

P. A. MYERS.

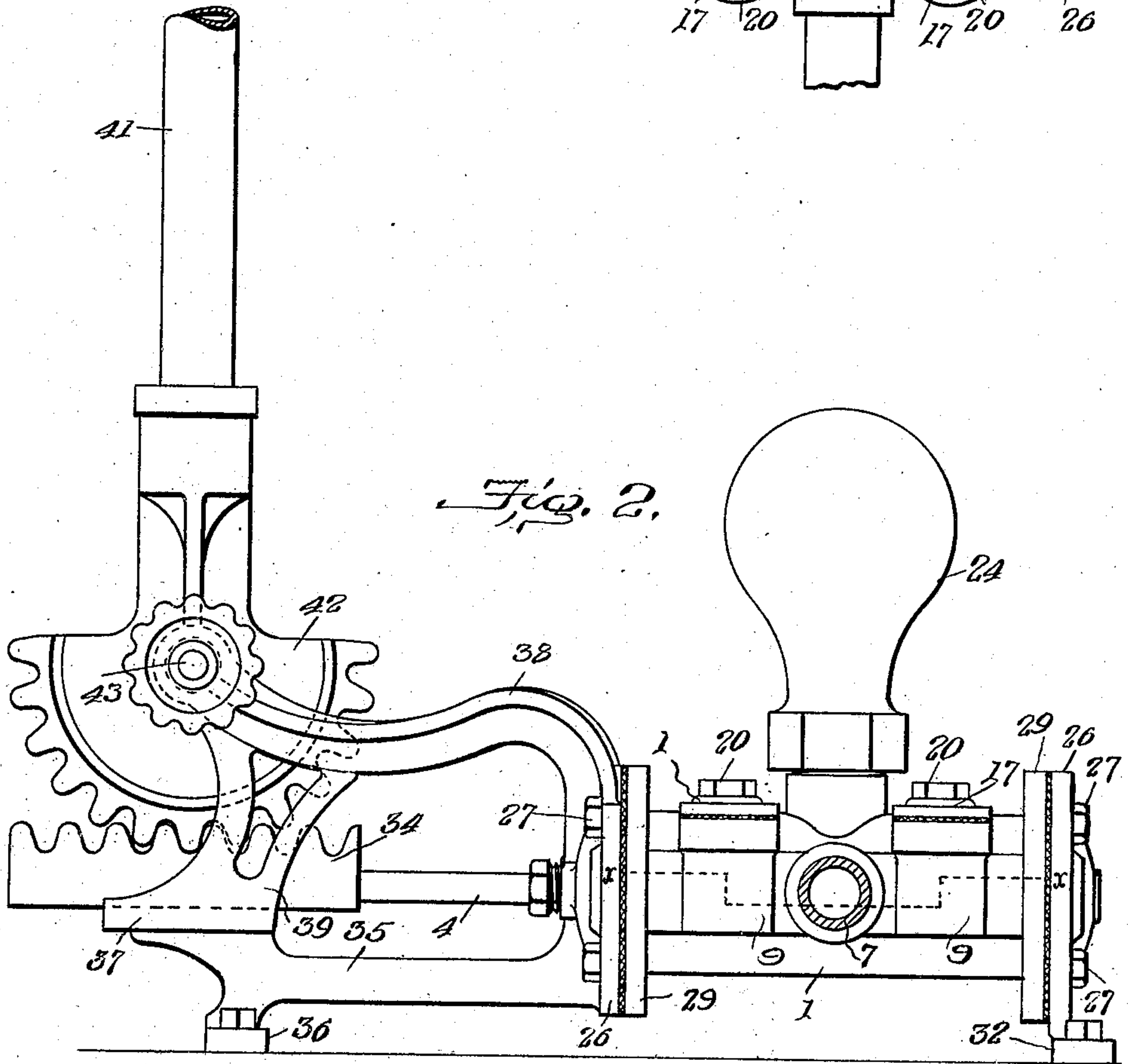
