June 17, 1930. R. J. GITS 1,763,961

MULTIPLE OILER

Filed March 19, 1928 2 Sheets-Sheet 1

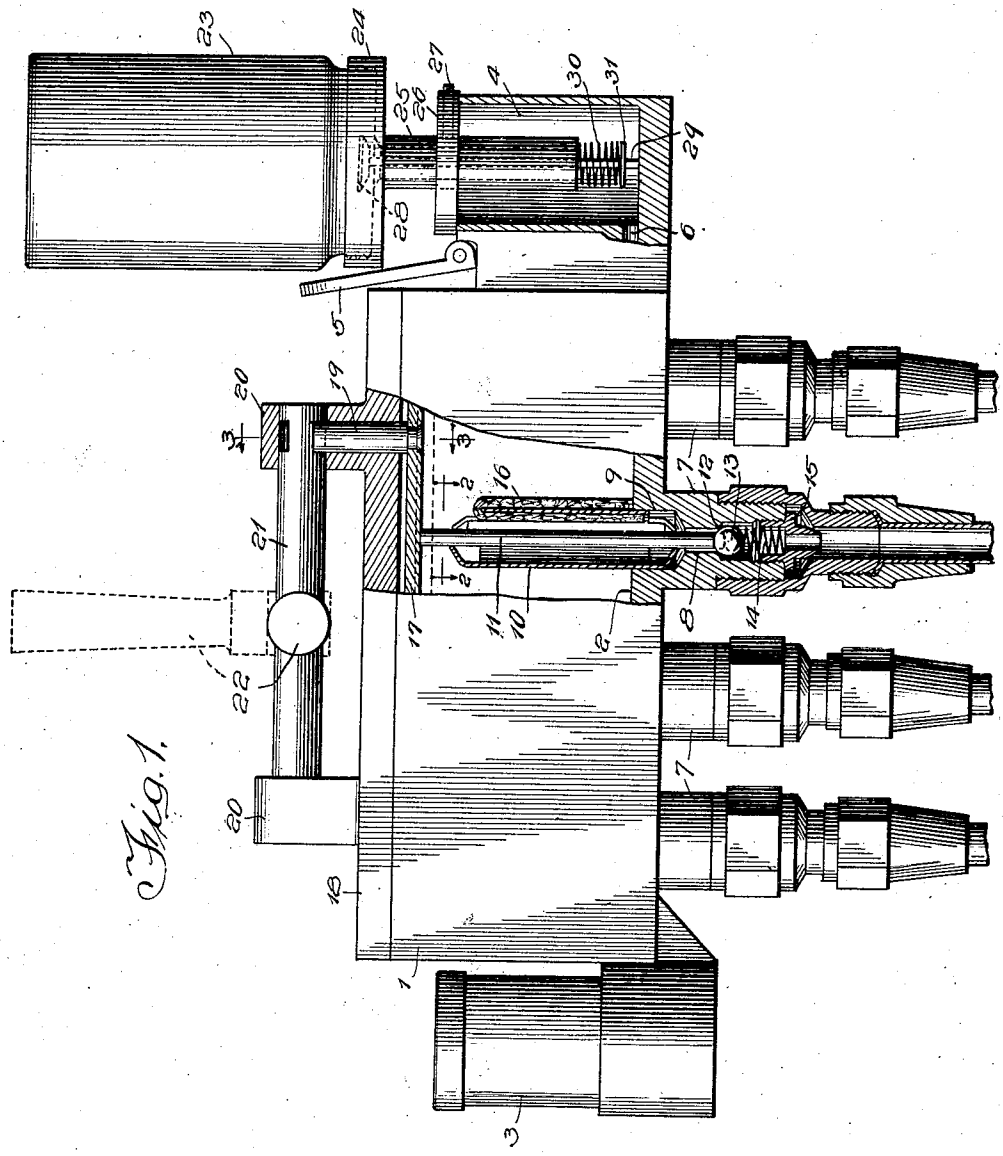


Fig. 1.

