

(No Model.)

J. W. POWERS.  
PUMP.

No. 287,053.

Patented Oct. 23, 1883.

Fig. 1.

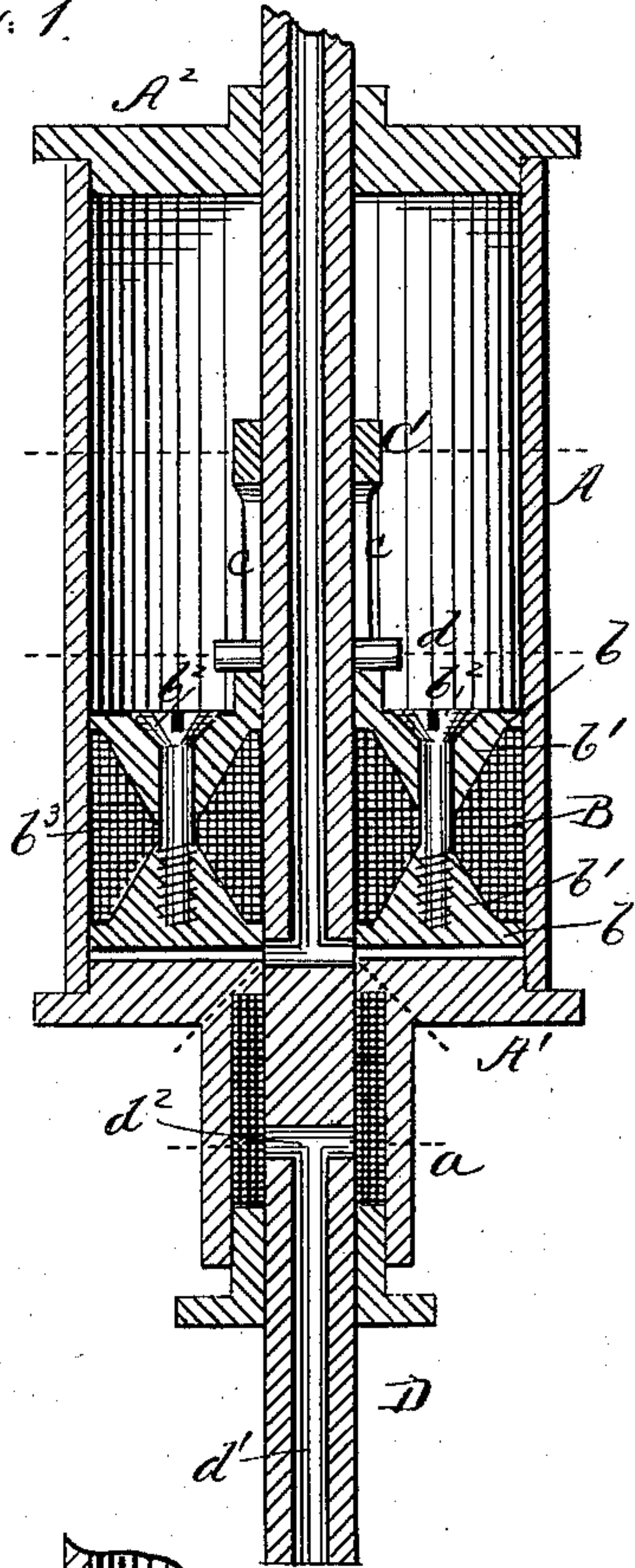


Fig. 2.

