

D. C. BRAWLEY.

METHOD OF PUMPING OIL WELLS.

No. 176,274.

Patented April 18, 1876.

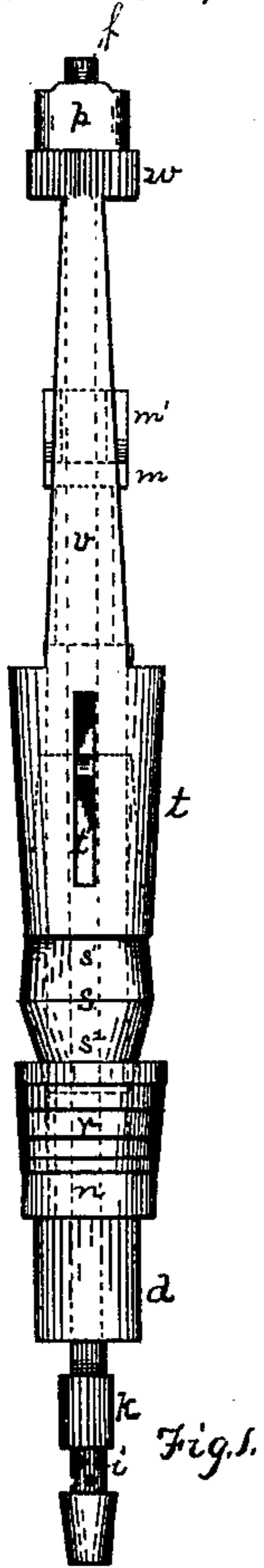


Fig. 1.

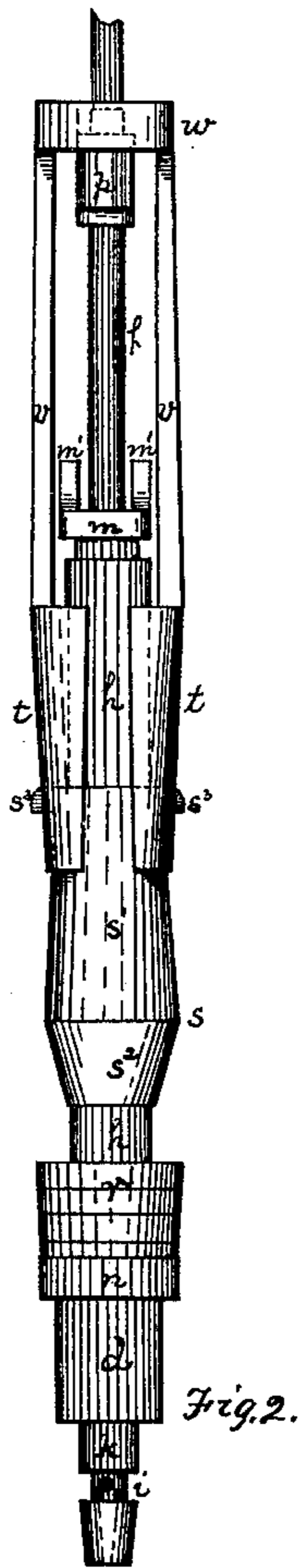


Fig. 2.

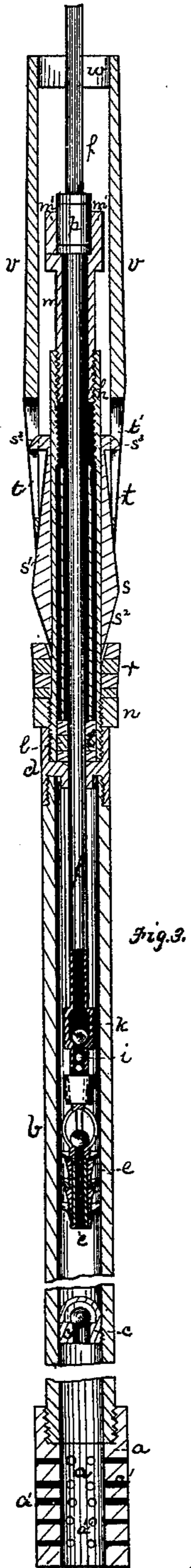


Fig. 3.

