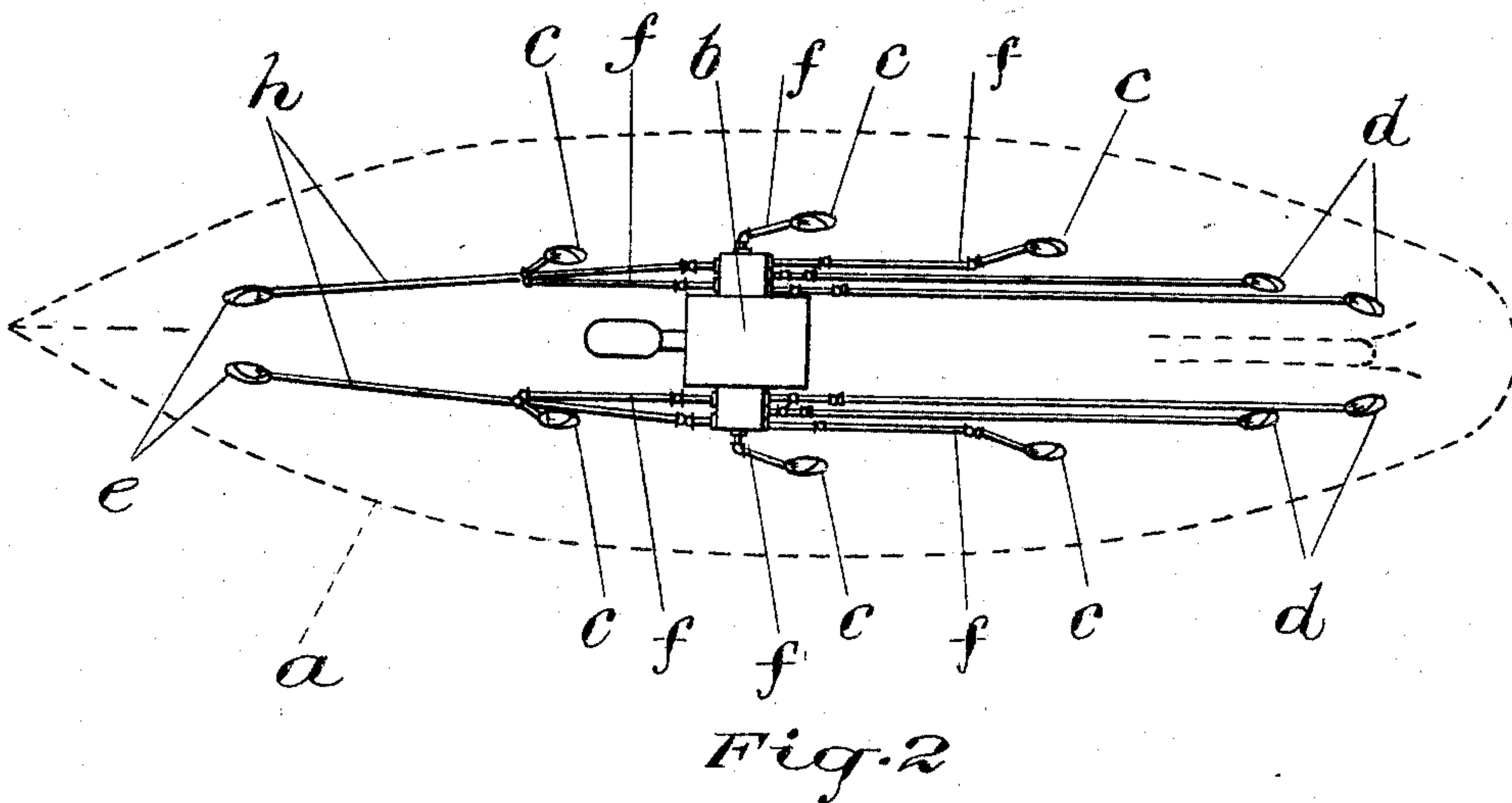
