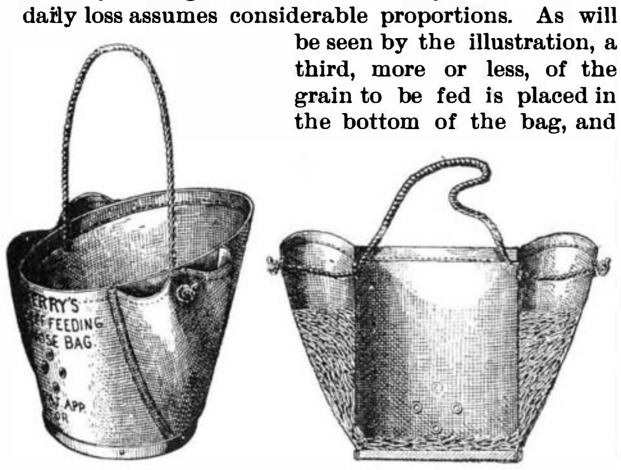
TERRY'S FEED BAG.

The accompanying illustrations show an article which embodies in itself a notable improvement on the horse feed bag in common use. This bag is designed to prevent the waste of horses' feed so prevalent where the common bag is now used.

Whoever may have noticed how oats are scattered about at midday in the streets of the metropolis has also probably been impressed with the thought that not only the yearly but also the daily loss of grain in the city of New York alone must be something enormous. It is safe to say that where the common nose bag is employed nearly one pint of grain is lost at every feeding. In a stable of only ten horses this daily loss assumes considerable proportions. As will be seen by the illustration, a third, more or less, of the grain to be fed is placed in the bottom of the bag, and



TERRY'S FEED BAG.

the balance in the two side pockets, in the lower end of each of which is a small aperture through which the grain passes automatically into the bag as fast as its contents are consumed. When in position on the animal's head, his lips are always within reaching distance of the bottom of the bag. So long as the bottom is covered to the depth of an inch or more, the grain in the side pockets cannot flow in. There are no springs, chains, metal tubes, etc., used in the construction of this bag, and it can be trampled on by the horse with impunity without suffering injury.

The automatic method of closure prevents the grain from being tossed out by the shaking of the animal's head.

A patent to cover this improvement has been applied for by Mr. T. Philip Terry, of No. 7 Bowling Green, New York City.

ALUMINUM BOAT—THE JULES DAVOUST.

Lieut. Hourst, of the French navy, and his mate, Ensign Baudry, in charge of the Niger hydrographic mission, left Bordeaux at the beginning of January carrying with them the Jules Davoust, a boat capable of being taken apart, and of extreme lightness, owing to its hull being constructed of an alloy of aluminum. This little boat, of which we give a view reproduced from a photograph taken near the Royal Bridge, at Paris, where it was exhibited before its departure, weighs 4,840 pounds, and has a capacity of 11 tons with a full load and a maximum draught of but 1·38 feet. The hull is formed of sixteen half sections assembled in pairs in the longitudinal direction upon a strong keel of hard steel that runs the entire length of the boat. In the transvere direction, each half section is connected with the following by bolts, and tightness is assured by the interposition of a strip of rubber between the flanges. The general aspect is that of a barge slightly depressed in front. This part is occupied by a wooden cabin for the captain and his mate. A second chamber, formed by the hold, is to receive the stores and the goods for trading purposes. At the rear there is a cabin for the crew. The three chambers thus formed are separated by tight bulkheads. The steering wheel is situated behind the captain's cabin. A movable tent arranged at this point is designed to protect the captain and his assistants during the hydrographic observations, and serves likewise to shelter the pilot.

