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Contents:

(Illustrated articles are marked with an asterisk.)

STEAM PIPES AS CAUSES OF FIRE.

The extract from the *Bulletin* of the National Association of Wool Manufacturers upon this subject, published recently in the SCIENTIFIC AMERICAN, has attracted much attention and excited some alarm in the minds of many using such apparatus. Some of these have made examinations into the condition of the wood work in the vicinity of such pipes and report "all right." Some have kindly sent us specimens of the wood, showing its condition after exposure for a considerable time to the action of the heat from steam pipes. Should the article in question lead to a general examination, and should our correspondents be communicative, it is probable much useful information would be elicited. Among those who have favored us with specimens are Dr. Daniel Ayres, of Brooklyn, N. Y. The chips presented by this gentleman were taken from wood in contact with pipes of the low-steam warming and ventilating apparatus, made by D. R. Benton of the same city.

The wood appears somewhat like that which has undergone what is known as dry rot, but shows no signs of combustion. It is remarkably dry, light, and brittle, may be much of it crumbled to pieces by the fingers, and is evidently in a condition to be ignited at a comparatively low temperature. These chips are of spruce timber, with some apparently of pine, which are the most brittle.

We are decidedly of the opinion that these chips would not ignite at any temperature to which they have been exposed during several years in the building from which they were taken, but we should decidedly fear their ignition in contact with pipes filled with high steam.

Some experiments to test the temperature at which wood in this condition would ignite would be of great practical value in settling the question of safety in using steam pipes for heating purposes, and we trust such experiments will be performed by some competent person, and their results made public.

A. H. Walker, of Oswego, N. Y., sends us a specimen of excellent tinder into which some new sack cloth placed in contact with pipes carrying steam at sixty pounds, six months since, has been converted. It is strongly suggestive of fire in its appearance, and catches and continues to burn from the slightest spark.

We would like to see this subject thoroughly ventilated and some definite and reliable conclusion reached in regard to it. The question is one of the utmost importance, and all its bearings should be thoroughly understood.

AMERICAN ENGINEERING IN CHINA.

Ting, late Taotai of Shanghai, the present Footai of the province, whatever these titles may imply, commenced in 1865 an arsenal on a small scale at that city. The works cover about half a mile square, and have been carried to completion under the direction of F. J. Falls, a citizen of the United States.

The Shanghai *News-Letter*, now before us, gives some details of interest, from which we extract some items.

In each of the different departments there is a mandarin, acting as an overseer over the native workmen, to prevent idleness among them, and to exercise a general control, but not in any way to instruct the native workmen, this being done entirely by the foreigners acting as foremen, etc. All the accounts of the arsenal are kept by Chinese officers.

Some steamers have been constructed, launched, and supplied with guns, and more are now under way, in addition to which one vessel 280 feet long and another vessel 260 feet long are projected—entire machinery, boilers, engines, and armament to be constructed at the arsenal.

A college is in formation, and literary men, appointed by the government, are at present employed with foreigners, translating works on mathematics engineering, chemistry, etc., in order to prepare class books in the Chinese language for the use of the arsenal, to be read throughout the middle kingdom, to educate the Chinese in all that relates to an arsenal, ship building, etc.

Engineering students are to learn mechanics in the college, and the practical parts in the shops. Navigating students are to have a large training ship, so that they may learn seamanship practically and theoretically.

The works contain a drawing department, pattern shop, foundery, forging shop, boiler shop, musket shop, engine shop, heavy machine engine and gun workshop, erecting shop, musket-finishing shop, shop for finishing shells, shop for the manufacture of Congreve rockets, rocket tubes, etc., mold loft, yards, storehouses, etc., all fitted out with approved tools and fixtures. Additional heavy machinery has been ordered from England.

Mr. Falls has gained the confidence of the Chinese, and has also the confidence and hearty support of his own officers; and the Chinese Government, being desirous of building steam vessels, and having every confidence in Mr. Falls, leave the entire responsibility of their construction with him.

