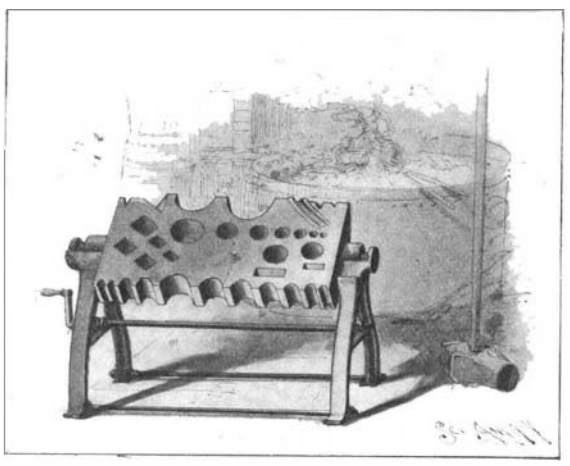
AN IMPROVED TYPE OF SWAGE BLOCK.

We show in the accompanying engraving an improved type of swage block invented by Mr. Horace B. Blood, of 89 Webster Avenue, Rochester, N. Y. For the benefit of those of our readers who are not acquainted with the term, we would define a "swage block" as a heavy iron block or anvil provided with notches and perforations which may be used by blacksmiths in shaping metal. The swage block illustrated



AN IMPROVED TYPE OF SWAGE BLOCK.

is so arranged that it may be readily clamped in any desired position and may as readily be released whenever it is necessary to adjust the anvil to a different position. The block it will be observed has trunnions or journals which engage open bearings formed on the top of the standards of the frame. The standards are connected with each other at their lower ends by bolts. Midway of their height they are connected by a clamping device which consists of a rod revolubly secured to one standard and threaded into a nut in the other standard. By operating a crank on this rod the upper ends of the standards may be drawn together to bind against the ends of the swage block and hold it from turning. Inwardly-directed flanges are formed on the standards just below the trunnion bearings, and these on being drawn inward form firm supports for the swage block when in horizontal position. The recesses lying between these flanges receive and securely hold the swage block when turned to vertical position. When the swage block is held at other angles the flanges sink into grooves formed in the ends of the block around the journals. The usual variety of notches, recesses, perforations, etc., are provided for assisting in upsetting bolts, shaping horseshoes, and forming all other devices which a blacksmith may be called upon to make. The construction of this swage-block is the extreme of simplicity, and the operator will find the tool useful because it may be so easily released from one angle, so readily adjusted to any other angle, and then so quickly and firmly clamped in the required position.

A METHOD OF MAKING GLASS MODELS OF MINES.

The Hill-Chamberlin Manufacturing Company, of New York city, has a patented method of making glass models of mines which enables them to reproduce in solid glass to an accurate scale all the underground workings and surface features of gold, silver, copper, iron, or coal mines.

The models are constructed of thick sheets of clear white glass, laid one upon another, and bolted together, thus forming a unit. The underground workings of the mine are excavated from the glass, and all drifts, shafts, stopes, winzes, upraises, crosscuts, etc., are shown as miniature excavations exactly as they exist in the mine. The top of the model, representing the surface of the ground above the mine, is cut to accurately represent the topographical features of the surface. Future workings can be added to the model as the development of the mine progresses.

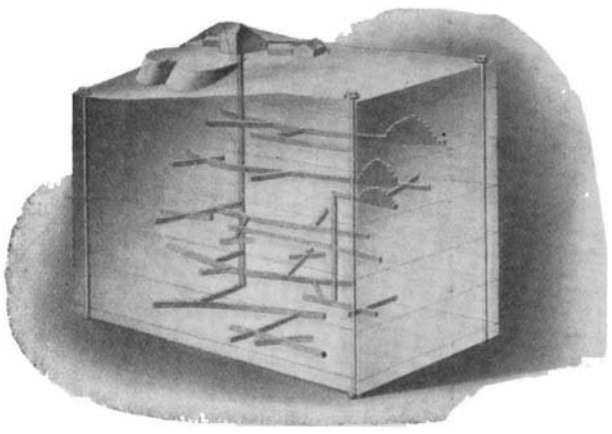
The sheets or plates of glass are fastened together by small bolts, one in each corner serving for the purpose; the holes for the same being drilled perfectly true and of uniform diameter, great care being taken to prevent even the smallest chips at the edges. The holes are drilled with such precision that no extra clearance is left between the bolts and the sides.

After the plates are securely bolted together, the edges are ground to a uniform plane on a horizontal iron disk charged with sand, and are then smoothed and polished. The top plates, intended to represent the topographical features of the surface, are ground upon upright iron mills and stones of various shapes and sizes, and are afterward brought to the same high polish as the sides.

