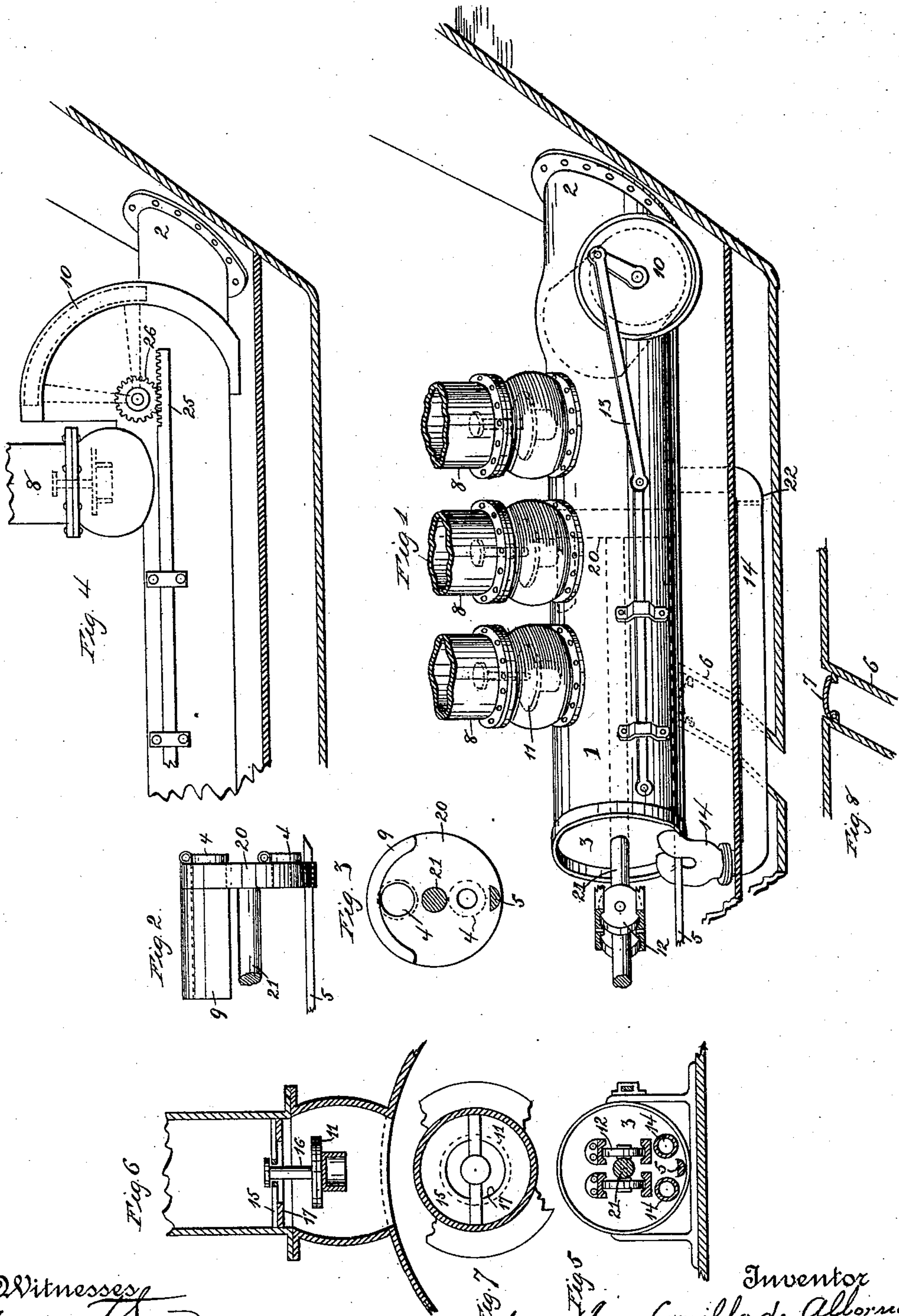


(No Model.)

I. CARRILLO DE ALBORNOZ.
MACHINE FOR PROPELLING VESSELS.

No. 474,939.

Patented May 17, 1892.



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MACHINE FOR PROPELLING VESSELS.

SPECIFICATION forming part of Letters Patent No. 474,939, dated May 17, 1892.

Application filed September 17, 1891. Serial No. 406,023. (No model.)

