July 24, 1928. 1,678,131

T. L. VAUGHN, JR

SAFETY FUSE

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Fig. 1.

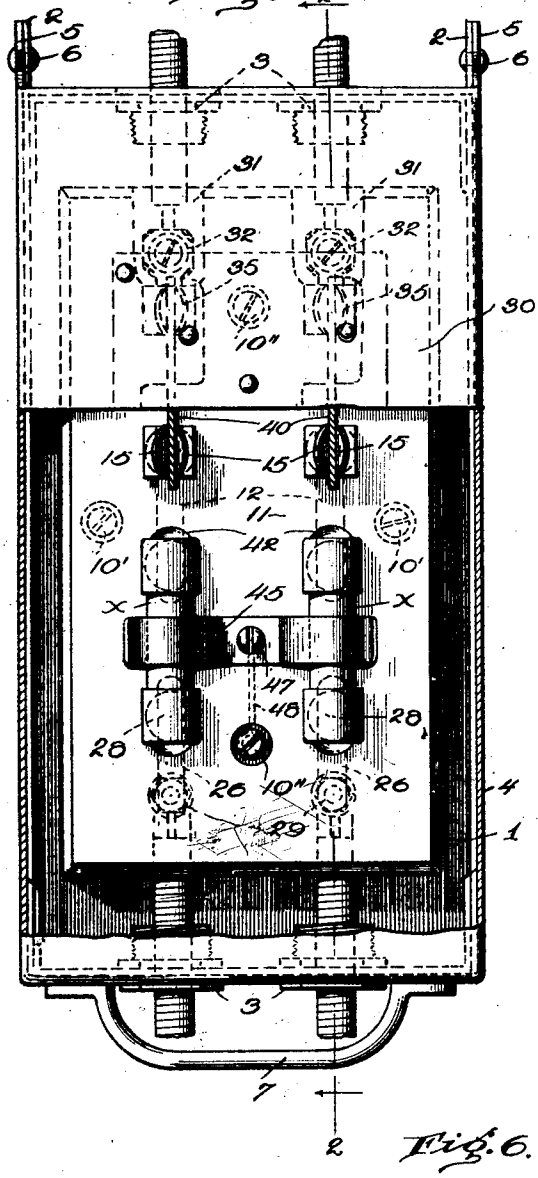


Fig. 2.

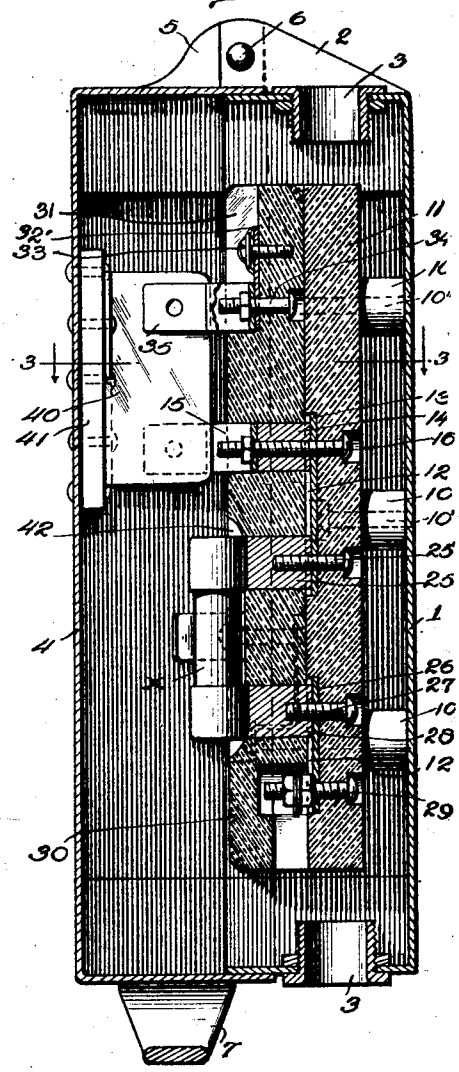
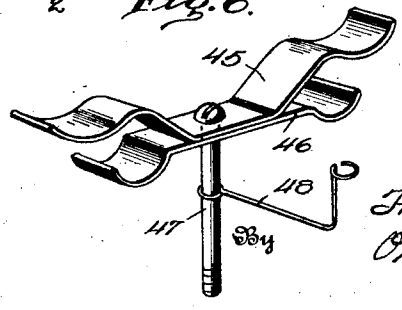


Fig. 6.



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Fig. 3.

