(No Model.)

3 Sheets—Sheet 1.

# S. O. JONES.

## LUBRICATOR.

No. 584,688.

Patented June 15, 1897.

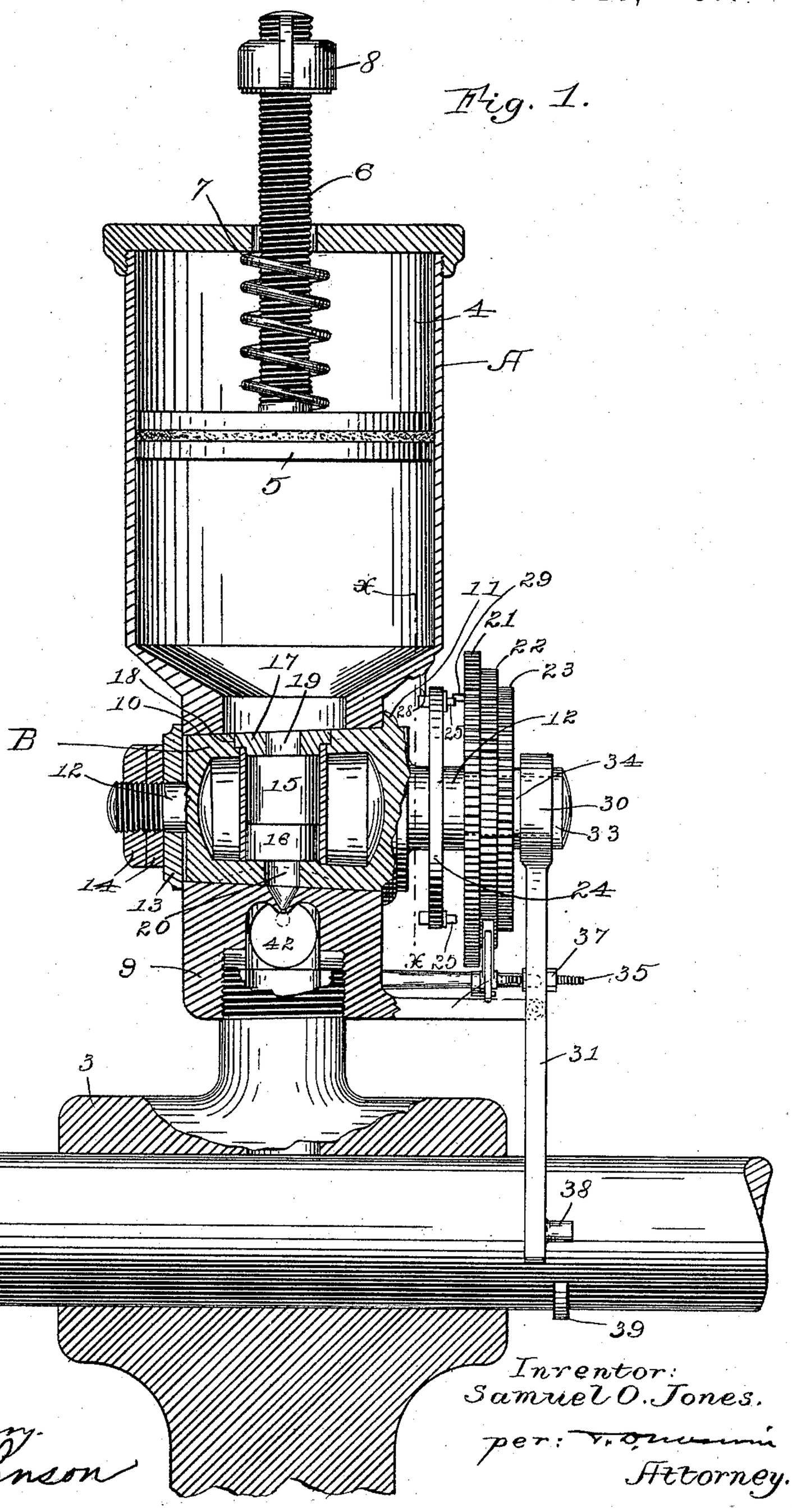


Fig. 1.

Witnesses:

V. D. Bradbury.

W. E. Johnson

Inventor:
Samuel O. Jones.
per: V. D. Bradbury
Attorney.

(No Model.)

