No. 786,871. PATENTED APR. 11, 1905.

C. CALLAHAN.

LUBRICATOR.

APPLICATION FILED DEC. 22, 1904.

Fig. 1.

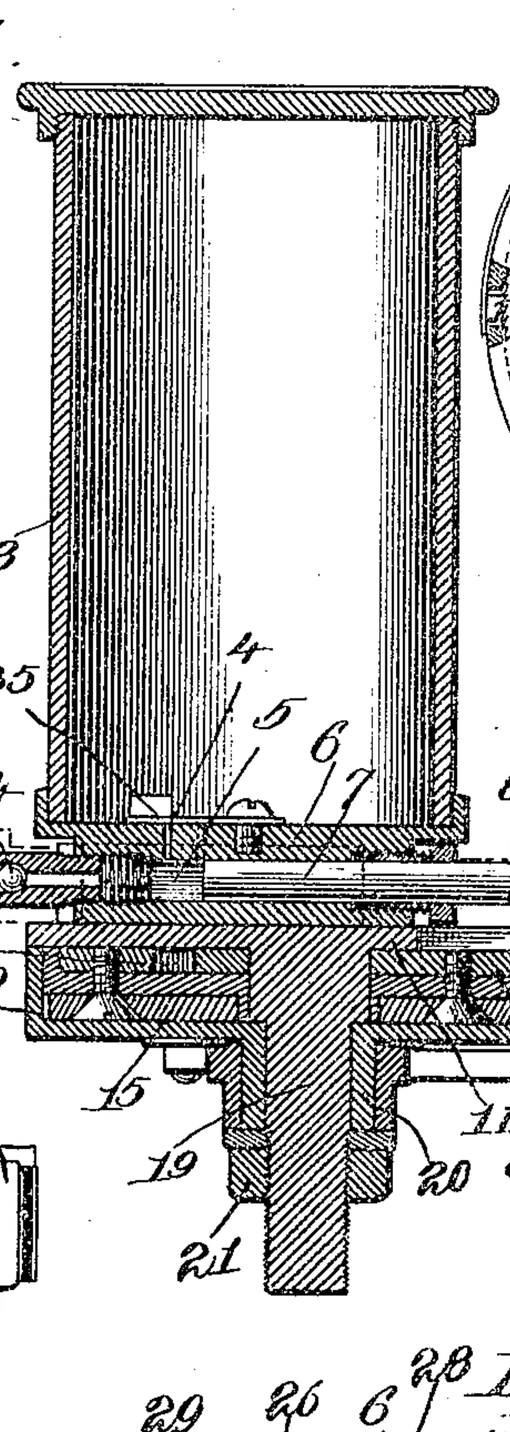


Fig. 3.

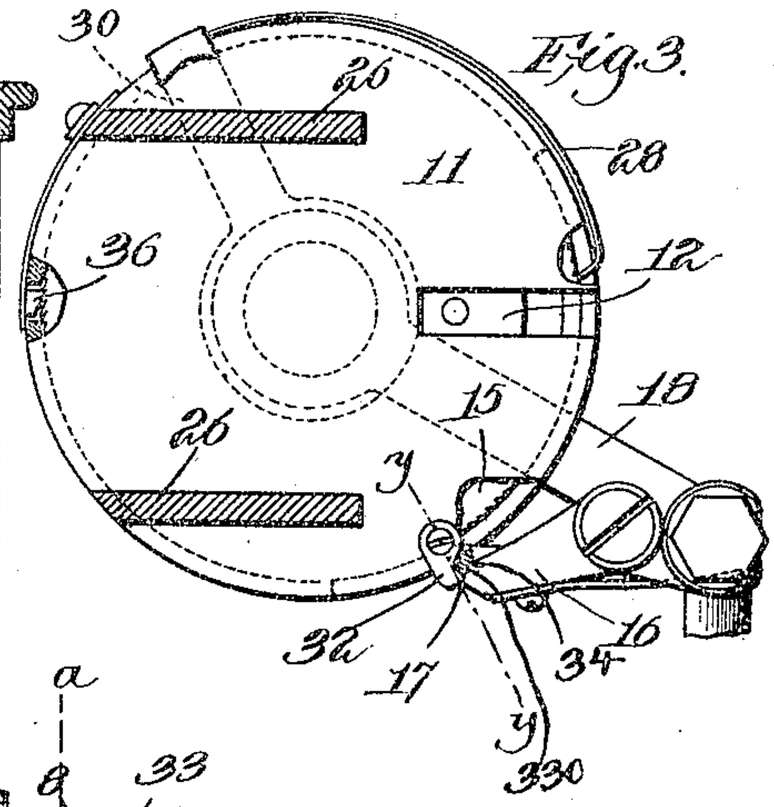


Fig. 6.

