

Sept. 14, 1937.

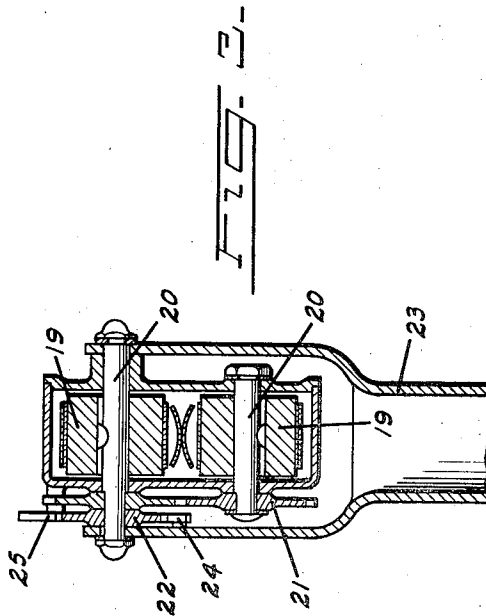
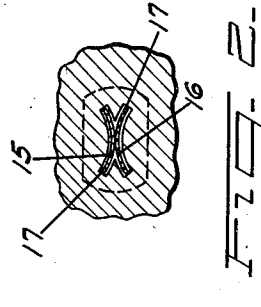
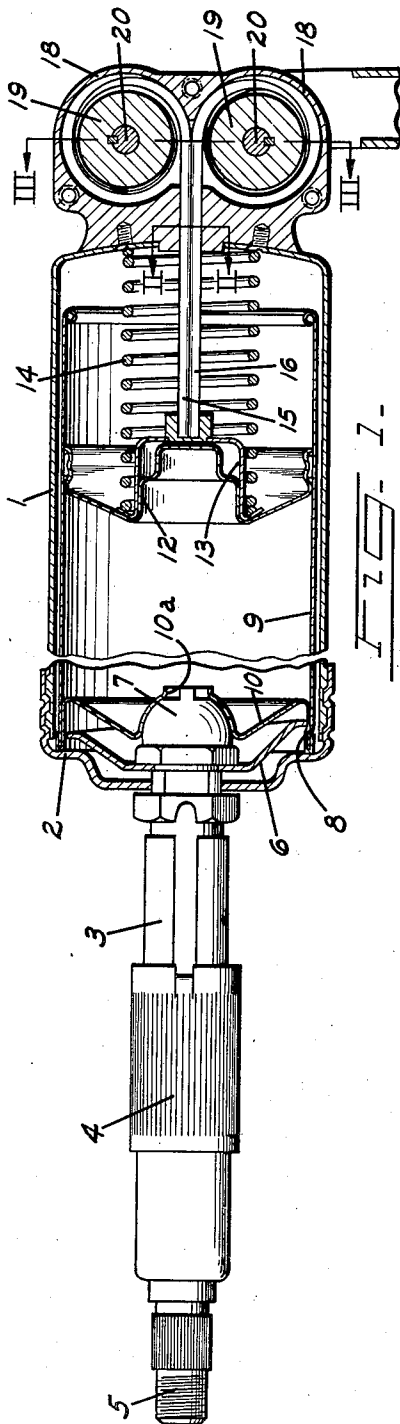
H. R. TEAR

2,093,387

LUBRICATING DEVICE

Filed May 16, 1936

2 Sheets-Sheet 1



INVENTOR
HARRY R. TEAR.
BY *John C. Watson*
ATTORNEY

Sept. 14, 1937.

H. R. TEAR

2,093,387

LUBRICATING DEVICE

Filed May 16, 1936

2 Sheets-Sheet 2

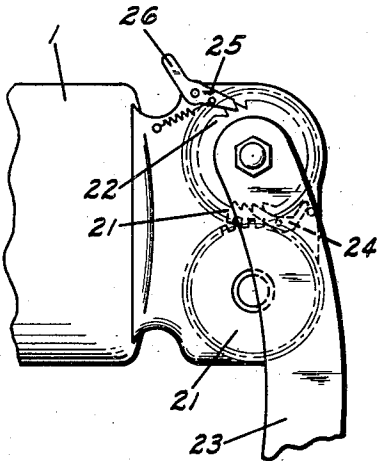


FIG. 4.

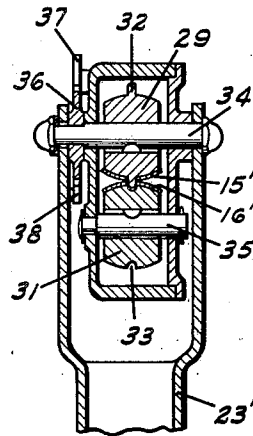


FIG. 6.

