(No Model.)

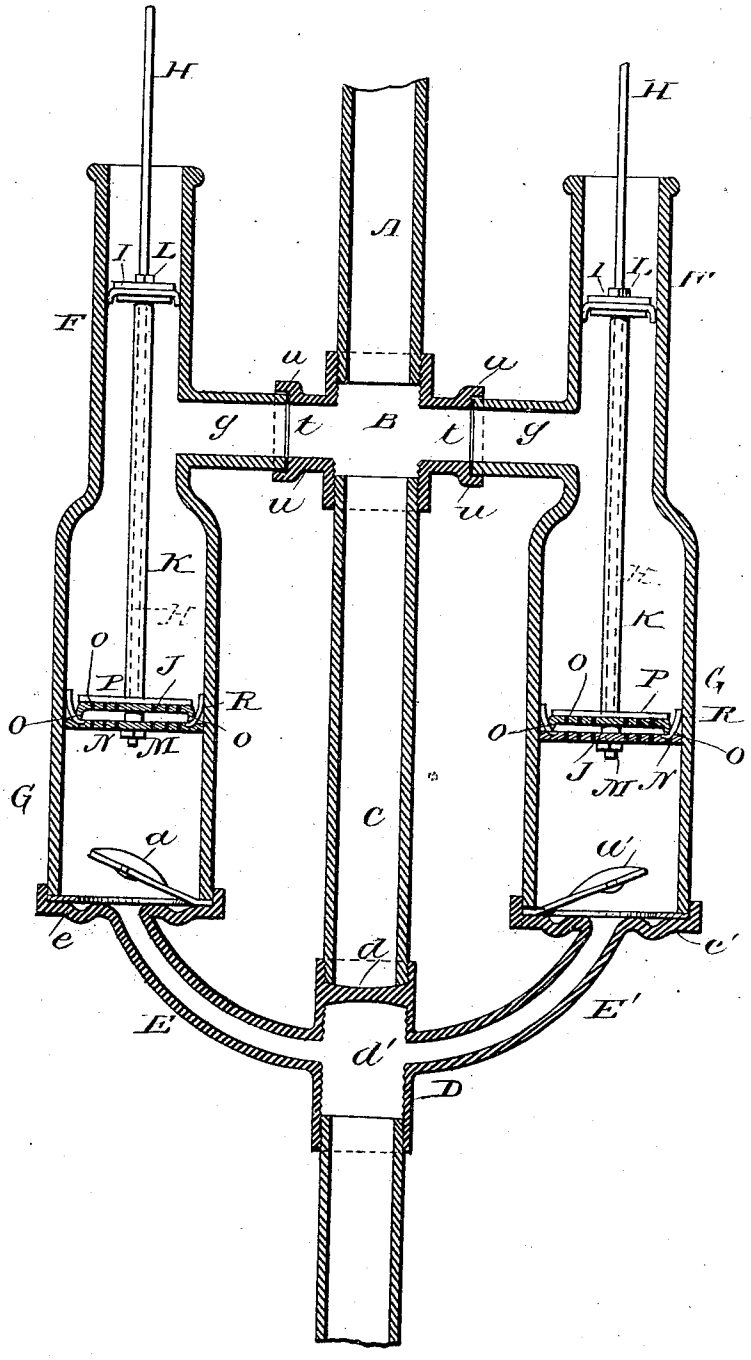
2 Sheets—Sheet 1.

A. CRAWFORD.

DOUBLE ACTING FORCE PUMP.

No. 291,859. Patented Jan. 8, 1884.

Fig. 1.



WITNESSES

Chas. A. Baker

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(No Model.) 2 Sheets—Sheet 2.

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DOUBLE ACTING FORCE PUMP.

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Fig. 2.

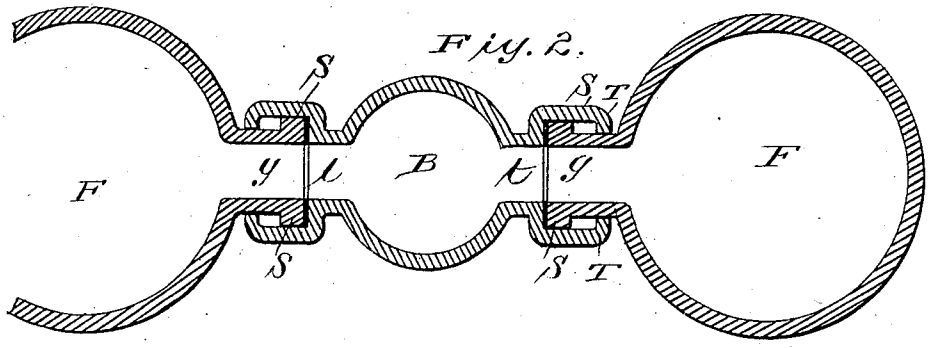


Fig. 3.

