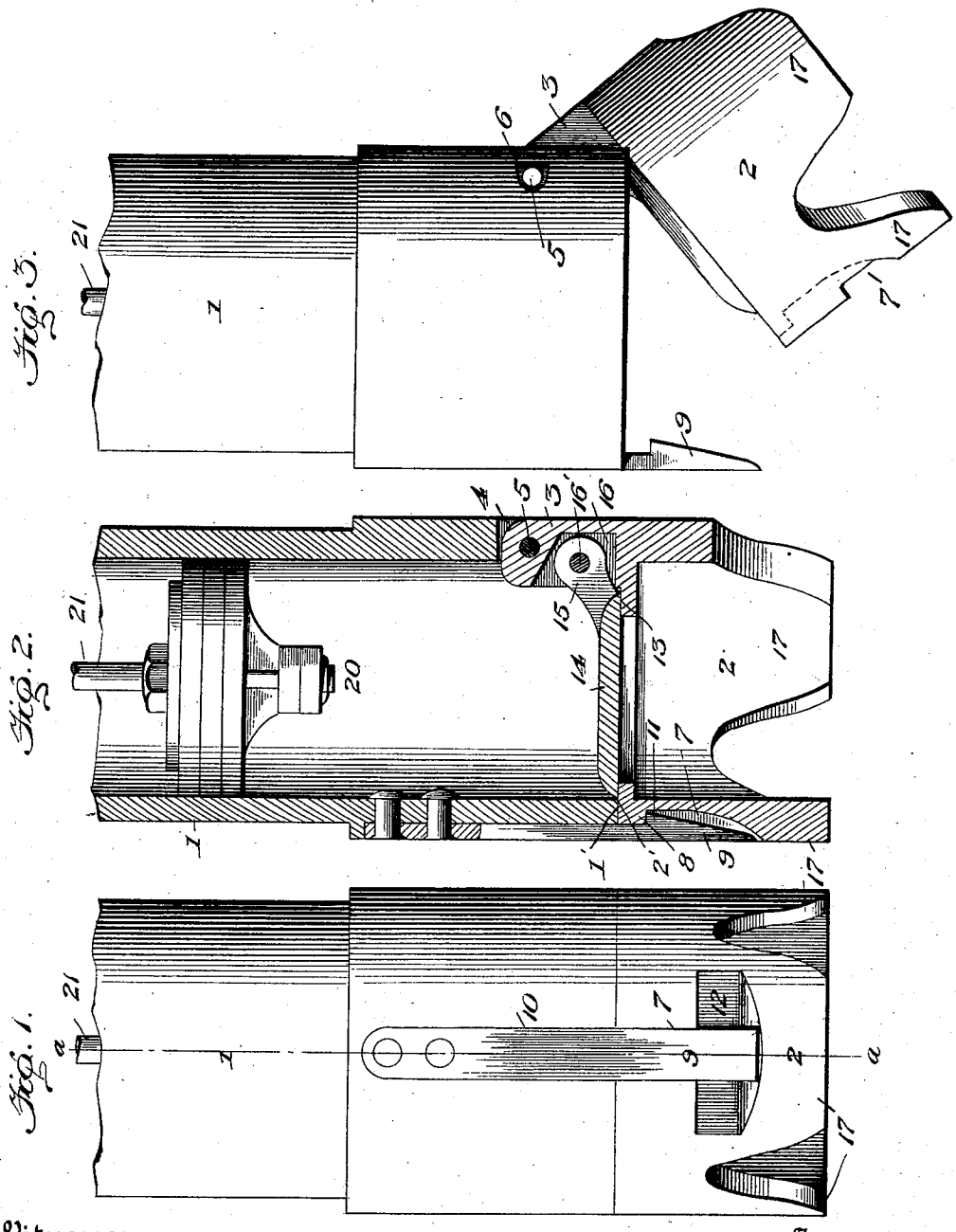
No. 750,192. PATENTED JAN. 19, 1904.

F. G. IRVINE.

SAND PUMP.

APPLICATION FILED SEPT. 25, 1903.

NO MODEL.



Witnesses

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No. 750,192. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK G. IRVINE, OF MARIETTA, OHIO.

SAND-PUMP.

SPECIFICATION forming part of Letters Patent No. 750,192, dated January 19, 1904.

Application filed September 25, 1903. Serial No. 174,616. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK G. IRVINE, a citizen of the United States, residing at Marietta, in the county of Washington, State of Ohio, have invented certain new and useful Improvements in Sand-Pumps, of which the following is a description, reference being had to the accompanying drawings, and to the figures of reference marked thereon.

My invention relates more particularly to that class of sand-pumps which are provided at their bottoms with an inwardly-opening valve and have a piston within the cylinder of the pump above the valve adapted when drawn up in the pump-cylinder to operate by suction to draw the sand or other detritus into the pump-cylinder through the valve until the cylinder is full, or substantially so, when the valve is closed by its own weight and that of the material sucked in, and the filled pump-cylinder may be raised and discharged of its contents. In sand-pumps of this class the discharging of the contents of the pump-cylinder after it has been raised from the well presents considerable difficulty, and various constructions intended to overcome this difficulty have been devised. In certain constructions it is necessary to invert the pump-cylinder to permit of the discharge of its contents. In other constructions means have been provided for discharging the contents from the bottom by either partially or wholly disconnecting the bottom from the pump-cylinder.

