

M. B. VAN NESS.
PUMP MECHANISM.
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Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

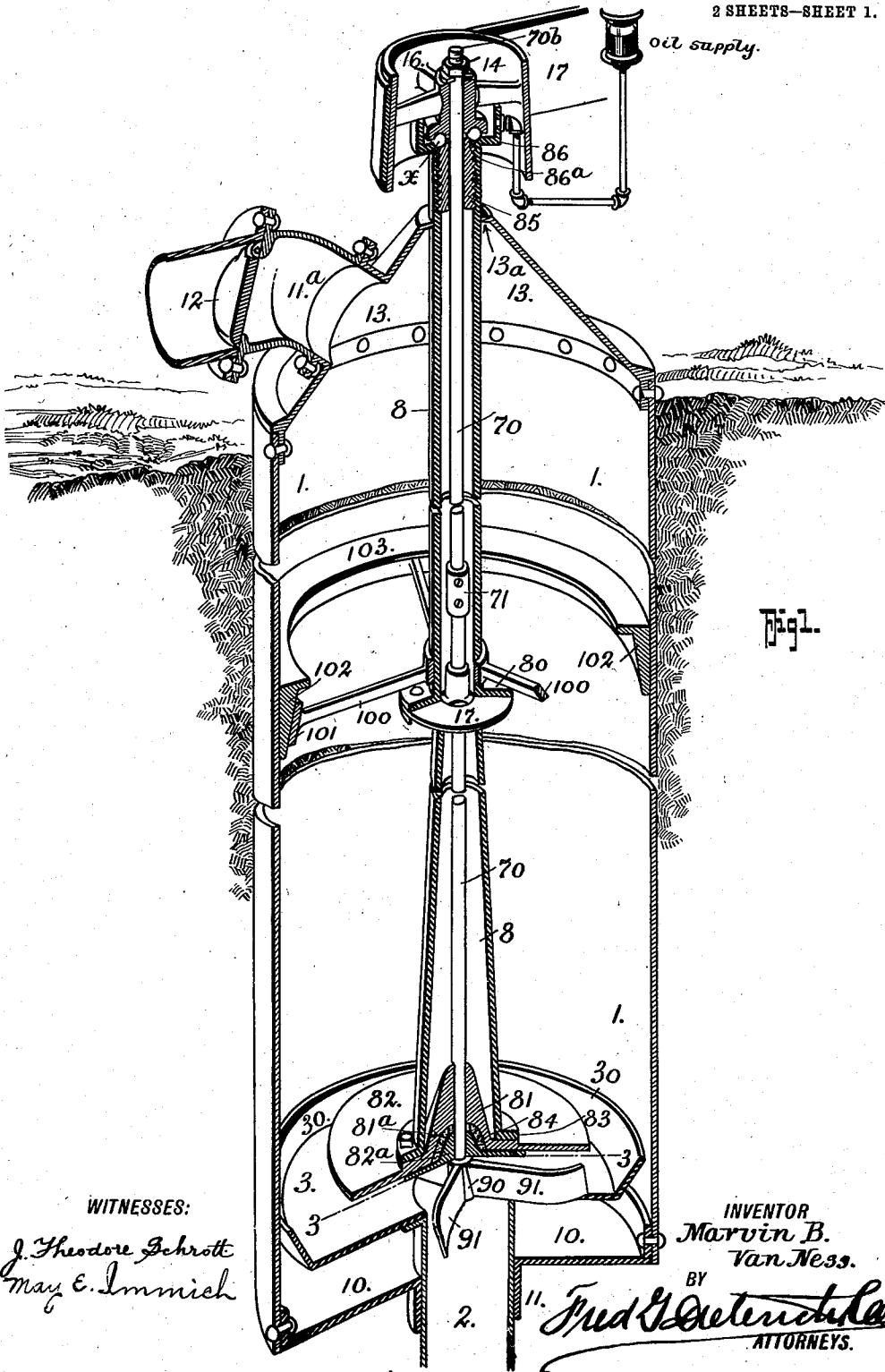


Fig. 1.

