May 1, 1923. 1,453,293

W. M. STEPHENSON

OIL SAVER DEVICE

Filed Oct. 26, 1917

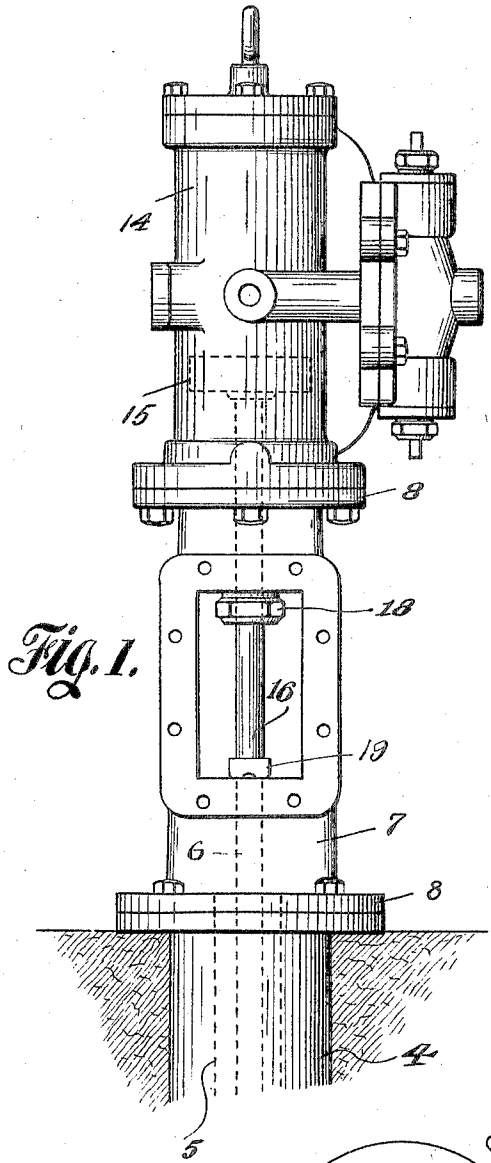


Fig. 1.

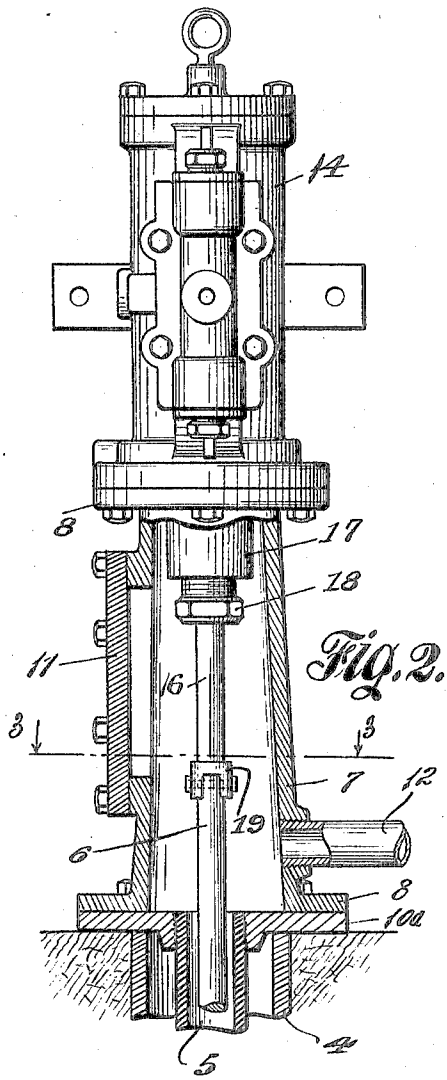


Fig. 2.

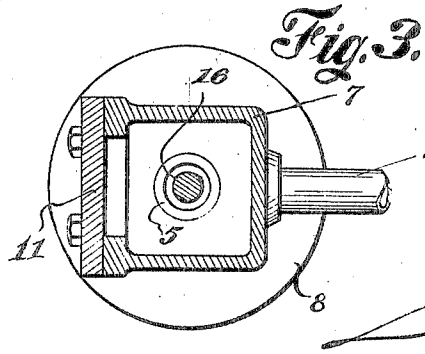


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM M. STEPHENSON, OF DALLAS, TEXAS.

