

No. 780,122.

PATENTED JAN. 17, 1905.

H. NELSON.
AIR APPARATUS FOR VESSELS.
APPLICATION FILED APR. 28, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

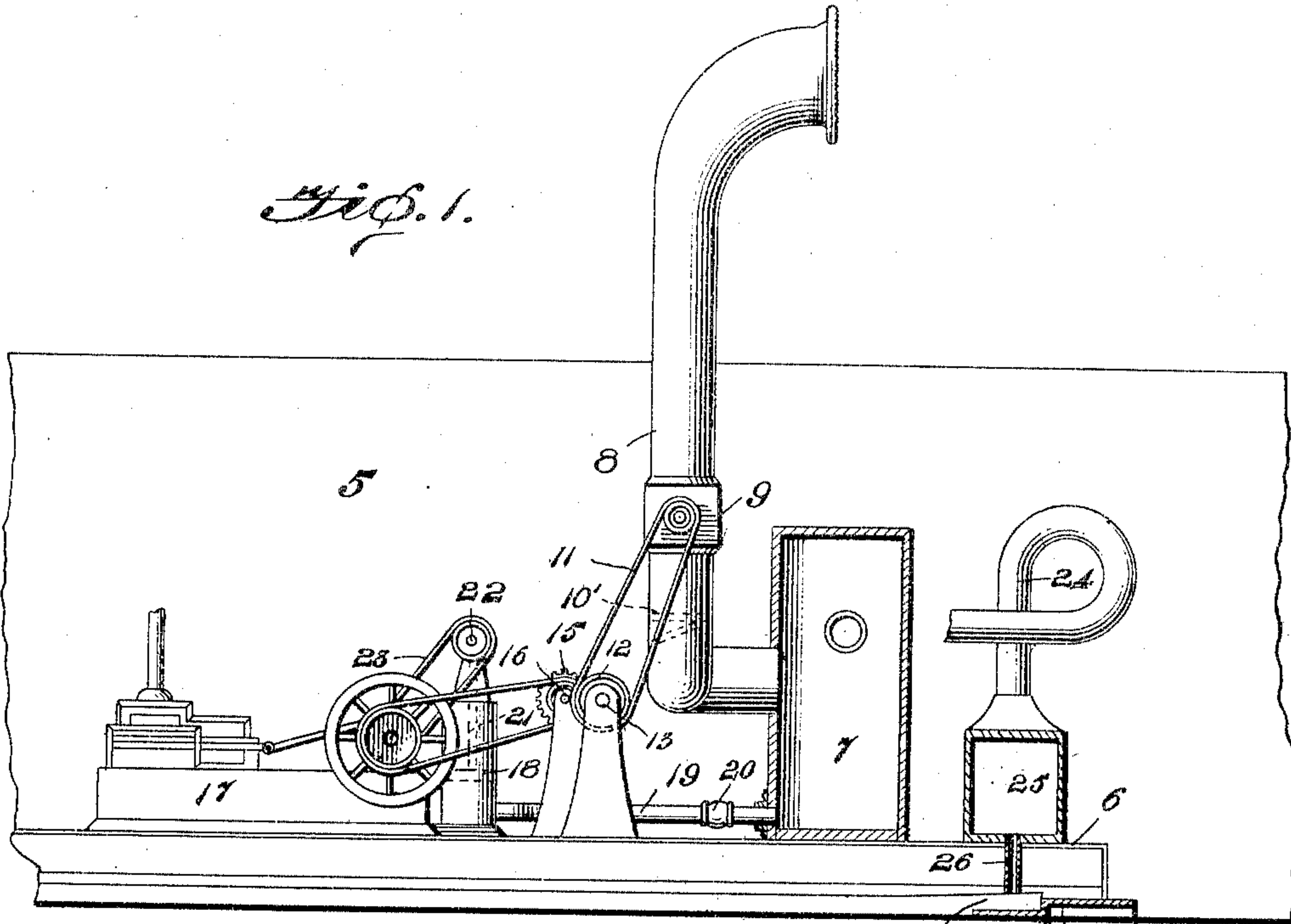
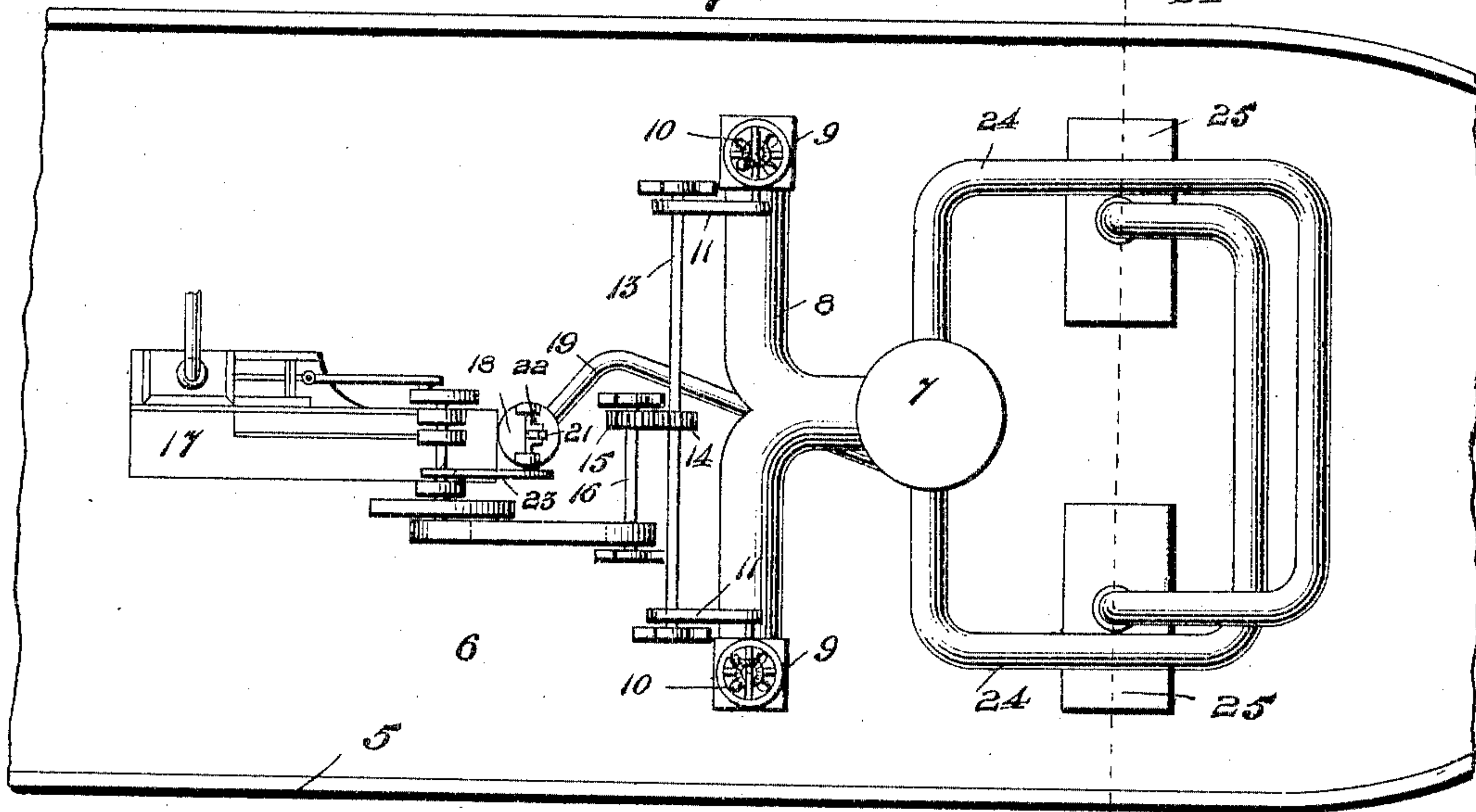