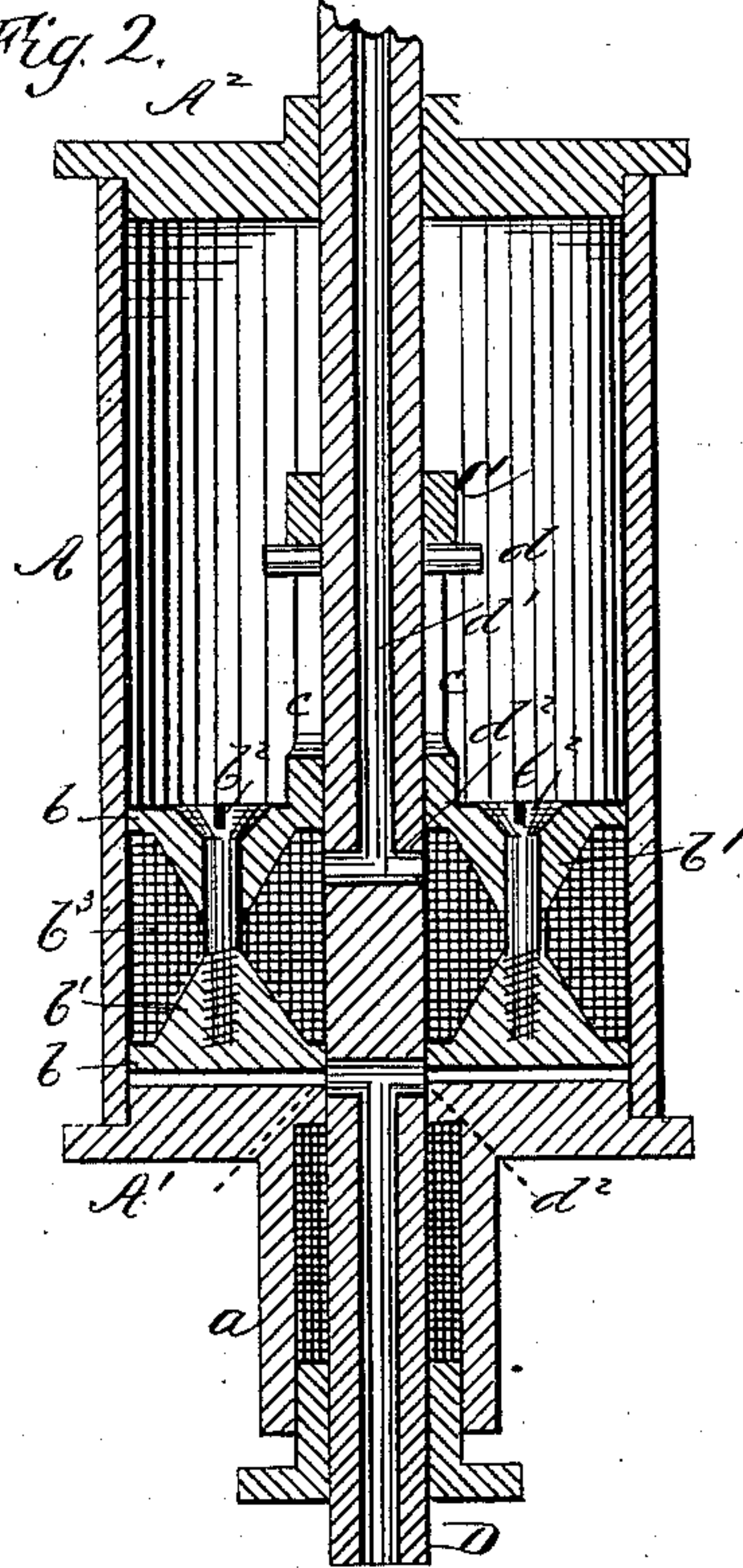


Fig. 3.

