March 31, 1931. J. P. BRUGGER 1,798,450

ROTARY SWITCH LUBRICATOR

Filed Sept. 25, 1929

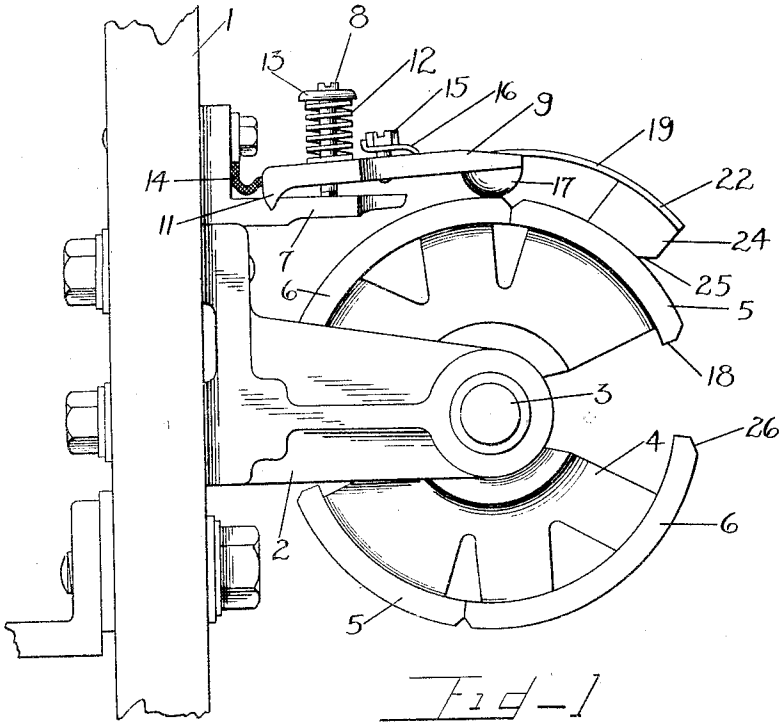


Fig-1

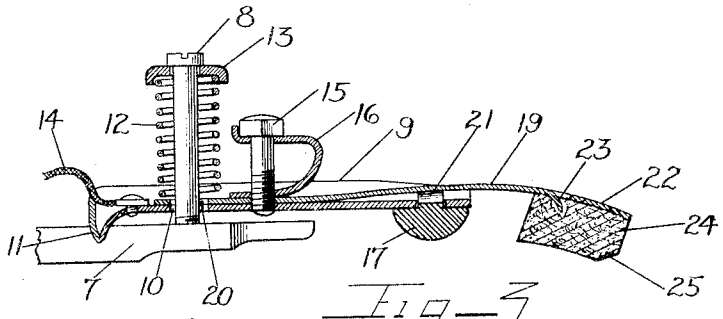


Fig-3

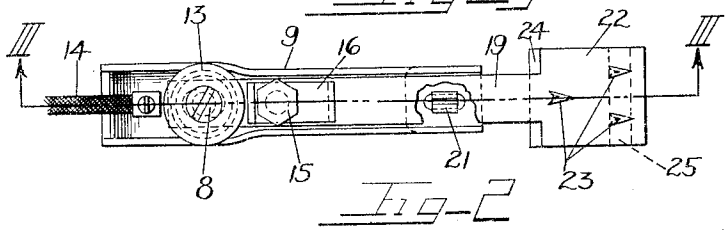


Fig-2

Inventor

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UNITED STATES PATENT OFFICE

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ROTARY-SWITCH LUBRICATOR

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In power control boards for use in connection with laundry machinery installations and the like, the power panels are very often equipped with rotary type switches each of which consists of a shaft mounted in suitable bearing brackets and carrying a plurality of drum members provided with contact segments with which spring controlled adjustable contact fingers coact. In this type of rotary switches, it has been found that the drum segments require proper lubrication to increase the efficiency of the switches. Heretofore numerous attempts have been made to equip the drum segments with graphite strips or small circular sections embedded in recesses provided in the drum segments. This arrangement has not proven satisfactory and in order to properly lubricate the drum segments of rotary type switches used on power panels and the like, this invention has been devised for the purpose of providing resiliently supported lubricating members which are adapted to be conveniently and removably carried on the contact fingers of the rotary switch and in resilient contact with the contact surfaces of the drum segments of the rotary members of the switch to efficiently lubricate the same continuously during the operation of the rotary switch.

It is an object of this invention to provide an improved lubricating device adapted for use on rotary type switches and adapted to be removably mounted on the contact fingers of the switch, without reconstruction of the same, and in resilient lubricating contact with the rotary drum segments of the switch.

It is also an object of this invention to provide an improved lubricating mechanism adapted to be mounted on the contact fingers of a rotary type switch and further adapted to be held in resilient contact with the drum segments of the switch with which the contact surfaces of the contact fingers are also engaged.

