

tion of the varnish used by engravers for their etching ground, he invented a kind of crayon composed of wax and tallow. One day his mother wished him to write out a list of clothes to be sent to the laundress. Paper and ink not being at hand, he wrote the list upon a stone with his crayon. When he was about to clean off the stone, it occurred to him, as it had to Dufay, that the body of the stone could be eaten down by aquafortis, leaving the lines in relief, so that the impressions could be taken in the usual manner. His experiments in this direction were partially successful, although less so than those of Blake. In 1798 he thought of the availability of the chemical principle, which is the foundation of the art of



PREPARING THE STONES.

lithography properly so called, namely, the mutual repulsion between oily substances and water. The art was introduced in America in 1821, and was practised by Messrs. Barnet and Doolittle in New York. For many years, owing to the want of artists, it made little progress on this continent, except for commercial purposes and cheap prints, but it can be justly said that the art has now attained a high state of perfection.

The material upon which the drawing is usually made is an argillaceous limestone. Stones more or less adapted for the purpose occur in various parts of Europe and America; but the best are found in the quarries



TRANSFER ROOM.

of Solenhofen, in Bavaria, Germany, and these are almost exclusively used, being exported to all parts of the world where lithography is practised. The stone is very closely grained, and is evidently formed from the finest sediments, the color varying from a light buff to a pearl gray. The stones being quarried in mass, are split into slabs from two to four inches in thickness, and of any required size.

To enable the reader to intelligently understand the art of lithography, we will take him with us in imagination to the premises of the Toronto Lithographing Company, corner of Jordan and Melinda Streets, and describe what is to be seen there. This company lithographed the attractive cover which adorns this month's issue of the ILLUSTRATED, and we will take it as an illustration. We enter the business offices of the company from Jordan street, which are roomy, well-lighted and handsomely fitted up. We explain to Mr. Stone, the general manager, the object of our mission, and he at once takes us to the elevator, and we are speedily landed on the third floor. Here in a large, airy room about thirty artists are busily engaged drawing, sketching, coloring, etc. Leading off this room is a smaller one called the designers' room, into which we are ushered. An idea is given to one of several designers of what is wanted. He prepares a rough sketch, which is approved. Meantime we descend to the second floor, where we find the stone polishers preparing the stones for use. To prepare the stones for use they are ground to a perfectly uniform face and polished. Then they are grained by rubbing two together, with the intervention of fine sand, the graining being finer



AMONG THE STONES.

or coarser according to the work required

After the stone is thus prepared it is taken to the artists' room where we will follow it. The artist first makes a faint tracing of his sketch upon the stone, to guide him in his subsequent operations. Then he draws his picture—from one to thirty days' work—with lithographic crayon, putting in his outlines of the position of the different colors. The crayons are

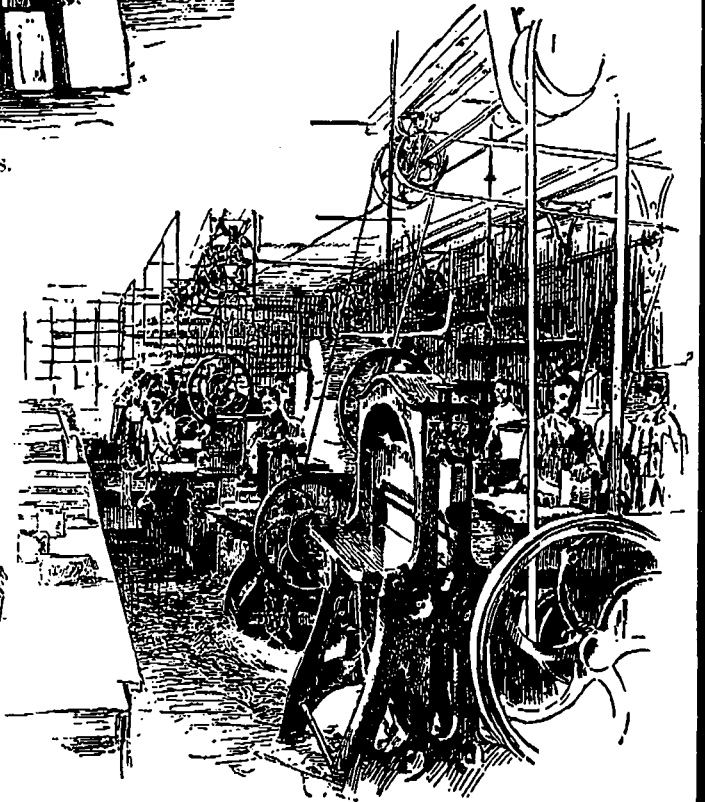
composed mainly of tallow, wax, hard soap and shellac, colored with lamp black; other ingredients being sometimes added.

Crayons, technically called "chalk," are required of different degrees of hardness; an increase of tallow makes them softer, of shellac harder.

The principle of lithography is simple. Owing to

the presence of the alkali of the soap, the chalk is soluble in water, and the drawing can be washed off. Diluted nitric acid and gum arabic are therefore poured over the stone; the acid unites with and neutralizes the alkali and attacks the uncovered portions of the stone, rendering them more porous and more absorbent and also eats it down, leaving the lines in slight relief, thus facilitating the process of printing. The stone is then moistened with pure water; a soft roller covered with printing ink is passed over it, the ink adhering to the drawn lines and rejecting the wet surface. Then you have only to press a sheet of paper upon the stone to take off an impression of the picture. This stone is called the keystone or black stone.

It is now taken to the proving room. Here impressions from the stone are taken upon paper for as many other stones as there are colors required for the job. The prover then sprinkles powdered red chalk on these impressions, and lays each one on a clean prepared stone. This gives the outlines of the picture in red chalk, as a guide or gauge for the artist in making the color stones. He now selects a stone for the yellow that is to appear in the picture, and following the faint and shadowy lines on the stone, he redraws—again with the lithographic crayon and lithographic ink—all those parts which are to be yellow, for instance, when the picture is printed. Then on the "red stone" he draws the portions that are to be red, and so on for each color that he needs. Each stone is sent to the prover after it has been drawn by the artist, and he proves it, being guided by the artist as to the shades and tints necessary. As the artist progresses with the stones, the prover follows, combining each color until the picture is completed, always keeping one perfect impression of each color, and of each combination, as a guide for the steam pressman in



CUTTING AND SHIPPING ROOM.

printing the edition. The proof being approved of and passed as perfect, the stones are then sent to the press room to have the required number of show cards, labels or whatever it may be, printed. After