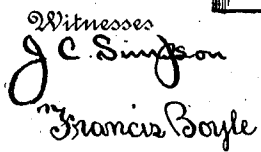


1,003,874.

2 SHEETS—SHEET 1.



Handwritten signature: "F. Chandler"

Attorneys

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SAND PUMP.

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1,003,874.

Patented Sept. 19, 1911.

2 SHEETS—SHEET 2.

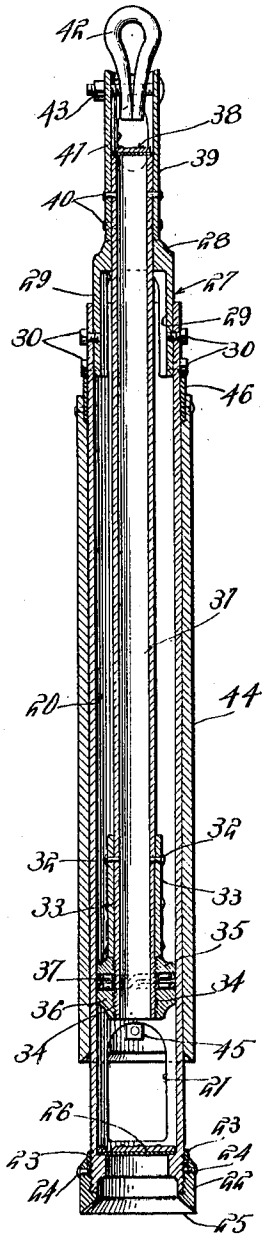


Fig. 3.

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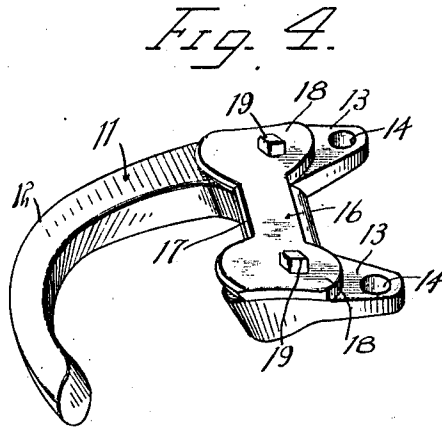


Fig. 4.

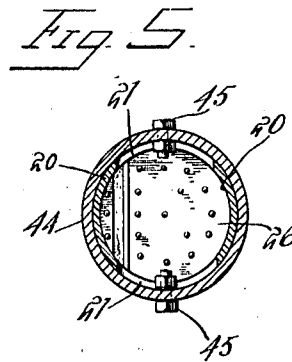


Fig. 5.

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UNITED STATES PATENT OFFICE.

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SAND-PUMP.

1,003,874.

Specification of Letters Patent.

Patented Sept. 19, 1911.

Application filed July 16, 1910. Serial No. 572,345.

To all whom it may concern:

Be it known that I, FRANK L. CASPER, a citizen of the United States, residing at Weiner, in the county of Poinsett, State of Arkansas, have invented certain new and useful Improvements in Sand-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pumps for removing sand from oil wells and for similar purposes, and has for its object to provide a pump that will have novel means for effecting the discharge of the sand automatically.

A further object is to provide a pump of this character that will be provided with a cut-off shell or sleeve that will be moved to its operative or released position without manual manipulation.

With these and other objects in view, the invention consists of the novel details of construction and combination of parts hereinafter fully described and claimed, it being understood that various modifications may be made in the minor details of construction within the scope of the appended claims.

In the accompanying drawings forming part of this specification:—Figure 1 is a side elevation of a pump constructed in accordance with my invention shown in engagement with the clench hook and in position for discharging sand. Fig. 2 is a side elevation of the pump. Fig. 3 is a longitudinal sectional view through the pump showing the cut-off sleeve in released position. Fig. 4 is a detail perspective view of the clench hook. Fig. 5 is a cross sectional view taken on the line 5—5, Fig. 2.

The sand pump comprising the subject-matter of this invention is designed to be supported by the usual derrick of an oil well or the like, the supporting means being a chain, cable, or similar device, this cable serving to simultaneously support the pump and actuate the pump piston as will presently be explained.

Referring now to the drawing 10 designates a beam of the above mentioned derrick, and fixed to this beam 10 is a clench hook 11 comprising a curved hooked extrem-

ity 12 from the outer edge of one side of which projects laterally a pair of spaced ears 13 which are equipped adjacent their extremities with openings 14 through which chains 15 are inserted, the free ends of these chains being secured to the beam 10 in any preferred manner. A grab plate 16 is mounted upon the uppermost side of this clench hook, the grab plate comprising a flat piece of metal formed on one edge with an angular rabbet 17 adapted to cooperate with the free extremity of the hook in engaging and lifting the cut-off sleeve of the pump as will hereinafter be described, the opposite edge of this grab plate being equipped with a pair of ears 18 which overlie for a portion of their length the ears of the clench hook and are bolted to the latter as shown at 19. The pump when lifted from the well by the derrick cable runs freely through the grab hook, but when the lifting movement of the pump ceases after the pump has been lifted out of the well and the pump is lowered slightly, the grab hook binds against the cut-off sleeve of the pump and holds the latter against movement so that as the pump cylinder is lowered the sand and gravel are discharged through openings in the cylinder as will hereinafter appear.

