G. W. ROSE.
Sand Pump.

No. 233,549. Patented Oct. 19, 1880.

Fig. 1.

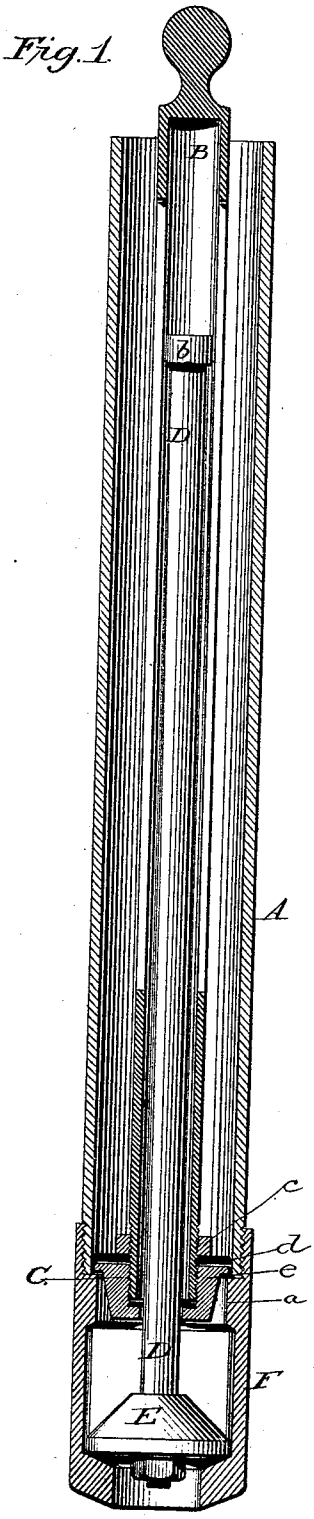


Fig. 2.

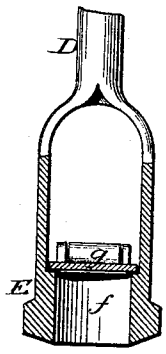


Fig. 3.

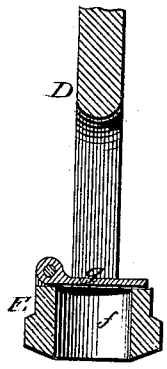
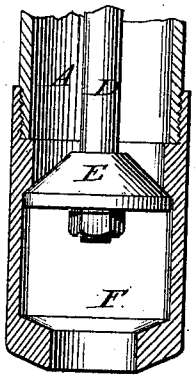


Fig. 4.



Attest.

Sidney P. Hollingsworth
F. A. Law

Inventor:
George W. Rose,
by Dodger Low,
Attys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. ROSE, OF BRADFORD, PENNSYLVANIA.

SAND-PUMP.

SPECIFICATION forming part of Letters Patent No. 233,549, dated October 19, 1880.

Application filed February 27, 1880.

To all whom it may concern:

Be it known that I, GEORGE W. ROSE, of Bradford, in the county of McKean and State of Pennsylvania, have invented certain Improvements in Sand-Pumps, of which the following is a specification.

This invention relates to that class of devices commonly known as "sand-pumps," which are employed to remove sand, chips, drillings, &c., from bored wells during the operation of sinking the same.

The invention consists in various details of construction, which are hereinafter described in detail, but more particularly in combining with an upwardly-acting bottom valve a secondary central valve therein, and in connecting the piston and the upwardly-closing bottom valve in such manner that the former closes the latter and lifts the pump with an easy action and without shock.

Figure 1 represents a vertical central section of my pump with the piston depressed; Figs. 2 and 3, vertical central sections of the lower valve in a modified form; Fig. 4, a vertical central section of the lower end of the pump, as shown in Fig. 1, with the piston in its highest position.

The pump consists, essentially, of a cylindrical barrel or body, an internal tubular rod or stem carrying a piston at its lower end, and a central rod or stem arranged within the piston-rod and carrying at its lower end a valve, which closes against the lower end of the pump-body when the piston is drawn up to its highest point, but which falls therefrom as soon as the piston commences its descent.

