

THE MANUFACTURE OF OIL-CLOTH.

The manufacture of oil-cloth is an industry which is carried on with the aid of very simple machinery—machinery so simple, in fact, that it is seldom out of order, and the costs of repairs are trifling. The buildings in which the operations of making oil-cloth are performed are constructed on an entirely different plan from large machine shops, the tendency being to minimize the ever-present danger of fire by locating the different steps of the industry in as many buildings as possible and isolating them. The plant which we illustrate is that of Alden Sampson & Sons, and is situated on the crest of a hill in a suburb of the old city of Brooklyn known as Fresh Pond. The buildings and grounds are twenty-six acres in extent. The various drying houses are separated by a series of great buttressed firewalls which sometimes form the end of one of the buildings, but are generally separated from each building. These walls are perforated by fireproof doors, which permit of rolls of oil-cloth passing through them on the elevated platforms called "railways." Should a conflagration occur in a building, sprinklers and fire pumps are automatically operated to extinguish the flames.

Oil-cloth consists of burlap which is painted repeatedly with a body color, and then printed with a pattern consisting of two to ten colors. The burlap, which comes from Scotland, is brought to the factory in bales containing twelve to fifteen bolts of one hundred and fifty-two yards each. Burlap used is made in six widths, 38, 47, 56, 74, 75 and 93 inches wide, though for special use it is made narrower, as for stair oil-cloth. The bolts of burlap are sewed together by women in the basement of one of the buildings, in order that a large roll may be obtained to be sized and dried. One of these rolls is seen at the right of our first interior view. The object of the sizing is to stiffen and give a surface which will take the paint, and in the cheaper and lighter varieties of oil-cloth the back is not painted, therefore in this case the size is dyed. The size is made on the floor above, and is allowed to flow while hot into the vat through the spout shown on the right of the engraving. The burlap passes under a roll in the bottom of the vat, then up under a bar known as a "knife," around the pair of rollers, and is finally wound on a great bobbin. Five of the bolts of cloth form a single roll. Beyond the sizing machine is a blower and air heater, which furnishes an enormous volume of hot air to be used in drying the sized burlap. The wet rolls are taken to a room on the floor above which immediately adjoins the drying room. Here they are pulled forward by pins which are attached to endless chains, and pass underneath a sash of a window and out on an iron framework, which is boxed in, and which receives the heated air from below. The burlap makes three turns of this drying arrangement, which is 60 feet long. As the temperature in the room is 220 deg. F. no men work in it, but the course of the cloth may be watched through windows at either end, one of which is shown in our third engraving. The calendering rolls and the endless chains are operated by a two-cylinder engine shown at the right of the engraving. As the burlap emerges from under the window-sash, it is automatically marked into lengths and then passes over three calender rolls which are heated by steam, which press and iron it. The burlap is then drawn from the calenders by tension rollers and is cut off into lengths and rolled up.

These pieces of cloth are then taken to the buildings where the body color is put on. There are three of these buildings, each very large, being usually five stories in height, and wide enough to permit of a considerable number of racks on each floor. All the paint used is ground and prepared on the premises, the linseed oil being kept in two large iron tanks in the yard holding 250,000 gallons. The paint is brought to each floor in tubs, which are wheeled to the painting machines which are shown in our engraving. These painting machines are of the utmost simplicity and are very effective. They move across the width of the building on a track, in order that they may be brought in front of each row of racks, for after the burlap is painted, it must be allowed to dry in a rack by itself out of contact with other pieces. The racks are built of yellow pine, and a considerable portion of the floors of the buildings are likewise slatted to allow of a free circulation of air. At night steam is turned on to assist the drying, and sometimes in cold weather steam is used in daytime. The roll of sized and dry burlap is put on a reel, shown at the right of the painting machine, and it then passes over two pads and under two knives. The paint is thrown onto the burlap by dipperfuls, the knife distributing it evenly. The piece of cloth, after being painted, is pulled onto one of the racks, which are each 76 feet long, and there are twenty-four tiers of them on each floor, and the buildings have generally seven ranges. In all there are 5,533 drying frames, aggregating 276,000 square yards of space. The end of the oil-cloth is secured by a clamp, which is shown resting against the painting machine. A rope is attached to this and threaded through the proper slats in the drying frame by a workman who walks through