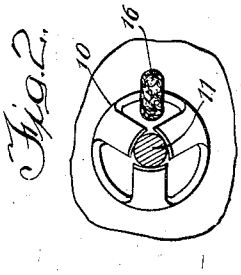


Fig. 2.

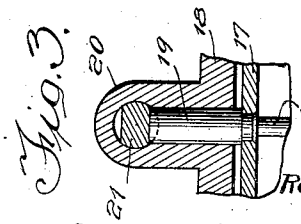


Fig. 3.

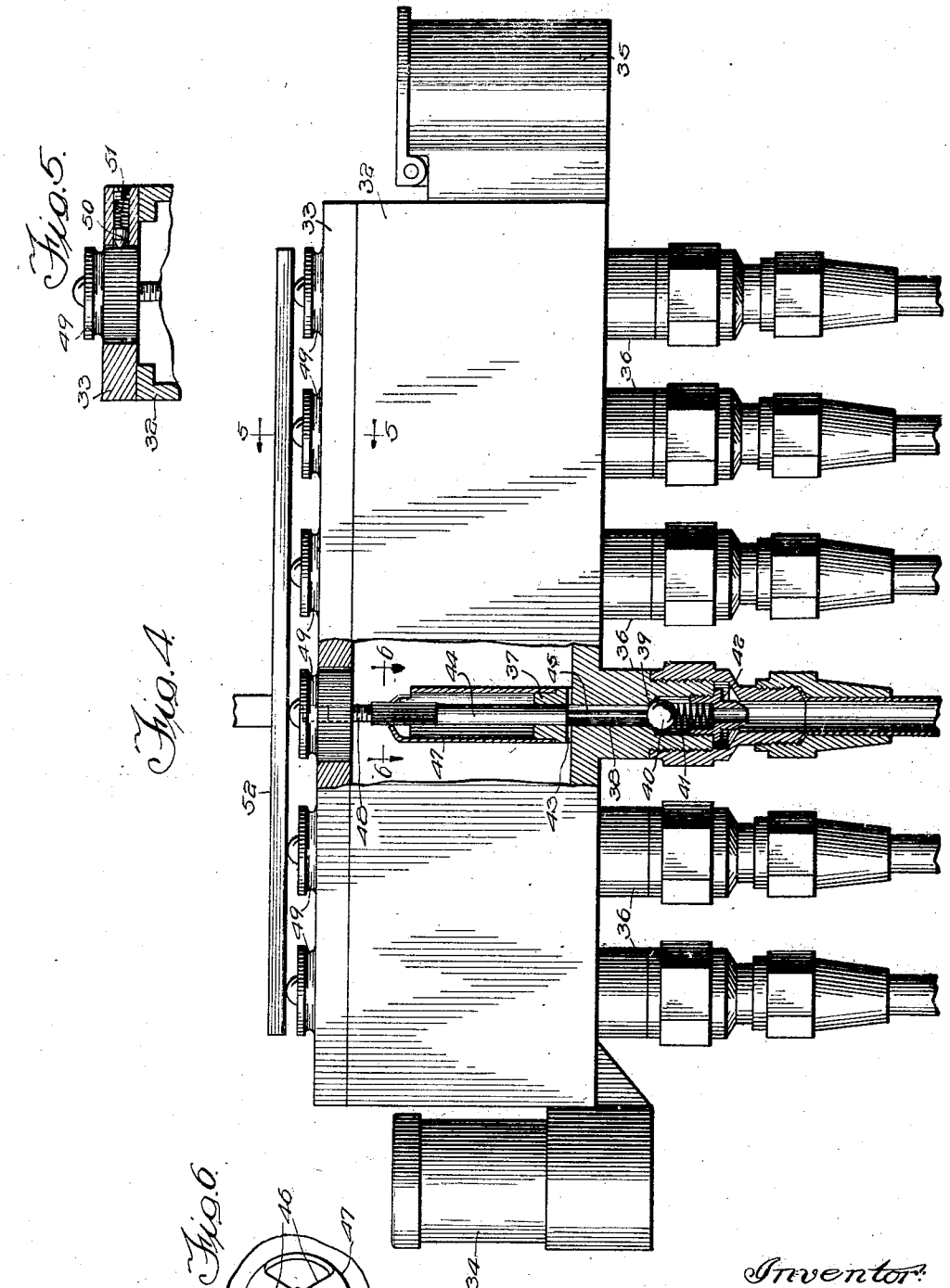
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Patented June 17, 1930 1,763,961

