(No Model.)

G. PALM.

SAND PUMP.

No. 563,055. Patented June 30, 1896.

Fig. 1.

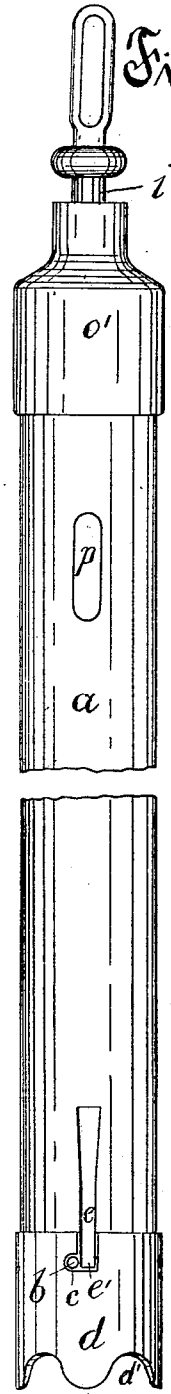


Fig. 2.

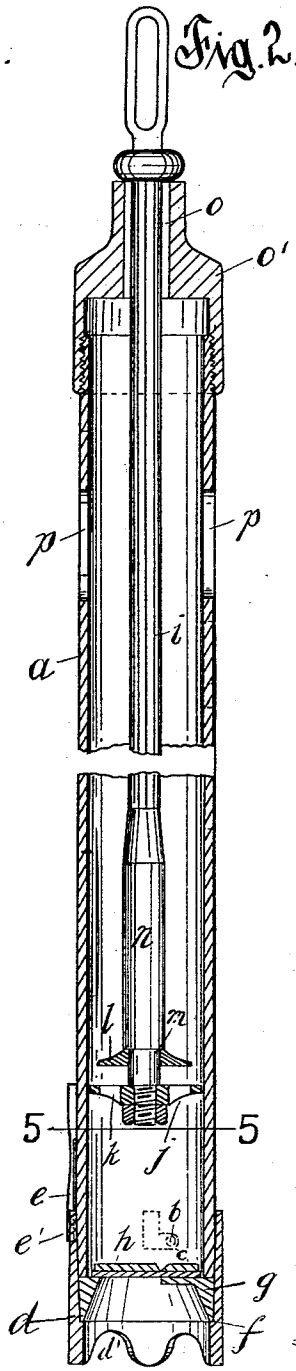


Fig 5.

Fig 4.

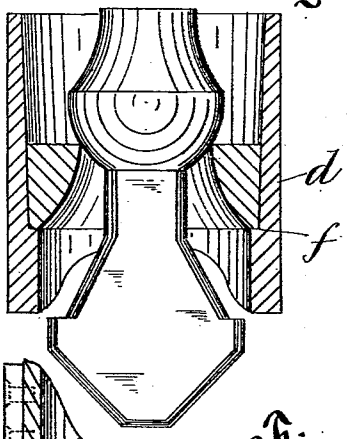
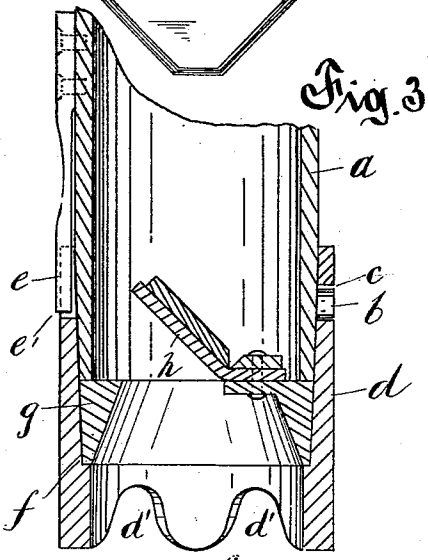


Fig. 3



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UNITED STATES PATENT OFFICE.

GEORGE PALM, OF BUTLER, PENNSYLVANIA.

SAND-PUMP.

SPECIFICATION forming part of Letters Patent No. 563,055, dated June 30, 1896.

Application filed September 7, 1895. Serial No. 561,730. (No model.)

To all whom it may concern:

Be it known that I, GEORGE PALM, a resident of Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Sand-Pumps; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to sand-pumps, or "bailers," as they are sometimes termed, such as are employed in connection with the drilling of oil-wells and like wells.

My invention comprises certain improvements in these pumps, all of which will be hereinafter fully set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved pump. Fig. 2 is a vertical section thereof. Fig. 3 is an enlarged sectional view of the end of the pump. Fig. 4 is a view of a dart-valve to be used in connection with my improved pump, and Fig. 5 is an enlarged section on line 5 5, Fig. 2, looking upwardly.

Like letters indicate like parts in each of the figures.

