

(No Model.)

2 Sheets—Sheet 1.

J. J. WOOD.
FUSIBLE CUT-OUT.

No. 536,311.

Patented Mar. 26, 1895.

FIG. 1.

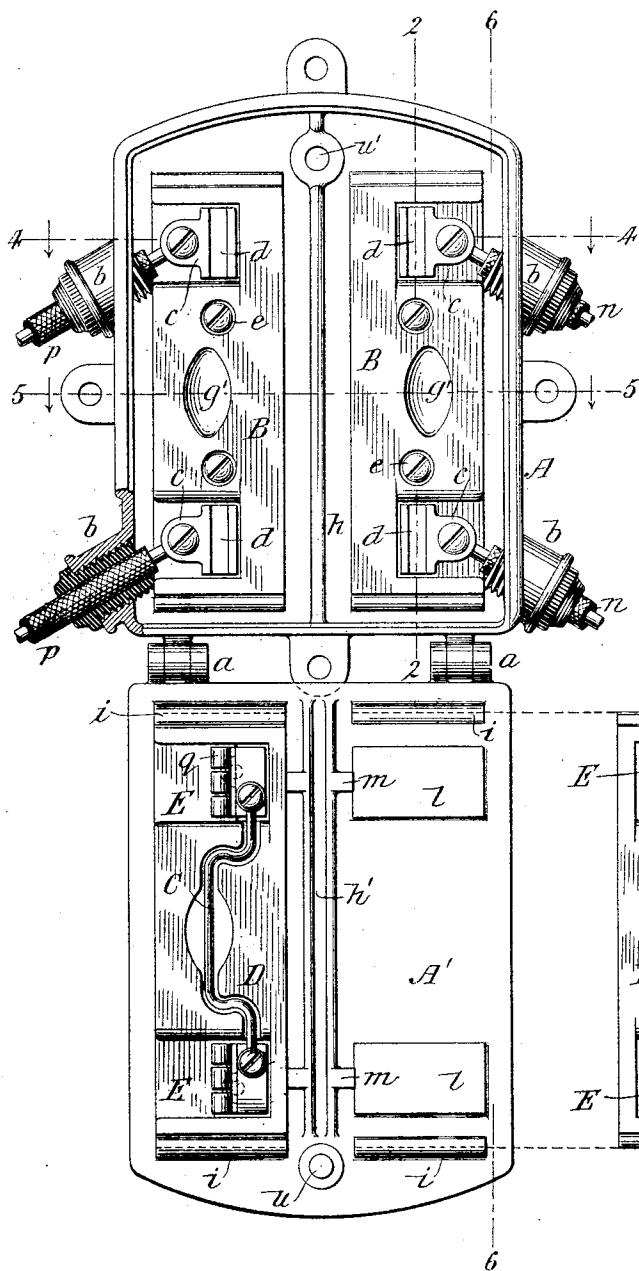


FIG. 2.

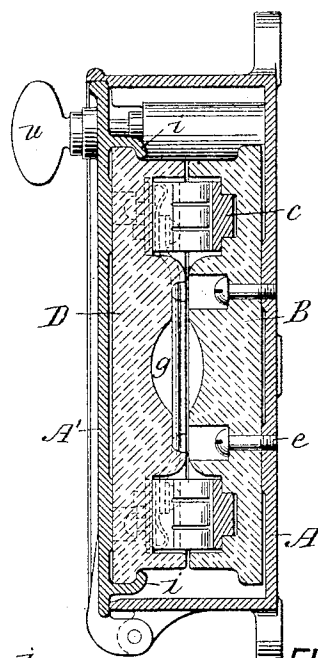
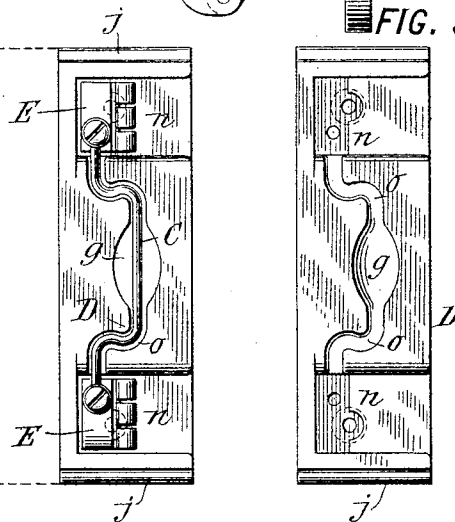


FIG. 3.