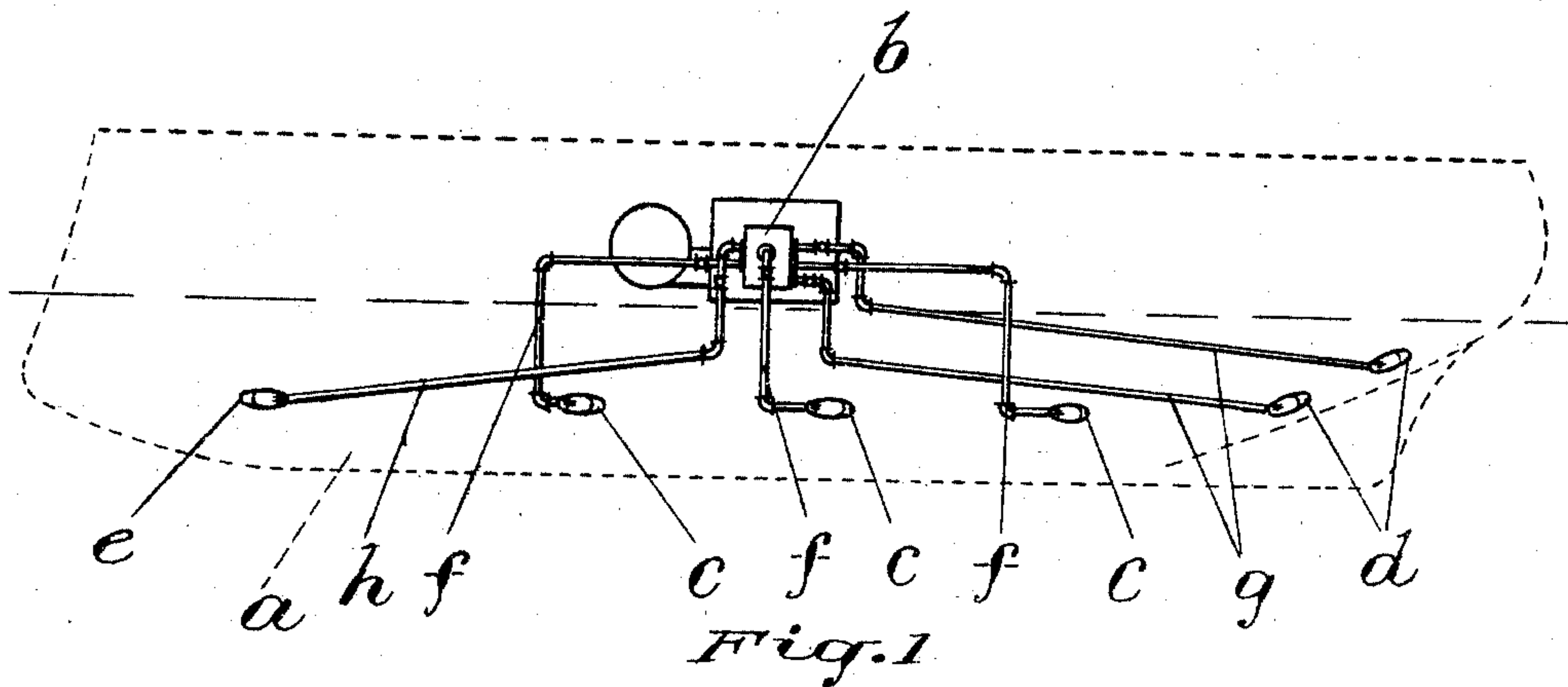


