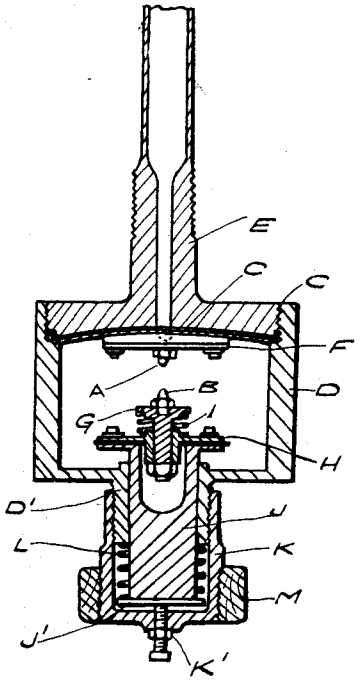
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ELECTRICAL CONTROL APPARATUS

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# UNITED STATES PATENT OFFICE

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## ELECTRICAL CONTROL APPARATUS

Application filed December 9, 1926, Serial No. 153,712, and in Great Britain December 31, 1925.

My invention relates to improvements in and connected with electrical control apparatus, and has for its object the automatic cutting off and on of the electrical supply in furnaces, ovens and the like.

In carrying out this invention, I provide an expansion bulb filled with a medium which operates a parabolic shaped steel diaphragm carrying a fixed silver point which under heat comes in contact with an adjustable silver point mounted on a secondary piston, the same in turn being mounted on a primary piston.

The primary piston is moved out and in by means of a thumb-screw having a pointer over a graduated dial. This, it will be observed, alters the position, of one silver point relatively to the other silver point and so raises the temperature control point. The control is so arranged that, when the medium expands under heat, the circuit is closed, thus operating a relay and so the main circuit of an electric furnace or the like.

In order that my invention may be properly understood and readily carried into effect, I have hereunto appended one sheet of drawing, which is a sectional elevation illustrating my invention.

Referring to the drawing, A and B are the two silver points, A being suitably connected to the steel parabolic diaphragm C. A second diaphragm C′ is used to seal up the liquid expansion medium in the container E which is suitably connected to the main body D. The container E is inserted into the apparatus the heat of which requires to be controlled. The silver point A together with a plate mounting is suitably insulated from the steel diaphragm C with its plate by the insertion of a sheet F of mica or other suitable material. The other silver point B is mounted on a secondary piston G carried on a disc H and is free to slide through the center hole on the disc H, a small spring I being provided between the flange of the secondary piston G and the disc H to cause the silver point to return to its original position when the temperature falls.

The disc H is suitably connected at its upper end to the primary piston J, which is contained in an extension D′ of the main body D, the lower end of the primary piston J being contained in the cap-nut K which cap-nut K is screwed on the extension D′ of the main body D. A spring L, is provided, one end bearing against the extension D′, the other bearing against a flange J′ fixed to the lower end of the piston J. The object of the spring L is to keep the primary piston in contact with the adjusting screw K′ of the cap-nut K. M is the handle of the cap-nut for operating the primary piston J and in turn the silver point B.

Under heat the contents of the container E expand, this causes the parabolic diaphragms C and C′ to move forward, consequently carrying the point A up to the point B, thus forming an electrical connection, and used to operate a suitable switch.

Claim:

Electrical control apparatus comprising a container for an expansive medium, a diaphragm arranged for movement by the expansion of the expansive medium, a contact point carried by said diaphragm, a body having a bore opposite said contact point, a primary piston arranged for movement in said bore, a disc on the end of said piston opposed to said contact point, said disc having a bore, a secondary piston movable in the bore of said disc, a contact point on said secondary piston, opposed to the first named contact point, a spring active to move the secondary piston with its contact point toward the first named contact point, a spring active to move the primary piston in the reverse direction to that of the secondary piston, a cap-nut enclosing said primary piston and the last named spring and means to adjustably move the primary piston and hence also the secondary piston against the tension of the second named spring.

In witness whereof I affix my signature.

ROBERT MACLAREN.