

(No Model.)

3 Sheets—Sheet 1.

H. C. LANGREHR.

COMPOUND PUMP.

No. 283,257.

Patented Aug. 14, 1883.

FIG. 1.

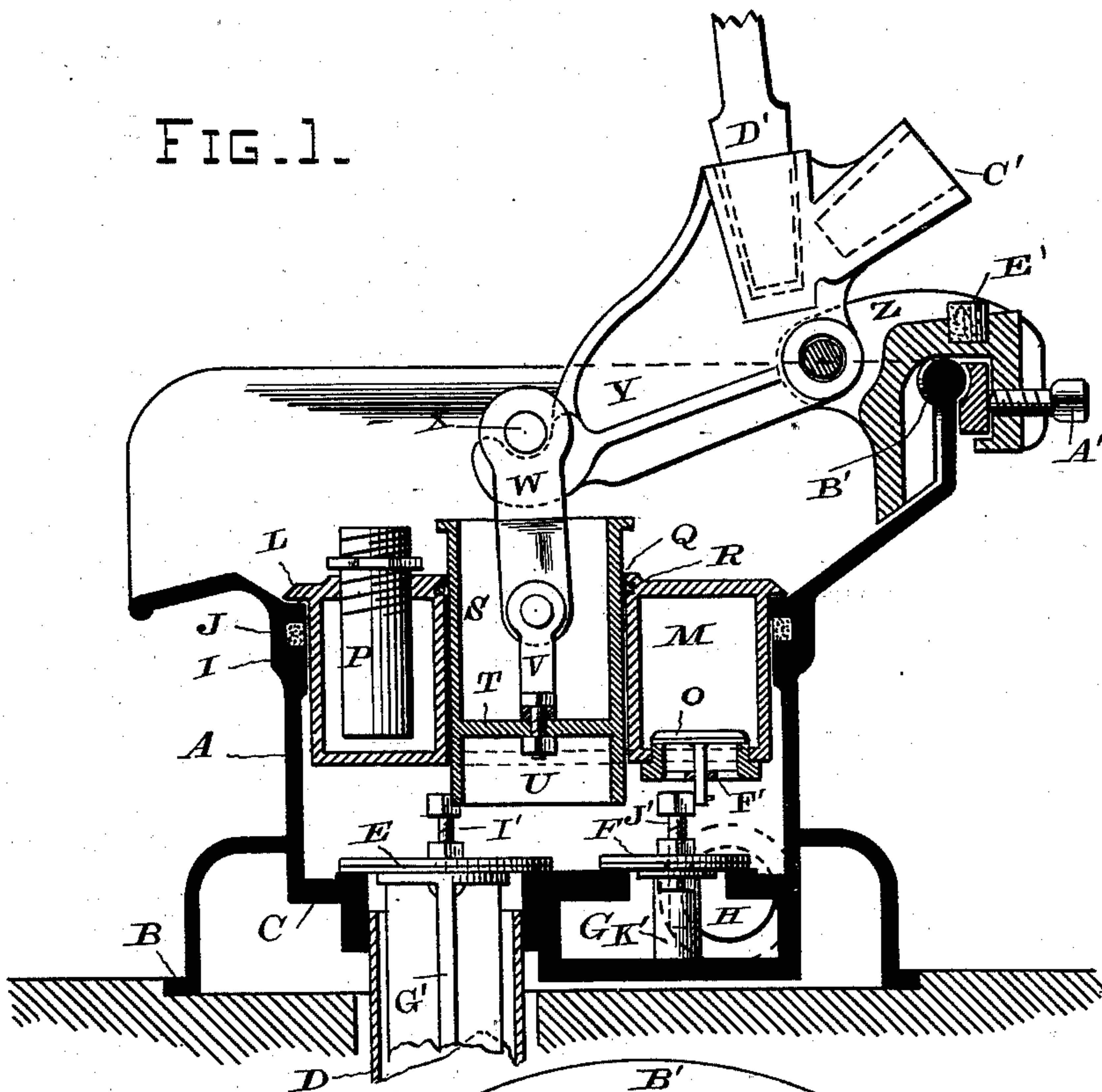
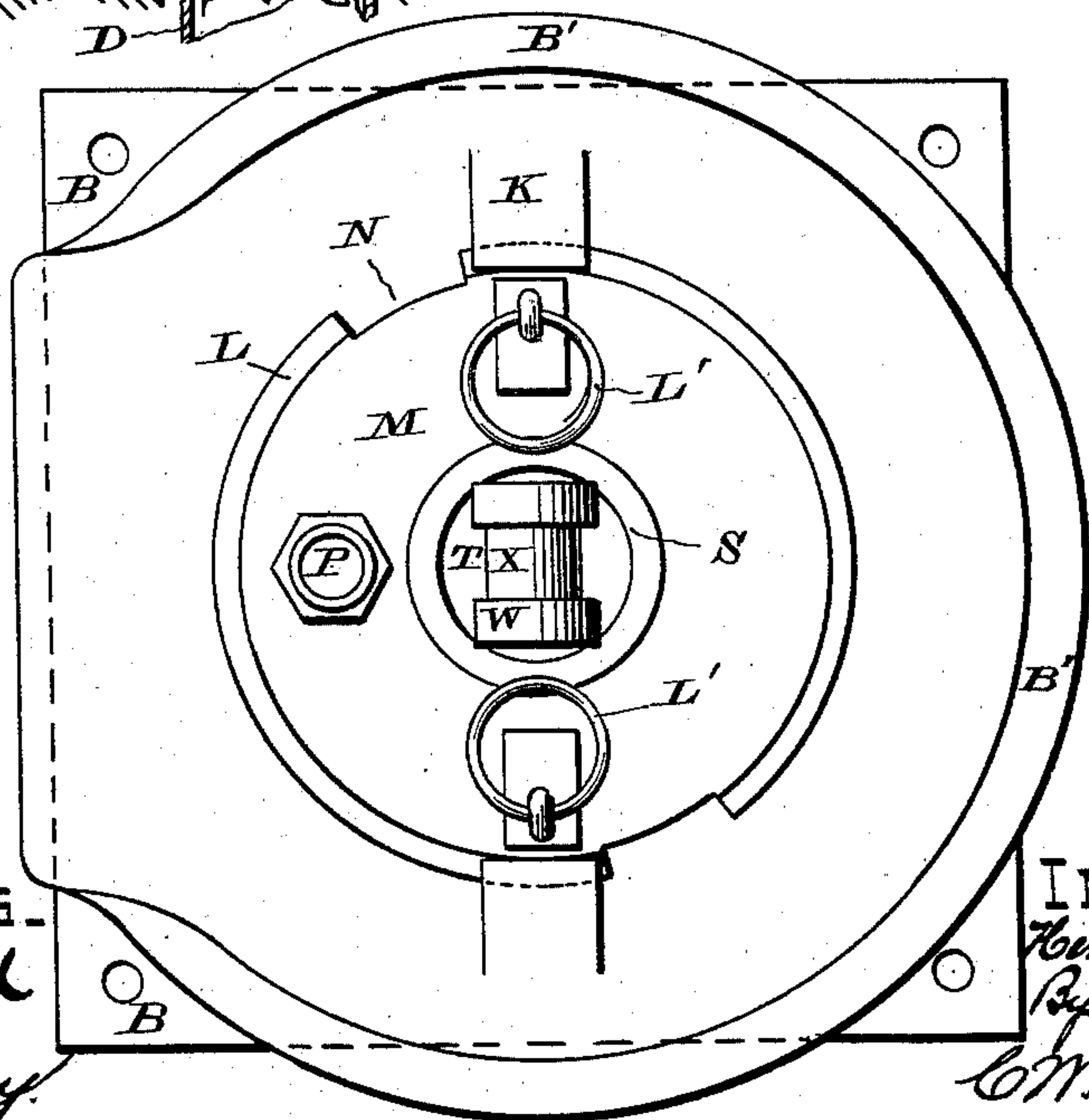


