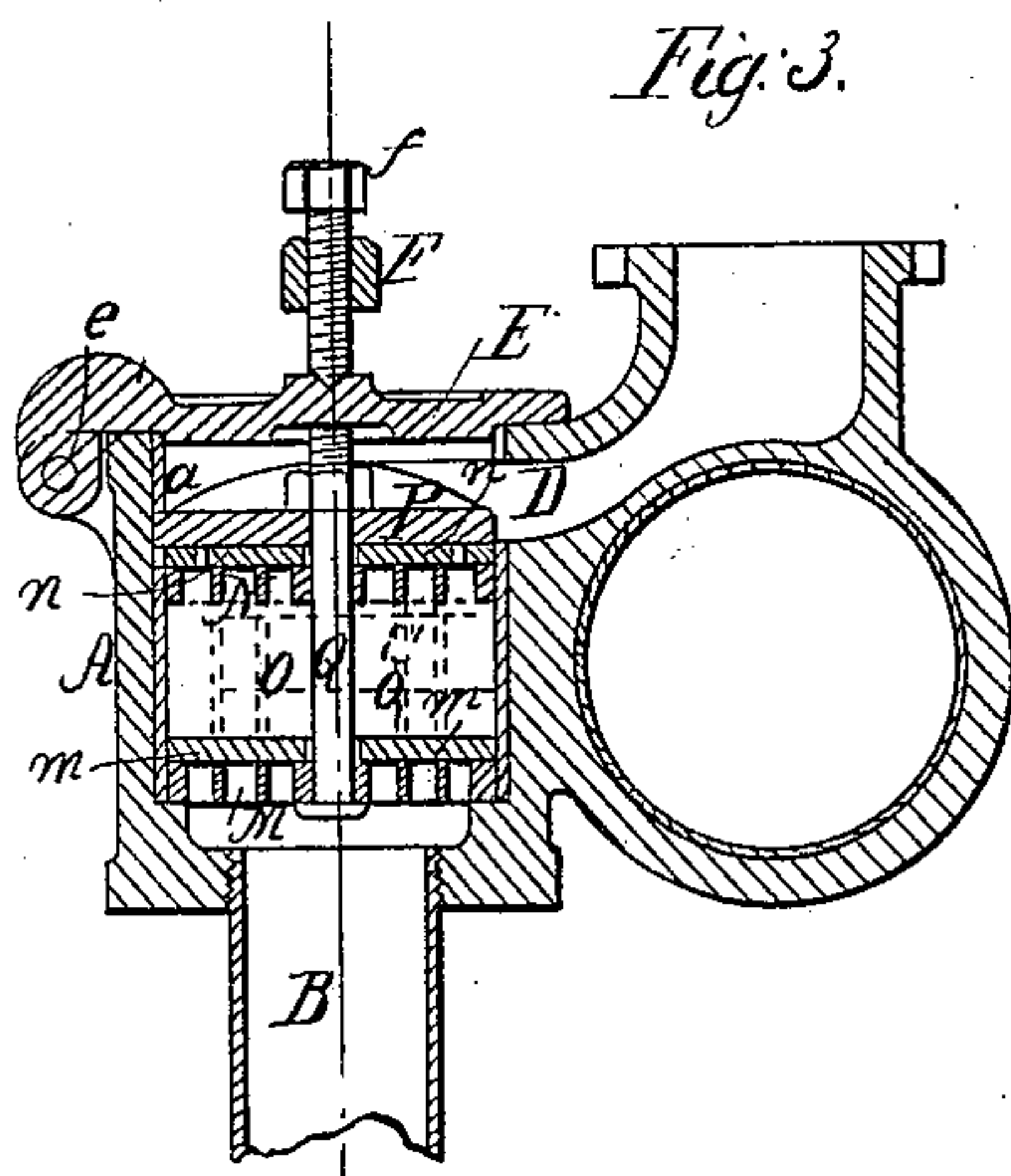
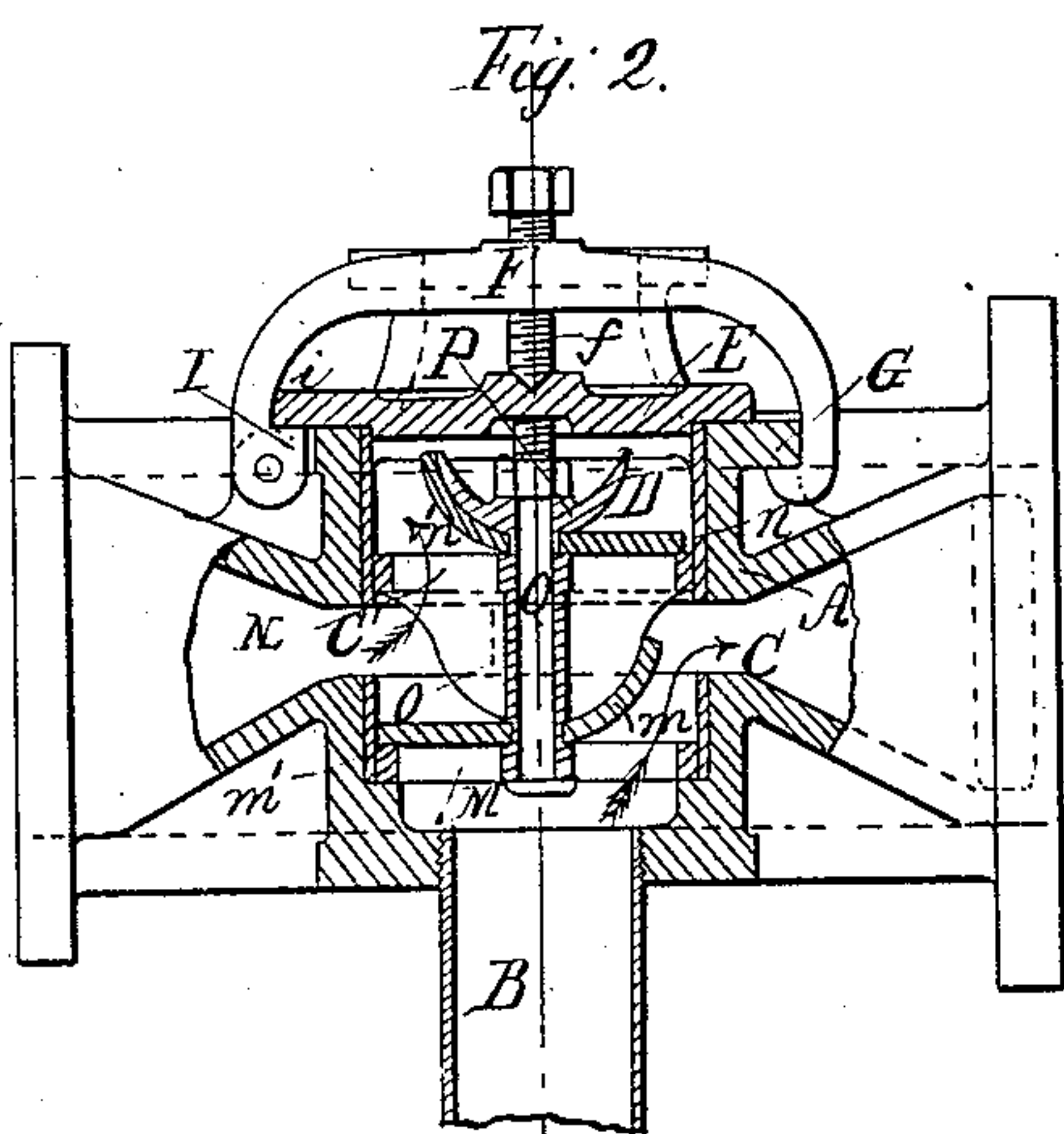
