

as Judge Charles F. MacLean, of the Supreme Court; W. G. Rainsford, and Captain Thomas C. MacLean, of the U. S. Navy, and as it was deemed desirable to secure Canadian capital, a company was formed to carry out the work. The capital was furnished by Charles R. Hosmer of the Canadian Pacific Railway; T. J. Drummond, Montreal, and several New York men, and the engineers were given orders to proceed. A complete plant was arranged for, and the work begun.

Mr. Wotherspoon, who was to have charge of the work up to the bulwarks of the vessel, began getting his crew together at once, and as he had worked for a long time in and around the tunnels in New York he knew just what kind of men he needed for the task in hand. He had a close acquaintance with the genus "sand hog" that remarkable class of men whose ability to work under ground or under water in an atmospheric pressure several times greater than normal has excited the wonder of those who read about them.

"Sand Hog" Crew

Mr. Wotherspoon collected his crew with great expedition, many of the "sand hogs" and mechanics being engaged actually as they came off shift from the different tunnels of New York, and forty were engaged the day it was decided to hire them. They were put on board a train that night and started for Montreal.

Within two days these men, together with thirty more hired in this country, and the air compressing plant, were taken by tugs from Quebec to the steamship. It took but a few hours to set up the machinery on deck and the men who had been brought from New York looked the Bavarian over.

There was a feeling among the men that the attempt to float the ship would be a failure and talk that if the vessel could be made to float by pumping her full of air she would turn turtle as soon as she got off into deep water. This fear was aggravated by some of the men who had been hired here, and who expressed doubts about going below under the air pressure. These fears were quickly dispelled, however, and the men went to work with a will.

Examination had shown that the Bavarian's bottom amidships was in a very ragged condition. The plating had been torn by the jagged rocks, and to patch it was impossible. The holes were so large that it would have been useless to try to pump the water out, so the preparations to blow it out through the rents in the bottom were hurried forward.

Holes Are Patched Up.

The ship's compartments were made as nearly air-tight as possible. Hatch after hatch was closed by plating which was simply laid under the hatch combing, so that when the air pressure was applied the covers would be held in place. Air locks were placed on the compartments which had filled with water. As the air was forced in the water rapidly receded and the workmen were able to stop the leaks with temporary plating.

One of the most difficult leaks to stop was in the fourth peak tank, which in the Bavarian is a great ballast tank of about 115 tons capacity. An air lock was not placed on this tank, but the manhole cover was put in place, and the air compressor applied. When the water had been driven out until the bottom was within a few feet of the surface, the manhole cover was taken off quickly, and the superintendent and a "sand hog" hurriedly dropped through. The manhole cover was put on and the air applied. This time the water was forced to the bottom, and the workmen closed the leak so completely that they were able to leave the tank at their leisure.

It had been planned to float the vessel November 15, on which day it was expected there would be a normally high tide, but instead a storm came on which caused a very low tide and the floating of the ship had to be postponed.

It was during this wait that the strain on the men's nerves was most apparent. Some of the "sand hogs" and the Italians who had been hired to take coal out of the bunkers began to murmur. They reminded each other that there was seven fathoms of water off the rock on all sides and that if the ship should turn turtle as soon as she floated off it would be pretty serious for all on board.

It was in this emergency that the presence of Mrs. MacLean, who had come on board two or three days before with her husband, Judge MacLean, proved fortunate, as she went among the men and reassured them by her composure.

She Floats Clear.

There was a gale blowing on November 16, and an indication of an unusually high tide. Owing to the bad weather the tugs which had been lying alongside had dropped down the river to a more comfortable harbor. As the tide rose the air compressors were set to work and the full power of the plant used in forcing the air into the hold of the ship. Suddenly there was a movement of the great hulk, and as she lifted herself from her rocky bed a cheer went up from those on board.

Five minutes later the Bavarian was in possession of her own again and floated clear of Wye Rock in sixty feet of water. After the first few minutes all apprehension that the vessel might turn over or that the air pressure would not hold the water back was dispelled. The Bavarian floated almost on an even keel, and was taken in tow for Quebec, where she lies beached near Wolf's Cove.

Estimates show that the cost of putting the Bavarian in a safe place, by the carrying out of this plan, was less than one-fourth the amount expended by those who attempted to salvage the vessel previously by the use of old wrecking methods. Only \$30,000 was spent, and if the salvage is half the value of the vessel, the prize is worth approximately \$500,000 to the company.



A CONTINUOUS BLUE-PRINTING MACHINE.

The Everett-McAdam continuous type blue-printing machine recently placed on the market has a number of novel and interesting features, which, through the courtesy of the Revolute Machine Company, of New York, we are enabled to describe and illustrate.

The principal feature of this machine is its ability to use blue-print direct from the roll without cutting into sheets, and to feed this paper to a continuously acting machine to which the tracings are supplied continuously and as rapidly as the printing can be done. As shown in figure 1, the roll of paper is placed at the top of the machine, and is fed through an opening to the printing apparatus, which consists of a rotating glass cylinder lying in a series of nar-

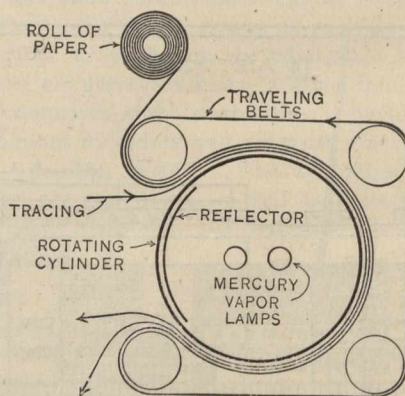


Fig. 1.—Diagram of Electric Blue-Printing Machine.

row belts, and within the cylinder are placed two mercury vapor lamps. The blue-print paper is fed continuously between the belts and the cylinder. If only a few prints are wanted, sheets of paper previously cut may be fed in. The tracings are inserted between the paper and the cylinder, and after passing around three-fourths the circumference of same, are deposited with the paper in a box in the front part of the machine. The printing is done from the inside of the cylinder as the paper and tracings travel around it.

To those who have to do with blue-prints the advantages of this arrangement are at once apparent. The blue-print paper itself is not touched by the hands; there is no limit to the length of prints, and prints as wide as 5 ft. may be made, which is the full width of the roll. The mercury vapor lamp which is used requires no attention, and as the printing is done from the inside all the rays strike the sur-