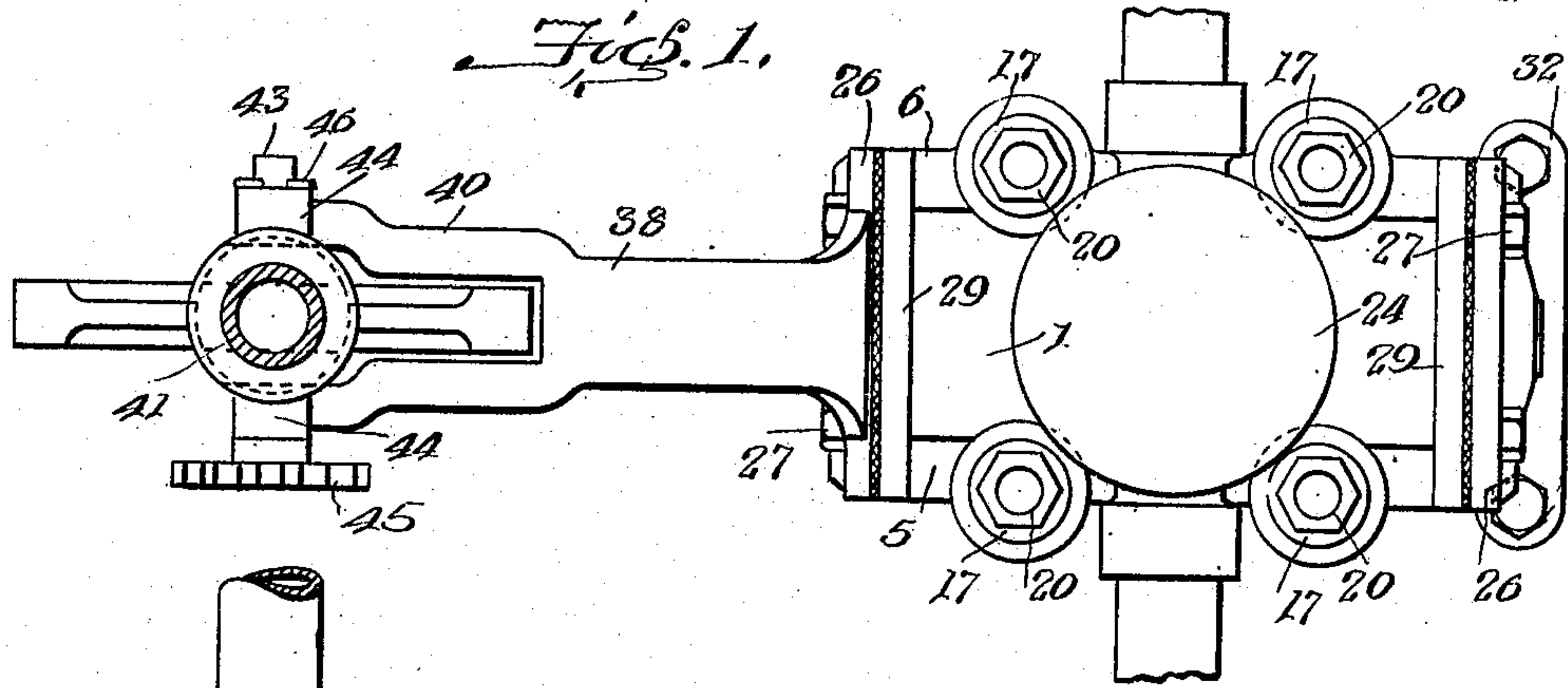
PUMP.