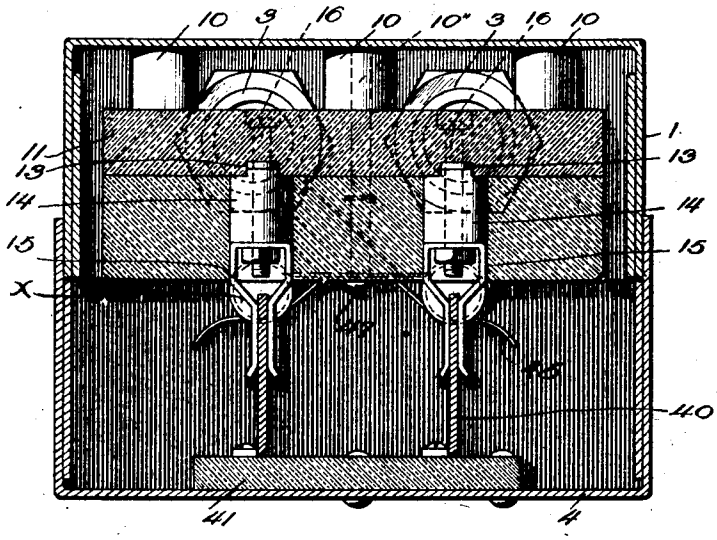


Fig. 4.

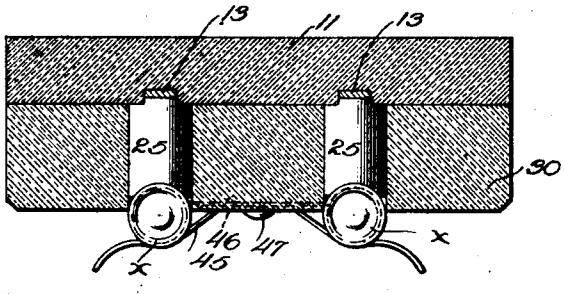
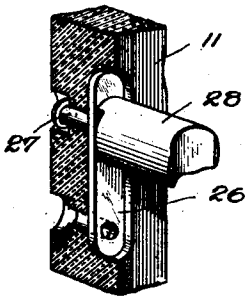


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SAFETY FUSE.

Application filed January 4, 1926. Serial No. 79,151.

The invention relates to a safety fuse structure comprising a supporting block with fuse engaging terminals carried thereby and a metal spring clip secured to the block adapted to clamp an insulated fuse, as, for example, a fuse of the cartridge type, to the terminals, said clip being of such low current carrying capacity that it will be practically destroyed by the passage of the line current through it, so that any attempt to bridge the fuse terminals by wire or other metallic conductor, in improper substitution of the fuse, will either burn out the clip or ground the current through a suitable connection with the clip. Preferably, the fuse engaging terminals are arranged in pairs and are associated with a line switch, the stationary contacts of which are mounted on the block and the movable element of the switch is carried on the inside of the cover of an enclosing box in which the block is mounted, so that the line circuit will be open, when the cover is opened, and closed, when the cover is closed.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a front elevation of the apparatus with a portion of the box or cover broken away.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a horizontal section through the fuse block.

Fig. 5 is a broken perspective showing the mode of mounting and connecting one of the fuse engaging terminals.

Fig. 6 is a perspective view of the spring clip.

Referring to the drawings, 1 indicates the body of a sheet metal box provided with ears 2 extending upward from the sides and having pairs of cable or conductor receiving nipples in its upper and lower ends. The box is provided with a cover 4 having a closed front with side and end walls which telescope with the corresponding walls of the box, said cover being provided with lug extensions 5 of its side walls, by means of which the cover is pivoted to the box by rivets 6 passing through registering openings in the lugs 2 and 5. The bottom of the cover is provided with a bail or handle 7 by means of which the cover is readily opened and closed. This construction of box provides a practically dust and moisture-proof receptacle for the fuse and switch mechanism, when the cover is closed, and the nipples 3 are substantially sealed by the cables or conductors passing into and out of the box.

Preferably secured to the interior of the back wall of the box are four metallic lugs 10, with screw threaded openings by means of which the fuse block is properly supported and secured within the box. The fuse block comprises two slab-like members 11 and 30, of generally rectangular form, fashioned of slate or other insulating material. The slab 11 is adapted to be secured independently to the two lateral lugs 10 by means of screws 10′ passing through openings in the slab, the heads of the screws being countersunk. The outer face of the slab 11 is provided with two channels 12, 12 in which are fixed two conductor strips 13, 13, by means of screws passing from the back to the front of the slab. Mounted on the upper end of each of the conductor strips 13 is a hollow stud 14 to which is secured a generally U-shaped terminal 15 of a knife switch, each terminal being locked to the stud by the bolt which secures the stud to the slab.

