

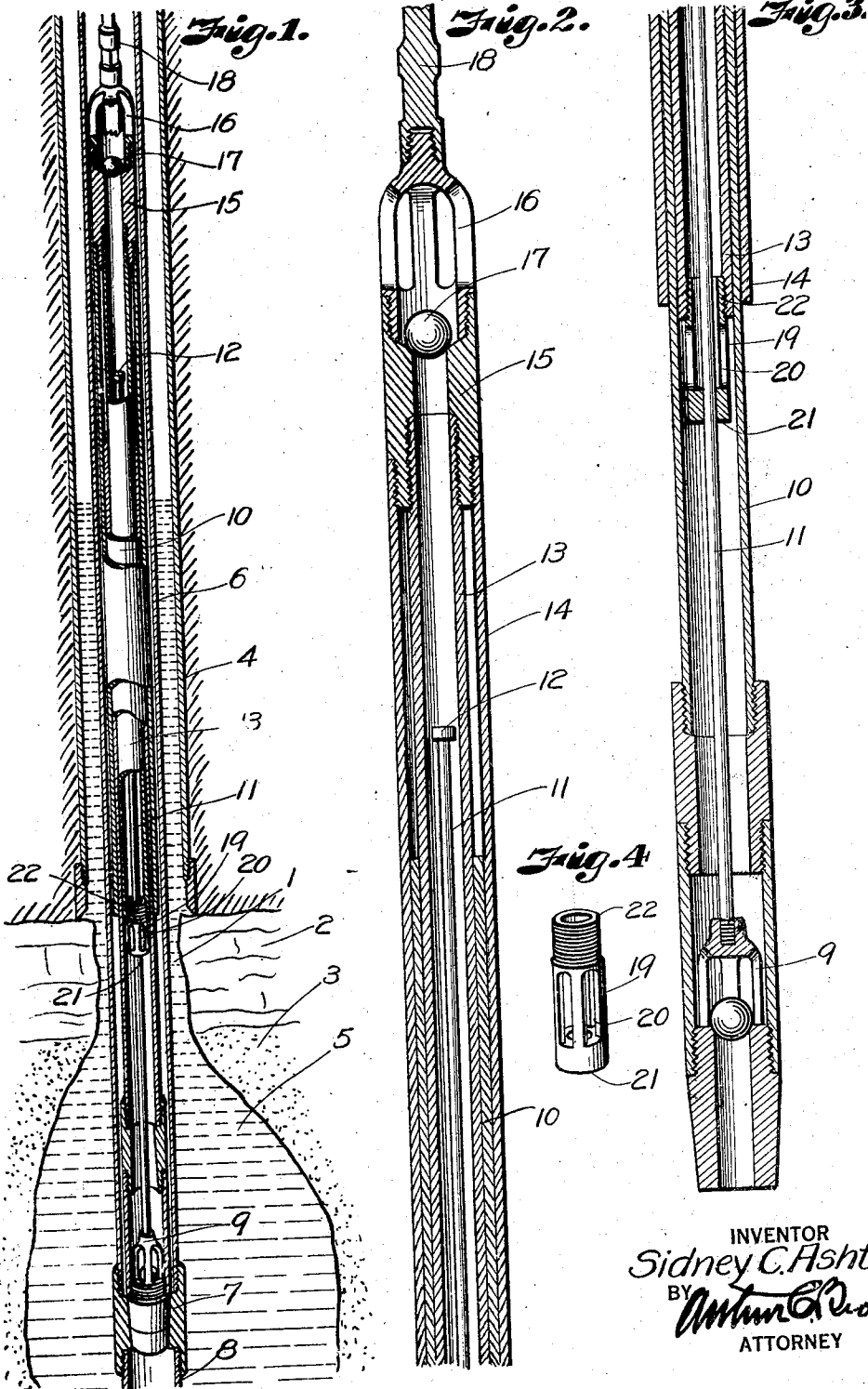
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OIL WELL PUMP

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# UNITED STATES PATENT OFFICE.

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OIL-WELL PUMP.

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My invention relates to deep well pumps and more particularly to one for use in oil wells and of the fixed plunger and travelling barrel type, the principal object of the invention being to eliminate disadvantages incident to the use of ordinary piston construction.

In accomplishing this object I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein

Fig. 1 is a vertical section of an oil well with its casing, illustrating a pump of my improved construction in connection with the well, parts of the pump being broken away for better illustration.

Fig. 2 is an enlarged, longitudinal section of the upper portion of the pump, particularly illustrating assembly of the travelling and working barrels.

Fig. 3 is a similar view of the bottom end of the pump.

Fig. 4 is a detail perspective view of the valve-pulling crown.

Referring more in detail to the drawings:

1 designates a well hole, lined to the top of the solid strata 2 above the oil sand 3 with ordinary casing 4. Extending through the well hole into the shot hole 5 is a tube 6, having an anchor seat 7 at its lower end provided with an extension 8 through which oil is admitted to the interior of the tube through a standing valve 9, having frictional seating in the anchor member 7.

Fixed to the top of the standing valve is a standing barrel 10 which extends upwardly to a sufficient height to accommodate the stroke of the pump.