It is a further object of this invention to provide a rotary type of switch with an improved lubricating device adapted to be held removably in position upon the contact fingers of the switch by means of the finger control springs and the adjusting screw control springs to permit the lubricating head of the device to be resiliently held in contact with the drum segments of the rotary members with which the contact fingers are also engaged.

It is an important object of this invention to equip rotary type of control switches with lubricating members which are carried on spring arms which are adapted to be removably engaged on the contact fingers of the switch by means of the regular finger control springs and the adjusting screw control springs which form standard parts of the rotary switch equipment.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a fragmentary top plan view of a portion of a power panel board having mounted thereon a vertical type of rotary control switch showing one of the contact fingers of the switch equipped with an improved lubricating device embodying the principles of this invention and illustrated in contact with one of the drum segments of one of the rotary units of the switch.

Figure 2 is an enlarged fragmentary elevational view of a rotary type switch contact finger removed from a power panel and equipped with an improved lubricating device embodying the principles of this invention.

Figure 3 is a detail sectional view of the switch contact finger and the lubricating device taken on line III—III of Figure 2 with parts shown in elevation.

As shown on the drawings:

The reference numeral 1 indicates a portion of a control power panel or board having mounted thereon a rotary type control switch comprising upper and lower shaft bearing brackets 2 rigidly secured to the panel 1 for supporting a switch drum shaft 3, the main body portion of which is covered by means of an insulating shaft tube upon which a plural-

ity of spaced wheels or drum sections 4 are mounted. Each of the switch drum sections is provided with a mutilated or split rim comprising contact segments 5 and 6. Secured on the panel 1 adjacent each of the drum sections or units 4 is a contact finger support or arm 7 having a screw or bolt 8 secured thereto. Positioned adjacent the support or arm 7 is the inner end of a contact finger 9 having an opening 10 therein through which the screw 8 projects. Integrally formed on the inner end of the contact finger 9 is a pivot shoulder 11 which seats upon the support 7. Engaged around the screw or bolt 8 is a finger control coiled spring 12 the upper end of which seats in a washer ring cap 13 mounted on the body of the screw below the screw head. The lower end of the control spring 12 normally seats against the top surface of the finger 9 and resiliently holds the same in contact with the finger support 7. A conductor 14 has one end thereof connected to the pivoted end of the contact finger 9 and the other end connected with the contact finger support 7. Also mounted on the contact finger 9 to the outside of the screw or bolt 8 is an adjusting screw 15 having a bow control spring 16 engaged thereon as clearly illustrated in Figure 3. The adjusting screw 15 projects through a threaded aperture in the contact finger 9 and is provided to coact with the contact finger support 7 to limit the swing of said contact finger toward the contact finger support to afford an arrangement to prevent the rounded contact head or knob 17 from descending too far into the notches or spaces 18 provided between the contact segments 5 and 6 of the switch drum unit. The contact head or knob 17 is secured on the underside of the outer end of the contact finger 9 as illustrated in Figures 1 and 3 and is adapted to normally be held in resilient frictional contact with the outer peripheral surfaces of the switch contact segments 5 and 6.

The parts hereinbefore described in detail and designated by the reference numerals 1 to 18 inclusive, are standard parts of a rotary drum type switch used on power panels and similar devices.

For the purpose of affording proper lubrication between the drum unit contact segments 5 and 6 and the contact head 17 of the contact finger 9, the improved lubricator embodying the principles of this invention has been devised for use in continuously lubricating the contact parts of the rotary switch and may be mounted in position without requiring any alteration or rearrangement of the standard parts of the rotary switch. The improved rotary switch lubricator comprises a resilient metal arm 19 which is slightly curved and which is provided with an opening 20 near one end thereof to permit the screw post 8 to be projected therethrough. The lubricator arm 19 is also provided with an opening through which the adjusting screw 15 is adapted to project. As illustrated in Figure 3, the lubricator arm 19 is adapted to have its supporting end seated in the channel groove of the contact finger 9 with the screw post 8 and the adjusting screw 15 projecting therethrough. The curved outer portion of the lubricator arm 19 is resiliently held fulcrumed or seated upon a fulcrum member or projection formed on the projecting end of the shank or shaft 21 of the contact head 17. The bow spring 16 engaged on the adjusting screw 15 acts to resiliently hold the arm 19 in contact with the fulcrum member 21. The coiled spring 12 has the lower end thereof seated against the inner end of the lubricator arm 19 to hold the same seated in contact with the contact finger 9 as clearly illustrated in Figure 3. The outer end of the lubricator arm 19 projects beyond the end of the contact finger 9 and curves toward the drum unit of the switch and is provided with an enlarged head or plate 22 having a plurality of pointed teeth or projections 23 cut therefrom and directed downwardly toward the outer end of the lubricator arm. The teeth 23 are provided for the purpose of projecting into and holding a lubricating pad or block 24 in position with the lower surface of said lubricating pad resiliently held in rubbing contact with the peripheral surface of the drum segments 5 and 6. The advance edge of the lubricating pad 24 is cut off to provide a bevelled or chamfered surface 25 to permit the outer end of the lubricating pad to engage and ride over the chamfered surface or edge 26 of an advancing switch segment when the drum units are in operation. The lubricating pad 24 may be constructed of felt or any other suitable material adapted to be saturated with a lubricant which may be deposited in required quantities upon the contact surfaces of the switch segments 5 and 6 during the operation of the rotary switch. The lubricating pad 24 is resiliently held in contact with the drum segments 5 and 6 depending upon the adjustment of the control springs 12 and 16 which also govern the resilient contact between the contact finger head 17 and the drum segments of the switch.