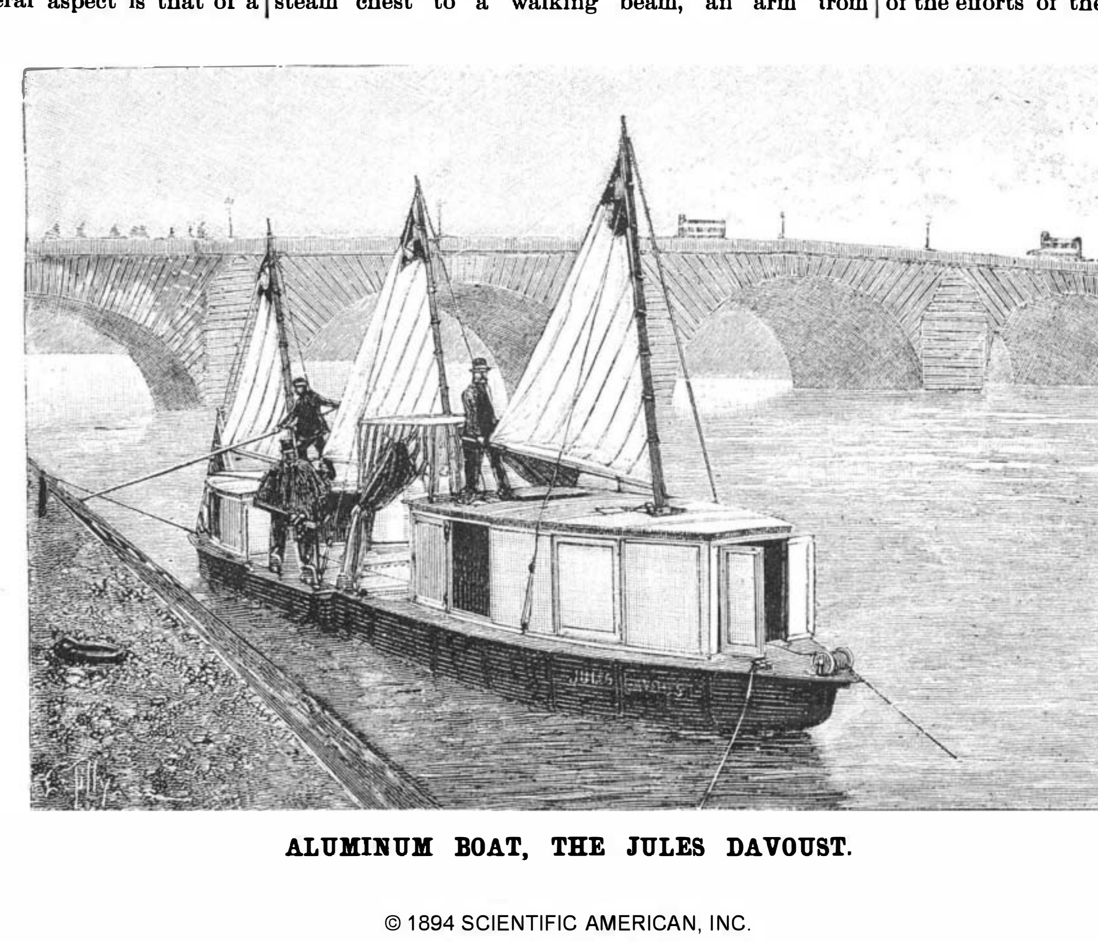
The boat is provided with three masts, with easily handled lateen sails. These masts are light and are placed at nearly equal distances from each other. The boat may likewise be propelled with oars. Two sponsons near the center of the boat support two Hotchkiss rapid-fire guns.

The following are the principal dimensions and weights of the various parts:

Total length	42	feet.
Breadth	9	"
Depth	2·6	"
Breadth outside of wales	10·5	"
Length of captain's cabin	13	"
Mean width	6·8	"
Length of rear cabin	10·8	"
" " central chamber	16	"
Light weight	4,840	pounds.
Total displacement	24,640	"
Corresponding draught	1·38	feet.
Mean weight of a section	82·5	pounds.

These sections are, therefore, easily transportable, and it is thus taken apart that the Jules Davoust is to reach the Niger, in the first place by sea, then by the Senegal River, and finally by the route by land from Kayes to Bamakou.

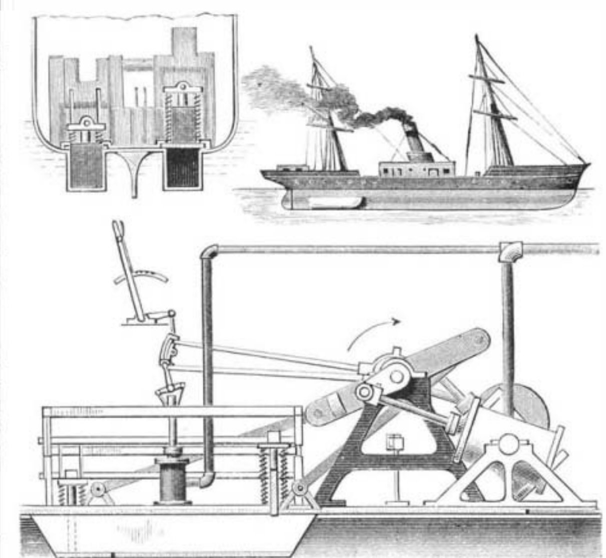
The use of aluminum in the form of an alloy, tough, yet soft enough to undergo forging (for pure aluminum is slightly brittle), constitutes a very important progress for the preparation of the carrying *materiel* that is to be used in the colonies, either for the construction of launches capable of being taken apart or for that of light vehicles adapted for following everywhere the movements of forwarding columns. The Jules Davoust was constructed at the works of Mr. Lefebvre, of Paris, who has already furnished the Monteil mission with a barge of the same nature, and has made a specialty of colonial war *materiel*, especially of light wagons, capable of being taken apart, that our troops have made use of several times in the Soudan and Tonkin expeditions.—*La Nature.*



ALUMINUM BOAT, THE JULES DAVOUST.