APPLICATION FILED DEC. 31, 1906.

915,994.

Patented Mar. 23, 1909.

3 SHEETS—SHEET 1.



Inventor  
*Philip A. Myers,*

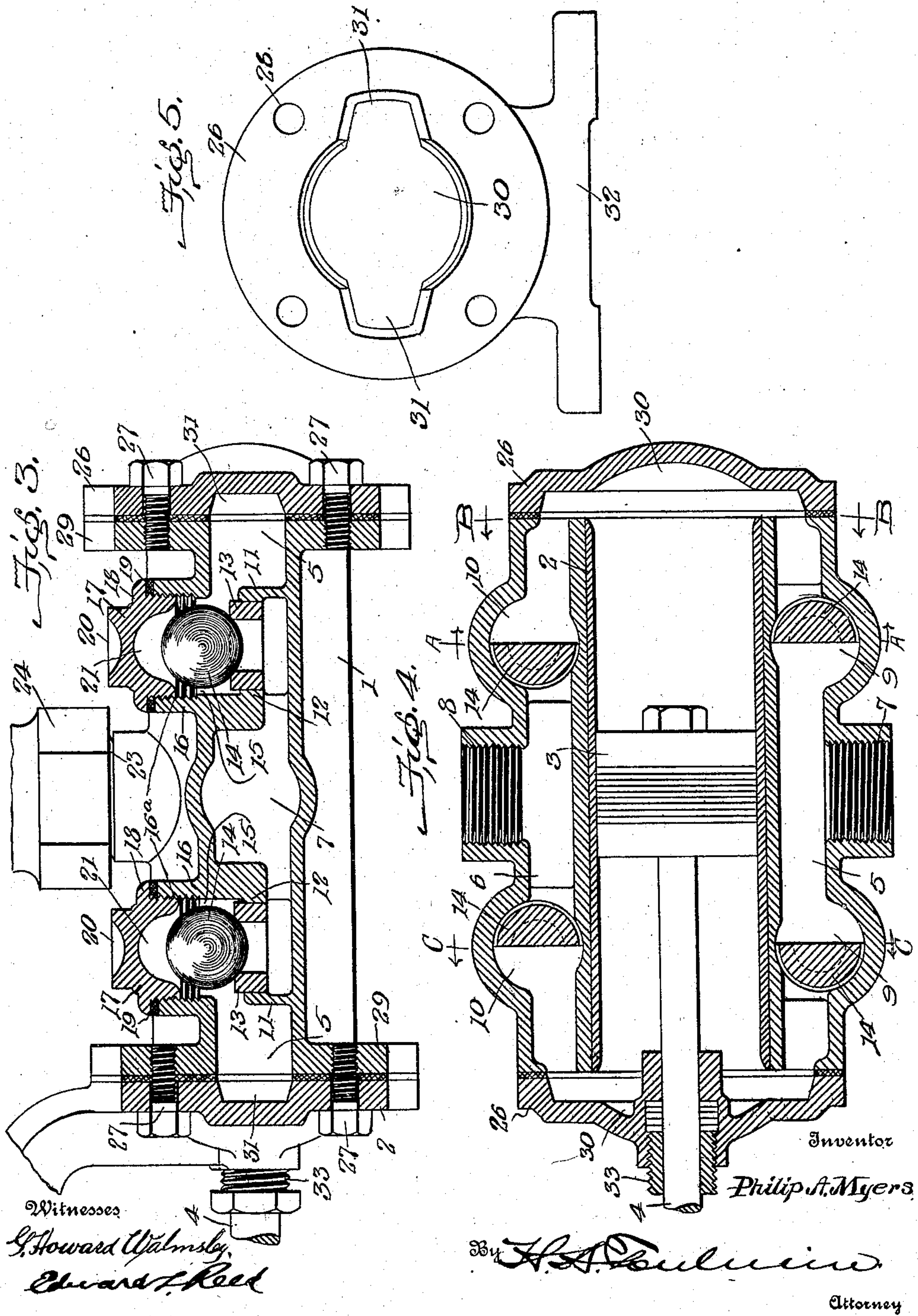
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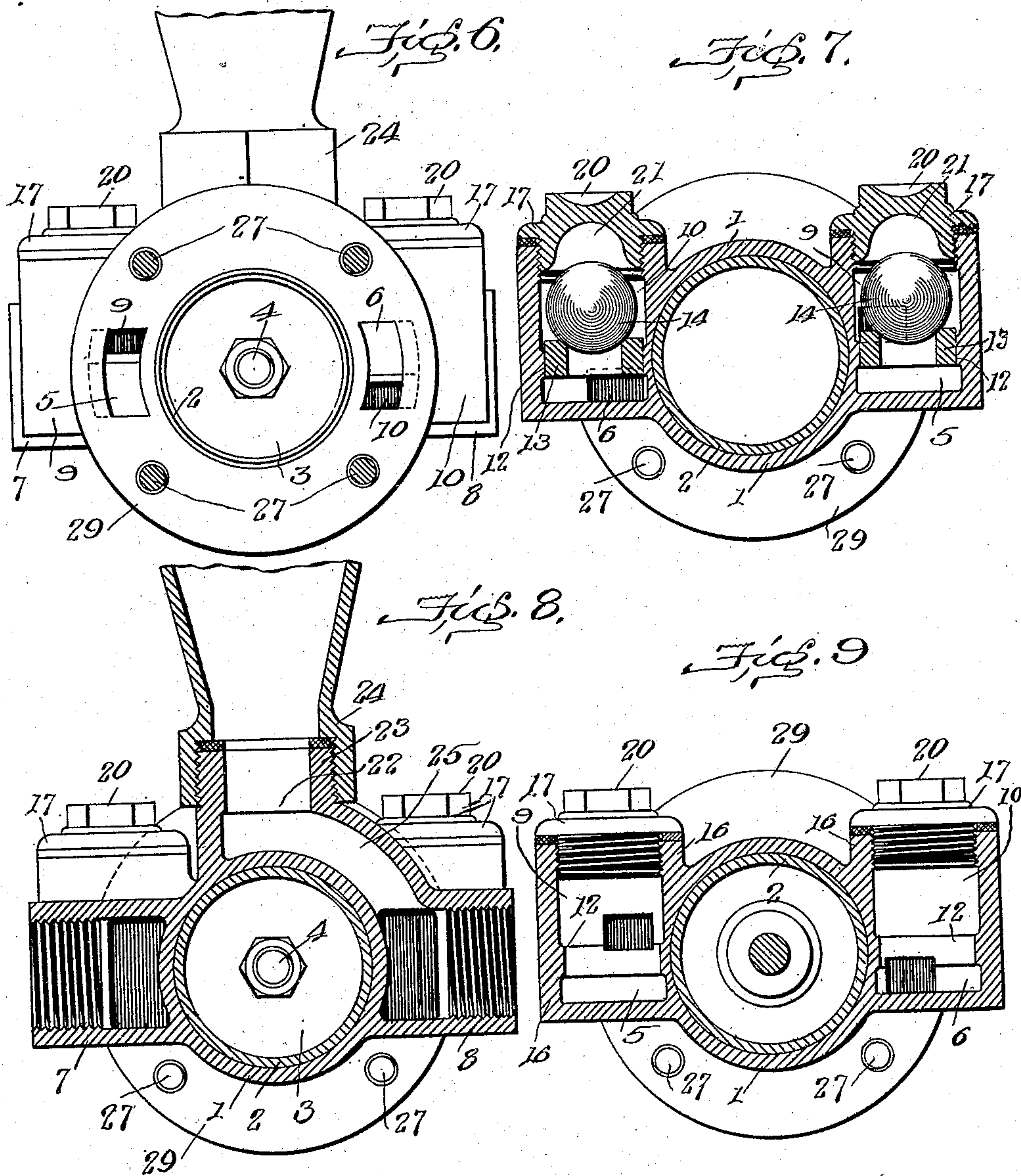




