

No. 837,624.

PATENTED DEC. 4, 1906.

D. S. KENT.

MEANS FOR OPERATING FORCE FEED LUBRICATORS.

APPLICATION FILED DEC. 18, 1905.

2 SHEETS—SHEET 1.

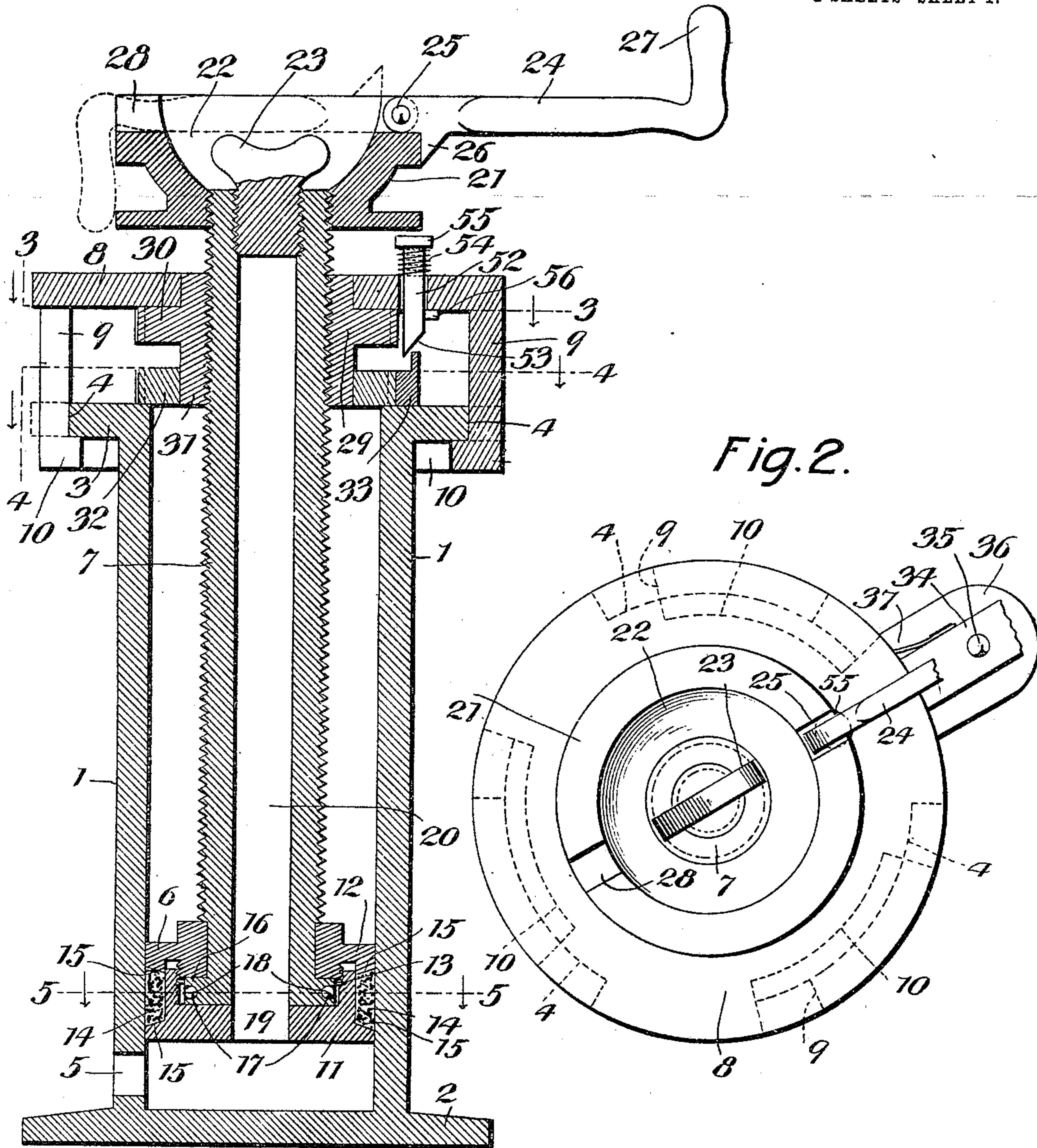


Fig. 1.

Fig. 2.