T. MOTTON.
SYSTEM FOR PROPELLING VESSELS.
APPLICATION FILED MAY 25, 1908.

927,996.

Patented July 13, 1909.
2 SHEETS—SHEET 1.



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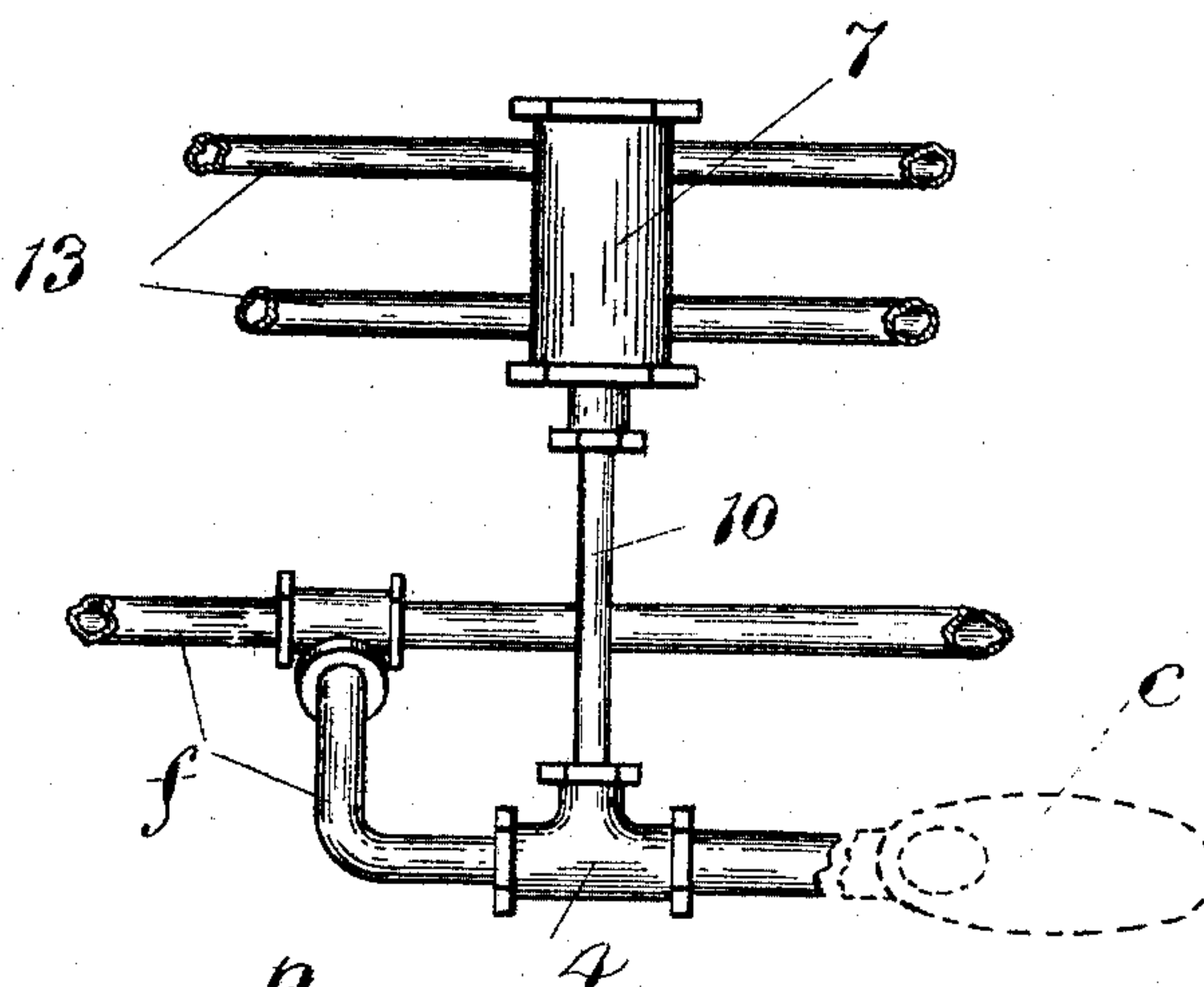
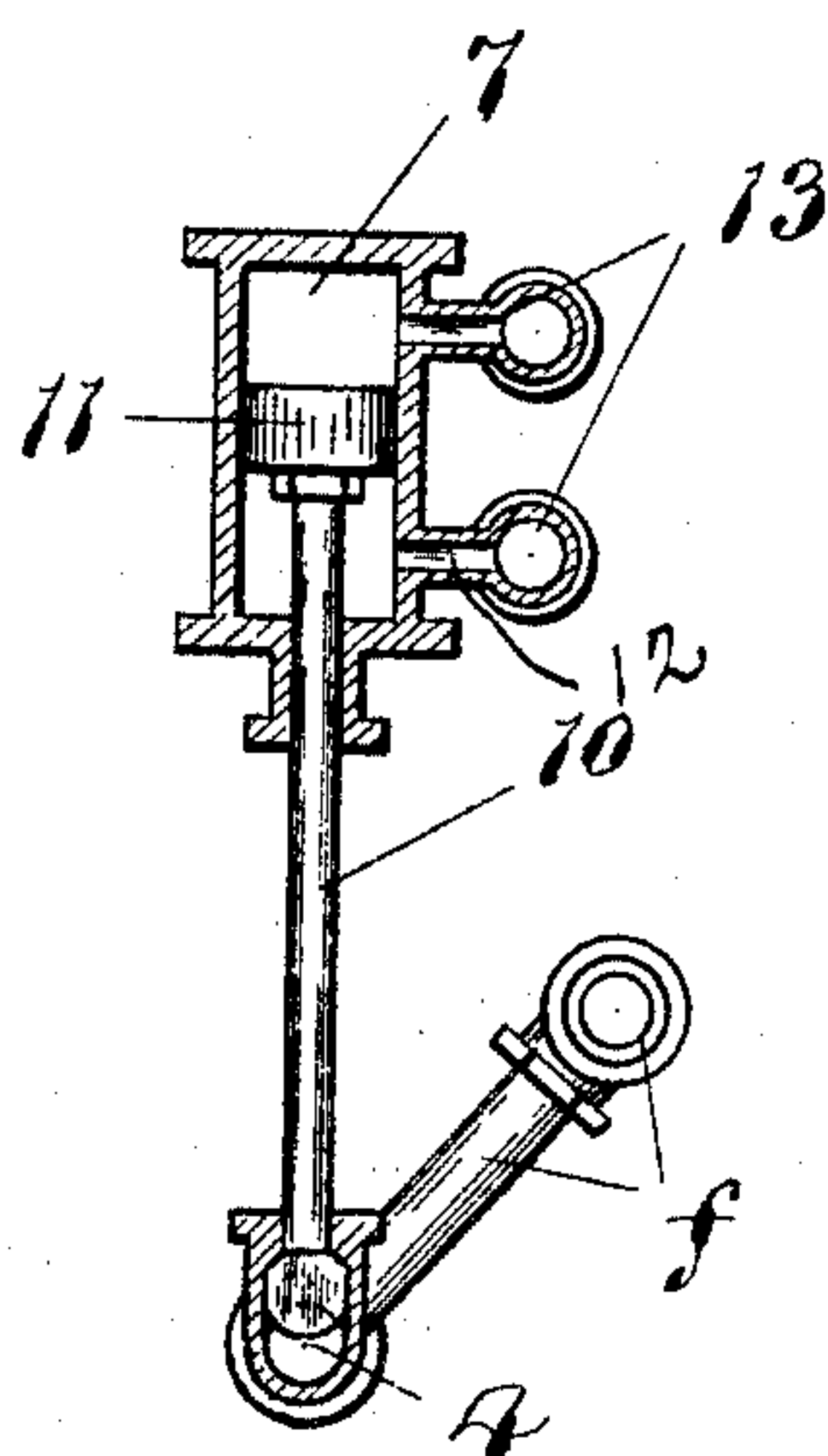
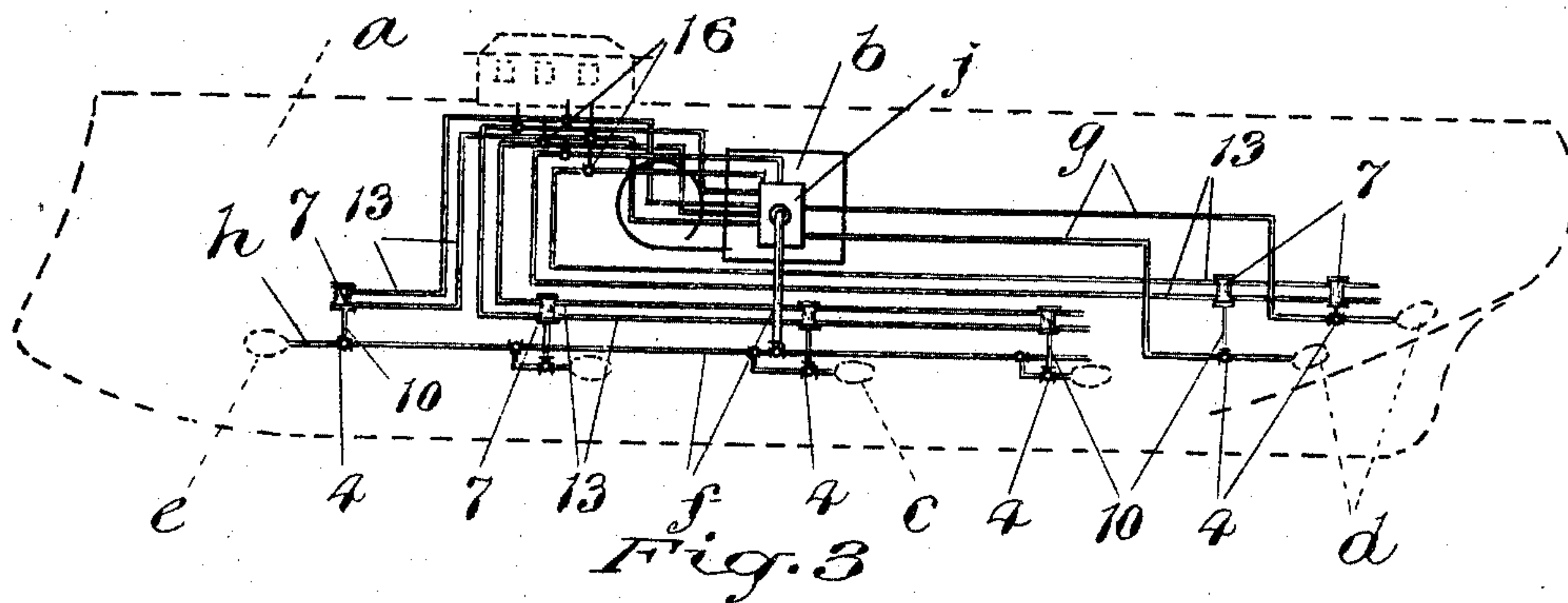