To all whom it may concern:

Be it known that I, ISAAC CARRILLO DE ALBORNOZ, of the city, county, and State of New York, have invented a new and useful Machine for Propelling Boats, of which the following is a specification.

In the accompanying drawings, illustrating my improvement, Figure 1 is a side view of my machine in position in the vessel. Figs. 2 and 3 are detailed views of the piston-head. Fig. 4 is a modified form of outlet-valve. Fig. 5 is an end-elevation of the inner or closed end of the cylinder. Fig. 6 is a sectional elevation of one of the air pipes and valves. Fig. 7 is a plan view of the air-valve; and Fig. 8 is a sectional view of the inner end of the inlet water-pipe, showing the valve in the same.

My invention relates to that class of propelling devices for vessels in which water is forced from the vessel in a direction opposed to that in which the latter is to be moved; and it consists of various improvements in the cylinder from which the water is forced and in the mechanism connected with the same.

1 is a longitudinal cylinder situated in the construction shown in the drawings in the stern of the vessel and near the bottom of the same, and opening at its rear or outer end 2 through the vessel directly into the water surrounding the latter. The inner end 3 of the cylinder is closed and is provided with openings for the piston-rod and the rod 5 on the piston and for the pipe 14. On top of the cylinder are pipes 8 8, provided with downwardly-opening valves 11 11, through which air passes into and out of the cylinder. These valves (shown more at large in Fig. 7) are provided on the under side with boxes or floats by which the valves are closed and held up against their seat 17 by the action of the water entering the cylinder. When not held up and closed by the water, the valves drop down and open and are supported by the heads on the stems 16 from the bars 15. As shown, the pipes 8 and the opening of the valves are large, so that the air can pass quickly in and out of the cylinder. In the bottom of the cylinder is the water-inlet pipe 6, which passes through the bottom of the vessel and opens out directly into the water

and by which water enters into the cylinder. This pipe is closed by an upwardly-opening valve 7, (shown more fully in Fig. 8,) which is held down on its seat by a rod 5 on the piston 20, as hereinafter described. Within the cylinder is the piston 20, moved back and forth by a piston-rod 21, connected by means of the wheels 12 or any other suitable means with the engine. The piston, as is shown in Fig. 2, is provided with two valves 4 4, which allow the air to pass through the piston and prevent suction, and has at the top a prolongation 9, which, being round and fitting the interior of the cylinder, closes the openings into the air-pipes as the piston passes under them, and thus prevents the water when being driven by the piston from going over and around the top of the piston to the back of the same. At the bottom of the piston is a rod 5, which extends back from the piston and over the valves 7 in the pipe 6 and serves to hold the latter down on its seat until the piston is drawn back of the valve toward the closed end 3 of the cylinder. This rod 5 passes out of the cylinder, as the piston moves back, through an opening 24 in the end 3, as is shown in Fig. 5. In the forward or open end of the cylinder next to the vessel is a valve 10, controlled by the rod 13, worked by an eccentric on the engine, which is so timed that the valve is opened just before the piston commences its forward movement from the closed end toward the valve and is closed the moment the piston commences its backward movement. The opening of this valve 10 is equal to the inner diameter of the cylinder, so that the water from the cylinder can be expelled through the valve without hinderance. Below the cylinder is a pipe 14, communicating with the interior of the cylinder at the rear through the closed end 3 and at a point 21 near the valve 10. This pipe is intended to assist in conveying any water that may be in the back end of the cylinder behind the piston to the part of the cylinder in front of the piston. A valve in the pipe at 22 prevents the passage of the water in the opposite direction.

The operation of my invention is as follows: I will suppose the piston 20 to be at the end of its forward stroke and to have just expelled the water from the cylinder. Before