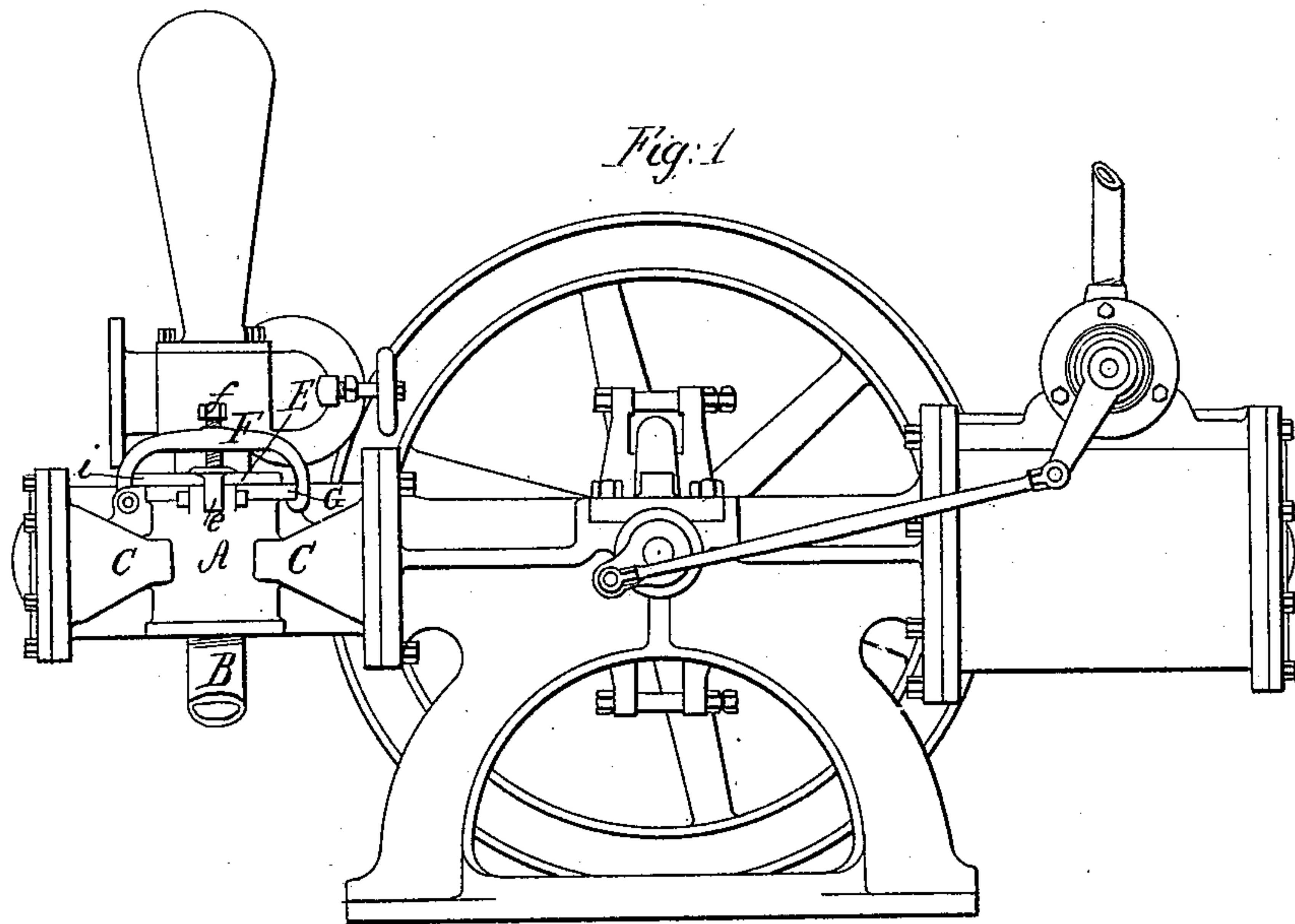


