

SCIENTIFIC MUSEUM.

White Sheep Skins for Door Mats.

Take two long-wooled sheep skins, and make up a strong lather of soap, the sign of proper strength is when the lather feels slippery between the fingers. When the lather is cold wash the skins carefully in it, squeezing them between the hands so as to take all the dirt out of the wool. When this is accomplished lift out the skins and wash them well in cold water until all the soap is extracted. Have a vessel of clean cold water ready, to which some alum and salt (about half a pound) which have been dissolved in a small quantity of hot water, are added, and the skins left to steep all night. They are taken out in the morning and hung over a pole to drip.—When all the alum water has dripped off they are spread out on a board to dry, and are carefully stretched with the hand from time to time. Before they are thoroughly dry a composition of two table spoonsfull of alum, and the same of saltpetre are ground to powder in a mortar or otherwise, and sprinkled carefully on the fleshy side of each skin. They are then placed the one on the top of the other, leaving the wool outside and hung upon a rack or slats, in a barn, shed, or dry airy place, for about three days, or until they are dry—they should be turned every day. After this they are taken down and the flesh side is scraped with a blunt knife and each skin trimmed for a mat. The flesh side may then be rubbed over with pipe clay, beat with a switch, and will then be found supple, of a beautiful white color, and fit for a door mat for a mechanic or a prince.

An Extensive Sugar Refinery.

The Grocers' Steam Sugar Refining Company are erecting an extensive and very substantial sugar refinery on the site of Swift's sugar-house, corner of Washington and Laight streets, in this city, which was destroyed by fire in May last. Its height will be 100 feet from the basement, and it will be divided into eleven stories. The building is to be entirely of brick and iron. The brick walls are 3½ in thickness at the bottom, and are laid in cement. The beams, floors, roof, door-cases, window-cases, doors, window sashes, shutters, inner-doors, and everything about the building which is not of brick and mortar is of iron. Heavy iron columns in rows sustain the floors. There will be fire-proof dividing walls through the building. The columns will weigh about 450 tons. It will be erected so as to be conducted on a different working-principle from any other similar establishment in the United States. The company has been organized with a capital of \$400,000. The building and machinery, aside from the site will probably cost about \$300,000. Included in the machinery of the concern will be four large vacuum pans—nine feet in diameter—two of them to be of iron and two of copper. Twelve large steam boilers will be used. They will employ about 300 men who will turn off about 1,000 bbls. of refined sugar per day—a business of about \$100,000.

Great Fishing.

The "Dodge County (Wis.) Gazette," of a recent date, contains a most remarkable fish story. The story is, that during the month of January and February the lake at Horicon (Wis.) has been crowded with fishermen, and that some days from one to eight and ten tons per day, of pickerel, weighing from two to twenty-three pounds each, have been caught. There have been, some days, fifty or sixty persons spearing, loading, and drawing away. Above the village, and along the lake shore for a few miles, there were from thirty to forty tents on the ice, where people were taking fish from holes cut in the ice, all the time—some taking as high as two tons per day. The fish have sold at from \$10 to \$30 per ton, on the grounds, and as high as \$6 per cwt. taken away.

The manufacture of the glass for the Crystal Palace has been undertaken by Messrs. Cooper & Belcher, of Camptown, N. J., who promise to supply the managers with 40,000 feet, one-eighth of an inch thick, enameled by a new process invented by Mr. Cooper, one

of the partners. The process is very simple. The enamel is laid upon the glass in a fluid state with a brush, and after being dried is subjected to an intense heat, which vitrifies the coating, rendering it fixed and durable as the glass itself.

Manufacture of Matches.

About fifteen years ago, no less than six cents were paid for a box of matches, where now two such boxes can be purchased for one cent. The progress of science and art is perhaps more fully developed in the manufacture of many things called *small*, than in those things which embrace a more large and prominent space in the world's eye. The benefits—the comforts—which all classes, rich and poor, now enjoy from the manufacture of cheap friction lighting matches, is incalculable. On the wild prairie, or in the far-back woods, a match and a few dry sticks can kindle up a fire in a few moments, which will cook the wanderer's soup, or broil the hunter's venison steak. The days of flint, steel, and tinder-box, for kindling fires, are over; the incomparable friction match kindles up an hundred thousand fires in our city every morning, and lights up ten times that number of gas and other lights every evening. Frequent inquiries have been made of us, by letter, respecting the composition of matches, and we have furnished many practical receipts for that purpose during the past five years. A knowledge of the manufacture of matches, however, is still limited, and the following information on the subject, condensed from the "Cyclopedia of Useful Arts," newly published, we believe will be interesting to many of our readers:—