Witnesses
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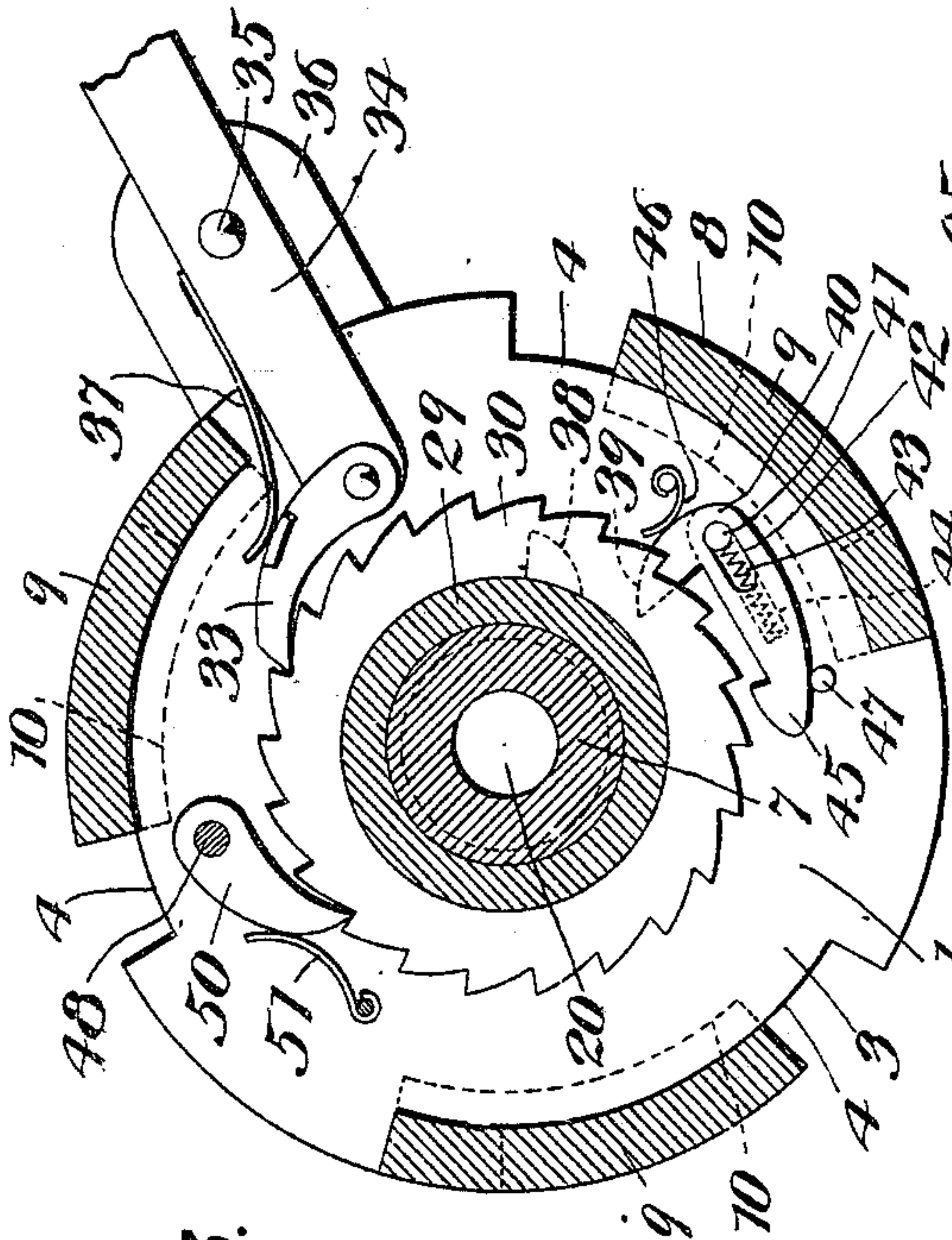


Fig. 3.

