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A NEW LIGHT DRAFT PROPELLER.

The principal demand which ship constructors find themselves called upon to meet at the present time is for small swift screw propellers. Pleasure vessels of this description have been constructed in large numbers both in Europe and in this country; and the speed obtained, through the progress made both in modeling the hull and in fitting thereto engines of maximum power yet of most compact form, is certainly remarkable when the small size of the craft is considered. The success thus attained has suggested the possibility of securing like qualities in the medium-sized vessels used for commercial purposes, thus bridging over the gap between the light and fast screw steamer and the small steam yacht, which hitherto has formed the stronghold of the now fast disappearing paddle wheel. The vessels occupying this intermediary position include ferry boats, river steamers, coasters, and the like, the first necessity in which is light draft of water, a cardinal requirement which, when the large carrying capacity and other requisites are considered, at once militates against the use of the screw. It will be seen, therefore, that the problem of a light draft screw steamer is by no means an easy one to solve; but on the other hand, the advantages to be gained by its solution are amply sufficient to warrant thorough study and investigation. That such a course will in the end lead to the desired result is clear from the fact that we are now enabled to lay before our readers one interesting instance of a vessel constructed under the required conditions and meeting all the requirements of actual usage in a thoroughly satisfactory manner.

The Geneva—represented in the engraving—has recently been built for the Kingston and Cape Vincent (Canada) Ferry Company, by Messrs. George Chaffey & Brother, of Portsmouth, Ontario. The depth of water of Lake Ontario, between the above named points, is such as to necessitate a light draft vessel; and at the same time a craft sufficiently fast to beat the best boat in the Company's service was demanded. The general dimensions laid down were as follows: Length over all 103 feet, beam on deck 20 feet, draft forward 3 feet 6 inches, aft 4 feet 4 inches. The vessel accom-

modates on her forward deck fifty head of cattle, and in her cabins and on the upper deck four hundred passengers. The high pressure engine, also built by the same firm, is of the ordinary type of inverted single cylinder, 14x13 stroke, constructed in the lightest manner consistent with strength: the rods, crosshead, and shaft being of steel. There is a return tubular boiler entirely of Lowmoor iron, 9 feet 3 inches long by 9 feet in height and 5 feet in diameter, containing 157 return tubes, each 2½ inches by 7 feet long. One and a half tons of anthracite coal is consumed per 100 miles run. This is the average consumption for the season, and is very small considering that the fires are kept in night and day, and that the cabins are heated by steam from the boiler. The propeller is a Chaffey wheel, 4 feet 4 inches in diameter, with 7 feet 6 inches pitch.

On the trial trip over a measured distance of 2½ miles, the Geneva ran at the rate of 14½ miles per hour, the engine making 208 revolutions with 100 lbs. of steam. She is now capable of running 15 miles per hour, and has beaten, we are informed, the fastest boats in the vicinity by over two miles per hour, despite the fact that, for the latter, speeds varying from 16 to 18 knots are claimed.

The lines of the Geneva's model are of great beauty. A noticeable fact is that, while running at the height of her speed, the vessel does not change the water line to any appreciable extent, but maintains the same trim as when at rest. This is remarkable, inasmuch as screw steamers ordinarily, when running at high speeds, settle aft, while many present the appearance of moving up hill.

The builders above named have already achieved considerable reputation for their steam yachts and pleasure vessels, all of which are notable for speed and beauty of model. Parties interested in the improved construction illustrated in the case of the Geneva may obtain further particulars by addressing Messrs. Chaffey & Brother, as above.

English Fire Engines.

A series of trials of Messrs. Merryweather & Sons' new steam fire engine lately took place at Devonport Dockyard, the Admiral, Superintendent, and several heads of the various