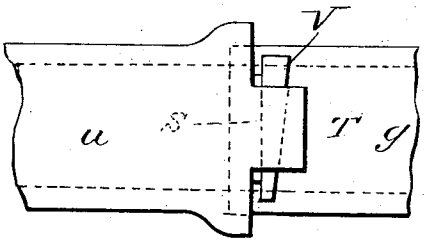
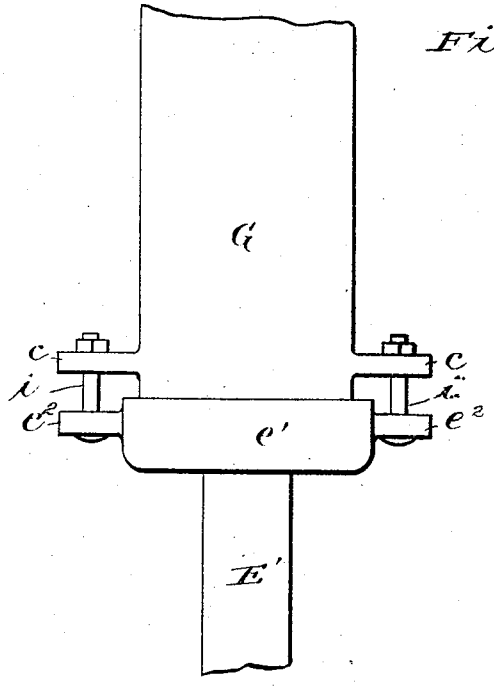


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER CRAWFORD, OF EVANSVILLE, INDIANA.

DOUBLE-ACTING FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 291,859, dated January 8, 1884.

Application filed September 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER CRAWFORD, a citizen of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Double-Acting Force-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to improvements in double-acting force-pumps; and its object is to provide a pump of this class that is simple and inexpensive in construction, and at the same time reliable in operation, and not liable to derangement; and to these ends the novelty consists in the construction of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings the same letters of reference indicate the same or like parts of the invention.

Figure 1 is a vertical section of my improved pump. Fig. 2 is a cross-section on the line of the upper-cylinder connections. Fig. 3 is a detail of the manner of connecting the upper-cylinder connections to the standard, and Fig. 4 is a detail of the lower-cylinder connections.

A is the standard or stand-pipe, and is of a sufficient length to extend a proper distance in the well, and likewise above the ground, where it terminates in a suitable casting, forming the delivery-spout and support or fulcrum for the handle or operating-lever. The lower end of the standard A is screw-threaded, and it couples with the cross-connection B.

C is a short pipe, screw-threaded at both ends, its upper end secured to the connection B, while its lower end screws into the base-bracket D. This bracket D has a partition, *d*, which cuts off communication between the lower portion, *d'*, and the pipe C.

E E' are tubular arms, formed integral with the bracket D, and are curved upward, terminating in the flanged foot-pieces *e e'*, which form the seat for the valves *a a'*.

F is the upper and G the lower pump-cylinder, the former having the delivery-pipe *g*, and the two cylinders and pipe are cast in one piece, as shown.

H is the piston-rod, and has an upper piston, I, and a lower piston, J, working, respectively, in the cylinders F and G.

K is a sleeve on the piston-rod, and extends between the upper and lower pistons, the upper one being held in place against the sleeve by the nut L, and the lower one by the nut M. The upper piston is of ordinary construction, and the lower one consists of a flat perforated disk, N, a smaller flanged perforated disk, O, the valve P, and the packing-ring R. The packing is a leather ring, and is held in place upon the surface of the disk N by the flange *o* of the upper disk, O, while the valve is a simple flexible rubber disk, covering the perforations in the disk O, so as to freely permit the water to pass upward, but of course prevents its passage the reverse way. The valve P is held in place by the end of the sleeve pressing the center of it against the top of the disk O, and said valve P, packing-ring R, and perforated disks N and O are all securely clamped in proper place by the nut M. The delivery-pipe *g* has a lug, S, cast on each side thereof at its end, and corresponding ears, T, project from the lateral branches *u* of the connection B.

t is a rubber or leather washer, making the joint between the parts *g* and *u*, and V is a taper key, which, when driven in between the lug S and ear T, secures the parts rigidly together. This form of connection is very simple and efficient, and as it dispenses with nuts, no wrench is required, but may be made with a hammer, and when repairs are necessary, by simply removing the key, which may be done instantly, the parts are separated.

Each of the lower cylinders, G, has a pair of lugs, *e e*, and e^2 e^2 are similar lugs on each of the foot-pieces *e e'*, through which the bolts *i i* pass to secure the cylinder to the said foot-pieces.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the cross-connection B, having ears T, of the cylinder F, having outlet *g*, provided with lugs S, and the taper key V, as and for the purpose set forth.

2. The combination, with the casting D,

having partition *d*, and arms E E′, provided with foot-pieces *e e′*, having ears e^2 e^2, of the cylinders G G, provided with ears *c c* and bolts *i i*, as and for the purpose set forth.

3. The combination, with the double cylinders F G, F G and means for operating the same, substantially as described, of the cross-connection B, the pipe C, and the casting D, having partition *d*, as and for the purposes set forth.

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

ALEXANDER CRAWFORD.

Witnesses:

H. J. ENNIS,

AUGUST SCHMITT.