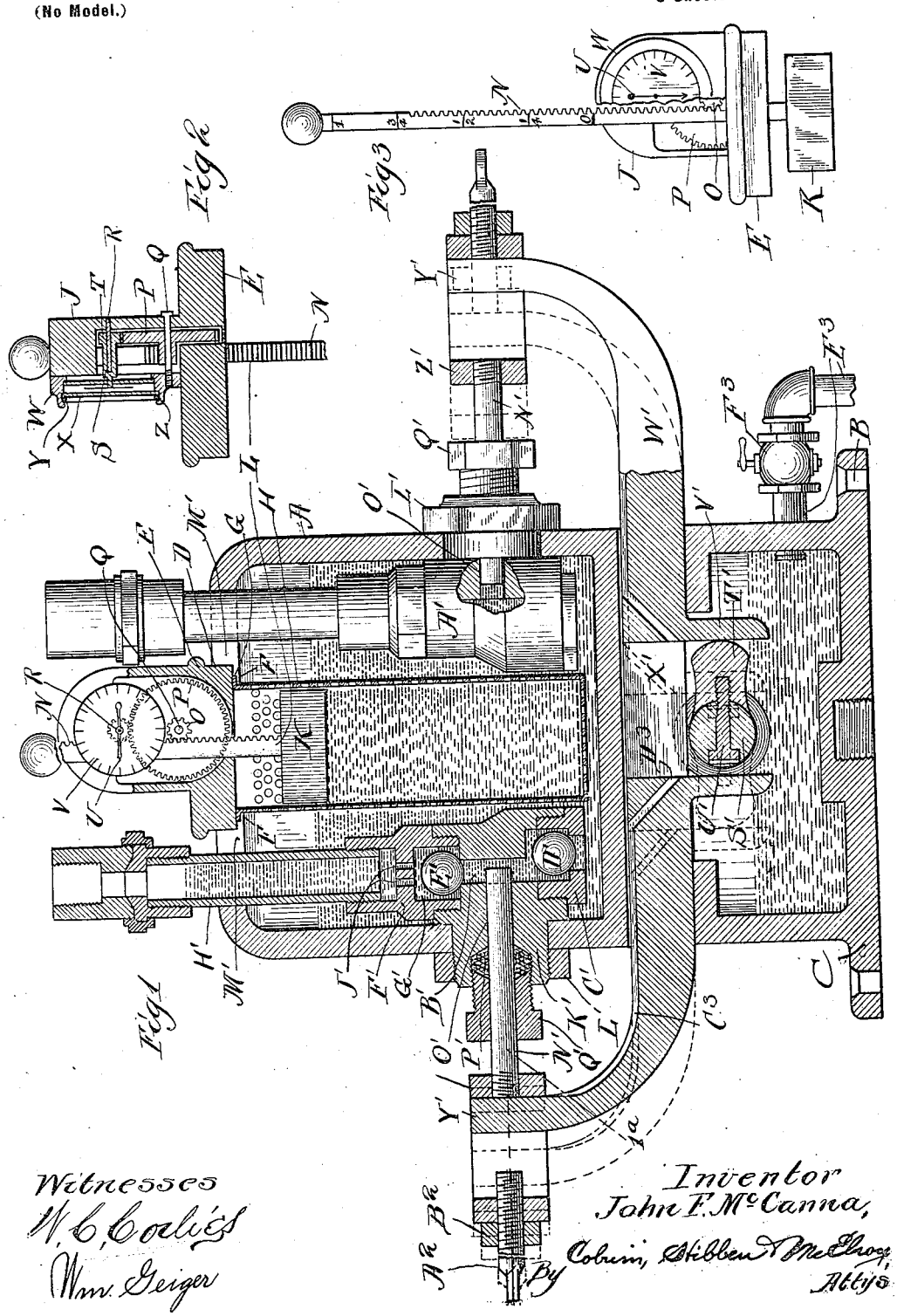
No. 648,669. Patented May 1, 1900.

J. F. McCANNA.

LUBRICATING PUMP.

(Application filed Mar. 9, 1899.)

(No Model.) 3 Sheets—Sheet 1.



