W. H. BIRGE.

SAND-PUMP.

No. 191,302. Patented May 29, 1877.

Fig. 1.

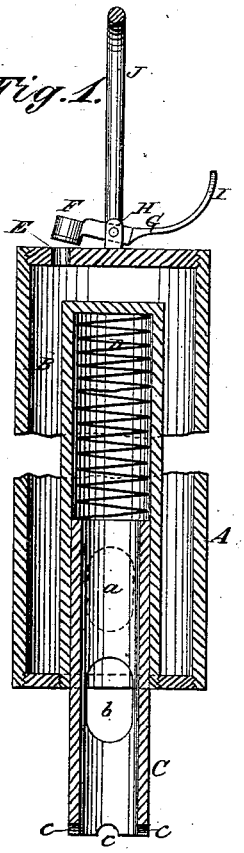
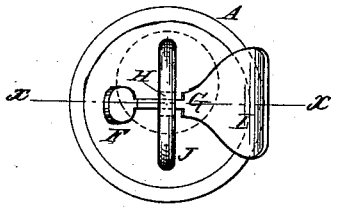


Fig. 2.



WITNESSES:

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WILLIAM H. BIRGE, OF FRANKLIN, PENNSYLVANIA.

IMPROVEMENT IN SAND-PUMPS.

Specification forming part of Letters Patent No. **191,302**, dated May 29, 1877; application filed October 23, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. BIRGE, of Franklin, in the county of Venango and State of Pennsylvania, have invented a new and Improved Sand-Pump for Oil-Wells, of which the following is a specification:

Figure 1 is a longitudinal section on line *x x* in Fig. 2. Fig. 2 is a plan view.

Similar letters of reference indicate corresponding parts.

My invention consists in the arrangement of a sliding valve in the lower end of a sand-pump, which is opened by the weight of the pump and closed by a spring. It also consists in the arrangement of an air-valve in the top of the sand-pump, which is closed by the water through which it passes, which acts on the fan-shaped end of the valve-lever, and is opened by the weight of the fan-shaped end of the lever, and by the upward pressure of air created by the entrance of water in the sand-pump.

The object of the invention is to provide a valve which will open and close with a positive motion, not depending on the action of the water or sand.

Referring to the drawing, A is the body of a sand-pump, which is closed at both ends.

B is a short tube, which is attached to the lower head of the sand-pump and projects inwardly. It is capped at its upper end and open at its lower end, and a valve-aperture, *a*, (shown in dotted lines,) is cut in one side.

C is a hollow cylindrical valve that is fitted to the tube B, and is provided with an aperture, *b*, corresponding to the aperture *a* in the tube B. A pin projecting from the valve works in a slot in the tube B, preventing the valve from turning and limiting its longitudinal motion. The valve C is opened by contact with the bottom of the well, and is closed by the spring D, which rests against the cap of the tube B, and presses upon the upper end of the valve. *c c* are notches cut in the lower end of the valve, to make a passage for the ingress of water and sand.

E is an air-aperture in the upper end of the sand-pump, which is closed by a valve, F. The said valve is attached to the end of a lever, G, which is pivoted at H and flattened and enlarged at I, forming a fan-shaped wing, which is curved upward, as shown in Fig. 1.

J is the ordinary staple or loop for attaching the rope that operates the pump. When the sand-pump is used it is lowered in the well in the usual manner. When it reaches the water the enlarged surface of the lever G is moved upward by the action of the water, and closes the valve F over the air-aperture E.

When the pump reaches the bottom of the well, the valve C strikes and remains stationary, while the body of the pump continues to fall until the opening *b* in the valve and the opening *a* in the tube B coincide, when the water and sand enter the pump, and the displaced air escapes through the aperture E, the valve F being raised by the pressure of air created by the entrance of the water and sand, and by the weight of the enlarged end of the lever G. On raising the pump the spring D moves the valve C, and closes the opening *a*, thus retaining the contents of the pump.

The advantages claimed for my invention are, that the motion of the valve is positive, not depending upon the pressure or action of the sand and water to operate it. The body of the pump can be made as long as desirable, and consequently a greater quantity of sand and cuttings can be removed at one operation than by pumps of ordinary construction.

It is obvious that sliding valves of various forms may be used; therefore I do not confine my invention to the precise construction herein shown and described.

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

1. The combination of the pump-body A, capped tube B, having the opening *a*, the valve C, having the opening *b*, and the spring D, substantially as shown and described.

2. The combination of the lever G, having the enlarged end I, the valve F, and the pump-body A, provided with the air-aperture E, substantially as shown and described.

WILLIAM H. BIRGE.

Witnesses:
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