Aug. 19, 1930. F. A. GERLING 1,773,669

DOUBLE ACTING LUBRICATING PUMP

Filed Jan. 2, 1930 2 Sheets-Sheet 1

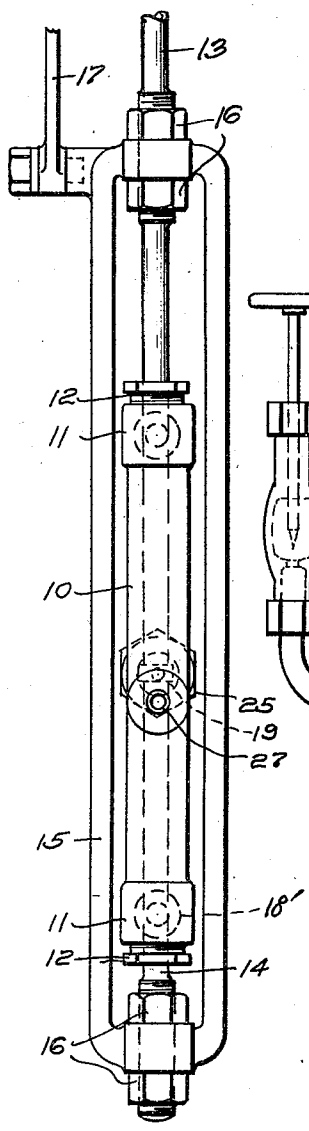

Fig. 1.

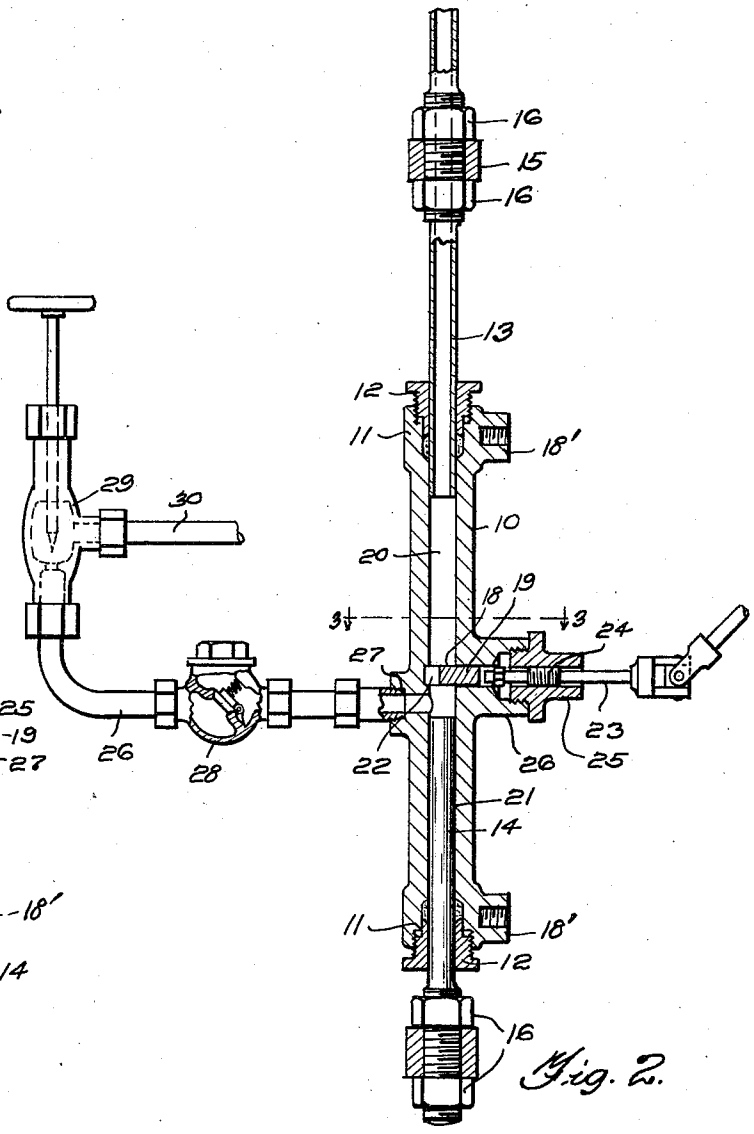

Fig. 2.