The pump is of such weight as to remain stationary at the bottom of the well during lifting of the piston by the cable, the piston gravitating upon slackening of the cable and forcing out the water taken in, as usual in pumps of this character. The pump comprises a pump cylinder 20 having formed in its sides adjacent its lower end a pair of oblong openings 21 which register with the bore of the cylinder, and further having peripheral threads on its extreme end which receives a metal circular shoe 22, this shoe serving to clamp a flexible packing collar 23 to the outer surface of the cylinder below the lateral openings therein, rivets or similar fasteners 24 being passed through the shoe and packing collar and serving to effectively secure the same to the pump cylinder. This metal shoe rests upon the bottom of the well and is provided with a lower sharpened edge 25 which penetrates and loosens the sand so that the same may rise into the bore of the pump cylinder.

Closing the bore of the pump cylinder at approximately the lowermost edges of the opening therein, is a flap valve 26, this flap valve opening as usual during the up stroke of the pump piston and permitting of sand and gravel and some water flowing into the bore of the pump cylinder and closing during the down stroke of the pump piston and preventing of the escape of the contents of the cylinder.

Mounted in the bore of the pump cylinder at the upper end thereof is a socket 27, this socket comprising a circular collar 28 having a pair of spaced parallel legs 29 which are inserted in the bore of the pump cylinder and conform snugly to the contour thereof. Bolts or similar connectors 30 are passed through the pump cylinder and legs of the socket and serve to secure the parts together, these bolts performing a further function of limiting the upward movement of the cut-off sleeve hereinafter described.

Slidingly fitted in the bore of the pump cylinder is a piston comprising a hollow piston rod 31, this piston rod having riveted as shown at 32 or otherwise fixed to its outer periphery a collar 33, and being reduced below the collar, this reduced portion being threaded as shown at 34. Threaded on this reduced portion is a ring 35 and threaded on the reduced portion in rear of this ring is a second ring 36, a loose flexible split ring 37 being mounted upon the reduced portion intermediate these rings and retained in position by these rings. The loose split ring is preferably formed of a helical length of spring material as shown and together with the retaining rings forms a head for the piston rod which snugly fits in the bore of the pump cylinder and prevents wobbling of the piston rod during its movement. The upper edge of the collar 33 engages the socket 27 and limits the outward movement of the piston rod.

The upper end of the piston rod is closed by a flap valve 38 which opens during the down stroke of the piston rod and permits of the escape of whatever water may have been drawn into the piston rod. During the up stroke of the piston rod the sand, gravel and a small quantity of water will be drawn into the pump cylinder, the water as above stated being discharged immediately through the flap valve at the upper end of the piston rod and the sand and gravel lodging in the bottom of the piston rod. For attaching the pump to the derrick cable, a sleeve 39 is riveted or otherwise secured as shown at 40 to the upper end of the piston rod, this sleeve having approximately oblong openings 41 that register with the flap valve at the upper end of the piston rod. Arranged in the bore of the sleeve is a metal eye 42, this eye having its terminals bolted as shown at 43 to the sleeve.

A check sleeve 44 as above stated, is slidingly fitted upon the pump cylinder 20, this sleeve being equipped at its lower end with a pair of bolts 45 which project into the lateral openings formed in the pump cylinder and by engaging the upper edges of these openings, limit the upward movement of the sleeve. By removing these bolts, the sleeves may be removed for repairs. A flexible packing ring 46 is riveted or otherwise secured in the bore of the sleeve and so tightly engages the pump cylinder as to prevent sand working out between the sleeve and cylinder. This packing ring engages the bolts 30 and limits the upward sliding movement of the sleeve.

The sleeve 44 is normally held with its lower edges in abutting contact with the packing ring of the shoe so that the lower lateral outlet openings of the pump cylinder are closed when the pump is being lowered into the well and during the actuation of the pump. When the pump is raised from the well, the sleeve passes freely through the clench hook above described until the upward movement of the pump is stopped and at the beginning of the lowering movement of the pump the clench hook binds on the sleeve and prevents further movement of the sleeve. Any further lowering movement of the pump will only serve to lower the pump cylinder whereby the pump cylinder slides downwardly through the sleeve, thus exposing the outlet openings so that sand, gravel and the like in the pump cylinder may be discharged. To release the clench hook the pump is raised and passed freely through the hook until finally the hook drops off the lower end of the pump. It is evident that the operation of the clench hook is automatic and that no manual handling of the sleeve is necessary during its operation.

What is claimed is:—

1. A sand pump comprising a pump cylinder having a valve mounted in its bore and having an inlet opening in its side, a sleeve mounted for longitudinal sliding movement on said cylinder and adapted to close the inlet opening therein, a stop arranged in the bore of the sleeve and engaging one edge of the inlet opening for limiting the movement of said sleeve when exposing said inlet opening, and a hollow piston working in said cylinder and having a valve in its bore.

2. A sand pump comprising a pump cylinder having a valve in its bore and having a plurality of inlet openings in its sides, a sleeve mounted for longitudinal sliding movement on said cylinder and adapted to close the inlet openings therein, stops arranged in the bore of the sleeve and engaging the edges of the inlet openings for limiting the movement of said sleeve in one direction, an annular shoe fixed to one extremity

of said cylinder and limiting the movement
of said sleeve in the opposite direction, said
shoe having a sharpened cutting edge for
penetrating into the soil, and a piston work-
5 ing in said cylinder and having a valve in
its bore to permit of the escape of water
therefrom.

In testimony whereof, I affix my signa-
ture, in presence of two witnesses.

FRANK L. CASPER.

Witnesses:

LEWIS HOGUE,
CHAS. THOMPSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