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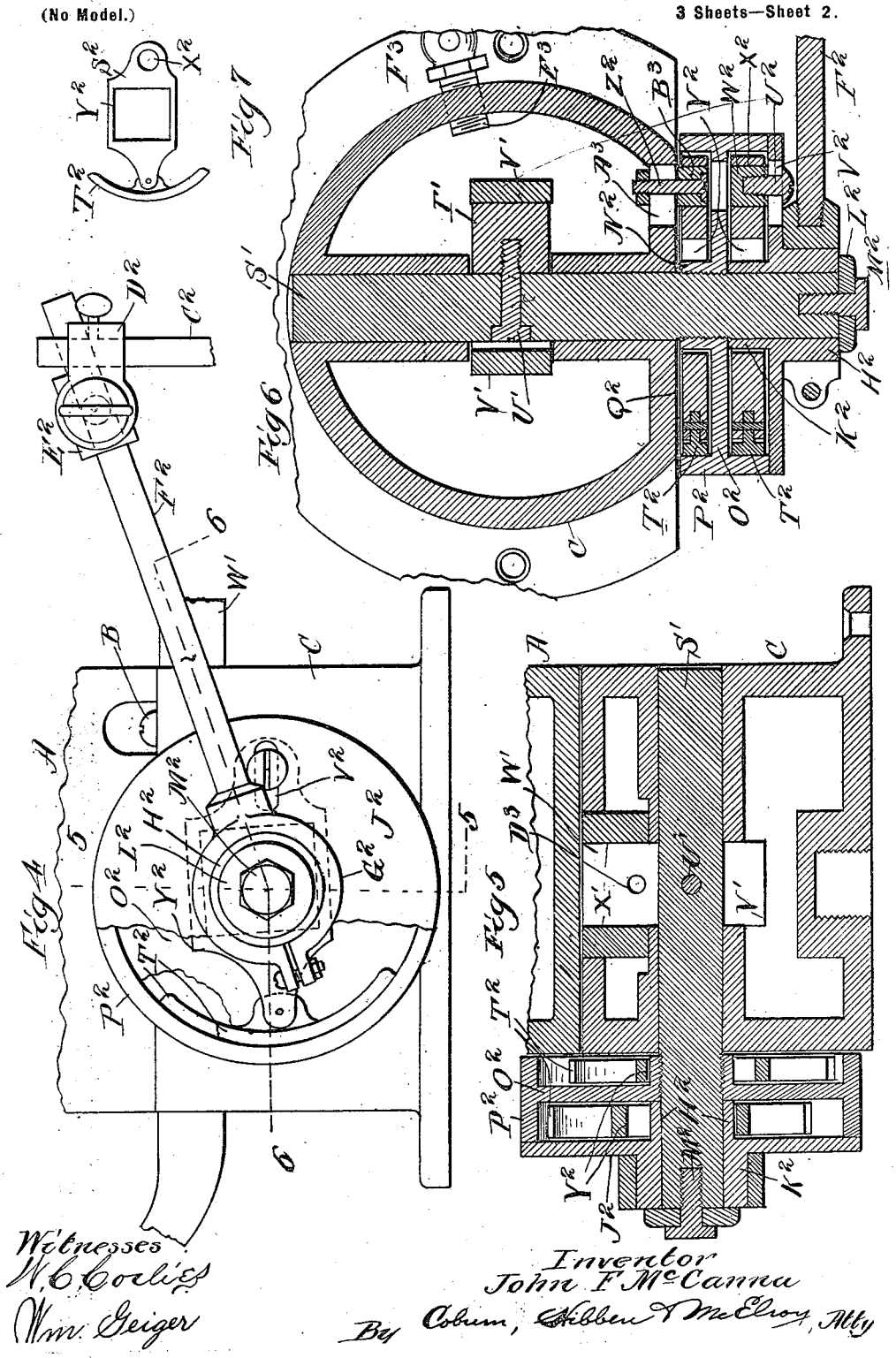
(No Model.) 3 Sheets—Sheet 2.



