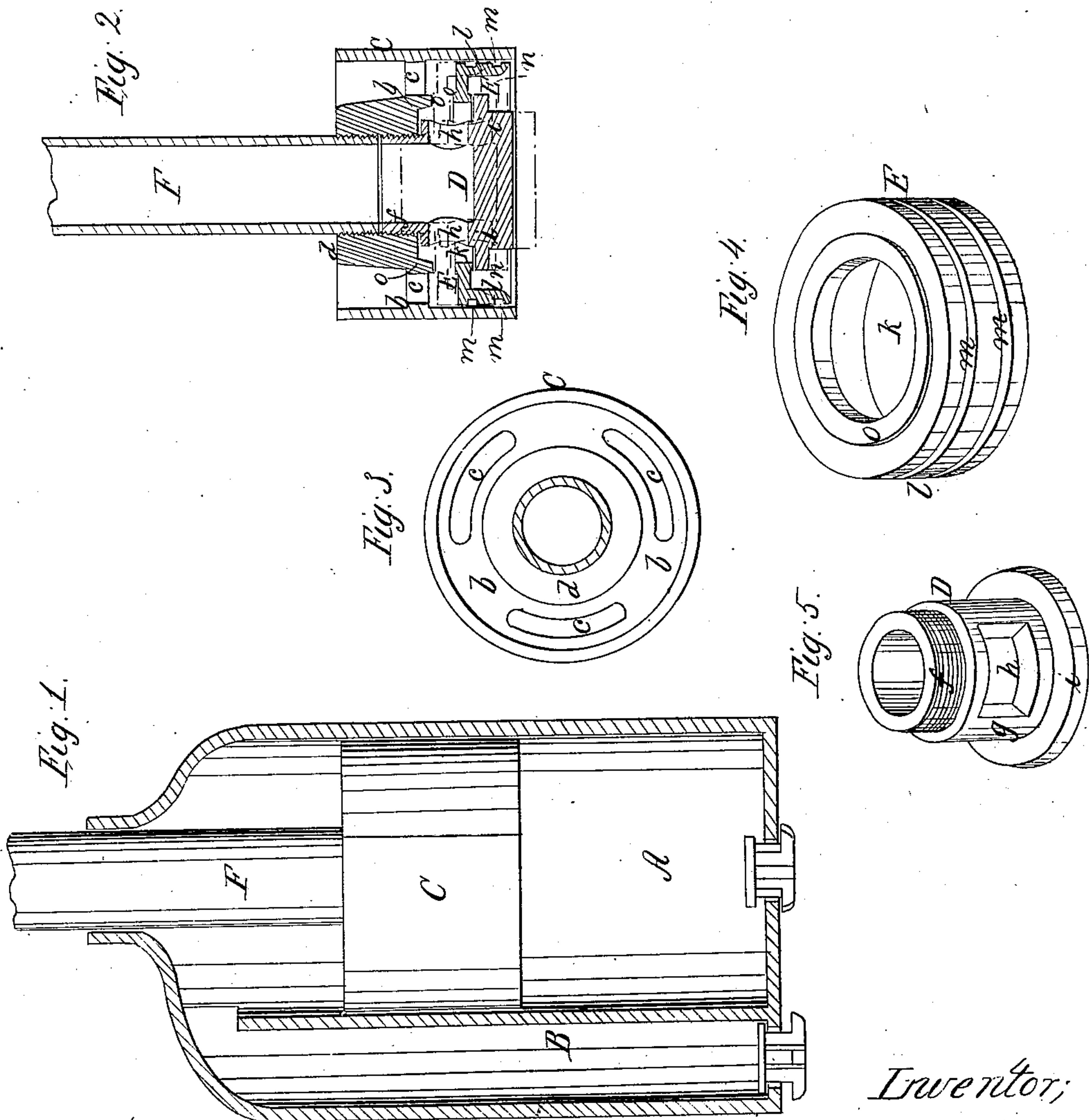


J. Michel,

Pump Piston.

N^o 53,467.

Patented Mar. 27, 1866.



Witnesses;
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UNITED STATES PATENT OFFICE.

JACOB MICHEL, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 53,467, dated March 27, 1866.

