Oct. 11, 1927. S. PALMER 1,645,346

MEANS FOR TESTING FUSES

Filed Aug. 3, 1926

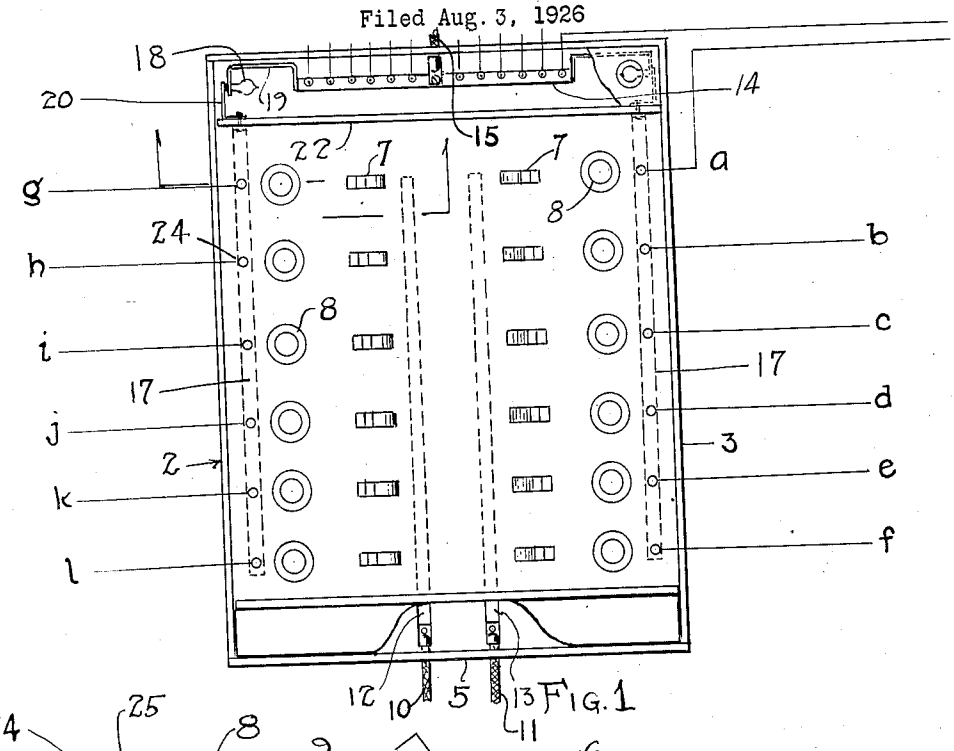


FIG. 1

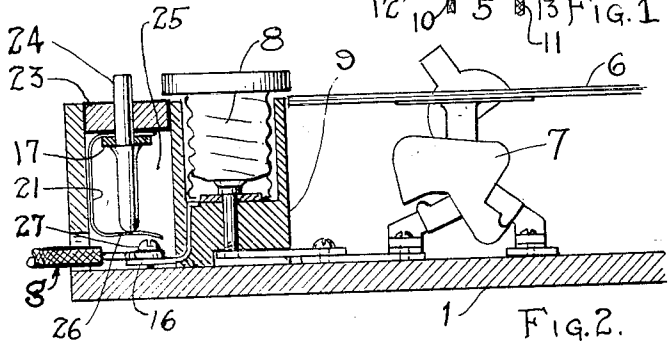


FIG. 2.

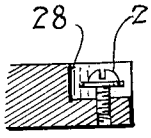


FIG. 4

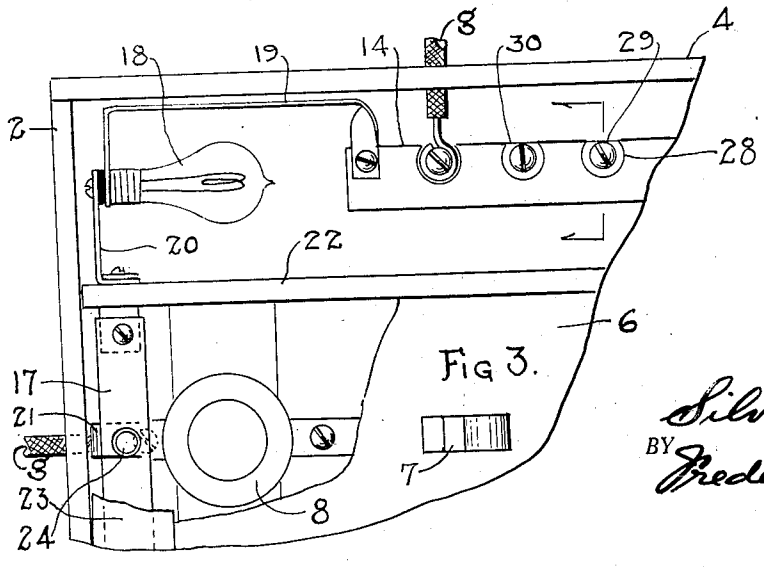


FIG 3.

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UNITED STATES PATENT OFFICE.

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MEANS FOR TESTING FUSES.

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This invention relates to means for testing fuses included in electric circuits for the purpose of readily detecting a blown out fuse, and my improvements comprise the employment of an indicating device, such for example as an electric light bulb, included in an auxiliary circuit that is parallel to the main circuit, said auxiliary circuit being normally open and adapted to be closed by manually actuable means for the selective determination of the particular fuse that has ruptured.