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FIG. 4.

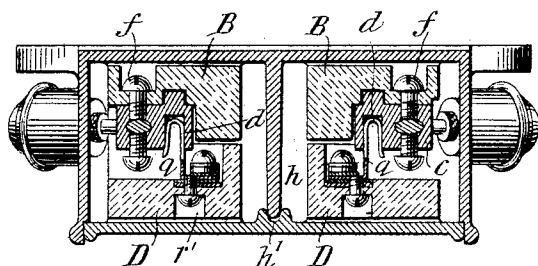


FIG. 5.

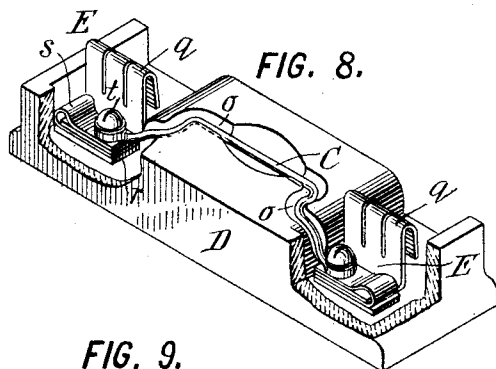
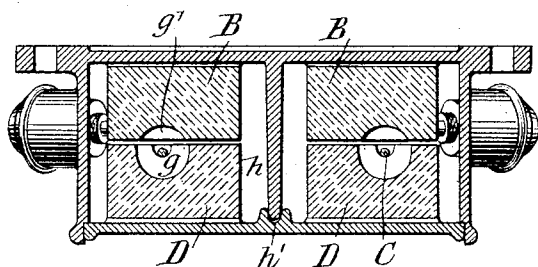


FIG. 9.

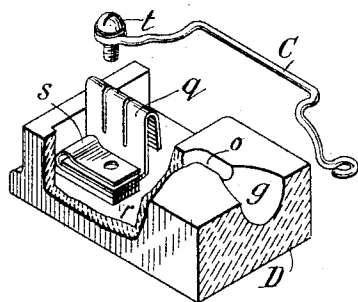


FIG. 6.

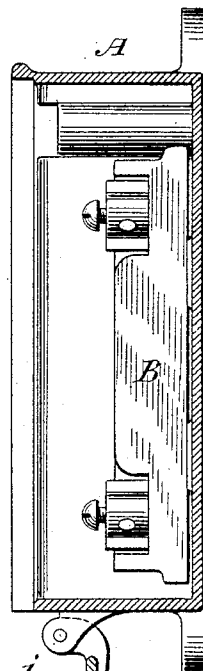
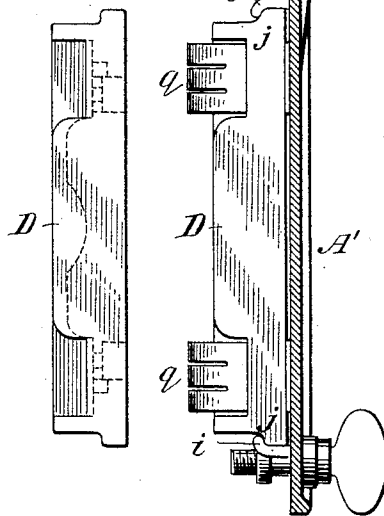


FIG. 7.



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UNITED STATES PATENT OFFICE.

JAMES J. WOOD, OF FORT WAYNE, INDIANA.

FUSIBLE CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 536,311, dated March 26, 1895.

