W. L. MORRIS.

LUBRICATOR.

APPLICATION FILED NOV. 26, 1906.

999,838. Patented Aug. 8, 1911.

Fig. 2

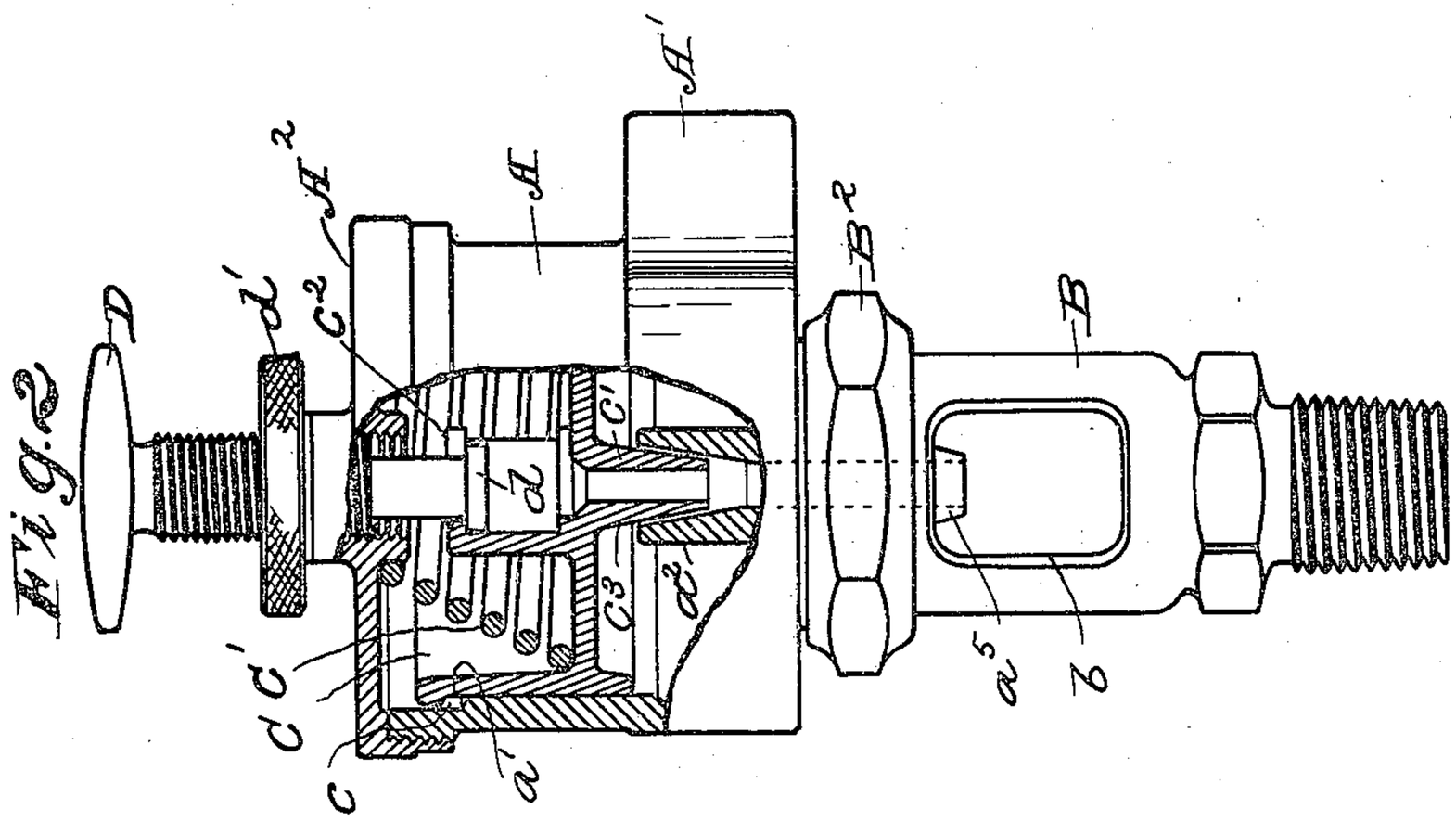


Fig. 3

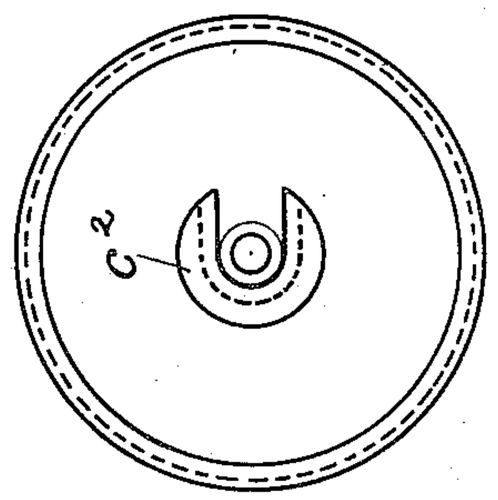
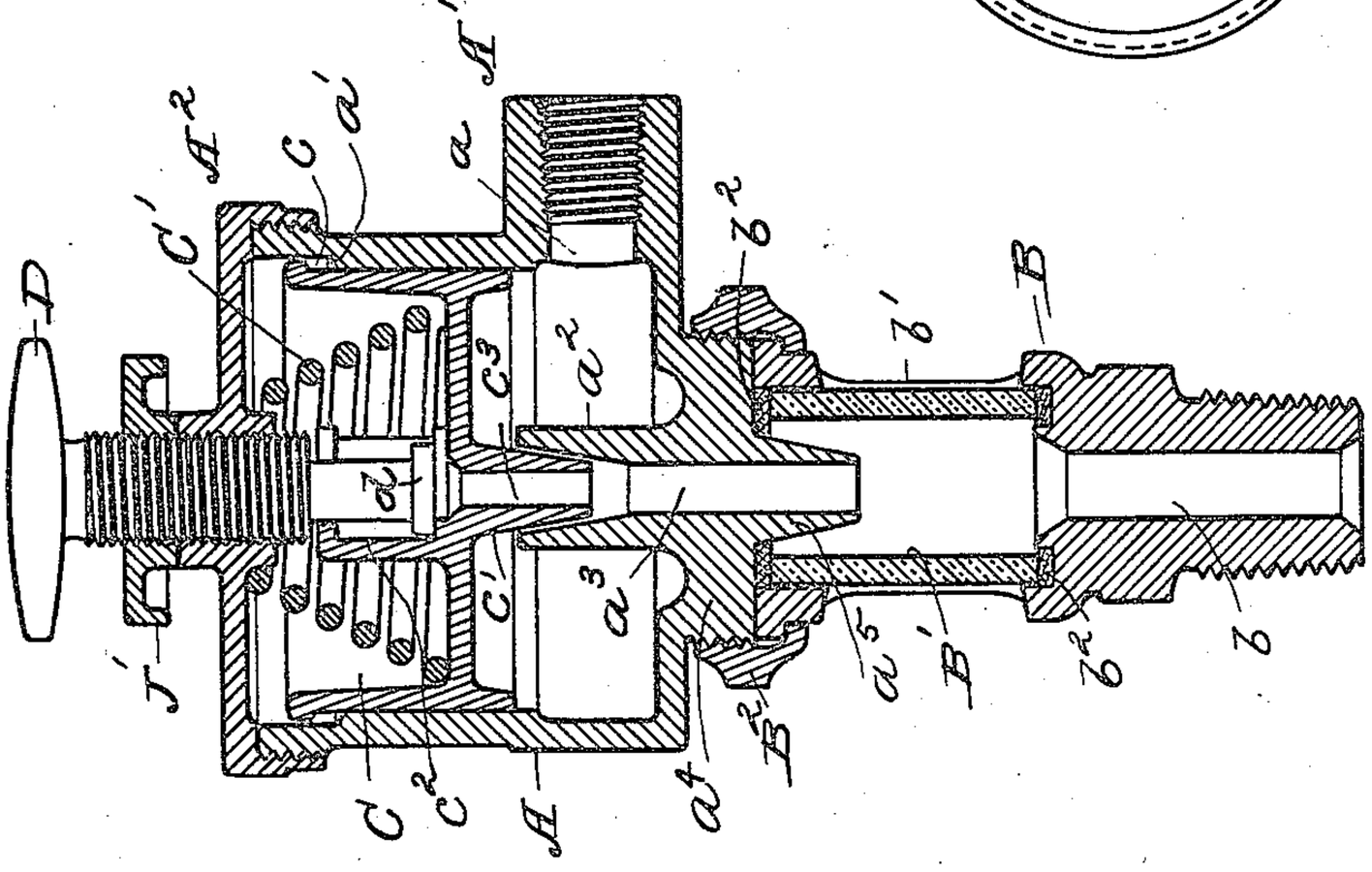