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# UNITED STATES PATENT OFFICE.

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## PUMP.

No. 915,994.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed December 31, 1906. Serial No. 350,223.

*To all whom it may concern:*

Be it known that I, PHILIP A. MYERS, a citizen of the United States, residing at Ashland, in the county of Ashland and State of Ohio, have invented certain new and useful Improvements in Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to pumps, and more particularly to that class of force pumps known as the horizontal pump.

The object of the invention is to provide such a pump in which the valves will be so arranged that each valve will be readily accessible independently of the other valves and without interfering with or removing any part of the pump or its casing; further, to so arrange the valves and the inlet and discharge passages leading to and from the same as to permit the working cylinder to be so extended that its ends will be flush with the ends of the casing, thereby greatly facilitating the insertion of the piston.

A further object of the invention is to so construct such a pump that it can be provided with a single support adapted to carry one end of the cylinder and casing, to form a guide and support for the piston rod and to support the handle in operative relation to the piston rod.

With these objects in view the present invention consists in certain novel features of construction to be hereinafter described, and then more fully pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a pump embodying my invention; Fig. 2 is a side elevation of the same; Fig. 3 is a longitudinal section taken through the inlet passage; Fig. 4 is a horizontal section taken on the line *x x* of Fig. 2; Fig. 5 is a detail view of one of the caps for closing the end of the casing; Fig. 6 is a transverse sectional view, taken on the line *B B* of Fig. 4 and looking in the direction of the arrows; Fig. 7 is a transverse sectional view, taken on the line *A A* of Fig. 4 and looking in the direction of the arrows; Fig. 8 is a transverse sectional view taken through the inlet and outlet passages; and Fig. 9 is a transverse sectional view, taken on the line *C C* of Fig. 4 and looking in the direction of the arrows.

In these drawings the reference numeral 1 indicates the outer cylinder or casing of a pump embodying my invention in its pre-

ferred form. This casing is provided with an inner lining or working cylinder 2, which extends throughout the length of the casing and has its ends flush with the ends of the casing and preferably flared outwardly, as shown in Fig. 4, and is provided with a suitable piston 3 mounted to reciprocate therein and having a piston rod 4 adapted to be actuated as hereinafter described. The casing 1 is provided with suitable inlet and outlet passages 5 and 6 adapted to connect the cylinder with the supply and discharge pipes by means of suitable ports 7 and 8. These ports are preferably located midway between the opposite ends of the passage, and the passage is provided between the ports and the ends thereof with suitable valves 9 and 10 for controlling the flow of the fluid to and from the cylinder. These valves are preferably formed by providing the passages with partitions 11 each having a horizontally extending portion 12 adapted to support a valve seat 13 which supports a suitable ball valve 14.

The casing 1 is provided with an aperture 15 in vertical alinement with the valve seat 13, which aperture is preferably provided with an upwardly extending flange or boss 16 surrounding the same and having an internal screw thread 16<sup>a</sup>, adapted to receive the screw-threaded plug 17 which closes the end thereof and has a flange 18 extending over the edge of the boss 16 and adapted to retain a suitable packing 19. The plug or cap 17 is further provided on its outer face with a wrench grasp 20 to enable the same to be readily removed. In order to avoid an unnecessarily long boss 16, the plug 17 is preferably provided with a recess 21 within the same, adapted to receive the ball valve 14 and forming a valve chamber between the plug 17 and the horizontal portion 12 of the partition 11. In the inlet passage the partition 11 is so arranged that the space beneath the horizontal portion 12 has its open side toward the inlet port, while the space above the horizontal portion 12 opens toward the end of the passage, whereby the pressure of the incoming fluid will raise the valve 14 from its seat and permit the fluid to flow through the passage 5 and into the cylinder, as hereinafter described. In the outlet passage, the arrangement of the partitions is just the reverse of that of the inlet passage, the space beneath the horizontal portion 12



of the partition 11 opening toward the end of the passage 6 which connects with the cylinder, and the space above the partition opening toward the outlet port 8, whereby the pressure of the fluid from the cylinder raises the valve and allows the fluid to escape through the port 8. The casing 1 is further provided on its upper surface, and preferably immediately above the inlet and outlet ports 7 and 8, with an aperture 22 provided with a screw-threaded boss 23 which is adapted to receive the lower end of an air chamber 24. The aperture 22 is connected with the outlet passage 6 by a suitable conduit 25 extending around the outside of the casing 1 and, preferably, formed integral therewith.

