

May 1, 1928.

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D. L. BROWN

LUBRICATING DEVICE

Filed April 7, 1926

3 Sheets-Sheet 1

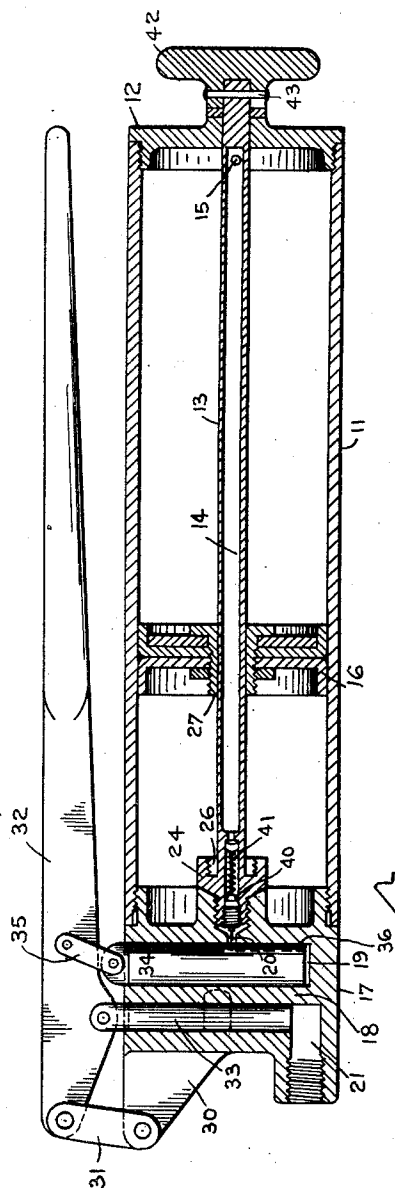


FIG-1

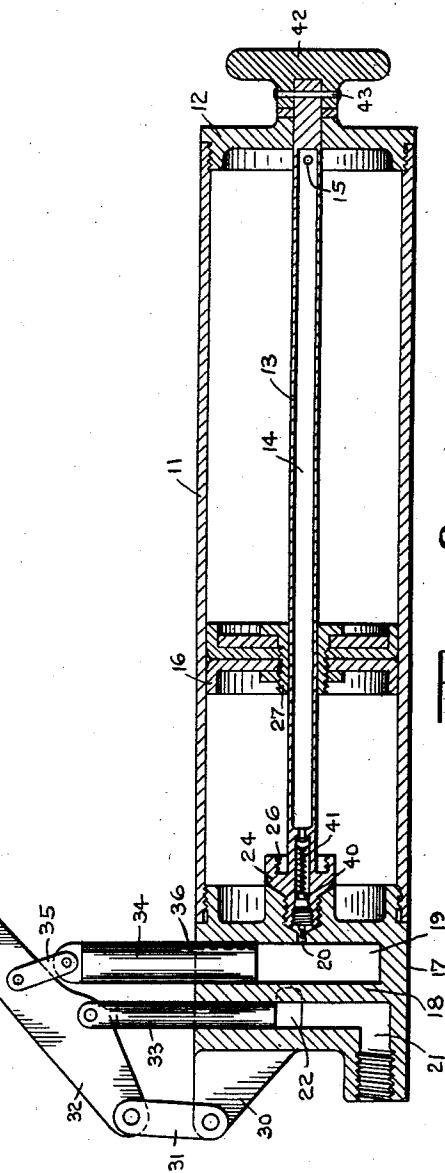


FIG-2

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3 Sheets-Sheet 2

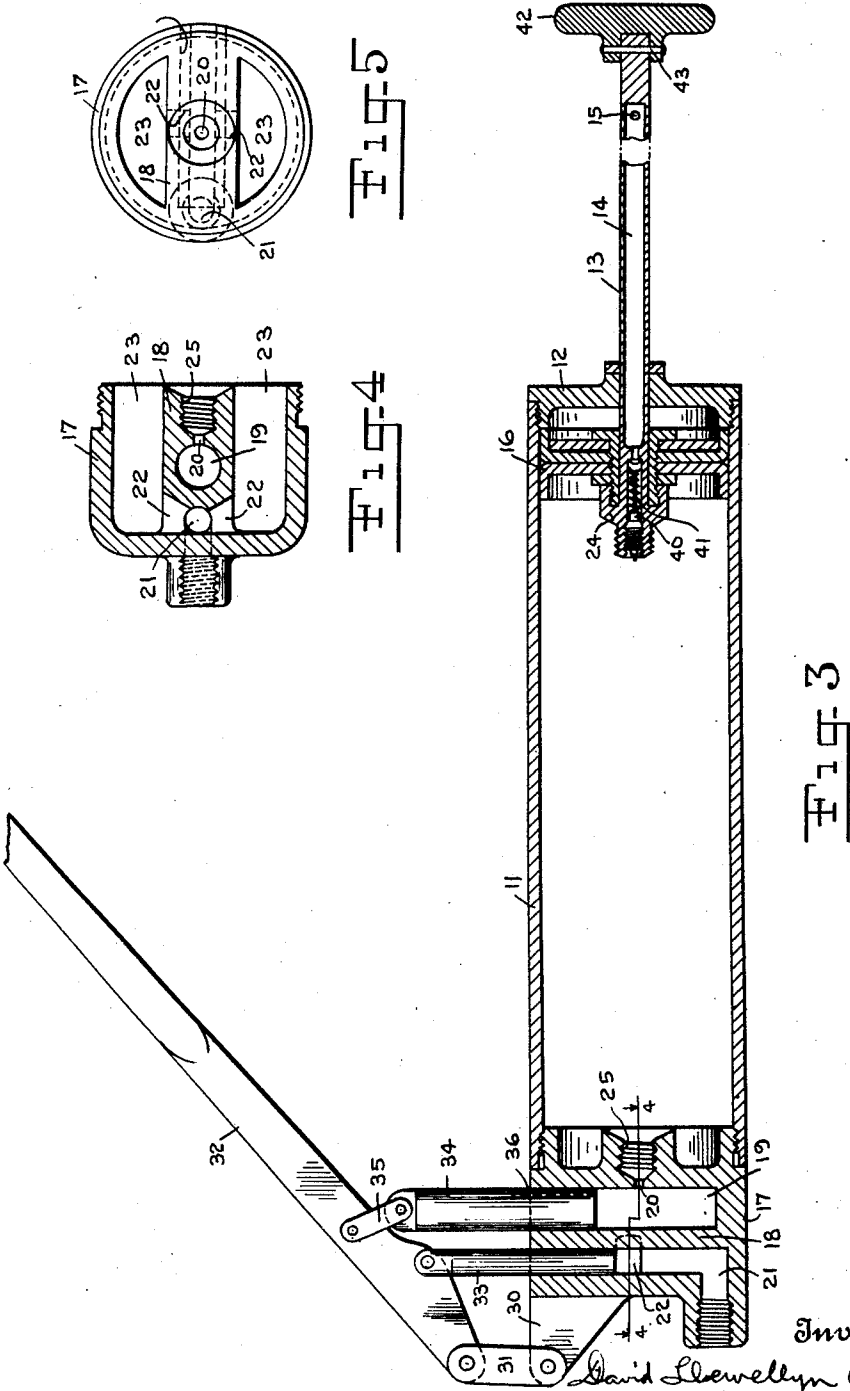


Fig. 5

Fig. 4

Fig. 3

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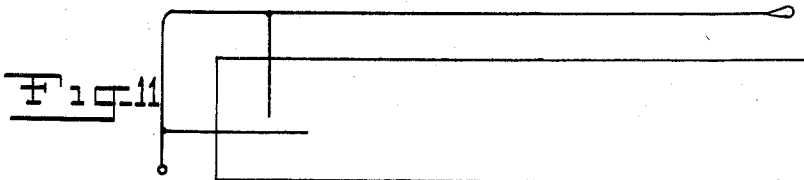
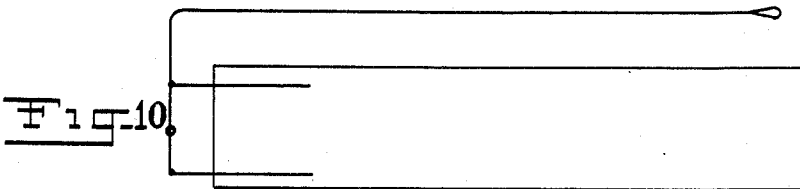
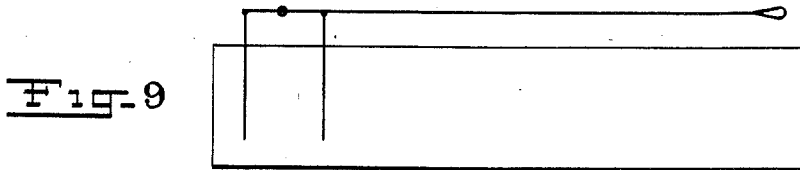
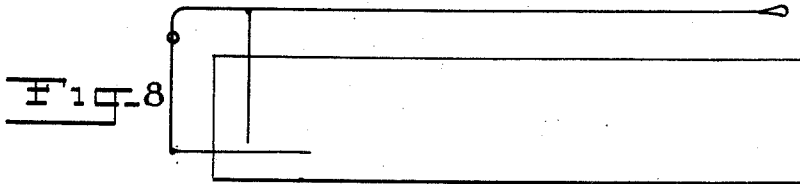
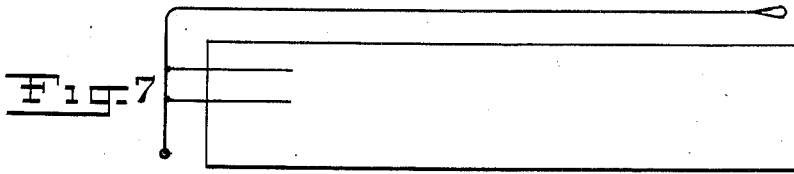
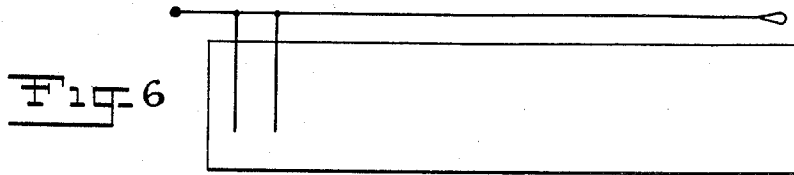
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Filed April 7, 1926

3 Sheets-Sheet 3



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Patented May 1, 1928.

1,668,002

# UNITED STATES PATENT OFFICE.

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## LUBRICATING DEVICE.

Application filed April 7, 1926. Serial No. 100,371.

My invention relates to lubricating devices and more especially to that class of such apparatus which are commonly called "grease guns", the same being employed for the purpose of applying a small or larger quantity as may be desired of oil or other lubricant to bearing surfaces of machinery, such