Fig. 5

Fig. 4

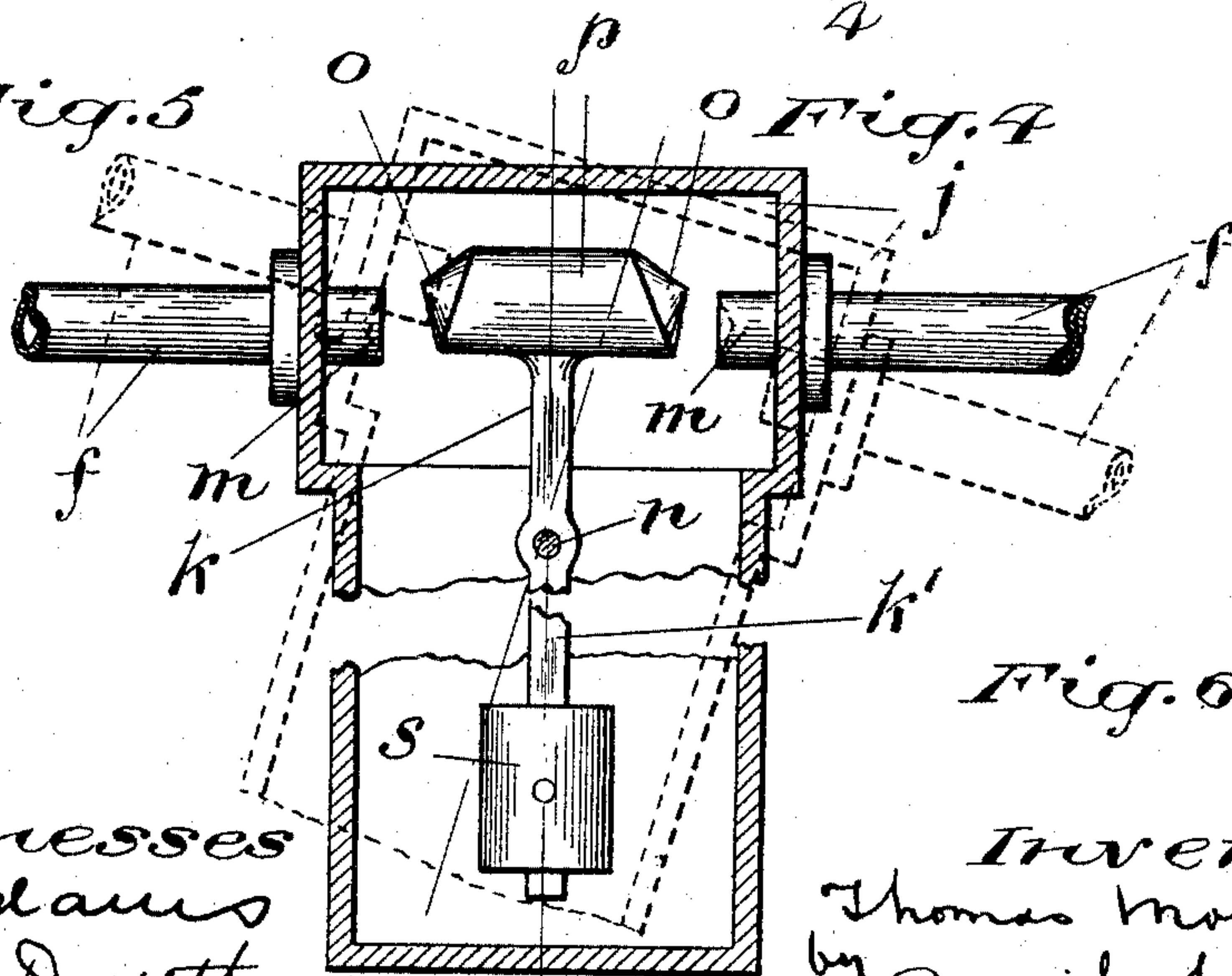


Fig. 6

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UNITED STATES PATENT OFFICE.

THOMAS MOTTON, OF TORONTO, ONTARIO, CANADA.

SYSTEM FOR PROPELLING VESSELS.