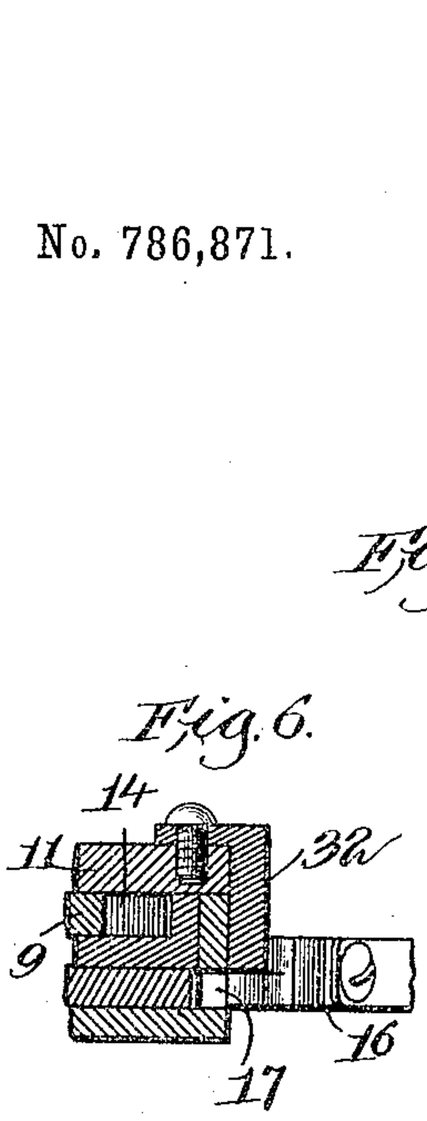


Fig. 4

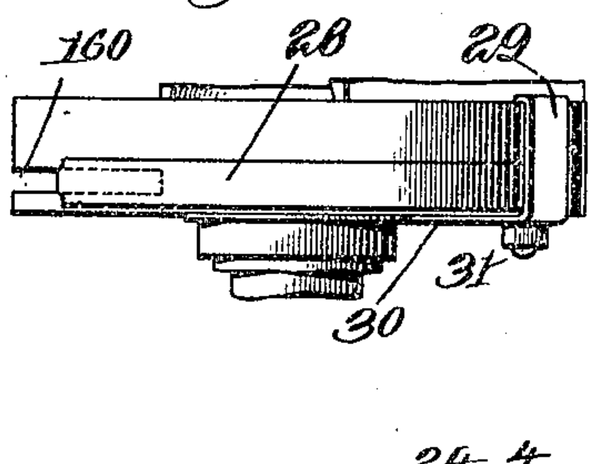


Fig. 2.