3 Sheets—Sheet 2.

# S. O. JONES.

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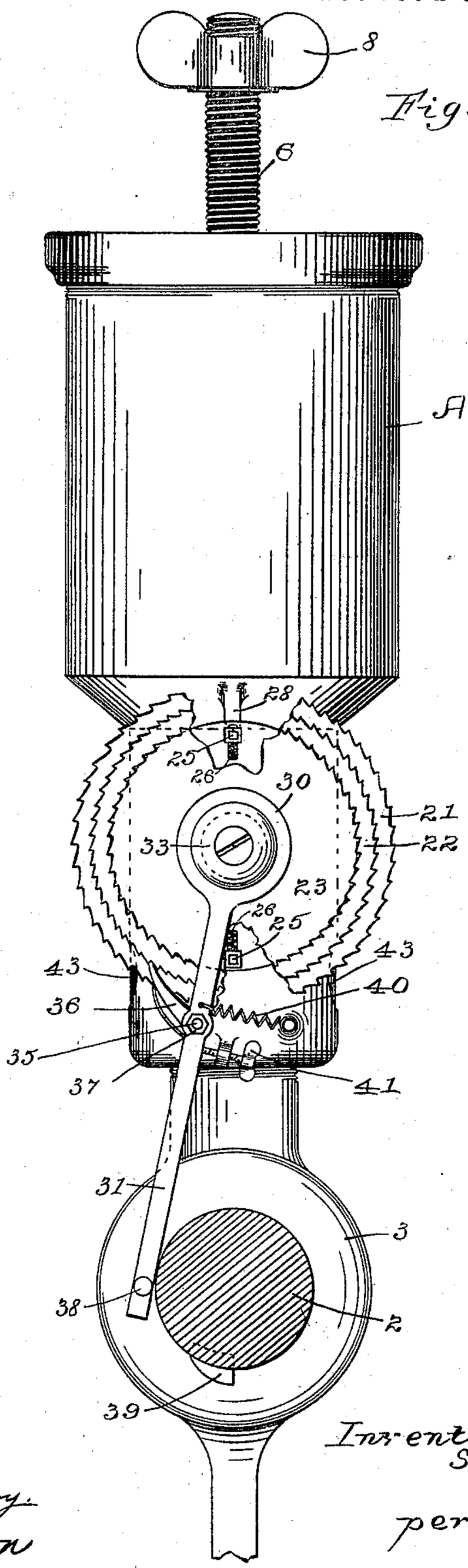


Fig. 2.

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H. T. Bradbury.

H. C. Johnson

Inventor:
Samuel O. Jones.

per: Thomson

Attorney.

(No Model.) 3 Sheets—Sheet 3.

# S. O. JONES.

## LUBRICATOR.

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Fig. 4.

