

R. A. McCauley,

Double Acting Pump.

N^o 49,640.

Patented Aug 29, 1865.

Fig. 1

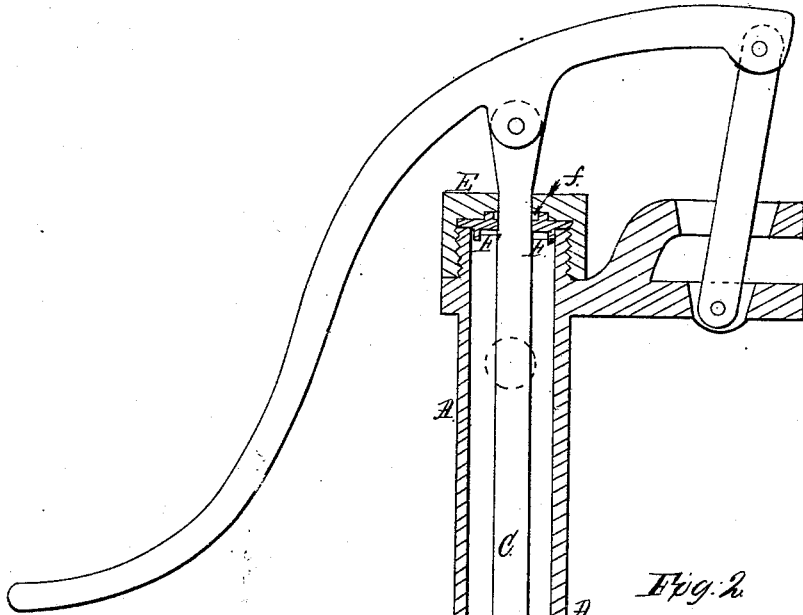


Fig. 2



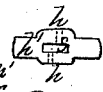
Fig. 3



Fig. 4



Fig. 5



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Witnesses:

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UNITED STATES PATENT OFFICE.

REUBEN A. MCCAULEY, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **49,640**, dated August 29, 1865.

To all whom it may concern:

Be it known that I, REUBEN A. MCCAULEY, of the city and county of Baltimore, in the State of Maryland, have invented a new and improved double-action regulating-pump, more particularly suited for Artesian or oil wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in providing an adjustable or regulating piston by which to secure a constant and steady flow of water, oil, or other liquid under varying circumstances of depth, pressure of gas, &c.

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

In the drawings, Figure 1 represents a section through the pump, exposing the piston and lower valve in place. It is shown "rigged" with an ordinary handle; but other attachments can be made by which to operate it by steam. I contemplate making it of sections of pipe A, secured by couplings B at the joints, the piston-rod C to be solid and in sections similarly secured. Its couplings *c* are shown in section. On each section of the piston-rod, and above its coupling, I place a guide-ring or brace, D. (Shown in section, as also in plan in Fig. 2.) Under the top screw-cap, E, of the pump I place a second cap, F, part of which forms a stuffing-box, *f*. It is shown in section also. The compound adjustable piston G is attached to the lower end of the piston-rod C by means of a pin, *a*, or in any suitable way, so it is secure, and can be easily detached when taken up. Below the head H, through which this pin passes, (connecting it with the lower end of C,) a rod, *h*, extends, to which is securely attached a multiple cam, I. (Shown in end view at Fig. 3—see red lines.) This cam is surrounded by several sections, *g*, covering it, and forming with it the body of the piston. The lower parts of these sections overlap each other, breaking joint, as will readily be seen. In the top and lower ends of these sections there are radial slots *i*, Fig. 3, for pins to enter, which are in the upper and lower heads, J J'. These pins are represented by *j*, Fig. 4. When the sections *g* are moved outward or inward by

turning the cam I these pins form guides working in the slots *i*, and the sections move radially. The head J rotates and rests against a shoulder on central rod, *h*, this latter passing through lower head, J, and a nut, N, screwing upon its lower end. By screwing up this nut tightly it holds the sections *g* (after a desirable adjustment of them has been made) firmly between the two heads. J' is then secured by a set-screw, (shown in the drawings above the nut,) which also must be secured by a pin passing through it and rod *h*, or in any equivalent manner. The sections *g* are shown expanded in red lines, Fig. 3.

Instead of the pins *j* and slots *i*, several other simple equivalent devices can be adopted to serve the same purpose, and which will readily suggest themselves to mechanical minds.

It must easily be seen how, by loosening the heads J and J' sufficiently and turning the cam I, the diameter of the piston G can be regulated or varied at pleasure, and thus control the amount of liquid passing between it and the sides of the tubing A. The head J is made to suit the piston in its most contracted form.

On top of head J, and sliding upon rod *h*, I have a valve, V. (Shown in plan in Fig. 5.) It has several openings sufficient for the passage of a maximum flow of liquid. In the downward stroke of the piston it rises up against the shoulder on H, as shown by red lines. On the lift it falls upon head J, and fitting nicely in the tube brings up the fluid which is cut off thereby. This arrangement of parts obviates any packing, a most desirable result, particularly in oil wells, where it is so much more liable to be destroyed and more difficult to replace.

In the lower end of the pump I have a valve, *v*, which works in a basket valve-seat, X. The outside of this valve-seat has a thread cut on it which takes into one cut on the inside of a ring, *r*. Between this ring and a flange, *p'*, on the upper part of valve-seat, I put a packing-ring, *l*, of any suitable material. It will be seen how, by screwing the lower part, A', onto the end of the pipe A, through shoulders on each, the ring and packing are held between the two. This ring may be pinned to part A', or can otherwise be a part of it. The valve-seat being screwed into this ring cannot be

forced up by the pressure of the gas or fluid. This is an advantage, particularly as it will admit of being removed and replaced, as will be explained. The handle of this valve-seat is shown in section in the pump in plan by *h'*, Fig. 6. In the center there is a slot, *s*, and on the under side two projections, *p*. The purpose of this handle and slot is to enable the valve-seat to be unscrewed and taken up, put down and secured, when desirable, in case any repairs should be needed; and this is effected by means of the lower part, *n*, of the nut *N*, which is so shaped as to enter the slot *s*, like a key, when let down. Then when turned through the rod *C* it comes against the projections *p*, and continuing on the valve-seat is unscrewed and can be raised with the piston. A reverse movement will secure it in its place in the ring *r*, which remains down. This nut therefore performs an extra and a very useful and novel function.

The minimum or contracted size of the piston does not affect the nature of the invention, and can easily be determined by experiment; and to give a maximum result it may be one-third less than the whole size of the chamber in which it works.

To suit the power without changing the speed, and secure a uniform flow of liquid, while the

supply of oil or pressure of gas may vary as well as depth of the well, it is that the diameter of the piston may be varied. By this variation the pump may be made a single-action lifting-pump or double-action or force-pump. It is less liable to get out of order than others, has no packing, requires less power, having less friction, and it can be worked to advantage in the body of oil in a well.

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

1. The compound adjustable piston *G*, constructed and operating substantially as described, for the purpose set forth.
2. The combination, with piston *G*, of sliding valve *V*.
3. The nut *N* on the lower end of the piston *G*, constructed substantially as described, and arranged in relation to and operating to unscrew and lift the valve-seat *X*, and the reverse.
4. The ring *r*, as arranged in relation to the valve-seat, and the piston and its rod, substantially as shown and described.

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Witnesses:

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