Fig. 1



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LUBRICATOR.

999,838. Specification of Letters Patent. Patented Aug. 8, 1911.

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To all whom it may concern:

Be it known that I, WILLIAM L. MORRIS, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Lubricators, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention, relating, as has been indicated, to lubricators, has regard more particularly to a lubricator or oil-feeding device for use in connection with lubricating systems, wherein the oil is fed from a central source of supply and under pressure, gravity or otherwise, to the various parts to be lubricated. Such lubricator, as will then be understood, is a device designed to regulate the amount of oil fed from such central source of supply to each of the individual parts. It will be evident, however, from the following description, that a number of the features presented by my improved form of lubricator, may be incorporated with advantage in the structure of oil-feeding devices or cups designed for use in other connections than that just indicated, and where the supply is contained within the cup itself.

Said invention, then, consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing: Figure 1 is an axial cross-section of a lubricator embodying my improved features of construction; Fig. 2 is a view, partly in cross-section, and partly in side elevation, of the same cup, certain of the parts being differently disposed than in said Fig. 1; and Fig. 3 is a plan view of a piston reciprocable within such oil-cup and forming one of the features of its construction.

It should be stated that in the above figures the device is shown entirely independent of all connections and other parts of the general lubricating system in conjunction with which it is particularly designed to operate. Such lubricator, then, consists of a cup-body A formed laterally with a boss A′, through a port *a* in which communication is had with the hollow interior of such body. Such port *a* in boss A is suitably threaded to afford means for connecting the cup with the supply-pipe, not shown, whereby oil is conducted from the central source, as a tank, to the cup. The cylindrical inner surface of the cup-body is formed intermediately of its ends with an encircling off-set a' ground to form a valve-seat the use of which will appear later. Centrally rising from the bottom of the cup is a boss a^2 through which there extends an aperture or port a^3 which forms the outlet of said cup. There is formed on the under side of the cup and in line with boss a^2 a similar downwardly-projecting boss a^4 that is adapted to be connected with the post B by means of which the cup is mounted on the journal bearing or other part to be lubricated. An extension a^5 of such boss provides a sort of tube from which the lubricant escapes in drops as it is fed from the cup. The construction of such post and the manner of its attachment to the cup-body, to which latter I invite particular attention, is as follows: The post is, of course, formed with a vertical passage *b*, as usual, such passage being throughout of considerable larger bore than port a^3, and being considerably larger in the upper portion of the post than in the lower portion, which latter is exteriorly threaded for the purpose of being mounted on the journal bearing as above stated. Such upper portion of the post is thus additionally enlarged in order to receive directly the sight-glass B′ which partially surrounds the extension a^5 of downwardly-projecting boss a^4 of the cup-body, and which is readily visible through a transverse opening or sight b' in the post. The under surface of boss a^4 of the cup-body is designed to be seated directly on the upper end of the sight-glass in question, suitable packing b^2 being introduced, of course, between such boss and the end of the glass, as also between the lower end of the glass and the off set formed between the larger and smaller portions of the passage *b* in such post B. To draw the cup-body tightly down onto its seat, on the top of the post as formed, a union coupling B^2, preferably of the simple form shown, is applied. Such coupling, as will be noted from an inspection of Fig. 1, is rotatably mounted on

the post and threaded upon the boss a^4 of the cup. Obviously this arrangement may be reversed where practicable and other types of coupling entirely, may be used with equally advantageous results. From the construction of post B, just described, and of the manner in which it is connected with the cup-body, it will be seen that the post and cup-body may be rotated independently of each other. Also by having the bottom of the cup-body seated directly upon the top of the sight-glass, special provision for mounting the latter is done away with, and a much more effective and lasting joint at the same time formed between such cup-body and post. The particular advantages arising from the independent movement of rotation permitted the post will be more fully pointed out later.