Fastened to the opposite end of each of the strips 13 is a fuse engaging contact comprising a stud-like member 25, which is secured to the strip by the screw 25′, which fastens the stud to the slab, the upper face of each stud being concaved to form a seat for the conducting end of a fuse of the cartridge type. Formed in horizontal alignment with channels 12 are channels 12′, each containing a conductor strip 26, to which is connected a stud 28 similar to stud 25 and constituting the other terminal for the fuse, the strip 26 and the stud 28 being secured to the slab by screw 27. Likewise connected to each strip 26 is a binding post 29 constituting the outlet terminal for one of the main conductors.

The fuse block also comprises a second slab 30, which overlies the slab 11 and is fastened to the latter by the screws 10″, 10″, which engage the upper and lower studs 10, 10. The outer slab 30 is provided with openings to permit the passage of the studs 14 and the knife switch terminals 15, 15 supported thereby and also the two pairs of studs 25 and 28, which constitute the terminals engaged by the fuses. The upper end of the slab 30 is recessed, as at 31, 31, to provide seats for conductor strips 32,

which are secured in position by screws 33, which constitute the fastening means for the input leads. Fastened to the lower ends of the strips 32 are switch terminals 35, which are locked to the strips 32 and the slab 30 by bolts 34.

Formed in the outer face of slab 30 are two parallel channels, the bottoms of which are curved to conform to the concavity of the faces of the fuse engaging terminals 25 and 28, so that, when a cartridge fuse is placed in each of the grooves, the conducting caps on the ends of the fuse will engage the terminals aforesaid and the body of the fuse will be retained in the groove 42.

The fuses x, x are, as indicated, preferably of the cartridge type having conducting caps on their ends and an enclosing jacket of insulation and, in order to secure the fuses in position, there is provided a special form of spring clip comprising an upper member 45 and a lower member 46, the outer portions of which are curved to embrace the insulating jackets of the fuses, the curved portions of the lower member 46 lying within and conforming to the cavity of the bottoms of the grooves 42, 42. The spring clip is secured to the slab 30 by means of a bolt 47, which latter is preferably connected by wire 48 with the screw 10″, which engages the lower stud 10 on the back wall of the box, so that the wire 48, screw 10″ and stud 10 constitutes a grounding connection for the spring clip.

The spring clip aforesaid not only serves the purpose of securing the fuses in position, but constitutes a safety element to prevent the substitution of improper bridging connections, such as wires, nails, strips of metal or the like, for the regular fuses and, to this end, the spring clip is so constituted that it will be substantially destroyed or burned out by the passage of the line current through the clip, should the fuse be substituted by bridging conductors, which come in contact with either of the members of the spring clip. Even if such improper substitution for fuses should not result in burning out or destroying the spring clip sufficiently to permit the latter to release the bridging conductors substituted for the fuses, the current would be grounded by the wire 48, which would be connected to the metallic sheathing of the main cables through screw 10″, stud 10 and the metal wall of the box.

As an additional element of safety, the fuse box is provided with a switch which is effective in breaking the main circuit ahead of the fuses, when the cover is opened. The stationary members of this switch are the two pairs of contacts 15 and 35, as hereinbefore described, the respective pairs being bridged by switch blades 40, 40 secured to an insulating block 41, riveted to the inside of the cover 4, so that, when the cover is completely closed, the switch blades engage the respective pairs of stationary terminals 15 and 35, and, when the cover is opened, the switch blades disengage the stationary terminals and the circuit is interrupted at two points.

While the particular exemplification of the invention involves a fuse box installation for two leads of conductors, obviously, the structure may be made to provide for any desired number of circuits by appropriately increasing the number of input and output terminals and fuse connections, as will be understood.

What I claims is:

1. A safety fuse structure comprising a supporting block, fuse engaging terminals carried thereby, and a metal spring clip secured to the block adapted to clamp an insulated fuse to the terminals and to be destroyed by the passage of the line current through the clip when the fuse is substituted by a bare conductor.

2. A safety fuse structure comprising a supporting block, fuse engaging terminals carried thereby, a metal spring clip secured to the block adapted to clamp an insulated fuse to the terminals and to be destroyed by the passage of the line current through the clip, when the fuse is substituted by a bare conductor, and a ground connection for said clip.

3. A safety fuse structure comprising a supporting block, pairs of fuse engaging terminals carried thereby, and a metal spring clip disposed between adjacent pairs of terminals adapted to clamp insulated fuses to the respective pairs of terminals and to be destroyed by the passage of the line current through the clip when the fuse is substituted by a bare conductor.

4. A safety fuse structure comprising a supporting block, pairs of concave faced terminals carried thereby to receive the conducting ends of insulated cartridge fuses, and a metal spring clip disposed between adjacent pairs of terminals adapted to clamp such fuses to the respective pairs of terminals and to be destroyed by the passage of the line current through the clip when the fuse is substituted by a bare conductor.

In testimony whereof I affix my signature.

THOMAS L. VAUGHN, JR.