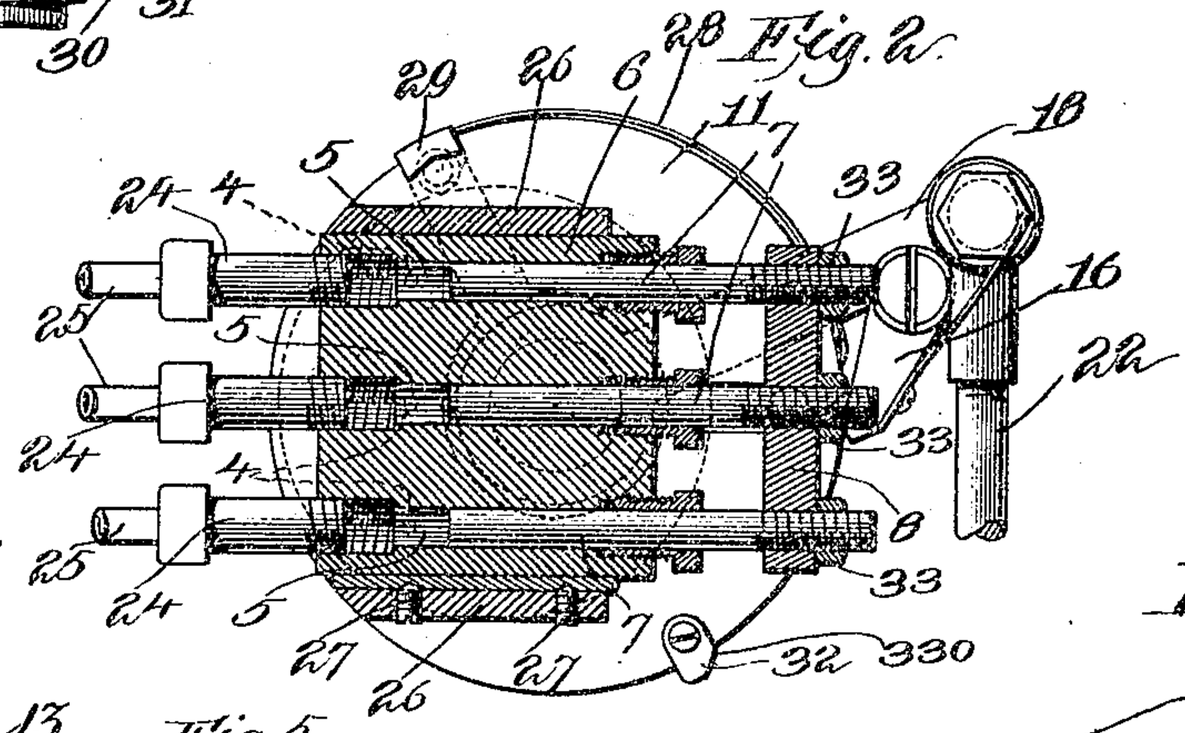


Fig. 7.

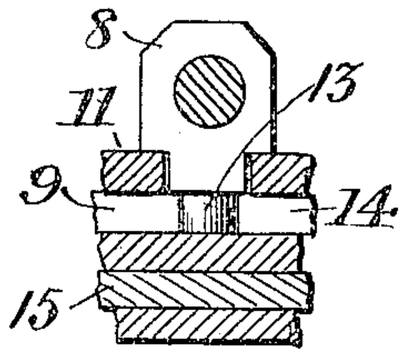


Fig. 5.

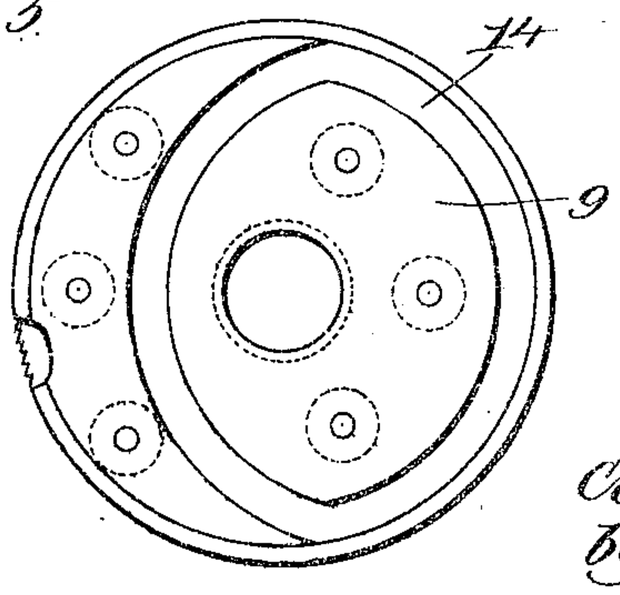
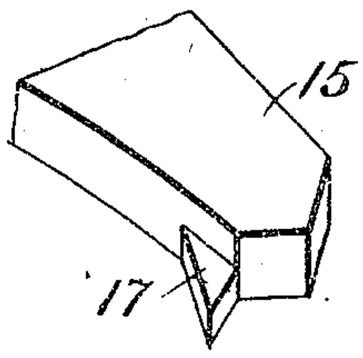


Fig. 8.



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S. W. Sutton.

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Cornelius Callahan
by Crosby Gregory Attys.

No. 786,871. Patented April 11, 1905.

UNITED STATES PATENT OFFICE.

CORNELIUS CALLAHAN, OF CANTON, MASSACHUSETTS, ASSIGNOR TO WILLIAM D. TICKNOR, OF BOSTON, MASSACHUSETTS.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 786,871, dated April 11, 1905.