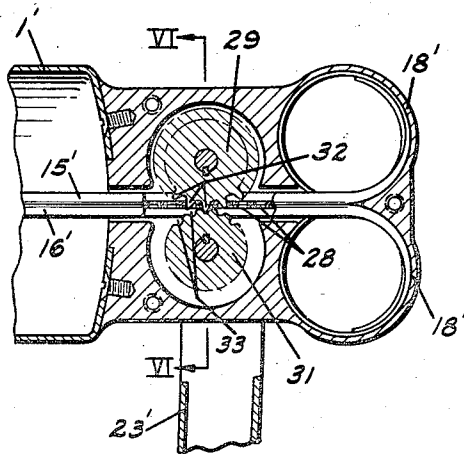


FIG. 5.

INVENTOR
HARRY R. TEAR.
BY *John C. Nathan*
ATTORNEY

UNITED STATES PATENT OFFICE

2,093,387

LUBRICATING DEVICE

Harry R. Tear, Evanston, Ill., assignor to The Lubrication Corporation, Chicago, Ill., a corporation of Delaware

Application May 16, 1936, Serial No. 80,077

10 Claims. (Cl. 221—47.3)

This invention relates to lubricating devices and more particularly to lubricant dispensers in which thrust is exerted on a piston to urge the piston through a container to dispense the contents thereof.

Lubricant dispensers have heretofore been proposed in which a piston is forced through a container by means of a feed screw, the feed screw serving both to exert force on the piston and to hold the piston straight in the container. However, such feed screw must be as long as the container and, when the container is full, will project therefrom a distance substantially equal to the container length. Thus at this time, the effective length of the whole device is substantially twice the container length and the device is awkward to handle.

Lubricating devices have also been proposed in which the piston is forced through the container by means of a spring, compressed air, or the like but in these devices it is necessary either to provide a relatively thick piston or guide means to prevent tilting or cocking of the piston. A thick piston reduces the capacity of the container and is too expensive to be practical for use with interchangeable lubricant cartridges and a guide means must either extend through the end of the container in the manner of a feed screw or must extend through the piston, which latter construction is also impractical for use with interchangeable lubricant cartridges.

Accordingly, it is one of the objects of the present invention to provide a lubricating device having a minimum length.

Another object of the invention is to provide a lubricating device having piston control mechanism which may be coiled but which is substantially rigid when straight.

Another object is to provide a lubricating device including piston guide means which may be stored in a relatively small space together with separate means to exert a thrust on the piston.

Another object is to provide novel thrust producing mechanism which may be stored in a relatively small space.

Other objects, advantages and novel features of the invention will be apparent from the following description when read in connection with the accompanying drawings, in which:

Fig. 1 is a central section with parts in elevation of a lubricating device embodying the invention;

Fig. 2 is a partial section on the line II—II of Fig. 1;

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

Fig. 4 is a partial side view illustrating the operating mechanism;

Fig. 5 is a partial section similar to Fig. 1 showing a modified construction; and

Fig. 6 is a section on the line VI—VI of Fig. 5.

The device illustrated in Figs. 1 to 4 comprises a cylindrical barrel or container 1 having one end closed by a cap 2 which is detachably secured thereto. The cap 2 carries a part 3 of a lubricant pump which is completed by a part 4 telescopically mounted on the part 3 and terminating in a discharge nozzle 5 formed for sealing engagement with a lubricant receiving fitting. The part 3 extends through the cap 2 and carries a connector plate 6 and inlet stud 7 for connection with an interchangeable lubricant cartridge. The connector plate 6 is provided with a series of slots and cam surfaces for forming a bayonet connection with lugs 8 on the end of a lubricant cartridge 9 in the manner more fully described and claimed in the patent to Dodge No. 1,987,002.

The cartridge 9 has a fixed end wall 10 provided with an outlet opening 10a, the walls of which are formed for sealing engagement with the stud 7 when the parts are assembled. The opposite end of the cartridge 9 is closed by a slidably mounted piston 11 having a central projection portion 12 to receive the stud 7 so that all of the lubricant may be dispensed from the cartridge and further to provide an outwardly extending projection for a purpose to appear later.

A cup member 13 is adapted closely to receive the projection 12, thereby to guide the piston 11 against tilting or cocking and a compression spring 14 engages the member 13 and the end of the barrel 1 to exert a thrust on the member 13 and the piston 11 tending to force the piston through the cartridge 9. The member 13 is secured to the ends of a pair of strips 15 and 16 which are formed with an arcuate cross section, as best seen in Fig. 2. The strips are so connected to the member 13 that their convex surfaces are held in contact.