UNITED STATES PATENT OFFICE

REMI J. GITS, OF CHICAGO, ILLINOIS

MULTIPLE OILER

Application filed March 19, 1928. Serial No. 262,919.

This invention relates to multiple oilers, particularly adapted for lubricating a plurality of bearings such as in a printing press.

The main objects of this invention are to provide a lubricating device which will discharge a substantial amount of lubricant immediately upon the initial opening of the lubricator so as to insure some of the lubricant reaching the bearing as well as to cover the conducting pipes leading from the lubricator to such bearing; to provide a lubricating device having a combined capillary attraction and siphoning feed wherein the feeding wick may be quickly and readily removed, and to provide a multiple lubricator or oiler in which each of the discharge openings is valve-controlled and all of the valves are operated by a unitary member.

An illustrative embodiment of this invention is shown in the accompanying drawings in which:

Figure 1 is a side elevation of the improved lubricator with a portion thereof broken away, shown in longitudinal vertical medial section, so as to show the interior construction of one of the lubricating units.

Fig. 2 is an enlarged fragmentary section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 1.

Fig. 4 is a side elevation of a modified form of lubricator with a portion thereof broken away and shown in longitudinal vertical medial section.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged section taken on the line 6—6 of Fig. 4.

Heretofore in the use of this general type of lubricator some difficulty has been experienced in the matter of removing the wicks for either washing or replacement. Such replacement or washing is ordinarily necessary about once in every six months, due to the fact that the wick becomes clogged with dirt and sediment and other impurities present in the lubricating oil. In cases where the wick is difficult to remove, the tendency for the user is to procrastinate and defer such removal until long after the time when the wick has passed its useful life. The result of such practice is that oftentimes bearings are insufficiently lubricated and damage results.

Lubricators having valve-controlled discharge openings of the type herein shown and described necessarily employ a relatively small valve stem. When the stem is formed integrally with the valve, the initial manufacture of the device requires a grinding of the valve to fit its seat. Furthermore in use, the valve stem sometimes becomes slightly bent or warped, thus throwing the valve out of line with its valve seat, and causing the valve to leak. The present invention overcomes both of the above-mentioned difficulties.

The wick used in the preferred form, shown in Figs. 1 to 3 of the drawings, is of inverted U-shape with straight substantially parallel legs. Such a wick may be quickly and readily removed from its operating position without dismantling any of the device, other than removing the cover from the lubricator.

The valve used in the present device is in the form of a steel ball and the valve stem is not connected thereto but merely abuts against the ball to move it from its valve seat and is therefore independent of any stress or strain which may be applied to the valve stem.

Another difficulty often encountered in lubricators of this type, which are remotely located with respect to the bearing being lubricated, is that if the lubricator has been shut off for some period of time, the oil drains out of the conducting pipes which lead from the lubricator to the bearing. Then when the machine is started up the lubricator begins feeding oil drop by drop to the conducting pipes and a considerable period of time elapses before the interior walls of the pipes are coated with the lubricant and the lubricant actually reaches the bearing. During this interval of time when

the bearing is not supplied with lubricant, much damage may occur.

In the present device when the lubricator is shut off, there will accumulate a supply of oil in an auxiliary reservoir and when the lubricator is initially opened, this accumulated quantity of lubricant will rush out and be discharged at once so as to immediately cover the walls of the conducting tubes between the lubricator and the bearing and feed oil into the bearing a few moments after the lubricator is turned on. After this initial flushing of the conducting tubes and bearings, the lubricator thereafter will feed the lubricant drop by drop until shut off.