Application filed December 22, 1904. Serial No. 237,888.

To all whom it may concern:

Be it known that I, CORNELIUS CALLAHAN, a citizen of the United States, residing at Canton, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Lubricators, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to lubricators of the type known as "force-feed" lubricators; and it has for its object to provide a simple and inexpensive lubricator of this class which is constructed so that it can be readily adjusted to regulate the quantity of oil which is fed to the device to be lubricated.

My improved lubricator comprises an oil-receptacle having a port, a cylinder communicating with the port, a plunger within the cylinder, and plunger-operating mechanism to give the plunger a fixed length of stroke and adjustably connected to the plunger, and means whereby the cylinder may be adjusted relative to the plunger-operating mechanism, the adjustment of the cylinder and also that of the plunger constituting means for regulating the effective stroke of the plunger, and thereby the quantity of oil which is delivered.

The particular features wherein my invention resides will be hereinafter more fully described, and then pointed out in the claims.

In the drawings, Figure 1 is a vertical central section through a lubricator embodying my invention. Fig. 2 is a section on the line *x x*, Fig. 1. Fig. 3 is a section on the line *z z*, Fig. 1. Fig. 4 is a side elevation of the casing supporting the cam mechanism. Fig. 5 is a top plan view of the cam for operating the plunger. Fig. 6 is a section on the line *y y*, Fig. 3. Fig. 7 is a section on the line *a a*, Fig. 1. Fig. 8 is a perspective view of the end of the pawl 16.

3 designates an oil-receptacle of any suitable or usual character having a port 4 leading to a cylinder 5. Said cylinder is herein shown as arranged horizontally and as being formed in any integral portion 6 of the oil-receptacle, which portion I will hereinafter refer to as the "foot" portion.

Operating within the cylinder 5 is a plunger 7, which is connected to a reciprocating member 8, the latter being operatively connected to and operated by a cam 9. (Best shown in Fig. 5.) Said cam is herein shown as being inclosed in a casing 10, the top plate 11 of which has a radial slot 12, through which a portion of the reciprocating member 8 passes, said portion having a pin 13 thereon, which is received in the groove 14 in the cam 9. The cam 9 is operated by means of a ratchet-wheel 15, which in this embodiment of my invention is rigid with the cam and is confined within the casing 10. Said casing has a slot 160 extending part way around its periphery and exposing a portion of the ratchet-teeth on the ratchet 15. Coöperating with the ratchet 15 is a spring-pressed pawl 16, having a nose 17 to engage the ratchet-teeth, which pawl is pivotally mounted upon a swinging arm 18, the latter for convenience being mounted to swing about a stud 19, depending from the casing containing the cam and ratchet-wheel. For convenience in construction I prefer to make the projection or stud 19 integral with the cap 11, as shown in Fig. 1, in which case said stud or projection extends through the cam and ratchet-wheel and serves as a bearing for them and also extends through the bottom of the casing. I have herein shown the casing-bottom as provided with the boss 20, on which said swinging arm 18 is directly mounted, said arm being held in place by a suitable nut 21, screw-threaded on the stud or projection 19. The arm 18 is connected, by means of a link 22, to any suitable reciprocating or oscillating part of the machine with which the lubricator is to be used, and therefore said arm has an oscillating movement about the boss 20. During such oscillations the ratchet-wheel 15 and cam 9 are moved forward intermittingly, thereby reciprocating the plunger within the cylinder 5. The plunger is shown in Fig. 1 as in its backward position, and as it moves forward or to the left