The earlier energetic efforts made have now grown into successful results, and are fast growing into larger proportions, which will greatly contribute to the building up and regeneration of the Chinese nation, resulting in advancing the Chinese people, to make China strong in her own resources; to make her a living nation.

To Mr. Fall's able supervision, with the hearty support of his officers, Fung-ta-jen and Sung-ta-jen, also with the zeal of subordinate mandarins, these good results are being brought about. This able engineer is entitled to the respect of his fellow-citizens, as his energy and ability reflect credit upon his native country.

THE EXHIBITION OF THE AMERICAN INSTITUTE.

The present writing found the machinery department still incomplete. Only three of the engines exhibited were running, driven by Root's boiler, the setting of Harrison's boiler being yet uncompleted. Only a few of the machines were in operation, and, as nearly every exhibitor was too busy in arranging his machinery to give information, we decided to again defer a notice of this department; and though it contains more of general interest to our readers than probably any other in the Fair, we must ask them to accompany us, for the present, in a ramble first through the

SILK DEPARTMENT.

Those of our readers who have followed the various articles on the manufacture of silk, published in these columns during the past year, are pretty well informed in regard to the present status of this industry. It will, therefore, be unnecessary to occupy much space in any general remarks upon this subject. We will say however, that in many lines of goods American products can now fairly compete in quality with the best that can be imported, while in sewing silks and twists, we are considerably in advance. In dyeing, we are now pretty well skilled, with the exception of what is technically called "weighting," *i.e.*, the restoring, in the dyeing process, of the weight lost in the process called boiling, wherein all of the gum is washed away. In this, however, the manufacturer is the only loser, the consumer being a gainer; for, as the gum adds nothing to the strength of the silk, and as, also, weighting imparts no strength, and also, as silk is sold by the pound, it follows that the purchaser of American sewing silks and twists gets more yards, of equal strength, for his money, than he would obtain were the original weight of the silk restored in the coloring process. But this is not the only reason why American sewing silks and twists are superior, as will be seen further on, when we notice in detail the goods displayed.

The Nonotuck Silk Co., 28 Warren st., New York, exhibit one of the most beautiful cases on the floor, very tastily arranged. It shows the whole progress of the silk from the mulberry-tree leaf, upon which the worm feeds, to finished

SPOOL SEWING SILKS AND TWISTS.

The case contains various specimens of cocoons, raw silk from Japan, and TSATTLEE, a superior kind of silk imported from China. It is brought to this country in bales of 100 lbs., and its value is from nine to twelve dollars per pound. This firm, as well as others, in this country, manufacture sewing silks and twists from Tsattlee, and also, from other fine grades of silk. In Europe, these grades are made into dress goods, ribbons, etc., and inferior grades are employed for twists, etc.; a second reason for the superiority of American goods of this class. English manufacturers state that they would not get first cost for their goods, were they to employ the quality of stock used in America for this purpose. The Nonotuck Silk Co. show in their case a large variety of colors, all of which compare favorably with imported goods. It may be observed here, that a slight deficiency is admitted for American goods, in the aniline colors, but this can only be detected by experts, and in some dress goods shown here, even the most critical would be forced to admit that no foreign goods, of the same class, can excel the beauty of either their colors or textures. The goods of the company under consideration are equal, in this respect, to any goods of the same class exhibited, and, we are informed, they have, in their establishment, the oldest American silk dyer in the country, who has been in their employ thirty years.

The following incident well illustrates the progress of the manufacture of twists in the United States, and also shows how one improvement creates a demand for others.

Less than twenty years ago, I. M. Singer applied to the Nonotuck Silk Co., for a twist suitable for use on sewing machines, and, as an inducement for this company to commence its manufacture, ordered *five pounds*, enough to supply him for several months. This company held Mr. Singer's trade, thus initiated, till it amounted to *eighty thousand dollars per annum*. The value of machine twist now made in the United States, amounts to probably not less than a quarter of a million dollars, the demand having been entirely created by the sewing machine.