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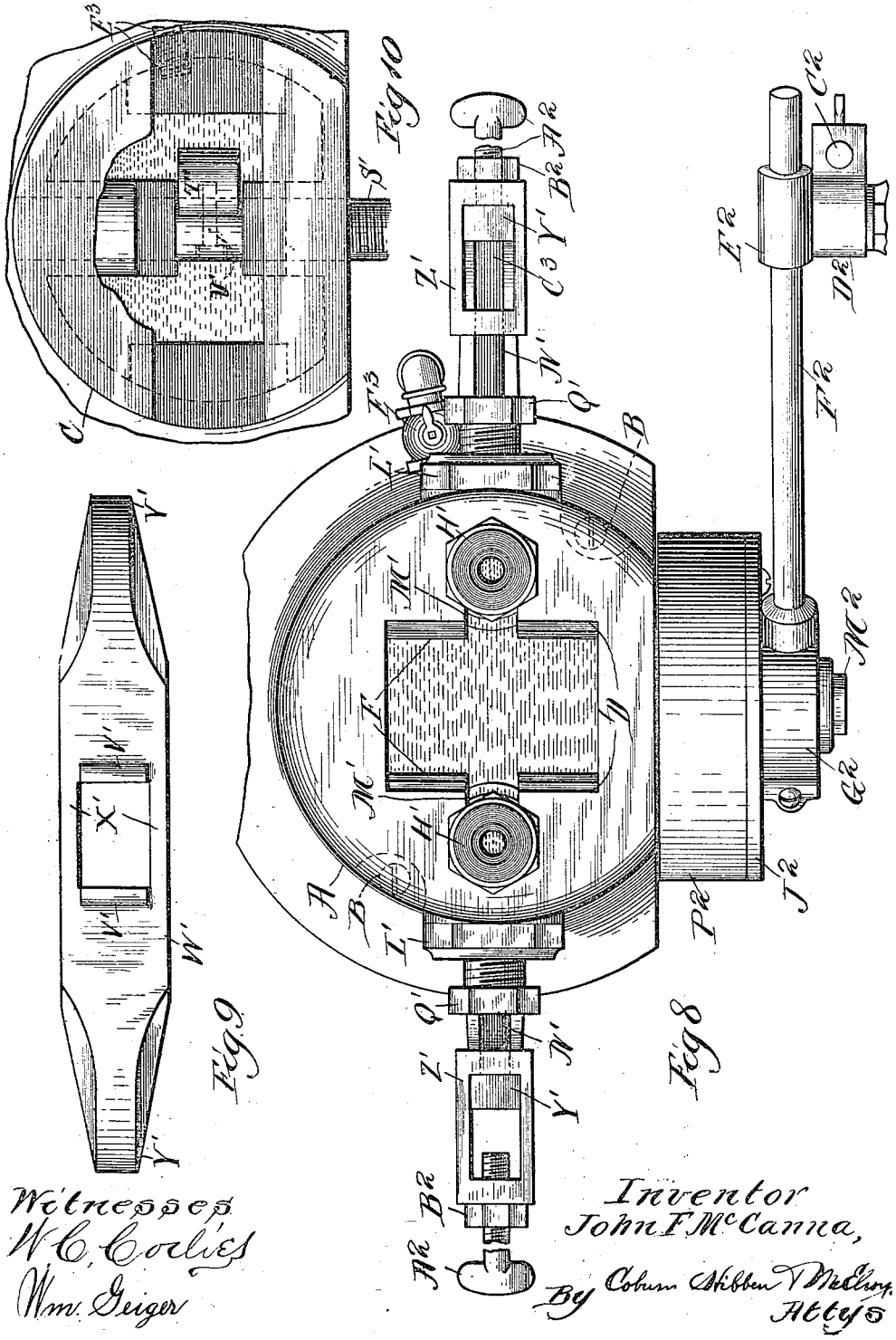

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UNITED STATES PATENT OFFICE.

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LUBRICATING-PUMP.

SPECIFICATION forming part of Letters Patent No. 648,669, dated May 1, 1900.

Application filed March 9, 1899. Serial No. 708,366. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. McCANNA, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lubricating-Pumps, of which the following is a specification.

My invention relates to certain new and useful improvements in what are known as "lubricating-pumps," which are small pumps ordinarily operated from some reciprocating part of a steam-engine and employed to pump oil to any parts that it is desired to have constantly and uniformly lubricated.

My invention is primarily concerned with a structure in lubricating-pumps whereby a single reservoir for the lubricating material may be employed in connection with two or more pumps which draw the supply therefrom and which pumps may be operated from the same driving mechanism.

My invention is further concerned with a novel structure and relation of the parts whereby the pump is removably secured in the oil-reservoir and operated by a piston reciprocating through the side thereof, being a structure wherein the only parts that ever become worn can readily be removed and replaced.

