

able to fill up with deals, timber and other freight to close out part grain cargoes at all seasons of the year. Steamers can be supplied promptly with first class steam coal at reasonable prices. Vessels of any size can be loaded and discharged very expeditiously at St. John.

There are no worms in the harbor of St. John, consequently vessels can lay in safety any length of time afloat, free from these pests; the large rise and fall of tide giving peculiar facility for the repair and reclassing of vessels. Vessels bound to St. John can always find first class pilots on the lookout 80 or 100 miles at sea.

The coasts on both sides of the Bay of Fundy from its mouth to St. John are plentifully supplied with light-houses, fog whistles and automatic buoys, by which the greatest safety is secured. The registered tonnage at St. John amounts now to 560 vessels, 155,221 tons.

St. John is the distributing centre for a large number of trunk and branch lines of railway, and of steamboat lines, in New Brunswick, Nova Scotia, Quebec, Ontario and the northern part of the State of Maine. The board of trade can point with much satisfaction to the very exceptionally low average of losses on vessels arriving at and departing from the port of St. John during a period of ten years, as made up by the entry and clearing department of the custom house, viz. :

- 1st. The percentage of loss of tonnage of steamers as compared with total tonnage of steam vessels entered and cleared is08 of 1 p.c.
- 2nd. The percentage of loss of tonnage of sailing vessels as compared with the total amount of tonnage of sailing vessels entered and cleared is..... .41 of 1 p.c.
- 3rd. The percentage of loss of cargoes of steam vessels as compared with the total amount of imports and exports is..... .002 of 1 p.c.
- 4th. The percentage of loss of cargoes of sailing vessels as compared with the total amount of imports and exports is..... .05 of 1 p.c.
- 5th. The percentage of loss of tonnage of both steam and sailing vessels as compared with the total tonnage entered and cleared is..... .26 of 1 p.c.

ONE who has closely studied boiler construction says: Fault is found with the behaviour of steel in boilers, not only in the shell, but also in stay-bolts and other parts. Locomotive practice shows that steel stay-bolts break off far sooner than bolts made of good brands of iron. The fault lies in the crystalline structure of the steel and the repeated bendings under expansion to which they are subject. The trouble seems to be incurable.

THE CHILIAN METALLURGICAL EXHIBITION.

In our last number we gave a paragraph announcing that a mining and metallurgical exhibition will, by order of the Government, be held in Santiago during the coming September. Mr. G. B. Day, of Montreal, the Consul for Chili, now gives us some further particulars. The exhibition will be organized and conducted by the Board of Directors of the National Mining Society of Chili, who have the idea of collecting in one spot—which, by the way, is the centre of one of the richest mineral districts in the world—all the elements best conducive to the effective development of the mining industries. With this international end in view, they have arranged specially generous facilities for foreigners. The Exposition Committee will defray the whole cost of transit, to and

from Chili, of the machinery and other articles exhibited, as well as of the passage of the workmen who may be necessary to instal and take charge of the exhibits. They will also supply free all necessary motive power. The exhibition will be divided into eight sections, as follows: (1) Motive Power; (2) Electricity; (3) Extraction Machinery; (4) Mechanical Preparation of Minerals; (5) Metallurgy; (6) Chemical Industries; (7) Statistics and Plans, and (8) Production of the Working of Mines and Metallurgy. Further information may be obtained of Mr. Day, Imperial Building, Montreal, to whom application should be made by those wishing to send exhibits.

CANADIAN IRON INDUSTRY.

BY GEORGE E. DRUMMOND, OF THE CANADA IRON FURNACE COMPANY
(Continued from last issue.)

Raw Material.—While in the actual work of proving and developing her mines, Canada has up to the present accomplished comparatively little, yet the careful preliminary explorations already referred to, have made it most evident that in raw materials nature has unquestionably endowed Canada with everything necessary to success.

Market.—Satisfied as to the possession of raw materials, the next most important question for Canadians is the market for the finished product. All facts and figures go to prove that for many years to come Canada's natural market for iron products lies within her own borders, side by side with her mines and forests.

According to the best authorities, Canada uses to-day upwards of 250 lbs. of the products of iron per capita. This in a population of say five millions, means, roughly speaking, an annual consumption of 600,000 net tons.

In his report of the "Bureau of Mines of Ontario" for 1892, Mr. Arch. Blue estimates the consumption to equal (after making all due allowance for waste in converting pig iron into finished iron and steel) say, 604,252 tons for 1891-2. To better realize the accuracy of these figures, it must be remembered for instance that Canada possesses to-day not less than 15,000 miles of railway, standing high among the nations in this particular regard. When her 15,000 miles of railway line is laid with standard 72 lb. rails (the rail of the future), she will have at 113 tons per mile, in round figures, 1,500,000 tons of steel rails. The average life of a rail is 15 years, therefore renewals are being made continually, and as a matter of fact the Dominion is using in this department alone 100,000 tons of the product of iron annually.

During the past year one of our great trans-continental lines alone imported 36,000 tons of steel rails. The Canadian railway companies, if they follow the example of their American rivals, will heartily support the production of steel rails from Canadian ore by Canadian labor. The revenue to be obtained from the carriage of raw materials to the furnace, and of the finished product to the market, as well as through an increased passenger traffic, will more than compensate for the extra price they will be called upon to pay for rail equipment during the first few years of the industry.

All the rails used in Canada to-day are of foreign make.

As a further illustration, the rolling mills at Montreal, Hamilton, Swansea, New Glasgow, N.S., and