OIL-SAVER DEVICE.

Application filed October 26, 1917. Serial No. 198,677.

To all whom it may concern:

Be it known that I, WILLIAM M. STEPHENSON, a citizen of the United States, residing at Dallas, county of Dallas, and State of Texas, have invented a new and useful Oil-Saver Device, of which the following is a specification.

This invention relates to well equipment, and especially oil well equipment. More particularly the invention relates to a new and useful oil saving device and engine support used at the head of oil wells in combination with pumping machinery.

Much oil is annually lost through leakage at the head of well casings where the ordinary stuffing box is relied upon to prevent it from leaking and wasting out of the delivery pipe and by the pump or sucker rod. The stuffing box of course wears and deteriorates after the pump has been worked for some time with the result that each stroke of the piston of the steam head, which lifts the sucker rod, throws out a small portion of oil beyond the stuffing box. This oil wastage saturates the soil surrounding the well and permanently destroys vegetation with the result that the ground is seldom if ever again usable for agricultural purposes.

It is fitting, therefore, that the primary object of my invention is to produce a novel and improved oil well pumping equipment, which obviates the above named faults of present oil well pumping machinery, which conserves the oil, and which functions to prevent the soil surrounding the oil wells from being saturated with waste oil, to the end that the vegetation is not destroyed, and to the further end that the soil may be used for agricultural purposes after the oil well has been exhausted and abandoned, and the soil returned to agricultural enterprises.

These desirable purposes are accomplished by employing a simple form of receiving chamber or receptacle fitted to the head of the well, above the well casing, and into which the oil is discharged from the delivery pipe or working barrel in the bottom of the well. The receptac'e functions as a base or support upon which is mounted any suitable form of motive power generally consisting of a steam head or single stroke engine for reciprocating the pump or sucker rod of the well pump equipment. The receptacle acts to seal and enclose the head of the well so as to restrain the oil against leakage, and confines it to flow only through a discharge pipe connected to the receptacle.

One of the important features of this invention, and that which contributes to its success, is the elimination of the usual stuffing box employed at the head of the well, and this is made possible by the use of the herein disclosed oil saver and receptacle which encloses all heretofore exposed parts of the pumping equipment and seals the head of the well against leakage.

With the above principal objects and others in view, the invention has relation to a certain construction and combination of parts, an example of which is described in the following specification, defined in the appended claims, and portrayed in the accompanying drawing, wherein:

Figure 1 shows the head of one type of oil well upon which is mounted a suitable steam head or engine, with the receiving chamber or oil saver interposed between the steam head and the well casing.

Figure 2 shows a view taken on a plane right-angular to the Figure 1, with the receiving chamber or oil saver and fragment of well casing shown in section.

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 2 illustrating the oil receiving chamber in sectional view.

In presenting a more detailed disclosure of the invention, reference is had to the drawing, wherein there is illustrated a well casing 4 in which is installed the usual oil delivery or working barrel pipe line 5. As is known to those conversant with the art, the well casing 4 and oil delivery or working barrel pipe line 5 extends downwardly to the source of oil supply, where on the lower end of the oil delivery pipe 5 there is installed a pump cylinder, usually known as a working barrel, which is equipped with a piston and connecting rod, and not shown in this disclosure since it is not a part of the

invention. A sucker rod 6 is confined in the oil delivery pipe 5 and connects at the bottom of the well, with the piston in the aforesaid working barrel. Thus the sucker rod 6 is employed to successively reciprocate the pump at the bottom of the well and lift the oil through the delivery pipe 5, where it is discharged at the surface of the earth through any suitable distributing pipe. In typical well pumping equipment, there is most always used a stuffing box not shown herein, on the upper end of the oil delivery pipe 5, and the sucker rod 6 passes through this stuffing box and connects with an engine or steam head superimposed above the head of the casing 4. The constant reciprocating motion of the sucker rod 6 through the stuffing box causes leakage of the oil from the delivery pipe 5 out through the stuffing box, and this leakage is constant and prevalent on all old types of oil well pumping equipment generally used in the oil fields.