FIG. 2.



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FIG. 3.

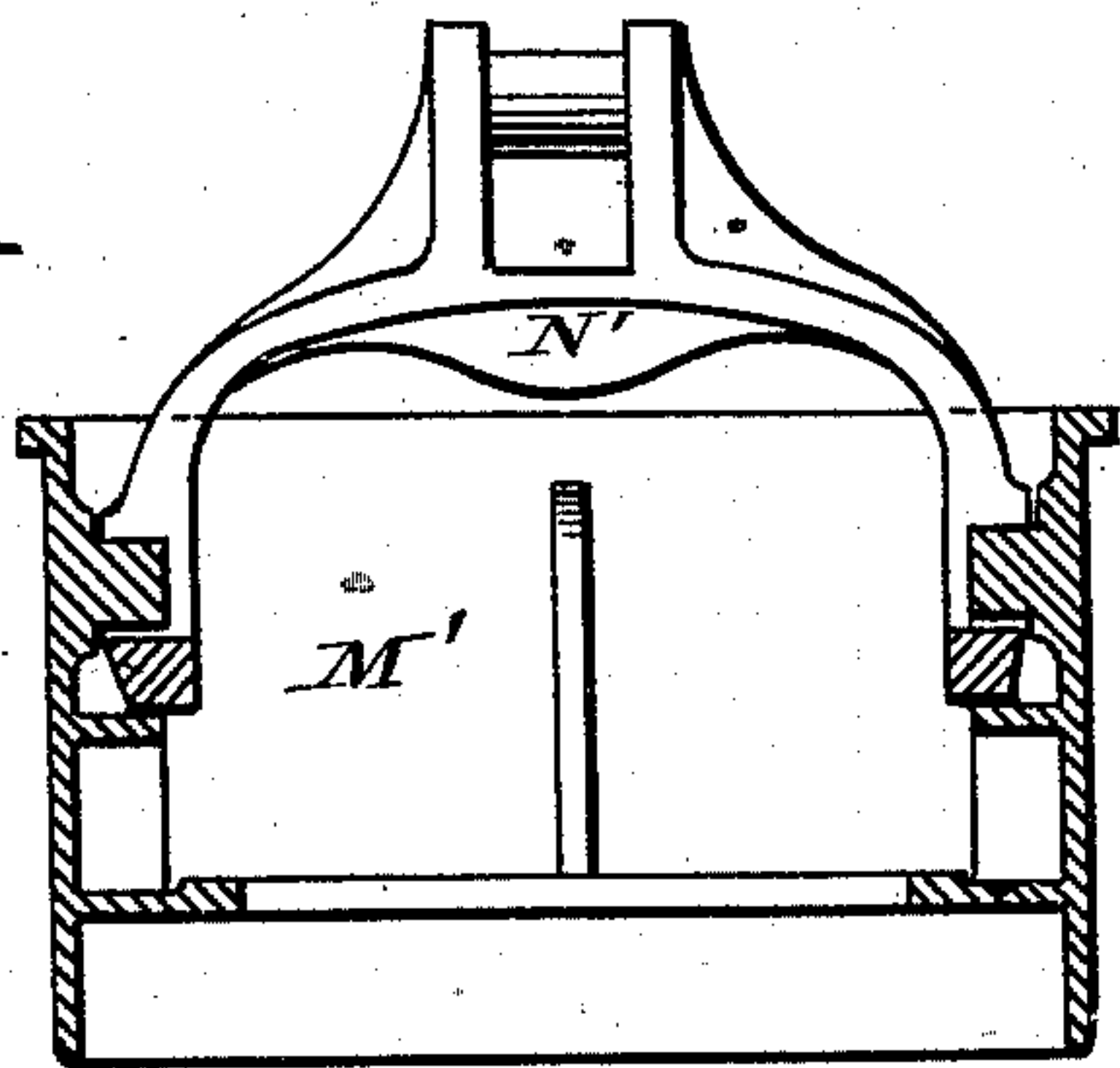


FIG. 4.

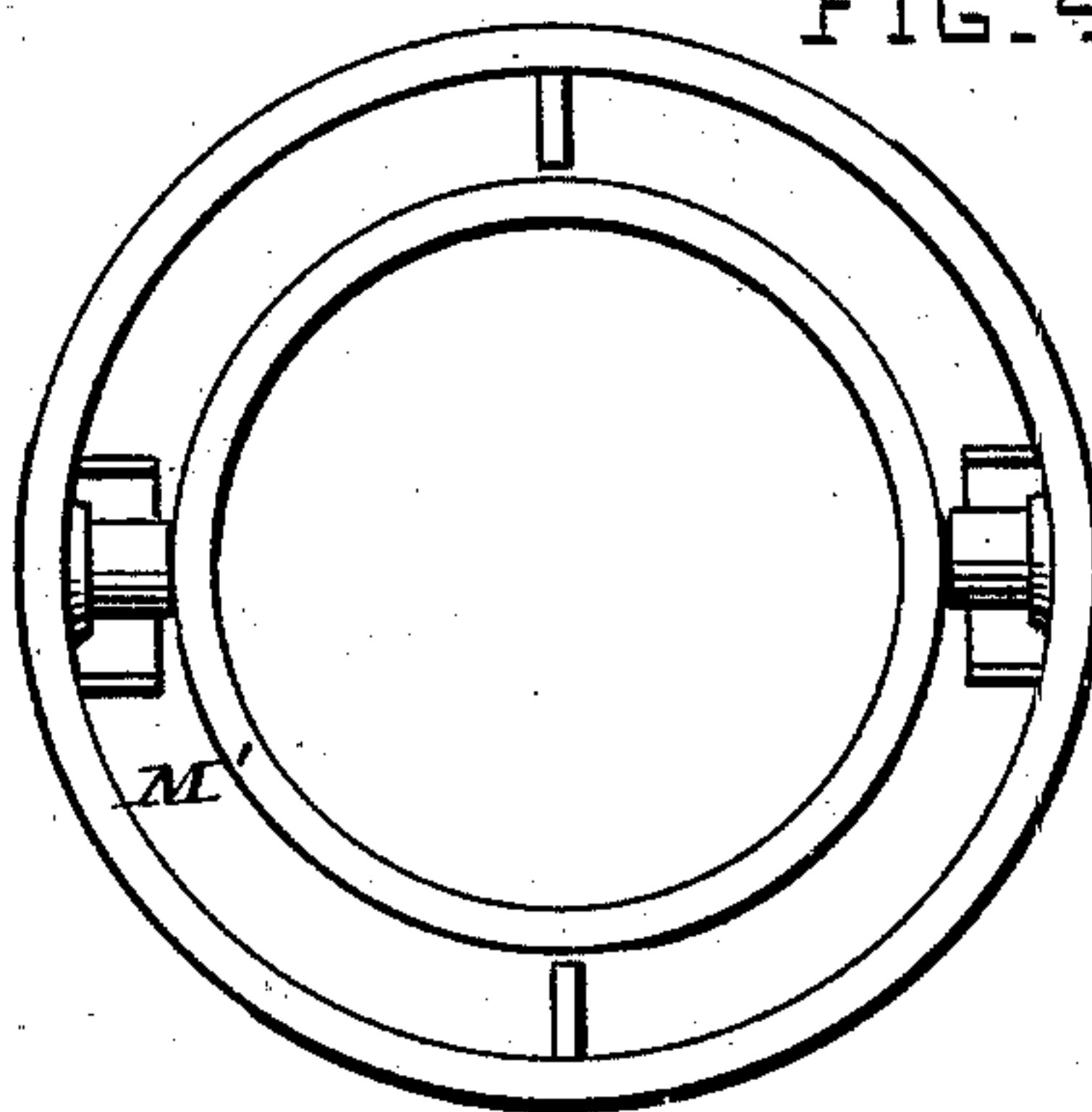


FIG. 5.