Referring to the drawings, A represents the cylinder or body of the pump; B, an internal tubular rod or stem carrying at its lower end a piston, C, and D a central stem or rod sliding freely within the last-mentioned stem, and provided at its upper end with a head or enlargement, and at its lower end with a valve, E. Screwed or otherwise secured upon the lower end of the barrel or cylinder A is a valve-cage, F, open on its sides, which limits the fall of the valve E, and which is furnished with an interior ledge or shoulder, *a*, the lower face of which forms a seat for the valve, while the upper face serves as a stop to limit the downward movement of the piston, as clearly shown in Fig. 1. The valve-stem D is formed with a head or enlargement, *b*, at its upper end, which is of a diameter to fit and move freely within the tubular stem B, thus serving to guide the upper end, while the rod or stem D is further guided where it passes through the piston C, as shown in Fig. 1, the piston consisting of a nut, *c*, screwed upon the exterior of the tubular rod or stem B, a disk or washer, *d*, of leather, rubber, or like flexible material, and a cap or nut, *e*, of a diameter to fit loosely the interior of the pump-cylinder A, screwed upon the lower end of the tubular stem B, and serving to clamp and support the leather disk. The lower face of the cap *e* is provided with a central opening just large enough to permit the stem D to slide freely through it until the head *b* and cap *e* come in contact, when the two stems will move together.

The device being thus constructed, the operation is as follows: A stout cord is attached to the upper end of the piston rod or stem B, and the pump thereby lowered into the well until the lower end of the valve-cage F comes in contact with the bottom, causing the fall of the barrel or body A to cease. The gravity of the piston and its rod causes them to continue falling, thereby, also, permitting the valve E to fall from its seat on the ledge *a* to the bottom of its cage, while the piston continues to fall until it reaches the lower end of the barrel A. The cord is then drawn upward, causing the piston C to rise, whereupon the water containing the chippings, sand, &c., rushes in to fill the vacuum. When the piston has almost completed its upward movement the cap *e* of the piston engages with the head *b* of the valve-stem, raising the valve E against its seat, as shown in Fig. 4, in which position the parts remain while the entire device is withdrawn from the well by means of the cord. When the pump is raised to the surface its lower end is allowed to rest upon the ground, when, by slackening the cord, the valve E is permitted to fall and the contents of the cylinder allowed to escape at the bottom.

Instead of the solid valve shown and described in connection with Figs. 1 and 4, it is apparent that the end of the rod or stem D may be forked, and the valve E formed thereon provided with a central opening, *f*, opened and closed by an upwardly-swinging gate or leaf, *g*, or equivalent upwardly-opening device.

The operation of the device under this construction is the same as under that above described, except that the water and other matters are enabled to pass up through the valve as well as over it into the pump-cylinder.

It is apparent that the details of construction are susceptible of modification, the piston, for instance, being formed solidly upon the stem, the cage F being made in one piece with the cylinder; or the rod or stem D may be limited in its movement by a pin or set-screw. These and other modifications will readily suggest themselves to the practical mechanic.

By reference to Fig. 1, it will be observed that the lower part of the rod or stem B is in the form of a perfect or complete tube, while its upper portion is open on the sides. This construction causes the head *b* to be cushioned upon the water, or, in its absence, by the air confined in the lower part of the tubular stem B, preventing any jar or concussion in lifting the pump from the well.

Having thus described my invention, what I claim is—

1. The combination of the cylinder, a piston, and the upwardly-closing foot-valve provided with the central opening and the secondary downwardly-closing valve to close the same.

2. In a sand-pump, the combination of a body or cylinder, a piston which after rising a limited distance in the cylinder lifts the same, and a bottom valve which closes gradually as the piston is in the act of completing its upward stroke, whereby the shock produced in lifting the cylinder is deadened and diminished.

3. In combination with the rod or stem B, having the tubular closed lower end to retain water, the valve-stem D, provided with the head *b*, substantially as and for the purpose set forth.

GEORGE W. ROSE.

Witnesses:
C. TAYLOR,
W. J. MCVAY.