The foregoing paragraph sets forth a synopsis of the construction and operation of a typical well. The loss of oil is so constant that in the course of the life of one well, there are many barrels of oil lost through the small leakage past the stuffing box due to the fact that no means is provided for catching the oil which is squirted out and lost through the old stuffing box upon each upward stroke of the sucker rod. The conception and reduction to practice of this invention contemplates the use of a receptacle to house and enclose the stuffing box and other parts to eliminate the necessity of the stuffing box and to receive all the oil which flows upwardly from the delivery pipe.

An oil saver receiving chamber 7 is preferably constructed in a single piece iron casting, and made in the form of an elongated housing which may be either cylindrical or rectangular in cross section. This receiving chamber or receptacle 7 is formed with an integral flange 8 at each end thereof, and each end of the receptacle is preferably left open so that the sucker rod may be inserted from the lower end of the receptacle and a steam head may be mounted on the upper end thereof. The bottom flange 8 is anchored to the well cap 9 which secures the receptacle in concentric position over the well casing 4. One side of the receptacle 7 is provided with an enlarged inspection opening which is closed by a cover plate 11. This construction provides a solid closed oil receptacle with a cover plate 11 which may be removed for inspection, assembly, or repair of parts within the receptacle. This receptacle 7 is made of such suitable length as to adequately function as a base or stand upon which is mounted a steam head or any suitable type of motor for working the sucker rod.

A discharge pipe line 12 is connected with the receptacle 7 for the purpose of conveying oil therefrom as it is forced upwardly from the delivery pipe 5. This discharge pipe 12 is connected to the receptacle 7 at a point suitably located adjacent the bottom end of the receptacle in order that the oil will not rise to any considerable height within the receptacle. The discharge pipe 12 leads from the well to any suitable place of storage. It is to be noted that in the assembly of this equipment both the delivery pipe 5 and the discharge pipe 12 open directly into the receptacle 7, and neither of these pipes is fitted with a stuffing box. In this manner oil flows freely out the top of the delivery pipe 5 into the receptacle 7, whereupon it flows from the receptacle 7 outwardly through the discharge pipe 12.

The receptacle is employed as a base or support, and on the upper end thereof, there is mounted a steam head or any other suitable type of engine or motor employed for the purpose of operating the pump. In the drawings, there is shown one universally used type of steam head 14 having a piston 15 and connecting rod 16. The connecting rod projects downwardly through a stuffing box casing 17 which has a pressure nut 18 for taking up wear in the stuffing box. The connecting rod 16 is confined in the receptacle 7 and joined to the sucker rod 6 through any suitable joint or connection 19. The connecting rod 16 reciprocates through the stuffing box 17, and both this stuffing box and the connecting rod joint 19 may be inspected and kept in working order through access thereto by the removal of the cover cap 11.

The above paragraph sets forth an approved source of motive power, in the form of a vertical single stroke engine, to drive a pump in an oil well. Before the use of my invention, it was necessary to employ a frame or legs to support the engine or steam head 14 directly over the well casing. In the use and practice of my invention, the receptacle 7 supplants the use of the old steam head supporting frame, and likewise performs the purpose of an oil saver receptacle to eliminate the use of the old stuffing box.

In the operation of an oil well pumping equipment embodying my invention, the steam head 14 is started in operation by opening the throttle or valve used to control the engine. The oil flows from the delivery pipe 5 upwardly into the chamber 7 and out through the discharge pipe 12. In the absence of a stuffing box at the top of the pipe 5 and around the sucker rod 6, the oil flows quite freely into the receptacle. The pressure of the steam in the cylinder of the en-

gine 14 prevents the oil from entering the cylinder, but sufficient oil is present to lubricate the piston and rod of the engine which obviates the necessity of oiling these parts. The receptacle being a closed housing or container, confines the oil therein until it has flowed out through the discharge pipe 12. Inasmuch as the receptacle 7 completely encloses the head and upper extremity of the delivery pipe 5, there is no egress or opportunity whatsoever for oil to be lost by leakage or seepage from the delivery pipe 5 into the ground, but on the other hand all the oil is confined within the receptacle 7 and caused to flow from the well out through the discharge pipe 12.