In the application of my invention to a switch board or panel carrying the usual fuse sockets I provide a series of spring contacts which are normally out of engagement with the terminals of the respective leads from the circuits to the fuses, said spring contacts however all being included in the auxiliary or indicator circuit. Each of these spring contacts is controlled by an individual push rod, composed of insulation material, whose inner end engages a spring contact and whose outer end projects through a removable cover strip of insulation material, said push rods, at their outer ends, being manually depressible to thereby respectively close the auxiliary or indicator circuit. Hence, when a fuse circuit becomes inoperative by reason of a ruptured fuse, the successive operation of the push rods will determine, by elimination, the particular fuse requiring replacement because, whereas the indicator will become energized when the push rods representing sound fuses are operated, the indicator will fail to respond with respect to a ruptured fuse when its representative push rod is operated.

Other features and advantages of my invention will hereinafter appear.

In the drawings:—

Figure 1 is a plan view of a switch board including my improved indicating means.

Fig. 2 is an enlarged detail view, in cross-section, taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged partial plan view, showing the upper left hand portion of Fig. 1, and

Fig. 4 is a section on the line 4—4 of Fig. 3.

In said drawings I have shown a switch board of usual character in the form of a box having the base or back 1, sides 2, 3, 4, 5 and face plant 6, all of insulation material, covering the switches and electrical connections.

Although not material to my invention, single pole, toggle switches 7 are here indicated by way of example and plug fuses 8 are shown as removably engaged in insulated shells 9 as included respectively in the electrical circuits controlled by said switches.

Two rows of the switches 7 and their complementary fuses 8 are represented in the drawing. The respective work circuits *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, *j*, *k* and *l*, controlled by the switches and fuses, are supplied with current by the positive and negative conductor wires 10, 11, the respective bus bars 12, 13, the neutral bus bar 14 and the neutral wire 15. Electrical connectors of usual character, such as those indicated at 16, make the respective polar connections with the fuses.

As thus far described the elements referred to are well known and form no part of my invention, my purpose in introducing these elements and their relative arrangement being to enable a comprehension to be had of my improved means for testing the fuses and conveniently localizing a blown-out fuse among a group of fuses.

Therefore I range, alongside each row of fuses, a corresponding row of contact devices which at their free ends are normally spaced respectively from the connectors 16 and which connect by conductor bars 17 and with the neutral bus bar 14 through a suitable indicating device, manually operable means also being provided for establishing contact between said contact devices with the respective connectors 16, thus creating a shunt circuit for energizing the indicating or signalling device for those work circuits whose switches are closed and whose fuses are intact. With these means a ruptured fuse is detected by failure of the indicating device to become energized when the manually operable device representing that fuse is actuated.

For example it can be assumed that the indicating or signalling devices shown at 18 are electric light bulbs, each connected to a conductor strip 19 that connects strip 20 with the neutral bar 14, the bars 17 being connected with contact springs 21. An insulation partition 22 within the box serves as confining means for the bulbs and bus bar 14, the strips 20 being secured at the inner surfaces of this partition, and engaging the bar 17 which latter is secured to the under side of a cover member 23 of insula-

tion material, each strip 20 being an electrical connection with the conductor bar 17. Now it will be apparent that if any one of the contact springs 21 be brought into contact with its adjacent connector 16, a parallel or shunt circuit will thereby be established, if the fuse to be tested is intact, and the bulb 18 in that shunt circuit will glow. But if the fuse has blown then of course a shunt circuit cannot be established and the lamp will not be energized.

As means for effecting contact between the springs 21 and connectors 16, I provide a series of push rods 24 ranged respectively alongside the fuses 8, in a chamber 25 formed at the side of the switch box, between a side wall thereof and the fuse shells 9. These push rods are movable in orifices provided therefor through the cover member 23 of insulation material, and they project beyond the outer surface of said cover member sufficiently to be engaged by finger pressure for pushing them inwardly. Also said push rods, at their inner ends, rest upon the bent portions 26 of contact springs 21, which bent portions lie normally spaced apart from screws 27 that secure the connectors 16 to base 1. The relation of the bent portion of each contact spring to its adjacent screw 27 is such that upon pressing inwardly the associated push rod 24 the spring will be flexed and caused to make contact with said screw, thereby closing the shunt circuit—when the fuse being tested is intact. Normally, however, the springs 21 serve the purpose of holding the push rods 24 in their upward positions.

The leads for the respective work circuits are connected to the bus bar 14 in novel manner, see Fig. 4, wherein the bus bar is shown as provided with segmental recesses 28 to receive the binding screws 29. The advantage of these recesses is that the screw heads lie below the surface of the bus bar and that the leads enter the recesses through the entrances 30 thereto.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure:

I claim:

1. A device for testing fuses, included in electric circuits, said device embodying a shunt circuit normally open, an indicating device in said shunt circuit, a series of spring contacts normally out of engagement with the leads of said fuses, a conductor rod electrically connected to said contacts and a plurality of push rods having their inner ends engaging said contacts and being manually depressible to close individual shunt circuits.

2. A device for testing fuses, included in electric circuits, said device embodying shunt circuits normally open, an indicating device in the circuit, a series of spring contacts normally out of engagement with the leads of said fuses, a conductor rod electrically connected to said contacts, a neutral bus bar in said circuit and a plurality of push rods having their inner ends engaging said contacts and being manually depressible to close individual shunt circuits.

Dated, July 26, 1926.

SILVIAN PALMER.