No. 927,996.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed May 25, 1908. Serial No. 434,787.

To all whom it may concern:

Be it known that I, THOMAS MOTTON, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, having
5 invented new and useful Improvements in Systems for Propelling Vessels, do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to a means for propelling vessels by compressed air ejected
10 from outlet ports situated below the water line, and adapted to discharge rearwardly from the stern and side of the hull. The air is compressed amidships by ordinary air
15 compressors operated by the usual steam engine or motor power, and is then conveyed by pipes or conduits throughout the vessel to the points of egress.

The objects of my invention are to create
20 a propulsion power whereby as little machinery as possible may be used to move the vessel, particularly as regards propelling blades as by eliminating the latter, the stern resistance from the following waves will be
25 overcome, and the friction on the screw therefrom is eliminated, thereby propelling the vessel by a means whereby the friction will be minimized.

By discharging compressed air through
30 outlet ports situated in the sides and stern of the hull, the air will be caused to strike against the water which tends to push it back, and as the water resists on account of its inertia, and as the water is heavier than
35 the vessel, therefore, the natural result will be that the vessel will be moved forward.

Near the point of outlet in each of the conveying tubes throughout the hull, I provide a gate valve adapted to close off the discharge of air from the outlet ports, and also
40 to prevent the water from entering in through the conveying tubes. The gate valves arranged in combination with the air conveying tubes, in close proximity with the
45 outlet ports, consist of a valve mechanism that may be operated by compressed air which will preferably be conveyed by a separate set of air tubes for the purpose of conveying the air from the air compressor to
50 a valve cylinder forming a part of each of the gate valves. The air in this separate set of air tubes will preferably be controlled by cut off valves operated from the pilot house in the vessel.

55 I make no claim to the system of air com-

pressing or to the means of distributing throughout the hull, but my invention relates to the system of ejecting air through a series of outlet ports arranged in the hull of the vessel, whereby the air will be caused to
60 strike against the water from below the water line in a sufficient volume to cause the necessary pressure against the inert water with the result that the vessel would be moved forward, in the same relative man-
65 ner as a vessel would be caused to move forward by the action of a propelling screw on the water.

In the drawings: Figure 1 is a side elevation of the hull of the vessel. Fig. 2 is a
70 plan view of Fig. 1. Fig. 3 is a side elevation of the hull of the vessel, showing the situation of the cut off valves and conveying tubes to operate same. Fig. 4 is a detailed
75 view of one of the cut off valves and the tubular connection therewith. Fig. 5 is a vertical section through Fig. 4. Fig. 6 is a sectional view through the coupling of the tubular connection of the air compressor
80 showing the controlling valve in position.

Like characters refer to like parts throughout the drawings and specification.

a, designates the hull of the vessel in all respects similar to the common shape of
85 hulls. Situated in any position amidship is an air compressor *b*. I make no specific mention to the system or means of operating the air compressor, as it may be of any of the common forms known, and will be of a capacity to distribute sufficient air to displace
90 the vessel in comparison with its capacity.

Situated through the sides of the hull below the water line are a plurality of outlet ports *c*, and extending through the stern part of the hull are outlet ports *d*. I prefer
95 to arrange the outlet ports in the stern part of the hull on either side of the rudder post, that I may discharge the compressed air from one side only, closing off the discharge from the opposite side, whereby the pressure
100 from the discharge of compressed air will be unequal or from one side of the hull only, as a means for turning the vessel. The same principle will apply to the outlet ports along
105 the sides of the vessel where the pressure of discharge of compressed air may be cut off from one side to provide for turning the vessel.

Situated in the bow of the hull below the water line are outlet ports *e*, adapted to dis-
110

charge the compressed air forward or in an opposite direction from that of the outlet ports *c* and *d*, arranged through the sides and stern part of the hull respectively. The outlet ports *e* in the bow of the hull are to be used for the purpose of causing the vessel to be moved backward, and may also be used to facilitate in turning the vessel whereby the compressed air may be forced out of the outlet ports in one side of the bow only. When the outlet ports *e* in the bow are to be used in conjunction with the outlet ports *d* in the stern, as a means for turning the vessel, the outlet ports through the side diametrically opposite those opened in the stern will be opened. It will be understood the outlet ports *e* will always be closed by the valves when the vessel is traveling forwardly.

Communicating between the outlet ports *c* in the sides of the hull and the air compressor situated amidship, are conveying tubes or conduits *f*, and communicating between the air compressor and the outlet ports *d*, are conveying tubes or conduits *g*. Communicating between the air compressor and the outlet ports *e* in the bow of the hull are conveying tubes or conduits *h*. The conveying tubes or conduits *f*, *g* and *h* are for the purpose of conveying the compressed air from the air compressor to the point of egress where it will be discharged through the outlet ports and caused to strike or push against the water at such an angle that it will cause the vessel to move forward.