"The wood employed in the manufacture of lucifers is the best pine plank, as free from knots as it can be procured. Each plank is cut across the fibres, by means of a circular saw, into 28 or 30 blocks, each measuring 11 inches long and 4½ wide, and 3 inches thick. These blocks are cut up into splints by a machine of simple but ingenious construction, which we will endeavor to explain in a few words. To the extremity of the horizontal arm of a crank is attached a frame, which reciprocates to and fro with the motion of the crank through a space of about four inches.—In this frame are fixed in a line some 30 or 40 lancets, with the points projecting upwards, and separated from each other by pieces of brass. The block of wood to be cut is inserted by the small end between uprights, and a lever placed upon it forces it down to a position such, that, as the lancet-points advance, the end of the wooden block is scored or cut in the direction of or parallel with the fibres, with as many lines as there are lancets. As the lancets are withdrawn by the motion of the crank, a scythe blade moving in a horizontal plane swings round, and cuts off the end of the block to the depth of the scores made by the lancets. The pieces thus cut off will evidently be four-sided splints square in section, supposing, as is the case, that the lancets are equidistant, and that the horizontal knife cuts exactly to the depth of the lancet scores. When the horizontal knife swings back, the block from which one layer of splints has thus been removed descends through a space equal to the depth of the section, the lancet-points again advance and recede, and the knife again does its work. In this way the cutting is carried on with such rapidity, that from 12 to 16 planks, each 12 feet long, 11 inches wide, and 3 inches thick, can be cut up into splints in a day of ten hours. Now, supposing 14 planks are thus cut up, and that each plank produces 30 blocks, we thus get 14×30=420 blocks.—Each block affords about 100 slices, which are cut off by the horizontal knife; but as each slide, before being cut off has been scored by 31 lancet-points, we thus get 420×100×31=1,302,000 splints; and as each splint makes two matches, we thus have 2,604,000 single match-splints per day. These bundles are piled up on the racks of a hot-room or drying-stove, and left for some hours until moisture is expelled.

The next process is the "sulphuring."—The sulphur is melted in an iron pot over a stove, and when sufficiently fluid, the two ends of the matches are successively dipped, the matches being shaken after each dipping,

in order to get rid of superfluous sulphur.—When the sulphur is dry the matches are ready for dipping in the phosphorous composition. Each manufacturer professes to have his own recipe, which he regards as the best, and, therefore, keeps secret. The ingredients are, however, well known to chemists; the principal one is phosphorus, which is made into an emulsion, with glue or gum arabic, the former being preferable, since gum absorbs moisture. Some makers use nitre, others fine sand; and all use coloring matter, which may be red ochre, red led, smalt, or artificial ultramarine.

The following proportions have been found to answer:

	Glue paste	Gum paste.
Phosphorus . . .	2.5	2.5
Glue	2	2.5
Water	4.5	3
Fine sand	2	2
Red ochre	0.5	0.5
Vermillion	0.1	0.1

Instead of the last two coloring substances, 0.05 of Prussian blue may be used.

FIG. 1



When glue is used, it is of very inferior quality. It is broken into fragments and soaked for a few hours in cold water; then dissolved in a large glue pot, or vessel, C, figure 1, heated by a water bath, W. When it is perfectly fluid, and at the temperature of 212°, the copper is withdrawn, and placed in the circular opening of the frame, figure 2. The phosphorus is then added by degrees; it melts immediately and subsides, but is kept in agitation by means of the wooden stirrer, S, which is furnished at the lower part with projecting pegs, the object being, as the glue cools, to obtain an emulsion of phosphorus in a minutely divided state. The sand and coloring matters are added during the stirring. The paste is kept at the temperature of about 98°, sufficient to retain it in a fluid state by placing the vessel, C, in a water bath."

The author of this useful invention—the friction match as used, notwithstanding its novelty and its youth, is unknown; probably it was discovered by more than one person about the same time. A great number of such matches are made in New York, and the manufacture of them by one house is conducted upon a scale of liberality to the operatives which is exceedingly creditable to the heart of the manufacturer.

