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PATENTED MAY 9, 1905.

L. E. ROBINSON.
COMBINED SAND PUMP AND BAILER.

APPLICATION FILED AUG. 31, 1904.

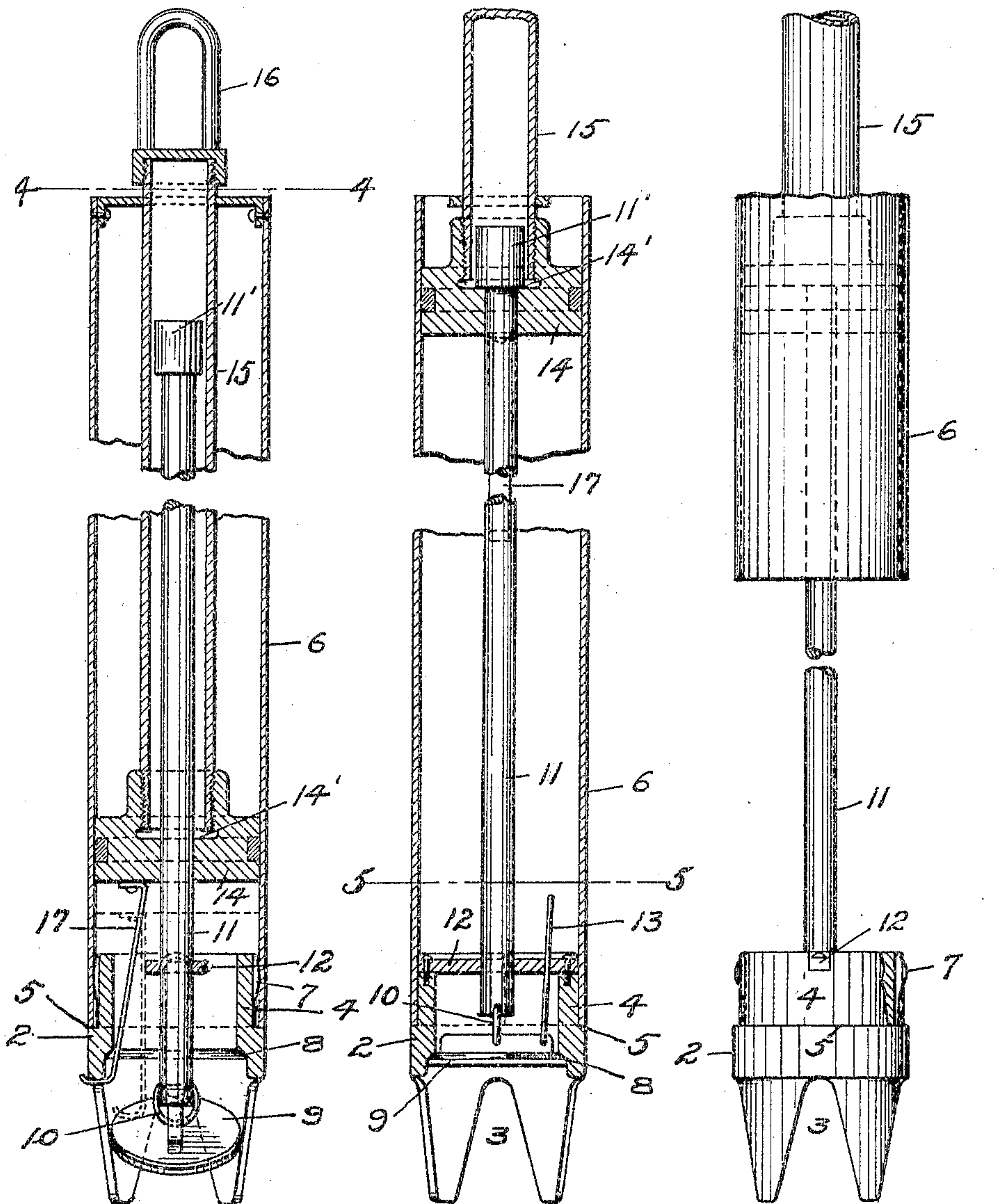


Fig. 1

Fig. 2

Fig. 3

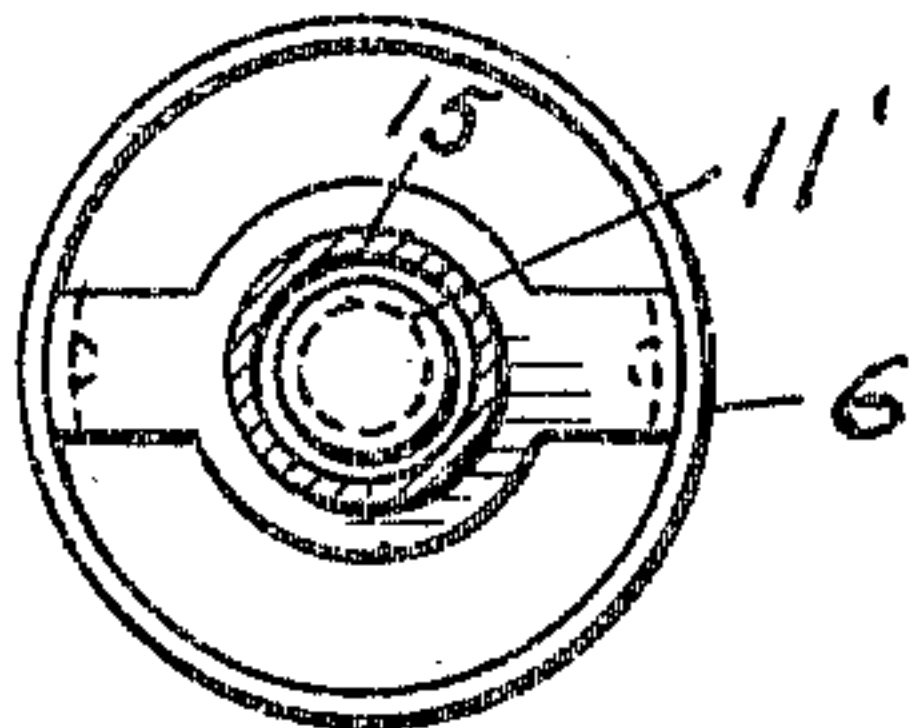


Fig. 4

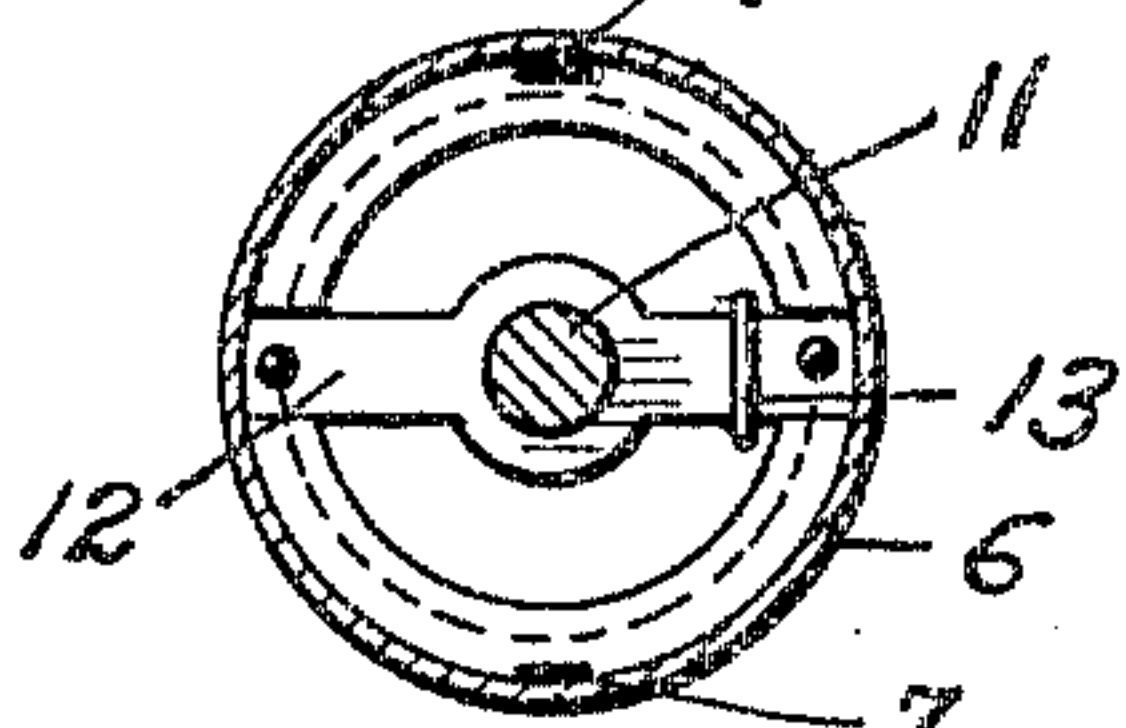


Fig. 5

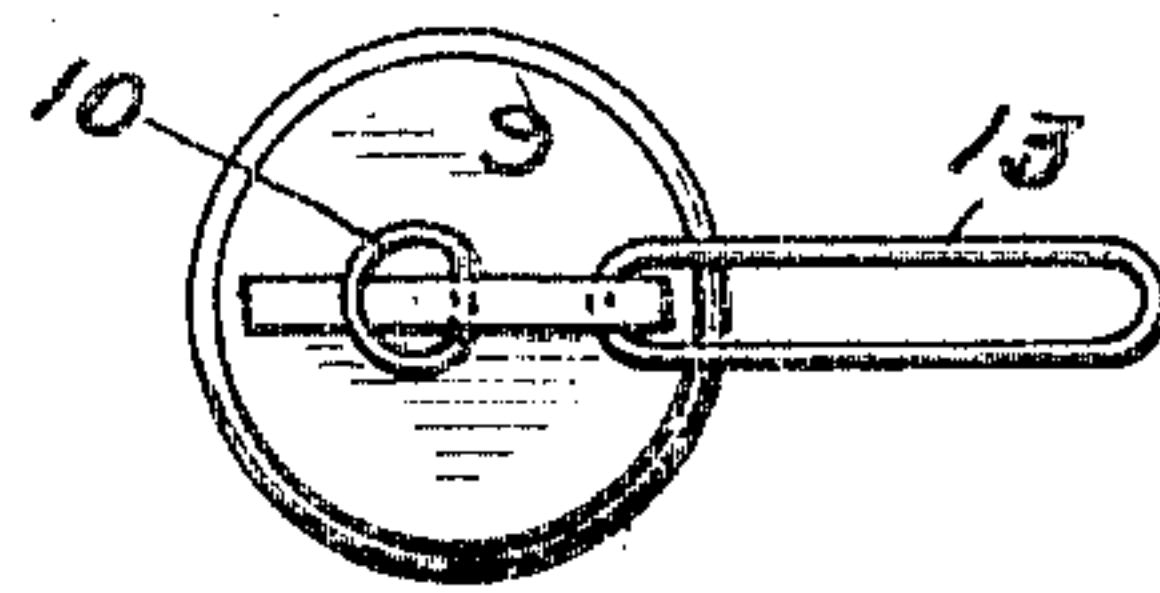


Fig. 6

WITNESSES
Lindsay & Little
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UNITED STATES PATENT OFFICE.

LAWRENCE E. ROBINSON, OF BUTLER, PENNSYLVANIA.

COMBINED SAND-PUMP AND BAILER.

SPECIFICATION forming part of Letters Patent No. 789,567, dated May 9, 1905.

Application filed August 31, 1904. Serial No. 222,820.

To all whom it may concern:

Be it known that I, LAWRENCE E. ROBINSON, a citizen of the United States, residing at Butler, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in