B. F. BIGGS.

Pump-Valves.

No. 153,801. Patented Aug. 4, 1874.

Fig. 1.

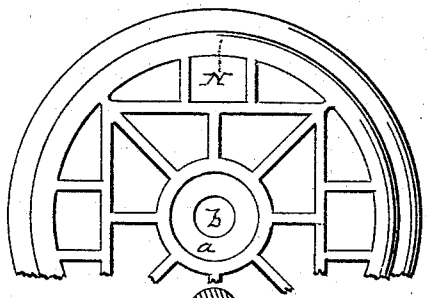


Fig. 3.

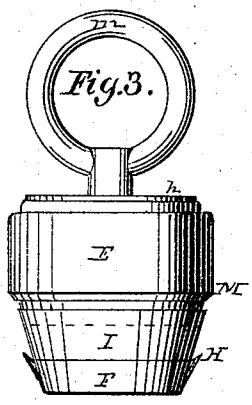
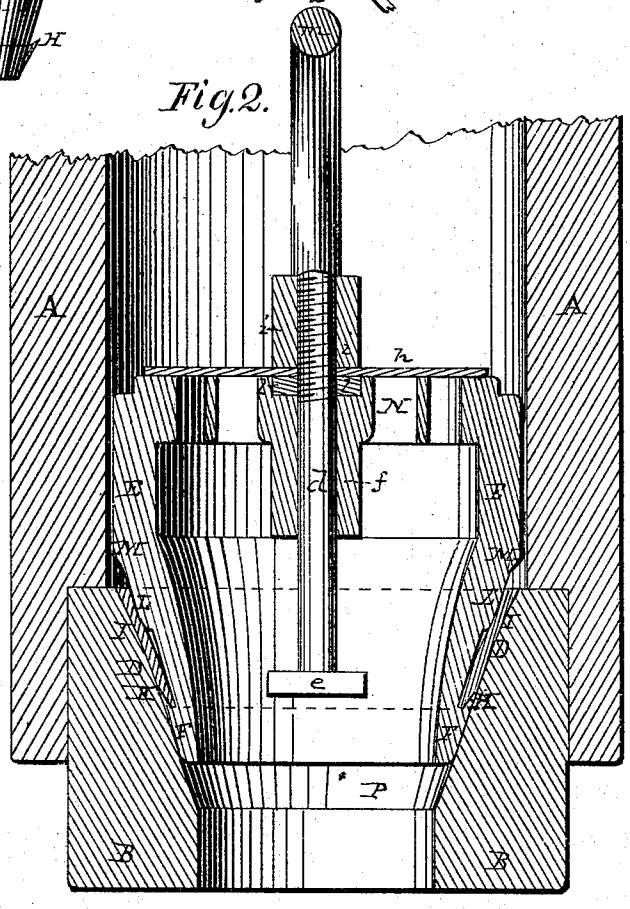


Fig. 2.



Witnesses:

R. Lunzinger

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By his attys.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. BIGGS, OF LAFAYETTE, INDIANA.

IMPROVEMENT IN PUMP-VALVES.

Specification forming part of Letters Patent No. **153,801**, dated August 4, 1874; application filed June 26, 1874.

To all whom it may concern:

Be it known that I, BENJAMIN F. BIGGS, of Lafayette, Indiana, have invented certain new and useful Improvements in Pumps, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to an improved pump-valve; and consists in having the upper end of the tube provided with an annular conical cavity, into which fits a drop-bucket having a hollow center closed above by a perforated plate, at the center of which is provided an aperture, through which passes a rod having a check-stud below and a pliable valve-stop above, the latter covering the perforated plate, so that the pressure of the water closes the valve and retains the drop-bucket or foot valve in place, whence it may be elevated by raising valve-stop and allowing the water to descend.

The invention further relates to the construction of the exterior of the bucket, which is generally conical, having an annular recess, about which is placed a leather or rubber packing-ring, the lower edge whereof enters an annular slot between an upright annular flange and the surface of the bucket, the flange being of such dimensions that, when the leather is in position, its exterior surface will be nearly flush with that of the flange.

Above the packing-ring, and immediately below its upper edge, are provided two other annular rings or shoulders, so that when the bucket is in operation it impinges against the conical cavity in the upper end of the tube at four points or planes, the object of the last-mentioned features being to supply a drop-bucket or foot-valve that will securely seal the mouth of the tube.

Figure 1 is a plan view of the cover N, hereinafter more fully described. Fig. 2 is a perspective view of the drop-bucket or foot-valve. Fig. 3 is a vertical section of a device embodying the invention.

A in the accompanying drawings is the pump-barrel, within the lower part of which is secured the upper end of the tube B, having on its inside the conical cavity D. The foot-valve E is reduced at its lower portions to fit snugly, and in a water-tight manner, into the cavity D, and is provided with the annular shoulder F, which, bearing against the wall of the cavity D, seals the interval between it and the foot-valve. The upper part of the shoulder F terminates in the flange H, which is removed a suitable distance from the surface proper of the valve. Within this interval is placed the lower edge of the packing-ring I, which encircles the valve, and which, when rendered pliable by the action of the water, is expanded outward against the flange, forming the second point of impact. Below the upper edge of the packing-ring I is provided an annular shoulder, L, which crowds the adjacent portion of the ring outward as the bucket is forced down by the pressure of the water above, forming the third point of impact. Above the shoulder L is provided the annular shoulder M, about which the pressure of the water forces the upper edge of the packing-ring outward against the tube, forming the fourth point of impact.

From the above it is clear that the escape of water is almost impossible, since any one or more of the above constructions would suffice to retain it.

The upper portion of the bucket P is covered by the perforated plate N, having at its center the seat *a* and aperture *b*, through which passes the rod *d*, having adjacent to its lower parts the dependent bumper *f*, and at its lower end the stop *e*, and above, near its upper end, the valve-stop *h*, secured between the cylinders *i l*, the latter of which descends into the seat *a*, so that the valve-stop may lie smoothly upon the plate M, and thus retain the water above the plate.

The upper end of the rod *d* is furnished with the ring *m* or any other convenient device by which it may be raised.

When it is desired to remove the seat-valve it is only necessary to elevate the stop *h*, which allows the water to descend, when the device may be easily withdrawn.

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

1. The foot-valve E, provided with the shoulder F, flange H, packing-ring I, shoulders L and M, in combination with the tube B, for

the uses and purposes substantially as shown and described.

2. The foot-valve E, provided with the perforated cover N, valve-stop *h*, rod *d*, and stop *e*, in combination, substantially as and for the uses and purposes shown and set forth.

In testimony that I claim the foregoing improvement in pumps, as above described, I have hereunto set my hand and seal this 12th day of May, 1874.

BENJAMIN F. BIGGS. [L. S.]

Witnesses:

JOHN D. GOUGAR,

JOSEPH BIGGS.