My invention further relates to new and improved actuating mechanism for use in such pumps, and includes, among other things, a novel clutch mechanism whereby the reciprocating rotary motion is applied to a shaft to give it an intermittent rotary motion.

Referring to the sheets of drawings, in which the same letters of reference are used to designate identical parts in all the views, Figure 1 is a central section through a reservoir employing two pumps. Fig. 2 is a central sectional view of the indicating mechanism. Fig. 3 is a front elevation of an indicating mechanism detached. Fig. 4 is an elevation of the actuating mechanism with some of the parts broken away to more clearly illustrate the details of the construction. Fig. 5 is a sectional view of the actuating mechanism on the line 5 5 of Fig. 4. Fig. 6 is a similar sectional view on the line 6 6 of Fig. 4. Fig. 7 is a detail view, on a smaller scale, of one of the clutch members employed in connection with the actuating mechanism. Fig. 8 is a plan view with the cap, indicating mechanism, and strainer removed. Fig. 9 is an inverted plan view of the actuating-slide, and Fig. 10 is a plan view of the base portion with the reservoir proper and the actuating-slide removed and a portion of the casing broken away.

The reservoir A, which contains the oil or other lubricating material, may be of the cylindrical shape shown, although any other shape might be employed. I have shown this reservoir A as secured by the screws B or otherwise on the hollow cylindrical base portion C. The top of the reservoir A has the rectangular aperture D therein, in which aperture fits the cap E, which supports the indicating mechanism. The aperture D is formed with the flange F therein, and upon this flange F rests the flange G of the strainer H, which, as shown, is of a shape to correspond with the aperture D. The flange G of the strainer H rests on the flange F formed in the aperture, and the cap E, resting upon the upper side of the flange G and in the aperture D, serves to close the aperture and secure the strainer in place. The cap E is formed with the portion J, which serves as a bearing or casing for the indicating mechanism proper. The float K is provided with the stem L, which may be graduated, as shown in Fig. 3, to indicate the amount of oil that has been pumped out since the reservoir was last filled. The scale on the stem L is graduated to coöperate with the opening in the upper end of the portion J of the cap through which it projects. It will be readily seen that the position of the float J will be regulated by the amount of oil in the reservoir and that consequently the position of the stem L will indicate the amount of oil remaining. To indicate the rate at which the oil is being pumped out, I employ the following construction:

One side of the stem L is formed with the teeth N, which form a rack-bar which meshes with the gear-pinion O, which with the gear-wheel P, to which it is rigidly secured, is rotatably mounted upon the pin or shaft Q, passing through the aperture or recess formed in the portion J of the cap. Journaled upon

a stud, shaft, or pintle R above the gear-wheel P is a hollow shaft S, which has a gear-pinion T meshing with the gear-wheel P and has its outer end carrying the pointer U, which plays over the graduated dial V, secured in the cap W, placed upon the front of the portion J of the cap E. Each graduation of the dial V represents a drop of the lubricating material, and it will be readily seen that as the oil is pumped out the falling of the float K will produce a movement of the pointer U, the rate of which movement will indicate the rate at which the oil is being pumped out of the reservoir. To protect the pointer U, I may place a glass plate X in front of it and conveniently secure it in the cap W by means of the spring-ring Y, fitting into a groove Z in the cap or cover W.

The pumping mechanism proper consists of the irregular-shaped portion or piece A', which has interiorly-screw-threaded openings in its bottom and top, and the passage B', connecting them, which passage is enlarged at the bottom, as seen. The screw-threaded valve-seat C' is screwed into the bottom of the piece A', and the ball-valve D' coöperates therewith, as will be readily apparent. The valve-seat formed by the upper end of the passage B' is closed by the ball-valve E'. The connecting-piece F' is screwed into the upper end of the piece A' and has the aperture G' formed in its lower side of a size to accommodate the movements of the valve E'. The pipe H', which is screwed into its upper end, serves to carry the oil to any desired place, and the holes J', bored through the central portion of this connecting-piece F', permit the passage of the oil upward to the tube H'. This piece A' has the preferably cylindrical portion K' projecting out through a similarly-shaped aperture in the side of the reservoir A, and the nut L', coöperating with the screw-threaded end of the cylindrical portion K', serves to hold this piece A' and its connected parts in position. When it is desired to take the pump out for any purpose, if the cap E and strainer H have been removed by lifting them out and the nut L' taken off the pipe H' can be moved toward the center of the reservoir, the slots M', leading to the aperture D, permitting this movement. In the construction shown the cap E and the opening D are elongated in the direction at right angles to the section in Fig. 1, and by turning the pipe H' so as to bring the longer portion of the part A' in line with the longer way of the opening it can be withdrawn from the reservoir. Of course the reverse method is employed in assembling the parts. The piston N' reciprocates in the bearing O', formed in the piece A', and through the stuffing-box P', which is closed by the nut Q', screwed into the cylindrical end K' of the piece A'.