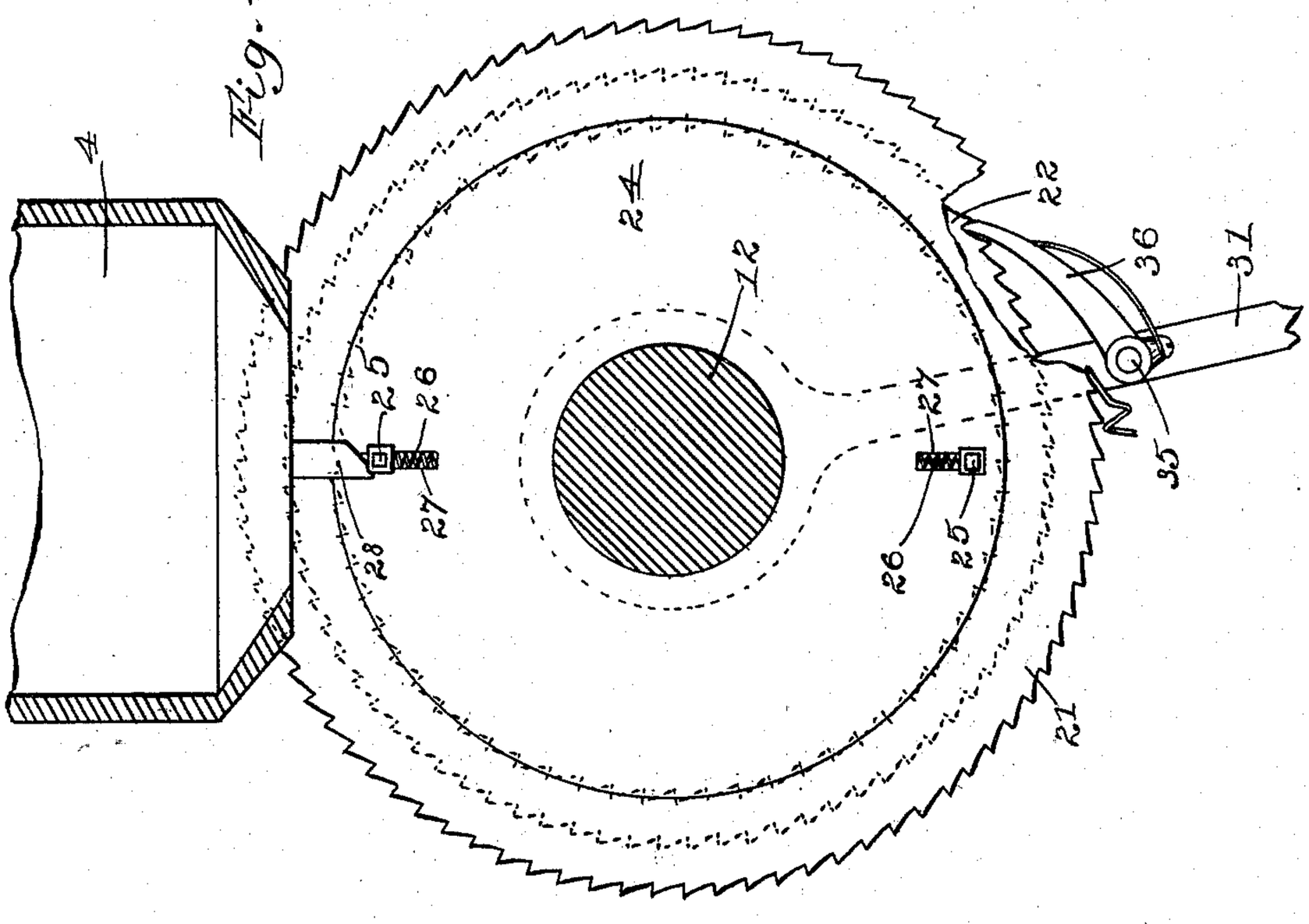
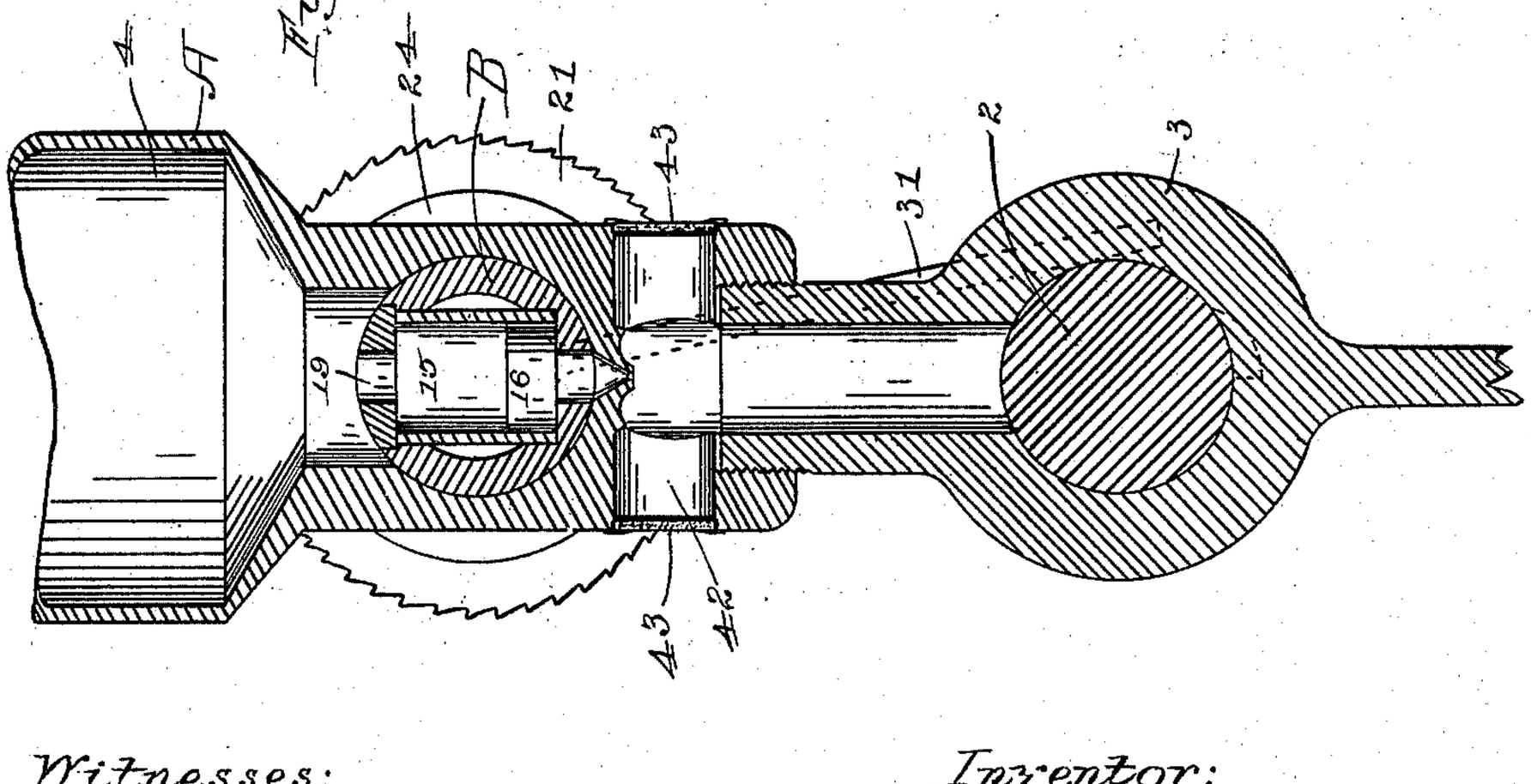