Geo. Comings, of New York, exhibits

SILK DRESS TRIMMINGS,

not a very extensive line, but praiseworthy in style and color.

B. Richardson, broker in raw silks, of New York, exhibits a great variety of

RAW SILKS, COCOONS, EGGS, ETC.,

from China, Japan, and Europe. This is a very interesting, and, to those unacquainted with the details of the business, an instructive display. The French and Italian silks are particularly beautiful. An important peculiarity of French and Italian silks is the uniformity of the thread; as in winding, great care is taken to wind from the same number of cocoons, and, whenever any one runs out, to replace it by another. This case is an important addition to the department, although it does not show the progress of the silk industry in the United States so much as the exhibitions of manufactured goods.

Cantrell and Chapin of Crestkill, N. J., exhibit

CANTON MACHINE TWIST,

a cheap variety of goods, but excellent of their kind; in our judgment, they are equal to any of the same class on exhibition. They are, for many kinds of work, as good as the more expensive kinds. Two cases are shown, one of which is arranged in quite a unique manner. It contains 3,500 spools, so placed that the name of the firm appears in prettily blended colors on a black background. This firm, also, manufacture Tram silks and organzines, for weaving, and are preparing to to enter upon the weaving of dress goods on

LYALL'S POSITIVE MOTION LOOMS,

one of which is now running on the floor, weaving dress silk, and attracting much attention. Its adaptation to this kind of work was minutely set forth in an illustrated description published on page 17, current volume of the SCIENTIFIC AMERICAN, to which we refer the reader. Another loom of this kind is also at work on goods *six yards and one quarter wide*, but a notice of which would be out of place here.

Werner, Itschner & Co., of Philadelphia, exhibit a small case of

RIBBONS,

which are, though commendable, scarcely equal to some exhibited by other establishments, yet to be noticed.

Horstmann Bros. & Co., of Philadelphia, exhibit a great variety of

UPHOLSTERY GOODS, REGALIA, CARRIAGE TRIMMINGS, MILITARY GOODS, AND LADIES' DRESS TRIMMINGS;

also, sashes, scarfs, and a great variety of other goods of their manufacture, all of excellent quality, and in a great variety of beautiful designs and colors. This firm have probably carried jacquard-loom weaving to a higher degree of perfection than any other American manufacturers, and the variety of the goods made by them is, we believe, the most extended of any American firm. We were much gratified, on a visit to Philadelphia, last winter, to witness the extent and systematic workings of their immense establishment, in which we spent considerable time, an interested spectator. The goods they exhibit are an honor to the firm and to the country, and they attract much attention from the visitor.

James S. S. Shapter, of New York, Secretary of the department, exhibits

DRESS SILKS,

beautiful in texture and color. We were gratified to witness the great progress which has been made in the manufacture of this kind of goods, as evidenced not only by this display, but also by other cases of goods exhibited.

The beautiful case of dress silks exhibited by P. G. Givernaud, of New Jersey, through his agents, Benkard & Hutton, of New York, can not be excelled by any goods ever imported. Both in texture and color they will be admitted by good judges to be first-class.

The same may be said of the splendid case of dress silks exhibited by Cheney Bros., of Hartford and Manchester, Conn., the leading silk manufacturers in the United States, who present a much larger variety of goods, forming one of the most attractive features of the Department. Their case contains, besides dress silks, ribbons, machine twist, poplins, Florentines, figured and plain, *gros grains*, extra fine organzine, buttonhole twist, etc., all of fine quality. It is a very rich display.

T. Baare, of Schoharie, N. Y., also exhibits a fine variety of dress silks, of good colors, and of undoubted good quality.

The Dale Manufacturing Company, in which the manufacture of dress silks has only quite recently been commenced, also exhibit a number of styles of dress silks, in connection with a large variety of

TAILORS' TRIMMINGS,

hat bands, and other narrow goods, to the manufacture of which their works are principally devoted. A full description of their mill was given on page 282, Vol. XIX., of this journal, to which the reader is referred. Their case, which is