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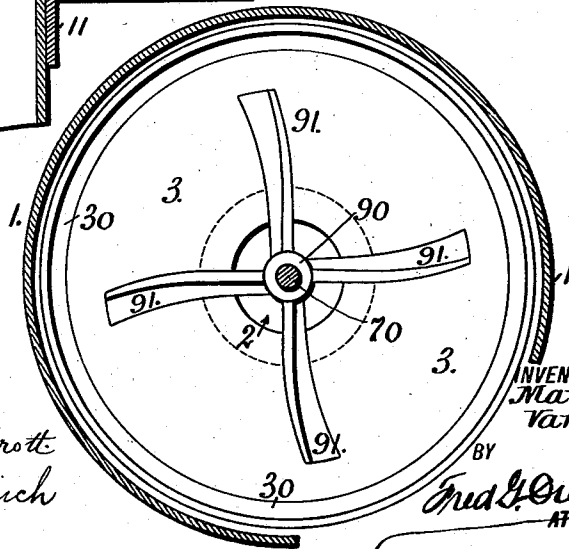
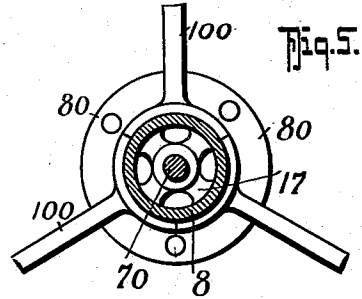
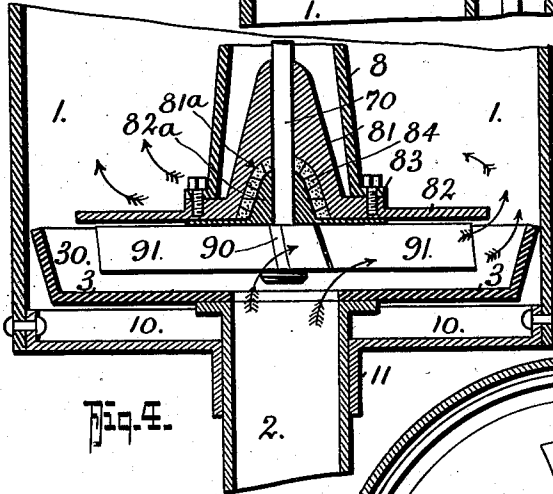
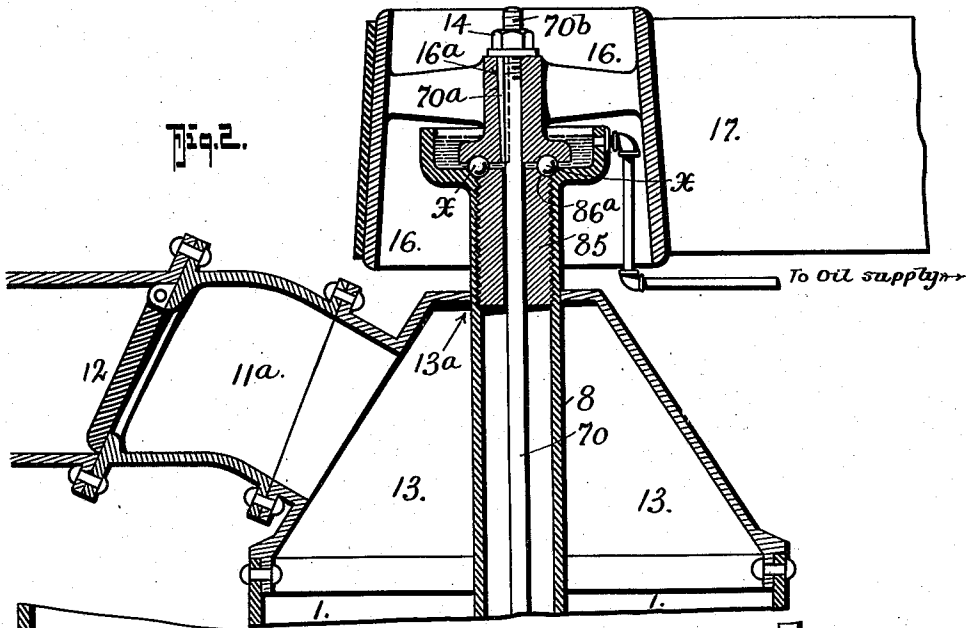
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2 SHEETS—SHEET 2.



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PUMP MECHANISM.

942,297.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed March 11, 1909. Serial No. 482,719.