It is the object of my invention to provide a strong, simple, and effective construction for sand-pump bottoms, which will permit of the free discharge of the contents of the pump-cylinder from its lower end; and with this object in view my invention consists in the construction and combination of parts hereinafter described, and particularly pointed out in the claim.

Figure 1 is a view in elevation of my improved sand-pump bottom, showing the device ready for use. Fig. 2 is a vertical sectional view taken on line *a a* of Fig. 1; and Fig. 3 is a view in elevation, taken at right angles to Fig. 1, showing the device open in position for discharging.

Referring to the drawings in detail, 1 is the tubular portion of the sand-pump, which may be of any desired length, and is provided with the piston 20, preferably imperforate, as shown, and carried by piston-rod 21. The tube may of course be of any diameter desired, preferably being of about the diameter of the well-hole. At the lower end of this tubular portion 1 is formed a flat face 1′, preferably at right angles with the axis of the tube.

Hinged to the tubular portion 1 is a bottom section 2 of the same exterior diameter as the tubular portion 1. At the upper end of this bottom section is formed the flat face 2′, adapted to fit against and make a tight joint with the face 1′ of the tubular portion. The hinge connection between the tubular portion 1 and the bottom section 2 is formed by an upwardly-extending lug 3 on the section 2, which is received in a recess 4, formed in the lower end of the tube 1, the lug 3 being perforated to receive a pin 5, which forms the pintle of the hinge connection. The pintle 5 is inserted from the exterior of the tube 1, a recess 6 being preferably cut or otherwise formed in the wall of the tube to receive the head of the pintle. Diametrically opposite the lug 3 the section 2 is provided in its exterior with a recess 7, having near its upper end a shoulder 8. In this recess is received the free end of a catch 9 of spring metal, secured at its upper end to the tubular portion 1 and arranged to lie in a longitudinal recess 10, formed in the exterior of the tubular portion. This catch is provided with a shoulder 11, adapted to engage the shoulder 8 of the section 2 and to normally hold the face 2′ of the bottom section 2 against the face 1′ of the tubular portion 1, as shown in Figs. 1 and 2. The portion of the catch 9 below the shoulder 11 is made wedge-shaped, so that as the bottom section is thrown up from the open position in which it is shown in Fig. 3 to the closed position (shown in Figs. 1 and 2) the shoulder 8 will readily force the end of the catch outward until it passes the shoulder 11, when the catch will spring into place, with its shoulder 11 engaging the shoulder 8. In order to facilitate the release of the catch from the shoulder 8, a cross-recess 12 is formed in the outer sur-

face of the bottom section below the shoulder 8, into which a pointed bar or other convenient instrument may be inserted beneath the end of the catch to raise it, and thus disengage its shoulder 11 from the shoulder 8.

The bottom section 2 is provided, preferably in the horizontal plane of the flat face 2′, with a valve-seat 13, adapted to receive a clack-valve 14, which is hinged to the bottom section in any convenient manner, preferably by means of a lug 15, extending into a recess 16 in the lug 3, through which a pin 16 passes, forming the pintle of the hinge.

The lower end of the section 2 is preferably cut away at intervals to form projections 17 to facilitate the entrance of the sand-pump into the material which is to be drawn from the well.

In operation the sand-pump is lowered into the well by means of a sand-line, as in the usual way. As the projections 17 strike the bottom of the well the piston 20 will descend until it nearly reaches the valve. More or less sand will enter through the valve as the pump passes into and through the sand. As soon as the piston has reached its lowest position in the pump-cylinder the sand-line is drawn up first, raising the piston within the pump-cylinder, causing the valve to raise and the sand or other material to be removed to enter the pump-cylinder by atmospheric pressure. The valve-opening being of large size gravel or even stones or other material of considerable size are permitted to enter freely. As soon as the piston has been drawn up to the limit of its movement in the pump-cylinder the further upward drawing of the sand-rope will raise the pump-cylinder, and as the valve will be closed by its own weight and that of the contents of the pump-cylinder the contents will be prevented from escaping until it is desired to discharge them. When the pump-cylinder with its contents has been raised from the well and has been swung into proper position to be discharged, a pointed bar or other suitable instrument is inserted in the recess 12 beneath the end of the catch 9, and the catch is disengaged from the shoulder 8, permitting the section 2 to turn on the pin 5 into the position shown in Fig. 3, thus permitting the material with which the sand-pump is filled to escape freely. By arranging the catch in a recess in the outer face of the device it is made readily accessible and offers no obstruction to the entrance or discharge of the material and cannot become accidentally disengaged. The meeting faces of the tubular portion and bottom section being flat may be readily formed at the least possible expense. By forming the valve-seat in the same plane with the upper face of the bottom section the construction is materially simplified.

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

A sand pump or bailer for wells, comprising a tubular portion having a flat face formed on its lower end at right angles to its axis, a bottom section of the same exterior diameter as the tubular portion provided with an upwardly-opening valve and having a flat face at its upper end to fit against the flat face formed on the tubular portion, a hinge connecting the bottom section to the tubular portion, a longitudinal recess formed in the exterior of the tubular portion opposite the hinge, a catch arranged in the recess and secured at its upper end to the tubular portion, a longitudinal recess formed in the bottom section to receive the catch having a shoulder formed therein, and a cross-recess formed in the bottom section below the shoulder; substantially as described.

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

FREDERICK G. IRVINE.

Witnesses:

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E. S. ALDERMAN.