In the modified form shown in Figures 4 to 6 inclusive, this initial supply of lubricant is forcibly ejected from the auxiliary reservoir by means of the valve stem which opens the discharge valve. This type of oiler is designed for intermittent use only and continues its oiling by intermittently ejecting small quantities of lubricant. Such type of lubricator is preferably electrically operated through the medium of a solenoid or an electro-magnet, the circuit of which is closed at suitable times by operation of the machine to which it is applied.

In the construction shown in Figs. 1 to 3 of the drawings, a main lubricant reservoir 1, preferably of rectangular cup-shape cast aluminum, has the usual side walls and a floor 2 integrally cast together. One end of the reservoir is provided with a glass sight gauge 3 which communicates with the interior of the reservoir. The opposite end of the reservoir is preferably provided with a filler opening 4 having a spring actuated hinged cover cap 5 for normally closing the top thereof. The filler 4 communicates with the main reservoir 1 through a transverse passageway 6 located closely adjacent the floor thereof.

The reservoir 1 is provided with a plurality of depending bosses 7, the number thereof being equal to the number of bearings to which the lubricator is to be connected. Vertical discharge passages 8 are drilled through each of the bosses 7 so as to communicate with the interior of the reservoir 1. The upper ends of each of the passageways are drilled out to a larger diameter so as to form an upwardly facing socket 9 which frictionally receives and supports a vertically-disposed tubular cage 10. The upper and lower ends of the cage 10 are cut away to leave three fingers which are bent inwardly toward each other, as shown particularly in Fig. 2, so as to support and guide a valve stem or push rod 11, the lower end of which passes down into the passageway 8 with sufficient clearance around it for lubricant to flow down the passageway readily.

The passageway 8 is also enlarged at the lower end thereof to form a valve seat 12 which cooperates with a ball valve 13 for controlling the discharge passageway. The lower end of the valve stem 11 rest on the ball valve 13 and the valve 13 is normally held in closed position on its seat by a compression spring 14 mounted within the lower end of the enlarged portion of the discharge passageway. The spring 14 is retained therein by a tubular member 15 which is threaded into the lower end of the discharge opening, as shown particularly in Fig. 1.

The cage 10 is sealed in the socket 9 at its lower end and oil is conducted from the main reservoir 1 to the interior of the cage 10, which forms an auxiliary reservoir, by an inverted U-shaped wick 16 the legs of which are substantially straight and parallel to each other. One end of the wick 16 extends down into the interior of the cage 10, and the other end thereof extends down and is closely adjacent to the floor of the main reservoir 1. The wick 16 is supported over the upper end of the cage 10 and the medial portion thereof is above the normal oil level in the main reservoir, so that oil is conducted from the main reservoir to the interior of the cage 10, or auxiliary reservoir, by a combined capillary attraction and siphoning action.

Means are provided for depressing all the valve stems 11 in unison and comprises a plate 17 carried on the under side of the reservoir cover 18 by means of upstanding pins 19. The lower ends of pins 19 are riveted to the plate 17 and the bodies extend up through openings in upstanding bosses 20 integrally cast on the top surface of the cover plate 18. The upper ends of the pins 19 contact with a horizontally-disposed cam bar 21 which is provided with a handle 22 for rotating it. The respective ends of the rod 21 are cut away at opposite sides as shown particularly in Fig. 3 so that when the handle 22 is in the position shown in full lines in Fig. 1, the pins 19 fit up into the cut-away portions of the ends of rod 21, and the plate 17 is in its raised position. When the handle 22 is raised to the position shown in dotted lines in Fig. 1, the ends of rod 21 cam the pins 19 downwardly, thus depressing the plate 17 and carrying all of the valve stems 11 downwardly in unison to open their respective discharge valves.

