

(No Model.)

E. S. WILLIAMSON.

APPARATUS FOR PUMPING AND FLOWING OIL WELLS.

No. 262,874.

Patented Aug. 15, 1882.

Fig. 3

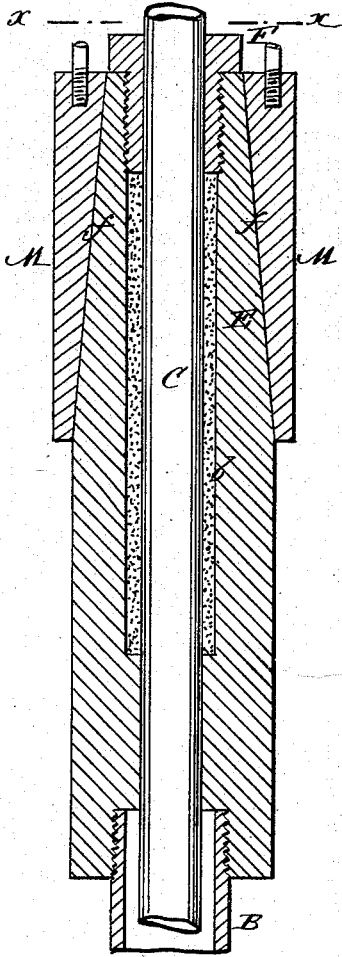
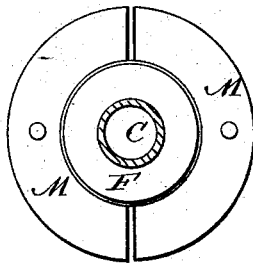


Fig. 4



WITNESSES:

C. Neveu
C. Sedgwick

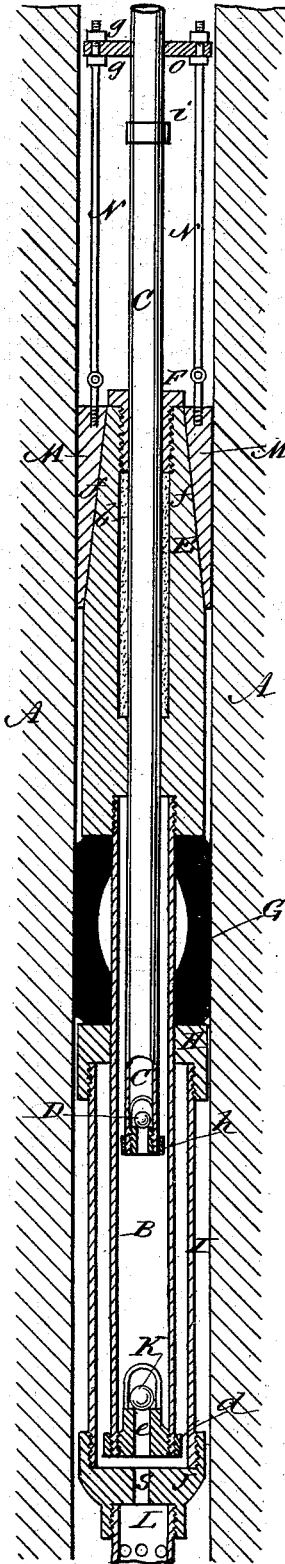
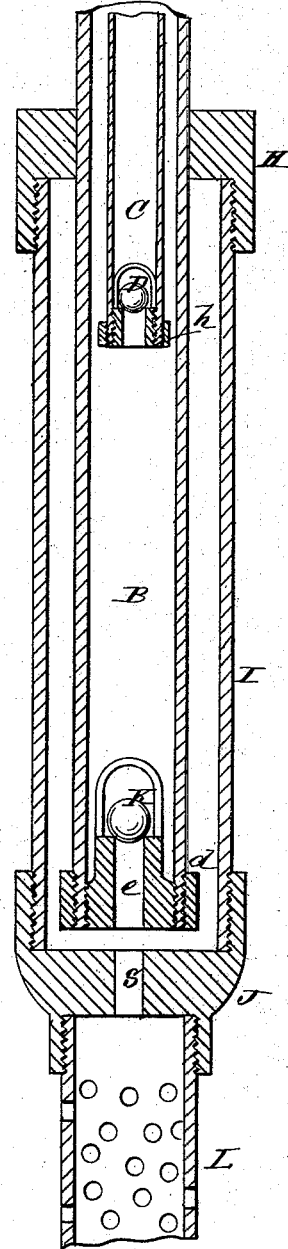


Fig. 1

Fig. 2



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ELI SAMUEL WILLIAMSON, OF BRADFORD, PENNSYLVANIA.

APPARATUS FOR PUMPING AND FLOWING OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 262,874, dated August 15, 1882.

Application filed May 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, ELI SAMUEL WILLIAMSON, of Bradford, in the county of McKean and State of Pennsylvania, have invented a new and Improved Apparatus for Pumping and Flowing Oil-Wells, of which the following is a full, clear, and exact description.

In pumping oil-wells it has heretofore been customary to employ means substantially as follows for raising the fluid to the top of the well: A long line of tubing of, say, two inches in diameter (more or less) is sunk in the ground or rock and becomes a permanent fixture. Inside of this tubing a long line of wooden rods having a valvular bucket at their lower end is reciprocated up and down for action in concert with a valve at the bottom of the tubing, whereby the oil is raised as required. In my improved apparatus I dispense both with this long line of fixed and close-fitting tubing and with the wooden pump-rods, and substitute therefor a much smaller movable tube, which acts both as pump-rod and conductor for the oil, and a working-barrel anchored at or near the bottom of the well.