To all whom it may concern:

Be it known that I, JACOB MICHEL, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a central vertical section of a double-acting pump provided with my improvement; Fig. 2, a central vertical section of the piston; Fig. 3, a plan of the piston; Fig. 4, a perspective view of the valve detached; Fig. 5, a similar view of the screw valve-seat detached.

Like letters of reference indicate corresponding parts in all the figures.

My improvement belongs to the class of double-acting pumps where a hollow piston-rod is employed; and the invention consists in the special construction and arrangement of the piston.

As represented in the drawings, A is an ordinary double-acting pump-cylinder, having the usual side passage, B, and C is the piston, operated by a hollow rod, F.

The rim of the piston is cast in a single piece, with a central horizontal partition, *b*, through which are made ports *c c c*, to admit water in the upstroke, and with a bearing, *d*, having a female screw to receive the end of the piston-rod and the screw valve-seat D. The rod screws in from the top and the valve-seat from the bottom, as clearly shown in Fig. 2.

The valve-seat is substantially of the form shown in Fig. 5, having a screw, *f*, to connect with the bearing *d* of the piston, the body *g*, through which are made ports *h h*, on opposite sides, and a closed head or bottom, *i*, which forms the valve-seat proper.

In the space within the rim of the piston, and between the head *i* and partition *b*, is situated a simple ring-valve, E, having a central opening, *k*, and a right-angled flange, *l*, with water-packing grooves *m m* cut in the face, which fits closely to the rim. The ring is made of sufficient width to cover the ports *c c c*, and also the port *n* around the valve-seat, so as to shut off the ingress of water in either direction when in proper position.

The bottom of the bearing *d* and the top of the valve are provided each with a projecting

rim, *o*, of small size, which strike together to prevent the valve from striking its whole surface closely against the partition *b*, in which case the two parts might not be easily separated.

The action is apparent. At each stroke of the piston the valve alternately rises and falls in the space between the seat *i* and the partition *b*, and alternately opens and closes the ports *c c* and *n*, and thus admits the water alternately over and under the valve into the ports *h h* of the valve-seat, whence it is elevated through the hollow piston-rod to the top of the well.

I am aware that pistons have been before used in which the valve is made to operate by moving up and down within the piston, and alternately opening and closing the ports; but I claim only the special construction here presented. In one device the rim of the piston is made in two parts, that are bolted together vertically, with the valve working between them. In this case the nuts wear loose and release the bolts, or the bolts and nuts oxidize, and the valve does not move easily over the bolts. In my device I obviate all difficulties of this kind by making the rim of the piston in a single piece and dispensing with bolts and nuts. Therefore the parts cannot become loose, and the valve has always a free play.

The employment of the single-screw valve-seat D in the place of bolts enables me to secure the valve in place or remove it by simply turning or unturning the same at one operation, which, being of large size, is easily accomplished; and, in addition to this, an important effect is accomplished that has never been accomplished in any other device so far as I am aware, viz: I can adjust the valve-seat D higher or lower at pleasure, as indicated by the red lines, Fig. 2, so as to give a greater or less vertical play to the valve, as may be necessary or desirable. It is thus adapted to the different conditions in which it is employed—for instance, in places where much sediment or foreign matter is to be raised with the water a larger water-passage around the valve may be required, owing to the tortuous passage through, than when the water is clear and pure, and in the latter case it will be desirable to give the valve as little play as possible. In case of throwing a stream with considerable force it will also be desirable to have a

larger passage around the valve than where it is simply desired to raise it gently to the top of the well.

The employment of the flange *l* of the valve furnishes an extended bearing against the rim of the piston where it works, and by having the water-packing grooves *m m* it is made much tighter than a simple ring-valve without a flange such as is used in other devices of this nature.

In addition to the advantages above set forth, the parts composing the entire piston are more easily fitted and finished than in similar devices. The under side of the partition *b* is faced up at one operation, while the valve-seat and valve are easily fitted in a lathe.

I am aware that a valve has before been made to play vertically within a piston, so as

to cover and uncover, alternately, the ports, and therefore I do not claim such, broadly.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination and arrangement of the valve-seat *D*, made to adjust lower or higher, to give greater or less play to the valve, the valve *E*, provided with the flange *l* and water-packing grooves *m m*, and the piston-rim *C*, made in a single piece, the whole operating substantially as and for the purposes herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JACOB MICHEL.

Witnesses:

R. F. OSGOOD,
Z. L. DAVIS.