a narrow hallway between each pair of racks. The end of the rope is brought out and three or four turns taken around the winch-head shown in the middle of the picture. The speed is adjusted by friction, so that the cloth is pulled steadily through the painting machine at the proper speed. When the entire twenty-four pieces of cloth have been painted, the machine is moved sideways until the next rack is reached. Considerable frictional electricity is generated at the painting machine, and a wire at the top conducts it to the ground. The paint on the cloth dries in the space of a day or so, and the cloth is then rolled up and taken to a rubbing machine, which forms the subject of our next engraving. It consists of a pair of parallel bars which are actuated in opposite directions with the aid of gears and cranks. Each bar carries a number of pumice-stone blocks, which serve to smooth the surface as the painted burlap is drawn through it. Sand is also thrown upon the cloth to assist the action of the rubbing blocks. The painted burlap is rubbed after each coat, and the number of coats depends upon the grade. In the most expensive oil-cloth four coats are given on the face and two to the back, and as it requires a day or so between each step, it will be seen that a considerable period must elapse before the oil-cloth is ready for printing. In the cheapest oil-cloth one coat is given to the face and none to the back. The edges are trimmed before printing.

Oil-cloth may be printed both by hand and machine, hand work being used for the heaviest and best grades and for samples, but the machine work is faultless. The printing blocks are of three varieties, pin or line blocks, depending on whether the pattern is produced by incised lines or by separate wooden pins, and metal blocks. Pin blocks are made by taking a piece of maple and sawing it both longitudinally and transversely with a series of fine saw cuts which form small square pins; the ones not needed in the pattern are chipped out. In the line blocks parts of the continuous lines not needed are cut away. Blocks are required for each color, and some patterns require as many as six or ten colors. The machines are over 50 feet long, and the oil-cloth is fed in at the rear and is pulled forward 18 inches each time the blocks descend. As was the case with the painting machine, this entire printing machine moves up and down the room, in order that the printed pieces of oil cloth may be delivered to the different sets of drying racks. The printing blocks are secured to cross pieces of frames which move vertically with the aid of cams. The blocks are inked by rollers which run in boxes, the box being filled with paint. Each roller inks one block, which prints one color. In operation, with the aid of a so-called crooked wheel seen at the right in the machine in the background, the painted burlap is moved forward and at the same time all of the printed blocks descend, each printing its own color. Thus at the first block only one part of the pattern in one color will be printed, while at the last block the entire pattern of oil-cloth is completed. As the blocks rise, the ink roller runs under the blocks and inks them, rolls back from underneath, and the block descends again. On each pattern is a block called a masher, which is simply an uncut block with all pegs or lines left in place. This spreads and smooths the paint in descending.

As the printing progresses, the piece is drawn into the drying room. Owing to the fire underwriters' ruling, the buildings are kept isolated, so that in this case there is no direct communication between the printing room and the drying house. This difficulty is gotten over by a series of iron doors which permit of the piece of oil-cloth being drawn through them. Each time the machine is moved it is drawn in front of one of these doors. A movable house, one story in height, passes up and down, outside the building, and the oil-cloth is drawn through this movable house into the drying house. Once in the latter the oil-cloth can be raised to any floor through traps and is drawn through the racks as before. It requires from three to twenty days for the printed oil-cloth to dry. The oil-cloth is then rolled and dried again for a month or so.

Hand-printing is used exclusively for samples, and very largely for the heaviest oil-cloth. The principles involved do not differ from those in which the machine is used. The block, which is 18 inches square, has a handle and is linked upon a pad, the paint being supplied and spread with the aid of a bristle brush. Our engraving shows only the white paint on part of the cloth. After all of the colors have been applied, and a masher used to spread the colors, the oil-cloth is pulled forward 18 inches by a rope, and the next section is printed. The oil-cloth is pulled into the drying frames as before.

After the finished product has become perfectly dry and hard, it is taken to a varnishing room. The varnishing machine consists of a metal trough which holds the varnish. When it is turned down the varnish runs out of twenty spouts, distributing it evenly over the oil-cloth, which is rapidly drawn between a metal and a printer's roller, the latter spreading the varnish. Workmen with the aid of brushes serve to distribute the varnish. The oil-cloth is hauled into the drying

racks as before. After it is entirely dry it is rolled up and stored with other rolls of its pattern in a warehouse. An open crate or shook is used in packing the oil-cloth for shipment.

Automobile News.

The Schweitzer portable bakery system, which has met with great success for army use, has lately made a combination with the automobile which increases its efficiency. An outfit of this type, designed by the Potel & Chabot Company, figured in the military maneuvers at Betheny on the occasion of the Czar's visit to France. This portable bakery has a mill attachment, and the bread is made on the spot from the grain. It first supplied the Thirty-first Regiment at Melun and then arrived on the field of the review at Betheny. At the close of the maneuvers a lunch was served to the Czar, President Loubet and the invited guests, and the small loaves of bread were baked on the spot by the apparatus. The system has already proved valuable in the army, and it will no doubt be more so when provided with the automobile method of propulsion.

