J. F. DAKE.

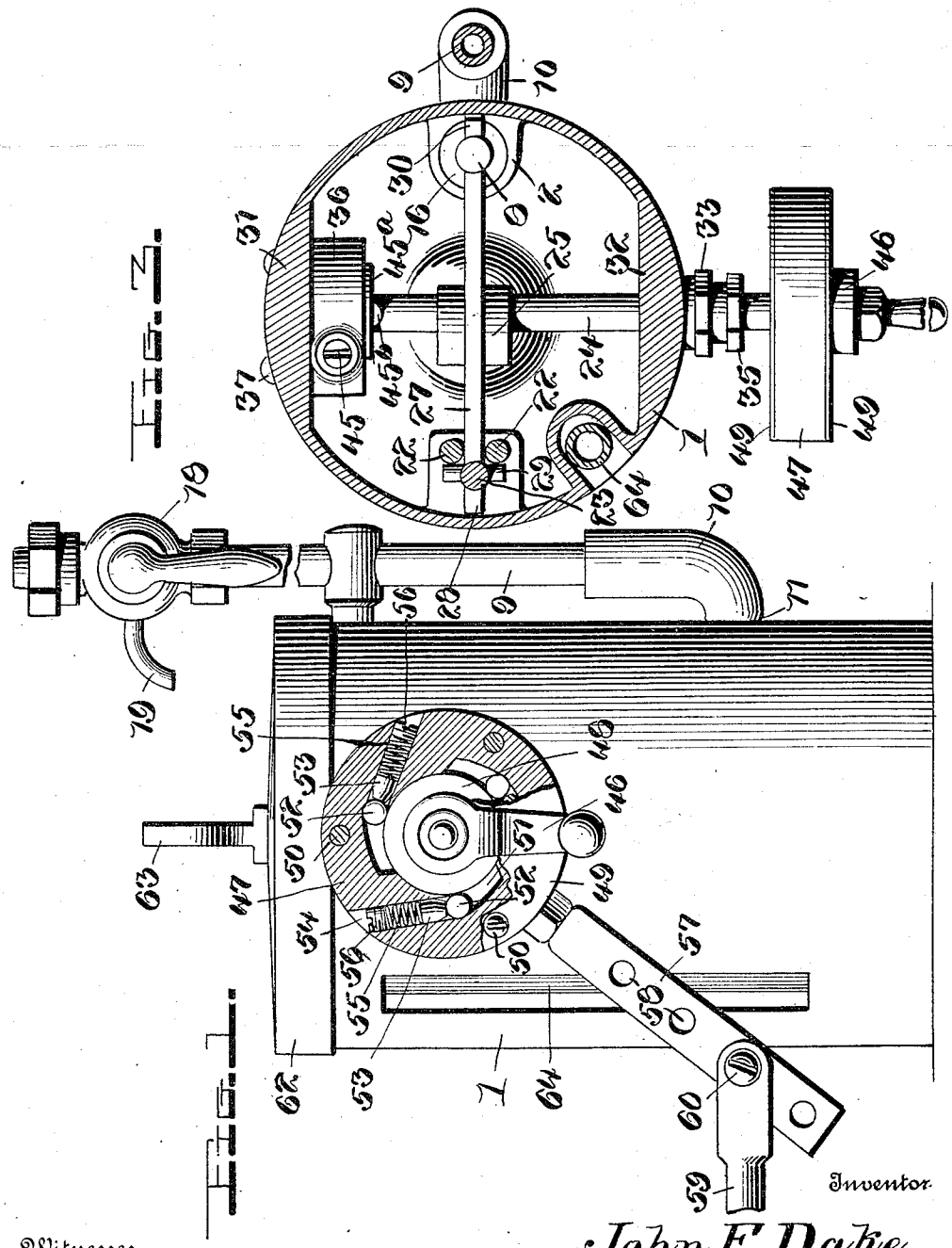
FORCE FEED LUBRICATOR.

APPLICATION FILED OCT. 3, 1910.

1,046,563.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.