any oil which is in the cylinder ahead of the plunger is forced back into the receptacle 3 through the port 4 until the plunger has moved sufficiently far to cover the port 4. During the remainder of the forward stroke of the plunger the oil ahead of it is forced outwardly past the check-valve 24 into the delivery-pipe 25, by which it is delivered into the steam-chest of an engine or any other point where the lubrication is to take place. As the plunger moves backwardly or to the right, Fig. 1, the check-valve 24 prevents the oil from being drawn out of the pipe 25, and a partial vacuum is thereby created within the cylinder. As soon as the plunger has been retracted sufficiently to uncover the port 4 the oil from the oil-cup 3 is sucked through the port 4 into the cylinder by the vacuum therein. As the plunger moves forwardly again the oil in the cylinder is forced back into the oil-cup during the first part of the stroke of the plunger, or until the plunger end covers the port 4, and thereafter the oil in the cylinder is forced into the delivery-pipe 25. It will thus be seen that the plunger has a stroke of a fixed length, and the effective stroke of the plunger in forcing oil into the delivery-pipe is that portion occurring after the plunger has closed the port 4. In order to vary the quantity of oil delivered at each stroke of the plunger, I have made provision for adjusting the cylinder 5 with reference to the plunger-operating mechanism, thereby to carry the port 4 nearer to or farther from the reciprocating member 8. It will be obvious that if the cylinder 5 is moved to the right, Fig. 1, thereby to carry the port 4 into the dotted-line position, the plunger will close said port at the very beginning of its stroke, and therefore the effective stroke of the plunger will be its full stroke, while if said cylinder is moved in the opposite direction the effective stroke of the plunger may be reduced to nothing, if desired. In order to permit this adjustment of the cylinder, I provide the top plate 11 of the casing with guides 26, between which the foot portion 6 of the oil-receptacle can be moved back and forth, said oil-receptacle being held in any adjusted position by clamping-screws 27. By this simple expedient of making the oil-reservoir and its foot portion adjustable on the top plate 11 provision is made for regulating the quantity of oil delivered at each stroke. I have also provided further means for thus regulating the amount of oil by controlling the time which the pawl 16 is in engagement with the ratchet during each oscillation of the arm 18. For this purpose I have provided a shield 28, which is adapted to partially cover the slot 160, said shield being carried by the head 29 of an arm 30, which is mounted upon the boss 20 and which is held in its adjusted position by a suitable set-screw 31. By loosening the set-screw 31 the arm 30 may be swung about said boss, thereby to carry the shield 28 over more or less of the slot 160. Said shield operates, as will be obvious, to hold the pawl 16 out of engagement with the ratchet-wheel during a portion of the stroke dependent upon the position of said shield.

32 designates a release device which is designed to throw the pawl out of engagement with the ratchet-wheel before the end of the slot is reached, the purpose of this device being to prevent the nose of the pawl from becoming injured by striking the end of the slot. This release device is adjustably mounted on the cover 11 and is provided with a cam-surface 330, adapted to engage the cam-surface 34 on the pawl, and thereby throw the pawl out of engagement with the ratchet. The ratchet is prevented from backward movement by a suitable stop-pawl 36.

It is sometimes desirable to deliver oil from a single oil-receptacle to a plurality of places, and in order to permit this to be done I may, if desired, construct the foot portion 6 with a plurality of cylinders 5, as shown in Fig. 2. In such case said oil-receptacle will have a port 4 leading to each cylinder, and a plunger 7 will be employed in each cylinder, said cylinders all being connected to the reciprocating member 8. Each cylinder communicates with a delivery-pipe 25, as seen in Fig. 2, and preferably a check-valve will be employed in each delivery-pipe to prevent the oil from being drawn back into the cylinder. Where a plurality of plungers are employed, it is sometimes desirable to be able to adjust the effective stroke of each plunger separately, so that different quantities of oil may be delivered from the different cylinders. In order to accomplish this, I have provided an adjustable connection between each plunger and the reciprocating member 8. One convenient form of such connection is shown in the drawings, wherein the plunger is simply screw-threaded into the reciprocating member. By simply turning any of the plungers within the reciprocating member 8 said plunger may be adjusted longitudinally of its cylinder to get the desired length of effective stroke.

33 designates suitable lock or check nuts for holding the plungers in their adjusted positions.

I will preferably provide a valve 35 within the oil-cup for controlling each port 4, whereby any port may be closed in case it is desired to stop the pumping operation of any cylinder, said valves being herein shown as pivotally-mounted plates, which can be swung over the ports 4 to close them more or less, as desired.

The embodiment of my invention herein

illustrated is that which I regard as preferable; but I wish to state that the invention is not limited to the exact construction herein shown, and therefore I reserve to myself the right to make all such changes as come within the scope of the appended claims.

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

1. In a lubricator, an oil-receptacle having a port, a cylinder with which said port communicates, a plunger operating in the cylinder, and plunger-reciprocating mechanism, said cylinder being adjustable relative to the plunger-reciprocating mechanism whereby the length of the effective stroke of the plunger can be varied.