The French Postal Administration is continuing its experiments in Paris with automobile postal wagons for collecting the mail matter with a view of replacing the old horse vehicles. This change has been contemplated for some time, and M. Mougeot, the Postal Director, who is quite in favor of the automobile system, has been carrying on a number of trials with different forms of automobile mail wagons during the past year; but it must be remembered that there are now as many as 400 of the ordinary wagons in service in the city, whose value is estimated at \$360 each, as well as 1,200 horses, and the total outfit represents a value of \$600,000. The post-office department will soon have four automobile wagons, two electrics, one gasoline and one alcohol. The latter was finished a short time ago, and is now on trial; it is of the Peugeot type, with a Longuemare alcohol carbureter. It uses the standard Leprêtre liquid, carbureted at 50 per cent.

Two or three years ago the British postal authorities carried out a series of experiments with a motor postal van for the conveyance of the parcel post between London and Brighton. The car selected for the task was the Lifu, but as it did not give entire satisfaction, the postal authorities abandoned the idea. Since that time, however, several improvements have been carried out in the propelling mechanism, and the Post Office is once more utilizing motor transport. The car selected for the arduous work is a Milnes lorry driven by a 6 horse power patrol engine. The road between London and Brighton is very rugged, and as the cargo of parcels carried every night is large and heavy, a powerful car is required. On a recent trial the lorry maintained an average speed of 10 miles an hour with a full load, as compared with 8 miles attained by the horse coach. If the scheme proves satisfactory, and the danger of breakdowns is averted, the Post Office will adopt the motor transport throughout its service.

The Semmering coasting race, organized by the Austrian Automobile Club, has been a very successful event. The Semmering, which is the last ramification of the Alps, is a picturesque mountain of 3,100 feet altitude which is only 50 miles from Vienna. The race starts from Schottwein, a small village situated at the foot of the mountain at 1,800 feet altitude, and is run over 6 miles of road with a total ascent of 1,200 feet. This makes an average grade of 4 per cent, but the slope is quite varied, as the grade commences slowly, but afterward becomes more and more steep until it is a hard climb for the machine. This is the fourth year of the Semmering races. The first two were won by Gasté and Marcellin, and the third by a Lohner-Porsche (electric). This year the previous record was beaten by a German machine of the Mercedes make, 35 horse power, piloted by Baron Richard von Stern. He covered the course in 12 m. 30 sec. The other records of the heavy machine class were a Mercedes 35 horse power machine in 13 m. 42 sec., a Serpollet steam automobile (with only a 6 horse power motor, however) in 14 m. 21 sec., and a Lohner-Porsche electric in 14 m. 29 sec. The voitures had an interesting struggle; these were represented by a De Dion of 6 horse power, a Darracq of 6½, and Blake (American) with a 4½ horse power steam motor. The De Dion came first in 18 m. 14 sec., which is a very good performance for this class. The Blake followed in 21 m. 13 sec. In the light vehicle class Edmond won on a four-cylinder Darracq (20 horse power) in 14 m. 35 sec. A second Darracq machine of 12 horse power followed in 15 m. 17 sec. In the motorcycle class three De Dion machines were entered; the 8 horse power machine made 13 m. 22 sec., the 3½ horse power 17 m. 42 sec., and the 2½ horse power 26 m. 37 sec. It may be remarked that the Mercedes (gasoline system) of the heavy machine class beat the record over this route and won over the steam and electric. The latter came first in 1900, but is last this year, although it has beaten its own previous record.

