W. H. RAYNER.

POWER PUMP.

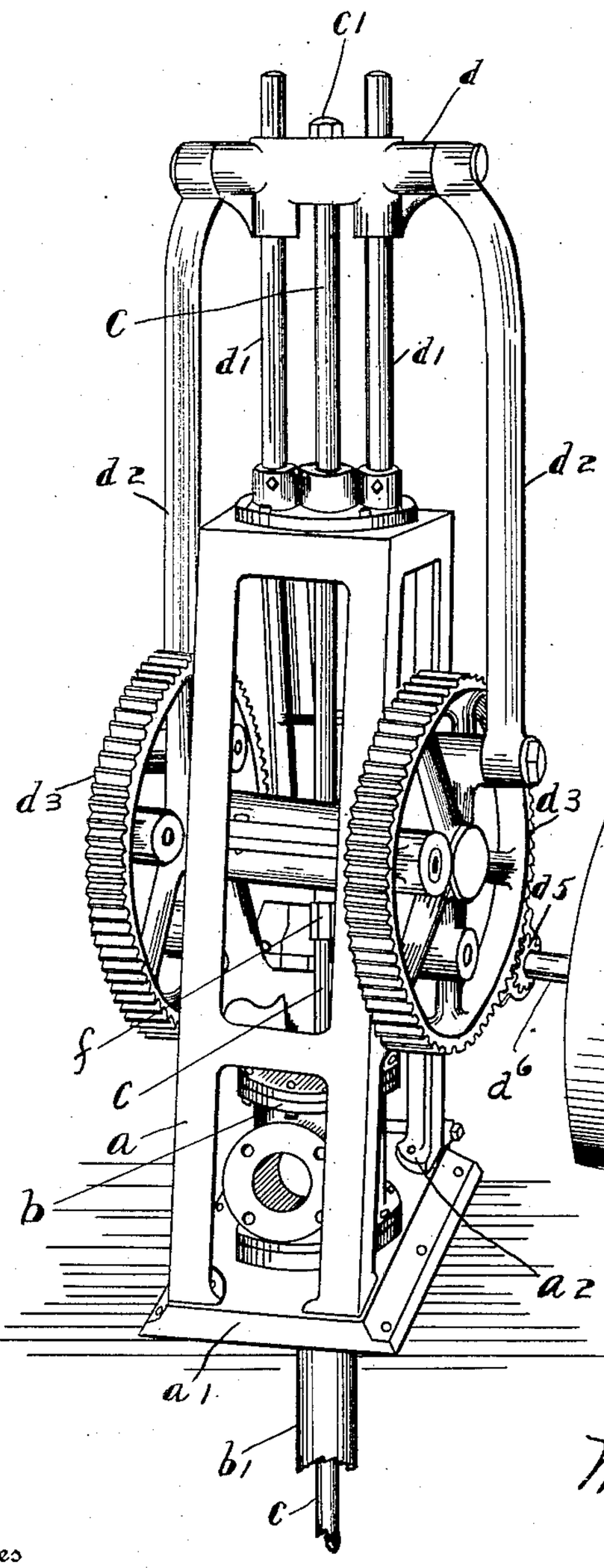
APPLICATION FILED JAN. 16, 1908.

