

survey will likely continue from the end of his work towards Rainy River. Under the terms of the charter, work must be commenced Aug. 1. It is said Wm. Mackenzie has been successful in securing the co-operation of British capitalists, & that 40 or 50 miles are likely to be built this year. (Unofficial.)

**Port Arthur, Duluth & Western.**—The proposed branch from near Stanley to Kakabeka Falls will not be gone on with this year. (Official.)

**Prince Edward Island, Belfast Branch.**—This branch of the Government line is projected from Charlottetown to Murray Harbor, on the s.e. coast. It would necessitate the bridging of the Hillsboro' River at Charlottetown, at an estimated cost of \$800,000, which would provide a combined railway & traffic bridge, in the building of which the Provincial Government is expected to aid. The length of the branch would be about 50 miles, its estimated cost, narrow gauge as is the rest of the line, being from \$7,500 to \$8,000 a mile. The branch would pass through one of the best & most prosperous districts of the Province, & the Hillsboro' River bridge would be a great convenience to people living east of the river, who now have difficulty in reaching Charlottetown when the ferry traffic is interrupted by ice. A preliminary survey of the proposed line was made for the Department of Railways some 5 or 6 years ago, & a more complete one was made last year by H. J. Mackenzie, C.E. Of course nothing further can be done till next session of the Dominion Parliament, & it is by no means certain that it will be taken up then. (Unofficial.)

**Toronto & Hudson's Bay.**—W. T. Jennings, C.E., left Toronto July 7 on behalf of the Toronto & Hudson Bay Ry. Co., to examine the country to the north of the C.P.R. & west to the Temiscaming & possibly to the Abitibi & Moose Factory, thence, as far as circumstances & time will permit, over rivers & inlets at the foot of James Bay, returning by Moose River & a route heretofore unexplored southward to Wahnapitae Lake. The examination of Wahnapitae & Temogami districts will then be taken up. The object of the examination is that an intelligent idea may be formed of the commercial value of the districts between the C.P.R. & James Bay, with the view of the immediate opening up & advancement of those districts as far as found practicable. Mr. Jennings took with him City Surveyor Sankey, of Toronto, & a sufficient number of canoe men & packers, who know the country, & will, therefore, be able to carry the expedition over as rapidly as possible. (Official.)

**Woodstock & Brantford.**—D. A. Middleton, C.E., of Ottawa, is making a survey for a line between Woodstock & Brantford, some 26 miles. It has been persistently stated that the proposed line is to be built by or in the interest of the C.P.R., but prominent officials of that Co. deny any knowledge of the matter.

There are now nearly 200,000 miles of railway in the U.S. They are capitalized at about \$10,000,000,000. They earn \$1,125,000,000 annually & disburse for material & wages \$793,000,000, & have a system of rates for the carriage of freight which is  $\frac{1}{3}$  less than that of the railways of Europe. There are directly in the service of the railways of the U.S. about 800,000 men, & about 2,000,000 members in the families of these employees.

The world's railway mileage at the present time is equivalent to more than 17 times the length of the equator. In more exact figures, the world's railway mileage, according to the latest verified returns, aggregates 433,953 miles, or 38,810 miles more than in 1891. This enormous mileage is distributed among the various subdivisions of the globe in the following manner: America, 299,722 miles; Europe, 115,284 miles; Asia, 26,890 miles; Africa, 8,169 miles, & Australia, 13,889 miles.

## SHIPPING.

### The C.P.R. Stikine Steamers.

The steamer Ogilvie, an illustration of which is given on page 131, is one of the fleet of 12 steamers built by the C.P.R. last winter & spring for the Stikine River, an extended description of which appeared in our April issue pg. 50. She made the round trip from Wrangel to Glenora & back in 44 hours, but was beaten by her sister steamer, the McConnell, which did it in 43 $\frac{1}{2}$ .

The C. P. R. Co.'s stern-wheel steamer Schwatka, recently built at Port Blakeley, Wash., for the Stikine River, has been taken to New Westminster, there being nothing for her to do in the northern trade.

Owing to the slump in the Stikine River trade, 2 out of the 3 steel-hull steamers built in Toronto for the C.P.R. & sent to Vancouver in sections will be put on the inland waters of B.C. One is being put together at Nakusp for service on the Arrow Lakes, & the other at Nelson for Kootenay Lake. All the other Stikine River steamers owned by the Co. have been taken off. Some of them may be utilized on the inland waters of B.C., or they may be laid up in the expectation that the business will revive.

In previous issues we have given pretty full descriptions of the C.P.R. Stikine River steamers, but it may be of interest to give the following extracts from the specifications of those built in Toronto with steel hulls, by the Polson Iron Works, as they were a decided departure in river steamer construction:

The dimensions are: length over all 161 ft. 6 ins., length from stern to transom 140 ft., breadth moulded 30 ft., depth moulded keel plate to beam at side 5 ft., ditto at centre 5 ft. 7 1-2 ins.

The hull is of open hearth mild steel, equal in quality to the requirements of English Lloyd's rules.

The keel and bottom tie plates are of  $\frac{1}{2}$  in. plate 12 ins. wide, the former strongly rivetted to lower end of stem, lapped and treble rivetted with  $\frac{5}{8}$  in. rivets, the latter extending the length of longitudinal bulkheads.

The stem is of wrought iron 5 ins. x 1  $\frac{1}{2}$  in. extending well under forefoot & scarping over fore-end of keel plate.