the piston starts on its return stroke the valve 10 is closed by the rod 13, moved by the eccentric. As the water is driven from under the air-pipes 8, the valves 11, no longer held
 5 up by the water, drop down, allowing the air to enter and fill the interior of the cylinder behind the piston. The piston now moves back on its return stroke toward the closed end 3, and as it does so the valves 4 in the piston open, allowing the air to flow through the
 10 piston, thus preventing any suction against the valve 10. After the piston has gone forward some quantity of water remains in the cylinder coming from the air-pipes; but as
 15 the piston is provided with the valves 4 when it recedes a part of this water passes through them and the remainder is pushed by the piston into pipe 14 and returns to the cylinder at 21. As the piston reaches the end of its back-
 20 stroke the eccentric connected to the bar 13 opens the valve 10. At the same time the piston passes over and back of the valve in the pipe 6, when the latter, no longer held down by the rod 5 on the piston, is at once opened
 25 by the pressure of the water outside, and the water quickly enters through the valve 10 and the pipe 6 and fills the cylinder. As the water enters the cylinder it drives the air out through the pipes 8 until the water, filling the
 30 cylinder and the bottom of the pipes, raises the valves 11 and presses them against their valve-seats 17, thus closing the air-pipes and preventing the escape of the water through them. The cylinder now being filled with
 35 water the piston starts on its forward stroke and, moving with rapidity, expels the water out of the cylinder and through the opening in the stern of the vessel, thus driving the vessel in the opposite direction. As the piston
 40 passes over the valve 7 in the pipe 6 it closes the latter down, and thus prevents the ingress of any more water. The piston having expelled all the water, the valve 10 is closed, the piston recedes, and the operation is
 45 repeated as before.

In Fig. 4 is shown another form of outlet-valve 10. This valve is curved and is opened and closed by a rack 25 and pinion 26, moved by the eccentric as before.

50 In my improvement, on account of the large air pipes and valves 11, the air enters the cylinder quickly as the water is expelled, and thus when not filled with water the cylinder is always full of air, and all suction against
 55 the piston as it moves in either direction is avoided.

My machine may be located at the stern of the boat, as in the illustration, and one or more cylinders may be used, or a cylinder
 60 may be placed on each side of the boat, so as to open rearwardly or toward the stern.

What I claim is—

1. The combination, in a boat-propelling machine, of a cylinder open at one end, a
 65 valve at the open end thereof, and means by which the valve is opened and closed as the

piston advances and recedes, an air-pipe provided with a valve by which air enters and leaves the cylinder, and a piston adapted to move back and forth in the cylinder, substantially as described. 70

2. The combination, in a boat-propelling machine, of a cylinder open at one end, a valve at the open end thereof, and means whereby the valve is opened and closed as the
 75 piston advances and recedes, an air-pipe on the cylinder provided with a valve actuated by the rise and fall of the water in the cylinder, and a piston arranged to move back and forth in the cylinder, substantially as described. 80

3. The combination, in a boat-propelling machine, of a cylinder open at one end, a valve at the open end thereof, and means whereby the valve is opened and closed as the
 85 piston advances and recedes, an air-pipe on the cylinder, provided with a valve actuated by the rise and fall of the water in the cylinder, and a piston arranged to move back and forth in the cylinder and provided with valves
 90 whereby the air can pass through the piston, substantially as described.

4. The combination, in a boat-propelling machine, of a cylinder open at one end, a valve at the open end thereof, and means
 95 whereby the valve is opened and closed as the piston advances and recedes, an air-pipe on the cylinder, provided with a valve actuated by the rise and fall of the water in the cylinder, an inlet-pipe in the cylinder communicating with the water outside of the vessel and having an upwardly-opening valve and a piston arranged to move back and forth in the cylinder, provided with a valve whereby
 100 the air can pass through the piston and having a rearwardly-projecting shield by which the mouth of the air-pipe is closed as the piston passes under the same, and a rearwardly-projecting rod adapted to pass over and hold down the valve in the inlet-pipe, substantially
 105 as described. 110

5. The combination, in a boat-propelling machine, of a cylinder open at one end, a valve at the open end thereof, and means whereby the valve is opened and closed, a series of air-pipes arranged longitudinally on the cylinder and provided with valves actuated by the rise and fall of the water in the cylinder, and a piston arranged to move back and forth in the cylinder, substantially as described. 120

6. The combination, in a boat-propelling machine, of a cylinder open at one end, a piston therein, said cylinder being provided with an air-opening intermediate its open end and the piston at the opposite end of its stroke, whereby a vacuum is prevented on the return stroke, a valve in said air-opening, and means whereby said valve is closed on the advance stroke of the piston, substantially as
 125 described. 130

7. The combination, in a boat-propelling

machine, of a cylinder open at one end, a piston therein, said cylinder being provided with an air-opening passed by the piston on its stroke in each direction, a valve in said opening, and means whereby said valve is opened for the return stroke and closed for the advance stroke, substantially as described.

Signed at the city of New York, in the county of New York and State of New York, this 16th day of September, A. D. 1891.

ISAAC CARRILLO DE ALBORNOZ.

Witnesses:

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