FIG. 2



There are some matches which make a slight crackling noise when rubbed on a rough surface; the cause of this is the chlorate of potash; those which do not produce such explosions on a small scale, have none of that dangerous composition. The following composition is an excellent one for matches. 16 parts by weight of gum arabic; 9 parts of phosphorus; 14 parts of nitre; 16 parts of manganese, and 5 of smalt. These ingredients are mixed up with water into a thick paste, into which the sulphured ends of the matches are dipped, and then carefully dried. The manufacture of matches in Germany produced fearful diseases among the work-people, owing to the injurious effects of phosphorus, a remedy for this was discovered by Prof. Schrotter of Vienna, and was described on page 187, Vol. 7, Scientific American. The

discovery was the rendering phosphorus amorphous; and a beautiful one it was in the department of chemistry.

Jewelry.

It is estimated that jewelry to the value of \$3,000,000 is manufactured yearly in New York. There are sixteen large houses engaged in the business and several small establishments. One concern does business to the amount of \$500,000 a-year, and employs about 150 men. The wages vary from 10 to 18 dollars, and some men earn as high as \$25 and even \$30 per week. The workmen are mostly Germans, though there are many French and Americans. The gold used is chiefly that of sovereigns; the refined gold from the bullion offices is likewise worked up.

LITERARY NOTICES.

LETTERS TO COUNTRY GIRLS—By Jane G. Swisshelm; 1 vol., 12mo., cloth, pp. 219; J. C. Riker, 129 Fulton st., New York. Some good advice, written in an homely manner, which we hope will be read by those for whom it is intended. Mrs. Swisshelm is rather eccentric in many of her notions, and has often an abrupt manner in expressing herself, but there is much common sense in many of her odd sayings, and both country girls and city ladies will not do wrong to read over her letters, which contain much practical information and sound advice that may benefit the junior portion of her sex. The book is free from politics and those peculiar notions of which the authoress is so able an advocate.

PUTNAM'S MONTHLY—Vol. I., Nos. 1, 2, 3; 25cts. per number. Putnam & Co., New York. This magazine, of which we have received the first three numbers, promises to be an excellent monthly publication, and much judgment is displayed in catering for the varying tastes of all. Considering the vast quantity of reading contained in each number, the whole of which is original, it may be reckoned as the cheapest magazine ever published, and we prognosticate for the publishers an unparalleled success, if it continues to be edited with the same spirit as is evinced in the commencement.

HISTORY AND PRACTICE OF DAGUERREOTYPING—By A. Eisbee, published by L. Clafin, Dayton, O. A small work in the pamphlet form, containing instructions in Daguerreotyping, and which will be found very useful to the incipient operator. In addition to other matter, there are several receipts for making quick stuff, rouge, etc., by which the artist will be enabled to make up many chemicals, for which he is excessively overcharged by dealers and others. Every daguerreotypist ought to know how to make his own chemicals if he wishes to insure success.

MINNIE'S DRAWING BOOK—No 6 of this incomparable work on Elementary Mechanical Drawing, is now ready, and is for sale by Dewitt & Davenport, Tribune Buildings, this city.

AMERICAN RAILWAY GUIDE—Published by C. Dinsmore & Co., 22 Spruce street, New York. The fourth anniversary of this valuable publication commenced with the April number, which is now ready, containing the official time tables of the railways throughout the United States.

THE GREAT ORATIONS OF DANIEL WEBSTER—For sale by Dexter & Brother, 43 Ann street. This publication contains five of Mr. Webster's greatest efforts, and is sold for 37 1/2 cts.

GRAY'S ELEGY ILLUSTRATED—A beautiful illuminated volume, containing this popular poem has just been issued from the Waverly Magazine Office, Boston, and can be had of Messrs. Dexter & Brother, 43 Ann st., N. Y.

MECHANICS

Manufacturers and Inventors.

A new Volume of the SCIENTIFIC AMERICAN commences about the middle of September in each year. It is a journal of Scientific, Mechanical, and other improvements; the advocate of industry in all its various branches. It is published weekly in a form suitable for binding, and constitutes, at the end of each year, a splendid volume of over 400 pages, with a copious index, and from five to six hundred original engravings, together with a great amount of practical information concerning the progress of invention and discovery throughout the world.

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