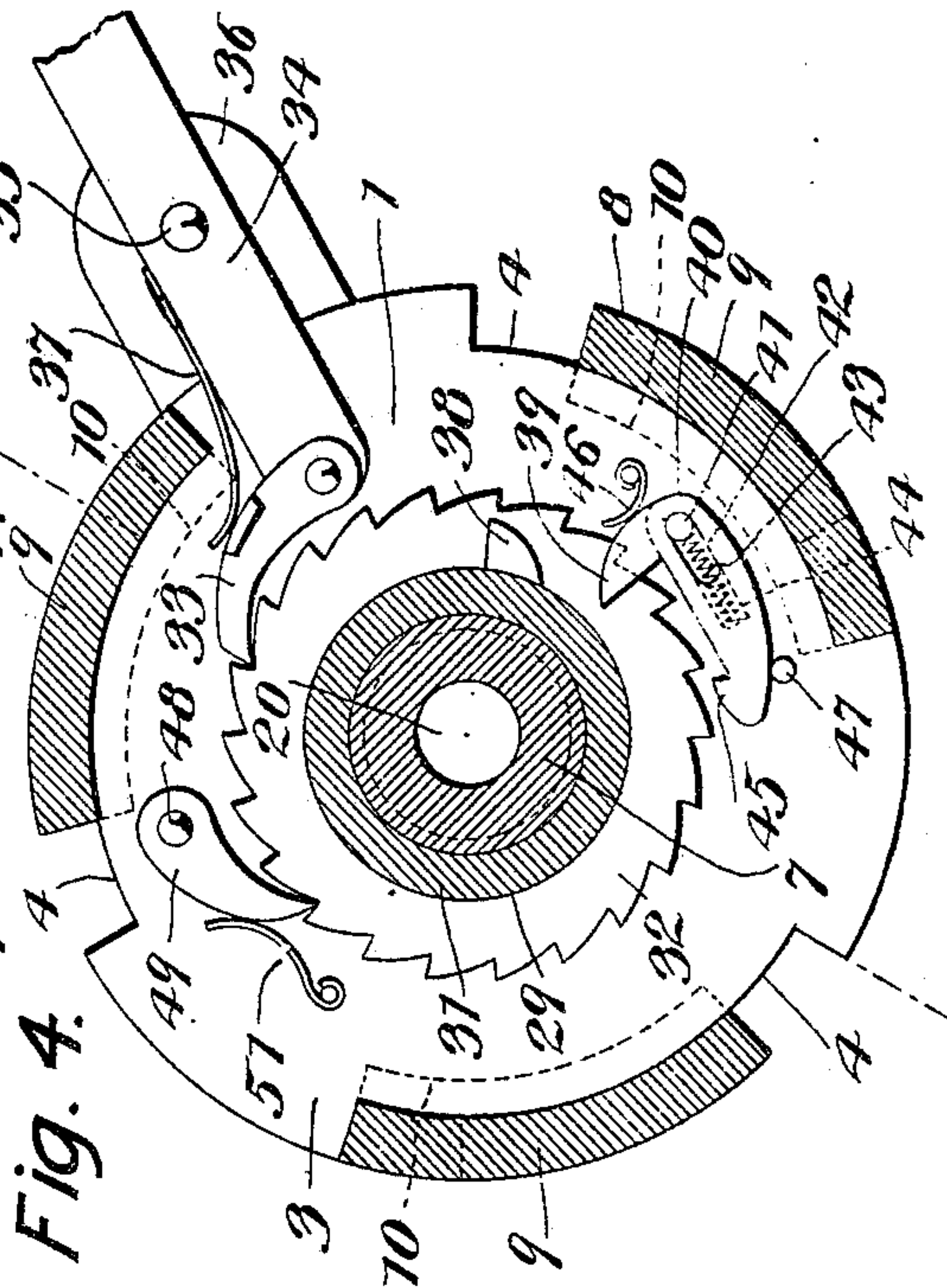


Fig. 4.