as automobiles, which require frequent attention. Some of the principal objects of my invention are to provide a device of the kind mentioned which shall be easily and cheaply manufactured, the construction of which is such that the lubricant can be ejected therefrom in either a large or small quantity and if desired with considerable force, which can be easily refilled or replenished with lubricant, and which is easily taken apart for the purpose of inspection and the like and easily reassembled. Other objects of the invention will appear from the following specification.

The invention consists in the novel construction, arrangement and combination of various devices, elements and parts, as set forth in the claims hereof, one embodiment of the same being illustrated in the accompanying drawings and described in this specification.

In the said drawings,

Fig. 1 is a longitudinal section of a lubricating device embodying my invention in one form thereof, showing the lubricant ejecting plunger in its depressed position;

Fig. 2 is a view similar to Fig. 1 but showing said plunger in its raised position;

Fig. 3 is a view similar to Fig. 2 but showing the piston in the main lubricant receptacle withdrawn to one end of the same, so as to permit the device to be used in a somewhat different manner, as hereinafter more particularly described;

Fig. 4 is a fragmentary section along the line 4-4 of Fig. 3, looking in the direction of the arrows;

Fig. 5 is an end view of the portion of the invention shown in Fig. 4; and

Figs. 6, 7, 8, 9, 10 and 11 are diagrammatic views pointing out certain modifications of the invention as hereinafter described.

In carrying my invention into effect in one of the embodiments thereof which I have selected for detailed illustration in the accompanying drawings and for more particular description in this specification, and re-

ferring now to Figs. 1 and 2, it will be seen that I provide a lubricant receptacle, preferably in the form of a cylinder as shown in said figures, the same being designated 11. This cylinder is provided at its rear end with a removable closure 12, perforated to allow the passage of a rod 13, which is of tubular form, having an internal bore 14 and a lateral opening 15 near its rear end which opens from said bore into the interior of the receptacle 11 when the rod is in place therein.

On the tubular rod 13 is slidably mounted a piston 16, which is preferably constructed, as shown in the drawings, so as to comprise a pair of cup washers facing in opposite directions so as to prevent grease or air from passing in either direction.