To reciprocate the piston N', the shaft S' is slowly rotated by means to be subsequently described, and this shaft S', which is mounted in bearings formed in the base C of the machine, has secured thereon the lug T', which is shown as fastened thereto by the screw U', passing through the shaft and into the lug. As the shaft S' rotates, the lug T' coöperates with the interior bearing-surfaces of the downwardly-projecting lugs V', which are carried by the reciprocating slide W', which moves back and forth in the openings (see Fig. 10) formed in the sides of the base C. A rectangular aperture X' is cut in the slide W' to permit the necessary rotation of the cam-lug T'. The ends of the slide W' are turned upward, as shown in Fig. 1, and take into the apertures formed in the yokes Z', to be described. These pistons N' have the rectangular yokes Z' secured on their outer ends and into which the upturned ends of the slide W' project. In the outer ends of the yokes Z' are located the screws A^2 and the jam-nuts B^2 thereon, by which the length of stroke of the pistons N' is regulated to discharge any amount of oil that may be desired. It will readily be seen that if the screw A^2 is in the position shown at the right hand of Figs. 1 and 8 the reciprocation of the slide W' will not affect the piston N', as the end of the slide W' will not contact with the yoke Z' to move it at all. If, however, the screw A^2 is moved inward to a position corresponding to its position on the left-hand side of the machine, after the slide W' has moved to the left a certain amount, the lost motion will be taken up and the remaining movement of the slide will be imparted to the piston N'. The reverse movement will occur as the slide moves in the opposite direction. It will be obvious that by the adjustment of the screws A^2 either or both of the pistons N' may be thrown entirely out of operative connection with the slide W', so that the operation of the pumps may be completely regulated in every detail.

To rotate the shaft S', I employ the following mechanism: The vertically-reciprocating rod C^2 is supposed to be attached to any reciprocating part of the engine, and this is secured in any desired position to the member D^2, which is pivotally mounted upon the adjustable bearing E^2, secured in any desired position upon the swinging rod F^2, the inner end of which is furnished with a clamping split ring G^2, by which it is secured upon the collar H^2, projecting outwardly from the circular plate J^2. This collar H^2 may also extend inwardly, forming the collar K^2, and the common aperture for these collars forms a bearing by which the plate J^2 is mounted upon the outer end of the shaft S', it being held in position by means of the washer L^2 and screw M^2. Screwed upon or otherwise rigidly secured to the shaft S' is the collar N^2, which has the circular flange or web O^2 terminating in the widened periphery P^2. The flange O^2 and its widened periphery P^2, coöperating with the flattened side Q^2 of the reservoir A and the disk J^2, form two annular cavities, in which are mounted two clutch elements,

each composed of the body portion S^2 and the curved dog T^2, pivoted thereto. The outer clutch member is pivotally secured in the outer cavity by means of the screw U^2, passing through the horizontal elongated slot V^2 in the face of the plate or disk J^2 and taking into the bearing stud or pintle W^2, upon which the clutch member is pivotally mounted by means of the circular aperture X^2. The enlarged aperture Y^2, which is conveniently square, permits the free passage of the shaft and sleeve K^2. Similarly it will be seen that the inner clutch member is secured in the inner cavity by means of the screw-bolt Z', passing through the horizontal slot A^3 in the flattened face Q^2 of the reservoir A and holding the bearing stud or pintle B^3 in position. The operation of these parts will be readily apparent. As the part C^2 reciprocates vertically, the arm F^2 will be reciprocated about the center of the shaft S' as a pivot and in its movement will reciprocate the disk J^2, to which it is secured. As the parts stand in their normal position, as shown in Fig. 4, the curved flange T^2 of the outer clutch member rests loosely against the inner side of the extended periphery P^2 of the disk O^2. As the arm F^2 moves downward the tendency of the pivotal point of the outer clutch member to approach the side of the extended periphery against which its flange T^2 takes, owing to the swinging of the pivotal point in a circle, causes the flange T^2 to bind against the widened periphery P^2 and the disk O^2 to advance with the outer clutch member during its forward movement. As the arm F^2 is raised the clamping effect of the clutch is removed and the disk O^2 remains still, and consequently the shaft S', to which it is attached, remains in its advanced position. The inner clutch member comes into play to prevent any possible friction between the disk J^2 and the disk O^2 from carrying the disk O^2 backward. The action of the clutch member in this will be readily apparent, as if the widened periphery P^2 of the disk O^2 were moved backward it immediately tends to clamp the inner clutch member and its fixed pivotal point absolutely prevents any backward movement after it is once clamped.