The end of the barrel 1 is provided with a guide opening, as best seen in Fig. 2, in the form of a pair of oppositely facing arcuate slots 17 which communicate at their central portion and are adapted closely to receive and to guide the strips 15 and 16. The barrel 1 is formed with an extension terminating in a pair of substantially cylindrical chambers 18 and a spool 19 is mounted in each of said chambers on a shaft 20, the ends of strips 15 and 16 being secured to the spools 19. The shafts 20 are journaled in the casing extension and have secured thereto a pair of inter-

meshing gears 21 by means of which the spools 19 are caused to turn synchronously. One of the shafts 20 carries a ratchet wheel 22 and has pivoted thereto on opposite sides of the casing extension the bifurcated ends of an operating handle 23. The handle 23 carries a spring pressed pawl 24 adapted to engage the ratchet 22 and a similar spring pressed pawl 25 is mounted on the casing extension to prevent rotation of the ratchet wheel 22 in one direction. The pawl 25 is provided with extensions 26 by means of which it may be moved out of engagement with the ratchet wheel to permit free turning thereof.

In operation a cartridge may be secured to the pump member 3 through the connector plate 6 and lugs 8 and the cartridge may then be inserted through the open end of the barrel 1, the handle 26 of pawl 25 being depressed at this time to permit rotation of the ratchet 22 and spools 19. It will be noted that as the cartridge is inserted in the barrel, the piston 11 will engage the member 13 and urge it rearwardly in the barrel, compressing the spring 14 and coiling the strips 15 and 16 around the spools 19 in the pockets 18.

When the cap 2 is secured to the end of the barrel 1, the spring 14 will exert a thrust on the piston 11 tending to force lubricant from the cartridge into the pump. If this force is insufficient, the handle 23 may be swung about its pivot, thereby operating the ratchet 22 and turning the spools 19 in a direction to unwind the strips 15 and 16 therefrom. This creates a thrust on the strips, the force of which is added to the force of the spring 14 to urge the piston 11 through the cartridge to dispense the contents therefrom. When lubricant has been forced into the pump, the nozzle 5 may be placed against a lubricant receiving fitting and a thrust exerted on the rear end of the device in the direction of the fitting to telescope the pump parts and to effect a discharge of lubricant from the pump under high pressure. It will be understood that a single thrust on the handle 23 could be utilized both to create a thrust on the strips and on the pump simultaneously.

The strips 15 and 16 are preferably formed of steel or like material and I have found that a strip of this character is relatively rigid in thrust and is sufficiently rigid against bending to prevent tilting of a piston, but that at the same time such a strip may be coiled readily in the manner indicated. I have further found that strips of this character have much greater resistance to bending in a direction to place their convex surfaces at the inside of the bend than they have in the opposite direction with the concave surfaces at the inside of the bend. Accordingly, by placing a pair of strips with their convex surfaces in contact as shown in the drawings, a very rigid assembly is produced which offers a high resistance both in bending and in thrust. However, by separating the strips and coiling them separately with their concave sides in, they may be coiled readily for storage in a relatively small space.

While the strips are relatively rigid in thrust, it will be apparent that they will flex in response to a predetermined thrust, thereby limiting the force which can be applied therethrough on the piston. By properly proportioning the size of the strips, the force they are capable of transmitting can be limited so that excessive pressure cannot be applied on the cartridge, thereby providing a safety feature to prevent the application of bursting pressure to the cartridge.

Figs. 5 and 6 illustrate a modified construction, parts therein corresponding to like parts in Figs.

1 to 4 being indicated by the same reference characters primed. In this construction the spools 19 are omitted and the strips 15' and 16' are coiled freely in the pockets 18'. The strips 15' and 16' are further provided with a central longitudinal series of perforations 28.

In order to exert a thrust on the strips 15' and 16' a pair of mating wheels 29 and 31 are provided, the wheel 29 having a series of teeth 32 and the wheel 31 having a series of complementary pockets 33 to receive the ends of the teeth 32. The wheels are mounted on shafts 34 and 35 which are journaled in the barrel extension and the shaft 34 carries a ratchet wheel 36 outside of the extension. Suitable spring pressed pawls 37 and 38 are provided on the extension and on the handle 23' respectively to control the ratchet wheel 36.

The wheels 29 and 31 engage the concave sides of the respective strips 15' and 16' with the teeth 32 projecting through the perforations 28 and into the pockets 33 as best seen in Fig. 6. In order to produce a thrust on the strips the handle 23 may be swung about its pivotal mounting on the shaft 34 to rotate the ratchet wheel 36 through the pawl 38. This causes rotation of the wheel 29 and creates a thrust on the strips through engagement of the teeth 32 in the perforations 28. Preferably the swinging movement of the handle is limited so that a thrust thereon may be effective both to produce a thrust on the strips and to thrust the gun against a fitting to operate the pump.

