

CANADIAN TELEGRAPH EXTENSION.—The government will, during the present season, undertake the further extension of Dr. Fortin's telegraph system along the north shore of the Gulf of St. Lawrence. The line is now completed to Bersimis, and it is intended to lay a cable from that point to Godbout River, near Point de Monts, a distance of 80 miles; thence a land line 75 miles long will run to Moisie River. Next year it is intended to push the land line as far as Esquimaux Point, 15 miles from Mingan Harbour, and 65 miles from Moisie River. Owing to the rugged nature of the country, the numerous deep harbours and fiords with which the coast is indented, the difficulty of constructing a land line east of Mingan is so great, that it is proposed to lay short cables from each important harbour or fishing station until Forteau is reached. This harbour is just inside the Straits of Belle Isle, and only five days's sail from Moville. The completion of the telegraph line to Forteau, it is claimed, will prove a great advantage to shipowners and merchants, as communication can be made with steamships going *via* Belle Isle during four or five days of the voyage from Montreal to Europe.

ELECTRICAL NAVIGATION.—The new launch constructed for the Electrical Power Storage Company by Messrs. Yarrow & Co., made a trial trip between the Temple Pier and Greenwich. A daily paper professing to have the *largest circulation in the world* describes her as a new steam launch, and her most remarkable features as being the complete absence of either boilers, funnel, or smoke. The following figures are stated to be her proper dimensions, but we are not quite sure of their correctness:—40 ft. long, 6 ft. beam, and having 3 ft. draft of water aft. She was fitted with eighty Sellen-Volckmar secondary batteries, having a weight of 60 lb. each, or in all about two tons, very neatly packed beneath the floor. The screw is 18 in. in diameter, with a 13 in. pitch, and making 680 revolutions per minute, being attached direct to the Siemens dynamo. The speed attained on the voyage was over 7½ knots; the passage down the river, immediately after the turn of high water, being made in 37 minutes, including the clearing of the screw from a floating basket which had fouled it.

A CANADIAN ON THE CHANNEL SCHEME.—It will be interesting to Canadians to draw attention to a book published some years ago by a Canadian, James Chalmers, upon the subject of "The Channel Railway connecting England and France." The second edition which is before us was published by E. and N. Spon, 16 Bucklersbury, London, in the year 1867. The plan proposed by Mr. Chalmers is by means of submerged tubes, the total cost of which he estimates at twelve million pounds sterling. The annual revenue he calculates at one million, three hundred thousand pounds; the amount of annual expenditure at eighty-five thousand pounds. The book is illustrated by a chart of Soundings and Lithographed Plans.

NEW ENGINE FOR ELECTRIC-LIGHTING.—Mr. E. D. Farcot has designed a new form of compound engine for electric-lighting machinery. It consists of two cylinders, the larger set above the smaller. The space between the two pistons is undivided, and is in communication with the interior of the engine-frame, and is never put in connection with the steam-supply pipe. The steam first enters the small cylinder, and is thence exhausted into the large cylinder, thus driving the pistons, which are both on a single rod, in opposite directions by a system of intermitted expansion. The engine is thus seen to be of the "Wolff system." The space between the two pistons is made to communicate with the larger space in the frame, merely to secure a reduced variation of uncounterbalanced pressure. No stuffing-box is needed in this engine in any inaccessible part of the machine. The valve-gear is of the plainest possible description, and the whole engine is built with a view to simplicity and small cost in construction and operation. It is intended to be driven up to four hundred revolutions per minute.

HEATING BY SUPERHEATED EXHAUST-STEAM.—Mr. Levi Hussey has devised a method of heating buildings in winter by the exhaust-steam from engines by first passing it through a superheater in the flue, and there taking up heat which would otherwise be sent up the chimney and wasted. The steam is thereby deprived of all moisture, and then heated to so high a temperature that it will heat more thoroughly, and with less obstruction by back-pressure, than saturated and wet steam. Heat is thus obtained without cost, and rendered

effective for useful application to a greater extent than has hitherto been possible.