At the other end of the receptacle 11 is removably secured the lubricant ejecting mechanism. This comprises a casing 17, which may if desired be in the form of an integral casting. This casing is provided with a vertical partition 18, some of the details of which are better shown in Figs. 4 and 5. In this vertical partition is a bore 19, which communicates through the opening 20 with the interior of the lubricant receptacle 11. There is also in this partition an L-shaped bore 21, the outer end of which communicates with the open air and is internally screw-threaded for the reception of the nipple of a flexible tube for conveying the lubricant to the place at which it is needed, and the other end of which communicates through the side passages 22 with the open spaces 23 (see Figs. 4 and 5) on each side of the partition 18, and thereby with the interior of the lubricant receptacle 11.

At the inner end of the rod 13 is located a member 24, which may be either integral therewith or removably secured thereto, the outmost end of which is externally screw-threaded and is adapted to engage with internal screw-threads 25 (see Figs. 3 and 4) in the enlarged portion of the passage 20 in the partition 18. The inner portion or heel of the member 24 has an annular socket 26, which is adapted to engage with screw threads on a nipple 27 on the piston 16 (see Figs. 1 and 2) so that the rod 13 may be operatively connected to the piston 16, in the position shown in Fig. 3, to permit a certain use of the device which will be hereinafter described. Inside the member 24 is located

a valve 40 controlled by a spring 41, which is adapted to permit the passage of air from the bore 19 into the lubricant receptacle, but to resist the passage of air in the other direction.

The casting 17 is provided with a lug 30, to which is pivotally attached a link 31, to which is then pivotally attached the inner end of an operating lever 32. A plunger 33 is pivotally attached to said lever, and is thereby adapted to be reciprocally moved in the vertical portion of the bore 21. A second plunger 34 is operatively connected by means of a link 35 to the lever 32 and is thereby adapted to be reciprocally moved in the bore 19. A groove or slot 36 is provided in the portion of the plunger 34, contiguous to the opening 20 which leads from the bore 19, so that there may be a small continuous passage between the bore 19 and the interior of the lubricant receptacle 11, even when the plunger 34 is entirely depressed.

The rod 13 may be provided at its outer end with a handle 42 for convenience in operating the same, which may be removably attached to the rod by a pin 43 or in any suitable manner.

The operation of my invention is as follows: Assuming the device to be empty, that is, unsupplied with lubricant, the rod 13 with the member 24 is unscrewed from its connection with the casting 17, and the latter, with its attached parts, is then unscrewed from the end of the receptacle 11, thus leaving the said receptacle open at that end. This open end is applied to a supply of lubricant, and the rod and piston drawn upward, whereby the receptacle 11 is filled more or less completely as desired with lubricant, sucked up by the drawing upwards of the piston. The parts are then reassembled in their operative position. The position as shown in Figs. 1 and 2 is that which would occur if the receptacle were filled only about one-third of its capacity with lubricant, the same occupying the space to the left of the piston 16, the space to the right being occupied merely by air, but in practice the receptacle would usually be filled entirely, so that the piston would be slid along on the rod 13, nearly up to the right-hand end of the device.

The device being charged with lubricant, the delivery of the same is accomplished by operating the lever 32. When the same is raised into the position shown in Fig. 2, both plungers 33 and 34 are elevated. Upon depressing the lever the plungers are operated into the position shown in Fig. 1. The reciprocal raising and lowering of the plunger 34 in the bore 19 forces the air contained in the said bore through the opening 20 past the valve 40, through the tube 14 and the orifice 15, into the receptacle, back of the piston 16, thereby compressing the air and

tending to force the piston 16 forward along the rod 13 and thereby to force the lubricant in front of the piston through the openings 23 and 22 into the bore 21, so that when the plunger 33 is depressed the lubricant is ejected therefrom.

The operation of my invention as above described is employed whenever it is desired to deliver the lubricant from same with a considerable degree of force or pressure, a large quantity being not so much desired.

There are, however, occasions in which it is desirable to deliver a large quantity of lubricating material into a place which it can easily enter, so that no great force is required to deliver the same thereto. In such case, the device is employed in the arrangement shown in Fig. 3, where, as will be seen, the rod 13 is disengaged from its screw-threaded connection with the casting 17 and is drawn up and placed in screw-threaded connection with the piston 16 by means of the internal screw-threaded portion 26 and the screw-threaded nipple 27 on the piston. The lever 32 is then raised, which carries upward the plungers 33 and 34, thus providing a free passage for the lubricant through the openings 23 and 22 into the bore 21 and out through the delivery passage. The piston 16 is then moved forward by means of the rod 13, forcing the lubricant out through said passages. Any tendency of the lubricant to pass up the tube 14 will be resisted by the pressure of the spring 41 on the valve, but should any tendency manifest itself of the lubricant to squirt out through the lateral opening 15 when the device is used in the manner just described, the same can be prevented by placing the end of the finger over the opening 15.

