers, who are responsible for its continued progress and increasing efficiency. Owing to the fact that the figures from the census of 1910 are not yet available as a complete survey of the textile industries it is necessary to cite here the figures of the census of 1907; but it should be noted that these figures do not adequately suggest the great expansion in the textile industries that has taken place since the enactment of the tariff law of 1887. Some later figures are indeed available, but even with the old figures it is possible to gauge quite accurately the present position of textile manufacturers. The statistics which follow cover only the cotton, the woollen and silk industries. In what the census reports term the "proper" sense of those words, namely, the production of fabrics either ready to wear or ready for the dyeing and finishing processes which precede the conversion of certain cloths into made up clothing.

Even the statistics of a decade ago are impressive evidence of the enormous strides made by the textile industries in this country during the last century. At the beginning of the nineteenth century the textile industries were represented by spinning mills for cotton yarn, by wool carding factories and fulling mills, in which cloth woven on hand looms in the households of the country was dressed and prepared for sale. It was not until 1814, less than a hundred years ago, that the first broad power loom for cotton goods was worked out by Francis C. Lowell of Boston and put in operation at the new plant at Waltham. From that time progress was rapid, and in the cotton industry particularly almost numberless improvements in machinery were made during the next decade. The actual complete establishment of the cotton industry in this country as a factory industry depending wholly upon power driven machinery dates from the establishment of the Middlesex Mills at Lowell in 1823. It was a year or two after this that the first broad power looms were introduced into wool manufacture. The history of our textile development since that time is too intricate to be summarized in this paper. It must be sufficient to note that now the United States is the second greatest producer in the world, not only of cotton and woollen cloths, but of silk; while the use of men for carpet yarns and thread and for towels and toweling has reached large proportions. Besides the textile industries "proper," there are also a great multitude of small factories engaged in the production of textile specialties.

The textile manufacture, probably to a greater extent than any other industry in the country, has tended to a complexity, both mechanical and operating, that is rather exceptional. This has been the result of two main factors: the first being the peculiar conditions imposed by the character of our most used natural fibre, cotton, and further by the constant necessity for a progressive decrease in the labor expense of cotton manufacture. The cotton industry has been shaped, as no other industry has, by the peculiar limitations found in the raw material itself. The necessity for a humid air in cotton factories, both to affect the physical condition of the fibre and to prevent the mischief caused by electricity in the fibres during manufacture, is a requirement of great importance, and one that has not even yet been satisfactorily met. The character of the cotton fibre also, whether well or ill moistened, imposes certain limitations upon the speed of the machinery handling it. On this side the speed at which roving is now handled seems to have reached the practicable maximum, and the same thing is true of looms. In the spinning frame, however, it has been shown that the cotton fibre will stand a more rapid handling than it now receives.

Nearly every engineer is familiar with what is known as the slow burning type of mill construction. It was first brought out by some of the early designers of cotton mills, and has since been used in some form or other in nearly every other type of industrial plant. For many years this form of construction, with slight variations, has been successfully used and has been regarded as sufficient for the needs of the industry. It has developed, however, that a better form of construction is available, and to this form of construction attention is called in this paper.

Rigid non-vibrating mill buildings are one of the immediately desirable things. The slow burning mill construction has great virtues, but rigidity is not one of its possessions. Hardly has been found to produce more economical in the maintenance of textile machinery, as well as machinery of many other types, and for this reason alone the modern type of reinforced concrete construction has proved itself

highly desirable. The friction between concrete floors and machine bases is so great that with much fewer bolts than are required on a wooden floor machinery can be so securely anchored that it will not walk out of its proper position. In consequence shafting and machines keep in better alignment, there is less wear and tear on the machines themselves, and the cost and bother of repair are greatly diminished. Simple and effective ways of attaching shafting and motors to concrete beams have been devised, so that from the point of view of machinery installation and maintenance the rigid frame mill building of reinforced concrete has proved itself superior to any other type.

The cost of reinforced concrete is somewhat greater than that of mill construction as a general thing, but there often exist in some localities special conditions in which concrete is as cheap or cheaper than mill construction. Against its usually higher cost there may properly be set its insensibility to fire. The concrete building not only does not burn, but if properly built it is so little harmed even by a serious fire that it can be equipped with new machinery and put in operation again in a very small part of the time needed to replace a damaged mill construction building. There is a species of fire loss, the interruption of production, which insurance is often an inadequate compensation; the concrete mill building practically eliminates this loss.