THE WIMBLEDON ELECTRIC RAILWAY.—The latest experiment in electric railways has not been very brilliantly successful. It was announced, with some little flourish of trumpets, that the miniature railway to the camp on Wimbledon Common was this year to be worked by electricity. It was not, however, till the last day but one of the meeting that the electricity could be brought into action, and even then the service of steam could not be dispensed with. The trial was again renewed, but the loss of power was very great, and it was as much as the twelve-horse power engine could do to get the cars along the line. Down an incline they ran well enough, but, as at Chiswick, where a similar experiment had similar results, they showed considerable reluctance to move whenever the gradient was against them. There is no doubt that electric railways can be made to work under favourable conditions—although hitherto nothing is known as to their cost as compared with that of steam—but for the ordinary tramway, or such a rough-and-ready temporary railway as that on Wimbledon Common, electricity cannot yet be regarded as a rival of steam.

ENGINES OF LAKE STEAMERS.—One of the steamers of the Western transportation line has engines of the "compound" type, two low and two high pressure cylinders, of 20 and of 40 inches diameter and of 40 inches stroke. The steam is cut off at 8 inches in the high-pressure cylinder, and the consumption of steam amounts to but 19 pounds per hour and per horsepower. The boat is 256 feet long, 38 feet beam, and 16 feet draught. The engines and boilers weigh about 100 tons. The latter have 100 square feet of grate-surface, and 3,366 square feet of heating-surface. Another vessel, the E. B. Hale, has simple engines, carries 1,600 tons of freight at 14 feet draught, makes about 10 knots an hour on 1,400 pounds of coal. The engines are 36 by 36, and are supplied with steam by one boiler 12 feet in diameter by 18 feet long.

ELECTRIC STOP FOR STEAM-ENGINES.—Mr. Tate, an English engineer, has combined the Leclanché battery, an electro-magnet, an auxiliary steam-cylinder, and a stop, to the closing of the stop-valve of the steam-engine, if its sudden stoppage should become necessary. It has been supplied by Mr. Tate to the driving-engines of his large woollen-mills in Bradford. The mechanism consists of a weighted suspension rod attached to the stop-valve by a bracket, and actuated by a small steam-cylinder, the piston of which is supplied with steam through a valve which is opened by the action of the electro-magnet and the weighted rod. The movement of this auxiliary engine shuts the stop valve of the engine in a small fraction of the time usually required to close it by hand. The wires of the battery are carried to various parts of the mill, so that the engine can be "shut down" at any instant, and from any one of a number of promptly accessible points. This arrangement is proposed to be attached to the engines of steam-vessels, the wires being led to the bridge, and to other parts of the vessel where the officers can easily reach the button.

"COMPOUND" LOCOMOTIVES.—M. Mallet communicates to the French society of engineers a note from M. Borodine, giving the results of experiments to determine the relative economy of the simple and the compound system of engine for locomotives. The engines experimented with were those designed for the railway from Bayonne to Biarritz by M. Mallet. The trials extended over a considerable period of time, and the comparisons were made fairly complete. The result showed the compound system to have an economy of from ten to twenty per cent., according to the conditions under which they are carried out. The variation in the ratio of expansion is very greatly restricted in the compound engine. The use of the steam jackets with which the engines were provided did not prove to be of advantage. The expenditure of steam was greater when they were in use than when they were shut off.

ZINC PAINT FOR CAST OR WROUGHT IRON.—A process of painting, as a substitute for galvanizing, has been invented by Messrs. Neujean & Delate, of Liege. It is specially intended for objects of large dimensions, which cannot well be moved, and therefore cannot well be dipped into a bath of melted zinc. The zinc, when finely pounded, is simply mixed with oil and siccative. In this way a varnish is obtained, which is applied with a brush in the usual manner. A single layer is sufficient, but two are preferable. The coated objects can be left as they are, or bronzed or painted as required.