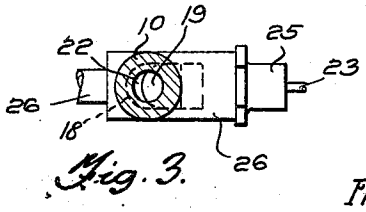

Fig. 3.

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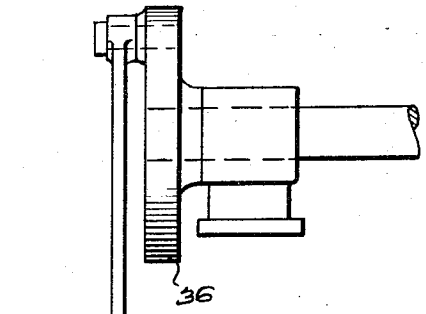

Fig. 4.

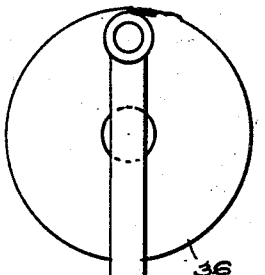

Fig. 5.

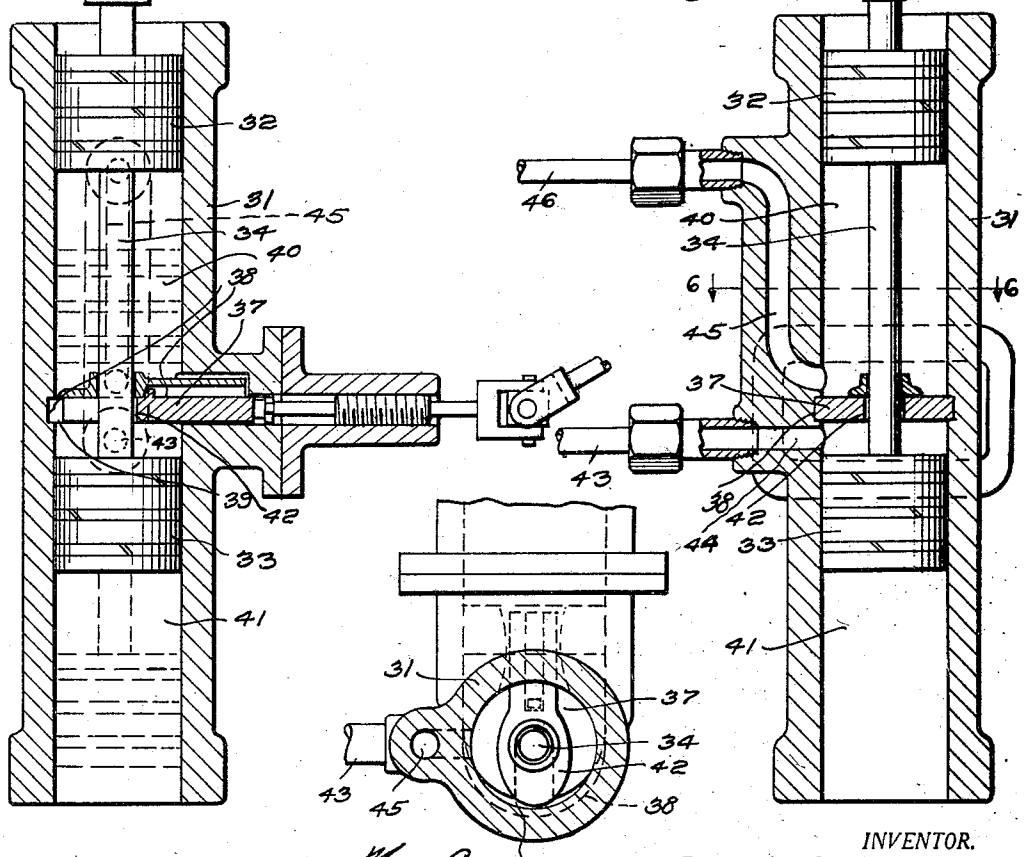

Fig. 6.