Taking up now the construction of the cup proper, it will be noted that a piston C is reciprocably mounted within the hollow interior of the cup-body. Such piston is formed on its external cylindrical surface with a peripheral valve face c, that is adapted in one position of the piston to register with the valve seat a' previously described as being formed in the walls of the cup-body. Such piston is further formed on its under face with a central boss c' in axial alinement with the outlet port a^3 in the bottom of the cup, and suitably faced to form a valve for such port, that is designed to close the same when peripheral valve-face c registers with valve-seat a'. The inlet port a in lateral boss A′ entering the cup-body below the piston when in its lowermost position, it will be evident that the pressure of the oil in the chamber formed in such cup-body between the bottom of the same and piston C will tend to raise such piston, and thus open outlet port a^3. This action is controlled by a helical spring C′ mounted between the upper face of the piston and a cap A^2 wherewith the top of the cup-body is closed. The tendency of such spring is, obviously, to close the outlet port entirely, and this is the result that occurs whenever, for any reason, the oil pressure in the cup ceases or unduly diminishes. Such spring C′ is preferably of conical form as shown, whereby the limited space available in the upper portion of the cup may be fully utilized, since the successive coils of the spring fall one within the other when the spring is compressed and thus permits the use of a spring of a greater number of convolutions than would otherwise be possible, with an increased delicacy of resilient action.

On the upper face of piston C there is provided a lip c^2 raised some distanee above such piston face, and of the general form shown in Fig. 3. Such lip is positioned directly over a central aperture c^3 that extends from the upper face of the piston through boss c', thereby affording constant communication between the upper portion of the cup-body and outlet port a^3. The object of aperture c^3 is to permit the escape from such upper part of the cup-body of any oil that may leak past the piston due to the pressure under which the oil is held in the oil-chamber proper of the cup. Directly over lip c^2 is fitted in cap A^2 of the cup, a set-screw D, the lower end of which is formed with a collar d or equivalent projection, that is adapted to engage lip c^2. Screw D may be securely held in any desired position in the cap A^2 by means of a jam-nut d'. From the raised construction of lip c^2 it will be obvious that piston C will normally have a reciprocable movement independent of the engagement of the lip with the collar or foot of the screw through a distance equal to the height of the lip above the upper face of the piston. However, when the screw is turned down far enough, the piston will obviously be locked in its lowermost position, closing outlet port a^3 and holding peripheral valve-face c tightly against valve-seat a'. When turned a sufficient amount in the opposite direction, the aforesaid collar or foot will be brought into engagement with the lip to raise the piston, and owing to the action of the spring, such piston will be held at whatever height it is desired to leave the same, or may even be brought up against the cap of the cup and tightly held there.

Having thus described, with what is deemed sufficient detail, the construction of the several parts of my improved lubricator or oil-feeding device, I shall now proceed to indicate the manner of its operation. When such device is utilized as a part of a general lubricating system, the oil, as has been indicated, will be supplied to the cup by means of a suitable supply pipe through inlet opening a in that port. Assuming the parts to occupy the positions shown in Fig. 1, it will be seen that the pressure of the oil in the oil-chamber proper of the cup will tend to raise the piston C against spring C′. The amount of movement thus occasioned the piston and the consequent amount of oil allowed to escape through outlet port a^3 of the cup is regulated by the position of the foot of set-screw D; as shown in Fig. 1, only a very narrow opening is permitted for the escape of the oil. If it be desired to increase the amount of oil flowing through the opening, or if, under a lower pressure of oil, such escape is not so rapid, regulation, as has been indicated, may be readily had by properly turning screw D. While the piston fits fairly tight, a small quantity of the oil will nevertheless escape past the same into the upper portion of the cup.

