

## BRITISH COLUMBIA LEGISLATION TO ENCOURAGE SHIPBUILDING.

**T**HE British Columbia Shipping Act constitutes a shipping credit commission consisting of a superintendent and two other directors with the power of an incorporated company which may own and operate vessels of all kinds, as well as build and deal in them generally.

The superintendent and one director are nominated by the Lieutenant Governor in Council, and the third director is the Deputy Minister of Finance. The commission is empowered to make loans subject to the provisions of the act and to deal with the necessary collateral securities, and must keep a register of loans. The loans made shall be on vessels built and registered in the province, and made on the written application of the borrower in prescribed form setting forth clearly the purpose for which the loan is required. No loan shall be granted for an amount exceeding 55 per cent. of the ascertained value of the vessel, or of the shares offered as security, and the loan may be made in instalments. A commissioner may not deal with any application for a loan by any person with whom he is within the third degree of consanguinity, or who is a partner, or a debtor under a mortgage to any association of which the commissioner may be a director or member.

The following provision shall be carried out in respect to vessels built under the aforementioned loans: The plan and specification of the ship shall be approved by the commission, and the ship shall be so built as to obtain a class in Lloyd's or Bureau Veritas; white labor only shall be employed in the construction, and in the subsequent operation and maintenance; such rates of wages as the commission may decide to be a fair wage rate shall be paid; the superintendent of the commission or such other person as may be approved by the commission shall be the managing owner of the ship until the loan is fully repaid; the ship shall not be sold or transferred except with the commission's consent for five years from the date of the loan and its cargo-carrying capacity shall be utilized to the full extent on each voyage outward, and shall be operated continuously to the commission's satisfaction; every charter shall be subject to the commission's approval during the currency of the loan, and the rates of freight on British Columbia shipments shall never exceed the actual rates paid on similar shipments at even dates in the States of Washington and California, and the commission shall have power to ascertain and certify such rates; all insurance and risks during construction shall be made loss payable to the commission as its interest may appear and exist, and such insurance shall be carried in any amount which the commission may deem necessary; the contract with the commission shall contain a provision whereby 1 per cent. of the gross earnings of the ship during the currency of the loan shall be paid to a reserve fund of the commission as a payment from the shipping industry benefitted by this act towards governmental risk, cost and expense of passing this act and carrying it into effect. Each loan made by the commission is to bear 6 per cent. interest, payable half-yearly, and the principal is repayable in five equal annual instalments; provided that should 50 per cent. of the net earnings of the ship for any year exceed the annual instalment of principal and interest, then the borrower shall repay a further sum so that the amount paid each year in reduction of the loan shall never be less than 50 per cent. of the net earnings of the ship, and never less than 20 per cent. of the original amount of the loan, without reference

to earnings. In case of default by the borrower, or if the commission considers that the loan or any portion of it shall have been used for any other purpose than that for which it was made, the commission may refuse to pay any unpaid portion of the loan and one month after demand by registered letter for the repayment of the loan made, may take possession of the whole or any part of the security, and dispose of same by public or private sale, applying the proceeds in payment in the first instance of money advanced under the loan agreement. Any loss which may arise from such sale to be debited to the reserve fund before mentioned.

## LAYING CONCRETE IN FREEZING WEATHER; TROY LOCK AND DAM.

By D. A. Watt, Assistant Engineer.

**I**N order to have the Troy lock completed and ready for navigation within the specified time, it was found necessary to carry on the work of placing concrete in the lock during the winter 1914-1915. Various expedients were used to prevent damage to the concrete from frost.

When the temperature fell below about 50° F., the sand, gravel, and water used in the concrete were heated. A steam jet placed in the water tank of the concrete mixer sufficed to heat the water. The sand and gravel were heated by steam jets located at the bottom of the bins of the mixer. The steam, escaping upward through the mass, made this method very effective, even when the mixer was running to full capacity. When running slowly, however, it was sometimes necessary to reduce the supply of steam, as it made the concrete too hot for the men to work in the forms and, in confined forms, resulted in so much vapor that the men could not see properly.

This method was also used on the construction of the dam, when toward the end of the working season the temperature fell below moderate. As the river water was shortly to be allowed to flow over the new section of the dam, it was necessary to harden the concrete rapidly, and this method proved very effective.

When the temperature fell below freezing, additional precautions were taken. Lighted lanterns were placed on top of the green monolith; and large improvised steam radiators, made of a few coils of 3-inch pipe were hung close along the side of the forming; the whole was then covered with tarpaulins and so left for about forty-eight hours. Loss of heat by radiation from steel forms is much greater than from wooden forms.

Concreting was carried on without special difficulty under occasional temperatures not far from zero, and the temperature of the concrete when delivered in the forms was rarely less than 60° F. The steam coils and tarpaulins were usually kept in place for about forty-eight hours, when the concrete had set sufficiently to allow the forms to be taken down. The lifts, or thickness of courses, ran from 3 or 4 to about 10 feet.

Difficulties also arose from the surface freezing of the sand and gravel storage piles, on which the cold would sometimes produce a frozen crust of a foot or more, hampering the operation of the excavating bucket. This was overcome by using steam pokers, consisting of 1 1/4-inch steam pipe, about 10 feet long, pointed at one end and having a few small holes. Two or three of these would be worked into the storage pile over night near its base, its surface being covered with tarpaulins.