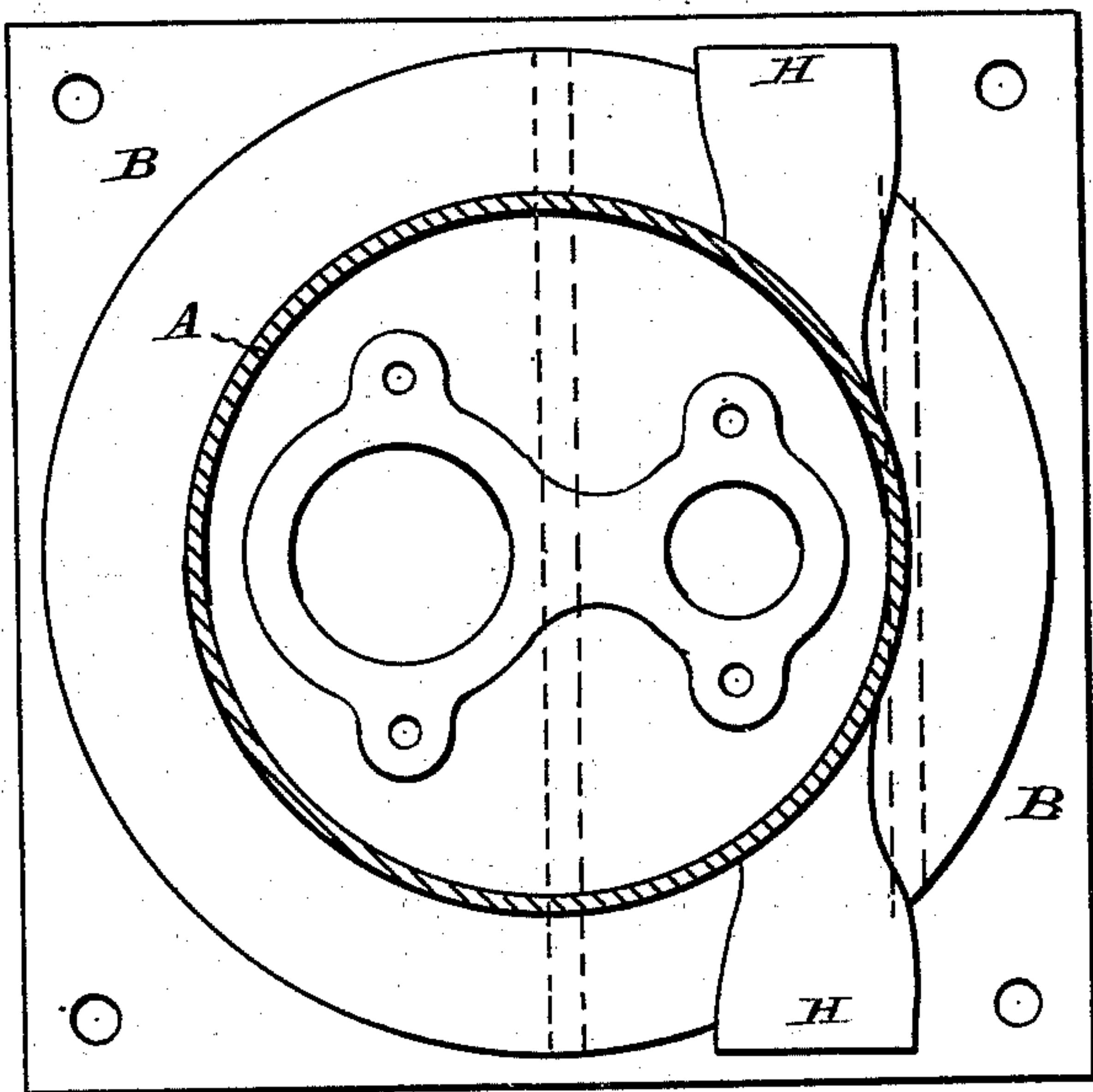


FIG. 6.

