

## SELF-PROPELLING STEEL CANAL BOATS.

BY WALDON FAWCETT.

The past decade or two has witnessed the advent on the great lakes of America of a number of novel and unique craft, prominent among which is the ice-crushing type of steamer, whose introduction by the Russian government within the past year has been the talk of European engineering circles. It is doubtful, however, if any of these vessels possess the characteristic of absolute originality to the extent of a pontoon barge which is to be constructed within the ensuing year for the Cleveland Steel Canalboat Company, which operates a line of steel canal boats from Cleveland and other ports on Lake Erie via the Erie Canal and Hudson River to New York city.

The whole project of the corporation mentioned has been a series of innovations, and were it not for the success which has attended it thus far, despite freely expressed predictions of failure, it is probable that this latest undertaking would be designated even more chimerical than its predecessors.

The success of the system for the transportation of freight by water without breaking bulk between ports on the great lakes and New York was manifest from the time the idea was placed in practical operation, but it has become more pronounced each successive year. At the outset, however, the influences were decidedly discouraging. The canal men claimed that no iron or steel boat could navigate the Erie Canal, owing to the rocky formation of the bottom of the waterway, while, on the other hand, wiseacres among the lake sailors were confident that no canal boat could weather the storms of Lake Erie.

A good sized fleet of steel barges and propellers has gradually been accumulated and is employed regularly, carrying sugar principally on the west bound trips and grain and flour on most of the east bound trips. All records on the canal have been broken time and again in the matter of time of passage, and the behavior of the boats during some of the very severe storms encountered on Lake Erie has been admirable, the barges bobbing along like corks after the steamer, which is usually assisted in towing by a tug on the Lake Erie portion of the route.

At the same time, Mr. C. E. Wheeler, the inventive genius of the canal boat company, has been wrestling for some time with the problem of the betterment of the plan in so far as it related to the canal boats traversing Lake Erie. Although the boats have time and again proved their ability to weather heavy storms, the management of the line has been averse to sending them out in the teeth of a gale that a regular lake freighter would plunge into with safety. Much time has thus been consumed by delays.

The provision of additional steamers was first considered, but this would mean a dividing up of tows and would thus involve additional operating expense without materially reducing the dangers of the Lake Erie trip. It was at this juncture that the pontoon barge idea was hit upon, and an investigation was at once entered upon, there being to commend it, in addition to the solution of the problems already outlined, the further fact that with this huge vessel in which to move the canal boats from Buffalo to Cleveland and return, more canal boats—especially the wooden boats, which are plentiful and could be rented or purchased at low cost—could be brought into play.

There was, naturally, not a little skepticism regarding the proposed barge at the outset, but the leading naval architects and engineers in the country to whom the plans have been submitted pronounce the scheme entirely practicable, and, moreover, tests made with a working model would seem to justify this confidence in every respect.

The barge, which will be completed in time for the opening of the season of navigation of 1900, will be 360 feet in length, 45 feet beam, and 24 feet in depth.

Structurally and in general appearance the craft will be very similar to the regular type of steel tow barge on the lakes; indeed, so strong is the resemblance that a few minor alterations would permit of the conversion of the boat into an ore carrier of the usual type. She will, of course, have a double bottom, and will also be provided with double sides for water ballast, so that in loading and unloading canal boats the operation will follow very closely that of a floating dry-dock. When the canal boats are securely wedged in place the water will be pumped out, it being estimated that the operation will require not to exceed an hour's time.

The method of securing watertightness in the vessel

tempered steel of even finer quality than that required by the government in the construction of war vessels. Considering its size, too, the canal boats are stronger than the largest freight-carrying vessels on the lakes.