*Reynolds & Babcock,*  
*Steam Pump.*  
*N<sup>o</sup> 40,945.      Patented Dec. 15, 1863.*



*Witnesses:*  
*Benjamin F. Palmer*  
*Abby E. Reynolds*

*Inventor:*  
*Geo. H. Reynolds*  
*Geo. H. Babcock*



# UNITED STATES PATENT OFFICE.

GEORGE H. REYNOLDS AND GEORGE H. BABCOCK, OF MYSTIC BRIDGE,  
(STONINGTON,) CONNECTICUT.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 40,945, dated December 15, 1863.

*To all whom it may concern:*

Be it known that we, GEORGE H. REYNOLDS and GEORGE H. BABCOCK, both of Mystic Bridge, (Stonington,) in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Pumps; and we do hereby declare that the following is a full and accurate description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a view of a steam pump with our improvements attached. Fig. 2 is a section through the valve-chamber and valves, and Fig. 3 is a cross-section of the same.

Similar letters refer to like parts in all the figures.

The nature of our invention consists, first, in the arrangements of the two induction and the two eduction valves of a double-acting pump in a single valve-chamber, in combination with a partition between the induction-valves and extending to the eduction-valves; also, in a construction and arrangement of the several valves and their seats, whereby the said valves and their seats may be removed from the valve-chamber in a single package or bundle; also, in the employment of a cam in combination with a hinged bail, for the purpose of breaking the joint of the valve-chamber bonnet.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation by the aid of the drawings.

The cylinder and piston of our pump may be constructed in any of the known forms, the piston being solid or without valves, and motion may be imparted thereto directly from a steam-cylinder, or in any other convenient manner.