a Combined Sand-Pump and Bailer, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a combined sand-pump and bailer for cleaning out drilled wells; and the primary object is to provide improved valve mechanism for the base of the pump.

A further purpose is to provide for holding the pump collapsed or with the plunger in the lower portion of the cylinder while the same is being lowered into the well.

The invention consists in the novel features of construction and in the combination of parts hereinafter fully described and claimed, and illustrated by the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of the pump, showing the position of the parts when being lowered into a well. Fig. 2 is a view similar to Fig. 1, showing the position of the parts as the filled pump or bailer is being drawn upward in the well. Fig. 3 is an elevation, partly in section, showing the cylinder detached from the pump-base to facilitate the dumping or emptying operation. Fig. 4 is a sectional plan view taken on line 4 4 of Fig. 1, and Fig. 5 is a similar view taken on line 5 5 of Fig. 2. Fig. 6 is a plan view of the valve.

In the present embodiment of the invention the base of the pump consists of a circular body 2, which is adapted to rest on the bottom of the well and which has side incisions 3, through which the sand and water may readily enter and be drawn upward into the pump-cylinder. The upper portion of the base is reduced exteriorly at 4, forming shoulder 5, and detachably embracing the reduced portion and resting on the shoulder is the elongated pump-cylinder 6. To prevent accidental displacement of the cylinder, the same may be impinged by outwardly-bowed springs 7, secured in recesses in the face of reduced portion 4.