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FRED A. GERLING, OF BOISE, IDAHO

DOUBLE-ACTING LUBRICATING PUMP

Application filed January 2, 1930. Serial No. 418,084.

My invention relates to a pump adapted to feed a lubricant to any desired point or points.

In accordance with my invention, I provide a pump which is adapted to feed a lubricant, either liquid or plastic, to desired point or points, and which may be adjusted from an external point, to regulate the pressure upon the lubricant being fed and the amount of such fed lubricant. The pump is simple in construction and reliable in operation.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same.

Figure 1 is an edge elevation of a pump embodying my invention,

Figure 2 is a side elevation of the same, parts shown in central vertical section,

Figure 3 is a horizontal section taken on line 3—3 of Figure 2,

Figure 4 is a central vertical longitudinal section through a pump embodying a second form of my invention,

Figure 5 is a central vertical longitudinal section taken on line 5—5 of Figure 4,

Figure 6 is a horizontal section taken on line 6—6 of Figure 4.

In the drawings, wherein for the purpose of illustration, are shown preferred embodiments of my invention, the numeral 10 designates a cylinder open at both ends and having upper and lower stuffing boxes 11 equipped with glands 12, as shown. Slidable within the upper end of the cylinder 10 is a tubular piston 13, having suitable connection with the point at which the lubricant is to be fed. A solid piston 14 is slidable within the lower end of the cylinder 10, as shown. The effective area of piston 14 is greater than that of piston 13. The numeral 15 designates an operating link or loop element, having openings in its ends to receive the pistons 13 and 14, which are clamped thereto by nuts 16, as shown. The link 15 may be reciprocated by any means, such as by a connecting rod 17, connected with any suitable driving element, adapted to reciprocate the same. The cylinder 10 is preferably vertically arranged, in use, and is provided with lugs 18′, having screw-threaded recesses for convenient attachment to a support.

Near its center, the cylinder 10 is provided upon its inner wall with a horizontal groove 18, to receive a sliding gate or valve 19, adapted to divide the bore of the cylinder 10 into upper and lower chambers 20 and 21, having communication through a restricted passage 22, afforded by the adjustment of the sliding gate 19. This gate has a swiveled connection with a rod 23, having a screw-threaded portion 24, engaging within a screw-threaded opening formed in a cap 25, engaging a housing 26. The rod 23 may be turned by any suitable means to regulate the sliding gate 19.

The numeral 26 designates a lubricant supply pipe leading into the bore of the cylinder 10 at 27, beneath the sliding gate, as shown. Connected with the pipe 26, is a check valve 28, opening toward the cylinder 10. A needle valve 29 connects the pipe 26 with a pipe 30, and may be adjusted to regulate the flow of lubricant from the pipe 30 to the pipe 26. The lubricant may be fed through the pipe 30 by gravity or by a forced feed.

In operation of this form of the invention, the plungers 13 and 14 reciprocate in unison. When the plunger 13 descends, the lubricant within the upper chamber 20 is displaced upwardly through the tubular plunger 13 and will pass upwardly through the same, as the area of its bore is greater than the passage 22. As the plunger 13 descends, the solid plunger 14 also descends, creating a suction within the lower chamber 21, causing check valve 28 to open, whereby the lubricant is drawn into the lower chamber 21. When the piston 13 rises, the pressure is released in the upper chamber 20 and the lower piston 14 rises, subjecting the lubricant to pressure within the chamber 21, forcing it through the passage 22 into the upper chamber 20. By adjusting the sliding gate 19, the extent of the passage 22 may be regulated, and hence the difference in pressures between the chambers 20 and 21 may be regulated, thus controlling the feed of the lubricant.

