(No Model.) 2 Sheets—Sheet 1.

C. S. DEAN.

PUMP.

No. 288,030. Patented Nov. 6, 1883.

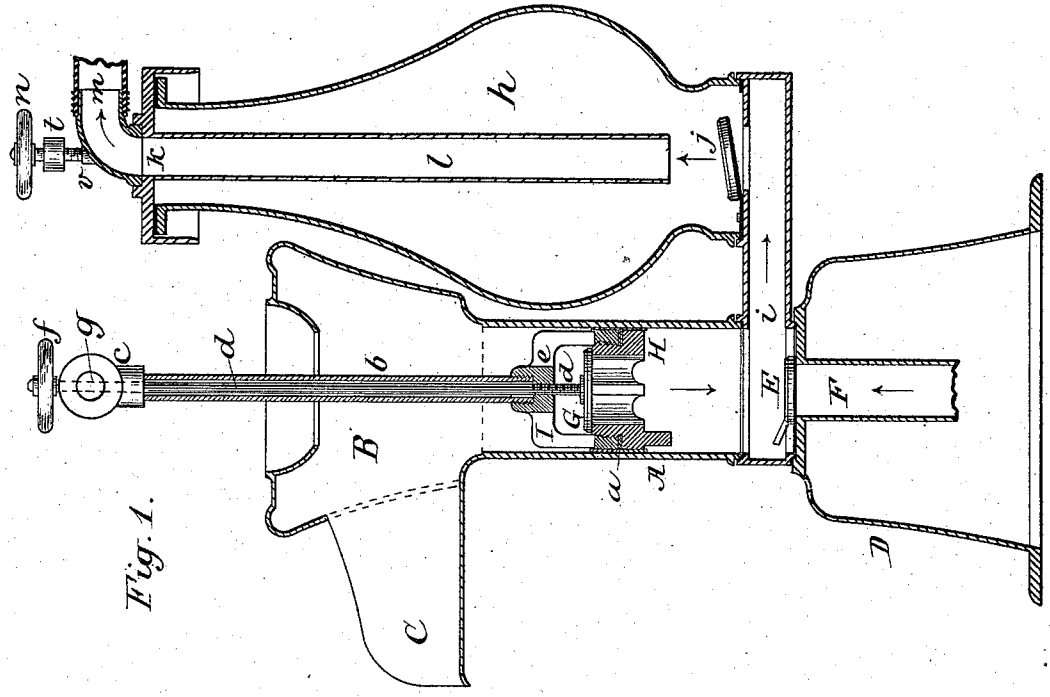

Fig. 1.

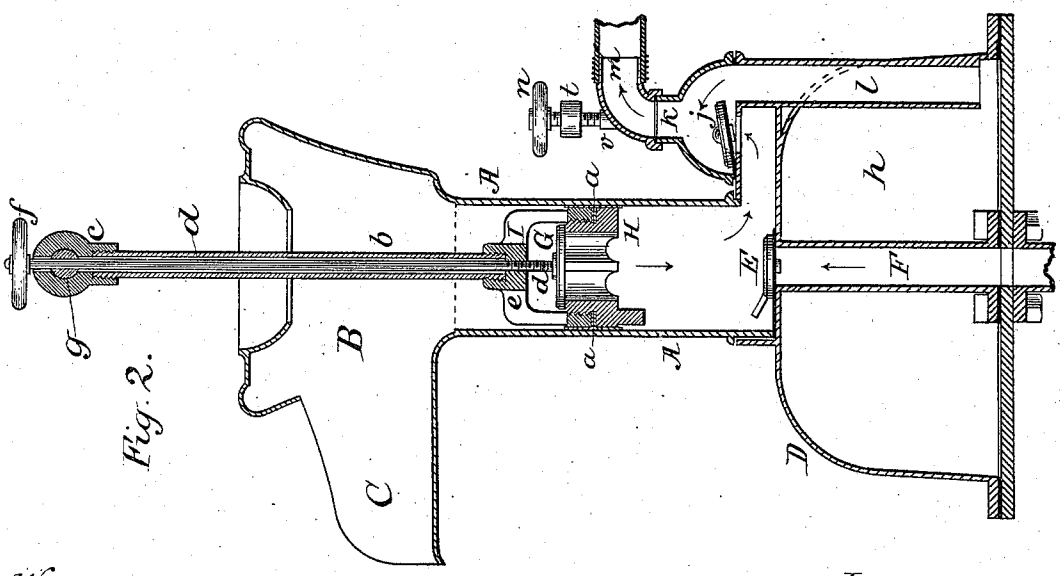

Fig. 2.

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Fig. 3.