Fig. 3.




Witnesses:

F. L. Broadbury.

N. S. Johnson.

Inventor:

Samuel O. Jones.

per: [redacted]

Attorney.

# UNITED STATES PATENT OFFICE.

SAMUEL O. JONES, OF STILLWATER, MINNESOTA, ASSIGNOR OF ONE-HALF TO GEORGE H. ATWOOD, OF SAME PLACE.

## LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 584,688, dated June 15, 1897.

Application filed March 9, 1896. Serial No. 582,375. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL O. JONES, of Stillwater, Washington county, Minnesota, have invented certain Improvements in Positive-Feed Automatic Lubricators, of which the following is a specification.

My invention relates to improvements in lubricating devices for journal-bearings and the like, its object being to provide a positive and automatically feeding lubricator by means of which any required amount of lubricant may be delivered to the bearing with any desired periodicity during the running of the connected mechanism.

To this end my invention consists in arranging adjacent the journal-bearing a lubricator tube or conduit intermediate of the lubricator-reservoir and the journal. Connecting the lubricator-reservoir and the tube is a transverse cylindrical opening, within which is fitted a cylindrical core having a diametric opening or chamber which normally registers with the openings to the tube and lubricator-receptacle, and by the rotating of the core may be oppositely registered. Arranged within this chamber in the core is a freely-moving piston. I connect the core by means of a suitable shaft and interposed pawl-and-ratchet device with the shaft turning in the bearing to be lubricated or with some other continuously-operating part, and also provide certain engaging mechanism between the ratchet and the core-shaft, whereby the core-shaft is intermittently rotated.

My invention further consists in the specific features of construction hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a sectional elevation of my invention, showing the interior construction. Fig. 2 is a side elevation of my invention shown in connection with a continuously-running main shaft. Fig. 3 is a vertical central cross-section of the same, looking toward the ratchets; and Fig. 4 is a vertical section taken on line *x x* of Fig. 1.

In the drawings, let 2 represent the main shaft, turning in the bearing 3, which is to be lubricated.