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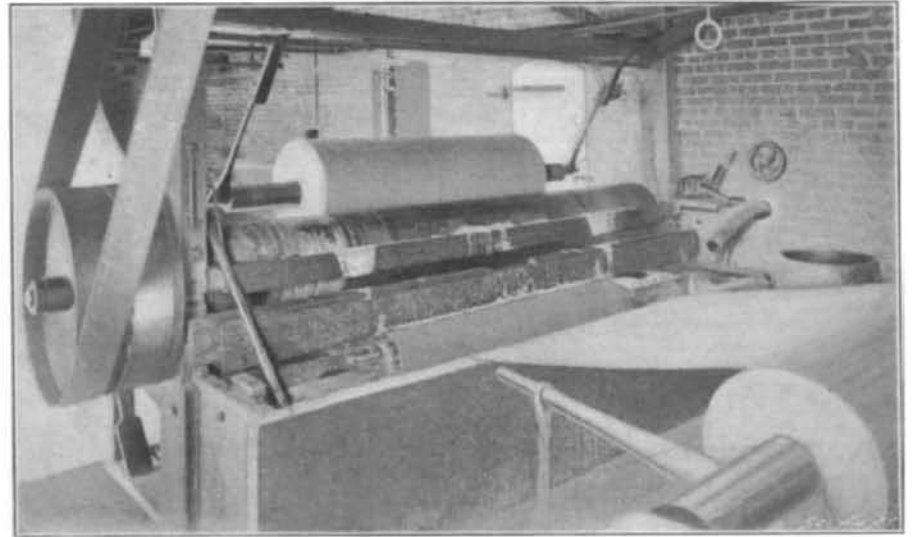
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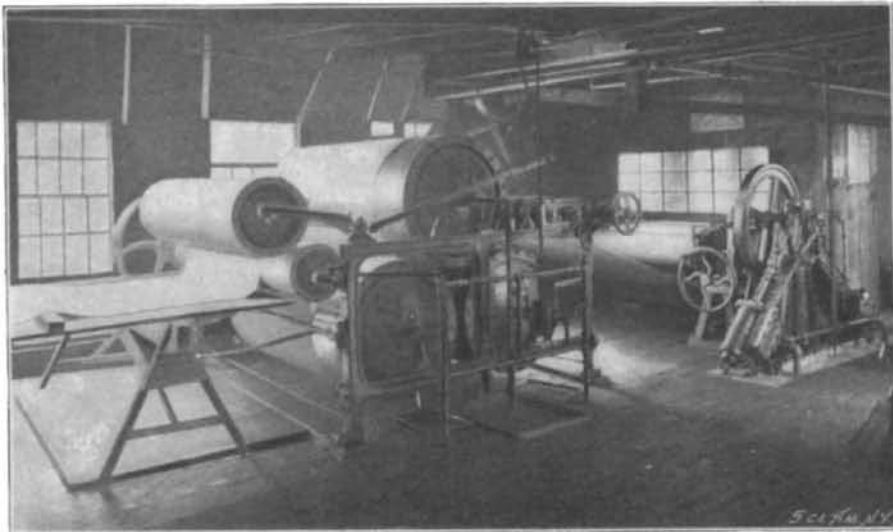
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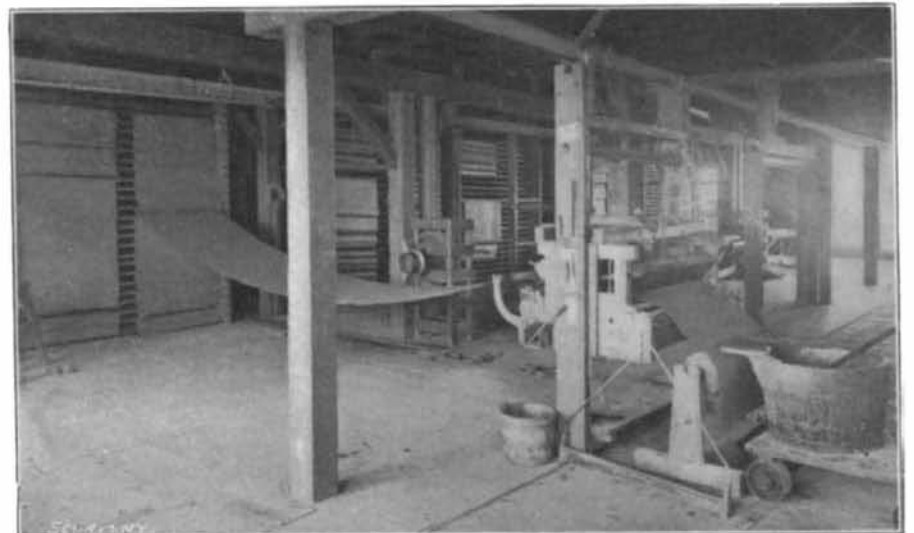
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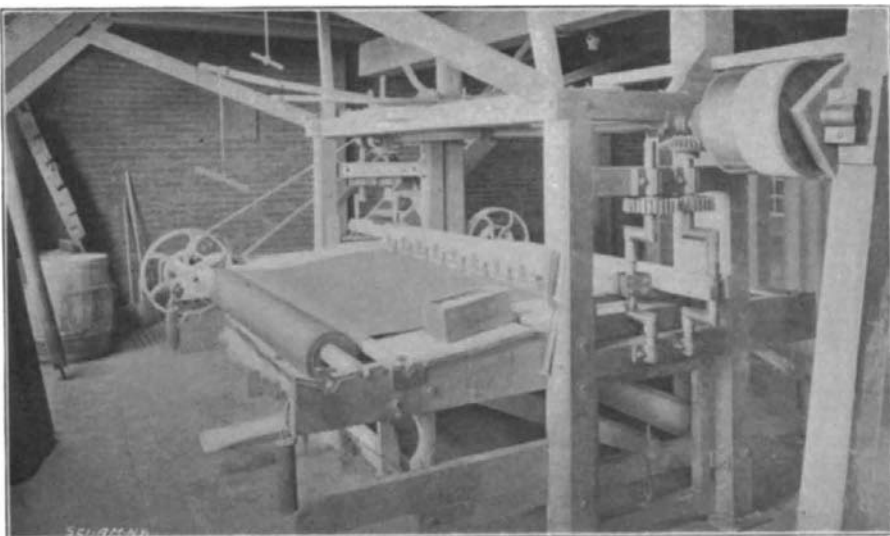
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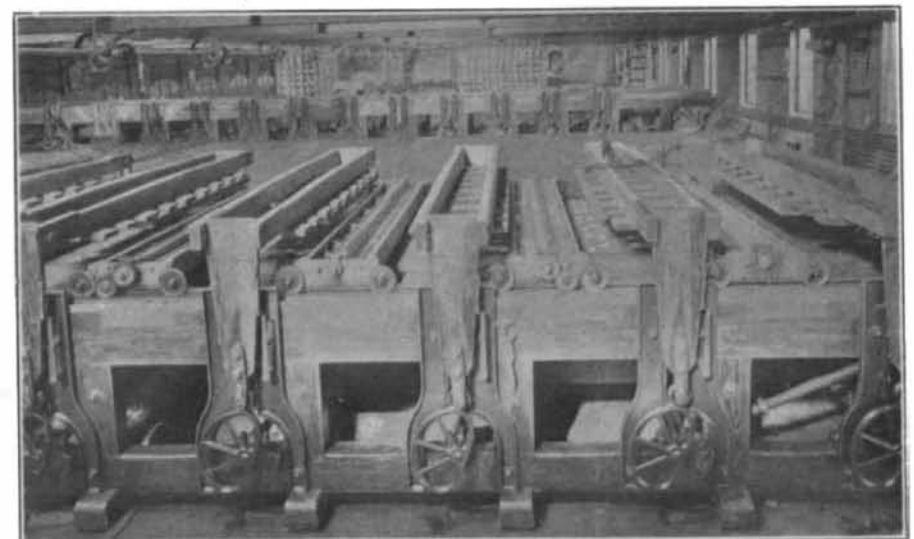
Calendar End of the Sizing Machine.