The casing 1 is provided at either end with a suitable closure which is preferably in the form of a cap 26, adapted to be secured to the casing by means of suitable bolts 27 extending through apertures 28 formed in the cap and engaging screw threaded apertures in a flange 29 formed on the adjacent end of the casing. Each cap is provided with a recess or chamber 30 registering with the corresponding end of the cylinder 2 and having laterally extending recesses 31 adapted to register with the corresponding ends of the inlet and outlet passages 5 and 6, respectively, and forming conduits to connect the same with the recess 30 of the cap and thereby with the cylinder 2. One of the caps 26 is provided with a downwardly extending or foot portion 32, adapted to engage the floor or other supporting surface and support the corresponding end of the casing. The cap at the opposite end of the casing is provided with a centrally arranged stuffing box 33 forming a bearing for the piston rod 4, which is preferably provided at its outer end with a rack 34. This cap is also provided with a bracket, which is preferably cast integral therewith and comprises a lower member 35 extending rearwardly from the cap and provided at its outer end with a downwardly extending foot portion 36, adapted to engage the floor or other surface, and with an upwardly extending portion 37 forming a support and guideway for the rack 34 of the piston rod 4. The bracket further comprises an upper member 38 which extends in substantially the same vertical plane with the lower member 35 and is preferably connected thereto at its outer end by means of braces 39. The member 38 has its outer end bifurcated, as shown at 40, and is adapted to support the operating handle 41 between the arms of said bifurcated portion. This handle is preferably provided with a toothed segment 42, adapted to mesh with the toothed rack 34 of the piston rod. This segment 42 is supported in its operative relation with the rack 34 by means of a pin 43 extending through the same and engaging the bearings

44 of the arms of the bifurcated portion 40 of the bracket. This pin is preferably provided with a milled head or a hand wheel 45 at one end to facilitate its insertion and removal and is adapted to be removably secured in position in any suitable manner, that shown being the usual cotter pin 46. By removing the pin 43 and adjusting the segment 42 relatively to the rack 34, the handle 41 can be so adjusted as to occupy either a vertical or a horizontal position relatively to the pump when in operative relation thereto. This arrangement of the bracket and the supporting foot 36 enables the single supporting foot 36 to carry the adjacent end of the casing, to provide a support and guideway for the piston rod 4, whereby the same is retained at all times in perfect alinement with the piston, and to support the handle 41 in operative relation to the rack 34 of the piston rod.

From the foregoing description and the accompanying drawings it will be apparent that I have provided a double action pump in which the valves are all readily accessible from the outside of the casing, each valve being accessible independently of all the other valves and without interfering with or removing any part of the pump or its casing, as distinguished from the usual form of pump in which it is necessary either to remove the entire upper part of the casing and expose all the valves in order to gain access to one of them, or in which at least a part of the valves are accessible only by removing some part of the casing, such as the cap or cylinder head, and gaining access to the desired valve through the interior of the casing, which not only requires at least partial dismantling of the pump, but places the valve in an awkward and inconvenient position and renders it difficult to inspect or repair the same. Further, it will be apparent that the arrangement of the valves and the inlet and outlet passages extending the entire length of the casing and communicating with the cylinder through the passages in the caps for the casing, enable me to extend the working cylinder the entire length of the casing, the ends of the cylinder being flush with the ends of the casing and having their ends flared outwardly, thereby greatly facilitating the insertion of the piston. In the ordinary pump of this character, the arrangement of the valves and their ports is such as to necessitate the arrangement of the working cylinder with its ends some distance from the ends of the casing, and the cylinder thus terminating, forms a projection from the walls of the casing, and, as the piston usually expands when removed from the cylinder, it is an exceedingly difficult matter to so compress the expanded piston as to insert the same in the cylinder when the end of the same is removed from the end of the casing. In my construc-



