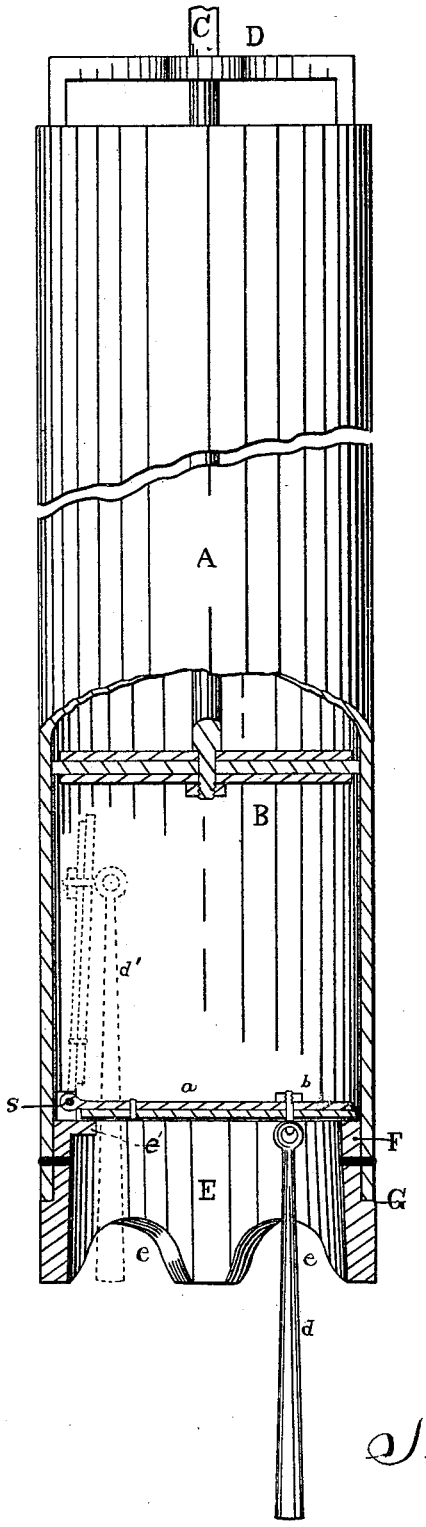
(No Model.)

S. McCAUGHTRY.

SAND PUMP.

No. 266,856. Patented Oct. 31, 1882.



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UNITED STATES PATENT OFFICE.

SAMUEL McCAUGHTRY, OF BRADFORD, PENNSYLVANIA.

SAND-PUMP.

SPECIFICATION forming part of Letters Patent No. 266,856, dated October 31, 1882.

Application filed June 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL McCAUGHTRY, of Bradford, McKean county, Pennsylvania, have invented new and useful Improvements in Sand-Pumps for Deep Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and the letters or figures of reference marked thereon.

My invention relates to that class of pumps used for removing the sand, gravel, broken rock, mud, or other sediment encountered or produced in drilling Artesian wells. The sand-pumps in common use are provided with a valve made in the form of a ball, or of an inverted truncated cone, having a stem reaching down through the bottom of the pump, so as to strike the bottom of the well and raise the valve for the admission of sediment, and also to raise the valve and allow the sediment to drop out when the pump has been drawn out of the well. This form of valve is seated centrally in the bottom of the pump, and when raised presents a narrow annular opening for the admission of cuttings of rock and other sediment. The sediment frequently collects into balls or lumps, and at other times forms a thick mud or gum of the consistency of putty, and when in these conditions can not be drawn through the narrow annular opening of the valves in common use, but remains at the bottom of the well and materially retards the process of drilling which follows.

To obviate this difficulty is the object of my invention, as shown in the drawing and specification.

The drawing represents my improved sand-pump in elevation, the lower part being cut away to a central section.

A represents the barrel of the pump; B, the piston, having a rod, C, working through the guide-bail D.

E is the valve-seat, having the upper portion, F, reduced so as to enter into the lower end of the pump-barrel, and presenting at its upper end a ledge for the valve to rest upon. The heavier lower end of the valve-seat has a shoulder, G, against which the lower end of the pump-barrel abuts. The seat may be fastened into the barrel by screw-threads or rivets or both.

a is the valve, resting on the upper edge of the valve-seat. It is hinged at *s*, so as to open upwardly and assume the position indicated by the dotted lines. When the valve is lifted part of the water runs between the rear of the valve and the barrel, and washes out over ledge *e'* any sediment which may have accumulated around the hinge, which, if this were not done, would soon become clogged.

b is an eyebolt passing through the valve, and to it is attached the stem or rod *d* in such manner as to fold toward the under side of the valve when the latter is raised and maintain a nearly-vertical position, as shown at *d'*. The stem *d* of the valve is of greater length than the height of the valve-seat, so that when the valve is closed the stem reaches considerably below the bottom of the pump. It should be of such length that when the valve is raised to a nearly-vertical position its lower end should be even with the lower end of the valve-seat, as shown in dotted lines.

e e are recesses in the lower end of the valve-seat for the passage of sediment from the outside to the inside of the pump. The operation of this pump is as follows: It is lowered into the well by a rope, called the "sand-line," attached to the upper end of the rod C. When the pump is suspended the piston is drawn to the top of the barrel, and as the pump descends the valve-stem *d* first strikes the bottom of the well and forces the valve open and into a nearly-vertical position, thus opening an inlet to the pump nearly equal to the internal diameter of the pump. After the pump-barrel has reached the bottom the momentum of the descending piston forces it down within the barrel to a point near the valve. Upon withdrawing the sand-line the piston B is first raised, while the barrel remains stationary, and a quantity of mud, sediment, or broken rock, as the case may be, is drawn into the pump. When the piston has reached the top of the pump-barrel the further withdrawal of the sand-line raises the barrel itself off the bottom of the well, and the weight of the stem *d* and of the fluid within the pump closes the valve *a* and prevents the escape of sediment from the pump. Upon reaching the top of the well the pump is rested down upon the lower end, when the valve-stem again raises the valve and the contained sediment falls out. The enlarged area of the induction-opening which this form of valve allows renders this

pump much more effective than those in common use.

I am aware that flap-valves have been used in sand-pumps, and that valves have been supplied with stems for lifting them from their seats; but I am not aware that a hinged stem has ever been pivoted to the under side of a flap-valve, so that when the latter is lifted the former will always remain in a perpendicular position, which would not be the case if the stem were rigidly attached to the valve.

What I claim as new is—

1. In a sand-pump, a flap-valve hinged substantially as shown, and having a hinged stem projecting below the bottom of the pump, for the purpose set forth.

2. In a sand-pump, the combination of a valve-seat having a ledge, *e'*, and a flap-valve having its hinge above the top of the valve and a space between the rear of the valve and the cylinder, for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of June, 1882.

SAMUEL McCAUGHTRY.

Witnesses:

GEO. A. STURGEON,

D. L. LEWIS.