

(No Model.)

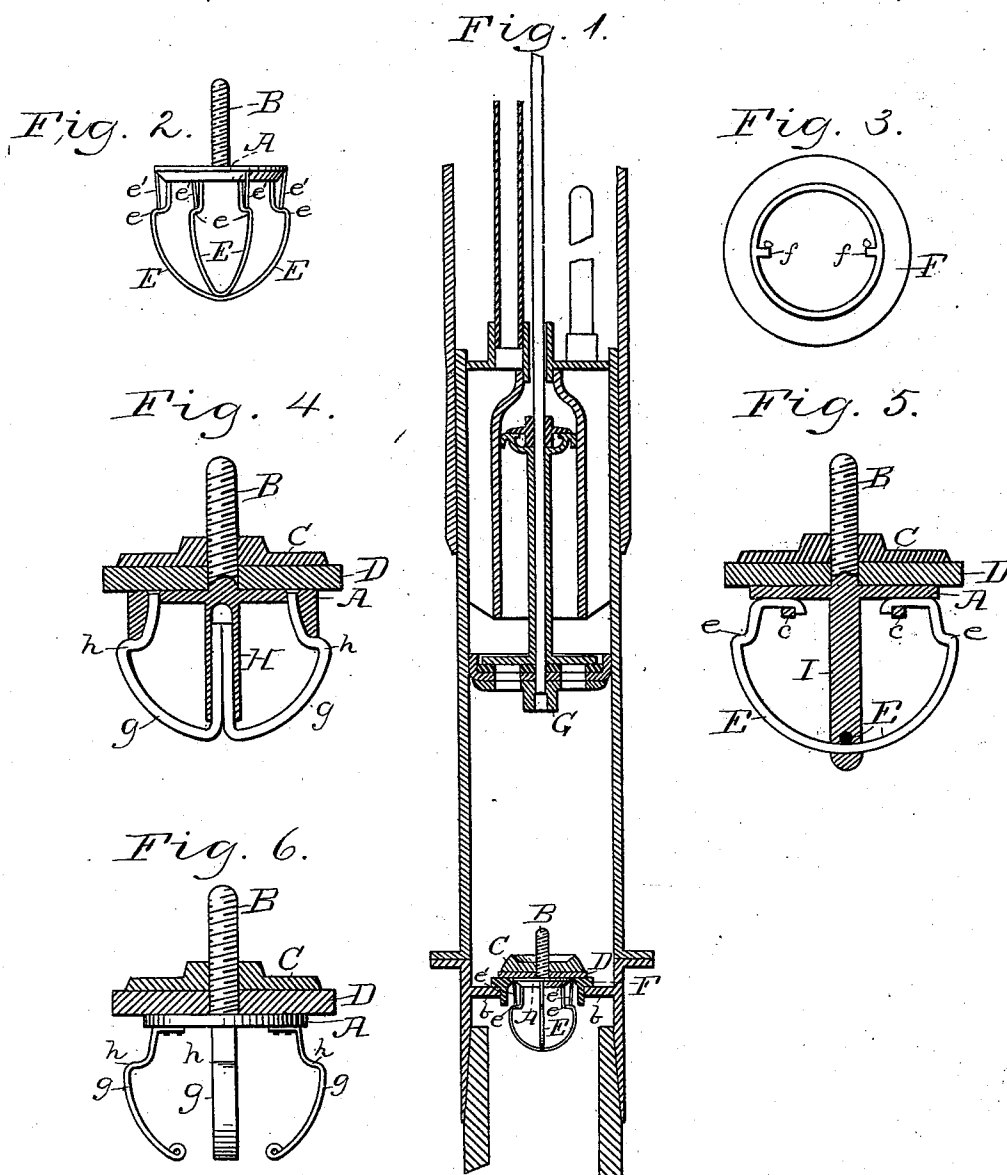
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PUPPET VALVE.

No. 548,834.

Patented Oct. 29, 1895.



WITNESSES:

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ROBERT M. LAFFERTY, OF DAVENPORT, IOWA; STANLEY B. LAFFERTY, ADMINISTRATOR OF SAID ROBERT M. LAFFERTY, DECEASED, ASSIGNOR TO THE RED JACKET MANUFACTURING COMPANY, OF SAME PLACE.

PUPPET-VALVE.

SPECIFICATION forming part of Letters Patent No. 548,834, dated October 29, 1895.

Application filed December 30, 1887. Serial No. 259,366. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. LAFFERTY, of Davenport, Scott county, Iowa, have invented certain new and useful Improvements in Puppet-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention is more especially adapted for use in lift-out pumps, and is designed to avoid by a simple construction the displacement of the valve from its seat when subject to ordinary usage and to permit its removal therefrom when necessary without employing extraneous appliances or the removal of screws and bolts, substantially as hereinafter fully described, and as illustrated in the drawings, in which—

Figure 1 shows a lift-out pump in vertical central section having my improved puppet-valve applied thereto. Fig. 2 is a side elevation of the body of the valve. Fig. 3 is a view showing the under side of the valve-seat ring, and Figs. 4, 5, and 6 show modifications of the valve proper.

Referring to the drawings, A is a circular or other desirable shaped plate composing the body of the valve, and it is provided with a central bolt B, projecting upward from its upper surface. Held concentrically with said bolt B upon the plate A by a nut C is a packing ring or disk D. The diameter of disk D is greater than plate A, and its projecting edges are adapted to rest upon the valve-seat edges or upon the valve-seat ring F. Ring F rests upon the inner annular ledge *b* of the pump-pipe, as shown, forming the valve-seat, and it is provided with a flange extending vertically downward from its inner edges, which are concentric with said pump-pipe, and fits snugly within the contracted opening made by the said ledges *b*.