Formed in the interior of body 2 is the inverted beveled valve-seat 8, and fitting this seat is the downwardly-opening disk valve 9. The upper face of this valve is secured centrally by link 10 to the lower end of rod 11, the latter being operative through guide 12, traversing the upper end of base 2. Extending upward from the valve at one side of its center is link 13, which embraces one of the arms of guide 12 and operates to suspend the valve in open position, as indicated in Fig. 1, when the pump or bailer is filling. At the same time link 13 so holds the valve that when rod 11 is drawn upward the valve will be properly seated.

Movable over rod 11 is plunger 14, and projecting upward from the plunger is tubular stem 15, which telescopes rod 11 and which at its upper end has the suspending-loop 16. The movement of tubular stem 15 over rod 11 corresponds to the length of cylinder 6 or the stroke of plunger 14, as when the latter approaches the upper end of the cylinder the head 11' at the upper extremity of rod 11 engages the inner shouldered face 14' of the plunger, thus moving upward rod 11 and closing valve 9 and providing a positive lifting or elevating connection with the lower portion of the pump, the cylinder simply resting on the pump-bottom and confining the water or sand, or both, as the case may be.

After the pump has been raised out of the well it is caused to stand upon its lower end on the derrick-floor or other convenient place, and with the upward pull on stem 15 slackened the valve is opened automatically by the weight of the cylinder contents and the latter are discharged. The pump may be entirely emptied in this way, or the emptying operation may be facilitated, especially when sand is being removed, by raising the pump-cylinder from the base, as indicated in Fig. 3.

To hold the plunger at the bottom of the cylinder while being lowered into the well, so that the valve will be open and the plunger in position to be drawn upward for filling the cylinder, I provide a spring-hook 17, which may depend from the under side of the plunger and be sprung outward into one of bottom incisions 3, as shown in Fig. 1. As soon

as the pump reaches and rests on the bottom of the hole plunger 14 and stem 15 will lower by its own weight sufficiently to permit hook 17 to spring inward out of engagement with the pump-bottom, as shown in dotted lines in Fig. 1. The plunger is then free to move upward within the cylinder and fill the same.

The pump-cylinder has absolutely smooth inner and outer faces, so that there are no lateral irregularities or projections to interfere with the free passage of the pump or bailer into the well or to retard the upward movement of the cylinder over the contents thereof, as in Fig. 3.

As I believe myself to be the first to connect the elevating means to the lower portion of the pump independently of the cylinder, also the first to provide for separating a smooth cylinder from the pump-base, and also the first to provide a positively-operated base-valve, I do not confine myself to the structural arrangement thereof herein disclosed, and it will be understood that other features may be changed without departing from the spirit of the invention as defined by the appended claims.

The tool may be used as a sand-pump for removing sand and water or as a bailer for water only without rearranging the valve or any other part.

I claim—

1. A sand-pump comprising a base having an inverted valve-seat, a downwardly-opening valve, a link connected to the valve at one side of its center and having limited vertical movement in the base, a cylinder, and valve-operating means extending through the cylinder and centrally connected to the valve.

2. A sand-pump comprising a base having a valve-seat, a downwardly-opening valve, a cylinder rising from the base, valve-operating means extending through the cylinder, and valve-suspending means separate from the operating means for limiting the downward movement of the valve.

3. A sand-pump comprising a base having

a valve-seat, a downwardly-opening valve, a cylinder rising from the base, a valve-operating rod extending through the cylinder and having loose connection with the valve, and valve-suspending means separate from the said rod for limiting the downward movement of the valve.

4. A sand-pump comprising a base having a valve, a cylinder rising from the base, a valve-operating rod extending through the cylinder and loosely connecting with the center of the valve, and valve-suspending means at one side of the said rod for limiting the downward movement of the valve and for holding the same tilted or inclined when open.

5. A sand-pump comprising a base having a valve-seat, a bar extending across the base, a cylinder rising from the base, a valve-operating rod extending through the cylinder and loosely connected with the center of the valve, and link 13 extending upward from one side of the valve and embracing the said bar.

6. A sand-pump comprising a cylinder, a plunger movable in the cylinder, a base-valve, and means operated by the movement of the plunger within the cylinder for holding the plunger in lowered position within the cylinder while the pump is being lowered in a well.

7. A sand-pump comprising a base, a cylinder extending upward therefrom, a base-valve, a plunger operative within the cylinder, and a spring-arm depending from the plunger adapted to be sprung laterally and removably engage the base and be held in such engagement by the upward pull of the plunger, whereby when the base strikes bottom and the plunger moves downward within the cylinder said spring-arm automatically releases and permits the plunger to move upward.

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

LAWRENCE E. ROBINSON.

Witnesses:

SAMUEL S. ATWELL,
CHAS. H. MILLER.