Means are provided for maintaining a definite predetermined oil level in the reservoir 1 and comprise a supply reservoir 23 preferably in the form of a glass jar which has a cap 24 threaded thereon. The cap 24 is provided with a spout or discharge nozzle 25 which has a collar 26 slidably mounted thereon and which may be adjustably secured in any desired position by a set screw 27. The flow of oil through the discharge nozzle 25 is controlled by the valve 28 seated

to close the inner end of the discharge opening through the nozzle. The valve 28 is carried by a valve stem 29 which projects or protrudes a substantial distance beyond the outer end of the nozzle 25. A compression spring 30 is interposed between the outer end of the discharge nozzle 25 and a cross head 31 on valve stem 29 for normally holding the valve 28 in closed position to prevent passage of lubricant through the nozzle 25.

This supply reservoir 23 is adapted to be used in an inverted position with the discharge nozzle 25 inserted into the filler opening 4, the end of valve stem 29 contacting with the floor of the filler opening so as to open the valve 28 from its seat. The height of the lower end of the discharge nozzle 25 with respect to the floor of the reservoir 21 may be adjustably positioned by means of the collar 26 and set screw 27, the collar being adapted to rest on the top of the filler opening to support the reservoir 23.

In the operation of this preferred form of lubricating device, the supply reservoir 23 is filled with fluid lubricant and the cap 24 screwed thereon. The reservoir is then turned upside down and the discharge nozzle 25 inserted into the filler opening 4 after the cap 5 has been raised. The collar 26 is adjusted so as to bring the lower end of the discharge nozzle 25 at the desired height from the floor of the reservoir. This height of the end of the nozzle determines the level of the lubricant in the reservoir 1.

When the nozzle is inserted in the filler opening 4, the valve stem 29 contacts with the floor of the filler opening and lifts the valve 28 from its seat against the action of compression spring 30, thus permitting the lubricant to flow out through the discharge nozzle until it rises to the height of the end of the discharge nozzle.

The wick 16 by capillary attraction and siphoning action, then transfers lubricant from the reservoir 1 to the interior of the tubular cage 10, which forms an auxiliary reservoir, filling such auxiliary reservoir to the level of the lubricant in the main reservoir 1.

When it is desired to put the lubricating device in operation, the handle 22 is grasped and raised to a vertical position as shown in dotted outline, Fig. 1. Movement of the handle in this manner rotates the horizontal rod 21 and causes the cam surfaces at the ends thereof to force the pins 19 downwardly. Downward movement of the pins 19 causes the plate 17 to press down on the top ends of all the valve stems 11, carrying the valve stems downwardly and pushing the ball valves 13 from their seats 12.

This opening of the discharge valves permits the accumulated lubricant in the auxiliary reservoirs to rapidly run out and down the connecting tubes or pipes leading to the respective bearings being lubricated. After this initial flushing by the accumulated lubricant, the wick 16 will thereafter feed lubricant drop by drop and continue until the device is shut off, at which time the auxiliary reservoirs will fill up to the level of the lubricant in the main reservoir 1.

In the modification shown in Figs. 4 to 6, inclusive, a main lubricant reservoir 32 of the same general construction as that shown in Fig. 1 is provided with a removable cover plate 33. The opposite ends of the reservoir are provided with a sight gauge and filler opening 34 and 35 respectively.

The exterior of the floor of the reservoir 32 is provided with a plurality of depending bosses 36 and the interior of the floor is also provided with a like number of upstanding bosses 37 arranged in registry with the depending bosses 36 respectively.

A discharge passageway 38 is drilled vertically through each of the bosses 36 and 37 and the lower end of each of the passageways is enlarged to provide a valve seat 38 for a ball valve 40 which is normally held against its seat by compression spring 41. Each of the springs 41 is retained by a tubular fitting 42 threaded into the lower end of each of the enlarged portions of the passageways 38.