936,359.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1




Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

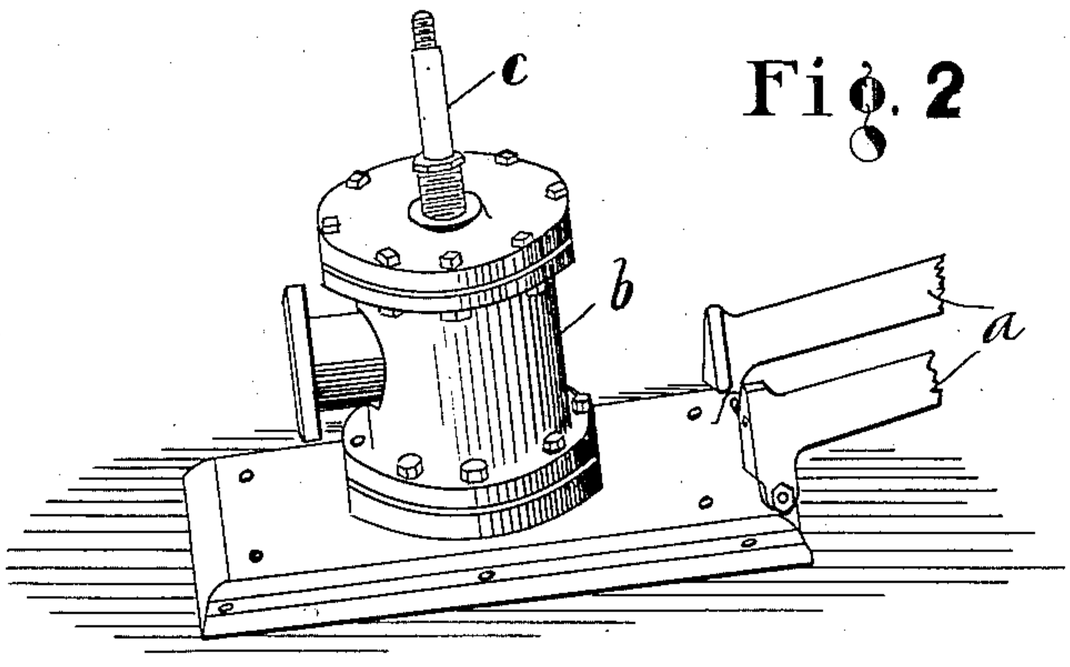



Fig. 3

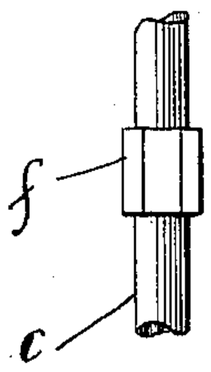



Fig. 4

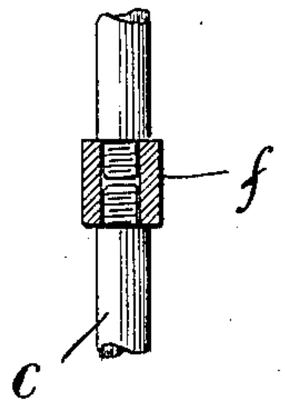
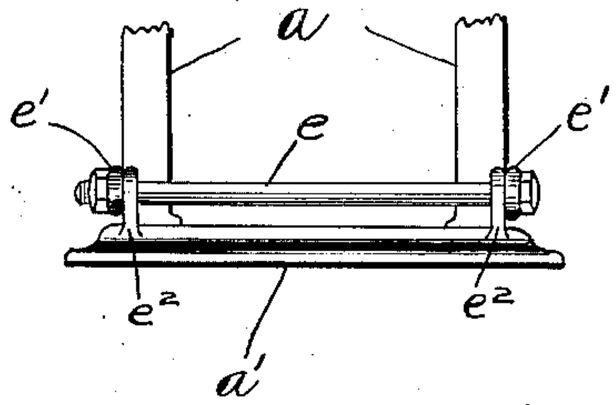



Fig. 5

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# UNITED STATES PATENT OFFICE.

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## POWER-PUMP.

936,359. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed January 16, 1908. Serial No. 411,040.

*To all whom it may concern:*

Be it known that I, WILLIAM H. RAYNER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Power-Pumps, of which the following is a specification.

My invention relates to improvements in power pumps, and particularly to power pumps of the vertical type.

The object of my invention is to provide in a pump of this kind means for permitting the plunger rod, valves and cylinder to be readily removed from the well without the necessity of dismantling or taking apart the other operating parts of the pump, or those parts which are assembled together and are known as the power working head of the pump; it being my particular object to provide means for hinging and securing this power working head to its base and to secure it to the plunger rod of the pump in such a manner that it may be readily detached from the base and plunger rod and swung back out of the way so that the parts of the pump which are located in the well may be readily removed therefrom as before stated.

My invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

In the accompanying drawings Figure 1 is a perspective view of a device to which my invention has been applied; Fig. 2 is a perspective view of a portion of the same in detail; Fig. 3 is a detail view of the detachable connection in the plunger rod; Fig. 4 is a sectional view of the same; Fig. 5 is a detail of the hinge connection for the power head frame.

Like parts are represented by similar characters of reference in the several views.

The main operating parts of the power pump for which I have devised my invention are of a well known type. In the said drawings, *a* represents a main frame, the particular form of frame which I have shown in the drawings being of the open type, although the improvement may be applied to a device of this character in which a supporting standard is employed. This frame is preferably shown with a plurality of pedestals, and a cross-bar or brace connecting the pedestals strengthens the frame so that the operating mechanism can be supported near the center of the frame instead of the extreme upper part thereof. This frame is supported upon the base, $a^1$, in the manner hereinafter more fully described, which base, $a^1$, rests and is secured to the usual top platform of the well. Also secured to the base and extending into the well is the usual cylinder or barrel, $b^1$, which incloses the plunger rod, *c*, and valves in the usual way. This plunger rod, *c*, extends up through the T-connection, *b*, located on the base and to which the discharge pipe is connected, and is also extended upwardly through a suitable bearing in the frame, *a*, and is secured at its upper end to a cross head, *d*, slidingly mounted on guide-rods, $d^1$, which project upwardly from the frame, and derives reciprocating movement from the driving pulley, $d^4$, through the medium of the pinions, $d^5$, gears, $d^3$, and pitman connections, $d^2$, all of these parts being supported by the frame in the usual manner.