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

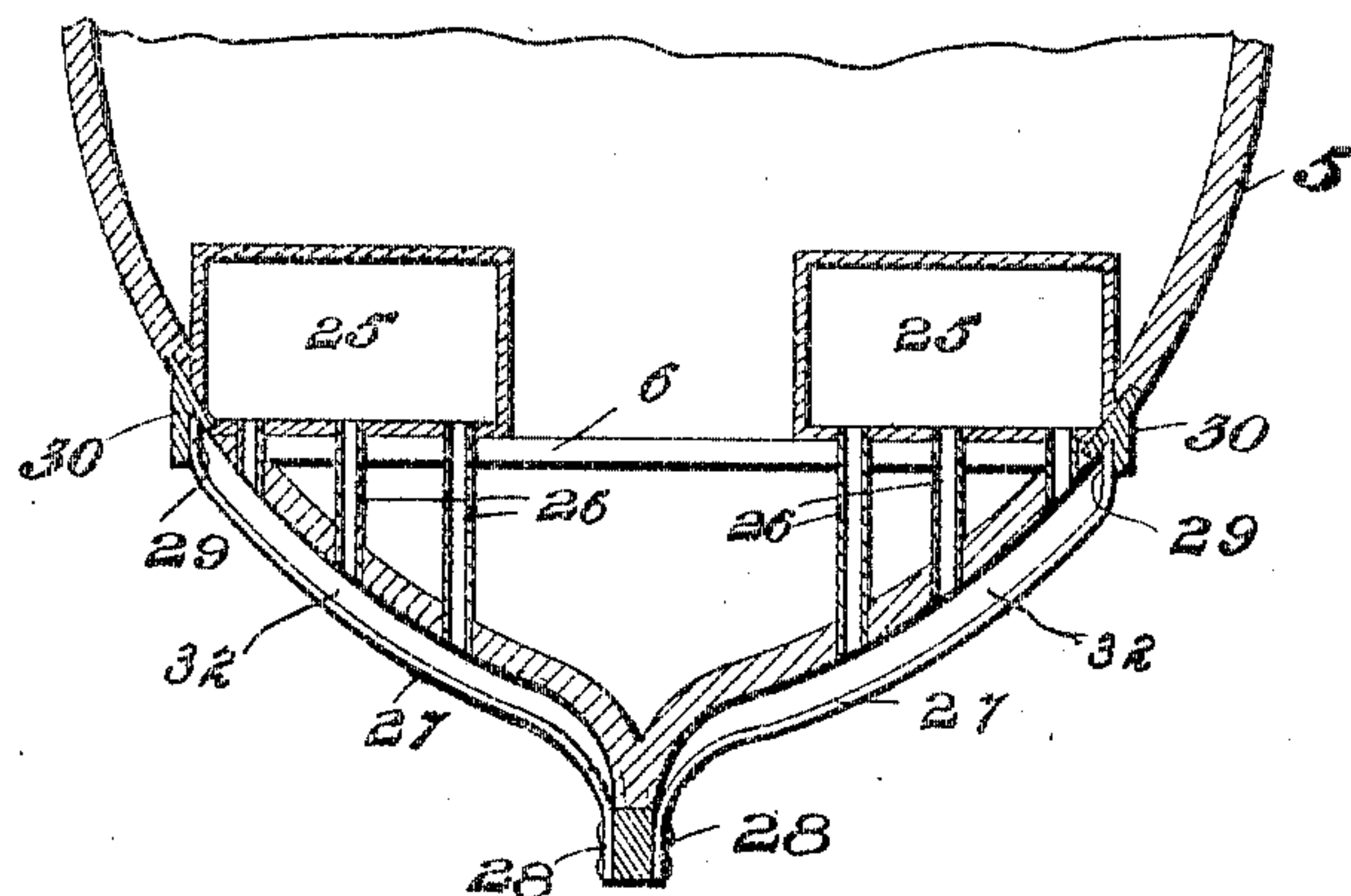
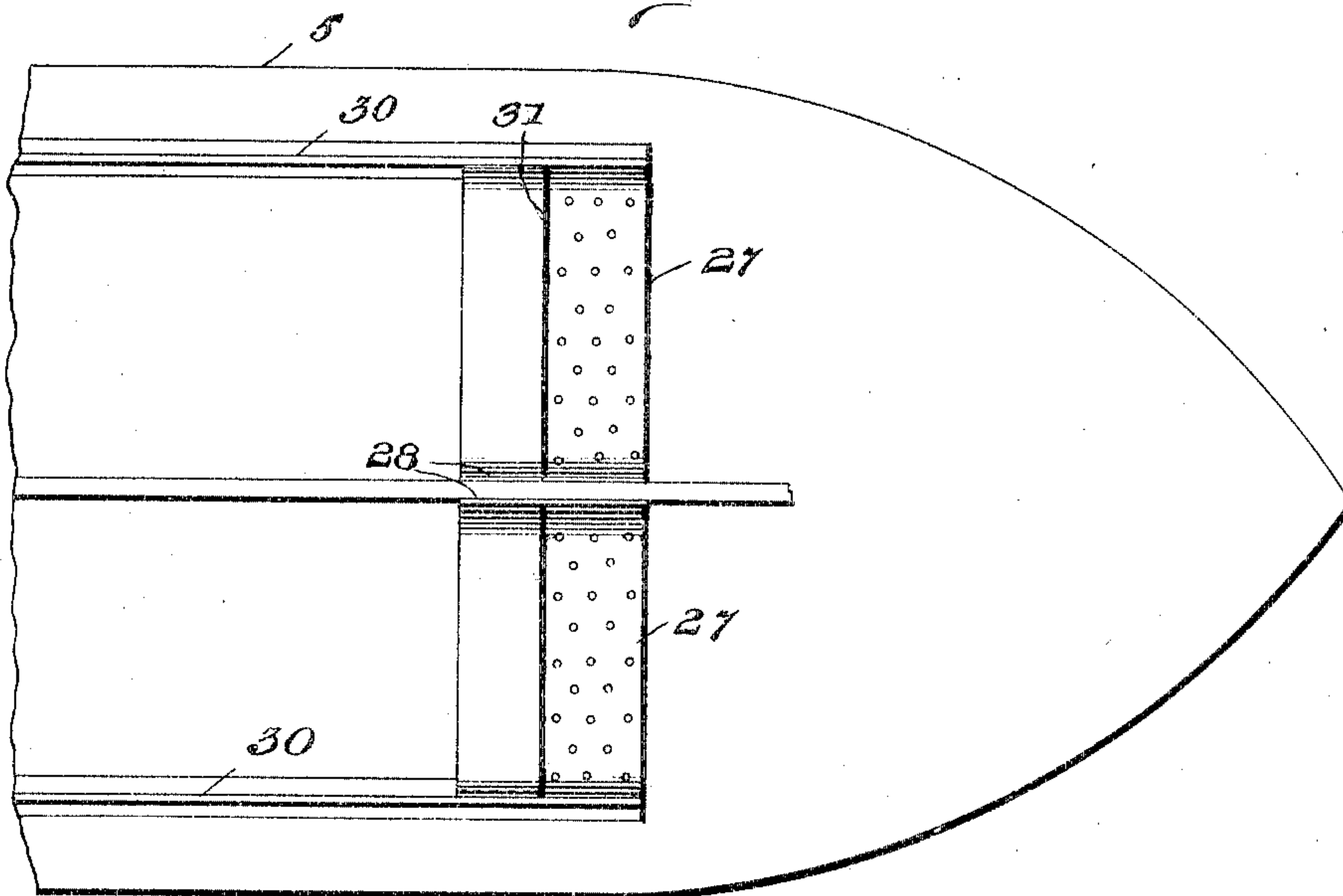