The invention consists in certain novel constructions and combinations of parts, including an independent wedging device, an elastic or flexible packer, and a slip-joint construction of tubes, whereby the anchoring of the apparatus is readily effected, its removal provided for, provision made for working the well either by flowing or pumping it, and other advantages are obtained.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a vertical section of an oil-well with my improved apparatus applied; Figs. 2 and 3, vertical sections of detached portions thereof upon an enlarged scale, and Fig. 4 a transverse section on the line *xx* in Fig. 3.

A indicates the walls of the well, and B is the working-barrel, of reduced diameter, anchored at or near the bottom of the well, substantially as hereinafter described.

C is the pumping-tube, arranged to extend from or above the top of the well-hole to or near the bottom of the working-barrel. Said pumping-tube, which is fitted at its lower end with a valve, D, opening inward, passes through

an externally conical or tapering elongated box, E, which is constructed to receive within it a packing, *b*, for the pumping-tube C, and is fitted with a follower, F, that closes down on the packing.

The working-barrel B, which may be two inches in diameter (more or less) internally, is screwed at its upper end into the lower end of the box E, and extends down through a rubber or other suitable packer, G, and from thence through a flange or upper head, H, of an enlarged lower tube, I, which is fitted at its bottom end with a reducing-coupling, J, having an inlet, S, through it.

Upon the lower end of the working-barrel B, on the outside thereof, is screwed a ring, *d*, and on the inside of its lower end is fitted a valve, K, which opens upward, and when down closes an inlet-aperture, *e*.

The tube I, which screws at its upper end into the flange or head H and into the reducing-coupling J at its bottom, makes a perfect slip-joint over the working-barrel B.

L is a perforated pipe connected by the coupling J with the lower end of the tube I, and projecting down to or near the bottom of the well for passing the oil to the inlet-aperture *s*. The coupling J and perforated pipe L virtually form an extension of the working-barrel to or near the bottom of the well, which is anchored as follows: Arranged around the box E, or tapering portion *f* thereof, is a longitudinally-divided wedge or duplicate wedges, M M, corresponding, as regards their interior surfaces, with the upper tapering surface, *f*, of the box E, and of such diameter and construction on their exterior surfaces as to fit the walls A of the well. From each of these wedges M is projected an upward attached rein or connection, N, which connections N are secured at their upper ends to a cross-head, O, by nuts *g*, arranged above and below said cross-head. When the wedges M M are brought to bear upon the tapering surface *f* of the box E they hold the apparatus firmly to the bottom of the well, so that the pumping-tube C is free to work up and down, and, as it is packed in the box E by the packing *b*, every time it makes a downstroke the fluid is forced up within it and ultimately to the top of the well.

The lower end of the pumping-tube C has a collar or projection, *h*, on it, and the upper

portion of said tube above the box E is fitted with a similar collar or projection, *i*. These collars are arranged at a suitable distance apart, and the several portions of the apparatus are of such proportions and length as to provide for the following manipulation and adjustment of the apparatus.

When it is required to remove the apparatus from the well the pumping-tube C is drawn up until the collar *i* comes in contact with the cross-head O. This raises the wedges M M and carries them up clear of the tapering surface *f* of the box E. Subsequently, and by continuing the upward movement of the tube C, the collar *h* is brought in contact with the lower end or portion of the box E and both move up together, allowing the packer G and the flange or head H of the tube I to remain stationary until the ring or projection *d* on the bottom of the working-barrel comes in contact with flange H, when, or after which, by continuing the upward pull on the pumping-tube, the whole apparatus is drawn out of the well. The ring *d* prevents the flange H, with its attached tube I and the rubber packer G, from becoming detached or slipping off when the apparatus is being drawn from the well.

When the apparatus is in place in the well any upward tendency of the box E to be lifted in the working of the pumping-tube C is resisted by the wedges M M, which are forced against the walls of the well, and the packer G, which was compressed by the pumping-tube C, resting by its collar *i* on the box E, and expanded laterally so as to bear against the walls of the well, acts, in conjunction with the wedges, to hold the apparatus in position, or, in other words, to anchor it, as required, within the well. By the use of this packer G the oil may either be supplied by direct flow—that is, when there is a sufficient natural pressure—or by the working of the pumping-tube, as described.

The wedges M may be made either of metal or any other hard material. The valves D and K may be of any suitable kind or construction.

By the slip-joint construction of the apparatus every facility is afforded for raising or lowering it, and for adapting it to wells of different depths and sizes, and for removing it when required, as hereinbefore described.

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

1. The combination, with the tapered box E, with the pumping-tube passing through it, of the wedges M, connected to a cross-head, O, capable of being acted on by a collar on the pumping-tube, substantially as and for the purpose set forth.

2. The combination of the head H of the pipe I, packer G, and tapered box E, connected to the cross-head O by tightening screws N and resting upon the packer, substantially as and for the purpose set forth.

3. The pumping-tube C, having a valve, D, in combination with the working-cylinder B, having a valve, K, and the outer tube, I, fitted to form a slip-joint on the working-barrel, and provided with a lower perforated pipe, L, substantially as specified.

4. The combination, with the pipes I L, connected together, the head H, connected to pipe I, and the box E, of the working-cylinder B, having a valve and collar and connected to said box, and the pumping-tube C, having a collar at its lower end, substantially as and for the purpose set forth.

5. The combination of the wedges M M, the cross-head O, to which said wedges are attached, the pumping-tube C, with its collars or projections *h i*, the tapering box E, the working-barrel B, with its lower collar or projection, *d*, and the outer tube, I, with its head or flange H, essentially as and for the purposes herein described.

ELI SAMUEL WILLIAMSON.

Witnesses:

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