A represents the lubricator-receptacle, which may be made of the cylinder 4, as shown, having the piston 5, rod 6, and operating-spring 7. The rod 6 is screw-threaded and provided with a thumb-nut 8, whereby when the lubricator-receptacle is emptied the piston may be lifted against the tension of its spring 7 by screwing down the nut. Below the lubricator-receptacle in the part 9 is the transverse, preferably tapering, opening 10, in which is arranged the rotatable plug or core B. The core, as shown, is formed with a circumferential flange 11 upon its larger end, abutting against the wall adjacent the opening 10, and mounted upon the core-shaft 12 at the opposite end is the collar 13, held loosely abutting against the outer wall adjacent the opening 10 by means of the set-nuts 14, whereby the core may be allowed to turn as freely as desired in its bearings.

The core is provided with the diametric opening or chamber 15, in which is arranged the freely-moving piston 16. One end of the chamber 15 is preferably closed by the plug 17, fitting into the opening 18 in the core and provided with a central port 19, opening into the chamber, the opposite side of the core being provided with a corresponding port 20. By removing the plug 17 the chamber 15 may be removed and another of smaller inner size substituted when it is desired to change the amount of lubricant delivered in a single operation.

Mounted upon the core-shaft 12 is the graduated series of ratchets 21, 22, and 23, turning loosely on the shaft. Upon the shaft, adjacent the inner ratchet 21, is the fixed collar 24, having the pair of oppositely-arranged pins 25 projecting therethrough, said pins being provided with controlling-springs 26, working in the slots 27 and holding them at the outer ends of the slots. The projecting ends of these pins upon the inner face of the collar 24 are adapted to engage the projection 28 upon the lubricator-receptacle, and upon the outer face of the collar are adapted to be engaged by the spur 29 upon the ratchet 21.

Mounted loosely on the core-shaft by means of its collar 30 is the arm or lever 31, being held upon the shaft by means of the cap 33 and having a suitable washer 34 interposed between the collar and adjacent ratchet.

This lever is provided with the bolt 35, threaded transversely therethrough and provided on its inner end with the spring-controlled pawl 36, adapted to be brought into engagement with either of the ratchets of the series, as desired, the bolt being provided with set-nuts 37, whereby it may be set in adjusted positions. The lever 31 depends and lies normally adjacent or upon the shaft 2 or other part from which it is operated and is provided with the lateral spur 38, adapted to be engaged by a projection or cam 39 upon the shaft in its rotation, so as to swing the lever and operate its connected pawl so as to turn the ratchet one step or more with each revolution of the main shaft.

The lever is normally held against the main shaft by means of the restraining-spring 40 and may be adjusted any desired distance away from the shaft by means of the screw 41, thus causing its pawl to engage a greater or less number of ratchet-teeth in each revolution of the shaft.

As shown in Figs. 1 and 3, I provide a transverse opening 42 below the measuring-chamber, provided with sights 43, so that the oil dropping through the conduit to the bearing may be seen.

The operation of the device is evident from the foregoing description and the drawings. The lubricator-receptacle being filled and the expelling-pressure being applied to the piston in the ordinary manner and the core standing with its opening in registering position with the outlet-port of the lubricator-receptacle, the contents of the receptacle are forced into the chamber in the core, driving the piston downward to the bottom of the chamber and filling the same.

The rotating of the shaft operates the pawl-lever, so as to turn the ratchets step by step, by means of the pawl 36. The ratchets turn until the spur 29 strikes the lower one of the pins 25 upon the collar 24, and the continued movement of the ratchets rotates the collar and connected measuring-core, by reason of the engagement of spur and pin, until the pin 25 strikes the beveled projection 28. The beveled edge of said projection causes the pin to slide downward in its slot, releasing the spur 29 before the pin itself is released from the projection. The collar and its core then stand still until the ratchets have made a half-revolution to bring the spur 29 into engagement with the opposite pin 25. It will thus be seen that with every alternate half-revolution of the ratchets the core is carried around a half-revolution, disengagement then taking place, as aforesaid, between the spur 29 and its engaged pin 25, the ratchet-wheels turning freely during the succeeding half-revolution, when engagement again takes place. When the core has thus been given a half-revolution, its diametric chamber is brought into opposite registering position with the ports in the core, thus permitting the contents of the chamber to descend through the connected tube to the journal-bearing and a like amount of the contents of the lubricator-receptacle to be forced into the opposite end, driving the piston downward. At this point the connection between the ratchet and the collar is tripped, as described, so that the core remains stationary until the engaging devices have turned upon the shaft through a half-revolution, so as to give time for the filling and emptying of the chamber. It will thus be seen that by adjusting the size of the ratchets and the number of their teeth, or the number of cams upon the main shaft, or otherwise, the relative speed of rotation of the core-shaft as compared with the main shaft may be adjusted at will, and by regulating the capacity of the chamber or opening in the core any desired amount of lubricant may be delivered.

