April 5, 1932. M. J. COMBS 1,852,920

SAND TRAP

Filed Jan. 12, 1931

Fig. 1.

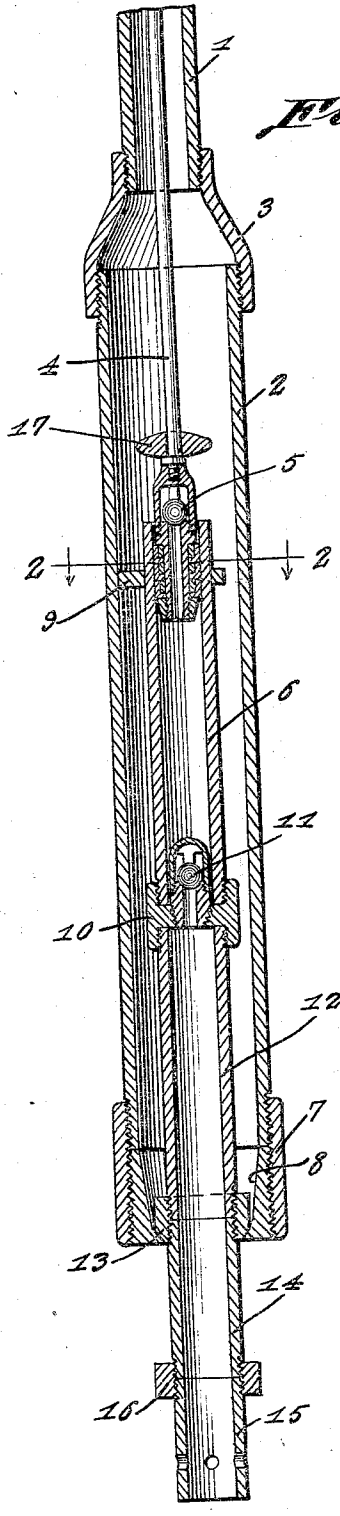
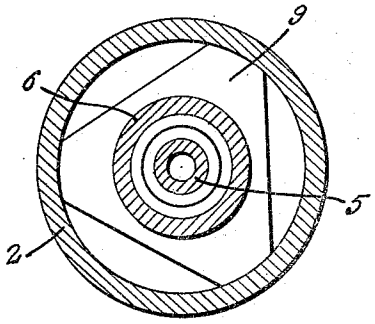


Fig. 2.



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UNITED STATES PATENT OFFICE

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SAND TRAP

Application filed January 12, 1931. Serial No. 508,283.

This invention relates to improvements in sand traps for pumps employed in oil or water wells and has for the primary object the provision of a device of the above stated character for separating sand and other foreign substances from the fluid removed from the well by the pump that the operating parts of the latter will not be interfered with either during the operation of the pump or when standing idle.

Another object of this invention is the provision of a settling chamber associated with the pump that foreign substances entering the latter with the fluid may be trapped and dumped whenever desired wihout removing the well tubing and other working parts of the pump, rendering a great saving in time, labor and expense and waste of fluid now experienced when cleaning pumps now in use in wells.

A further object of this invention is the provision of a novel mounting of the settling chamber with the pump parts and the association of a valve therewith which may be opened at any time by lowering of the well tubing and thereby moving the settling chamber relative to the pump cylinder and sucker mechanism thereof to empty the foreign substances collected back into the well without undue waste of the fluid contained in the pump.

A still further object of this invention is the provision of a sand trap of the above stated character which will be simple, durable and efficient, and which may be manufactured and sold at a comparatively low cost.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a vertical sectional view illustrating a sand trap associated with a well tubing and the sucker mechanism of a pump and constructed in accordance with my invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Referring in detail to the drawings the numeral 1 indicates the lower end of a well tubing detachably secured to the upper end of a trap 2 by a coupling 3. The sucker rod 4 of the pump extending downwardly through the tube 1 from the pump carries the usual working valve 5 for reciprocation in a pump cylinder 6 located within the chamber 2.

The chamber 2 consists of a tubular member of a diameter greater than the well tubing and has each end screw-threaded with one end threaded into the coupling 3 while the other end has threaded thereto a collar 7 having a ground valve seat 8 threaded therein and engaging one end of a tubular member.

A substantially triangular shaped plate 9 is secured in the trap 2 and supports the cylinder 6 and the lower end of the latter is screw-threaded to receive a collar 10 provided with a screw-threaded opening of tapered formation to receive a standing valve 11 located below the working valve 5. A tube 12 is connected to the lower end of the cylinder 6 by the collar 10 and has its lower end screw-threaded to receive a valve member 13 having a ground face to cooperate with the seat 8 in closing the lower end of the settling chamber 2. The valve 13 extends beyond the lower end of the tube 12 and receives the upper end of a tube 14 extending below the settling trap and detachably connected to the usual perforated anchoring member 15 by a bumper collar 16.

A deflecting plate 17 is slidably mounted on the sucker rod 4 and when the working valve 5 moves downwardly in the cylinder 6, the deflecting plate engages over the upper end of said cylinder.

In operation, the reciprocation of the working valve 5 first draws fluid from the well into the cylinder 6 by way of the tubes 12, 14 and anchoring element 15 and then expels the fluid trapped in said cylinder by the standing valve 11 upwardly through the working

valve into the upper end of the settling chamber 2. The fluid striking the deflecting plate 17 is slightly retarded in its upward movement permitting foreign substances that may be in the fluid to settle or gravitate downwardly in the settling chamber 2 below the upper end of the cylinder 6.

After the operation of the pump over a length of time, the well tubing is lowered carrying with the same the settling chamber 2 and bringing the anchor 15 in contact with the bottom of the well and further movement of the tubing disengages the valve 13 from the seat 8 opening the settling chamber to permit the foreign substances collected therein to drain back into the well. In the lowering of the settling chamber after the anchor 15 contacts with the bottom of the well, the valve seat will strike against the bumper collar 16 causing sufficient vibration to loosen any foreign substances that may be lodged in the settling chamber and consequently permit such substances to gravitate or escape from the chamber through the valve seat into the well.

While I have shown and described the preferred embodiment of my invention it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope as claimed.

Having thus described my invention, what I claim is:

A trap comprising a tubular member secured to the lower end of a well tubing to provide a settling chamber, a pump cylinder in said tubular member, a standing valve in the pump cylinder, a sucker rod connected to the working valve, a deflecting plate mounted on the sucker rod, a valve seat carried by the lower end of the tubular member, a tube connected with the pump cylinder, a valve member carried by said tube for engagement with the seat, an anchor member connected to the pump cylinder and extending below the lower end of the tubular member and adapted to be lowered into engagement with the bottom of a well, and a bumper collar carried by the anchor member to be engaged by the tubular member when lowered for vibrating the latter to cause foreign matter to pass therefrom.

In testimony whereof I affix my signature.

MILLARD J. COMBS.