This oil, however, flows through port c^3 into outlet port a^3, and is negligible so far as its lubricating effect is concerned. If, now, for any reason, the pressure of the oil in the cup is abnormally decreased, for instance if, as may frequently happen in the case of a lubricating system such as that contemplated, it becomes necessary to cut off the supply from the main supply tank, and feed the cups appertaining to a particular machine from a local emergency tank, such pressure may not be sufficient to operate the piston, as has just been described. In this event, the screw D is utilized in the manner clearly shown in Fig. 2 to positively raise the piston, and hold the same in position to allow the desired amount of oil to escape through outlet opening a^3. In other words, the lubricator in this connection becomes in effect simply a valve, of the type now frequently used where the supply is of the character assumed. If, on the other hand, it is desired to entirely shut off the supply of oil to a particular part, by merely turning screw D down far enough the piston not only closes outlet port a^3 securely, but by bringing valve face c into register with valve-seat a' even the slight escape of oil past the piston and thence through port c^3 to the bearing is effectively shut off.

The object accomplished by the construction of the post B and of the connection utilized for joining the same to the cup-body is to permit rotation of such post independently of the cup-body, and thereby position the sight in the post as desired. In the case of a cup independently mounted on any part, the whole cup along with the post is rotatable, and thus the sight may be turned until a proper light is secured to permit the observation of the flow of oil from the cup. Where, however, as in a system such as that described, the cup is connected with supply pipes or the like in such a fashion as to be held against rotation, some other means must be provided for securing this adjustment, or else difficulty will frequently ensue in observing the flow of oil past the sight. By the means here shown, however, although the cup-body proper is thus connected and held against rotation, post B can be rotated as desired, and this without affecting in the least the tightness of the joint between the two members. In fact, such joint is utilized, as has been described, to permit the more ready and secure mounting of the sight-glass in the post than has been possible in constructions heretofore obtaining.

A further advantage accruing from the construction under consideration is that, when it becomes necessary to disconnect the part being lubricated from the lubricating system, the valve borne by piston C can be utilized to shut off the supply of oil to such part, and the disconnection in question then effected at the union joint between the cup-body and post B. The use of an extra stop-cock or valve in the supply-pipe leading to the cup is hence done away with and such disconnection much facilitated.

Having thus described my invention in detail, that which I particularly point out and distinctly claim, is:

1. In an oiling device, the combination with an oil cup having an oil outlet, of a valve controlling such outlet, said valve being operable by the pressure of the oil in said cup to open such outlet, and means adapted to operate said valve in either direction independently of such oil pressure.

2. In an oiling device, the combination with an oil cup having an oil outlet, of a valve controlling such outlet, said valve being operable by the pressure of the oil in said cup to open such outlet, and manually operable means adapted to retain said valve in its open and closed positions independently of such oil pressure.

3. In an oiling device, the combination of an oil cup having an oil outlet; a cap for said cup; a valve operable by the pressure of oil in said cup to open such outlet, means tending to move said valve to close said outlet; and a screw mounted in said cap and operatively connected with said valve, such connection permitting a limited relative movement between said screw and valve.

4. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and provided with a valve adapted to control said oil outlet, said piston being operable by the pressure of the oil in said cup to open such outlet, and means for operating said piston independently of such oil pressure to open said outlet.

5. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and provided with a valve adapted to control said oil outlet, said piston being operable by the pressure of oil in said cup to open such outlet, and manually operable means adapted to position said piston independently of such oil pressure.

6. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and provided with a valve adapted to control said oil outlet, said piston being operable by the pressure of the oil in said cup to open such outlet, and means for retaining said piston in its open and closed positions independently of such oil pressure.

7. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and

provided with a valve adapted to control said oil outlet, said piston being operable by the oil pressure in said cup to open such outlet, and manually operable means adapted to retain said piston in its open and closed positions independently of such oil pressure.

8. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and provided with a valve adapted to control said oil outlet, said piston being operable by the pressure of the oil in said cup to open said outlet, means tending to move said piston to close said outlet, and independent means for positioning said piston.

9. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet, of a piston fitting in said cup and provided with a valve adapted to control said oil outlet, said piston being operable by the pressure of oil in said cup to open said outlet, resilient means tending to move said piston to close said outlet, and manually operable means adapted to position said piston independently of said resilient means and such oil pressure.

10. In an oiling device, the combination of an oil cup having an oil inlet and an oil outlet; a cap for said cup; a piston fitting in said cup and having a valve adapted to control such outlet, said piston being operable by the pressure of the oil in said cup to open such outlet; and a screw fitted in said cap and operatively connected with said piston, such connection permitting a limited relative longitudinal movement between said screw and piston.

11. In an oiling device, the combination of an oil cup having an oil inlet and an oil outlet; a cap for said cup; a piston fitting in said cup and having a valve adapted to control such outlet, said piston being operable by the pressure of the oil in said cup to open such outlet; a spring between said cap and said piston tending to move the latter to close such outlet; and a screw fitted in said cap and operatively connected with said piston, such connection permitting a limited relative longitudinal movement between said screw and piston.

12. In an oiling device, the combination of an oil cup having an oil inlet and an oil outlet; a cap for said cup; a piston fitting in said cup and having a valve adapted to control such outlet, said piston being operable by the pressure of the oil in said cup to open such outlet; a spring between said cap and said piston tending to move the latter to close such outlet; and a screw fitted in said cap, said screw being formed at its lower end with a foot, and said piston being provided on its upper face with a lip adapted to engage said foot.

13. In an oiling device, the combination of an oil cup having an oil inlet and an oil outlet; a cap for said cup; a piston fitting in said cup and having a valve adapted to control such outlet, said piston being operable by the pressure of the oil in said cup to open such outlet; a spring between said cap and said piston tending to move the latter to close such outlet; and a screw fitted in said cap, said screw being formed at its lower end with a collar, and said piston being provided on its upper face with a raised lip adapted to engage said collar.

14. In an oiling device, the combination of an oil cup having an oil inlet and an oil outlet; a cap for said cup; a piston fitting in said cup and bearing, centrally disposed on its under face, a boss forming a valve adapted to control said outlet, said piston having an axial port extending from its upper face through said boss, and being operable by the pressure of oil in said cup to open such outlet; a spring between said cap and said piston tending to move the latter to close such outlet; and a screw fitted in said cap, said screw being formed at its lower end with a collar, and said piston being provided on its upper face with a raised lip adapted to engage said collar.

15. In an oiling device, the combination with an oil cup having an oil inlet and an oil outlet and formed with a valve-seat on its inner cylindrical surface; of a piston fitting in said cup adapted to control said oil outlet, said piston being operable by the pressure of oil in said cup to open such outlet and being formed with a peripheral valve-face adapted to register with aforesaid valve-seat when said oil outlet is closed, and manually operable means adapted to retain said piston in its open and closed positions independently of such oil pressure.

16. In an oiling device, the combination with an oil cup having an oil inlet and oil outlet and formed with a valve-seat on its inner cylindrical surface; of a piston fitting in said cup adapted to control said oil outlet, said piston being operable to open said oil outlet by the pressure of oil in said cup and being formed with a peripheral valve-face adapted to register with aforesaid valve-seat when said oil outlet is closed; resilient means tending to move said piston to close said outlet; and manually operable means adapted to position said piston independently of said resilient means and such oil pressure.

17. In an oiling device, the combination with an oil cup having an oil inlet and oil outlet and formed with a valve-seat on its inner cylindrical surface; of a cap for said cup; a piston fitting in said cup adapted to control said oil outlet, said piston being operable to open said oil outlet by the pressure

of oil in said cup and being formed with a peripheral valve-face adapted to register with aforesaid valve-seat when said oil outlet is closed; a spring between said cap and said piston tending to move the latter to close such outlet; and a screw fitted in said cap and operatively connected with said piston, such connection permitting a limited relative longitudinal movement between said screw and piston.

Signed by me, this 23d day of November, 1906.

WILLIAM L. MORRIS.

Attested by—
D. T. DAVIES,
JNO. F. OBERLIN.