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DISCHARGE CONDUIT CONTROL DEVICE

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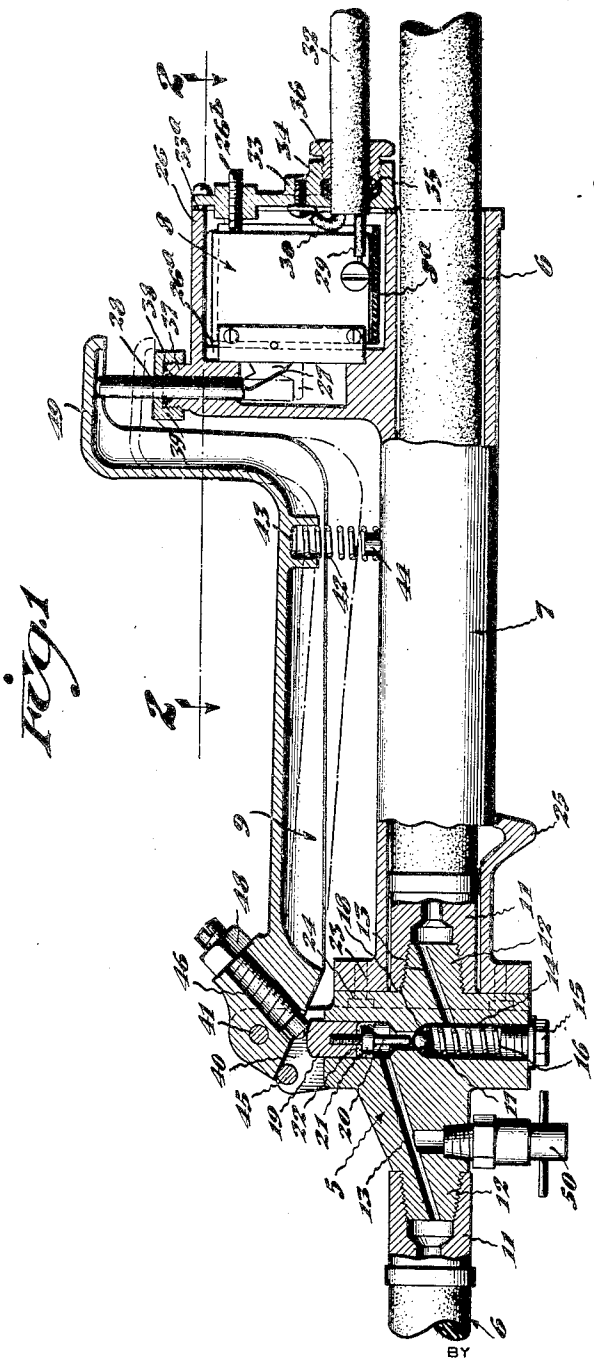


Fig. 1

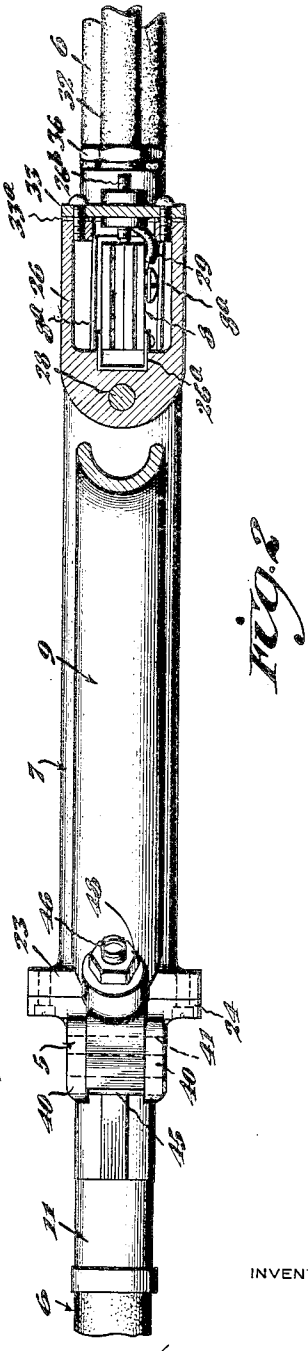


Fig. 2

INVENTOR

Cleo Harris

BY

Woodard Woodard ATTORNEYS

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CLEO HARRIS, OF CINCINNATI, OHIO, ASSIGNOR TO THE CINCINNATI BALL CRANK COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO