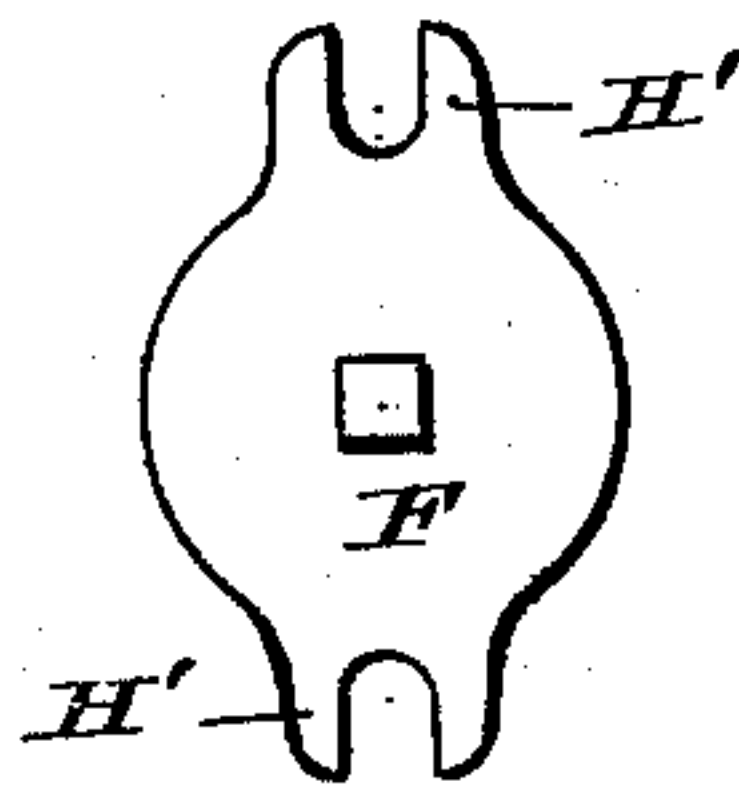
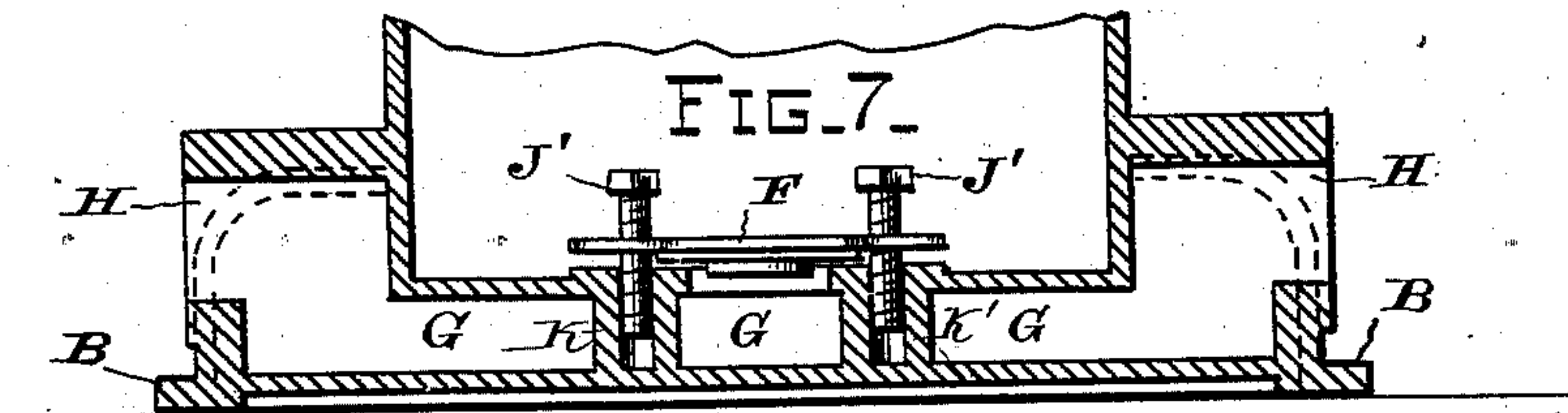


FIG. 7.



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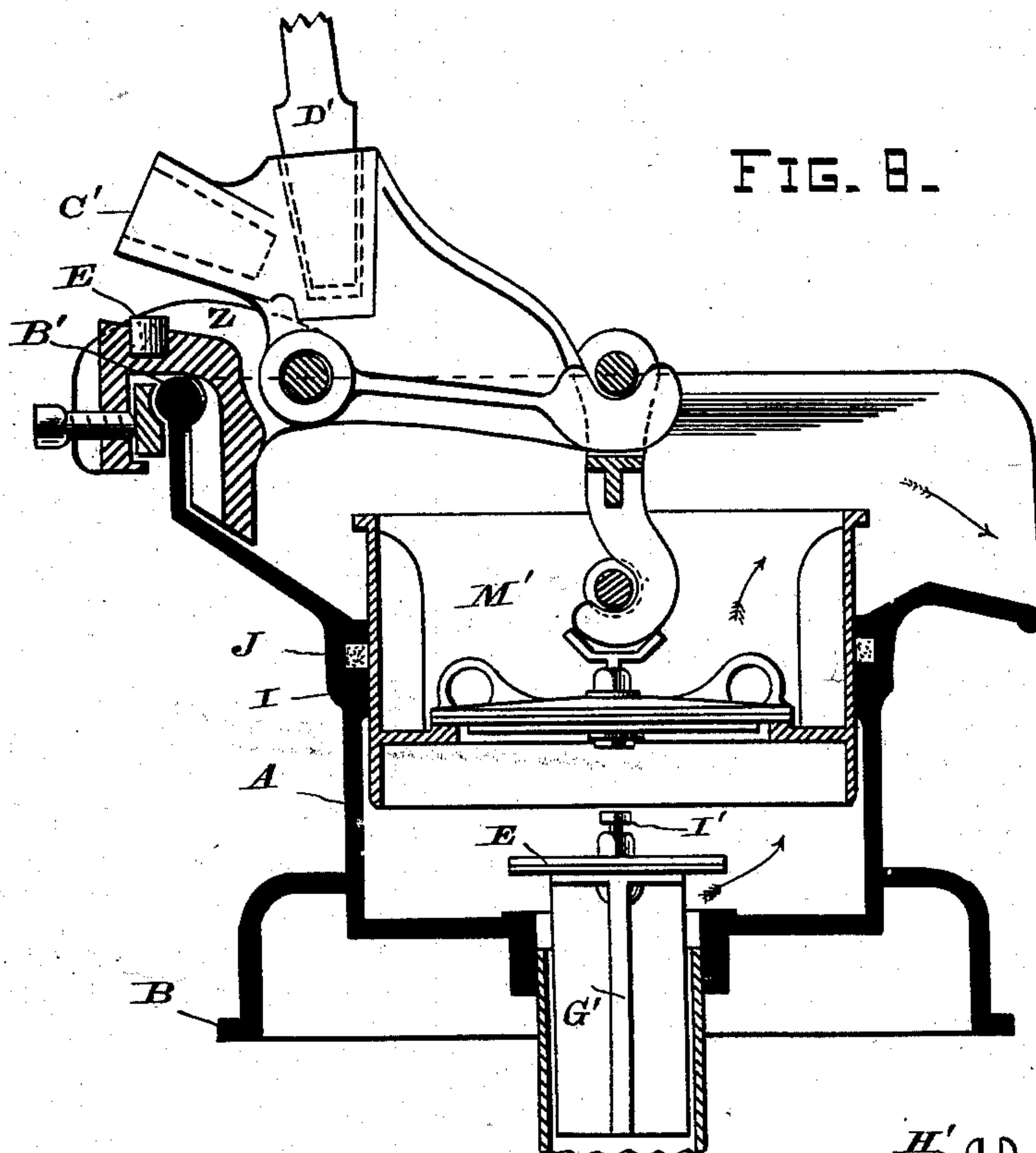