The improved lubricating device of this invention as hereinbefore described is adapted to be readily mounted in position upon the contact finger of a rotary or reverse drum type switch, and furthermore is adapted to be removably held in position by the standard spring control parts of the contact finger, such for example, as the control spring 12 and the adjusting screw spring 16. When mounted in position as described, the improved lubricator is adapted to resiliently hold the lubricating pad or block in resilient frictional contact with the contact surfaces of the drum segments 5 and 6 of the rotary switch. It will be noted that the adjustment of the

adjusting screw control spring 16 not only acts to hold the adjusting screw in a set position of adjustment but furthermore serves as a resilient retaining means for holding the mounted end of the lubricator arm 19 resiliently seated in the channel of the contact finger 9. The improved lubricating device of this invention may be readily mounted in position by any attendant of the power panel and the device is furthermore so constructed that the lubricating pad 24 may be easily replaced with a new lubricating pad when the same becomes worn. The lubricator also affords a positive means of continually lubricating the contact segments during the operation of the rotary switch. While the pointed teeth 23 have been described as affording a means whereby the lubricating pad 24 may be secured in position on the head 22 of the lubricating device, it will of course be understood that any other suitable means may be used for removably securing a lubricating pad on the resilient lubricator arm 19.

It will of course be understood that many details of construction may be varied through a wide range without departing from the principles of this invention and it is therefore not purposed limiting the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. The combination with a rotary switch contact segment, of a contact finger engaged therewith, spring means for holding the contact finger in resilient contact with the contact segment, a spring controlled adjusting screw on said contact finger, an arm on said contact finger held in position by said spring means and said spring controlled adjusting screw, and a lubricating member carried by said arm and having contact with the contact segment of the switch to lubricate the same.

2. A rotary switch lubricator comprising in combination a rotary contact, a stationary support, a pivoted contact finger thereon co-acting with said rotary contact and having an opening and a threaded aperture therein, an apertured arm seated on said contact finger and projecting beyond one end thereof, a bolt secured to said support and projecting through said apertured arm and through the opening in said contact finger, a finger control spring coiled around said bolt and seated against said arm to resiliently hold the contact finger in pivoted contact with said support, an adusting screw engaged through said arm and threaded through the threaded aperture in said contact finger for co-action with said support, a control spring engaged on said screw and contacting said arm, and a lubricating member carried on the projecting end of said arm for lubricating the rotary contact.

3. In a rotary switch device the combination with a movable contact, of a stationary support, a contact finger pivoted on said support for co-action with said movable contact, a resilient arm on said contact finger and projecting beyond one end thereof, a lubricating means on the projecting end of said arm for lubricating the movable contact, a bolt secured to said support and projecting through said contact finger and through said arm, an adjusting screw projecting through said arm and through said contact finger, and spring members engaged on said bolt and on said screw to resiliently hold the arm seated on said contact finger.

4. In a rotary switch device the combination with a stationary support, of a rotary contact mounted adjacent thereto, a contact finger pivoted on said support for co-action with said contact, a lubricating mechanism supported on said contact finger for lubricating the rotary contact, a plurality of springs for holding the lubricating mechanism in position, and members for mounting said springs, with one of said members secured to the stationary support and the other member adjustably connected with said contact finger for co-action with the stationary support.

5. The combination with a rotary switch contact, of a pivoted contact finger co-acting therewith, a lubricating device on said contact finger for lubricating the rotary switch contact, and a plurality of spaced spring mechanisms engaging the lubricating device to hold the same resiliently supported on the contact finger, one of said spring mechanisms serving as a mounting for the contact finger and the other of said spring mechanisms positioned for co-action with the first mentioned spring mechanism to limit the pivotal movement of the contact finger.

6. The combination with a rotary switch contact, of a movable contact finger co-acting therewith, a fulcrum member on said contact finger, a flexible arm on said contact finger seated on the fulcrum member and projecting beyond one end of the contact finger, a lubricating device on the projecting end of said arm to lubricate the rotary switch contact, spring means for holding the inner end of said arm in contact with the contact finger, an adjusting screw adjustably engaged through said arm and the contact finger, and a resilient member on said screw and engaging said arm to resiliently hold the same in contact with the contact finger and said fulcrum member and furthermore serving as a resilient stop for the upward movement of said arm.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

JOHN P. BRUGGER.