

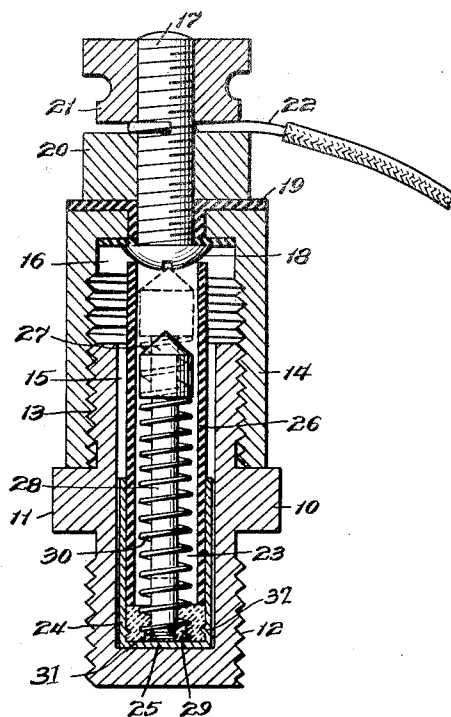
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THERMOSTATICALLY CONTROLLED CIRCUIT CLOSER

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THERMOSTATICALLY-CONTROLLED CIRCUIT CLOSER.

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The invention relates to a thermostatically controlled circuit-closer of the type of such devices which are intended to be screwed into or otherwise attached to a bearing or other machine part, the abnormal heating of which is intended to close a circuit through an alarm or other electrically actuated mechanism. The invention is further identified as being of that type in which the grounding of a metallic part of the thermostat on the part to which it is attached completes the circuit and in which the electric current is led to the thermostat by a single electric lead fastened to a binding post carried by the thermostat.

Such devices are usually mounted in locations where they are subject to a flow of oil passing about the same or where there is likelihood of dust and dirt entering into the interior of the thermostat with a resulting tendency to short circuit the same or at least to act deleteriously on the effectiveness and life of the device.

Accordingly, one of the objects of the invention is to provide a simplified form of the thermostat of the type outlined and which can be mounted in position with the circuit closing mechanism housed and protected from the infiltration of dust, dirt, oil or the like. This object is attained by forming the enclosing shell of two parts which when screwed together will seal an enclosed thermostatically actuated circuit closer unit.

Another object of the invention is to provide within the shell operative parts which can be readily replaced in case the device should become defective for any reason or in case the device should become inoperative by reason of the fact that it has once functioned.

I attain this object by supplying with the thermostat shell a form of insert which will constitute in effect a charging cartridge and which cartridge will contain the necessary thermostatically controlled mechanism for completing the circuit between the binding post on the shell in case of the presence of a temperature sufficiently high to melt the securing fusible solder usually used in devices of this character.

Another object of the invention is to provide a simple form of thermostat which can be cheaply constructed and this particularly applies not only to the enclosing shell but also to the small replaceable cartridge which

is characterized by the fact that it can be installed quickly without necessity of demounting the thermostat shell.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawings the figure is a sectional view taken axially through a preferred embodiment of the invention.

In the following description and in the claims, parts will be identified by specific names for convenience of expression but they are intended to be as generic in their application to similar parts as the art will permit.

In the drawings there is shown a shell provided with a centrally positioned outstanding flange 11 and which shell is threaded on opposite sides to provide on one side of the flange a thread 12 for engaging in a suitably tapped hole in the bearings or other part of the machine designed to carry the thermostat. The opposite end of the shell is screw threaded as shown at 13 and a closing cap 14 engages the threads 13 and is tightened against the flange 11. The shell is provided with a bore 15 which opens into an enlarged bore 16 formed in the cap 14. It will be understood that the mechanism containing space provided by the bores 15 and 16 are air tight when the two parts of the shell are assembled as shown in the drawings.

The cap 14 is provided at the upper end thereof with a binding post 17 which is in the form of a headed screw with the head portion 18 exposed in the bore 16 and with the screw insulated from the cap by means of an insulating bushing 19. The exteriorly projecting end of the screw 17 is provided with nuts 20 and 21 between which is positioned the conductor 22 which constitutes the lead for conveying electric current to the device.

Loosely positioned within the bore 15 is a small cylindrical insert or cartridge 23. This cartridge includes a relatively short metal sleeve 24, open at one end, the bottom end of which constitutes a spring bearing and

when in the shell rests on the bottom of the bore 15. Closely fitted within the metallic sleeve is an insulating sleeve 26 which projects upwardly from the sleeve 24 and extends slightly above the upper end of the shell 10 so as to protect the encircled head 27 of a centrally disposed plunger or circuit closing element 28 and to provide means for enclosing the plunger and to prevent accidental breaking of the same when the cartridges are stored prior to use in the shell. The plunger 28 is secured at its lower end to the bearing 25 by means of a readily fusible disk 29 of solder. A spring 30 is coiled about the plunger, bears at one end against the bearing 25 and bears at its opposite end against the head 27 of the plunger. This plunger is locked to the solder disk by a peripheral groove and rib connection 31 and the solder disk is locked to the metal sleeve 24 by a similar connection 32. This prevents creeping of the plunger in case the device is used upside down.

In operation and assuming that there is a temperature present sufficient to melt the solder 29, the spring acts on the head to project the same from the full line into the dotted line position shown in the figure. The contacting of the plunger head against the screw head 18 acts to complete the circuit from the binding post 17 through the plunger head and through the distended spring to the metallic sleeve 24 which is grounded on the shell 10.