FIG. 8.

FIG. 9.

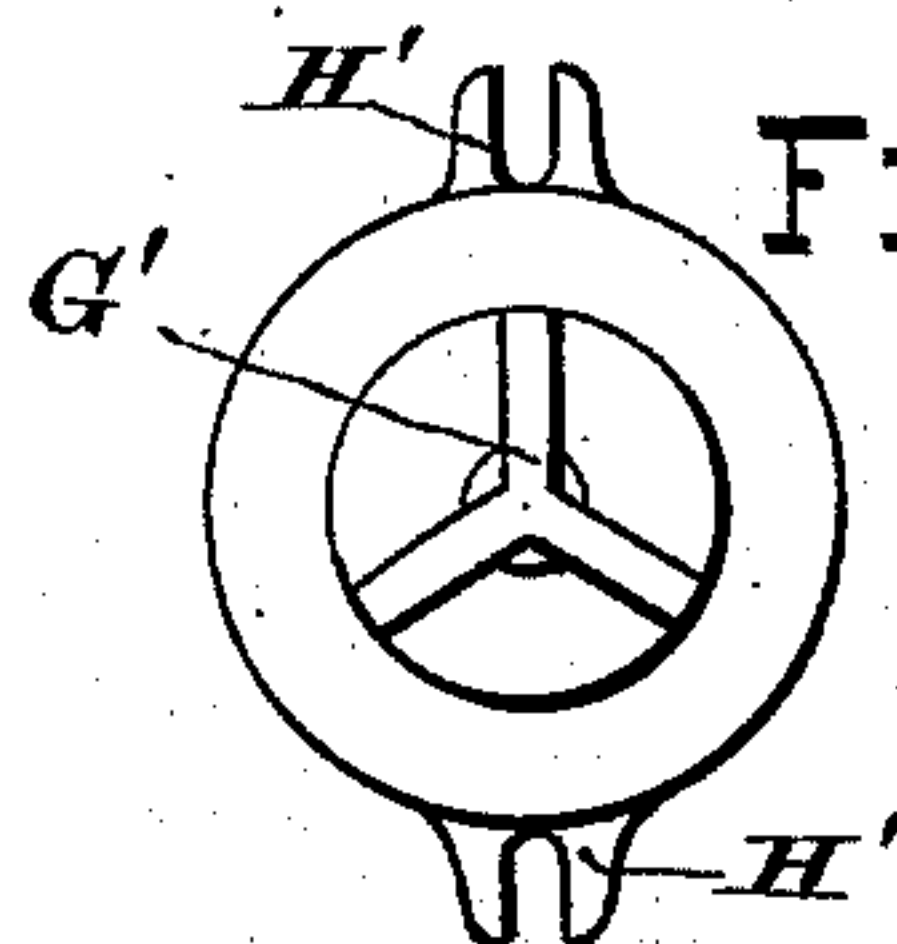
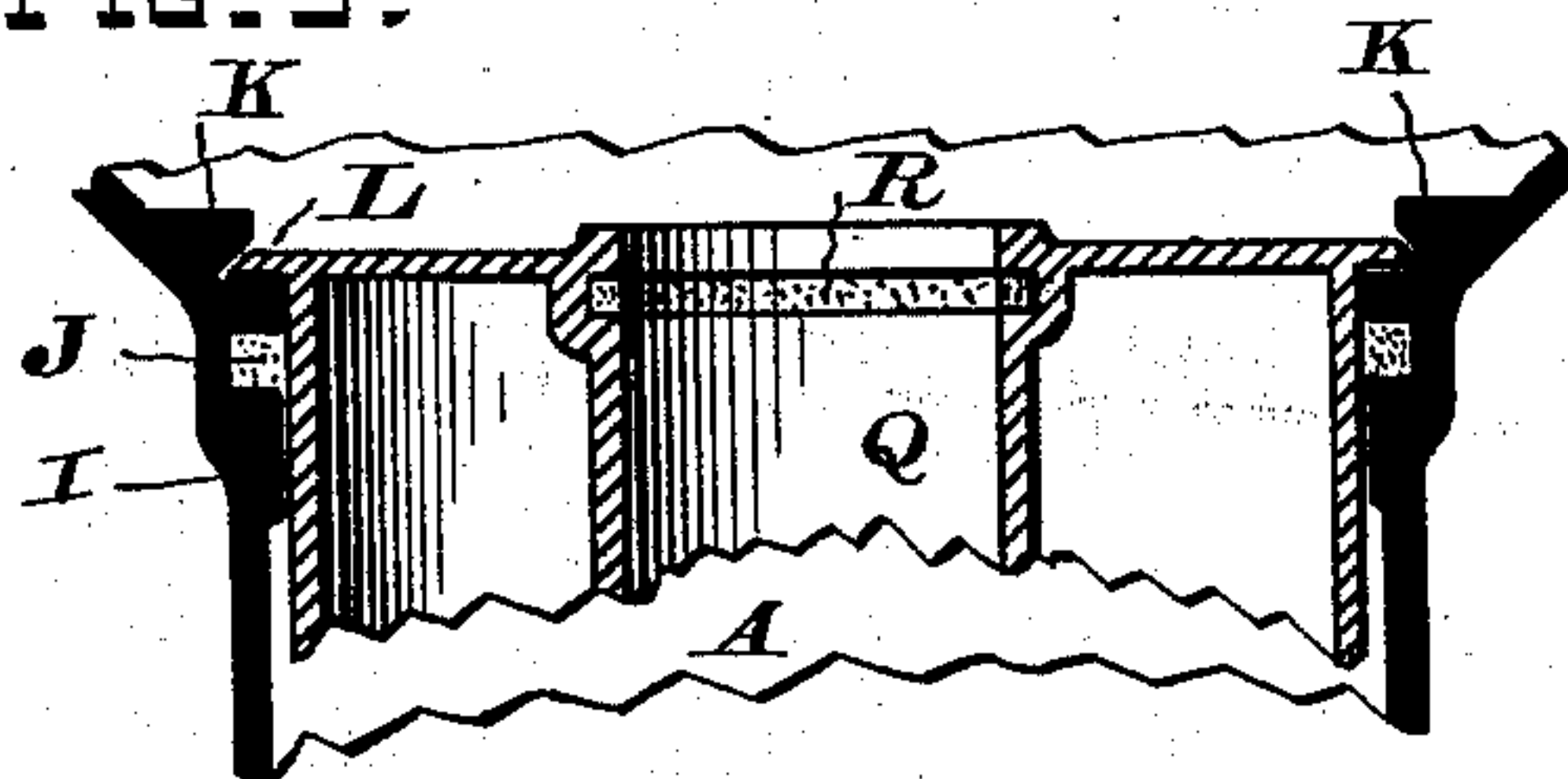