Witnesses

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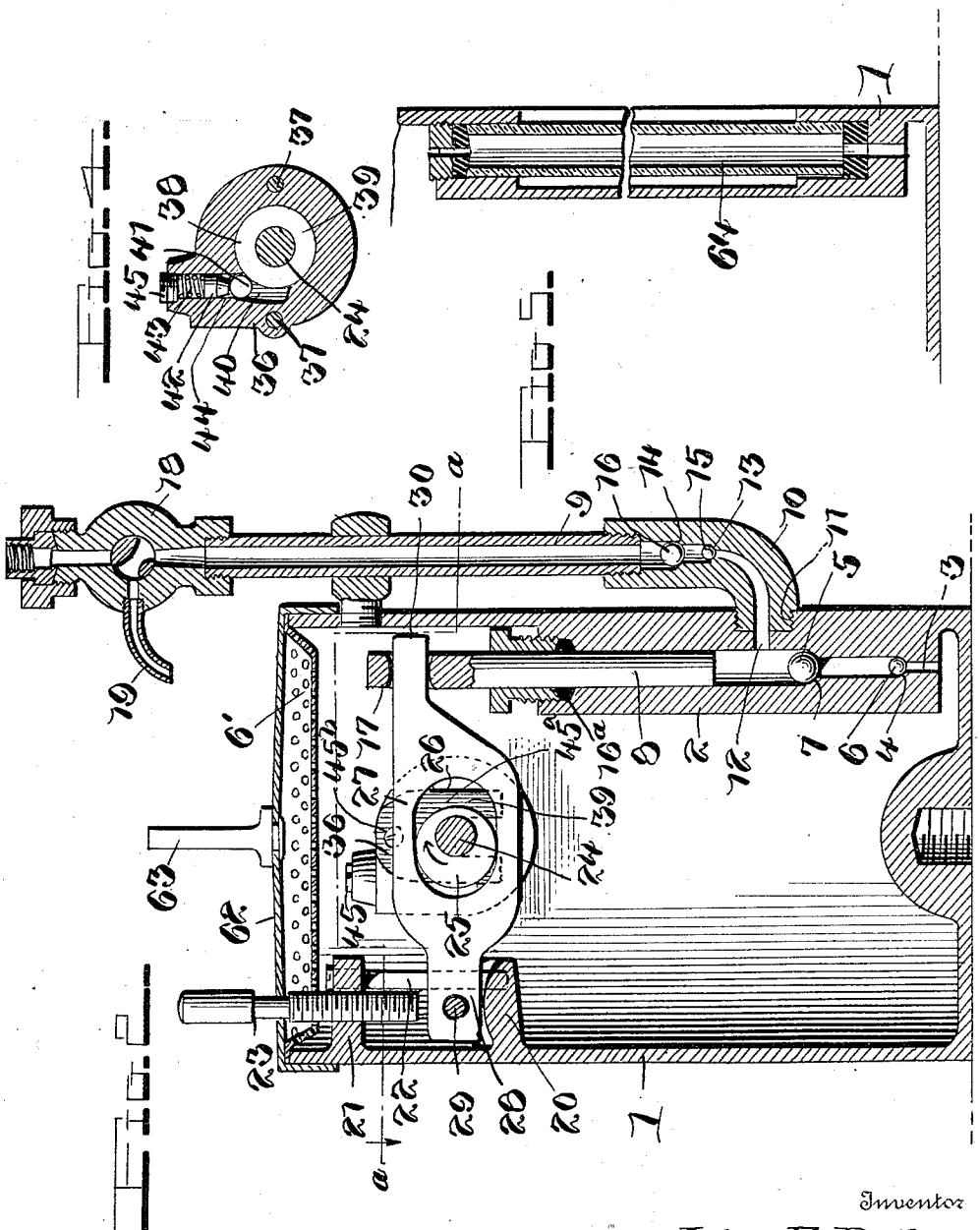

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UNITED STATES PATENT OFFICE.

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FORCE-FEED LUBRICATOR.

1,046,563. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed October 3, 1910. Serial No. 585,167.

To all whom it may concern:

Be it known that I, JOHN F. DAKE, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Force-Feed Lubricators, of which the following is a specification, reference being had to the accompanying drawings.

My invention has for its object the production of a force feed lubricator which is particularly simple in construction and highly efficient and durable in use.

Another object of my invention is to provide improved means for operating the pump which forces the lubricant from the reservoir, whereby the effective stroke of the pump piston may be regulated at will according to the desired quantity of lubricant to be forced at each stroke of the pump piston.