The underground workings of the mine are excavated from the glass by small steel disks and drills of various shapes and sizes, charged with carborundum; the greatest care being necessary to prevent tool marks and small chips appearing in the cuttings. Stopes and other workings between the levels can thus be shown either vertical or on the dip of the vein. Shafts and winzes are shown in the model as rectangular openings with smooth sides. Veins and fissures are shown extending downward from the surface, and on their proper dip and trend across the property, by use of a sawing machine capable of cutting through glass of great thickness; being constructed as an endless band charged with carborundum and running at great speed.

An excellent representation of ore in place in the vein is accomplished by filling the saw cutting with a semi-transparent colored substance mottled to show the structure of the vein.

In assembling the various plates the horizontal planes are coated with a transparent substance adjusted to the same refractive index as the glass, thereby making the entire model optically homogeneous and avoiding the annoying reflections caused by a series of horizontal polished planes.

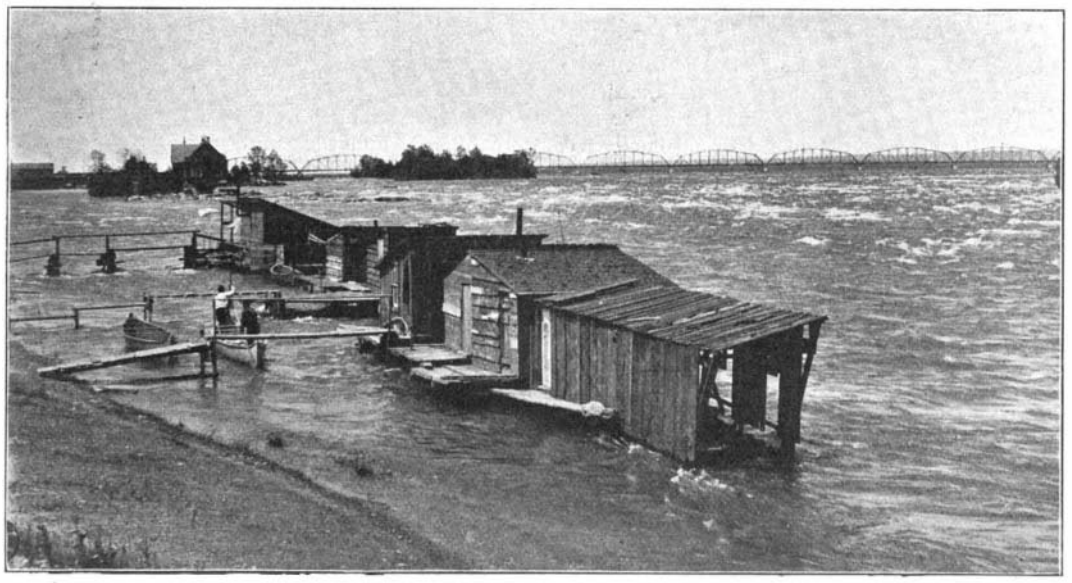


A GLASS MODEL OF A MINE SHOWING UNDERGROUND WORKINGS.

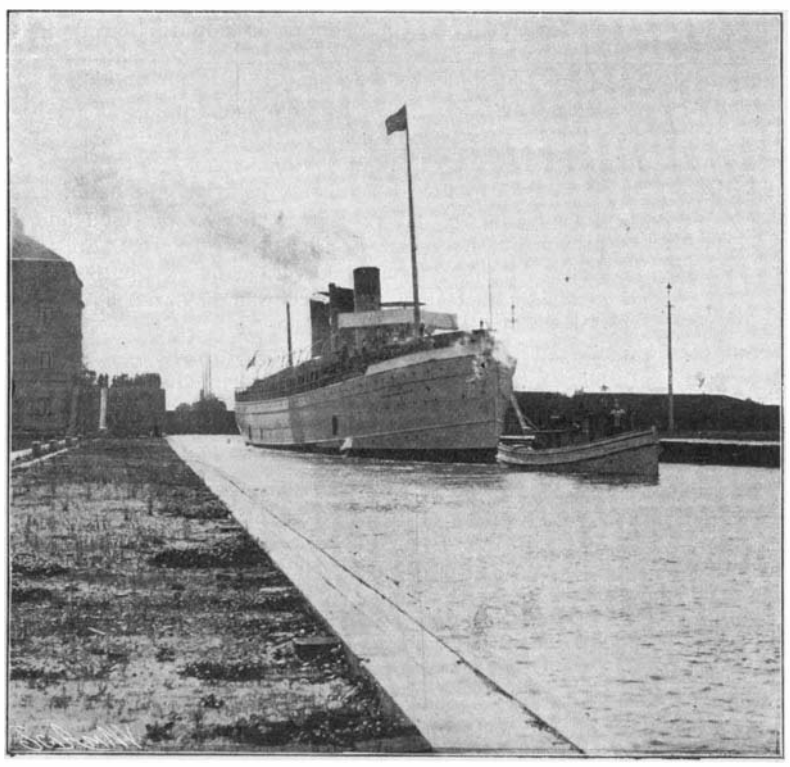
THE "SOO" SHIP CANAL SYSTEM--THE FIFTIETH ANNIVERSARY OF ITS COMMENCEMENT.