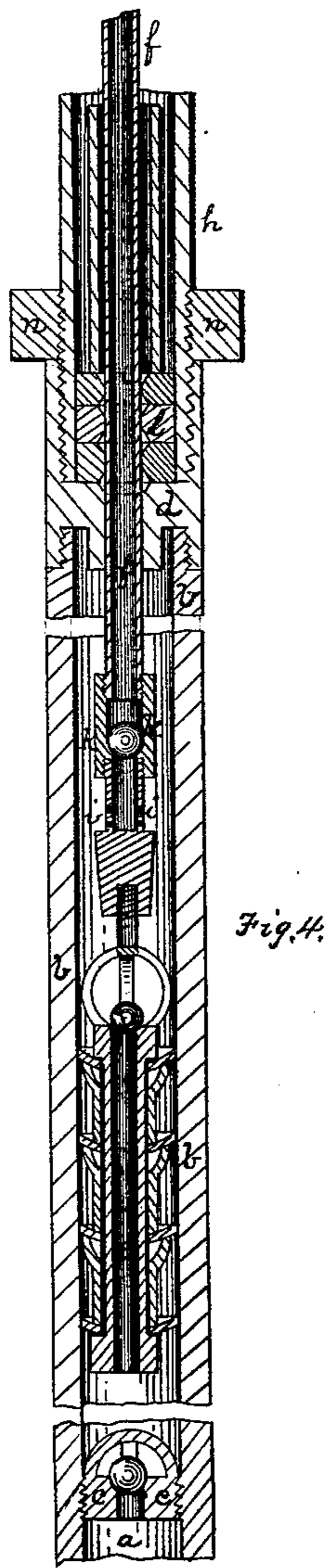


Fig. 4.

WITNESSES

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IMPROVEMENT IN METHODS OF PUMPING OIL-WELLS.

Specification forming part of Letters Patent No. **176,274**, dated April 18, 1876; application filed February 10, 1876.

To all whom it may concern:

Be it known that I, DEWITT C. BRAWLEY, of Parker township, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Method of Pumping Oil-Wells; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side view of the devices used by me in carrying out my invention, showing the mode whereby they are anchored and held in working position in the well. Fig. 2 is a front view, showing the mode whereby my devices are loosened and removed from the well. Fig. 3 is a sectional view of the devices used for carrying out my invention, and Fig. 4 is an enlarged sectional view of the working-barrel, working-valve, and connections therewith.

Like letters of reference indicate like parts in each.

Hitherto, in the pumping of oil-wells, it has been usual to extend an iron tubing to or near the bottom of the well, having a working-barrel attached to the bottom of the tubing. A plunger or working-valve was then extended by means of sucker-rods to the bottom of the tubing, and by power applied from above, worked in said working-barrel, forcing the oil through said tubing to the top of the well. This method of pumping oil-wells was expensive, as it was necessary to have both the tubing and sucker-rods.

By my improvement I am enabled to dispense with the sucker-rods in the well, thus saving much time and labor, as also the cost of the same.

My invention relates to devices for pumping oil and similar wells.

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

In the drawing referred to *a* is the anchor at the bottom of the well, provided with the openings or perforations *a'* for the passage of the oil from the oil-bearing rock. Above the anchor *a*, and attached thereto, is the working-barrel *b*, provided with the standing valve *c*. These are of the usual construction, except

that the working-barrel is provided at the top with the head and coupling *d*, through which the tube which takes the place of the sucker-rod works. In the working-barrel *b* is the working or plunger valve *e*, which is attached to the sucker and conducting tube *f* in any suitable way. This tube *f* is an iron tube, from one-quarter inch to two inches in inside diameter, the diameter varying according to the capacity of the well, and is continued to the top of the well by extensible connections of tubing in the usual way, and attached to the walking beam of the engine. Just above the connection with the working-valve *c* I make the openings or perforations *i*, through which the oil passes from the working-barrel into the tube. Just above the perforations in the tube *f* I place the check-valve *k*. Attached to the head *d* is the stuffing-box *h*, through which the tube *f* works, and which is filled with any suitable packing, *l*, secured and tightened therein by the follower *m*. This follower *m* is provided with screw-thread, which works in corresponding screw-thread in the box *h*, and also with the arms *m'* *m'*. Rigidly attached to the tubing *f* is the flat jar-head *p*. On the stuffing-box *h*, above its connection with the head *d*, I screw the ring *n*, upon which the packing *r* rests. This packing *r* is of rubber, leather, cork, or other substance suitable for the purpose. Sliding on the stuffing-box *h* is the hollow double cone *s*, the cone *s'* tapering upwardly, and the cone *s''* downwardly. At the top of the cone *s'* are the lugs or projections *s'''*. Attached to the hollow shoulder or yoke *w*, through which the tube *f* and jar-head *p* pass, are the reins *v* carrying the slips or wedges *t*, which slide upon the upper cone *s'*. In the slips *t* are the slots *t'*, in which the lugs *s'''*, on cone *s*, work. The hollow shoulder or yoke *w* is flattened, so that the jar-head *p* will pass through it when in line therewith; but when given a quarter-turn will form a "jar" therewith, either above or below the shoulder.

