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ELECTRIC FUSE SWITCH

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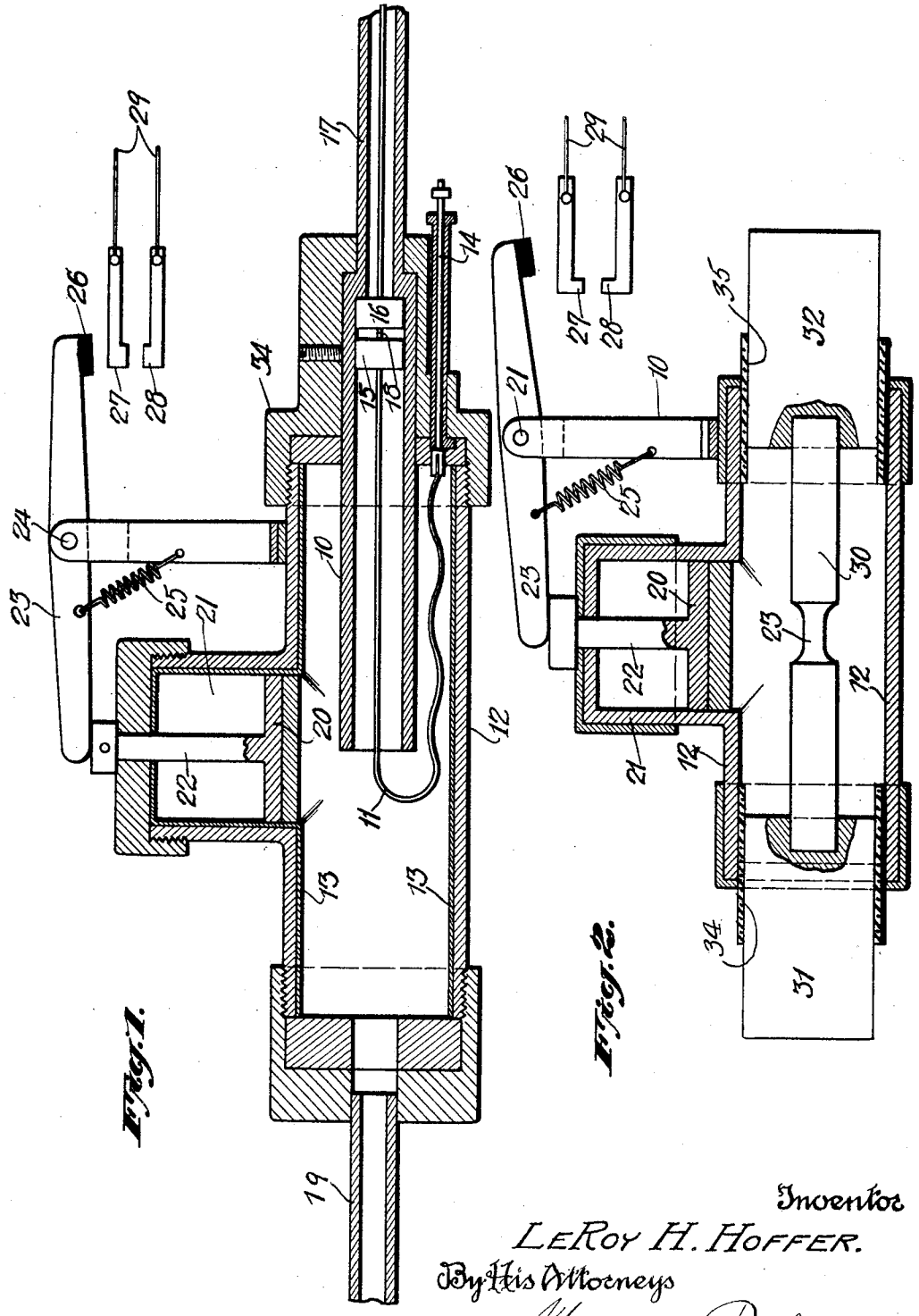


Fig. 1.

Fig. 2.

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ELECTRIC FUSE SWITCH

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My invention relates to electrical apparatus having a fuse or fusible element and a circuit associated with the blowing of said fuse to operate any related or other apparatus such as a bell, circuit breaker, oil switch, lamp, etc.

Objects of the invention are to provide a fuse apparatus in which the blowing of the fuse causes the closing of a circuit; and further, to provide apparatus in which the fuse for controlling the circuit is vented and the creation of an arc thereby prevented.

With these and other objects in view which will appear more fully from the following description, the invention comprises the apparatus described in the following specification.

The features of the invention are illustrated in the accompanying drawing, in which—

Fig. 1 is a longitudinal section of a fuse and circuit controlling switch embodying a preferred form of the invention.

Fig. 2 is a longitudinal section of a modified form of fuse and circuit controlling switch actuated thereby.