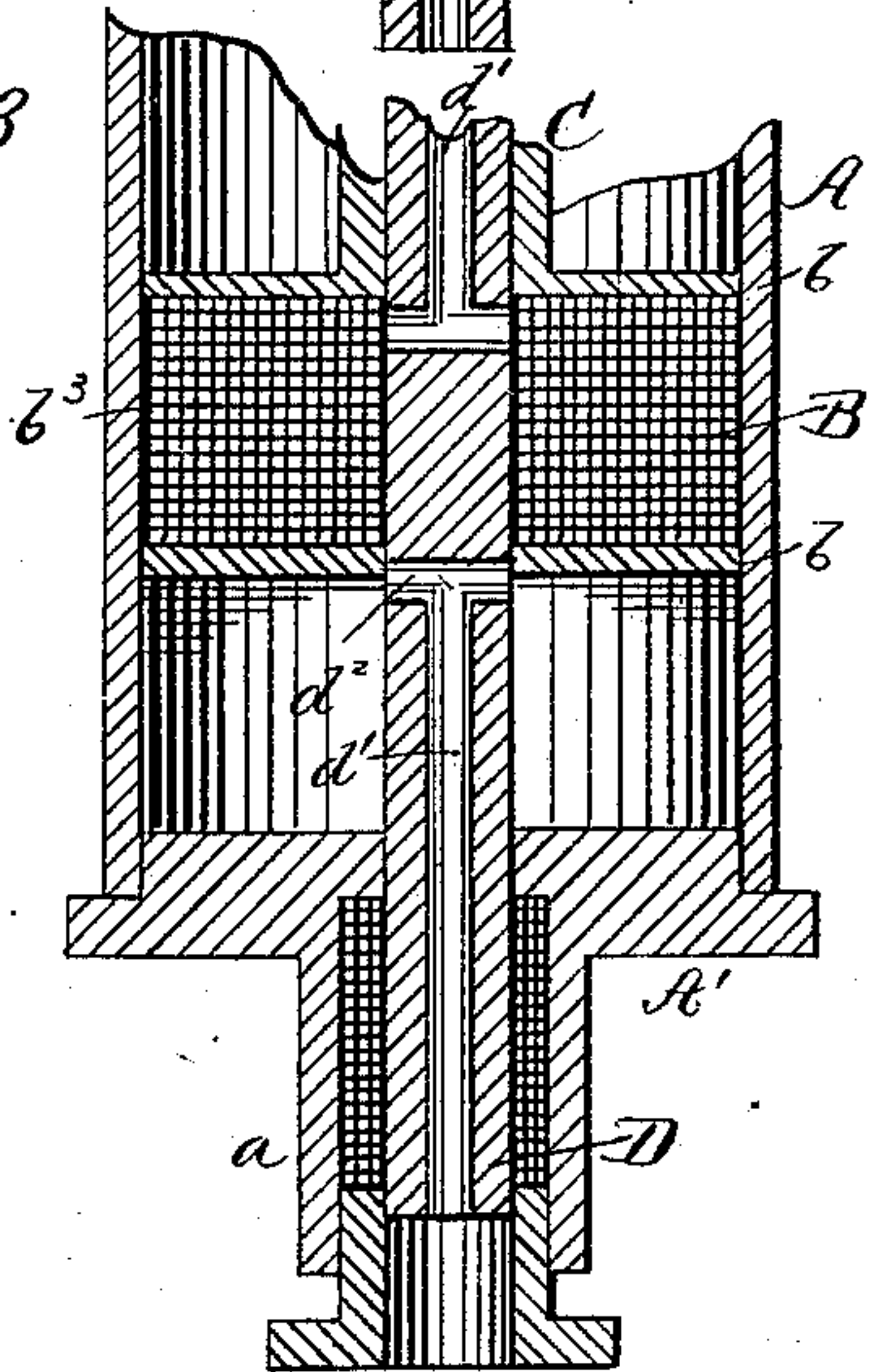
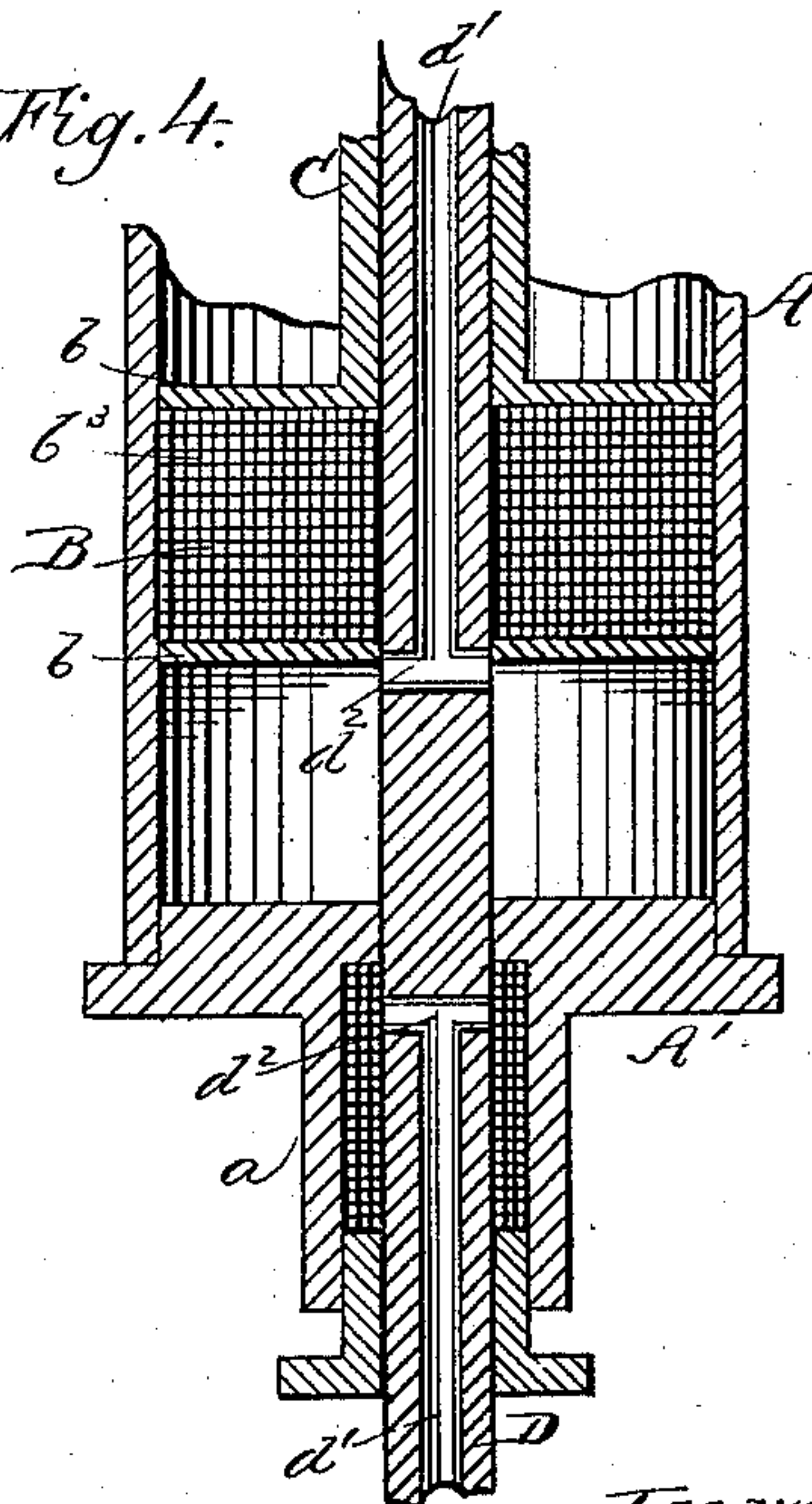