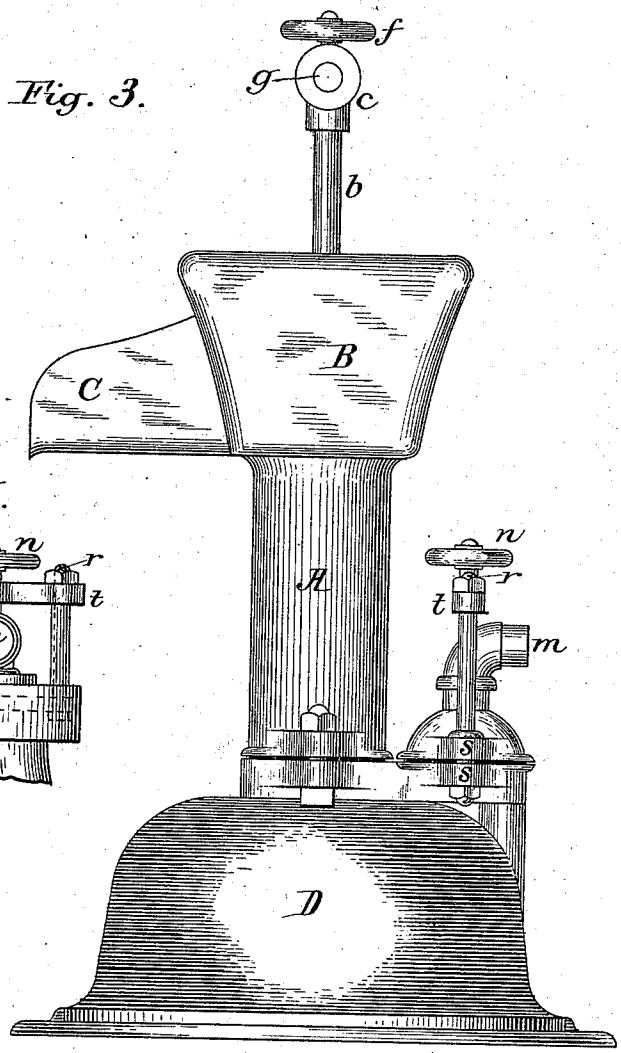


Fig. 5.

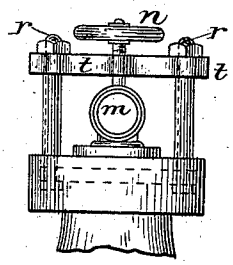
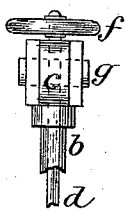


Fig. 4



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UNITED STATES PATENT OFFICE.

CYRUS S. DEAN, OF FORT ERIE, ONTARIO, ASSIGNOR TO EDWIN MORRIS, OF COWLAND, ONTARIO, CANADA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 288,030, dated November 6, 1883.

Application filed February 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, CYRUS SUMNER DEAN, a subject of the Queen of Great Britain and Ireland, residing at Fort Erie, in the county of Welland, Province of Ontario, in the Dominion of Canada, have invented new and useful Improvements in Pumps, of which the following is a specification.

My improvement relates to what is known as the "pitcher" or common iron "lift" pump, and particularly to such pump constructed with a force attachment, whereby to produce a convertible force and lift pump.

The objects of my improvements are to render such force attachment more effective, durable, and convenient for use, and to provide for a continuous and steady stream of water in using the convertible force attachment in the common pitcher-pump.

An important matter of my improvement is the adaptation of the force attachment to the pitcher-pump, whereby the latter as now constructed can be easily provided with the force attachment, using the ordinary lift-valve and its box or seat. The convertibility of the pump consists in the employment of means for closing the valve upon its seat, and of maintaining it in such closed position, and in this it is important that the force be exerted upon the valve in a direct central line, so as to hold the valve closed with an equal and tight bearing upon its seat against the great pressure of the water in the descending movement of the valve. It is also of great importance that the means for supporting the valve under its pressure should be itself properly supported and arranged, with convenient outside means for operating it to convert the pump from a lift to a force; and it is to these particulars that my improvements are directed, in connection with an air-chamber through and by which a steady force flow of the water is effected.

Referring to the accompanying drawings, Figure 1 represents a vertical central section of a lift-pump embracing my improvements; Fig. 2, a similar sectional view, showing the air-chamber formed in the base-casting of the pump; Fig. 3, a side elevation of the same; Fig. 4, a detail view of the handle-joint head, and Fig. 5 a detail view of the clamping device for the hose attachment.

The pump-cylinder A has the usual open pitcher top, B, and lift-discharge C, and is mounted upon a base casting or pedestal, D, for the foot-valve E, and the pipe F, leading into the well or cistern, as shown; or it may be of any suitable construction; but the construction shown is preferable, because it is the common iron lift-pump generally in use. In such pump the lift-valve G is carried by a metal stock or seat, H, provided with a suitable packing, *a*, and a metal yoke-housing, I, for the valve, which is preferably of winged or spider form and of metal. These parts, with the foot-valve E, which may be of the ordinary flap kind, form the common lift-pump.

The force attachment which I have combined with this pump consists of an improved construction for closing the lift-valve upon its seat, for maintaining a direct well-supported central force upon said valve, and of an air-chamber connected with the force-discharge.