In the accompanying drawings—Figure 1 is a side elevation of a force feed lubricator constructed in accordance with my invention, the clutch constituting a part of the step-by-step mechanism which rotates the shaft, being shown partly in section. Fig. 2 is a vertical central sectional view of my improved force feed lubricator. Fig. 3 is a horizontal sectional view of the same on the plane indicated by the line *a*—*a* of Fig. 2. Fig. 4 is a detail vertical sectional view of one of the bearings for the shaft which actuates the pump mechanism. Fig. 5 is a sectional view illustrating the gage with which the reservoir of the device is provided.

The reservoir 1 is here shown as a cylinder open at its upper side. It may be of any suitable form, and of any suitable size. In one side of the reservoir and formed integral therewith is a vertically disposed pump barrel 2 having an inlet passage 3 in its lower end and provided with seats 4, 7, for ball valves 6, 5, which open upwardly so as to admit lubricant to the bore of the pump valve on the up-stroke of the pump piston 8, and to close on the down stroke of the pump piston. A lubricant feed pipe 9 leads from the reservoir and is connected thereto by an angle union 10 which is screwed into one side of the reservoir as at 11, and communicates with the discharge passage 12 of the pump, the said angle union having its bore provided with valve seats 13, 14, for ball valves 15, 16 which open upwardly. A suitable packing box 16^a is shown at the upper end of the pump valve to prevent leakage around the pump piston. The piston is a solid cylindrical bar provided near its upper end with a transverse opening 17. The pipe 9 is provided with a three-way valve 18 which may be set to permit the flow of lubricant through the pipe 9 to the steam cylinder or other machine element to be supplied by the lubricator or may be set so as to cause the lubricant forced out by the pump to be returned to the reservoir through a spout 19, the said three-way valve hence affording means for testing the operation of the lubricator as will be understood.

In the sides of the reservoir 1, opposite the pump are a pair of inwardly extending horizontally disposed lugs 20, 21 the latter being spaced a suitable distance above the former. These lugs are connected by a pair of vertically disposed guide rods 22 which are spaced apart a suitable distance, and the lug 21 has a vertically threaded opening in which is an adjusting screw 23. A horizontally disposed shaft 24 which extends transversely through the reservoir is provided with an eccentric 25. The said eccentric operates in a slot 26 in a lever 27, one arm 28 of which at one end of the said lever is disposed between the guide rods 22, and bears against the lower end of the screw 23. The said screw forms a vertically adjustable fulcrum for the said lever. A cross pin 29 passes through the arm 28 of the lever 27, and engages the inner sides of the guide rods 22. The arm 30, which extends from the end of the lever opposite that which is provided with the arm 28, passes through the opening 17 near the upper end of the pump piston or plunger, and hence the lever is loosely connected to the pump piston or plunger for angular movement. In opposite sides of the reservoir and at right angles to the lugs 20, 21, and the pump, are bosses 31, 32, the opposing sides of which are flat. A threaded opening extends through one side of the reservoir and also through the boss 32, and in the said opening is screwed a bearing sleeve 33 for the shaft 24, the said bearing sleeve being provided with a packing gland 35. A bearing block

36 is detachably secured to the inner side of the boss 31 by screws 37, and is provided with a cylindrical opening 38 constituting a bearing for a cylindrical disk 39 which is concentric with the shaft 24, and is secured thereto for rotation therewith. A downwardly narrowing opening 40 is in the block 36 and communicates at one side with the bearing opening 38, the opposite side of the said opening 40 inclining downwardly toward the opening 38. A roller 41 is mounted in the said opening 40, and bears between the inclined wall thereof on one side of the disk 39. A shoe 42 bears on the roller 41, and is pressed downwardly by a spring 43 which is disposed in a vertical opening 44 with which the bearing block 36 is provided, the said spring being engaged at the upper end thereof, by an adjusting screw 45. The recess 40 and roller 41 are covered by an inverted U-shaped plate 45[a] which is disposed astride the shaft 34 and secured to the inner side of the block 36 by means of a screw 45[b]. The function of this spring pressed roller 41 which bears against one side of the disk 39 is to permit the shaft 24 to rotate in the direction indicated by the arrow in Fig. 2, and prevent the shaft from rotating in the reverse direction. It will be understood that should the said shaft tend to move in the direction reverse to that indicated by the arrow, the roller 41 would be forced downwardly in the opening 40 and by contact with the inclined side of the said opening would be wedged against the disk 39 and hence lock the latter and the shaft.