As there is always a certain amount of gradual leakage out of the stuffing-box, I provide the slide W' with the grooves C^3 directly beneath the ends of the stuffing-boxes, which carry this waste oil and discharge it through the apertures D^3 into the chamber formed in the base C of the pump. This oil is discharged upon the cam bearing-surfaces, and even if it were not the oil which gradually accumulates in the chamber will eventually become deep enough so that the end of the lug T' in its rotation will take into the oil and carry enough with it to thoroughly lubricate the bearing-surfaces with which it contacts. To draw off any surplus of oil that may accumulate in this chamber, I may provide the pipe E^3, opening into it, which is provided with the cock F^3 for opening or closing it, as may be desired.

The complete operation of the pump will be readily apparent and no detailed description thereof is deemed necessary. It will be seen that the amount of the feed can be easily and readily regulated by the adjustment of the bolts and nuts A^2 and B^2 and that the indicator provided will always show the actual amount being pumped out. Of course it will be understood that I might, if desired, employ only one pump in the reservoir, or I may employ more than two, conveniently arranging them in pairs and providing a slide W' for each pair, or I might connect a plurality of slides or form them integral.

It will be understood that I do not desire to be limited to the exact form shown and described, but that my invention may be embodied in a variety of forms, and that I do not desire to be limited therein, except as necessitated by the state of the art.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a device of the class described, the combination of the reservoir A having an opening in its top, with a detachable pump located within said reservoir and removable through said opening, a discharge-pipe connected to said pump and leading from said reservoir, a bar reciprocating outside of said reservoir, and a piston for said pump passing through a side of said reservoir and reciprocated by said bar, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

2. In a device of the class described, the combination of the integral reservoir A having an opening in its top, with a detachable pump within said reservoir and removable through said opening, a discharge-pipe connected to said pump and passing through said opening in the reservoir, a bar reciprocating beneath said reservoir, and a piston for said pump passing through a side of said reservoir and reciprocated by said bar, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

3. In a device of the class described, the combination of the reservoir A having an opening in its top, with a valved pump located within said reservoir and removably secured in a side thereof so that it can be detached and removed through said opening, a discharge-pipe leading from said reservoir and connected to the pump, a piston for said pump passing through the side of said reservoir in which the pump is secured, and means outside of said reservoir for reciprocating said piston, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

4. In a device of the class described, the combination of the reservoir A having an opening in its top, with a valved pump located

within said reservoir and removable through said opening, a discharge-pipe leading from said reservoir and connected to the pump, a piston for said pump passing through a side of said reservoir, a bar reciprocating outside of said reservoir and coöperating with said piston to reciprocate it, and means for reciprocating said bar comprising the rotating shaft S′ having the cam-lug T′ coöperating with the bearing-surfaces V′ on said bar, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

5. In a device of the class described, the combination of the reservoir A having an opening in its top, with a plurality of pumps located within said reservoir and removable through said opening, a corresponding number of discharge-pipes leading from said reservoir and severally connected with said pumps, a corresponding number of pistons for said pumps passing through the sides of said reservoir, and a bar reciprocating outside of said reservoir and coöperating with said pistons to operate them, the elements being so constructed and arranged that any of the pumps can be removed from the reservoir without disassembling it.

6. In a device of the class described, the combination of the reservoir A, with a plurality of removable pumps located therein, a corresponding number of discharge-pipes and pistons for said pumps, the discharge-pipes severally connected thereto and leading from said reservoir, and the pistons severally cooperating with their respective pumps, and a single reciprocating member for actuating the pistons for said pumps, substantially as and for the purpose described, the elements being so constructed and arranged that any of the pumps can be removed from the reservoir without disassembling it.