In my invention the pressure generated by the melting and vaporizing or "blowing" of a fuse or fusible element is caused to act upon one side of a movable surface or piston and thereby to move the piston. This movement of the piston is transmitted directly or, through suitable transmission elements, to a switch of a circuit and in a direction to close the switch.

Referring more particularly to the embodiment of the invention shown in Fig. 1, a cartridge 10 having a fusible strip or element 11 is mounted within a container 12 which is lined with insulation 13 of any suitable type. The fusible element or strip 11 is secured in a terminal 14 at one end of the container or chamber 12 and then extends to the open end of the cartridge 10, then enters the cartridge and extends through a pair of spaced plugs 15 and 16, and thence through an end 17 of the cartridge that projects through the end wall of the container 12. The plugs 15 and 16 are slightly spaced from each other and in the space between the plugs the fusible wire 11 is notched or constricted as at 18 so that when the current through the fusible strip reaches the limit set for it, the fuse melts and blows at the constriction 18 between the plugs 15 and 16. The plug 16 is held against longitudinal movement away from the plug 15 by means of a retaining shoulder in the cartridge 17.

The plug 15 is, however, free to move toward the open end of the cartridge 10 away from the plug 16 under the pressure generated by the blowing of the fusible strip at 18. When the plug 15 is thus propelled to the outer end of the cartridge 10 under the pressure of the blowing fuse, it effectively separates the melted ends of the fuse. When is has passed out of the cartridge 10 it also releases the pressure within the cartridge into the container or chamber 12. The chamber 12 is provided with a narrow, constricted vent 19 which permits a gradual escape of the gases under pressure within the container 12, but this vent is too narrow to prevent a sharp rise in the air pressure within the cartridge 12 immediately after the blowing of the fuse.

The pressure generated within the chamber 12 by the blowing of the fuse strip 11 acts against the lower surface of a piston 20 which is movable in a cylinder 21 extending from the side of the chamber 12. The piston 20 is free to move outwardly under the pressure exerted against its lower face and carries with it a stem 22 which bears against one end of a lever 23 pivoted on a pivot 24 supported on the outer wall of the chamber 12. The movement of the stem 22 lifts the end of the lever 23 against the action of a spring 25 and depresses an insulating button 26 on the other arm of the lever and causes it to press downwardly on an upper spring contact 27 and force it into contact with the lower contact 28 of a circuit 29. The circuit 29 is thereby closed and may serve to operate a circuit breaker, alarm bell, or other apparatus.

In the modification of the invention shown in Fig. 2, the arrangement of the chamber 12, cylinder 21, piston 20, piston stem 22, lever 23, contacts 27 and 28 and circuit 29 are the same as in the form shown in Fig. 1. Instead, however, of having a fuse placed within a cartridge and having a movable plug, a

fuse strip 30 is placed directly between a pair of terminals 31 and 32 in opposite ends of the container 12. The fuse strip 30 is constricted at 33 within the container 12 and, when it blows, acts directly on the lower face of the piston 20.

Short circuiting of the fuse through the walls of the chamber 12 is avoided by inserting thin sheets 34 and 35 of insulating material between the chamber walls and the terminals 31 and 32.

While the invention has been described with relation to a specific type of fuse, it will be evident that other types of fuse may be used and that instead of operating to close the contacts of a circuit, it may be arranged to open a circuit.

It will be understood that when the fuse has blown in either of the forms shown in Figs. 1 or 2, it may be removed and replaced with another fuse and the lever 23 and contact elements reset.

In the modification shown in Fig. 1 the fuse may be replaced by first removing a screw-threaded end 34 of the container 12. In the form shown in Fig. 2, the terminals 30 and 31 are so fitted into the container 12 that they may be removed endwise therefrom.

Various modifications may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is—

1. Apparatus of the type described which comprises an enclosure, a fuse within said enclosure, a member movable by pressure generated within said enclosure by the blowing of said fuse, an electric circuit switch moved to closed position by said moving member, and means to return said member to original position after said generation of pressure.

2. Apparatus of the type described which comprises an enclosure, a fuse within said enclosure, a plug movable in said enclosure by pressure generated by the blowing of said fuse, an electric switch, a lever for transmitting movement from said plug to said switch to close the latter when said plug is moved by pressure within said chamber, and resilient means tending to hold said lever against said plug.

3. Apparatus of the type described which comprises an enclosure, an electric switch, a member movable by pressure within said enclosure to operate said switch, and a fuse comprising a cartridge, and a plug within said cartridge and displaceable into said container.

4. Apparatus of the type described which comprises an enclosure having a cylindrical part, an electric switch. a piston in the cylindrical part of said enclosure, means for resiliently holding said piston in said cylindrical part of said enclosure, means actuated by said piston in its outward movement from said enclosure to close said switch, a restricted vent for said enclosure, a fuse having a cartridge, and a plug expellable into said enclosure upon the blowing of said fuse.

In witness whereof, I have hereunto signed my name.

LE ROY H. HOFFER.