Each of the bosses 37 is horizontally drilled closely adjacent the floor of the reservoir 32 to provide oil passageways 43 which permit lubricant in the main reservoir to flow to the auxiliary reservoirs formed by the passageways 43. A valve stem 44 of substantially the same diameter as the discharge passageway 38 is slidably mounted in each unit, and the lower end thereof is of reduced diameter as shown at 45 so as to provide considerable clearance with the side walls of the passageway 38 so as to form an auxiliary lubricant reservoir. The lower end of the reduced portion 45 of valve stem 44 contacts with ball valve 40. The upper end of each of the valve stems 44 is triangular in shape as shown particularly in Fig. 6 and is slidably retained against rotation relatively to the reservoir by the inwardly turned fingers 46 of a tubular cage 47 mounted upon the upstanding boss 37.

The extreme upper end of each of the valve stems 44 is threaded as shown at 48 and has an adjusting nut 49 threadably mounted thereon.

The cover plate 33 is provided with a plurality of openings therethrough to slidably receive the adjusting nuts 49 so that the top ends thereof protrude slightly above the surface of the cover. The peripheral surface of the nuts 49 are preferably vertically grooved or ribbed so as to cooperate with a slidably mounted plunger 50 yieldingly urged thereagainst by a compression spring

51, both of which are carried in a passageway drilled horizontally in one side of the cover plate 33 as shown particularly in Fig. 5. This arrangement permits manual rotation of the adjusting nut 49 relative to the valve stem 44 against the frictional action of the plunger 50 but prevents accidental relative rotation between the two parts.

Means are provided for pressing down on all of the adjusting nuts 49 in unison and comprises a bar 52 which may be operated by any suitable means such as a solenoid or electromagnet, the circuit of which is intermittently closed by the operation of the machine to which the lubricator is attached.

In the operation of this modified form of lubricator, the reservoir 32 is filled to the proper level with a suitable fluid lubricant and when not in operation, the compression springs 41 maintain the ball valves 40 in contact with their seats 39.

The reduced portion 45 of each of the valve stems 44 is so proportioned that when the ball valve 40 is on its seat communication is effected between the passageway 38, which acts as an auxiliary reservoir, and the interior of the main reservoir 32, through the passageways 43.

Downward movement of the bar 52 carries each of the valve stems downwardly, the amount of travel depending upon the adjustment of the nuts 49. Initial downward movement of the valve stems 44 closes communication between the auixiliary reservoir and the main reservoir 32. Continued downward movement of the valve stem forcibly ejects the lubricant in the auixilary reservoir out around the discharge valve 40.

Although but one specific embodiment and one modification of this invention has been herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a device of the class described, a main reservoir having a discharge opening leading therefrom, a valve seat in said discharge opening distantly located with respect to the inner end of said discharge opening, a valve cooperating with said seat to control said discharge opening, a valve stem slidably mounted in said discharge opening and having one portion thereof of substantially the same diameter as said discharge opening so as to serve as a piston, the lower end of said valve stem being of reduced diameter to form an auxiliary reservoir for lubricant, means for filling said auxiliary reservoir with lubricant from said main reservoir when said valve is closed and said valve stem is in one position, said valve stem being adapted to close communication between said reservoirs when shifted to a position which opens said valve, such shifting causing said valve stem to forcibly eject the lubricant from said auxiliary reservoir.

2. In a device of the class described, a reservoir for containing a lubricant, an upstanding boss on the inside of the floor of said reservoir, a depending boss on the outside of the floor of said reservoir in registry with said inside boss, said bosses and the floor of said reservoir having a discharge passageway therethrough, a valve stem slidably mounted in said passageway, a tubular cage mounted on said inside boss, the upper end of said cage supporting the upper end of said valve stem, means on said stem and cage for preventing relative rotation therebetween, an adjusting nut threaded on the top end of said stem for varying the effective length thereof, and means for normally preventing relative rotation between said adjusting nut and said valve stem.

Signed at Chicago this 15th day of March, 1928.

REMI J. GITS.