

been demonstrated by the shipbuilders in Toronto and other ports, but shipbuilders will not increase their plants, nor will those engaged in the transportation business give orders for additional vessels if the Government can relax the coasting regulations to meet any casual congestion of business, or if Parliament will uphold the Government in such an illegal action as was committed in 1899. One Toronto shipowner has stated that but for the action of the Government at that time his firm would have had two more vessels on the great lakes by this time. This probably is not an isolated case and shows that what is required to aid in building up a strong Canadian fleet on the great lakes is the firm enforcement of the act of 1886, not only in regard to the carrying of grain, but also in regard to the use of U.S. tugs for towing rafts from place to place in Georgian bay, about which there have been many complaints during the present season. With as firm an administration of the law, as the law is clear and explicit, and with the operation of a Canadian Shipping Association founded on similar lines to the Lake Carriers' Association of the U.S., Canadian shipyards will be enlarged and the Canadian mercantile marine will be strengthened by the addition of all the new vessels required to handle the increasing trade between Canadian ports on the Great Lakes and the St. Lawrence river.

**Danger Warnings on the Sea Coast.**

Lieut.-Col. Anderson, Chief Engineer of the Department of Marine, recently lectured before the Ottawa Literary and Scientific Society on "Modern Types of Danger Warnings on the Sea Coast." In the course of his lecture he said:—

"We meet with a good deal of difficulty and disappointment in operating our fog signals, because we cannot make mariners understand that sound signals are extremely liable to aerial disturbance. Theoretically sound waves are propagated in straight lines in all directions from their source, exactly as light waves are propagated. Practically these straight lines of sound waves are deflected by any little irregularity in the air through which they pass. If the air is not wholly homogeneous, the sound waves will not pass through it in straight lines, but will be deflected, and whether the deflection is down towards the surface of the water, or up into the air, the effect is the same; the sound does not travel parallel to the surface of the sea, and is lost to the sailor who is listening for it. A small island, a reef, or rocks, or even a shoal lying outside of a fog-alarm station, will have the effect of unequally heating the air which covers them, and the air thus separated into strata of unequal densities causes refraction of the waves of sound, and the fog alarm be-

comes ineffective. The same thing may happen, though it is not so likely to do so, where none of these natural obstructions are apparent. Times without number complaint has been made that one of our fog alarms was not in operation, when investigation proved that it was sounding as loudly as ever, the trouble being with atmospheric conditions. Some of you may have noticed echoes produced where there was apparently no hill or surface to reflect the sound. These echoes must have been reflected from strata of air differing greatly in density from that at the point of production of the sound, and are one example of the difficulties that fog alarm signals strive in vain to overcome. For these reasons we warn mariners that they must never judge their distance from a fog signal either by the power of the sound, or by the absence of sound, because under certain conditions of atmosphere the sound may be heard loudly at long distances from the alarm; under other conditions it may be lost at a very short distance, and these conditions may vary at the same station within very short intervals of



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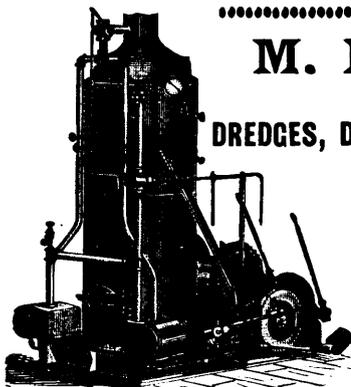
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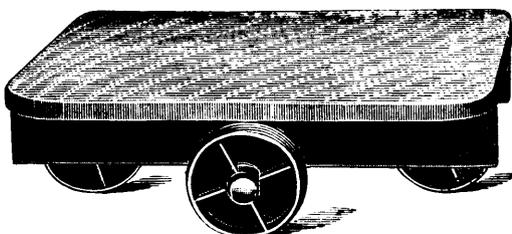
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