FIG. 10.

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UNITED STATES PATENT OFFICE.

HENRY C. LANGREHR, OF SAN FRANCISCO, CALIFORNIA.

COMPOUND PUMP.

SPECIFICATION forming part of Letters Patent No. 233,257, dated August 14, 1883.

Application filed February 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. LANGREHR, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Compound Pumps, of which the following is a specification.

My invention relates to improvements in compound ships' pumps, or pumps which may be altered from a lift to a force pump by the substitution of a forcing mechanism for the lifting device, and also to certain details of construction which will more fully appear hereinafter.

Figure 1 is a sectional side elevation of the complete pump, showing its self-contained removable air-chamber. Fig. 2 is a top view of the pump, the operating-lever being omitted. Fig. 3 is a vertical section through the interchangeable lifting-cylinder, and Fig. 4 is a plan view of the same. Fig. 5 is a plan view, showing the position of the lower valve-seats; and Fig. 6 is a plan view of one of the lower valves. Fig. 7 is a vertical section of Fig. 5. Fig. 8 is a sectional side elevation, showing a modification. Fig. 9 is a sectional view, showing the means for securing the air-chamber within the main casing of the pump. Fig. 10 is a bottom view of the suction-valve.

Similar letters of reference are used to designate like parts throughout the several views.

The pump-case A is cast in the form shown, and is provided at its base with a projecting square flange, B, adapted to be mortised into the deck-planks, and by matching upon two of its sides with the seams between the planks a snug fit can be had and the joints calked. Suitable bolt-holes are made in this flange for the purpose of securing the pump in place. By having the base thus countersunk into the deck a much firmer support and foundation is had for the pump than when it is set flush with the deck. The lower portion, C, of the base is provided with an opening which receives the bilge-pipe D, and is provided with a lift or suction valve, E. At one side of the bilge-opening there is formed a second opening provided with a lift-valve, F, and communicating with a chamber, G, situated below the main chamber or drum of the pump, as shown in Fig. 1, and extending from side to

side, as indicated by dotted lines in Fig. 5 and shown in Fig. 7. At either end of the chamber G there are formed openings H H, adapted for the attachment of a hose-pipe.

Near the top of the pump-drum I form a guide-bearing, I, provided with a water-tight packing, J. The upper edge of the pump-drum is provided with two lugs, K K, the office of which will be explained hereinafter. Within the pump-drum, and supported by a projecting flange, L, upon its upper edge, I place the air-chamber M. The flange L of this chamber rests upon the top edge of the pump-drum, and is made beveled, as shown in Figs. 1 and 9, and is also provided with two rabbets, N N, which are somewhat longer than the width of the lugs K K, the outer faces of which have an under-cut or bevel corresponding with the bevel of the flange L, and in practice the air-chamber is passed down within the pump-drum until its progress is arrested by its upper flange, and the lugs K K are fitted within the rabbets N N. A short turn to the right is then given the air-chamber, and the beveled portion of the rim or flange is brought under the undercut lugs K K, by which means the air-chamber is prevented from being forced upward by the pressure of water from below.