Fig. 4.



Witnesses:

A. H. Armer  
H. C. McArthur

Inventor:

J. W. Powers



# UNITED STATES PATENT OFFICE.

JAY W. POWERS, OF WINNETKA, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
MORRIS J. MOTH, OF SAME PLACE.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 287,053, dated October 23, 1883.

Application filed December 22, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAY W. POWERS, a citizen of the United States of America, residing at Winnetka, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to pumps, either oil, water, or air; and it consists of a cylinder provided with a piston-head and a piston-rod having a short stroke in either direction without imparting motion to the head, whereby ports opening into passages leading to either end of the piston-rod are alternately placed in communication with the pump-chamber, and closed by the piston-head or stuffing-box, substantially as will be hereinafter more fully described.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a central vertical section of a pump-cylinder, showing the piston-head and hollow rod at the lowest point of their stroke. Fig. 2 is a similar view, showing the rod at the center of its upward stroke, but the head in the same position. Fig. 3 shows both rod and head at the upper point of their stroke, and Fig. 4 shows the rod at the middle of its downward stroke, but the piston still at rest.

A represents a cylinder, of suitable size, fitted with a head,  $A'$ , in one end, having a stuffing-box,  $a$ , and having its opposite end provided with a head or spider-ring,  $A^2$ , which may be either solid or open, as it merely serves as a guide for the piston-head.