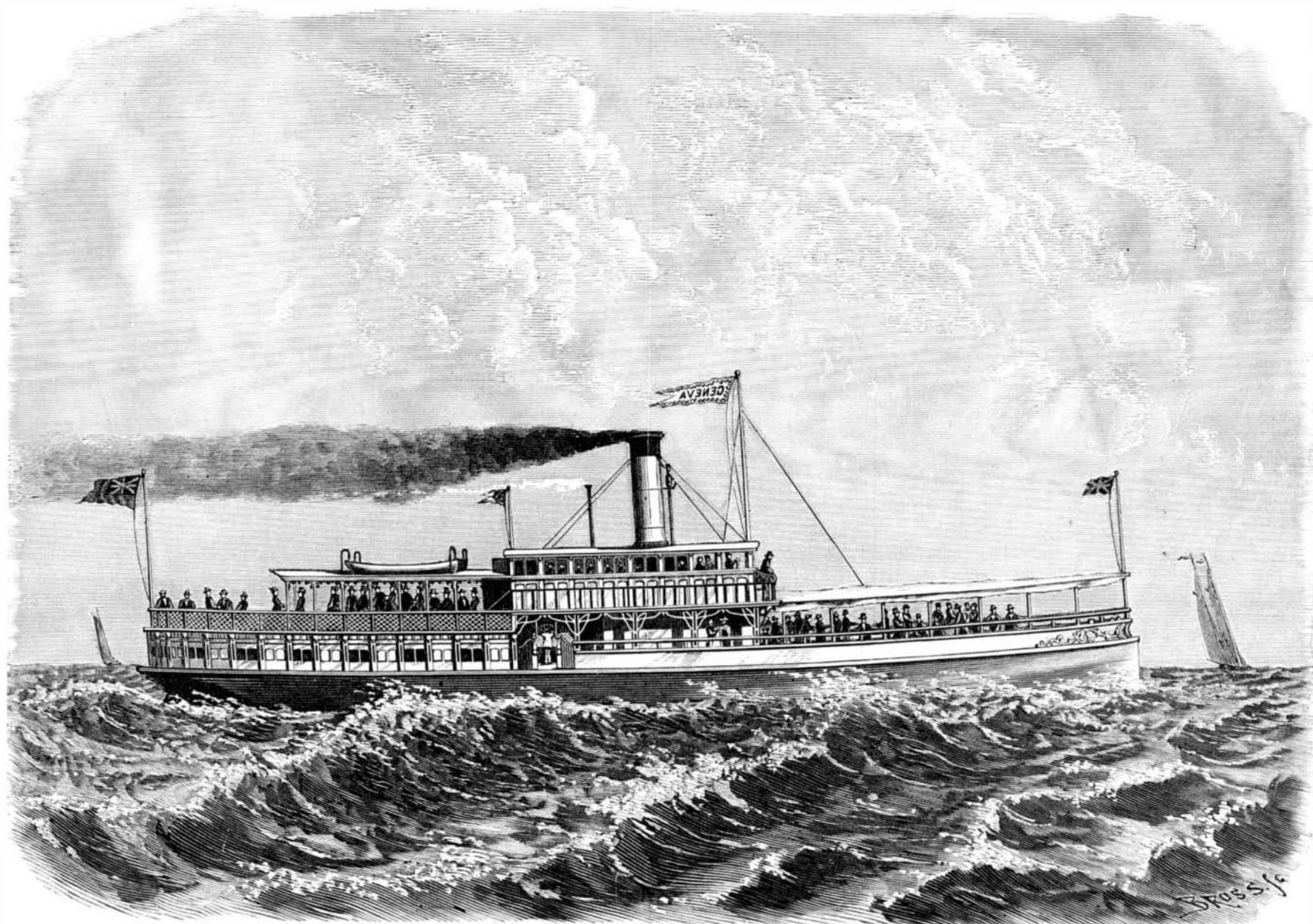
departments being present. The engine being placed along side the basin, and four lengths of suction pipe connected, a most severe test of raising the water through this vertical lift (32 feet) was satisfactorily accomplished. Steam was raised to 40 lbs. pressure in 5½ minutes, and to 120 lbs in 11 minutes. Two jets of water, 1½ inch in diameter, were thrown through 200 feet of hose to a vertical height, estimated at 170 feet, with a mean water pressure of 100 lbs. on the square inch. After pumping sea water, the engine was then removed to take its supply from the dockyard fresh water service. Several interesting tests took place, one notably being that a 2 inch solid jet of water was projected over the various buildings.

Mr. Thomas Fearn.

The Birmingham (England) *Gazette*, announcing the death of Mr. Thomas Fearn, says: "Mr. Fearn may be said to have been the inventor of the process known as electro-metallurgy, the patent for which he disposed of to the Messrs. Elkington, and which he was instrumental in introducing to every part of the Continent. He studied at the Queen's College, Birmingham, afterwards at Paris, and for some time was a distinguished pupil of the well known German chemist, Dr. Liebig, with whom he formed a lasting friendship. He was well known to the leading electro-metallurgists of Paris, Vienna, Berlin, and Cologne, and in Birmingham his society was courted, not only for his bright and far-reaching intelligence, but for his kindly and unostentatious geniality."

San Fernando Tunnel.

The tunnel through the San Fernando mountains has just been completed, and is worthy of notice, as it is by far the largest on the Pacific coast. Its length is 6,966 feet, while the longest tunnel on the Central Pacific Railroad, in crossing the Sierra, is not over 1,200 feet. It is not two years since the first borings were made, and since then many unforeseen difficulties have had to be encountered. From the character of the rock and the enormous pressure upon the timbers placed as supports, the tunnel will have to be lined with strong masonry throughout.



THE GENEVA—A NEW LIGHT DRAFT PROPELLER.