A is the valve-chamber, which we prefer to make cylindrical and with a vertical axis. The induction-pipe B is connected to the lower end of A, as represented. Ports C C' extend from opposite sides of the valve-chamber, near the center of the length thereof, to either end of the pump-cylinder, as shown in Fig. 2. An eduction-port, D, extends from near the top of said valve-chamber to the discharge-pipe. The valve-chamber A is provided with a cover or bonnet, E, hinged at *e*, and held in place by a bail, F, and set-screw *f*. The bail F is

hinged to the side of A at right angles to E, and is provided with a hook at the other end adapted to catch under a projection, G, on the side of A, as represented. The hinge of F is sufficiently loose to allow a side motion to relieve it from the projection G when it is desired to gain access to the interior of the valve-chamber. A projecting point or cam, I, is formed on F near the joint, and adapted to rest under a projection, *i*, upon E when the parts are in the position shown; but when the bail F is thrown over for the purpose of gaining admission to the interior of A, the cam I acts upon *i* and raises the cover E to a slight extent, sufficient to break the joint, when E can be thrown back and the interior of A exposed.

M is a grated disk fitting the interior of A, and resting upon a shoulder therein in a position between the induction port B and the cylinder-ports C C'. This disk M forms the seat of the lower or induction valves, *m m'*, which consists of an india rubber disk held across one diameter and allowed to lift on either side.

N is a similar disk, but with a flange or partition, O, cast thereto extending entirely across A and resting upon the rubber disk upon M, and forming the guard for the lower valves, as clearly shown in the drawings. This partition O is of such a length as to support the upper disk, N, in a position intermediate between the cylinder-ports C C' and the eduction port D. This disk N forms the seats for the upper or eduction valves, *n n'*, which are made in a manner similar to the lower valves, *m m'*, and are held in place by a guard, P, placed across them in line with the partition O. A single bolt, Q, passes through M, N, and P and binds the whole together, holding the seats and valves and guards all in place. This bolt is of such a length that the bonnet E rests on the end thereof, and thus holds the several ports down in the position shown. The end of P is made to enter a recess, *a*, in A, as shown in Fig. 3, for the purpose of holding it and the partition O in a plane perpendicular to the axis of the pump-cylinder, so that the partition O divides the chamber A between the upper and lower valves into two compartments, each communicating with a port, C or C'. Supposing the piston to be moving in the direction from the right to the



left, a vacuum tends to form on the right hand end of the pump and in the port C leading thereto. The partition O prevents water from passing from the port C' thereto, and the valve *n* prevents any from returning from the eduction-port. The valve *m* therefore rises and water flows from the pipe B, as shown by the arrow, to fill the space behind the piston. On the other hand, the water which was on the left of the piston is forced through the passage C', and as it cannot find egress past the partition O, nor through the valve *m'*, it lifts the valve *n'* and escapes through the eduction-port D. On the return-stroke of the piston the valves *m* and *n'* close and *m'* and *n* open, and the water which filled the right end of the cylinder is forced into the eduction-port, while the other end is filled from the induction-pipe B. When from any cause the valves become choked or leaky, and require attention, the screw *f* is turned back so as to relieve the bail F, which is then unhooked and thrown back upon its hinge. In doing so the cam I "breaks the joint" between A and E, and E may then be easily thrown back upon its hinge, and by taking hold of P the four valves *m m' n n'*, with their seats and guards and the partition O, may all be removed in one mass, and any foreign matter extracted. In this condition the several parts are easy of access for cleaning, and by unscrewing the bolt Q the valves may be taken apart and removed, if necessary. On dropping the valves and their seats again in their places, the bonnet E may be replaced and fastened by the bail F, when the pump is again ready for action.

In the ease with which access may be had to our valves for cleaning or repair lies the chief advantage of our invention. This is

a very valuable quality in many situations, such as for bilge-pumps on board of vessels, where a choked pump may endanger the lives of all on board, and where pumps are peculiarly liable to become choked from the foreign matter which works into the bilge from the cargo and from carelessness. The cam I, for breaking the joint, is very valuable where time is an object, and very convenient at other times, as any one who has ever had occasion to break a joint which has been standing some time can appreciate.

Having now fully described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. The two induction-valves and the two eduction-valves of a double-acting pump, arranged as shown, in a single chamber, A, in combination with the partition O between the induction-valves *m m'*, and extending to the eduction valves *n n'*, substantially as and for the purpose herein described.

2. The construction and arrangement of the valve-seats M N, the valves *m m' n n'*, and the partition O, whereby the said valves and their seats may be removed from the chamber A in one mass, substantially as herein specified.

3. The employment of the cam I, in combination with the hinged bail F and the bonnet E, substantially as and for the purpose herein set forth.

In testimony whereof we have hereunto set our names in presence of two subscribing witnesses.

GEO. H. REYNOLDS.  
GEO. H. BABCOCK.

Witnesses:

BENJAMIN F. PALMER,  
ABBY E. REYNOLDS.