

are only in operation about half the time, while those above average, probably, three-quarters of the time.

At present there is a channel thirty feet deep from Montreal to the sea. Work is being done in Lake St. Peter, and at several points below, and with the exception of a short distance in Lake St. Peter, the channel is now 300 feet wide



Fig. 2.—"Galveston" Suction Pipe on Board... The gentlemen, beginning at the left are: F. W. Cowie, V. W. Forneret, A. Beauchemin, Superintendent of Dredging below Quebec; Captain Caron, and Chief Engineer Lecroix, of the dredge.

in the straight portions, and 450 feet and over on the curves. The intention is to make the straight portions 450 feet, and the curves 500 to 800 feet wide. Below Quebec at Crane Island, Beaujeu Bank, a channel 1,000 feet wide, with a minimum depth, at extreme low water, of 30 feet, is being dredged. The channel is now well lighted and marked out by means of buoys, but it is the intention to increase its safety and efficiency in this as well as other respects.

In the work of deepening and widening the channel, several types of dredges are used, each being specially adapted for the class of work in which it is engaged. There are six elevator dredges which are used for any kind of material, whether hard or soft. These are often efficient and economical, and leave a clean bed.

A spoon dredge is now under construction at Sorel for Cap a La Roche. This type is specially adapted for use in dredging berths, and in general harbour work where anchors and moorings are not needed. They will work effectively on almost any kind of material, and in many cases are found to be the most economical in operation. At the present time there are no spoon dredges operating in the channel, but several may be seen in Montreal harbour. One hydraulic dredge is in use, viz., the "Tarte," and another, the "Beaujeu," is being built in the government shipyards at Sorel. This latter will be a modification of the suction dredge, a cutter head being added. This cutter will break up material, allowing it to pass through the suction pipe more easily.

The "Galveston" is the only suction dredge operating in the channel. It is at work below Quebec, near Crane Island. This dredge deposits the material in large hoppers, which when full are taken to some selected spot and the material is deposited at the bottom of the river again. The other dredges mentioned are all working above Quebec, the "Tarte" being in Lake St. Peter.

Recently, in accordance with instructions from the Hon. Mr. Brodeur, Minister of Marine and Fisheries, a representative of the Canadian Engineer, along with other gentlemen, was invited by Mr. Cowie to accompany him and Mr. Forneret on a trip of inspection down the river, on board the government steamer "Frontenac." The trip lasted two days. At Sorel, where the first stop was made, an opportunity was given to inspect the government shipyard, which is under the directorship of Mr. G. J. Desbarats. Here was seen the new steel hopper dredge, "Beaujeu," in course of construction. When completed, this dredge will be the largest of this type built in Canada, and will be one of the largest hopper dredges in the world. The hull of the "Beaujeu" is 250 feet long, 45 feet wide, and 20 feet deep, drawing 15 feet of water when loaded, and she is fitted with twin screws. The dredge was launched on December 1st, and it is expected that she will be ready to go into commission early this fall. It is estimated that she will cost about \$350,000. It is proposed to operate the new dredge at the St. Thomas Flats, Beaujeu Bank, Crane Island, where the channel requires to be widened, deepened, and straightened. This dredge will be the second of its kind operating in the St. Lawrence, the other being the "Tarte," which, as already stated, is now at work in Lake St. Peter. She is designed for work in soft clay and sand, and the suction pipe is fitted with a cutter head used for breaking up the material. This cutter revolves in a similar manner to a large bit. Some idea of the sizes of this cutter may be gathered from the fact that it weighs 10,900 pounds, and the shaft for operating it is 8 inches in diameter, and 76 feet long, weighing 13,295 pounds. The hoppers have a capacity of 2,000 cubic yards, and the dredge will cut at a depth of 65 feet below the water line.

It is interesting to note that very shortly construction of a dipper dredge for use in Cap a la Roche Channel will be commenced. This dredge will work on shale rock, and the dipper will have a capacity of 10 cubic yards. It will be one

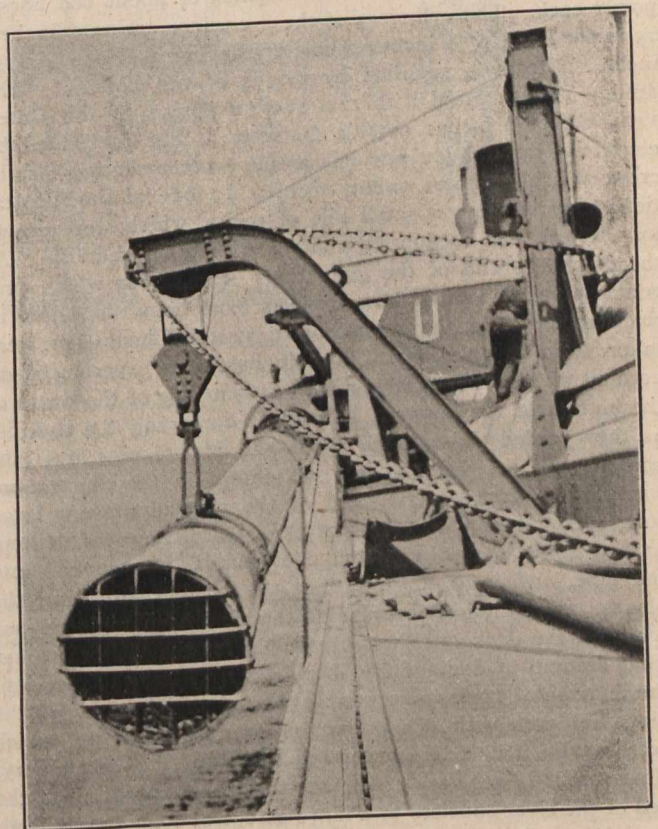


Fig. 3.—"Galveston," showing Suction Pipes being lowered over side.

of the largest and most powerful dipper dredges in the world, having a direct bucket pull of 180,000 pounds.

The second stop was made in Lake St. Peter at the dredge "Tarte." This dredge is one of the most efficient of the fleet, and has a very fine appearance. The "Tarte" pumps the material excavated through a line of floating pipe