It is also evident that by this mechanism any kind of lubricant adapted to be used upon such bearings may be efficiently used, whether of the more freely-flowing character or of lubricants which require heavy pressure to be expelled from the receptacle, since the parts may be adjusted so that this pressure both serves to fill the chamber in the core and also serves to drive the piston to the opposite end, forcing the contents out into the journal-bearing, thus making the feed of the lubricator and the bearing absolutely positive and automatic and without possibility of variance or irregularity either in the quantity or periods of feeding.

I claim—

1. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the core interposed between said receptacle and bearing, and having a diametric opening therethrough, the piston working in said diametric opening, and the mechanism interposed between said core and a continuously-operating part, whereby said core is rotated to cause its diametric opening to successively register with its inlet and outlet ports, and to receive and deliver to said bearing portions of the contents of the receptacle with a predetermined periodicity.

2. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the interposed, transverse core provided with a diametric opening adapted to register alternately with the ports connecting the cylinder with said receptacle and said bearing, the piston working in said diametric opening, and the mechanism interposed between said core and the shaft running in said bearing, whereby said core is oppositely operated from said shaft so as to cause its diametric opening to successively register with its inlet and outlet ports and receive and deliver to said bearing predetermined portions of the contents of the receptacle.

3. In an apparatus of the class described, the combination with the journal-bearing, its continuously-running shaft, and the lubri-

cator-receptacle, of the interposed, transverse rotatable core provided with a diametric opening, forming a chamber of predetermined capacity, the piston working in said chamber, the core-shaft, the ratchet journaled upon said shaft, the pawl operated by said main shaft so as to actuate said ratchet, the interlocking devices between said ratchet and core-shaft, and the tripping mechanism for periodically disengaging said ratchet and said shaft.

4. In combination with the bearing and the lubricator-receptacle having respectively inlet and outlet ports, of the interposed rotatable plug provided with a diametric opening adapted to register with said ports, the piston working in said opening, and the means for intermittently partially rotating said core to reverse the registration of said openings with said ports.

5. In combination with a bearing to be lubricated, and the lubricator-receptacle having respectively inlet and outlet ports, of the interposed rotatable plug provided with a diametric opening adapted to register with said ports, the piston working in said opening, and means connected with a continuously-operated mechanism for intermittently and with predetermined periodicity partially rotating said core to reverse the registration of its opening with said ports.

6. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the intermediate core having a diametric opening or passage adapted to normally register with ports leading to said receptacle and bearing respectively, the step-by-step mechanism interposed between the core and a continuously-moving part, whereby said core is operated to cause its diametric opening to successively register with said ports, and the means for releasing said step-by-step mechanism from said core to allow the same to remain stationary for a predetermined period.

7. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the intermediate rotatable core having a diametric opening or passage therethrough normally registering with ports leading to said receptacle and bearing, the mechanism interposed between said core and a continuously-moving part, whereby said core is operated from said part to cause its diametric opening to successively register with said ports to receive from said receptacle and deliver to said bearing predetermined quantities of lubricant, and the means for periodically disengaging said mechanism and core.

8. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the intermediate rotatable core having a measuring-chamber normally registering with a port leading from said receptacle, the step-by-step mechanism interposed between the core and an operating part, whereby said core is operated to cause its measuring-chamber to register with the port leading to the bearing, said step-by-step mechanism being adapted to be automatically disengaged from said core to allow the same to remain stationary for a predetermined period.

9. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing, of the intermediate rotatable core having a diametric opening therethrough, the step-by-step mechanism interposed between said core and an operating part, the means for adjusting said mechanism to vary the movement of said core, and the means for periodically disengaging said mechanism and core, and for reëngaging the same.

10. In an apparatus of the class described, the combination with the lubricator-receptacle and the bearing to be lubricated, of the intermediate rotatable core having a diametric opening or passage, the piston working in said opening, the step-by-step mechanism interposed between said core and an operating part and the means for periodically disengaging and for reëngaging the same.

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

SAMUEL O. JONES.

Witnesses:
H. S. JOHNSON,
MINNIE L. THAUWALD.