DISCHARGE CONDUIT CONTROL DEVICE

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This invention relates to control devices for discharge conduits and is particularly directed to a device of this nature for coincidentally operating a switch and valve disposed toward the discharge end of the conduit for simultaneously opening the valve and starting a pumping motor, which motor forces grease or oil through the line, or for closing the valve and stopping the motor.

An object of this invention is to provide a manually operated control device at the discharge end of the conduit wherein a single lever operates a valve in the line and a switch for a pumping motor. It is provided by means of this single lever control that no discharge of lubricant occurs after the motor switch has been operated to break the circuit to the motor since the movement necessary to release the motor control switch closes the line and prevents the over-run of the motor from discharging excess grease.

It is another object of this invention to provide a conveniently arranged device of the above nature interposed in the conduit including a handle surrounding the conduit, and a lever fitting close along the handle whereby the control device may be gripped in one hand and conveniently operated.

Another object of this invention is to provide a control lever for operating an associated switch and valve wherein the movement imparted to the valve is relatively slight, and whereby a long leverage is provided for exerting considerable force on the valve for the purpose of opening the same, and to further provide that the lever is quickly and automatically returned upon a release by the operator.

Another object of this invention is to provide a valve operating means which includes an improved arrangement of the lever relative to the valve plunger wherein the action of the lever on the plunger creates substantially no side thrust and is extremely effective for imparting a great pressure to the plunger through a cam action imparted by the lever against the plunger.

Another object of this invention is to provide a motor control switch mounting or enclosure associated with a lubricant discharge conduit wherein the switch is effectively sealed so as to prevent the entrance of moisture to the switch parts.

Other objects and certain advantages will be more fully apparent from a description of the accompanying drawings in which:

Figure 1 is a longitudinal sectional view of the coincidentally operated valve and switch.

Figure 2 is a sectional view taken on line 2—2, Figure 1.

Generally described, the control device includes a valve 5 inserted in a discharge line or conduit 6 and a handle 7 attached to the valve. The handle includes an encased switch 8 at its outer end, a lever 9 being mounted between the switch and valve for the purpose of simultaneously opening the line and starting a pump motor (not shown), or vice versa. The conduit may be provided for the discharge of lubricant, either oil or grease, and the switch may control any electric power source for forcing lubricant through the discharge tube.

Referring specifically to the drawings, the respective sections of the conduit, between which the valve is inserted, have metal coupling elements 11—11 affixed to their ends adjoining the valve, these coupling elements being internally threaded and screwed onto nipples 12—12 extending from each side of the valve casing. The grease passageway 13 through the valve is intersected by a transversely extending bore 14. This bore 14 contains the valve element for controlling the passageway. The lower end of the bore is closed by means of a plug 15, this plug compressing a coil spring 16 disposed within the bore against a ball valve 17 for seating the ball on a valve seat 18 formed by an internal shoulder in the bore.

Above the internal shoulder a plunger 19 is slidably mounted in the bore and carries a stud 20. The stud 20 is screwed into the lower end of the plunger concentrically therewith. An intermediate shoulder 21 of the stud engages upon a packing ring 22 disposed against the underside of the plunger, which ring has a downwardly disposed sealing flange adapted to be spread against the wall of the bore by the grease under pres-

sure. The tip of the stud 20, normally, is very slightly spaced away from the valve for permitting the valve to be seated by the spring. Upward movement of the plunger is limited by means of the valve actuating lever mechanism hereinafter described.