MEANS FOR PROPELLING VESSELS.

The illustration represents an apparatus for the propulsion of vessels in which pistons are operated in open-ended pipes extending longitudinally beneath the vessel, the impact of the pistons on the water being designed to act with great efficiency in moving the vessel ahead, and the piston and tube being designed to handle with much better effect the same quantity of water that the screw of a vessel of the same kind would handle. The improvement has been patented by Mr. William H. Witte, of No. 253 Flushing Avenue, Astoria, L. I., N. Y. On opposite sides of the keel are parallel rectangular, open-ended pipes, as shown in the transverse sectional view, these pipes being closed on their upper or inner sides by slide plates moving in suitable slideways, and reciprocated by pitmen pivotally connected with cranks on a transverse crank shaft, at whose ends are driving cranks pivoted to piston rods whose pistons work in the common form of oscillating steam cylinders, whose trunnions are journaled in suitable supports, as shown in the longitudinal sectional view. The cranks extend from opposite sides of the crank shaft, so that the two slides are moved simultaneously in opposite directions. Each slide carries a vertical piston moving through a slot in the slide plate, each piston having a longitudinal movement backward through the pipe, and ejecting the water therefrom in a solid stream. An upwardly extending shank of each piston has a crosshead sliding on vertical guide posts around which are spiral springs normally raising the piston, and each crosshead slides longitudinally on a guide rod forming part of a frame moving with the pistons, the top beam of each frame having a lateral arm attached to the piston rod of a steam cylinder, two such cylinders being arranged vertically side by side and having a common steam chest between them. The valve stems extend upward from the steam chest to a walking beam, an arm from which is pivoted in a link pivotally supported on a rod suspended from an arm moved by a hand lever, the latter being held in the usual manner by a quadrant. The opposite ends of the link connect by rods with eccentrics on the main crank shaft, so that by means of the hand lever the strokes of the pistons in the steam cylinders may be reversed without stopping the machinery. In operation, as the revolution of the crank shaft causes the slides to be reciprocated



WITTE'S APPARATUS FOR THE PROPULSION OF VESSELS.

by the pitmen, the piston moves downward at the end of each forward movement of the slide, the slide then moving backward and carrying the piston with it, the piston being raised as it reaches the end of its stroke, and the alternate raising and depressing of the pistons in the slide being effected by the pair of vertically arranged steam cylinders. Instead of the steam mechanism for effecting the vertical movement of the pistons, a very complete system is provided by means of which this operation may be automatically effected by electricity. The inventor differentiates his system widely from the ordinary methods of jet propulsion, in which comparatively small quantities of water are ejected at high speed, but proposes to expel the water with about the same velocity given to it by the screw propeller, the water being expelled at about the plane of the ship's bottom, and thus exerting great power.

Her Majesty's Ships at Sea.

The Chief Constructor of the British Navy recently read an important and reassuring paper at the Institute of Naval Architects on the subject of the qualities and performances of first-class battleships of the Royal Sovereign and Resolution class. There was but little said about that bugbear of some writers on naval subjects, the metacenter, but a great deal about the *periods* of the rolling motion of the ships and the *periods* of the waves being isochronous. "I venture to illustrate this point by the simile of a boy in a swing and a man swinging him. If the latter exerts his force concurrently with the movement of the swing and the boy in it, as he increases his efforts the higher the swing goes, and as he uses less strength so will it tend to bring the swing to a state of rest. The ship's period is that of the boy in the swing; the wave's period that of the efforts of the man. The difficulty I find in the matter of the Resolution is that, taking the chief constructor's views as correct, and that there was "no danger whatever, only discomfort," why did not she continue her voyage instead of returning to Queenstown, when a small craft like the Gleaner pursued her way in safety? Of course, the talk about the foreturret lifting some inches was 'twaddle,' though a large quantity of water was shipped and went below. This was due, as I heard at the time on excellent authority, to the tarpaulin cover not fitting the lower part of the turret, or the right cover being mislaid, and to a large ventilator on deck not being unshipped and the dead-light screwed down, as it ought to have been."—*Westminster Gazette.*

IN the eleventh century both English and French dandies covered their arms with bracelets.