The projecting end of the shaft 24 is provided with a hand crank 46, whereby it may be manually rotated. The said shaft is also provided contiguous to the hand crank with an annular head 48 which is encircled by a disk 47, said disk 47 having secured to it on opposite sides, disk-shaped plates 49, screws 50 or the like, serving as the fastening devices between the plates 49 and the disk 47. The plates 49 are adapted to overlap the sides of the annular head 48, as shown in the broken out portion of one of the plates 49 in Fig. 1, whereby to prevent the disk 47 from longitudinal displacement. The disk 47 is formed with recesses 51 which are contracted toward one end and which accommodate rollers 52. In each of the said recesses is mounted a roller 52. The said rollers are kept in engagement with the periphery of the disk by means of feet or plungers 53 which operate in tangential openings 54 with which the said head is provided, coil springs 55 being in said openings, and engaging at their inner ends with the said feet or plungers, the outer ends of the said springs being engaged by screws 56 which serve to enable the said springs to be put under any desired degree of tension. It will be understood from the foregoing description, and by reference to the drawings, that the said rollers by reason of the inclined walls of the recesses in which they are disposed, cause the shaft 24 to be turned in one direction, as indicated by the arrow when the disk is turned in such direction, and permit the head to turn in the reverse direction independently of the disk 47, and the shaft 24. A crank arm 57 is attached to the disk 47 and is provided with adjusting openings 58. A rod 59 which is reciprocated by a machine element such for instance as a crank or an eccentric, is pivotally connected to the crank arm 57 by a screw 60 which may be engaged with any one of the adjusting openings 58, so that assuming the stroke of the said connecting rod to be always the same, the head may be caused to be turned thereby, first in one direction, and then in the reverse direction, through as many degrees as may be desired according to the extent to which it is desired to turn the shaft 24 at each stroke of the said rod and of the crank arm 57.

It will be understood that the clutch which connects the crank 57 with the shaft coacts with the roller 41, and recessed block 36, to impart step-by-step rotary movement to the shaft 24 when the engine or other machine to which the lubricator is connected is in operation.

The rotary movement of the shaft 24 by the coaction of the eccentric 25 and slot 26 in which the latter operates causes vertical oscillating motion to be communicated to the lever 27, the latter turning on the lower end of the adjusting screw 23 which forms the fulcrum for the said lever. The arm 30 of the lever being connected to the piston or plunger 8 of the pump, reciprocating motion is communicated to said piston or plunger as will be understood and hence at each down stroke thereof, a quantity of oil or other lubricant determined by the extent of movement of said piston will be forced through the pipe 9 of the engine or other machine element with which said pipe is connected. The throw of the lever 27 may be regulated by adjusting the fulcrum screw 23 so that the piston may be caused to move to any desired extent at each rotation of the shaft 24 and its eccentric 25. Hence the quantity of lubricant forced from the lubricator at each stroke of the piston may be accurately predetermined and controlled. In the top of the reservoir I preferably employ a strainer 61 through which the upper portion of the adjusting screw 23 extends. The reservoir is also provided with a cover or cap 62 which is fitted loosely on the upper end, is provided with a handle 63 and is also provided with an opening through which the upper portion of the adjusting screw 23 extends. In one side of the reser-

voir is a tubular glass gage 64 which indicates at all times the quantity of the lubricant in the reservoir.

I claim:—

In a force feed lubricator, a reservoir having a pump in one side thereof and including a movable member and provided on the opposite side with a fixed fulcrum and a fixed support above said fixed fulcrum, an adjusting fulcrum screw carried by said fixed support, guide rods in said reservoir, a lever having one end connected to the movable pump member and the other end extended between the guide rods and disposed and movable between the fixed fulcrum and the lower end of the adjusting fulcrum screw and provided with a cross pin to co-act with the guide rods and prevent casual displacement of the lever, and actuating means for the lever connected thereto at a point intermediate its ends.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOHN F. DAKE.

Witnesses:
JAMES A. GILLIES,
BURLEW HILL.