Fixed to the top of the cage of the standing valve 9 and extending upwardly to a point slightly above the top of the working barrel, is a rod 11 having a head 12 at its upper end for engagement by the crown on the travelling barrel when the latter is pulled, to remove the standing valve along with the balance of the pump.

Slidable over the inner and outer surfaces of the standing barrel 10 are inner and outer tubes 13 and 14, threaded at their upper ends onto a tubular valve body 15, having an upper cage 16 for a downwardly seating ball valve 17, and extending at their lower ends to a point along the standing barrel sufficient to accommodate the pump stroke.

The valve cage 16 is supported from a sucker rod in the ordinary manner.

Threaded into the lower end of the inner tube 13 of the travelling barrel is a crown 19 having side ports 20 through which fluid may pass freely to the interior of the tube, the crown having an apertured bottom 21, serving as a guide for the lifting rod and an open top 22 for guiding the rod and also adapted for engagement with the lifting head 12 of the rod 11 when the travelling barrel is raised to pull the pump.

In installing a pump of this construction the tubing 6 is lowered into the well in the ordinary way. The pump being assembled with the standing valve fixed in the lower end of the standing barrel and the travelling barrel tubes fitted over the standing barrel, is let into the well and the standing valve located in its anchor seat, frictional contact of the standing barrel with the travelling barrel tubes being sufficient to hold the parts together during the letting in travel, although adapted for permitting movement of the travelling barrel over the standing barrel when the pump is in operation.

When the travelling barrel is reciprocated under influence of the sucker rod, the travelling barrel tubes move over the standing barrel with the check valve 17 closed on upward stroke to close the barrel and draw oil into the tube through the standing valve. On down stroke of the travelling barrel the standing valve closes and the valve 17 opens to force oil trapped in the pump into the tube above the travelling valve, reciprocation of the travelling barrel alternately drawing oil into the standing barrel and forcing it upwardly through the tube, the operation corresponding to that of an ordinary piston pump, but with the advantage that no plunger valve is employed with its rings and packing, subject to scarring due to the unavoidable admission of sand between the piston and its enclosing wall.

When the pump is to be removed from the well the travelling barrel is drawn outwardly, lifting the crown 19 up against the head on the rod 11 and pulling the standing valve from its seat, so that the pump may be removed as a unit.

What I claim and desire to secure by Letters Patent is:—

1. A pump of the character described, comprising a standing barrel, a standing valve fixed to the lower end of the standing barrel, a travelling barrel comprising spaced, concentric tubes movable along the

inner and outer faces of the standing barrel, a down-check valve on the travelling barrel, and means connected with the travelling barrel and standing valve co-operative to lift the standing barrel and standing valve upon extended elevation of the travelling barrel.

2. A pump of the character described, comprising, in combination with well tubing and an anchor member, a standing valve normally seated in the anchor member, a standing barrel fixed to the standing valve for removal therewith, a headed rod on the standing valve, a travelling valve, a travelling barrel comprising spaced members fixed to the travelling valve and movable as a unit over inner and outer surfaces of the standing barrel, and a crown on the travelling unit engageable with the headed rod to effect removal of the standing valve and standing barrel upon extended upward movement of the travelling barrel.

3. In a pump of the character described, a standing barrel, a standing valve fixed to the standing barrel and having a headed lift rod, a travelling barrel comprising spaced, concentric tubes movable over inner and outer faces of the standing barrel, a down-check valve on the travelling barrel, and a crown on the lower end of the inner tube of the travelling barrel engageable with the headed rod to lift the standing valve and standing barrel upon extension of the travelling barrel.

4. A pump of the character described comprising, in combination with well tubing and an anchor seat, a standing valve, a standing barrel connected with the standing valve, a travelling valve, a travelling barrel comprising spaced tubular members movable over inner and outer surfaces of

the standing barrel and both fixed to the travelling valve for removal through the tubing with the travelling valve, and means effecting removal of the standing valve and standing barrel with the traveling valve and traveling barrel.

5. A pump of the character described comprising, in combination with well tubing and an anchor seat, a standing valve, a standing barrel connected with the working valve, a travelling valve, a travelling barrel comprising spaced tubular members movable over inner and outer surfaces of the standing barrel, both fixed to the travelling valve for removal through the tubing with the travelling valve, a crown on the inner travelling barrel member, and a rod on the standing valve having a head engageable by said crown upon extended upward movement of the travelling barrel to effect removal of the standing valve and standing barrel with the travelling barrel.

6. A pump of the character described comprising, in combination with well tubing and an anchor seat, a standing valve and standing barrel, a travelling valve, a travelling barrel comprising spaced tubular members movable over inner and outer surfaces of the standing barrel, both fixed to the travelling valve for removal through the tubing with the travelling valve, a crown on the inner travelling barrel member, and a rod on the standing valve having a head engageable by said crown upon extended upward movement of the travelling barrel to effect removal of the standing valve with the travelling barrel, the standing barrel being fixed to the standing valve to be removed therewith.

In testimony whereof I affix my signature.  
SIDNEY C. ASHTON.