The rudder frame is of forgings 3 $\frac{1}{2}$  ins. diam. and 4 in. no., fitted into bearings at aft side of transoms.

The frames are of angle steel 3 ins. & 2 $\frac{1}{2}$  ins. x  $\frac{1}{2}$  in., spaced 21 ins. centres in after body & 18 ins. centres in fore-body, double at bulkheads.

The reverse frames are of angle steel 2 x 2- $\frac{1}{8}$  ins. rivetted across top of floors & continued to upper turn of bilges.

The floors are of steel channels 7 ins. deep, 9.75 lbs. per foot between longitudinal bulkheads, to which they are rigidly connected with  $\frac{3}{8}$  in. plate. Brackets from the longitudinal bulkheads to the sides are of  $\frac{3}{8}$  in. plate, 7 ins. deep, tapered at one end to size of frame & turned so as to extend up to upper turn of bilge. Floors forward of fore-bulkhead are of  $\frac{3}{8}$  in. plate of sufficient depth to suit frame of vessel.

The centre keelson is a bulb T 6 ins. deep, 15.3 lbs. per foot, extending from transom plate as far forward as practicable.

The main deck stringer plate is 15 ins. wide amidships,  $\frac{1}{2}$  in. thick, diminishing to  $\frac{3}{8}$  in. at ends, lapped & treble rivetted, the rivets being countersunk. The bar is 2 $\frac{1}{2}$  x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  in. worked outside underneath, close-rivetted & caulked.

There is 1 beam to every frame, of 3 x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  angle steel extending 2 ft. 3 in. on each side, fastened to main deck stringer plate & longitudinal bulkhead by angle lugs of sufficient length, supported at centre by 2 $\frac{1}{2}$  in. pipe stanchion having wrot.-forged ends, rivetted to beams and keelson, with alternate

frames. The deck openings are framed out to suit requirements of machinery, etc. Holes are punched for deck bolts.

There is a stanchion to each alternate beam, as described in foregoing paragraph.

The steel plating is of  $\frac{3}{8}$  in. steel extending from main deck springer plate to a distance down the side sufficient to allow the last strake of wood sheathing on bottom being brought up around bilge & finishing on the side planking, & to receive the upper strake of the planking. An angle bar of 2 $\frac{1}{2}$  x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  in. is worked all around the vessel. The butts of the plating are lapped & treble rivetted, all holes being punched fair & holes countersunk outside. The bottom of the vessel was covered with wood sheathing by the C.P.R. Co., at Vancouver, but the bolts for same were furnished by contractors, who have also punched the holes necessary to receive the bolts through the bottom, & the same for the deck.

The diameter and spacing of rivets is in accordance with Lloyd's rules, all plates & bars being punched & sheared from the laying side & all rivetted work is laid up close.

There are two longitudinal bulkheads throughout, placed each 7 ft. apart from centre line, of 3-20 in. steel plate, extending the whole moulded depth, connected to the bottom tie plates & deck beams by 2 $\frac{1}{2}$  x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  angle bars stiffened by double 3-16 in. brackets, one on each side at every floor, one 3-16 in. bracket at each deck beam, & a vertical stiffening bar 2 $\frac{1}{2}$  x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  in. opposite each alternate frame space. The lower bars connecting with the plates are close rivetted for water-tight work. Five athwartship water-tight bulkheads are fitted between double frames formed of 3-20 in. plate, stiffened with 2 $\frac{1}{2}$  x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  in. angle bars 30 ins. apart & strongly attached to longitudinal bulkheads between double bars. A partial bulkhead is fitted two or three frame spaces from transom, arranged so that its upper edge is above the load line level, & is stiffened as required.

Wale bar, a steel angle 3 x 2 $\frac{1}{2}$  x  $\frac{1}{2}$  in., is worked all around beam ends to act as a tie to beams & to receive the wale strake fastenings.

A flanged 3-16 in. bracket is worked & rivetted to each alternate frame head & main deck stringer plate on each side.

A wrot.-iron tiller is fitted to each rudder stock & all connected together by one rod. The necessary sheaves, rods or wire, wheel, chains & fairleaders are furnished by contractors, also a set of deck castings, consisting of 10 bollard heads, 4 warping chocks, 4 side pipes & 1 chain conductor & cap.

Steel coamings are fitted to deck openings.

One coat of paint was given after fitting up at Toronto & another was put on after erecting & riveting at Vancouver.

The work was all fitted up in Toronto & as much of the riveting completed as possible. It was then taken down, placed on cars & dispatched to Vancouver with sufficient materials & tools to re-erect & complete the hull there, by the contractors. The C.P.R. Co. provided suitable premises at Vancouver, with sufficient blocking, staging, &c.

The vessel is efficiently stiffened between decks with a lattice girder or truss; underneath the I-beams carrying the engines, & the beams are also strongly supported by brackets or otherwise outside the transom. A gutter or trough is furnished in deck to receive the swing of pitman rod.

The fire-room floor is covered with  $\frac{3}{8}$  in. steel plating, with holes for piping punched out.

THE BOILER is of the locomotive fire-box type, shell 62 ins. diam., & 14 ft. long. The fire-box ends from 32 ins. to 36 ins. below the shell, & is 5 ft. wide & 7 ft. long on the inside, surrounded by a water space 5" thick.

The boiler contains between 200 & 210