To all whom it may concern:

Be it known that I, MARVIN B. VAN NESS, residing at Welsh, in the parish of Calcasieu and State of Louisiana, have invented a new and Improved Pump Mechanism, of which the following is a specification.

My present invention, which generally relates to improvements in the construction of centrifugal pumping mechanisms adapted for deep or driven wells, having pits in which the rotary pumping head is held, more especially refers to the construction of pumping mechanism disclosed in my Patent No. 915,253 dated March 16, 1909, and my said present invention primarily has for its object to provide certain improvements whereby the cost of construction of the said pumping mechanism is materially decreased, the parts the more readily assembled for use and by which the general efficiency of the pump construction disclosed in my patent referred to is greatly increased.

My present improvement, in its most essential features embodies a new design of bearing for the upper end of the pump shaft that simplifies the arrangement of the upper or exposed end of the pump mechanism.

Another and important feature of my present invention lies in the manner in which the intermediate or spider bearing for the shaft is arranged and particularly in the means for securing the said bearing for insuring perfect alinement of shaft.

A further feature of this invention is in the development of the bearing or coupling means at the lower end that coact with the rotary pumping head and which include a special arrangement of parts within the shaft tube for preventing the oil draining from the casing, other, but subordinate, features being also embodied in my present invention, all of which will be hereinafter fully explained, specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1, is a vertical section, parts being in perspective, of my improved pump construction. Fig. 2, is a vertical section of the upper end thereof that more particularly illustrates the upper bearing and the driving means for the pump shaft. Fig. 3, is a horizontal section taken on the line 3—3 on Fig. 1. Fig. 4, is a vertical section of the lower or rotary head end of my improved pump. Fig. 5, is a detail section

of the coupled ends of two of the tubular casing members hereinafter referred to.

In my present form of pump, 1 designates the steel pit whose bottom 10, that is bolted to the body portion, see Fig. 4, has a central tubular hub 11, through which passes the upper end of a deep well tubing 2, the upper end of which extends a short distance above the pit bottom and has fixedly secured thereto a false bottom 3 of the diameter of the pit and having an annular outwardly flared vertical flange 30 for directing the fluid, that is centrifugally directed by the rotary head presently referred to, in an upward direction, see the arrows on Fig. 4, by reference to which it will be seen the said bottom 3 forms the base plate of the pumping shell, the aforesaid member 10 forming the closure for the lower end of the pit.

Pendently supported over the bottom 3 by the means presently referred to is the pumping head which may be of any well known construction, and as shown, consists of a hub 90 to which the pumping blades 91 are fast, the said blades having such shape that they act to draw up the water from the tube 2, and direct it centrifugally against the flange 30 and up into the pit from whence it discharges at the top.

The lower end of the pump shaft 70 to which the pump head is secured, rotates in a long bearing hub 81 fast to the bottom plate 82 of a tubular casing 8 that surrounds the shaft to keep it clear of the water that rises into the pit, the said plate 82 forming the top of the pump shell, it being bolted to an annular flange 83 on the lower end of the said casing 8, as shown.

The hub of the pump head has a central vertically projected convex bearing 82^a for engaging a concaved seat 81^a in the bottom of the hub 81 and between the faces of the hub 82^a and the seat 81^a is mounted a metal packing or washers 84, such arrangement of parts being especially provided for making a tight joint and preventing the danger of the vacuum draining off the oil (in practice, contained in the casing 8) through the shaft aperture in the long bearing 81, it being understood that since the lower end of the shaft 70 is made fast to the pump blade carrying hub that when the said shaft 70 is drawn upwardly, in the manner presently described, a solid connection of the parts under the lower end of tube

8 is made and the lower end of the said tube is effectively closed.

In my present construction of pump, the upper end of the pit is conical and is bolted to the body portion as is best shown in Fig. 2 which also shows the top or cap portion 13 formed with the outlet 11^a which may have the usual type of back check valve 12. At the apex, the cap 13 has a central opening 13^a for the upper end of the casing 8 that is fixedly mounted in the said cap 13 and the said upper extension or end has a plug bearing 85 for the upper end of the shaft 70 which extends above the said bearing 85 and also has a feather 70^a to engage the groove 16^a in the hub of the driven pulley 16, around which takes the drive belt 17, as shown, the shaft end 70^b having a clamping nut 14 attached thereto, as best shown in Fig. 2, whereby the said shaft may be readily drawn up to make the desired closure bearing at the lower end of the hub 81 mounted on the plate 82 that closes the lower end of the casing 8. To provide for easily passing the lubricant into the casing 8, the upper end thereof terminates in a cup 86 that surrounds the lower part of the hub of the belt pulley, the latter riding in ball bearings $x-x$ mounted in a ball race 86^a in the upper end of the plug bearing 85, as shown.