tion, the ends of the cylinder being flush with the ends of the casing, it is a very simple matter to so compress the piston as to allow it to enter the cylinder. It will further be  
 5 observed that the arrangement of the parts of the pump has enabled me to provide the same with an improved support for the operating mechanism, whereby the adjacent end of the casing, the operating handle and the  
 10 piston rod are all supported by a single supporting member which further provides a suitable guide for the piston rod to retain the same in constant alinement with the piston, instead of employing the ordinary construc-  
 15 tion in which the casing is directly supported by a suitable foot or support and the piston is connected to the operating handle by links, the movement of which tends to throw the end of the piston rod out of alinement, there-  
 20 by greatly increasing the wear on the parts and rendering the operation of the pump much more difficult. This supporting mechanism further enables me to so adjust the operating handle that the same can be oper-  
 25 ated from a vertical position when the pump is on the floor or can be operated from a horizontal position when the pump is carried by an elevated support.

I wish it to be understood that I do not  
 30 desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described my invention,  
 35 what I claim as new and desire to secure by Letters Patent, is:—

1. A pump of the character described comprising a casing, a cylinder within said casing, a piston adapted to reciprocate in said  
 40 cylinder, a piston rod for actuating the same, inlet and outlet passages arranged on opposite sides of said cylinder and connected therewith on both sides of said piston, each of said passages having valve chambers near  
 45 the opposite ends thereof, horizontal valve seats mounted in said chamber in substantially the same horizontal plane with said piston rod, an independently detachable closure for the upper end of each of said valve  
 50 chambers, and a valve member in each of said valve chambers adapted to engage the valve seats therein and removable through the upper end of said valve chamber.

2. A pump of the character described comprising a casing, a cylinder in said casing, a  
 55 piston adapted to reciprocate in said cylinder, a piston rod for actuating said piston, inlet and outlet passages arranged on opposite

sides of said cylinder and connected therewith on both sides of said piston, each of said  
 60 passages having valve chambers near the opposite ends thereof, horizontal valve seats mounted in said chambers in substantially the same horizontal plane with said piston rod, a closure adapted to be inserted in the  
 65 upper end of each of said valve chambers and having a recess in the inner face thereof, and a valve in each of said valve chambers adapted to enter the recess in said closure.

3. A pump of the character described comprising a casing, a cylinder within said cas-  
 70 ing, a piston adapted to reciprocate in said cylinder, a piston rod for actuating the same, passages on the opposite sides of and extending parallel with said cylinder and hav-  
 75 ing their ends coincident with the ends of said casing, an inlet opening intermediate the ends of one of said passages, an outlet opening intermediate the ends of the other  
 80 passage, valve chambers in each of said passages intermediate the opening therein and the ends of said passage, said valve chambers extending to the top of said casing, a  
 85 valve seat in each of said chambers arranged in substantially the same horizontal plane as said piston rod, independently detachable closures for the upper ends of said valve  
 chambers, closures for the ends of said cyl-  
 90 inders having conduits for connecting the ends of said passages with the corresponding end of said cylinder, and removable valves in said valve chambers for controlling said pas-  
 sages.

4. In a pump of the character described, the combination, with a cylinder, a piston  
 95 adapted to reciprocate therein and having a piston rod, of a rack carried by said piston rod, inlet and outlet passages on the opposite sides of said cylinder and connected thereto, valves arranged in substantially the  
 100 same horizontal plane with said piston rod for controlling said passages, and detachable closures for the ends of said cylinder, of a bracket carried by one of said closures and comprising a member having a guideway for  
 105 said rack, a second member, a handle mounted thereon, a toothed segment carried by said handle adapted to mesh with said rack, and a support for the outer end of said  
 110 bracket.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP A. MYERS.

Witnesses:

F. B. KELLOGG,  
 PERCY McDOWELL.