It will be understood that the mechanism provided for producing a thrust on the strips might be omitted and the thrust produced by means of a spring such as the spring 14 in Fig. 1 or by compressed air or the like acting on the piston 11. In this case the strips would serve solely as a guiding means for the piston to prevent tilting or cocking thereof. It will also be apparent that the invention can be used equally well with a lubricant container which is directly loaded by bulk lubricant instead of using an interchangeable lubricant cartridge.

Various other changes might also be made without departing from the spirit of the invention and it is not intended to be limited to the forms shown or otherwise than by the terms of the appended claims.

I claim:

1. A lubricating device comprising, a container having a piston therein, a discharge device communicating with said container, and piston operating mechanism including a pair of strips having curved cross-sections whereby they are relatively rigid in thrust but relatively flexible in bending, said strips being secured together at one end and adapted to engage the piston, means for guiding said strips in side-to-side unfastened relationship whereby they mutually brace each other, means for applying a thrust to said strips in the direction of the piston to urge the piston through the container, and means for separately coiling those portions of the strips which are not in use whereby they may be stored in a relatively small space.

2. A lubricating device comprising, a container having a piston therein, a discharge device communicating with said container, and piston operating mechanism including a pair of strips having arcuate cross-sections, said strips being secured together at one end with their convex surfaces facing and adapted to engage the piston, means for guiding said strips in parallel relationship

whereby the strips mutually brace each other, means for applying a thrust to the strips in the direction of the piston to urge the piston through the container, and means for separately coiling the strips with their normally concave sides in, whereby they may be stored in a relatively small space.

3. A lubricating device comprising, a lubricant discharge device, a relatively thin walled lubricant cartridge communicating with said discharge device, a piston in said cartridge, a pair of metal strips having curved cross section, means for securing the ends of said strips together with their convex surfaces in contact, said ends engaging the piston, and means for applying a thrust to the strips in the direction of the piston.

4. In a lubricating device having a container and a piston slidable therein, piston controlling mechanism comprising, a strip having a curved cross section whereby it is relatively rigid when straight but may be coiled into a relatively small space, means connecting one end of said strip to the piston, whereby said strip holds the piston in alinement in the container, means separate from the strip for applying pressure to the piston, and means for coiling that portion of the strip which is not in use.

5. In a lubricating device having a container and a piston slidable therein, piston controlling mechanism comprising, a pair of strips having arcuate cross-section means guiding said strips in parallel relationship with their convex surfaces in contact whereby the strips form a relatively rigid assembly, means connecting one end of each strip to the piston, and means for separately coiling those portions of the strips which are not in use.

6. In a lubricating device having a container and a piston slidable therein, piston controlling mechanism comprising, a pair of strips having arcuate cross-section means guiding said strips in parallel relationship with their convex surfaces in contact whereby the strips form a relatively rigid assembly, means connecting the strips to the piston at one end, means for applying pres-

sure to the piston separately from the strips, and means for separately coiling those portions of the strips which are not in use with their normally concave sides in.

7. Thrust producing means comprising, a pair of strips of relatively thin material having arcuate cross-section, a pair of spools, one end of said strips being secured to said spools respectively, the opposite ends of said strips being secured together with their convex sides in contact, means for guiding said strips in a straight line with their convex sides in contact, and means for rotating said spools to exert a thrust on the strips.

8. Thrust producing means comprising, a pair of strips of relatively thin material having arcuate cross-sections, said strips having longitudinal series of openings therein, means connecting one end of the strips together with their convex sides facing, a pair of wheels each engaging the concave side of one of the strips, one of said wheels having a series of teeth to project through the openings in both of said strips and the other wheel having a series of sockets to receive the ends of said teeth.

9. Thrust producing means comprising, a pair of strips of relatively thin material having arcuate cross-sections, said strips having longitudinal series of openings therein, means connecting one end of the strips together with their convex sides facing, a pair of wheels each engaging the concave side of one of the strips, one of said wheels having a series of teeth to project through the openings in both of said strips and the other wheel having a series of sockets to receive the ends of said teeth, and means forming a pair of pockets, each adapted to receive and to coil one of said strips.

10. Thrust producing means comprising a pair of strips of relatively thin material having arcuate cross section, means for securing one end of the strips together with the convex sides in contact, means for guiding said strips in parallel relationship with their convex sides in contact, and means for applying a thrust to said strips.

HARRY R. TEAR.