The advantages of my invention will be obvious from what has been above said with regard to its construction and operation, where the same are necessarily discussed, and it is therefore unnecessary to recapitulate the same here.

I do not limit myself to the particular details of the embodiment of the invention which I have above described and which is illustrated in the accompanying drawings, as it is obvious that various modifications of the same can be made without departing from the spirit and scope of the invention. For instance it is not essential that the operating lever should be a lever of the second class, being pivotally attached at its outer end and connected with the plungers intermediate that and its operating end, as the arrangement may be modified so that a lever of a different class may be used. Neither is it necessary that the plungers ascend and descend simultaneously, as they may be arranged so that one is ascending while the other is descending, in which case the lever would be as to one a lever of the first class

and as to the other a lever of the second class, the fulcrum being between the two plungers. Nor is it necessary that the plungers operate transversely to the longer axis of the cylinder, as an embodiment of the invention may be employed in which one or both of the plungers operate in a line substantially parallel to the longer axis of the receptacle. Some of these modifications of the invention are diagrammatically illustrated in Figs. 6, 7, 8, 9, 10 and 11 of the accompanying drawings, which show, in merely a skeleton form, a receptacle, an operating lever, an air-pressure plunger, and a lubricant ejecting plunger, in combination in various operative relations. Still other modifications may be employed, to adapt the invention to use in special circumstances.

It will be understood of course that the plungers 33 and 34 and the passages in which they operate, need not be of the comparative sizes as shown in the drawings, as it may be under some circumstances advantageous to construct the device with the passage 19 and the plunger 34 smaller than the passage 21 and the plunger 33 instead of larger as shown in the drawings.

It is also obvious that by designing the parts with reference to such modified use, the plunger 33 may be dispensed with, the passage 21 in that case not communicating with the open air at the top thereof as shown in Figs. 1, 2, 3, and particularly in Fig. 4, but being closed above the side inlets 22 (see Fig. 4). In this form of the device the power for ejecting the lubricating material would be derived entirely from the reciprocation of the plunger 34, which would force air through the tube 14, out through the port 15 into the interior of the cylinder 11, which would then force the piston 16 forward and force the lubricating material in front of said piston out through the passage 21.

Another modification of the invention which under certain circumstances proves more efficient than the modification particularly described in the above specification, is that in which the air inlet tube, connected with one of the plungers, and which I have shown as located inside of the cylinder, is instead placed outside of the cylinder, connected at its forward end with an air-forcing plunger and at its rear end opening into the cylinder, behind a sliding piston therein analogous to the piston above described.

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

1. A lubricating device comprising in combination the following elements: a cyl-

inder adapted to contain lubricating material, a closure for the rear end of said cylinder, a tube extending longitudinally inside said cylinder having a port near its rear end opening into said cylinder, a member secured to the forward end of said cylinder, a passage in said member communicating with an opening in the forward end of said tube, a plunger in said passage, a second passage in said member communicating at one end with the interior of said cylinder and at the other end with the open air, a plunger in said second passage, means for reciprocating said plungers in their respective passages, and a piston within said cylinder slidably mounted on said tube: whereby when said plungers are operated air is forced from said first-named passage through said tube and into said cylinder behind said sliding piston, so that lubricating material is then forced by said piston into said second-named passage ready to be ejected therefrom by the reciprocating plunger in said second-named passage.

2. A lubricating device comprising in combination the following elements: a cylinder adapted to contain lubricating material, a closure for the rear end of said cylinder, a tube extending longitudinally inside said cylinder having a port near its rear end, a valve near its forward end, a spring adapted to press said valve forward in a closed position, a piston slidably mounted upon said tube when it is desired to operate the device in one manner and means to secure the forward end of said tube to said piston when it is desired to operate the device in another manner, a member secured to the forward end of said cylinder, a passage in said member communicating with an opening in the forward end of said tube when said passage and said tube are contiguous but opening into the interior of said cylinder when said tube is drawn backward away from said passage, a plunger in said passage, a second passage in said member communicating at one end with the interior of said cylinder and at the other end with the open air, a plunger in said second passage, and means for reciprocating said plungers and for holding said plungers partly out of said passages: whereby when said plungers are partly withdrawn from their respective passages lubricating material may be forced by said piston from said cylinder into and through said second named passage and ejected therefrom.

In witness whereof I have hereunto signed my name this 27th day of March 1926.

DAVID LLEWELLYN BROWN.