The main driving shaft, $d^6$, to which the driving pulley is connected is supported in suitable bearings (not shown) on the main frame, *a*, and the outer end of this shaft is also supported in the bearing, $d^9$, located on the standard, $d^7$. The standard, $d^7$, is permanently connected to its base or support and has a detachable part, $d^8$, to which the bearing proper, $d^9$, is swiveled by set-screws, $d^{10}$, one only of which is shown; it being understood that the part, $d^8$, will be formed preferably in the nature of a yoke, with a set-screw on each side of the bearing proper, $d^9$, to permit the bearing to be self-alining. The removable portion, $d^8$, fits in a recess or pocket in the standard proper, $d^7$, as shown, and is connected thereto by a bolt, $d^{11}$, so as to be readily removable therefrom.

The frame, *a*, and the various operating parts supported by it are, as before stated, known as the power working head of the device. In order that this head may be readily removed out of the way at any time when it is desired to take out from the well the plunger and valves or the cylinder, I have so mounted and secured this head to the base to permit it to be readily detached and swung back out of the way without disturbing the arrangement of any of the operating parts on the head. At one end of the frame adjacent to the base I provide a hinge, preferably in the form of a hinge-bolt, *e*, which passes through lugs, $e^1$ $e^1$, on the rear legs of

the frame and through registering lugs, $e^2$ $e^2$, extending up from the base. Each of the legs of the frame is provided with a foot, $a^2$, adapted to receive a bolt to connect the same to the base. The plunger rod is further constructed in two parts the adjacent ends of which are screw threaded and connected together by a nut, or coupling, *f*. The upper part of the plunger rod, *c*, where it passes through the cross head, *d*, is reduced so as to form a shoulder thereon and it is clamped in the cross-head by the nut, $c^1$, the end of the rod being screw-threaded to receive this nut.

By the construction described it will be seen that at any time it is desired to remove any of the parts from the well the supporting frame, *a*, may be unfastened from its base, the plunger rod disconnected, the part, $d^8$, detached from the standard, $d^7$, and the head thrown back about its hinged connection. The parts of the plunger rod may be disconnected either by having the coupling formed with right and left threads or by unloosening the nut, $c^1$, and turning the part, of the rod *c*, with a pipe wrench or other tool until it is disconnected from the coupling. When the plunger rod is thus disconnected the lower part of the rod will drop by gravity into the cylinder for a limited distance, say until the nut, *f*, which may have been left on the lower part of the rod, contacts with the stuffing-box in the upper end of the cylinder or T-connection, so that this rod will not interfere in any way with the tilting of the frame but will permit said frame to readily clear it.

By means of the detachable bearing described for the outer end of the main driving shaft, I am enabled to provide means for firmly supporting the driving shaft at either end which will not interfere with the tilting operation of the head. In this type of machine it is desirable that the parts be so arranged that the standard, after once being properly secured to the ground support or floor, can be maintained there and yet permit the removable part carrying the bearing to be quickly detached and the head tilted.

Having thus described my invention, I claim:—

1. In a working head for pumps, the following instrumentalities: a base having one member of a hinge and having a head with inlet and outlet openings, a piston rod working through the head and having a coupling, a frame having at its lower end the other hinge member, whereby the frame and base are hingedly connected near the ground, and having driven gears mounted thereon near one side and below the upper end, and a driving shaft and its pinions mounted on the opposite side of the frame, each pair of these gears and pinions, respectively, intermeshing, and cross-head guides carried at the upper end of the frame, a cross-head on the guides, pitmen connecting the gears and the cross-head, and an actuating rod operated by the cross-head and detachably connected by the coupling to the piston rod.

2. In a working head for pumps, the combination, with a base having inlet and discharge openings, a pump rod formed in two parts together with means for detachably securing said parts together, a cross-head attached to and detachable from said pump rod, guide rods on which said cross-head is mounted, a frame for said guide-rods mounted on said base, said frame being hinged to said base and having means for detachably securing it thereto, means for actuating said cross-head comprising a driving shaft and its pulley extending beyond said frame, a permanently attached support independent of said frame, and a detachable bearing for the outer end of said shaft located on said support.

In testimony whereof, I have hereunto set my hand this 10th day of January, 1908.

WILLIAM H. RAYNER.

Witnesses:
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CHAS. I. WELCH.