Some of the new designs of steel, as well as concrete ties, are so constructed as to make them hard to apply in track where automatic signals are in operation on account of the difficulty of getting proper insulation; some of them are so constructed that it is hard to apply the rail to them with anything but a bolt and nut, which by some railroads is not considered a satisfactory fastening.

Again, owing to the salt brine that comes from refrigerator cars, as well as to the fact that the nuts may be hard to keep tight, and also in case of a derailment of a heavy engine or car, the fastenings might become so damaged that new ties and fastenings would have to be applied before the track could be made safe or put in usable condition, the problem is a hard one to solve.

There are a great many things that should be taken into consideration before we make up our minds:

First, we should consider how much the first cost of the new tie would be.

Second, we should consider how much more it is going to cost to handle the tie, on account of its weight, shape, kind of fastening, etc.

Third, we should consider the safety of the appliance by which the rail is fastened to the tie.

Fourth, we should consider how much labor it is going to require first to fasten the rail to the ties and how much labor it is going to require to keep them in proper shape.

Fifth, we should consider how durable and efficient the contrivance is for proper insulation in all kinds of weather, on all kinds of roadbeds and under all kinds of traffic.

Owing to the fact that the time has come, as we have said before, when it seems as if we would have to begin to figure on something to substitute for wood ties, should we not stop and take into consideration whether or not a steel or concrete tie, made a little wider and not quite so deep would answer the purpose of a tie. If a tie made a little bit wider and not quite so deep would answer the purpose of a tie, it would not require so many ties for a mile of track and we would get the same amount of bearing on our rail and on our roadbed as we have now, and it would not take so much material to make the ties; therefore, the ties would not cost so much. And if the tie was not so deep as the tie we are using at present, it would require less labor to put the tie in, as well as less labor to tamp the tie, which would be quite a saving. This is very important, as a number of trunk lines are ballasting their roads with stone, slag, or some other hard material which is more expensive to handle in every way.

If a tie could be constructed so that we could narrow up the shoulders and still have the same amount of ballast up against the end of the tie, this would be another saving, and a tie made thinner than the ties we are now using would not require so much ballast to fill in between the ties, which would be another saving.

During the past six or eight months we have received illustrations of concrete ties, on which at present there are patents. We have become quite interested in them, and while some are not the same shape as the ties we have always been used to using, some of them look to be practical for railway use. It is a fact that the first cost of them would be considerably more than our present tie, but the amount of labor saved in handling them and putting them in the track, etc., tamping them after they are in the track and the amount of ballast saved owing to their peculiar make-up would almost enable a railway company to tie up their tracks at the same expenditure it is costing us now to put in wood ties.

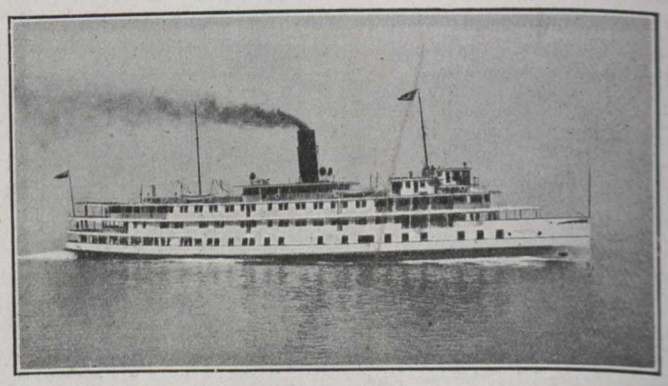
L. C. Ryan, Chairman; P. J. McAndrews, John O'Leary, F. R. Laying, John D. Boland, F. D. Harrigan.

A NEW STEAMER.

A somewhat novel type of steamer, recently described in Engineering, built for the Richelieu & Ontario Navigation Company, by the Fairfield Shipbuilding Company, of Scotland, named the "Saguenay," has just entered service.

The dimensions of the ship had, of course, to be restricted to suit the special service of the St. Lawrence River, and thus the length is only 275 ft., the breadth 54 ft. 6 in., while the depth to the hurricane deck is 40 ft., the only structures above this being those associated with the navigation of the vessel. The vessel has been classed at Lloyd's, and the scantlings have been made light, to minimize the draught, but in all cases strength has been carefully considered. A notable feature is the heavy "guard," to act as a fender along each side above the water-line; this guard is reinforced by beams below, secured to the shell-plating and framing, and assists greatly in giving longitudinal stiffness.

As regards the machinery, it follows the usual merchantship practice of the Fairfield Company. The two sets of engines have each four cranks, with four cylinders, arranged for triple compounding, and on the Yarrow-Schlick-Tweedy balanced system. The screws are of the built-up type, with bronze blades. The engines are designed to run at high



The "Saguenay".

speed, the revolutions being 180 for 2,100 horse-power. Special care has been taken in the design of the valve-gear to ensure quiet running, as well as to eliminate vibration. As is the case with all Canadian and American river passenger-steamers, the starting-platform, from which the main propelling engines are controlled, is situated at the level of the main deck, within the engine-room casing. The whole of the gear is conveniently arranged here, and from this position both sets of engines can be easily manipulated by the engineer on watch. The three boilers supply steam at a pressure of 175 lb. per sq. in., and are worked on the Howden system of forced draught, for which there have been fitted two large steam-driven fans, located in the main engine-room. Each fan is sufficient for all the boilers when running at full power, so that one is a stand-by. The auxiliary machinery is very complete, including two powerful electric-light engines and a refrigerating machine.

The vessel before leaving the Clyde ran her steam trials on the measured mile at Skelmorlie, when under service conditions, a speed of 16 knots was attained. This was regarded as specially satisfactory, the conditions of trials being arranged and carried out, like the design and construction of the ship, under the personal supervision of Mr. A. Angstrom, the consulting naval architect to the Richelieu and Ontario Navigation Company.