Thus the invention features the simple receptacle acting the double part of an engine support pedestal or base, and a receptacle or well seal to receive and distribute the oil to the discharge pipe, whereby is eliminated the waste of oil and consequent saturation of the earth surrounding the well to the end that economy and efficiency characterizes the operation of an oil well operated under the plan of my invention.

Having thus described the use and advantage of this invention, its construction and operation, what I desire to secure by Letters-Patent, and what I claim is:

1. An oil pumping system including an engine in combination with the casing of a well, and an oil receptacle device interposed between the well casing and the engine to support said engine and act as an oil receptacle, and a discharge pipe connected to the receptacle.

2. An oil receptacle employed as a combination receiver and supporting base for the steam head of an oil pumping mechanism, comprising a hollow cast member having provision for attachment to the well casing and to the steam head, and used for the purpose of receiving the oil pumped from the well, and further used for the purpose of supporting the engine, and a discharge pipe connected to the receptacle for the purpose of conveying the oil away from the well.

3. A pedestal for pumping engines and the like comprising a hollow support, means on the lower end of the support to rigidly fix the support to the head of a well casing, means on the upper end of the support to anchor a pumping engine thereto, said pedestal support provided with an aperture for connection with a liquid discharge pipe and also being provided with an inspection opening, and a cover plate over the inspection opening.

4. In combination, an oil well casing and delivery pipe, a receptacle having an open unobstructed oil passageway leading to the delivery pipe, an engine supported on the receptacle, and a connecting rod extending from the engine down through the receptacle and through the passageway into the delivery pipe.

5. Improvements in well pumping apparatus comprising a suitable motive power unit, a pump rod operated thereby, a hollow pedestal functioning as a support for the unit and as a liquid receptacle, and means forming part of the pedestal structure to connect with pipe lines.

6. Improvements in well pumping apparatus comprising an engine cylinder, a stuffing box thereon, a liquid receptacle enclosing the said stuffing box, and a piston rod extending from the cylinder working through the stuffing box and through the receptacle, and means on the receptacle for connection with a well delivery pipe.

7. Improvements in well pumping apparatus comprising an engine cylinder, a stuffing box thereon, a liquid receptacle enclosing the said stuffing box, a piston rod extending from the cylinder working through the stuffing box and through the receptacle, and the aforesaid receptacle made in the form of a base to support the engine, and provided with means for connection with a well pipe.

8. A combination engine pedestal and liquid receptacle for well pumping systems comprising means for eliminating objectionable stuffing boxes at the head of oil wells and the like, embodying a hollow casting adapted to function as an engine base or support and liquid receptacle, and a bolting flange on each end of the casting for making a liquid tight connection between the said casting and engine and well.

9. A combination engine pedestal and liquid receptacle for well pumping systems comprising means for eliminating objectionable stuffing boxes at the head of oil wells and the like, embodying a hollow casting adapted to function as an engine base or support and liquid receptacle, and means on each end of the casting for making liquid tight connection between the well and engine and receptacle.

10. A combination engine pedestal and liquid receptacle for well pumping systems comprising means for eliminating objectionable stuffing boxes at the head of oil wells and the like, embodying a hollow casting, a bolting flange on each end thereof for making a liquid tight connection between the casting and engine and well, said casting made with an opening therein through which inspection of the interior may be made, and a cover plate secured over the opening.

11. Improvements in well pumping or liquid circulating power plants, comprising a power unit for driving pumps, a pump rod operated by the power unit, a pump rod stuffing box made on the power unit, a hollow

frame pedestal forming part of the power unit and extending downwardly therefrom forming a liquid receptacle which encloses the stuffing box, the said pedestal being closed at one end by the power unit and stuffing box and made open at the other end for the reception of liquid from a well, said open end of the hollow pedestal provided with means for anchoring the power unit and pedestal to the well, and provision on the pedestal receptacle for connection with a discharge pipe to convey liquid from the well.

In testimony whereof I hereunto affix my signature.

WILLIAM M. STEPHENSON.