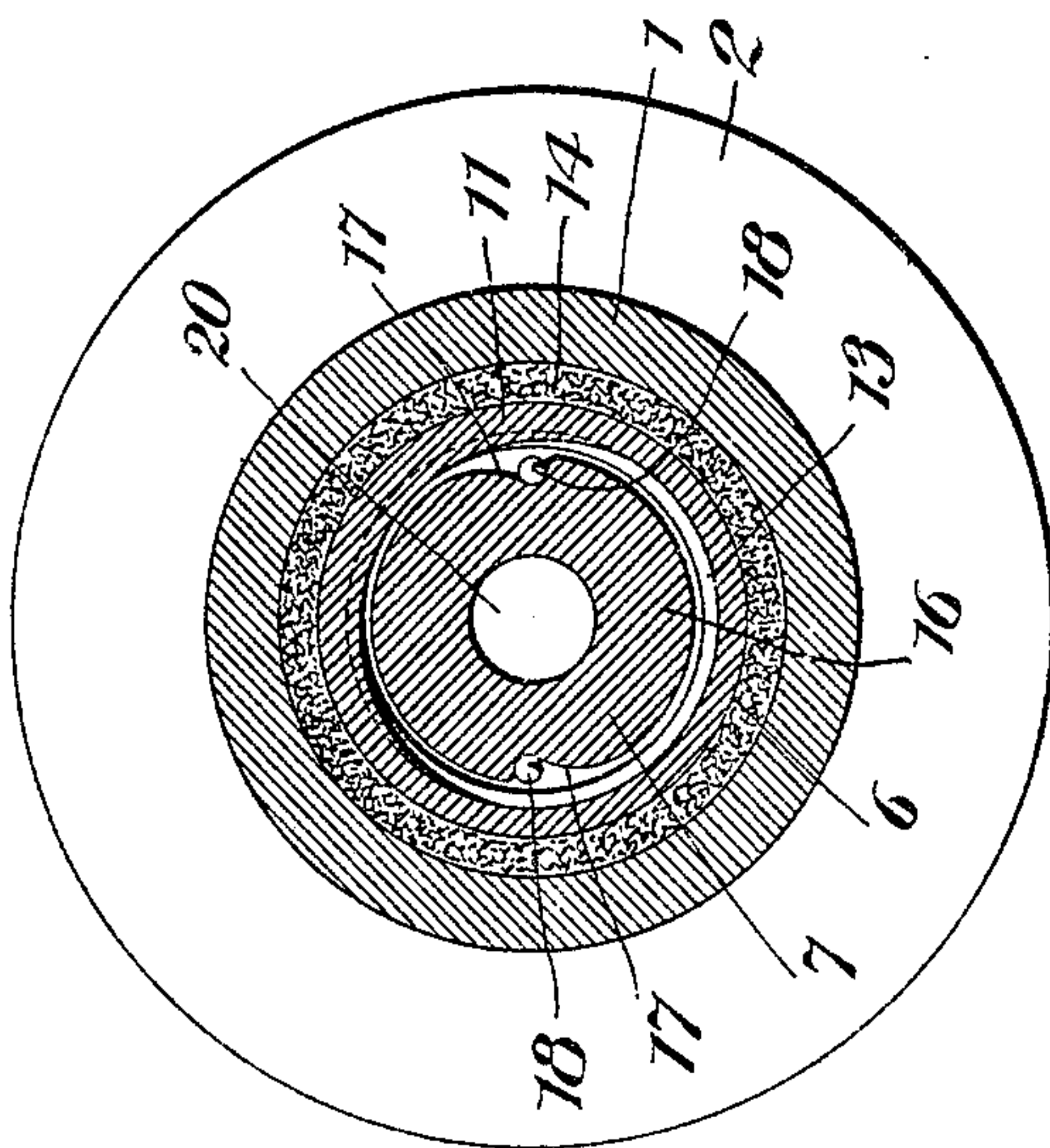


Fig. 5.

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UNITED STATES PATENT OFFICE.

DANA S. KENT, OF PEORIA, ILLINOIS.

MEANS FOR OPERATING FORCE-FEED LUBRICATORS.

No. 837,624.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed December 18, 1905. Serial No. 292,313.

To all whom it may concern:

Be it known that I, DANA S. KENT, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Means for Operating Force-Feed Lubricators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in force-feed lubricators of that class used for applying oil for lubricating purposes to the different parts of steam-engines and other machinery.

The object of the invention is to improve and simplify the construction and operation of devices of this character, and thereby render the same more durable and efficient.

Another object of the invention is to provide simple and effective means for stopping the operation of the lubricator when the supply of oil is exhausted.

With the above and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a vertical sectional view through a force-feed oil-lubricator constructed in accordance with my invention. Fig. 2 is a top plan view of the same; and Figs. 3, 4, and 5 are horizontal sectional views taken, respectively, on the lines 3 3, 4 4, and 5 5 of Fig. 1.

