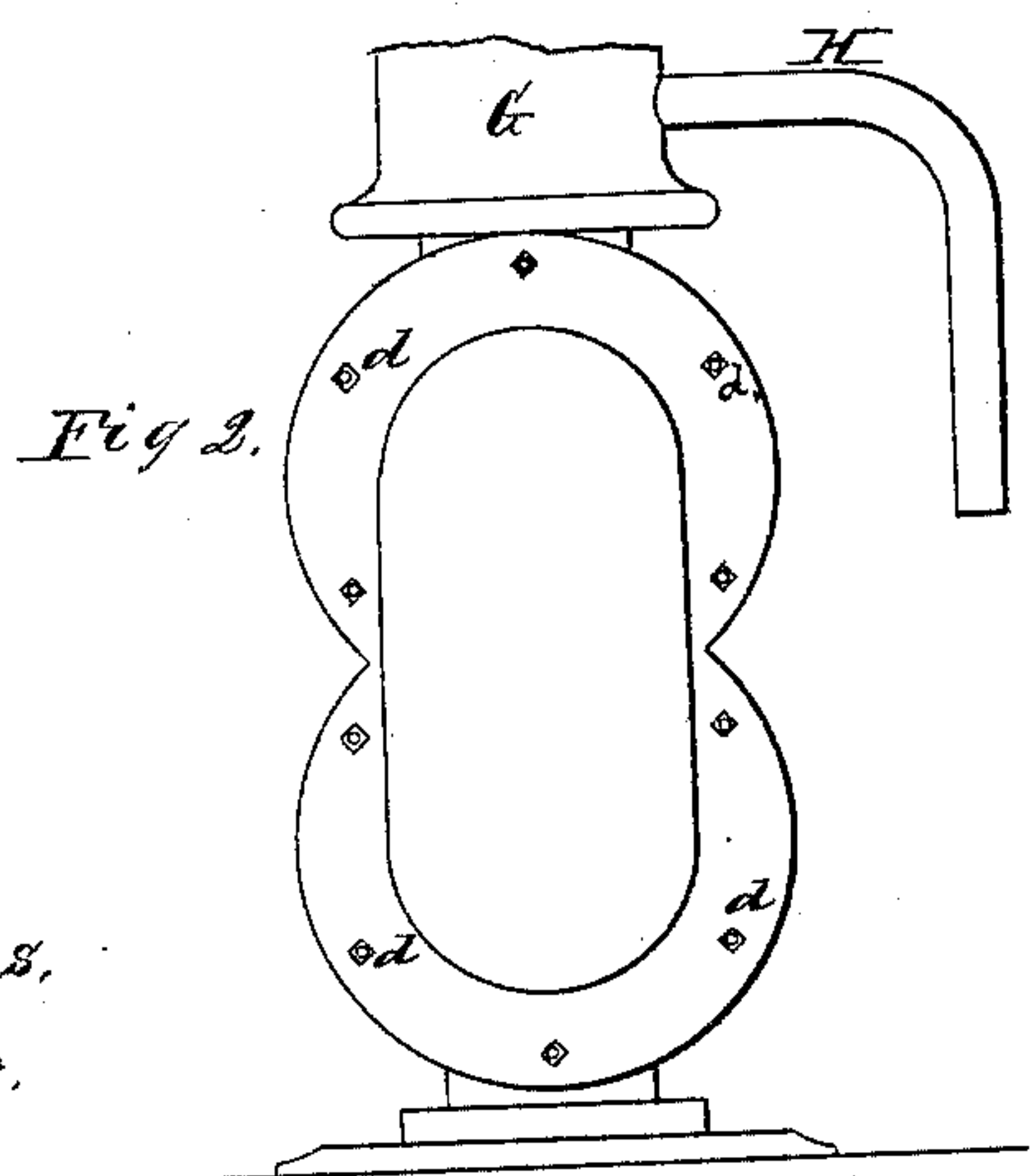
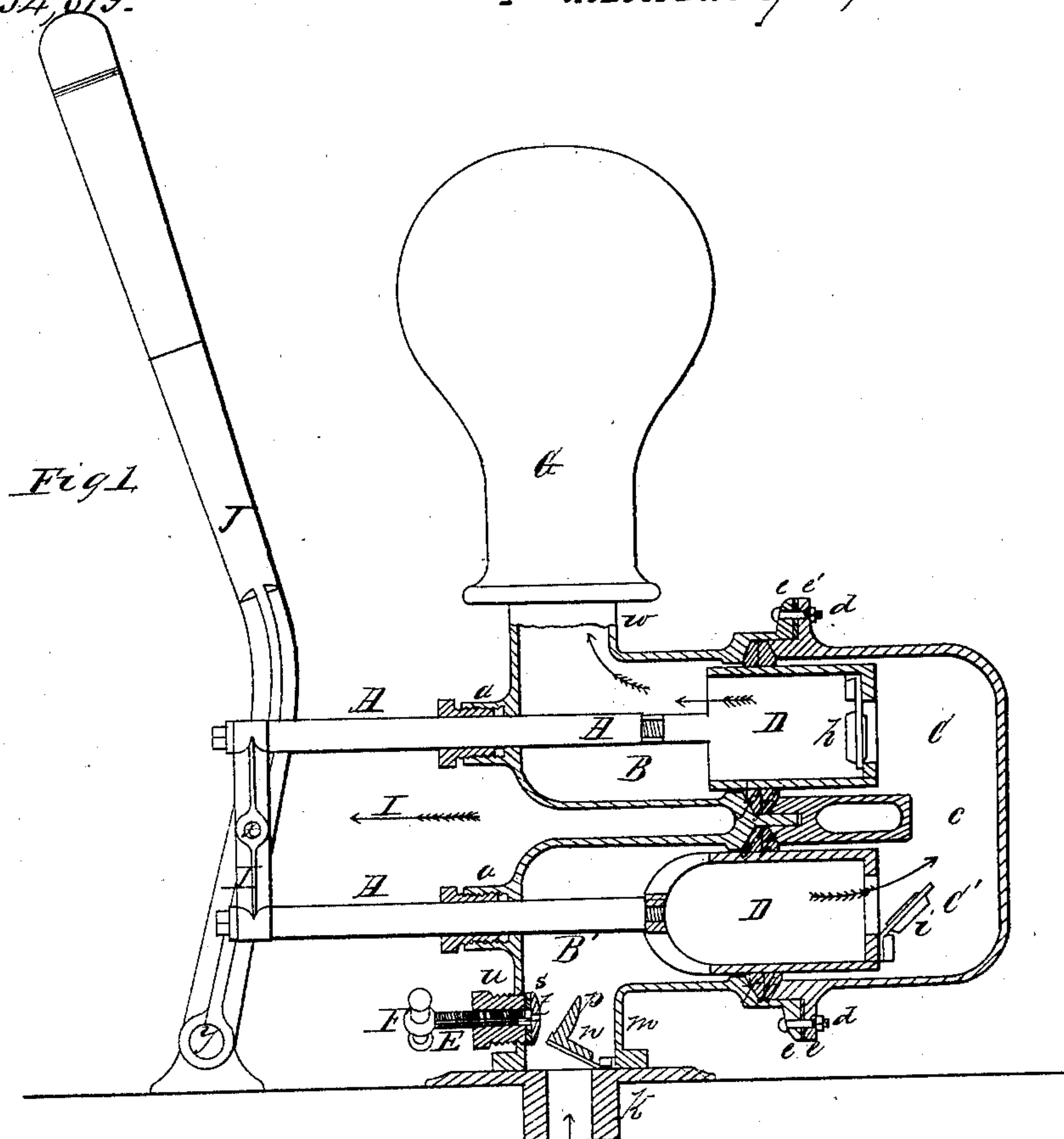