2. In a lubricator, a cylinder, an oil-receptacle having a port leading to the cylinder, a plunger operating in the cylinder, and mechanism to reciprocate the plunger a definite distance at each stroke, said cylinder being adjustable relative to said mechanism whereby the length of the effective stroke of the plunger is regulated.

3. In a lubricator, a cylinder having a port through which oil is delivered thereto, a plunger within the cylinder, and plunger-reciprocating mechanism adjustably connected to the plunger, said cylinder being also adjustable in the direction of the length of the plunger.

4. In a lubricator, an oil-receptacle having a port, a cylinder with which said port communicates, a plunger operating in said cylinder, said plunger constituting a valve for the port, and plunger-reciprocating mechanism, said cylinder being adjustable in the direction of the length of the plunger.

5. In a lubricator, an oil-receptacle, a plurality of cylinders each communicating with the receptacle, a plunger in each cylinder, and means for operating the plungers simultaneously, said means operating to give all the plungers the same length of stroke, said cylinders being adjustable in the direction of the length of the plunger.

6. In a lubricator, an oil-receptacle, a plurality of cylinders each communicating with the receptacle, a plunger operating in each cylinder, and means for simultaneously operating said plungers, said cylinders being adjustable in the direction of the length of the plungers.

7. In a lubricator, an oil-receptacle, a plurality of cylinders, each communicating with the receptacle, a plunger operating in each cylinder, and a reciprocating member to which said plungers are connected, said cylinders being adjustable relative to the reciprocating member.

8. In a lubricator, an oil-receptacle, a plurality of cylinders each communicating with the receptacle, a plunger operating in each cylinder, and a reciprocating member to which each plunger is adjustably connected, said cylinders being adjustable relative to the reciprocating member.

9. In a lubricator, an oil-receptacle, a cylinder communicating therewith, a plunger within the cylinder, said cylinder being adjustable in the direction of the length of the plunger, a cam for reciprocating the plunger, a ratchet connected to the cam for operating the latter, a pawl, means for reciprocating the latter, and means to regulate the time of engagement between the pawl and ratchet during each stroke.

10. In a lubricator, a slotted plate, a cylinder adjustably mounted thereon, a plunger in the cylinder, a reciprocating member guided by said slot and operatively connected to the plunger, and means to reciprocate said member.

11. In a lubricator, a casing inclosing a connected cam and ratchet-wheel, the top of said casing being slotted, a cylinder above the casing, a plunger within the cylinder, a reciprocating member connected to the plunger and operating in said slot, and means to actuate the ratchet-wheel.

12. In a lubricator, a casing inclosing a connected cam and ratchet-wheel, said casing having a peripheral slot and a slotted top, a cylinder above the casing, a plunger within the cylinder, a reciprocating member connected to the plunger and operating in the slot, said member being actuated by the cam, and an oscillating pawl working through the peripheral slot of the casing and an adjustable shield to partially cover the slot and thereby regulate the extent of movement of the ratchet.

13. In a lubricator, a casing, a connected cam and ratchet within the casing, said casing having a peripheral slot, an oil-pump operated by said cam, an oscillating pawl working in said slot and engaging the ratchet, and a release device to disengage the pawl from the ratchet.

14. In a lubricator, a casing, a connected cam and ratchet within the casing, said casing having a peripheral slot, an oil-pump operated by said cam, an oscillating pawl working in said slot and engaging the ratchet, and an adjustable release device to disengage the pawl from the ratchet.

15. In a lubricator, a slotted member, a cylinder above said member, said cylinder extending parallel to the slot, a plunger within the cylinder, a reciprocating member adjustably connected to the plunger and guided in its movement by said slot, and a cam beneath said slotted member for operating the reciprocating member.

16. In a lubricator, a slotted plate, a cylinder adjustably mounted thereon, a plunger in the cylinder, a reciprocating member guided by said slot and adjustably connected to the plunger, and means to reciprocate said member.

17. In a lubricator, a casing inclosing a cam, the top of said casing being slotted, a cylinder above the casing, a plunger within the cylinder, a reciprocating member adjustably connected to the plunger and operating in said slot, and means to actuate the cam.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CORNELIUS CALLAHAN.

Witnesses:
LOUIS C. SMITH,
WILLIAM D. TICKNOR.