In Figures 4 and 5, inclusive, I have shown a modified form of lubricant pump, wherein

the numeral 31 designates a preferably vertically arranged cylinder, preferably having its ends open. Mounted to reciprocate within these cylinders are upper and lower pistons 32 and 33, which are spaced, and rigidly connected by a rod 34, so that they move in unison. The upper cylinder is connected with a pivoted rod 35, connected with a crank disc 36 to reciprocate the same, although it may be reciprocated by any other suitable means.

A sliding gate or valve 37 operates within a horizontal interior groove 38 and affords a restricted passage 39, between upper and lower chambers 40 and 41, provided by the sliding gate. The sliding gate is provided with a longitudinal slot 42, which is adapted to be closed by an upwardly opening flap or check valve, 42′, slidably mounted upon the rod 34.

The numeral 43 designates a lubricant supply pipe, leading into the cylinder 31, beneath the sliding gate 37, as shown at 44. This pipe is equipped with a check valve and a cut-off valve similar to valves 28 and 29, Figure 2. A discharge port 45 for the lubricant leads into the cylinder 31 above the sliding gate 37 and discharges into an outlet pipe 46, leading to the desired point or points of lubrication. The area of the lower piston 33 may be slightly greater than that of the upper piston 32.

In the operation of this form of the invention, the sliding gate 37 being adjusted to provide the desired contracted passage 39, upon the down stroke of the upper piston 32, the lubricant within the upper chamber 40 is compressed and is fed outwardly through the port 45 since it has a greater area than the contracted passage 39. Upon the downward movement of the piston 32, the lower piston 33 descends, creating a suction within the lower chamber 41, and drawing in the lubricant through the pipe 43, such lubricant discharging into the lower cylinder 41, since the check valve in the pipe 43 opens toward the cylinder 31. Upon the up stroke of the pistons 32 and 33, the pressure is released in the upper chamber 40 and is applied to the lubricant in the lower chamber 41, forcing the same through the restricted passage 39 into the upper chamber.

It is to be understood that the forms of my invention, herewith shown and described, are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts, may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. A lubricant feeding pump comprising a cylinder, a sliding gate movable across the bore of the cylinder and dividing the same into chambers and affording a contracted passage between the chambers, means to move the sliding gate to a selected adjusted position and holding the same stationary in such position, lubricant supply means leading into one chamber, pistons mounted to reciprocate within the chambers, there being lubricant outlet means leading into the other chamber, means connecting the pistons so that they move in unison, and means to reciprocate the pistons.

2. A lubricant feeding pump comprising a cylinder, an adjustable sliding gate movable across the bore of the cylinder and dividing the same into chambers and affording a contracted passage between the chambers, said passage being permanently uncovered, means to supply a lubricant to one chamber, a solid piston mounted within such chamber, a tubular piston mounted within the other chamber and having its bore in communication with the last named chamber so that the lubricant discharges through the bore of the tubular piston, means to connect the pistons so that they move in unison, and means to reciprocate the pistons.

3. A lubricant feeding pump comprising a cylinder, an adjustable sliding gate valve movable across the bore of the cylinder and dividing the same into chambers and affording a contracted passage between the chambers, said passage being uncovered, a supply pipe leading into one chamber and having a check valve opening toward said chamber, a solid piston within said chamber, a tubular piston within the other chamber and having its bore in free communication with such chamber so that the lubricant discharges through the bore of the tubular piston, and means to reciprocate the pistons in unison.

4. A lubricant feeding pump comprising a cylinder, having an intake port and an outlet port, a sliding gate movable across the bore of the cylinder between the ports and dividing the cylinder into chambers, said gate having a slot and adapted to produce a contracted port between the chambers, pistons mounted within the chambers, a rod connecting the pistons and passing through the slot, a flap valve to cover said slot, and means to reciprocate the pistons.

In testimony whereof I affix my signature.

FRED A. GERLING.