The lower face or bottom of the air-chamber is provided with a lift-valve, O, and the upper face or top is provided with a pipe, P, which extends downward to within a short distance of the bottom. The upper part of this pipe has a screw-thread formed upon it by which to attach a hose-pipe or cap, as may be required. The central part of the air-chamber is provided with a bore or opening, Q, provided near its upper end with a ring of packing, R. This opening or bore forms a passage-way for the travel of the hollow plunger S, which is cylindrical in form, and has a head or diaphragm, T, placed within it some distance from the lower end, in order that a chamber, U, may be left at the lower end, which will increase the capacity of the pump without increasing its external dimensions.

To the upper face of the diaphragm or head, T, I bolt the clevis-iron V, to which is pivoted the connecting-link W, having at its upper end the cross-bolt X, under which is hooked the outer end of the lever Y, that is pivoted to the lug Z, which is clamped by a

set-screw, A', to the head B', formed upon the upper edge of the pump-case. The upper surface or short arm of the lever Y is provided with sockets C' C', which receive the
 5 handspikes D', by which the pump is operated; and the upper portion of the lug to which this lever is pivoted is provided with a buffer or cushion, E', of rubber or leather, which prevents the short arm of the lever from
 10 coming in contact with the metal of the lug and the consequent jar to the pump.

The lift-valve O is provided with a downwardly-projecting stem playing within a bearing, F', and having a small stud at its lower
 15 end to regulate the rise of the valve. The valve E has a three-ribbed downwardly-extending guide, G', which gives weight to and balances the valve. Both this valve and the valve F are provided upon their opposite sides
 20 with prongs H' H', Figs. 6 and 10, which embrace set-bolts I' I' J' J', Figs. 1, 7, and 8, by means of which the lift of the valves can be regulated; and in order to obtain a socket for the reception of the screw-bolts of the valve
 25 F, I form two posts, K' K', which extend down through but do not bar the passage G, as is shown at Fig. 7. The under side of all these valves is to be faced with leather or rubber washers, and where the pump is used for
 30 pumping vinegar, wines, or acids the valves should be of the kind known as "ground-joint" valves.

Suitable lifting-rings, L' L', are attached to the upper face of the air-chamber, and to
 35 which a purchase may be rigged for the purpose of lifting the chamber out of the pump should it become frozen or rusted in.

The operation of the pump above described will be as follows, to wit: When it becomes
 40 necessary to pump from the bilge, the bolts J' J' are screwed down and clamp the valve F firmly upon its seat. The plunger S is now raised, when water will flow through the valve E into the suction-chamber, completely filling
 45 it. Upon the downstroke of the plunger the suction or bilge valve will close, and the water will be forced through the valveway O into the air-chamber, and from thence up the pipe P and discharged over the spout onto the deck,
 50 or conducted through a hose-pipe to any desired point. The compressed air in the upper part of the chamber will insure a steady stream at all times. Should it become necessary to take water from over the side, a hose-
 55 pipe is attached to one of the openings H of the chamber G. The valve E is clamped upon its seat and the valve F is slackened, and upon operating the plunger the action will be

the same as that last described. Should I now desire to use the pump solely as a bilge 60 or lift pump, the lower or suction valves are to be set as circumstances may require, and the air-chamber M is removed from the pump, and in lieu thereof I insert the cylinder M' and its forked connecting-link N', (shown in 65 Figs. 3, 4, and 8,) and which is identical in its construction and mode of operation to that shown and described in my application for Letters Patent for an improved ship's pump filed November 3, 1882, and to which reference 70 is made.

In the modification shown in Fig. 8 I cast the body of my pump with but one suction-opening; but either the cylinder M', last above mentioned, or the air-chamber M may be em- 75 ployed. This form of construction is particularly applicable in breweries or manufactories, or for agricultural purposes, and in all locations where the source of supply is permanent. 80

From the foregoing it will be seen that I am enabled to dispense with an auxiliary air-chamber or air-dome, thereby reducing the cost of the pumping mechanism, and at the same time to secure great compactness and so- 85 lidity of construction; and I have found from actual practice that the interchangeability of the air-chamber and the lift-cylinder is of great advantage where the same pump is used for pumping different kinds of liquids, and 90 where it is necessary to conduct or direct the flowing liquid to various points.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is— 95

1. In a compound pump, the combination, with the casing A, having lugs K K, of the air-chamber M, provided with lifting-rings L' L', and having a beveled flanged rim, L, and rabbets N, substantially as described. 100

2. In a compound pump, the combination, with the casing A, inclosing a reciprocating cylinder or plunger, of the lever Y, movable lug Z, and buffer E', substantially as described. 105

3. A compound pump having a shell or casing, A, cast in one piece, and provided internally with an annular guide-bearing, I, and water-tight packing J, substantially as described. 110

In testimony that I claim the foregoing I have hereunto set my hand and seal.

HENRY C. LANGREHR. [L. S.]

Witnesses:

WILMER BRADFORD,
 CHAS. E. KELLY.