When the device has once functioned the cap is unscrewed, the used insert thrown away and a new insert dropped into the bore 15 after which the cap is again screwed into position and the device is again ready to function.

While I have shown and described, and have pointed out in the annexed claims, certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, I claim:

1. A thermostat including a metal shell having one end threaded and adapted to be positioned in a support, and having a bore therein opening through the other end, a readily replaceable insert in the form of a cylindrical open end cartridge loosely positioned in said bore and including a base member engaging the bottom of the bore, a circuit closing plunger housed within the outlines of the cartridge secured at one end by fusible solder to said base member, a spring bearing on said base member and plunger to project the same when released by the melting of the solder, a cap telescoping the shell in

screw-threaded engagement therewith for closing the open end of the bore and for housing the inserted cartridge in a dust proof casing and a binding post carried by and insulated from the cap for receiving an external conductor, said post having an inner end facing the open end of the cartridge and disposed in the path of movement of the free plunger and adapted to be engaged thereby when projected by the spring.

2. A thermostat including a metal shell adapted to have one end threaded and adapted to have its threaded end positioned in a support, and having a bore therein opening through the other end, a readily replaceable insert loosely positioned in said bore projecting beyond the open end and including a base member engaging the bottom of the bore, a circuit closing plunger housed in the insert and secured at one end by fusible solder to said base member, a spring bearing on said base member and plunger to project the same when released by the melting of the solder, a cap engaging the shell for closing the open end of the bore and for housing the insert in a dust proof casing and a binding post carried by and insulated from the cap for receiving an external conductor, said post having an inner end disposed in the path of movement of the free plunger and adapted to be engaged thereby when projected by the spring, and said insert including an insulating sleeve surrounding the plunger and spring to prevent accidental movement of the same against the shell prior to the release of the plunger.

3. A thermostat including a metallic housing, a binding post carried thereby and insulated therefrom, and a readily replaceable insert adapted to be placed in said housing, said insert including a metal sleeve having a closure at one end constituting a spring bearing, a plunger secured to the bearing by a fusible solder and held thereby normally in spaced relation to the binding post, a spring between the plunger and bearing and acting on the melting of the solder to project the plunger into circuit closing engagement with the binding post and an insulating sleeve fitted in the metal sleeve and acting to guide the plunger when released axially into engagement with the binding post.

4. An insert for insertion in the shell of a thermostat comprising a metallic sleeve closed at one end and opened at the opposite end, a circuit closing plunger secured rigidly at one end to the closed end of the sleeve by a fusible solder and projecting through and beyond the open end of the metallic sleeve, a long spring coiled about the plunger, disposed between the closed end of the sleeve and the plunger and acting on the part of the plunger outside of the sleeve to project the free end of the plunger on the melting of the solder and a

long sleeve of insulating material for guiding the plunger when released.

5 In a thermostat, the combination of a grounding shell, a replaceable insert therefor comprising a metallic sleeve closed at one end and opened at the opposite end, a circuit closing plunger secured at one end to the closed end of the sleeve by a fusible solder and projecting through and beyond the open end of the metallic sleeve, a long spring coiled about the plunger, disposed between the closed end of the sleeve and the plunger and acting on the part of the plunger outside of the sleeve to project the free end of the plunger on the melting of the solder, and a sleeve of insulating material disposed between the plunger and metallic sleeve and projecting beyond the open end of the sleeve.

20 6. In a thermostat, a two-part shell adapted to be grounded on the member on which it is mounted, said shell provided with an air-tight chamber, one of said parts having a single binding post extending axially there-through, insulated therefrom and adapted on its outer end to receive an electric conductor, an insert constituting a cartridge positioned in said air-tight chamber, said insert including thermostatically controlled means for completing the circuit between the inner end of the insulated binding post and the grounded shell and an open end tube of insulating material having one end engaging the inner end of the binding post and acting to guide the movable element of the circuit closing means into its circuit closing engagement with the binding post.

35 7. In a thermostat the combination with a dust tight metallic shell adapted to be grounded provided with a mechanism containing chamber and formed of two ports in

threaded engagement for providing access to the chamber, and a conductor leading through said shell into the chamber and in air tight engagement with the shell, of a thermostatically actuated circuit closer constituting a replaceable unit fitted in the chamber and otherwise free of attachment with the shell and adapted to engage the conductor to complete the circuit between the conductor and the shell.

50 8. In a thermostat, the combination of a casing, a replaceable insert therefor including a metal shell, a disk of solder provided with means for locking the same in said metal shell, a plunger normally locked in said solder disk, a spring for acting on the plunger when released by the melting of said solder disk and means for permanently securing one end of the spring electrically to the metal shell.

60 9. A cylindrical cartridge adapted to fit in the bore of a thermostat shell and otherwise free of any connections for engaging with the shell, said cartridge comprising a cylindrical metal sleeve having a closed end, a fusible solder disk in said sleeve and engaging said closed end, a cylindrical insulating sleeve fitted in said metallic casing extending between the solder disk and projecting beyond the open end of the sleeve, a plunger contained within the outlines of the insulating sleeve having one end electrically engaging the closed end and provided with a head at its other end and a spring bearing at one end on the head and having its other end secured in the solder disk.

75 Signed at Gulfport in the county of Harrison and State of Mississippi this 30th day of December, A. D. 1924.

HERBERT D. MONTGOMERY.