Another valuable advantage of the concrete mill building is that it allows a much greater window space than is possible with anything else but steel construction, which latter, if effectively fireproofed, is much more costly than concrete. A concrete building can have as much as 80 per cent. of its outer wall area devoted to lighting, as against a production of about 20 per cent. in mill construction. Existing provisions for the escape of operatives in case of fire in cotton mills are on the whole exceedingly inadequate. Most mills are equipped, in addition to stairways, with the familiar type of outside fire escape, consisting of galleries or balconies for each story, with ladders from the top of the escape to the ground. The actual operation of this type of escape is that the population of a big workroom is in case of fire crowded upon a series of outside balconies from which movement to the ground is excessively slow under the best of conditions, and in case of a fire panic is but little less dangerous than the fire within the wall. If a fire occurs in a lower floor of the mill it breaks from the windows of that level, and the ascending smoke and flames instantly render useless the whole tier of fire escape balconies above. It would seem that nothing more faulty in principle or imperfect in execution could well be imagined, and it is a fair cause for astonishment that these contrivances should for many years have been accepted by engineers.

The proper and only adequate device in the way of a fire escape is the isolated stair tower. It is doubtful if the building of such towers in adequate number would at all seriously increase the construction cost of cotton factories. It is evident that the isolated stair tower can be a real fire escape, and it would seem to be equally evident that this type of safeguard should be provided for in every new mill and that every old mill should be made to provide for it in existing buildings. It may be objected that disastrous fires in textile mills are comparatively rare, and this is true. The objection, however, is beside the point. Mills several stories high cannot be built utterly without fire escapes, and if the necessity of some form of fire escape has once admitted the argument for putting in a really efficient device is a strong one.

DRYING WOOL

A Hard Task to Do Properly—Some Interesting Methods.

Wool drying is one of the principal and serious operations in the woollen industry. The more gently and uniformly the wool is dried, the better is the result attained. For should the wool be slightly damp in some of its parts, the dye does not take well and the result is an unevenly dyed yarn which shows in the texture of the woven goods.

Overdrying is also to be guarded against. By some manufacturers the wool from the squeezing roller is whizzed into a hydro extractor which drives out so much of the moisture that the further drying is easily effected. The commonest way of drying, however, is to spread the wool as uniformly as possible over a framework of wire netting under or over which is a range of steam heated pipes. A fan blast blows air over these hot pipes and the heated air is passed and forced upward or downward as the case may be, over the layer of wool which rests on the netting. In this case, unless the wool is spread with great evenness, it gets unequally dried and at points where the hot air escapes freely it is much overdried.

A more rapid and uniform result may be obtained by the use of a mechanical wool drier, a close chamber divided into horizontal compartments, the floors of which have alternate fixed and moving bars. Under the chamber is a tubular heating apparatus and a fan by which a powerful current of heated air is blown up the side of the chamber and through all the shelves and compartments successively, either following or opposing the wool passing through the machine. The wool is introduced by a continuous feed at one side of the chamber; the strength of the blast carries it up and deposits it on the upper shelf, and by the action of the moving bars, which are worked by cranks, it is carried forward to the opposite end, from where it drops to the next lower shelf, and so on it travels to the bottom of the lower shelf, passing out by the delivery lattice well and evenly dried.

R. & H. Simon

Union Hill

New Jersey

The difficulties to be met with in the manufacture of silk in America have been so many that until a comparatively recent date a silk industry that would even partially supply the home demand seemed an impossibility. Now it has become an accepted fact that this country is fast becoming independent of the silk manufacturers of the Old World who for so many centuries have controlled the silk market.

This flourishing condition has not been reached without effort, and the effort has not been wholly confined to manufacturers who started with ample capital to purchase the expert knowledge that would yield returns in the industry. There has been more than one instance where a high place in the ranks of silk manufacturers of this country has been gained by means of other stock in trade than ability of the highest order and a determination to succeed. Of these, excellent examples are furnished by the great establishment of the R. & H. Simon factory at Union Hill, N. J.

"Made in Germany" has come to be a stamp of peculiar excellence, and "born in Germany" is a mark of the highest type in citizenship and the symbol of sound fundamental knowledge and strict business principles. It was by two brothers, Robert and Herman Simon, natives of Germany, that the great factories of R. & H. Simon, at Union Hill, N. J., were founded. They came to this country with an equipment of executive ability, technical knowledge of their line of work and a determination to make the silk industry pay. In 1874 they established a small factory at Union Hill.

The first factory was a very modest one indeed, a three story structure, but sufficient to house the industry at that stage of its development. Growth seemed slow, but in time Robert Simon invented the first power loom to be set up in the United States that produced a really high grade of silk. Seventy of these looms were installed, and the factory, operating on a three thousand spindle basis, began the production of an excellent quality of gros grain silk. In the beginning the output of the Simons plant, like that of the other silk producers of that time, was largely hand woven. By perfecting a series of inventions the brothers were in a comparatively short time enabled to become entirely independent of the numerous hand weavers whose work they had utilized. They spent much time also in designing silk patterns, and in the beauty of these became able to compete successfully with the most notable importations from Europe.