The cylinder *a*, which contains the pump mechanism, may be of any desired length and this length may be increased over that of the ordinary sand-pump, as it is not necessary to invert the cylinder in my pump after the same has been filled with water and sediment taken from the well, the pumps having been made of different lengths between twenty-five and forty feet. At the lower end of the cylinder *a* are the lugs *b*, said lugs being adapted to engage with the seats *c* in the ring or collar *d*, the connection between said ring or collar *d* and the casing *a* being made by what is generally known as a "bayonet-joint." A spring *e*, secured to the cylinder *a*, has its free end *e'* entering one of the seats *c*, whereby said spring locks the bayonet-joint and prevents the disengagement of the ring or collar *d* from the cylinder *a* until the free end of said spring is thrown out to allow for the turning of the ring *d* to release it from the lugs *b*. This ring or collar *d* has inwardly-tapering walls, which form a seat *f*, adapted to receive a tapering valve-seat *g*, which has the clack-valve *h* mounted thereon, the inwardly-tapering walls and the tapering outer face of the valve-seat being employed, so that the valve-seat will naturally wedge within the collar *d* and bind thereto, so that it forms part of the collar for ordinary handling, but can be easily removed therefrom, as hereinafter described. The ring *d* has the recesses *d'* to allow the water to pass down under said ring. When the ring *d* is in position, the lower end of the cylinder *a* will come in contact with the tapering valve-seat *g* and hold the same securely in position.

Within the cylinder *a* is the piston-rod *i*, said piston-rod having secured to the end thereof the piston *j*. This piston *j* has the apertures *k* formed therein. A plate *l* above the piston *j* is adapted to cover the apertures *k* of the piston *j*. The movement of this plate *l* is regulated by the shoulder *m* on the piston-rod *i*. The piston-rod *i* has the enlargement *n* formed thereon just above the piston *j*, said enlargement being adapted to fit neatly within the opening *o* in the cap *o'* of the cylinder *a*. The cylinder *a* has the openings *p* at the upper end thereof, to allow for the escape of the fluid above the piston *j* when said piston is raised.

When my improved pump is in use, it is lowered into the well, the upper end of the piston-rod *i* being connected to the cable or rope which is attached to the walking-beam. As the piston is lowered the plate *l* will be raised, allowing the fluid to pass up through the apertures *k* in said piston, while upon the descent of said piston the plate *l* will close the apertures *k*. By having the enlargement *n* on the piston-rod *i*, I am enabled to cushion the stroke of the piston *j*, for as said piston rises beyond the openings *p* in the cylinder the enlargement *n* will enter the opening *o* in the cap *o'*, practically filling the same or choking it, so that there is but a slow escape of fluid, giving the dash-pot action and cushioning the piston, and the water not being allowed to escape, to any great extent, through the opening *o* in the cap *o'* on account of the enlargement *n*, whereby said piston will be prevented from striking the cap *o'*. This is an important feature, as where a wire cable is employed for pumping the piston often

strikes with considerable force against the upper end of the pump, which action is very severe on the piston.

When the cylinder *a* is withdrawn from the well, it is only necessary to draw out the free end *e'* of the spring *e* and turn the ring *d* to release it from the cylinder. Upon the removal of said ring the contents of the cylinder *a* will be discharged therefrom without the necessity of tilting the pump. This bayonet-and-spring connection gives a quick and ready means for removing the valve, as upon the turning of the ring to bring the lugs and slots into line the water in the pump will force down the ring and valve and the operator can draw them to one side, leaving free escape for the contents. To obtain successful results it is necessary to have such quick means of releasing the rings and cap. All the solid contents can therefore be easily discharged from the bottom of the pump and without turning the pump over, as is usual with ordinary sand-pumps used in Artesian wells. In this way the pump can be constructed to any length desired.

In case it is desired to use a dart-valve, such as shown in Fig. 4, the valve-seat *g* can be readily removed from the ring *d* and the tapering valve-seat of the dart-valve can be fitted within the tapering seat *f* and the ring *d* can be adjusted to position with the end of the cylinder *a*, raising with it the tapering valve-seat to hold it in position.

In my improved pump the contents may be discharged without difficulty, while at the same time different kinds of valves may be secured in place quickly.

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

1. In a sand-pump, the combination of a suitable cylindrical shell, a ring forming a valve-seat connected to the lower end of said shell by means of a bayonet-joint, and a spring adapted to lock said joint, substantially as set forth.

2. In a sand-pump, the combination of a suitable cylindrical shell, a removable ring connected to the lower end of said shell by means of a bayonet-joint and a spring to lock said joint, said ring having a tapering inner face, and a valve-seat having a tapering outer face and engaging with said ring, substantially as set forth.

3. In a sand-pump, the combination of a suitable cylindrical shell, having a contracted opening at the upper end, and escape-ports near the upper end, of a piston contained therein, and a piston-rod engaging with the piston and passing through such contracted opening of the cylinder and having an enlargement just above said piston adapted to enter said contracted opening, substantially as set forth.

I testimony whereof I, the said GEORGE PALM, have hereunto set my hand.

GEORGE PALM.

Witnesses:
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