In Fig. 1 of the drawings I have shown the conveying tubes or conduits *f*, *g* and *h* all as separate connections between the air compressor and the outlet ports, but in practice I may find it more practical to have one main conduit from the air compressor with a branch connecting with each of the separate outlet ports as shown in Fig. 3.

Fitted in each of the conveying tubes or conduits *f*, *g* and *h* in close proximity with the outlet ports are air controlled valves 4, so arranged that they may be adjusted to permit the compressed air to escape through the outlet ports and also to be adjusted to prevent water from entering in through the tubes or conduits when the compressed air may be cut off from all or any one of the tubes, as for instance when the compressed air is closed off from discharging from either side of the vessel when backing or turning.

Arranged or set in the coupling box for the air conveying tubes or conduits with the air compressor, is an automatic pendulum valve *k*, that will instantly open and close the supply of compressed air from the air compressor to the conveying tubes or conduits. The automatic pendulum valve is for the purpose of opening and closing, the supply of compressed air to either side of the vessel alternately, when the vessel may

roll or pitch extensively in stormy weather which would cause any of the outlet ports to be exposed above the water line.

The air conveying tubes on conduits *f*, that supply the air to the outlet ports *c* formed through the sides of the vessel, are coupled to the sides of the air compressor, and extend sidewise therefrom.

The coupling box *j*, consists of a boxlike projection formed with the air compressor into which the ends *m* of the tubes or conduits *f* extend.

Pivotally suspended by a pin *n*, and adapted to swing sidewise in the coupling box *j*, is the pendulum valve *k*. The pendulum valve *k* comprises a head *p*, formed on the upper end of the pendulum bar *k'*, and is situated to be interposed between the ends *m* of the tube or conduit *f*, projecting into the coupling box *j*. The head *p* is formed with conical shaped ends *o* adapted to engage in the ends *m* of the tubes or conduits *f*. On the lower end of the pendulum bar *k'* is fastened a weight *s*, adapted to create momentum. In the event of the vessel rolling into a position as shown in dotted lines in Fig. 6, the pendulum valve *k* will swing sidewise until the head *p* engages into the open end *m* of the tubes or conduit *f*, and forms a plug by which it will close off the air from passing into the end *m*, of the tube or conduit *f*, in that side of the vessel until such time as the vessel rights itself, when it will return to a vertical position.

4, represents gate valves arranged in combination with the conveying tubes or conduits *f*, *g* and *h* respectively, discharging into the outlet ports *c*, *d* and *e* respectively. Arranged immediately above each of the valves 4 and forming a part therewith is a cylinder valve casing 7.

10 designates the valve spindle formed with each of the valves 4, and adapted to extend upwardly into the respective cylinder valve casing. Formed on the upper end of the valve spindle 10 is a piston head 11, adapted to move up and down in the said cylinder valve.

Formed on the cylinder valve casing and forming communication with the upper and lower parts therein are couplings 12, and connected with the couplings 12 are conveying tubes or conduits 13, for the purpose of conveying compressed air from the air compressor to the respective cylinder valves 7. The conveying tubes or conduits 13, are adapted to pass in close proximity or through the pilot house, and are fitted with cut off valves 16, so that the air may be controlled to be conveyed and discharged into the upper or lower part of the cylinder valve as the case may be, which would cause the piston head 11 to rise or lower, and open the valves in the conveying tubes *f*, *g* and *h*. The valves 16 may be opened or closed that

all of the valves 4, may be opened or closed simultaneously or separately. By opening the valves 16 to permit the air to pass into the lower part of the cylinder valve casing, the piston head 11 would rise and open the gate valve and allow the air to discharge through any of the outlet ports, and by closing off the air from the lower part of the cylinder valve casing and forcing it into the upper part the piston head would be caused to lower, and close the gate valve in connection with the outlet port, and prevent the discharge of air therefrom. When any of the valves 16 are opened to permit the air to enter into the upper or lower part of the cylinder valve casing, it will be necessary to open or close a vent in one or another of the upper or lower conveying tubes or conduits as the case may be, to prevent back pressure.

By reference to the drawings it will be noticed by the arrangement of the outlet ports in the hull, the compressed air would be caused to discharge obliquely, and as the compressed air will seek to rise to the surface of the water, it will be understood that a certain tendency to displace the water from the hull will be effected, by which action I maintain I may move the vessel.