Referring to the drawings by numerals, 1 denotes the body or cylinder of my improved lubricator, which, as shown, is formed at its bottom with a flanged base 2 and at its open top with an annular flange 3, which has portions of its edge or periphery notched or cut away, as shown at 4. Adjacent to the lower end of the cylinder 1 is an oil or lubricant outlet 5, to which suitable feed-pipes (not shown) may be connected to conduct the oil to the various parts of the engine or other machine. Mounted to slide in the cylinder 1 is a piston 6, which is carried by the lower end of a piston-rod 7, here shown in the form of an externally-screw-threaded tube. The open top of the cylinder 1 is closed by the mechanism for actuating the piston-rod 7, which mechanism is mounted beneath a cover 8. The latter is of circular form and is remov-

ably secured upon the cylinder by means of depending lugs 9, which are arranged at intervals around its edge, corresponding to the arrangement of the notches in the flange 3, and which have inwardly-projecting ends 10, adapted to engage the under side of said flange to secure the cover 8 upon the top of the cylinder. It will be seen that when the cover 8 is turned, so that the lugs 9 register with the notches in the flange 3, said cover may be lifted off of the top of the cylinder and that when said cover is turned so that the inwardly-projecting ends of the lugs 9 lie beneath the flange 3 the cover will be retained upon the cylinder.

The piston 6 consists of two members 11 12, which have a telescoping screw-threaded connection 13 with each other and between which is adapted to be clamped an annular band of packing 14, which bears against the inner face of the cylinder and prevents the escape of oil around the piston.

The shoulders 15 on the members 11 12, between which the packing 14 is disposed, are slightly beveled, as shown, so that when the two members are screwed together the said packing will be compressed between them and expanded laterally to so closely engage the inner face of the cylinder as to prevent the oil or lubricant from getting past the piston. The piston is mounted upon the lower end of the rod 7, so that the latter may turn freely therein in one direction; but may not be turned in the reverse direction when at work. This is effected, as clearly shown in Figs. 1 and 5, by forming on the lower end of the rod or tube 7 an annular flange 16, which is disposed between the two members 11 12, and by forming in the periphery of said flange one or more substantially V-shaped recesses 17, adapted to receive clutch-balls 18. It will be seen that when the screw turns in one direction, the balls 18 will fall back into the deep portions of the recesses 17 and permit the tube or rod 7 to rotate independently of the piston and that when the rod or tube is turned in the reverse direction said balls will wedge between the inclined walls of the recesses 17 and the member 11 of the piston and lock the latter to said rod or tube. Hence the rod or tube will be held from rotation while it is being acted upon by the nut 29, hereinafter described. The member 11 is formed with a central opening 19, which registers with the bore 20 of the rod or tube 7. The latter is tubular in form, as

shown, to permit the cylinder 1 to be filled with oil or other lubricant. Upon the upper and outer end of the tube or rod 7 is a circular head 21, formed in its top with a concave recess 22, which permits said head to serve as a funnel. It will be seen that the oil poured into the recess 22 will pass through the bore 20 in the rod or tube 7 and into the cylinder 1 beneath the piston 6. After the cylinder has been filled the bore 20 is adapted to be closed by a plug 23, which is screwed into the upper end of said bore, as shown in Fig. 1. To permit the tube or rod 7 to be operated manually either to move the piston 6 downwardly or to retract or elevate it, I preferably provide a lever 24. The latter is shown pivoted, as at 25, in a recess formed in the top of the head 21, so that it may be swung to either its full or dotted line position. (Shown in Fig. 1.) Said lever is formed adjacent to its pivoted end with a projecting stop 26 and at its rear end with a right-angularly projecting handle 27, so that when said lever is in its open position (shown in full lines in Fig. 1) the stop 26 engages the side of the head 21, and the handle 27 projects vertically to permit the lever to be used as a crank for turning the tube or rod 7. When the lever 24 is swung over upon the head to its folded position shown in dotted lines in Fig. 1, its free end is adapted to seat in a notch or recess 28, formed in the head 21, as shown.

