

tons of freight in an ordinary season. The canal, which overcomes forty-five per cent. of the total rise in the St. Lawrence from Montreal to Lake Ontario, is operated and lighted throughout its length by electricity, which is distributed from a central powerhouse. One of the more serious problems to be faced by the engineers was the passing of the drainage water of the country lying to the north. The river Delisle, with a maximum flow of more than 200,000 cubic feet a minute, had to be carried under the canal through four lines of cast-iron tubes ten feet in diameter, laid in a trench fifty feet wide. Two other rivers of less volume are also carried under the canal.

The shipping season is now near its close, and therefore not much use will be found for the Soulages Canal until next spring.

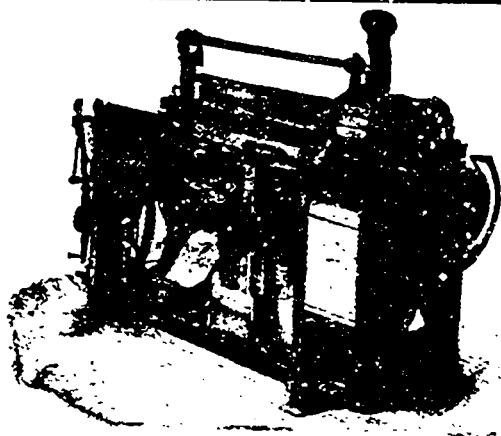
Then it will be possible for steamers of fourteen feet draught to convey wheat from Fort William on Lake Superior right to the sea without breaking cargo. — London Engineering.

A COMBINED GAS AND STEAM ENGINE.

In the steam-engine, the heat of moderately slow combustion is applied to vaporize water in bulk, and the vapor is used to drive a piston. In the gas-engine the piston is moved by a minute explosion, or, in other words, by the sudden expansion due to the very rapid combustion of gas mixed with air. According to The Western Electrician, an engine combining both these principles has been devised by Prof. V. H. Emerson,

of Ottawa, Ont., who has established a reputation in Canada through his recent discovery of a process for the conversion of sawdust and saw-mill refuse into calcium carbide for the production of acetylene gas. In his new engine, water-spray is suddenly converted into steam by the explosive combustion of air charged with carbonaceous matter. The mixture is exploded by electric spark, and hence Professor Emerson has given to the device the somewhat misleading name of "hydro-electric motor." In an interview quoted by the correspondent of The Electrician, the inventor said:

"The principal upon which my motor operates is equivalent to building a fire directly in a vessel of water; the water, taking up the entire heat, becomes expanded into steam, and thus produces mechanical



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