BY DAY ALLEN WILLEY.

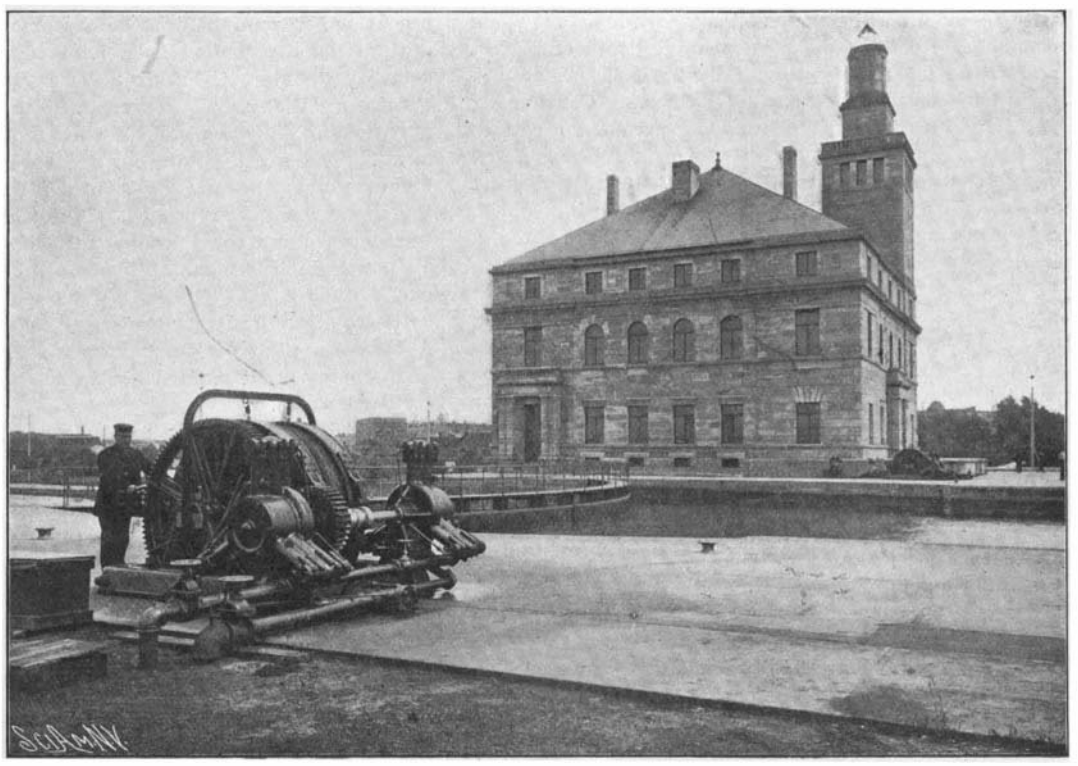
This month marks the fiftieth anniversary of the digging of the Sault Ste. Marie Canal system. On June 4 a celebration, international in its character, commemorated the work begun a half century ago. Representatives of the United States and Canadian governments, in addition to prominent officials of Michigan and other States bordering on the Great Lakes, participated. Their presence was appropriate; for the importance of the canals both to this country and the Dominion is indicated by the traffic which passes through them. Since the gates of the canal locks were first opened, the commerce of the upper lakes has developed to such an extent that during the past year nearly 36,000,000 tons of freight passed into Lakes Huron and Superior. This is an increase of 7,500,000 tons over any previous year in the history of the canals, and, as is well known, is far greater than that of any other artificial waterway in the world. In fact, the "Soo" has been contrasted with such passages as the Suez, which, furnishing a short route between two continents, is perhaps the next in commercial importance. This canal, although it cost $140,000,000 in round numbers, represents an average yearly traffic of less than 10,000,000



THE RAPIDS OF SAULT STE. MARIE.



S. S. "NORTHLAND" AT SAULT STE. MARIE.



GATE-OPERATING MECHANISM AT SAULT STE. MARIE.