Painting Machine and Drying Racks.



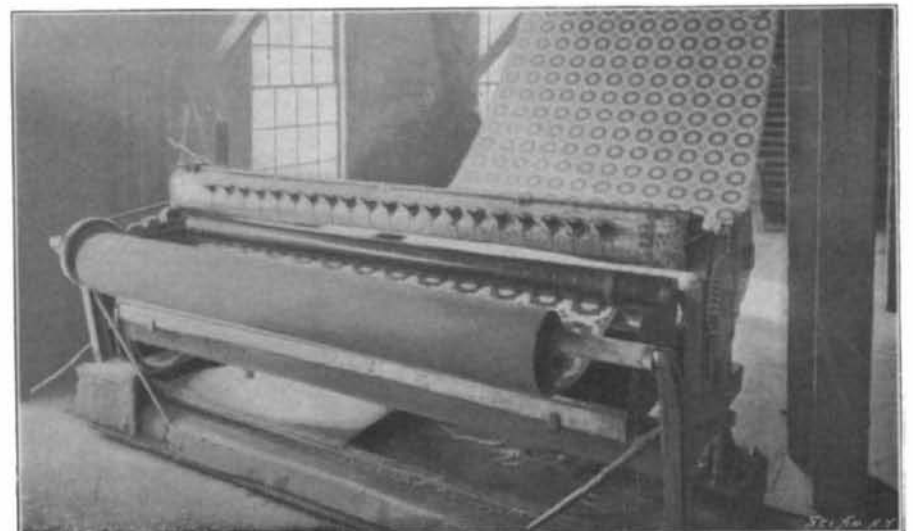
Rubbing Machine.



Printing Machines Running Nine Colors.



Hand Printing a Mosaic Pattern.



Varnishing the Printed Oil-Cloth.

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