Instead of the solid rod for connecting and operating the box of the lift-valve, I use a tube, *b*, which may be a piece of gas-pipe screwed into the yoke or housing I for the lift-valve, and, passing through the open top of the pump-cylinder, is screwed into a joint-head, *c*, to which the pump-handle (not shown) is jointed in any suitable manner. This operating-tube forms the guide and support for an adjustable stop-rod, *d*, which is screw-threaded at its lower end, and is screwed into the cross-bar *e* of the yoke or housing for the valve, which housing-yoke forms the nut for the screw-rod. This adjustable stop-rod is preferably of brass, to prevent corrosion, and passes through the joint-head *c*, and is provided with a hand-wheel, *f*, by which it is screwed up and down, to bring its lower end down upon the top of the metal valve, and thereby close it upon the seat or box, as shown, to convert the lift into a force pump. Raising the screw-rod leaves the valve free to rise and fall, as in the ordinary lift-pump. This construction and arrangement of the valve-closing device gives the important

advantage of a direct central stop or hold upon the valve, and thereby insures an equal pressure of the valve upon its seat, and provides for properly supporting the stop-rod at the point of pressure, and at the upper outside operating end, which is thereby brought within convenient position for being turned to raise and to lower the screw-rod. As the pressure upon the valve is very great when it is closed, the direct central support given by the screw-rod is of vital importance, since there is no lateral strain upon rod and no side strain upon the valve. The joint-pin *g* for the handle passes through the joint-head *c*, and the screw-rod passes through a hole in said joint-pin, and thus secures it in place without riveting or screw-nut fastening.

To effect a steady and continuous flow of the water, I combine an air-chamber, *h*, with the force-discharge opening, and a valve arranged between the lower end of the pump-cylinder and the communication with said air-chamber. As shown in Fig. 1, this air-chamber is mounted upon a separate flat-chambered casting, *i*, which is fastened upon the top of the pedestal, and the pump-cylinder is fastened by the same screw-bolts upon the top of said flat-chambered casting, there being a through opening in said chambered casting corresponding with the pump-cylinder. Over this through opening the foot-valve is secured or placed upon the top of the pedestal. The chambered casting projects to one side of the pump-cylinder, and the force-discharge valve *j* is fastened to its upper side and opens within the air-chamber, the valve-opening forming thereby the communication of the pump-cylinder with the force-discharge *k*, which also communicates with the air-chamber. This latter communication must be with the bottom of the air-chamber, and for this purpose the force-discharge extends by a pipe, *l*, down into and opens near the bottom of said air-chamber. The force-discharge opening *k* is formed so as to receive a coupling, *m*, attached to the end of the hose.

Provision is made for the easy and quick attachment of the hose to the force-discharge by a clamping device consisting of a hand-wheel screw, *n*, supported centrally over the force-discharge by screw-bolts *r r*, fastened in lugs *s s* in the fixed castings, and connected at their upper ends by a cross-bar, *t*, through a screw-threaded opening, in which the clamping hand-wheel screw *n* passes, so as to be screwed down upon a boss, *v*, on the hose-coupling, to bind it upon the nozzle of the force-discharge. By this construction the air-chamber and its force-discharge can be applied to the iron lift-pump now in use, in which case the flat-chambered casting is secured by the screw-bolts passing through the usual lugs on the bottom of the pump-cylinder and the top of the pedestal. When the air-chamber is formed within and by the pedestal-casting, as shown in Figs. 2 and 3, the flat-chambered casting is formed upon its top, and the force-discharge pipe *l* is cast upon the side of said air-chamber, into the bottom of which it opens.

I do not claim, broadly, a lift-pump provided with a force-discharge, and means for producing a convertible force and lift pump in which the lift-valve of the piston is provided with an adjustable stop adapted to close the piston-valve to produce a force-discharge.

I claim—

I. The combination, in a pump-cylinder having a lift-discharge and a force-discharge, of the lift and the foot valves with the open valve-seat yoke I, a tubular operating-connection, *b*, for said valve-yoke, and a screw-rod, *d*, passing through a nut, *e*, in said valve-yoke and through said tubular connection, and provided with an outside hand-wheel, *f*, for closing said lift-valve G upon its seat and centrally supporting the closing screw-rod, substantially as described.

2. The combination, in a pump having a lift-discharge and a force-discharge, of the lift and the foot valves, and means, substantially such as described, whereby the lift-valve may be closed upon its seat, with an air-chamber, *h*, having a valved communication, *j*, with the lower end of the pump-cylinder, substantially as described, for the purpose specified.

3. The combination, in a pump, of the lift and foot valves, the tubular operating-connection *b* for the lift-valve seat, the screw-rod *d*, for closing said lift-valve, passing through said tubular operating-connection, the flat-chambered casting *i*, the air-chamber *h*, the force-discharge tube opening therein, and the valved communication *j* with said air-chamber, substantially as described, for the purpose specified.

4. The combination, in a convertible lift and force pump, of the tubular operating-connection *b* for the lift-valve with the screw-rod *d*, for closing the lift-valve upon its seat, passing through a nut, *e*, in the lift-valve yoke, and through the joint-head *c* and joint-pin *g* for the operating pump-handle, and provided with a hand-wheel, *f*, outside of said joint-connection, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CYRUS S. DEAN.

Witnesses:
A. E. H. JOHNSON,
J. W. HAMILTON JOHNSON.