## Antarctic Exploration.

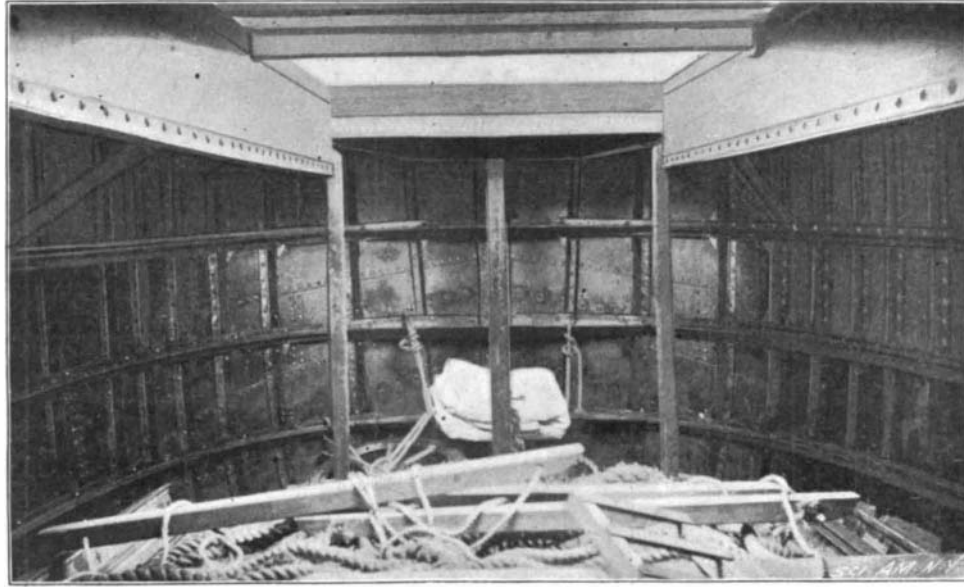
At a meeting held recently by the Geographical Society of Berlin, under the presidency of Herr von Richthofen, the question of an Antarctic expedition was considered. This expedition will probably be undertaken if a sufficient sum can be raised by subscription. From a geographical point of view, the fundamental problem as to the existence of an Antarctic continent has not yet been solved, and besides this there are other questions for which a solution is desired, such as the geological structure and character of the Antarctic soil, this being of importance owing to the relation supposed to have existed between South America and Australia. Among other questions are the study of masses of ice and their movements, the origin of cold oceanic currents, the condition of atmospheric pressure and temperature in those regions, besides the questions relating to terrestrial magnetism, etc. Herr von Drygalski presented to the society his plan for making the exploration. The point of departure would be the southern part of the Indian Ocean. The expedition would then proceed toward Kerguelen Land, making scientific observations on its way, and will then endeavor to reach a point favorable for passing the winter, from which it will start again in the spring

toward the magnetic pole over the ice. In the autumn the expedition would return by a route chosen as far toward the west as possible, along a line of coast which it is supposed would be discovered. The boat carrying the members of the expedition would be constructed almost entirely of wood, in order not to affect the magnetic observations. Its construction would be carried out according to data specially determined for resisting the storms of the southern seas, where, on the other hand, the pressure of ice is less to be feared than in the Arctic regions.

## Disposal of Wastes in Paris.

In a report presented to the Société des Ingenieurs et Architectes Sanitaires of Paris, M. Périssé shows that four different processes have been proposed for disposing of the household waste of the city. 1. Direct employment for agriculture. 2. Incineration. 3. Steam treatment. 4. Grinding. He eliminates the first three of these processes for various reasons, and recommends the fourth, on account of the favorable results which have been obtained by a small testing plant installed near the city, and which in the first half of 1897 treated 50 tons of waste matter every day. The output of the plant may, however, be increased to 200 tons per day without difficulty. By this process, the waste passes over an endless web, and hard or bulky substances are extracted. The remainder is torn into fragments by means of toothed steel wheels, and upon coming out of the mill it falls directly into the wagon which is to transport it. According to M. Périssé, this process is by far the most economical. It has the advantage of preserving all the fertilizing principles and at the same time gives it a form which facilitates handling and distributing upon the soil. The process is arranged so that the grinding is effected immediately, and thus fermentation does not commence before it has reached its destination.

At the Paris Exposition special effort will be made to make a striking exhibition of Indian corn and its food products. It is intended to establish in connection with the American agricultural exhibits a "corn kitchen," in order that the visitors may be furnished with all kinds of maize foods. It is hoped that this will increase the market for American corn.



CONSTRUCTION OF CANAL BOAT SEEN FROM WITHIN.

consists of a rather novel arrangement, formed by two huge doors, which insure double protection. One door is hinged at the bottom, while the other is unhinged and lifts perpendicularly. The pumps employed will, of course, be quite powerful. It is expected that this vessel can readily be towed in almost any weather at the rate of nine miles per hour by almost any of the large lake tugs, whereas the speed of the canal steamers towing a fleet of canal boats does not exceed seven miles per hour, and this without reference to the frequent delays on account of the storms on Lake Erie.

The barge will cost in the neighborhood of \$159,000, and it will increase the transportation facilities of the company several times over. Officials estimate that it will be possible after the barge is placed in commission



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to operate a fleet of seventy-two canal boats, and that the barge with six loaded canal boats aboard will make three trips per week between Buffalo and Cleveland. It is claimed that there will be no delay in handling cargoes, as six loaded canal boats will be ready at each port to replace those discharged from the pontoon. Fifteen loaded canal boats will leave New York each week.

The steel canal boats employed in this traffic are themselves of novel design. Both propellers and consort are each about 100 feet in length by 18 feet beam and 10 feet moulded depth. Each propeller is engined for about 250 horse power. The propellers have a capacity ranging from 125 to 175 tons of freight, while the capacity of the barges ranges from 200 to 300 tons. All of the vessels are constructed of open hearth mild