Fig. 4.



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UNITED STATES PATENT OFFICE.

HANS NELSON, OF CHIPPEWA FALLS, WISCONSIN.

AIR APPARATUS FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 780,122, dated January 17, 1905.

Application filed April 28, 1904. Serial No. 205,424.

To all whom it may concern:

Be it known that I, HANS NELSON, a citizen of the United States, residing at Chippewa Falls, in the county of Chippewa and State of Wisconsin, have invented a new and useful Improvement in Air Apparatus for Vessels, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in the construction of vessels, and more particularly to means for increasing the speed of the latter.

The object of the invention is to improve the construction of the hulls of vessels and to provide means for increasing the speed of the latter by uniformly distributing a current of air, gas, or similar fluid between the hull and the water in which the hull rests, thereby reducing the frictional resistance of the vessel and materially assisting the driving mechanism in propelling the boat.

A further object of the invention is to provide novel means for compressing air and forcing the same under pressure longitudinally of the hull and in a direction opposite to the direction of travel of the vessel.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation, partly in section, of a portion of a boat or vessel constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse sectional view taken on the line 3-3 of Fig. 2. Fig. 4 is a bottom plan view of a portion of the hull. Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

5 designates the hull of a vessel, which may be of any desired shape and formed of wood, metal, or other suitable material. Arranged

within the hull and secured in any suitable manner to the deck 6 is an air chamber or reservoir 7, and communicating with said reservoir and extending above the hull are a pair of air-conducting pipes or tubes 8. The pipes or tubes are preferably united where they enter the reservoir 7, and each pipe is provided with a fan-casing 9, in which is mounted a rotary suction-fan 10 for forcing air under pressure into said reservoirs.