The method of securing and working my improved devices in the well is as follows: The devices are let down into the well in the position shown in Fig. 2, the wedges *t* and cone *s* being suspended on the jar-head *p* by the shoulder *w*, so that they will not bind in the

well, and the whole apparatus being suspended and lowered on the working-tube *f*. When the anchor *a* strikes the bottom of the well, the jar-head *p* is turned in line with the shoulder *w* passing through it. The head *p* is then given one-quarter turn, and is dropped upon the shoulder *w*, forming a jar and forcing the slips or wedges *t* down upon the cone *s*¹ until they strike the wall, when they, in turn, force the cone *s*² into the packing *r*, and expand it against the wall, thus preventing the liquid from escaping outside of the tube *f*. The friction of the wedges *t* upon the wall of the well prevents the pressure of the packing from raising the cone. After the apparatus has been securely anchored in the well, the jar-head *p* is again turned in line with the shoulder or yoke *w*, and passing through allows the working-valve *e* to enter the working-barrel *b*.

By means of power applied from the walking-beam, through the conducting-tube *f*, the working or plunger valve *e* is operated in said working-barrel *b*, drawing the oil from the openings in the well or crevices in the rock through the anchor *a*, and standing valve *c* into the working-barrel. Upon further operation of the working-valve the oil is forced above the valve through the perforations *i* into the conducting-tube *f* to the top of the well, whence it is carried by hose or other connection to the tank. The check-valve *k*, placed just above the perforations *i*, carries the oil in the conducting-tube *f*, and prevents its weight from bearing on the working-valve *e* and stuffing-box *h*. This valve *k* will not be in all cases necessary, as I find the apparatus works well without it. When the packing in the stuffing-box *h* becomes loose the flat jar-head *p* is lowered between the arms *m'* of the follower *m*, and being turned from above screws the follower into the box *h*, and thus tightens the packing.

When the apparatus is to be withdrawn from the well the jar-head is raised until it comes against the shoulder or yoke *w*. By "jarring" upon the shoulder *w* the wedges *t* are lifted from their position, and with them, by means of the lugs *s*³, the cone *s*, thus loosening the packing *r* and allowing the apparatus to be lifted to the top of the well by the tubing *f*.

. In some cases, where a smooth wall cannot

be found at the bottom of the well, it will be necessary to lengthen the connection between the working barrel *b* and coupling-head *d*, and also the conducting-tube *f* by means of tubing of the proper size.

I am aware that a hollow piston-rod, having the piston valves or plunger connected therewith, has been used in conjunction with a working-barrel or cylinder attached to the bottom of the well-casing or line of tubing, and do not herein claim such subject-matter; but I am not aware that the hollow piston and plunger have been so combined with a working-barrel or cylinder that the barrel could be lowered by means of the piston-rod, and then anchored in the well by suitable devices, so as to dispense with the expensive line of tubing or casing, which has heretofore been attached to the working-barrel, and by means of which the barrel has heretofore been lowered and retained in position; and therefore

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

1. In a pump, for oil and similar wells, the combination of the working-barrel and suitable devices, substantially as hereinafter described, for anchoring the barrel with the plunger or bucket, and the discharge-tube, connected to and adapted to reciprocate the plunger, substantially as and for the purpose specified.

2. The combination of the packing, the sliding cone, the jar, and suitable intermediate devices for transmitting the stroke of the jar, substantially as and for the purpose specified.

3. The combination of the packing, the sliding double cone, and the wedges or slips for locking the cone, substantially as specified.

4. The combination of the jar-head *p*, rigidly attached to tubing *f*, shoulder or yoke *w*, reins *v*, and wedges *t*, substantially as and for the purposes set forth.

5. The combination of the tubing, the jar-head, the follower, and stuffing-box, substantially as and for the purpose described.

In testimony whereof I, the said DEWITT C. BRAWLEY, have hereunto set my hand.

DEWITT C. BRAWLEY.

Witnesses:

JAMES I. KAY,
J. J. CAMPBELL.