7. In a device of the class described, the combination of the reservoir A, with a plurality of detachable pumps removably located therein, a corresponding number of discharge-pipes, each discharge-pipe being connected to its corresponding pump and leading from said reservoir, and the pistons severally coöperating with their respective pumps, and a single reciprocating slide located outside of said reservoir, for alternately actuating said pistons, the elements being so constructed and arranged that any of the pumps can be removed from the reservoir without disassembling it.

8. In a device of the class described, the combination of the reservoir A having an opening in its top, with a valved pump located within said reservoir, a discharge-pipe leading from said reservoir and to which the pump is connected, a bar reciprocating outside of said reservoir, a piston for said pump passing through a side of said reservoir, and connections for imparting a portion of the movement of said bar to said piston comprising the yoke Z′ fixed to said piston and a movable abutment A^2 for regulating the stroke of said piston as shown and described.

9. In a device of the class described, the combination of the reservoir A, the detachable pump removably located within said reservoir, the piston N′ for said pump reciprocating through a side of said reservoir, with the actuating slide-bar W′ located outside of said reservoir, connections between said slide and the piston for imparting a portion of the movement of said slide to the piston, and the rotating shaft having the lug thereon coöperating with the bearing-surfaces on the slide W′, substantially as and for the purpose described, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

10. In a device of the class described, the combination of the reservoir A, a detachable pump removably located within said reservoir, a discharge-pipe leading from said pump, a piston for said pump passing through one of the sides of the reservoir; with a chamber beneath said reservoir, a sliding bar mounted in said chamber and reciprocating to operate the piston, a rotary shaft also located in said chamber, and connections between said shaft and slide to reciprocate the slide from the continuous rotary movement of the shaft, the elements being so constructed and arranged that the pump can be removed from the reservoir without disassembling it.

11. In a device of the class described, the combination of the reservoir A, the pump therein, a discharge-pipe leading from said pump, a piston for said pump passing through one of the sides of the reservoir; with a chamber beneath said reservoir, a sliding bar mounted in said chamber and coöperating with said piston to reciprocate it, a rotary shaft in said chamber, connections between said shaft and slide whereby the rotary movement of the shaft is transformed into reciprocating movement of the slide; and means for carrying the waste oil from said piston to said chamber where it is available to lubricate the said connections.

12. In a device of the class described, the combination of the pump having the piston N′ reciprocating through the stuffing-box, with the actuating-slide W′ directly beneath the piston, and having the channel C^3 therein, substantially as and for the purpose described.

13. In a device of the class described, the combination of the pump having the piston N′ reciprocating through the stuffing-box, with the actuating-slide W′ directly beneath the piston and having the channel C^3 therein, and the rotary shaft S′ having connections for reciprocating the slide W′, said shaft being located at the terminus of the channel C^3.

14. In a device of the class described, the combination of the pump having its piston N′ reciprocating through the stuffing-box, with the actuating slide W′ directly beneath

the piston and having the channel C^6 therein, the chamber through which the slide W′ reciprocates in suitable bearings, and the rotary shaft S′ carrying the lug T′ which coöperates with the bearing-surfaces V′ on the slide W′, substantially as and for the purpose described.

15. In a device of the class described, the combination of a reservoir, with a plurality of pumps located therein, a reciprocating piston for each of said pumps passing through the side of said reservoir, a single reciprocating member for moving said pistons, adjustable connections between said pistons and member capable of adjustment so as to throw any desired one or more of said pumps out of operation, substantially as and for the purpose described.

16. In a lubricator, the combination of the reservoir for the oil having an aperture in one of its sides, with the valved pump removably located therein and having a piston-barrel passing through said aperture, a piston in said barrel and having one end projecting inside of the reservoir, and means outside of said reservoir for reciprocating said piston comprising a reciprocating bar adjustably connected to the projecting end of said piston so as to impart to it any desired portion of its stroke.

17. In a lubricator, the combination of the reservoir A for the oil having an aperture in one of its sides and an opening in its top, with the pump consisting of the block A′ having the horizontal piston-bearing O′ and the valve-seats connected by the passage B′ and having the portion about the piston-bearing shaped to fit the aperture, the piston N′ in said bearing, and means to reciprocate said piston, substantially as and for the purpose described.

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