Suitable check-valves 10' are arranged within the pipes 8 to prevent the escape of air from the reservoir.

Power is transmitted to the fans 10 through the medium of belts 11, driven by pulleys 12, the latter being keyed or otherwise rigidly secured to a transversely-disposed shaft 13, journaled in suitable bearings, as shown. Keyed on the shaft 13 is a pinion 14, which meshes with a gear-wheel 15 on a counter or stub shaft 16, the latter being driven by an engine 17, secured to the deck of the vessel. Mounted on the bed-plate of the engine and preferably at the forward end thereof is an air pump or compressor 18, designed to assist in compressing air within the reservoir 7, the air being fed thereto through a pipe 19, provided at one end with a suitable check-valve 20, as shown. The air-compressor 18, which may be of any improved construction, preferably consists of a vertically-disposed cylinder the piston 21 of which is connected to a crankshaft 22, the latter being driven by a belt 23, passing over a pulley on the main driving-shaft of the engine. Connected to the main reservoir 7 are oppositely-disposed pipes 24, through which air under pressure is forced into auxiliary reservoirs 25 and thence through depending tubes 26 to the bottom of the hull. As a means for uniformly distributing the currents of air over the bottom of the hull, and thereby reducing the frictional resistance of the vessel as it travels through the water, I provide deflector-plates 27, said plates being preferably bent to conform to the shape of the hull and secured to the latter immediately below the auxiliary reservoirs, as clearly shown in Figs. 3 and 4 of the drawings.

The plates extend transversely of the hull and are provided with terminal flanges 28 and

29, the flanges 28 being riveted or otherwise secured to the keel of the vessel and the flanges 29 to longitudinal retaining-strips 30, which extend the entire length of the vessel and
 5 serve to retain the air beneath the hull of the latter.

The deflector-plates 27 are formed with offsets or shoulders 31, which space the rear ends of said plates from the bottom of the hull and
 10 form air-receiving pockets 32 on each side of the keel, so that air under pressure passing through the tubes 26 and entering said pockets will be deflected longitudinally of the hull and in a direction opposite to the direction of travel
 15 of the vessel.

In operation air is supplied to the main reservoir 7 by the suction-fans 10 and said air compressed and forced under pressure into the auxiliary reservoirs and thence to the
 20 bottom of the hull by means of the pump 18.

The currents of air striking the deflector-plates are interposed between the hull of the vessel and water in which the hull rests, thereby preventing the water from retarding
 25 the progress of the vessel and materially assisting the driving mechanism in propelling the boat.

Having thus described the invention, what is claimed is—

30 1. The combination with the hull, of a main air-reservoir, an auxiliary reservoir, deflector-plates secured to the bottom of the hull beneath the auxiliary reservoir, a plurality of spaced air-conducting pipes leading from said
 35 auxiliary reservoir to the deflector-plates, a pipe connecting the main and auxiliary reservoirs, and means for supplying air under pressure to the former.

2. The combination with the hull, longitu-

dinal air-retaining strips secured to the bot- 40
 tom of the hull on each side thereof, deflector-plates fastened to the inner walls of said strips and spaced from the bottom of the hull, an air-reservoir, spaced air-conducting pipes communicating with the reservoir for uni- 45
 formly distributing air to said deflector-plates, and means for supplying air under pressure to said reservoir.

3. The combination with a hull having a keel, longitudinal retaining-strips secured to 50
 the bottom of the hull on each side thereof, deflector-plates secured to the inner walls of the retaining-strips and to the keel of the hull, said deflector-plates being provided with an offset or shoulder defining air-reservoir, 55
 pockets of uniform width on each side of said keel, an air-reservoir, a plurality of spaced air-conducting pipes leading from the reservoir to said pockets, and means for supplying
 60 air under pressure to said reservoir.

4. The combination with a hull, of a longitudinal air-retaining strip secured to the bottom of the hull on each side thereof, deflector-plates secured to the inner walls of said strips and spaced from the bottom of the hull, a 65
 main air-reservoir, pipes extending above the top of the hull for supplying air to said reservoir, an auxiliary reservoir disposed above the deflector-plates, a plurality of vertically-
 70 disposed pipes extending through the bottom of the hull for conducting air from the auxiliary reservoir to the deflector-plates, and a source of communication between said auxiliary reservoir and the main reservoir.

HANS NELSON.

In presence of—

DAYTON E. COOK,
 MARGARET TUOHY.