The outlet ports in the stern of the hull are adapted to eject the compressed air obliquely, and in a manner that the air in rising to the surface would strike the under side of the stern which will be slanting upward, and as the air passes along the face of the hull in rising to the surface, it tends to displace the water, or pushes it away in such a manner that as the vessel is lighter than the water the natural course of the vessel would be forced forward.

The system of distributing the compressed air from the air compressor to the outlet ports may consist of any suitable conduit system, and the valve mechanism arranged in the different conduits may be of any of the common forms known.

I make no claim as to the number of outlet ports arranged in the hull or to the exact situation of their shape or size, as for different size vessels greater or lesser numbers of outlet ports may be required, and I may find that the shape of the outlet ports may require to be varied for different styles of vessels.

What I claim as new and desire to secure by Letters Patent is:

1. In a system for propelling vessels, of a plurality of outlet ports through the hull below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, gate valves arranged in said conveying tubes or conduits adjacent to said outlet ports, a valve cylinder arranged in combination with said gate valve, means for operating said valve cylinder and gate valve, as and for the purpose specified.

2. In a system for propelling vessels, of a plurality of outlet ports through the hull, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, gate valves arranged in said conveying tubes or conduits adjacent to said outlet ports, a valve cylinder arranged in combination with said gate valves, tubular conduit connections between said valve cylinder and said air compressor, and means for operating said valve cylinder and gate valves by compressed air, as and for the purpose specified.

3. In a system for propelling vessels, of a plurality of outlet ports through the hull below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, gate valves arranged in said conveying tubes or conduits adjacent to said outlet ports, a valve cylinder arranged in combination with said gate valves, tubular conduit connections between said valve cylinder and said air compressor, a piston head adapted to be raised or lowered in said valve cylinder by the alternate ingress and egress of compressed air supplied to said valve cylinder, said piston head connected with valve spindle of said gate valve, and adapted to operate therewith, as and for the purpose specified.

4. In a system for propelling vessels, of a plurality of outlet ports through the hull and below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, gate valves arranged in said conveying tubes or conduits adjacent to said outlet ports, a valve cylinder arranged in combination with said gate valves as a means for operating said gate valves, a pendulum valve in combination with said conveying tubes or conduits adjacent with the coupling with said air compressor, and adapted to automatically open and close the supply of air to said conveying tubes or conduits through the rolling of the vessel, as and for the purpose specified.

5. In a system for propelling vessels, of a plurality of outlet ports through the hull and below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, a pendulum valve arranged with said conveying tubes or conduits adjacent with the coupling to the said air compressor, said pendulum valve consisting of the pendulum bar pivotally connected within said coupling, a T shaped head formed on said pendulum bar, said T shaped head formed with conical ends, said conical ends adapted to engage in

the open ends of said conveying tubes or conduits, as and for the purpose specified.

6. In a system for propelling vessels, a plurality of outlet ports through the hull 5 below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, a pendulum valve arranged in combination with 10 the coupling of the said conveying tubes or conduits with the said air compressor, said pendulum valve pivotally arranged adjacent with said inlet ends of said tubular connection or conduits, said pendulum valve 15 formed with a T shaped head, said T shaped head formed with conical ends, said conical ends adapted to engage in the ends of said conveying tubes or conduits to open and close the admission of air to said conveying 20 tubes or conduits, said pendulum valve adapted to be actuated by the rolling of the vessel, as and for the purpose specified.

7. In a system for propelling vessels of a plurality of outlet ports through the hull 25 below the water line, an air compressor suitably situated in said hull, conveying tubes or conduits communicating between said air compressor and said outlet ports, a pen-

dulum valve arranged in said coupling adjacent to the conveying tubes or conduits 30 with said air compressor, gate valves arranged in said conveying tubes or conduits adjacent with said outlet ports, said pendulum valve adapted to automatically close 35 off the supply of air to said conveying tubes or conduits from the said air compressor, said gate valves adapted to prevent the discharge of air and the inflow of water through said outlet ports, as and for the purpose 40 specified.

8. In a system for propelling vessels consisting of the herein described means of discharging compressed air from outlet ports, situated in the hull below the water line, 45 and valves arranged in combination with the said outlet ports to open and close said outlet ports, and prevent the discharge of compressed air and to close off the inflow of water through said outlet ports, as and for 50 the purpose specified.

Signed at Toronto this 9th day of May 1908.

THOMAS MOTTON.

In the presence of—

J. N. BLACK,
LILLIAN CLANCY.