The intersected passageway 13 has its intake extent emptying into the lower end of the bore below the valve and its discharge extent providing the grease exit from the upper portion of the bore above the valve. These passageway portions are obliquely disposed relative to the grease conduit.

To provide a convenient handle for manipulation of the discharge end of the conduit and an improved mounting for the switch, a tubular handle element 7 is attached to the valve and extended rearwardly about the discharge conduit. This casing provides a lateral flange 23 at its end abutting the side of the valve, which flange is bolted to a corresponding flange 24 of the valve. The casing is tubular for surrounding the grease conduit and for the purpose of providing a conveniently positioned grip. To further facilitate a firm grasp on this handle, a protuberance 25 is formed thereon on its underside, which protuberance may be straddled by the fingers to permit a firm grasp, particularly for preventing longitudinal slippage of the handle in the hand.

At the rear end of the casing a lateral casing extension 26 is provided, in which extension the snap switch 8 is mounted. This switch may be of any conventional construction. In the instance shown, the switch is of that type providing a trigger 27 which must be held down to keep the contact in and the motor running. The switch structure includes for this purpose a spring return for the trigger (not shown). It will readily be understood that the spring return type is not essential but that the switch could be directly returned by means of the lever actuating the same. The switch is adjustably secured in position so that the relation of the trigger may be varied relative to an operating plunger 28.

The plunger is slidably mounted in the rear wall of the casing and has its inner end protruding into a recess formed in the wall, within which recess the trigger of the switch is operated. This wall is slotted as at 26^a to receive the rear edge of the switch. The engagement of the switch within the slot or groove is fairly snug, but sufficient clearance is provided to permit sliding of the switch in the groove laterally of the lubricant conduit so as to adjust the trigger relative to the plunger 28.

The switch is clamped or secured in set position in the groove by means of a set screw 26^b disposed through the cover plate and engaging the forward edge of the switch.

The two electric leads 28, 39, for the switch are attached respectively to the switch 8 and to the switch casing 26 and extend through a conduit 32, which conduit is attached and sealed through the end or cover plate 33 of the casing 26 by means of an internally collapsible compressible packing ring 34 held in position in a bore 35 of the cover surrounding the conduit by means of a packing gland nut 36. The clamping ring provides inclined inner and outer edges, these edges being inclined toward each other and outwardly. The cover plate is secured in position by means of screws engaged into internal bosses in the extension or switch enclosure. The inner end of the gland nut 36 provides a correspondingly inclined surface engaging the clamping ring, urging the ring against a correspondingly inclined bore shoulder.

The trigger for the switch is disposed for operation by the vertically moving plunger 28, this plunger being slidably disposed through a boss 37 in the outer wall of the switch casing. A packing gland 38 surrounds this plunger 28 and has an inclined lower edge secured against a concave outer end of the outward portion of the boss by means of an internally flanged nut 39 screw threaded onto the boss. The plunger 28 and conduit 32 have the packing about them at those points at which they traverse the casing so as to prevent the entrance of moisture, grease, etc. into the switch, thereby preventing short circuits. For the same purpose, a gasket 33^a is placed under the cover plate 33. The switch is enclosed in a sheet of insulating material 8^a to insulate the same from the walls of the casing.

The lever 9 for operating the switch plunger 28 and the valve plunger 19 extends longitudinally of the handle normally in parallelism therewith and is pivotally mounted on the valve body between outwardly extending arms 40 thereof on a cross pin 41 mounted in and between the arms. This lever is normally held in valve release or closing position by means of a coil spring 42 under compression between the outer end of the lever and the handle casing. The coil spring is engaged within a cup-shaped boss 43 of the lever and about an outwardly or radially extending stud 44 on the handle casing. This spring under compression maintains the forward end of the lever beyond the pivot against a cross pin 45 constituting a stop therefor.

