## COST OF THE TRANSCONTINENTAL.

From Moncton to the Rocky Mountains the estimated cost of the National Transcontinental now is some $85,000,000; the sum total is made up as follows:—

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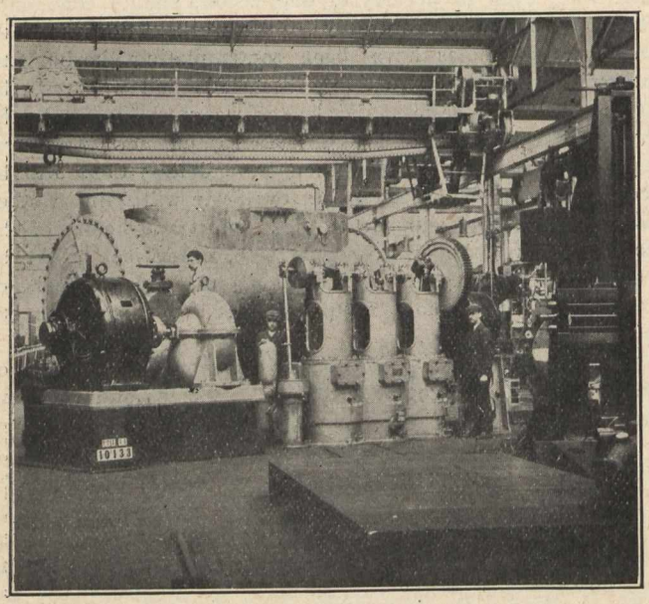
|---|---|
| National Transcontinental under contract | $44,389,393 |
| National Transcontinental not under contract | 19,030,173 |
| Grand Trunk Pacific, Prairie section | 21,872,200 |
| Total | $85,291,766 |

These figures are the estimates upon which the contracts have been or will be let.

The estimated cost of the 1,227 miles under contract on the Eastern division, or National Transcontinental, is some $44,000,000; or rather over $36,000 a mile.

## CONDENSING PLANT.

We published in our current issue a photograph taken in the makers' works of a large condensing equipment. which is one of a set of five complete equipments which have been recently designed and constructed by Messrs. W. H. Allen, Son & Company, Limited, Queen's Engineering Works, Bedford. The five sets are all, constructed exactly to the same drawings, and each is capable of dealing with 66,000 lbs. of exhaust steam per hour, and of maintaining a vacuum within



2 inches of the barometric pressure, when supplied with circulating water at a temperature of 70 degress Fahrenheit.

A large and almost unequalled experience in this class of apparatus, which extends over a great many years and in all parts of the world, together with the expert knowledge obtained through years of careful experimental work carried out by their own staff at Bedford, places Messrs. Allen in the very fortunate position of being able to decide the correct proportions of the various parts of a condensing equipment with the greatest possible accuracy, so that the transfer of heat from the exhaust steam to the circulating water may be carried out in the most expeditious manner possible, and with a minimum expenditure of power.

As regards the details of the very large plant which we illustrate, in the first place it has been designed to deal with the exhaust from a steam turbine, and this has necessitated the employment of a very large steam opening in the top of the condenser body. The latter is of cylindrical form, and of cast-iron, and of ample stiffness—extra stress being placed in the casing where necessary.

The tube plates are of rolled brass and are carefully stayed. The tubes are of solid-drawn brass, the total surface being 10,000 square feet. The circulating water enters the lower part of the condenser through the water box which is situated at one end and circulates from end to end of the same water box.

The supply of cooling water is effected by one of Messrs. Allen's well-known "Conqueror" centrifugal pumps, having suction and discharge branches 20 inches in diameter, and capable of supplying 66,000 gallons of water per hour against a total head of 20 feet. The pump casing is of cast-iron, and the impeller of gunmetal, the spindle being of forged naval bronze. It is direct-driven by means of a three-phase motor of 67 B.H.P. running at 410 revolutions per minute, and receiving current at 220 volts and 60 periods.

The air pump is of the three-throw "Allen-Edwards" type, and is of Messrs. Allens very latest and improved design. The three barrels are exactly similar, having a diameter of 18 inches, the plunger having a stroke of 14 inches, the crankshaft making 135 revolutions per minute. This is driven by means of a threephase motor of 19 B.H.P. running at 575 revolutions per minute, and receiving current at 220 volts, 60 periods. The air pump delivers the condensed steam into a surge tank situated in the lower part of the air pump casing, and at the near end of the pump shown in the photograph. This water is withdrawn by means of a single-acting force pump having a plunger 17 inches in diameter, the stroke being 10 inches, and capable of delivering against a head of 10 feet. The arrangement of this pump is well shown in the photograph, the drive being effected from an outside disc crank on the end of the air pump crank-shaft. The crank-shaft and motion work of the air pumps are of the best open-hearth mild steel, the bearings being lined throughout with white metal—with the exception of the cross-head bearings which are of gunmetal. The lubrication, as will be seen in the photograph, is effected by means of "Stauffer" spring grease cups.

The cross-head guides are cylindrical, and bored at one setting with the facing of the trunk in which they are fixed, thus ensuring a perfect alignment. The air pump buckets are of cast-iron, and are fitted with a solid gunmetal ring; the air pump barrel is also of solid gun-metal as well as the valve plates, the valves being of the "Kinghorn" metallic type resting on accurately faced seatings.

The force pump is also fitted with gun-metal plunger and liners; the air pump casing is fitted with the usual accessories in the way of shifting valves, drain cocks, and relief valve, all of which may be seen in the front of the casing in the photograph. A large sluice valve is also provided on the discharge side of the circulating pump in accordance with the specification for the plant. Careful examination of the photograph will convince of the admirable way in which the arrangement of the plant has been carried out so that easy accessibility of all the working parts is ensured.

The water-box covers on the condenser are also easily removable for cleaning the tubes, and are provided with small inspection covers which permit of easy access to the interior of the water boxes for inspection only.

The executive officers of the Westinghouse Electric & Manufacturing Company, now at 111 Broadway, New York, N.Y., and the New York sales offices and export offices, of that company now at 11 Pine Street, will be removed on Monday, April 20th, 1908, to the new City Investing Building, No. 165 Broadway, New York.

In the design of the new jute mill of the Columbian Rope Company, at Auburn, N.Y., the architect, Mr. Charles T. Main, of Boston, has introduced somewhat unusual features in the design of the floors. Because of the large size and excessive weight of the machines in the second and third storeys, as well as on account of vibratory effect of their rotary movement, exceptional strength and stability was required. The columns, spaced on 10-foot bays across the building and on 18 to 24-foot centres lengthwise, are of 16 x 16 Georgia pine. The beams running lengthwise of the mill are of the same size and material, while the flooring is of 6-inch plank, spliced and toe nailed together, and covered with ordinary maple top. The result is a practically solid floor which is absolutely rigid and capable of sustaining the heaviest possible loads.