Under its able management the R. & H. Simon plant at Union Hill developed in size and importance, until now the factories cover fifty-eight city lots. In 1883 the Simons decided to erect a plant at Easton, Pa., and this plant now exceeds the original plant in size. The combined number of employees in both factories is 2,600 people, which, in consideration of the labor saving machinery that has been invented by the Simons, constitutes an enormous force. In 1901 Robert Simon died, and since then Herman Simon has conducted the

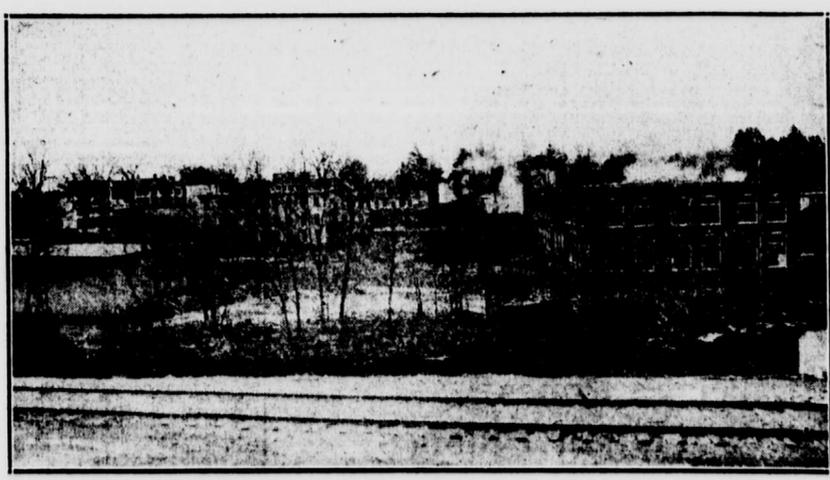
business alone. He has changed none of the business principles of the firm that have won for his industry so great a success, but is broadening his field of operation wherever practicable and is keeping thoroughly abreast of the times.

Herman Simon was born in Frankfurt-on-Main, Germany, April 25, 1850, the son of a prominent tobacco manufacturer and general merchant, who was the head of many establishments in various German cities. He was educated at Hassell's Institute, Frankfurt-on-Main, and received technical training in the art of weaving at the Royal Weaving School, at Mulheim-on-the-Rhine, to which he attributed the familiarity with technical minutiae to which his success as a manufacturer has been largely due.

Coming to New York in 1868, at the age of eighteen, he was employed by A. T. Stewart & Co. for several years, but in 1874, in conjunction with his brother Robert, started the manufacture of silk at Union Hill. Herman Simon is a man of forceful character, energetic and thoroughly imbued with a sense of personal responsibility which impels him to give his business strict supervision that in these days of many interests for men of affairs is unusual, and, needless to say, highly beneficial. Besides his manufacturing interests, he is a director in many banks and important corporations. He is also a member of the German Club of Hoboken, N. J.; the Deutscher Verein and the National Arts Club of New York City; Lotus Club, New York; Automobile Club of America, New York; Knights Templar, Hugh de Payer Commandery, Easton, Pa.

Robert Simon, the younger brother of Herman Simon, was born in Frankfurt-on-the-Main, November 9, 1852. He died at Koenigstein-im-Taunus, a famous German health resort, July 26, 1901. Coming to America in 1870, Mr. Simon entered the silk mills of Benkart & Hutton, in West Hoboken, and two years later, with his brother, entered into the organization of the firm known as R. & H. Simon. He was the head of the concern and had personal charge of the Union Hill works until his death. Not only was Robert Simon one of the leading men in the silk industry, but his personal traits of character were such that they brought him the love and esteem of all with whom he came in contact. Generous, sympathetic and just, his employees found in him a helpful friend in times of need. He bestowed his charities with a liberal hand and without display or any disposition to pose as a philanthropist, and his memory is cherished as that of an unselfish benefactor. Refined and cultivated in his tastes, he was the possessor of a valuable collection of paintings.

It is not strange that under the supervision and by the efforts of two men of such sterling worth and signal ability the silk trade of the United States should look to the standard achieved by R. & H. Simon as the highest. In the quality, finish and artistic design of silk produced the goods put on the market from the Simon mills have no superior, and are going far to achieve for American manufacturers of silk a reputation not second to those of any country in Europe.



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