A contact screw 46 is mounted in the forward end of the plunger 19. This screw is obliquely disposed and its upper end inclines toward the rear end of the device. The screw has an oval dog point contacting the plunger and has a nut 48 screwed onto its outer end engaging the lever for definitely setting the contact screw in any desired position.

The pivot pin 41 connecting the lever to the valve body is located directly above the

plunger, the axis of the pin and plunger being in substantially the same plane. The contact screw providing the operative engagement between the lever and the plunger has its dog point disposed substantially beneath the pivot pin due to its oblique position in the lever. It therefore follows that a swinging movement of the lever on its pivot swings the dog point across the convex upper end of the plunger and, due to an initial slight off-set of the dog point contact to one side of the plunger head, causes a camming action to ensue whereby a great force is exerted upon the plunger and comparatively little movement imparted thereto. It requires but very little movement to unseat the ball valve to permit the passage of the pumped grease through the valve.

The rear end of the lever is turned at right angles adjacent the laterally extending switch casing and has a contact end 49 extending rearwardly over the casing. This contact end engages the uper end of the pin or plunger contacting the switch trigger.

When the lever is depressed the switch plunger is depressed therewith, moving the trigger of the switch into motor starting position. At the same time, movement is imparted to the contact screw at the valve end of the lever. This movement cams the plunger of the valve downwardly sufficiently to unseat the valve. Thus the starting of the motor and the opening of the valve occur simultaneously or substantially so. When a sufficient quantity of lubricant has been delivered, the operator releases the lever and the spring beneath the lever as well as the spring in the switch acting on the plunger tend to return the lever to normal position.

The plunger 19, which unseats the valve, is lifted against the screw 46 by the back pressure in the discharge end of the conduit so that its weight does not rest on the ball. The ball is normally seated by the pressure in the line created by the overrun of the motor after the valve is closed. A petcock 50 is provided in the valve in communication with the discharge extent of the passageway of the valve. This petcock functions when manually opened to relieve the pressure in the line beyond the valve. This is necessary since it frequently occurs that grease is trapped between the nozzle (not shown) at the end of the discharge line, and the valve preventing disconnection of the coupling or nozzle from the fitting.

Having described my invention, I claim:

1. In a device of the class described, a discharge conduit, a valve disposed toward the outer end of said conduit, a tubular handle telescopingly engaged about said conduit and attached to said valve, a lever pivotally connected to said valve and extending longitudinally of said handle, a valve controlling plunger extending from said valve, and a contact screw engaged through said lever having its point in contact with the upper end of the plunger whereby depression of said lever against the tubular handle depresses the valve controlling plunger.

2. A valve construction, comprising, a body having a passageway therethrough, a valve element seated in said passageway, a plunger for engaging and unseating said valve element, a lever pivoted to said valve body above the plunger, a set screw extending obliquely through said lever, said set screw having a convex tip, said plunger having a convex head, said tip and head in engagement whereby rocking of the lever on its pivot causes a camming action between the screw and the plunger for imparting a slight valve unseating movement exerted under considerable force.

3. In a control device, a body having a passageway therethrough, a valve element seated in said passageway, a plunger for engaging and unseating said valve element, a lever, means for pivoting said lever to said valve body, said pivot means located on the axis of the plunger, an adjustable screw extending obliquely through said lever, said screw having a dog point, said plunger having a convex head, said tip and head in engagement whereby rocking of the lever on its pivot causes a camming action between the screw and the plunger for exerting a slight valve unseating pressure.

4. In a device of the class described, a flexible discharge conduit, a valve interposed in said conduit, a tubular handle attached to said valve and telescopically disposed about said flexible discharge conduit for preventing flexing of the conduit adjacent the valve, and a lever having operative connection to said valve, said lever extended from said valve and along said handle, whereby the valve is adapted to be firmly held and manipulated by grasping the lever and handle.

In witness whereof I hereunto subscribe my name.

CLEO HARRIS.