The mechanism mounted beneath the cover 8 for moving the tube or rod 7 downwardly to force the oil beneath the piston 6 out through the outlet 5 comprises a nut 29, which is mounted in the cover 8 and has formed or secured thereon a ratchet-wheel 30. This nut is turned in one direction on and independent of the screw-piston tube or rod 7 by means hereinafter described to move the said tube or rod and the piston 6 downwardly in the cylinder to force out the lubricant. Upon the cylindrical body portion 31 of the nut 29, beneath the ratchet-wheel 30, is loosely mounted a second ratchet-wheel 32. The latter is actuated by a dog or pawl 33, pivoted upon the inner end of a lever 34, which is adapted to be actuated by the valve-gearing of the engine or by any suitable mechanism. This lever 34 is pivoted at 35 upon a projecting lug 36 and carries a spring 37, which is adapted to hold the pawl 33 in engagement with the teeth of the ratchet 32. Said ratchet 32, which is spaced beneath the ratchet 30, has provided upon its upper face a lug or projection 38, which, as said ratchet 32 rotates, is adapted to engage one end 39 of a dog or pawl 40. The latter is right angular in form and is slidably and pivotally mounted upon a pin 41, as clearly shown in Fig. 4. This mounting of the dog or pawl 40 is effected by forming in the latter a slot 42, through which the pin 41 projects and in which is disposed a coil-spring 43. The lat-

ter has one of its ends bearing against the pin 41 and its other end seated in a recess 44, as shown. The hook-shaped end 45 of the dog or pawl 40 is adapted to engage the teeth of the ratchet-wheel 30 and to move the latter a distance of one tooth when said lug 38 engages the end 39, upon each complete revolution of the ratchet-wheel 32. In order to hold the dog or pawl 40 in its normal position, so that its end 45 is out of engagement with the teeth of the ratchet 30 and its end 39 is in the path of the lug 38, I may provide a spring 46, which engages the end 39, as shown in Fig. 4. The movement of the dog or pawl under the action of the spring 46 is limited by a stop 47. In order to prevent retrograde movement of either of the ratchet-wheels 30 32, I pivotally mount upon a pin 48 two pawls 49 50, which are respectively held in engagement with the wheels 30 32 by springs 51.

In order to stop the operation of the lubricator when the piston 6 reaches the limit of its downward movement, I provide in the cover 8, beneath the head 21, a trip device which is adapted to be actuated by the latter to disengage the pawl 33 from the teeth of the ratchet-wheel 32. This device as shown comprises a slidably-mounted pin 52, which has a beveled lower end 53, adapted to enter the space between the pawl 33 and the ratchet-wheel 32 to move the former away from the latter. The upper end of the pin 52 projects above the cover 8 and is surrounded by a coil-spring 54, which is confined between said cover and a flange or head 55, provided upon the top of said pin. The upward or outward movement of said pin is limited by a stop 56, which it carries and which is adapted to engage the under face of the cover 8, as shown in Fig. 1.

The operation of the device is as follows: After the piston has been elevated to the top of the cylinder 1 by rotating the crank-lever 24 when in its full-line position (shown in Fig. 1) the cylinder is filled with oil by pouring the latter into the funnel 22 and allowing it to pass through the bore 20 of the rod or tube 7 and into the space beneath the piston. The screw-plug 23 is then screwed into the bore 20 and the lever 24 swung over to its dotted-line position. (Shown in Fig. 1.) The lever 34 is then actuated by any suitable mechanism to cause its pawl 33 to rotate the wheel 32 by a step-by-step movement. Upon each complete revolution of the wheel 32 its lug 38 will engage the end 39 of the pawl or dog 40 and cause the end 45 of the latter to engage the teeth of the ratchet-wheel 30 and rotate the latter a distance of one tooth, thus causing the nut 29 to gradually feed the tube or rod 7 downwardly to cause the piston 6 to force the oil through the outlet 5. When the piston reaches the limit of its downward movement, the under side of the head 21 will

contact with the upper end of the pin 52 and move the latter downwardly against the tension of its spring and cause its beveled or wedge-shaped end 53 to move the pawl 33 out of engagement with the teeth of the ratchet-wheel 32, thereby throwing the lubricator out of operation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

It is evident that the construction, combination, and arrangement of devices herein shown and described may be used for other purposes as well as for feeding a lubricant, and I do not desire to limit myself in this particular.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a cylinder, a screw-threaded piston-rod, a piston revoluble on the rod in one direction, means coacting with the piston-rod and cylinder to prevent rotation of the piston-rod in one direction, a bearing, a nut mounted in the bearing and engaging the piston-rod to longitudinally move the latter and the piston in one direction when the nut is turned, means to turn the said nut, and means to enable the piston-rod to be manually rotated in one direction independently of the nut to withdraw the piston, substantially as described.