The shaft 70 and the casing are made in sections, the number of which depends on the depth of the pit, and although not shown, in practice the pit may also be of sections joined in any suitable manner. The shaft sections 70 are joined by the ordinary form of coupling union 71 while the casing sections are joined by skeleton disks 17 bolted between opposing flanges 80—80 on the casing sections 8, and provided with a central hub bearing for the shaft 70, see detail Fig. 5. In my present construction of pump, means is also provided for bracing the casing 8 with respect to the pit so as to maintain the disk bearings 17 in proper position for holding the shaft sections in true alinement, the said means consisting of a skeleton brace 100 having a central hub through which the casing 8 passes and having an annular rim 101 of a slightly less diameter than the pit, said rim being on a taper for the easy insertion of the wedge flange 102 on a clamping ring 103, as clearly shown in the drawing, it being manifest that the brace 100 can be placed at any desired point within the pit and fixedly held with respect to the pit and the casing 8 by driving down the wedge ring.

By reason of the improved arrangement and construction of parts as shown and described, the general construction and advantages of the pump disclosed in my patent referred to is rendered more economical and the efficiency of the said pump increased, the

shaft sections are the more positively held in true alinement, the casing is strengthened and held in a more rigid position and the running of the pump head made easier, and with less wear than before.

Having thus described my invention, what I claim is:

1. The combination with a deep well tube, a pit in which the tube extends, a disk plate on the upper end of the tube that forms the bottom of the pumping shell, said plate having an outwardly flared rim, and the pit a discharge in the upper end; of a centrally disposed casing pendent from the top of the pit, a plate that forms the closure for the bottom of the casing and the top of the pump shell, said plate having a hub bearing, a hub bearing in the upper end of the casing, a rotary pump head mounted in the shell at the bottom of the pit, a shaft that extends down into the pit through the casing and carries the said head, means for vertically adjusting the shaft and the head, and for imparting motion to the shaft.

2. The combination with the pit closed at the top and the bottom and having a central intake at the lower end and a discharge at the upper end, a casing that extends from the top of the pit to a point near the intake, a rotary pump that operates in the bottom of the pit to direct the fluid from the intake to the discharge end of the pit, the casing having a closure hub in its upper and in its lower end, a shaft journaled in the hubs having a drive pulley at the upper end and carrying a rotary pump head at the lower end, and adjustable means for bracing the casing in the pit, said means consisting of a skeleton brace having an annular rim, and a central hub for the casing, and a clamping ring having a wedge rim for fitting between the annular rim of the brace and the pit wall.

3. The combination with the pit closed at the top and bottom having a discharge at the upper end, and a central aperture at the lower end to receive the end of the well tubing; of a pump shell mounted on the bottom of the pit in communication with the well tubing and having an annularly and upwardly directing fluid discharge; a rotary pumping head horizontally mounted in the shell, a shaft connected to the pumping head that extends through the top of the pit, a casing that surrounds the shaft and extends through the top of the pit, said casing having a plug bearing on each end for the shaft, the plug in the lower end of the casing having a concaved bearing, the pump head having a convexed bearing for fitting the said concaved bearing, a metallic washer interposed between the two bearings, and means at the upper end of the shaft for adjusting it vertically with respect to the said bearings.

4. The combination with the pit, the pump head in the bottom thereof, a pump shaft, belt pulley on said shaft, the shaft casing that extends through the top of the
5 pit to support said pulley and take the belt pull and closed at the top and bottom, an oil supply to the casing, a packing bearing between the lower end of the casing and the pump head and means operable from the
10 top of the pit for adjusting the shaft and head vertically.

5. In a pumping mechanism of the character described, a well pit, a rotary pump

head therein, a line of shaft from the pump through the top of the pit, a casing that en- 15
tirely surrounds the shaft portion inside the pit, means for leading lubricant into the casing and devices for adjusting the bearing of the pump head against the lower end of the casing for cutting off oil leakage 20
therefrom.

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Witnesses:

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