*G. H. Dodge,*  
*Double-Acting Pump.*

*N<sup>o</sup> 34,819.*

*Patented April, 1862.*



*Witnesses,*  
*Charles E. Fisher,*  
*L. Howson*

*Inventor,*  
*G. H. Dodge.*  
*per Henry Howson*  
*Atty*

# UNITED STATES PATENT OFFICE.

GEORGE H. DODGE, OF CAMDEN, NEW JERSEY.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 34,819, dated April 1, 1862.

*To all whom it may concern:*

Be it known that I, GEORGE H. DODGE, of Camden, Camden county, State of New Jersey, have invented certain new and useful Improvements in Double-Acting Pumps; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the peculiar construction, arrangement, and operation of parts which compose my improvements in double-acting pumps, and which are fully described hereinafter, the objects of the said improvements being the attainment of simplicity and cheapness as regards construction, a ready means of packing the plungers, and of drawing off the water from the pump after it has been used, and thus preventing the accumulation of ice in the barrels during the winter months.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional view, and Fig. 2 a view of the rear end, of my improved double-acting pump.

A and A' are the two piston-rods of the pump, the former passing through a stuffing-box *a*, attached to the upper barrel of the pump, and the piston-rod A' passing through the stuffing-box *a'*, attached to the lower barrel of the pump. The front portions of these two barrels consist of the hollow cylinders B and B', which are cast in one piece, the rear portion of the two barrels consisting of the two hollow cylinders C and C', which are also cast in one piece, and which communicate with each other through a passage *c*, the hollow cylinder B being a continuation of the hollow cylinder C and the cylinder B' a continuation of the cylinder C'. The two castings which thus form the front and rear ends of the two barrels of the pump are secured to each other by bolts *d d*, which pass through the flanges *e* and *e'* of the two castings, between which are the packing-pieces *f f*, of leather or any other appropriate material,

these packing-pieces forming the stuffing-boxes for the upper plunger D and lower plunger D'. Both of these plungers consist of hollow cylinders, and are so connected to the piston-rods that the water can have an uninterrupted passage through the interior of the plungers. The rear end of the upper plunger D is furnished with an internal valve *h* and the rear end of the lower plunger D' with an external valve *i*.