2. The combination of a cylinder, a piston therein, an externally-screw-threaded piston-rod connected to said piston, a cover for said cylinder, a nut mounted in said cover, a ratchet-wheel for actuating said nut, a pawl engaging said ratchet-wheel, means for actuating said pawl, a head upon said piston-rod, and a sliding pin in the path of said head adapted to disengage said pawl from said ratchet-wheel, for the purpose set forth.

3. The combination of a cylinder, a piston therein, a screw-threaded piston-rod, to which the piston is connected for rotation in one direction, a bearing, an operating-nut mounted in said bearing and engaging the screw-threaded piston-rod, and means coacting with the piston-rod and cylinder to hold said rod from rotation while said rod is being acted upon by said nut.

4. The combination of a cylinder, a screw-threaded piston-rod, a piston on said rod and in said cylinder, a nut engaging the threads of said rod, a bearing for said nut, a ratchet-wheel carried by said nut, a second ratchet-wheel, loosely mounted, a lever, a pawl carried by said lever and adapted to actuate said second ratchet-wheel, there being a projection on the latter, a double-ended pawl adapted to have one of its ends engaged by said lug and its other end adapted to actuate the first-mentioned ratchet-wheel, a head

carried by the outer end of said piston-rod, and a sliding spring-projected pin having a beveled inner end to engage the first-mentioned pawl and its outer end adapted to lie in the path of said head, for the purpose set forth.

5. The combination of a cylinder, a screw-threaded piston-rod, a piston in said cylinder and mounted on said rod to rotate thereon in one direction, means coacting with the cylinder to prevent the piston-rod from rotating in the reverse direction, a removable cover for said cylinder, a nut mounted in said cover and engaged with the screw-threads on said piston-rod, a ratchet-wheel fixed upon said nut, a second ratchet-wheel, loosely mounted, there being a projection upon the second ratchet-wheel, a double-ended pawl slidably and pivotally mounted and adapted to have one of its ends actuated by said lug, and its other end actuated by the first-mentioned ratchet-wheel, a spring to hold said double-ended pawl in its normal position, and means for imparting a step-by-step movement to said second ratchet-wheel.

6. The combination, of a cylinder, a screw-threaded piston-rod, a piston in said cylinder mounted on said rod to rotate in one direction, means carried by the piston to prevent the piston-rod from rotating in the reverse direction, a removable cover for said cylinder, a nut mounted in said cover and engaged with the screw-threads on said piston-rod, a ratchet-wheel on said nut, a second ratchet-wheel, loosely mounted, and provided with a lug, a double-ended pawl slidably and pivotally mounted and adapted to have one of its ends actuated by said projection and its other end actuate the first-mentioned ratchet-wheel, a spring to hold said double-ended pawl in its normal position, means to prevent retrograde movement of said ratchet-wheels, a pivoted lever, and a spring-actuated pawl pivoted upon said lever and engaged with the teeth of the second ratchet-wheel, substantially as described.

7. The combination, of a cylinder, a screw-threaded piston-rod, a piston in said cylinder mounted on said rod to rotate in one direction, means coacting with the cylinder to prevent the piston-rod from rotating in the reverse direction, a removable cover for the cylinder, a nut mounted in said cover and engaging the screw-threads of said piston-rod, a ratchet-wheel fixed on said nut, a second ratchet-wheel, loosely mounted, and having a lug, a double-ended pawl slidably and pivotally mounted and adapted to have one of its ends actuated by said lug, and its other end actuating the first-mentioned ratchet-wheel, a spring to hold said double-ended pawl in its normal position, means to prevent retrograde movement of said ratchet-wheels, a pivoted lever, a spring-actuated pawl on said lever and engaged with the

teeth of the second ratchet-wheel, a pin
slidably mounted in said cover and having a
beveled inner end to engage said spring-
actuated pawl, a spring to actuate said pin,
5 and a head upon the outer end of said piston-
rod to move said pin inwardly against the
tension of the spring.

8. In a force-feed lubricator, the combina-
tion of a cylinder and a screw-threaded
10 piston-rod having at its inner end an annular
flange formed with a substantially V-shaped
recess in its periphery, a piston upon the

flanged end of said rod and comprising two
members having a telescopic screw-threaded
connection, a clutch-ball in the recess in said 15
flange, and a packing between the members
of said piston, substantially as described.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

DANA S. KENT.

Witnesses:

R. W. GRAY,
E. WETHERELL.