Secured to and depending down from the under surface of plate A are the wire yokes E. The ends of each of these wire yokes or loops E are secured to said plate A at such distances from the center that they come within the radius of the contracted opening of the valve-seat. From thence they pursue a straight downward course a suitable dis-

tance, whereupon they are bent outward radially to form the shoulders *e e*. It is thus obvious that the vertical movement of the valve is limited to the distance between the plate A and said shoulders *e e*, and it is equally apparent that this distance must be sufficient to permit the water to pass up through the contracted opening of the valve-seat.

The yokes E, being made of spring-wire, may by the exertion of a little force be caused to pass down through the contracted opening of the valve-seat ring, and when they have been so crowded through they are sufficiently rigid to prevent the pressure of the water as it rushes into the cylinder from below from forcing them back through the opening. Thus the valve is a perfect puppet-valve and cannot during the ordinary process of pumping be displaced, but can, when necessary, be removed from off the valve-seat without removing any bolts or screws.

In order to withdraw said puppet-valve when used in a lift-out pump without going to the necessity of using extraneous appliances, I make a nut G, preferably integrant with the head of the plunger or piston, which by screwing it down onto bolt B will, when lifted, remove said valve from its seat. To prevent the valve turning while the nut G is being screwed onto said bolt B, I provide ring F with one or more inwardly-projecting lugs *f f*, which when the valve begins to rotate meets one of the yokes and prevents further rotation thereof.

If desired, in order to insure the perfect vertical non-rotating movement of the valve, I can provide guides *e'*, of wire, which are preferably secured to the shoulders of the yokes and arising vertically move in suitable recesses made in the valve-seat with reference to them.

Other well-known mechanical expedients can be used for holding the packing-disk in position. I prefer that shown, however.

There are several constructions of the yokes or equivalents thereof that I desire to cover as well as that shown. For instance, in Fig. 5 I cast integrant with or secure to the under surface of plate A the staples *c c*, and by bending the ends of the yokes at right angles

to that stretch thereof between the shoulders *e* thereof and plate A in toward the center of the plate can pass them through said staples, from which I prevent their withdrawal by bending the extremities of said yoke laterally, as shown. When a yoke or loop is secured in this manner to plate A, the upper ends are pinched in toward each other when forced through the valve-seat opening, where-
 10 as in the construction shown in Fig. 2 the yokes under similar circumstances elongate vertically. I prefer when using the construction of these yokes as shown in Fig. 5 to extend a suitable stud I centrally downward
 15 from said plate, through which the bends of said yoke pass.

In Fig. 4 I show how the yokes can be dispensed with. I substitute in lieu of each yoke two spring-wires *g g*, each of which projects down from said plate in substantially the same manner as the ends of yokes E and curves downward from the shoulders *h* thereof in toward each other. Just before these wires *g* touch they bend centrally upward into the
 25 common central pocket of the stud H, depending vertically and centrally down from said plate A.

In Fig. 6 is shown a yet simpler construction of the springs *g*. Instead of wire springs
 30 they are shown as being made of flat spring metal. They are preferably riveted to plate A, and they extend downward similar to the shape of the sides of the yokes. They terminate, however, before their lower ends
 35 meet, and being more flexible are not as well adapted for my purpose as the yokes or the springs *g* shown in Fig. 4. All of these springs *g* or yokes E are, it will be observed, provided with the outwardly-projecting shoulders, which limit the upward movement of the
 40 valve and are yet sufficiently flexible to permit the valve to be removed from off its seat upon the application of sufficient force. This is one of the most important features of my
 45 invention, and being entirely new I desire to cover the same broadly.

What I claim is—

1. The combination with a well-pipe having a circumferential flange or ledge projecting
 50 inward from the inner circumference so as to reduce the diameter of the bore and furnish a valve-seat, of a valve resting on said valve-seat, which is of a diameter too great to pass through the restricted opening thereof,
 55 and flexible yokes E depending down from

said valve at points an equal distance from the center thereof coming within the radius of the restricted opening of said valve-seat; said yokes depending down through said opening, and at corresponding distances from
 60 said plate bent radially outward beyond the circumference of the annular edges of the valve-seat to form shoulders, which when said valve is lifted, strike against the under surface of the valve-seat, and limit the move-
 65 ment of and prevent the displacement of the valve; said yokes then extending downward and inward toward the return bend thereof, as set forth.

2. In a puppet valve the plate A and the
 70 downwardly extending frame-work having an elastic enlarged portion of a diameter greater than the opening in the valve-seat, and a contracted portion of less diameter than said opening, the frame work consisting of a series
 75 of loops, each loop beginning at one edge of the valve, and extending continuously down and up, and to the edge of the valve opposite to where the loop began, substantially as set
 80 forth.

3. In a puppet valve, the plate A and the
 80 downwardly extending framework having an elastic enlarged portion of a diameter greater than the opening in the valve seat, and a contracted portion of less diameter than said
 85 opening, the framework consisting of a series of continuous loops, each loop beginning at one edge of the valve and extending continuously down and up and to the edge of the
 90 valve opposite to where the loop began, and guides *e'*, substantially as set forth.

4. The combination of plate A provided with bolt B, elastic yokes E having shoulders
 95 *e* and guides *e'*, valve ring D, plate C and valve seat ring F having inwardly projecting lugs, as set forth.

5. The combination with a well pipe and valve seat therein plate A, bolt B, projecting inward concentrically therefrom, springs
 100 depending downward therefrom, passing through said valve seat, and at corresponding points below said plate A, provided with shoulders *e*, and guides *e'* connecting said shoulders and plate A of the piston and nut G, on the lower end thereof, as set forth.

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Witnesses:

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