Communicating with the front portion B' of the lower barrel of the pump is a branch *k*, to which is secured a pipe communicating with the well or reservoir from which the water has to be raised, a branch *m*, which forms a part of the said front portion of the lower barrel of the pump, being secured to the branch *k*, and the latter being attached to the top of the well or reservoir. Between the two branches *k* and *m* is the foot-valve *n*, which has a projection *p*, so formed and so situated as to be acted on by a metal disk or washer *t* on the end of a screw E, which passes through a hollow screw *u*, and which is furnished at the outer end with a suitable handle F, there being a washer *s*, of gum-elastic or other suitable material, between the metal washer *t* and the hollow screw *u*. It will be observed that a longitudinal groove is cut in the screw E, for an object which will be explained hereinafter. An air-vessel G is secured to a branch *w*, which forms a part of and communicates with the hollow cylinder which forms the front portion of the upper barrel of the pump, and from this air-vessel projects any desired outlet-pipe H. The two piston-rods are connected together by the cross-head I, midway between the opposite ends of which is a pin *x*, passing through an oblong slot in the handle J, the fulcrum of the latter being on a pin *y*, secured in any suitable manner to the foundation on which the pump rests, so that on imparting a vibrating movement to the handle a simultaneous reciprocating motion will be imparted to the plungers, both moving in the same direction. When the plungers are moved in the direction of the arrow 1, Fig. 1, the foot-valve *n* will be open, the valve *h* being closed and the valve *i* open, the water contained in the lower barrel will, owing to the vacuum caused by the upper plunger, pass through



the lower plunger D' into the rear portion C' of the lower barrel, as well as into the rear portion C of the upper barrel. At the same time the plunger D, with its closed valve *h*, will be forcing the water contained in the front portion B of the upper barrel into the air-chamber G and through the exit-pipe H. When the movement of the plungers is reversed, the foot-valve *n*, as well as the valve *h*, will be open and the valve *i* closed, so that the water contained in the lower barrel will be forced into the rear portion of both barrels through the plunger D and into the air-vessel by the lower plunger D', with its closed valve, the foot-valve remaining open at all times, excepting when the reversal of the barrels takes place, when the valve is momentarily closed. As the reciprocating motion of the plunger is continued, therefore, an uninterrupted stream of water must pass through the exit-pipe.

One of the most important features of my improved pump is its simplicity as regards construction, no boring out of the barrels being necessary, as the plungers are free from contact with the interior of the barrel and bear against the packing-pieces *ff* only.

Another important feature in my improved pump is the ready manner of tightening the packing-pieces *ff* round the plungers, this being accomplished by simply tightening the nuts of the bolts *dd*, and thus bringing the rear portions nearer to the front portions of the barrels, and consequently compressing the packing-pieces of the two barrels simultaneously. These packing-pieces also serve to keep the junction between the two portions perfectly water tight.

When during the winter months the operation of the pump is discontinued after being temporarily used, it is important that as much of the water as possible should be allowed to escape from the barrels, which would otherwise become inconveniently clogged with ice. This may be effectually accom-

plished by the grooved screw E and foot-valve *n*, for on the discontinuance of the movement of the plungers the screw E may be turned until its metal washer *t* is brought in contact with the projection *p* of the foot-valve *n*, thus raising the latter and forming a free passage for the escape of the water. At the same time the groove of the screw E affords a free passage for the air into the lower barrel of the pump and facilitates the free passage of water into the reservoir or well below. When the pump has to be again used, the screw is turned to its former position, its metal washer *t* compressing the packing *s* against the end of the hollow screw *u* and preventing all entrance of air to the barrel along the groove of the screw.

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

1. The upper and lower barrels with the communicating passage *c*, the branches *w* and *m* and foot-valve *n*, in combination with the hollow plunger D and its valve *h*, and the hollow plunger D' and its valve *i*, the whole being constructed, arranged, and operating as and for the purpose herein set forth.

2. The hollow plungers D and D', with their respective valves, and the packing-pieces *ff*, when the latter are confined between the two portions of the barrels, as set forth, for the purpose specified.

3. The grooved screw E, its metal disk or washer *t*, and packing-washer *s*, in combination with the foot-valve *n* and the projection *p*, the whole being arranged for joint action, substantially as and for the purpose herein specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. DODGE.

Witnesses:

HENRY HOWSON,  
JOHN WHITE.