B is the piston-head, which may be of any suitable form, but which I prefer to construct, as shown, of two circular plates,  $b b$ , provided on their opposing faces with annular V-shaped rings  $b'$ , through which are passed a series of screws,  $b^2$ , to secure the plates firmly together and admit of their being adjusted to or from each other. The space between the plates  $b b$  is filled with a suitable packing substance,  $b^3$ , and it is evident that as the two plates are drawn together by the screws the packing will be distended and the piston-head well packed.

The upper plate,  $b$ , is provided with a sleeve, C, formed with a slot,  $c$ , on each side, and the piston-rod D passes through this sleeve, the head B, and stuffing-box  $a$  at one end, and through the head or ring  $A^2$  at the other, and is adapted to slide freely through them all, thus giving it a short stroke independent of the movement of the piston-head, this stroke being the length of the slots  $c c$  in the sleeve C, the piston being provided with pins or projections  $d d$ , working in these slots, as will be seen by reference to the drawings. The piston-rod D is bored out from each end toward its center, to form passages  $d'$ , which do not meet, but communicate with the outer side of the rod by ports  $d^2$ . The distance between the inner ends of these passages is left solid, and corresponds to the length of the slots  $c c$ .

The operation of the pump is as follows: The piston head and rod being in their lowest position, as seen in Fig. 1, the upper passage,  $d'$ , is in communication with the pump-cylinder, and the lower one or suction passage is closed by the stuffing-box  $a$ . The rod now rises the length of the slots  $c c$  without moving the piston, and the upper passage,  $d'$ , is closed by the head B, while the lower one registers with the cylinder, as seen in Fig. 2. As the rod continues to rise the pins  $d$  lift the piston-head, and the liquid or air is drawn into the cylinder through the lower passage in the rod, as seen by Fig. 3. The piston-rod now having reached the upper end of its stroke, the motion is reversed, the rod falls through the head until the lower passage,  $d'$ , is closed and the upper one registers with the cylinder, as seen by Fig. 4, and as the head is forced down the water, air, or oil is forced out through the exit-passage  $d'$  until the parts again assume the position shown by Fig. 1, when the motion is reversed and the operation repeated. It is obvious that this pump will work equally well in pumping water, oil, or air, and that any mechanism may be used to operate it that will impart the requisite reciprocating motion to the piston, and I have not deemed it necessary to show any devices for this purpose. It will also be understood that the position of the cylinder, either horizontal or vertical, will have no effect on the operation of the device, and



also that by a duplication of the parts described a double-acting pump may be made that will admit and expel the air from both sides of the piston as well as the one just described.

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

10 1. In a pump, the combination, with a pump-cylinder and its piston-head, of a piston-rod formed with inlet and outlet passages communicating with its opposite ends and adapted to be shifted a short distance in either direction without moving the piston-head, substantially as shown and described.

15 2. In a pump, a piston-head having a suitable packed opening through its center for the passage of the piston-rod, in combination with a piston-rod provided with inlet and outlet passages leading to its opposite ends, and adapted to be moved in either direction a sufficient distance to close one and open the other of these passages independent of the motion of the piston-head, substantially as described and shown.

25 3. In a pump, a piston-head formed of two plates having annular V-shaped rings upon their contiguous faces, said plates being secured together by screws and packed with any suitable material, and an opening through the center for the passage of the piston-rod, where-  
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by when the two plates are drawn together by the screws the packing is distended and tightly packs both the piston-rod and piston-head, substantially as shown and described.

4. In a pump, the combination of the piston-head B, composed of the plates *b b*, secured together by screws *b<sup>2</sup>*, and provided with the sleeve C, having slots *c*, of the piston-rod D, provided with passages *d' d'*, leading from near its center to either end, and pins *d d*, 40 working in the slots in the sleeve, whereby the rod has a slight motion independent of the head to cover and uncover the cored passages, substantially as described and shown.

5. In a pump, the cylinder A, having head A' and stuffing-box *a*, in combination with the piston-head B, having sleeve C, provided with slots *c c*, and piston-rod D, having inlet and outlet passages *d' d'*, communicating with its opposite ends, and pins or projections *d d*, 50 working in the slotted sleeve, all constructed and arranged to operate substantially as and for the purpose set forth and described.

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

JAY W. POWERS.

Witnesses:

HARRY HARRISON,  
FRANK JOHNSON.