Application filed December 27, 1894. Serial No. 533,056. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. WOOD, a citizen of the United States, residing in Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Fusible Cut-Outs for Electric Circuits, of which the following is a specification.

This invention relates to what are commonly called fuse boxes.

The invention introduces several improvements in the construction of such boxes, and especially in the application thereto of removable fuse blocks.

The invention relates in part to fuse boxes wherein the fuse is connected to the lid of the box, so that when the lid is opened the fuse is separated from the line circuit terminals and may be inspected or renewed without danger.

My invention also provides improvements in double-pole fuse boxes designed to make it impossible for the blowing of one fuse to be across to the other side of the line.

The accompanying drawings show my invention as embodied in a double-pole fuse box designed especially for connection between a primary circuit and a transformer, although applicable in other locations.

Figure 1 is a front elevation showing the lid thrown open and one of the fuse blocks slid out from the lid. Fig. 2 is a vertical section cut on the line 2—2 showing the box closed. Fig. 3 shows a fuse block with the fuse and terminals removed. Fig. 4 is a horizontal section on the line 4—4 in Fig. 1. Fig. 5 is a horizontal section on the line 5—5 in Fig. 1. Fig. 6 is a vertical section on the line 6—6 in Fig. 1 showing the fuse box open. Fig. 7 is a side elevation of one of the fuse blocks. Fig. 8 is a perspective view thereof with a fuse in place, the fuse block being partly broken away. Fig. 9 is a sectional perspective showing the fuse detached from the block.

Referring to the drawings, let A designate the box or case, and A' its cover or lid, which preferably is hinged thereto by hinges *a a* at the bottom of the box. The box is provided with any suitable ears or lugs for attaching it to a wall or elsewhere, or with any other suitable means of attachment. In the construction shown, which is for a double-pole fuse box, the box is constructed with four in-

olated side openings *b b* for admitting the circuit wires, these openings being arranged on an inclination so as to shed water exteriorly of the box. The line wires *p p* enter on one side of the box, while the line wires *n n* enter on the other side. The bared ends of the wires within the box are clamped fast in binding posts *c c*, which may be of any suitable construction. In the construction shown they are formed each as metal blocks having a deep groove or plug socket *d*, the shape of which is shown in Fig. 4. These socketed binding posts thus constitute the circuit terminals of the fuse box. These terminals are insulated by being mounted on blocks B B of porcelain or other insulating material, which blocks are fastened to the box A by screws *e e* or other suitable fastening means. The circuit terminals *c* are first fastened to the porcelain blocks by screws *f f* (Fig. 4) or other means. The blocks B B are recessed to receive the circuit terminals as shown, and are also formed each with a central cavity *g'*.

The box A is divided by means of a partition *h* into two chambers in which the respective blocks B B are placed. The lid A' is constructed with ribs or otherwise has a groove *h'*, which when the lid is closed fits or embraces the front edge of the partition *h*, as shown in Fig. 4. By this means the interior of the box is completely subdivided into two chambers.

The fuses or fuse wires C C, which may be of lead or other suitable material, are carried by fuse blocks D D of porcelain or other suitable insulating material. These two fuse blocks are mounted removably upon the lid A'. In Fig. 1 the left-hand one is shown in place on the lid, while the right hand one is shown detached therefrom. The fuse blocks are connected to the lid in any suitable manner admitting of their quick and ready detachment therefrom, preferably without resort to screws or any other fastening devices requiring the employment of tools. The preferred construction, which is that shown, consists of overhanging ribs *i i* at top and bottom of the lid, engaging flanges *j j* formed on the ends of the fuse blocks, in the manner best shown in Figs. 2 and 6. By this construction it is only necessary to slide the block bodily sidewise in order to enter or remove it

from its place upon the lid. The lid is formed with slightly projecting lands *ll* against which the backs of the blocks rest, and with projections *mm* which constitute shoulders serving
5 as stops to prevent the blocks being slid too far, thus serving to hold them at the desired distance apart and in line with the blocks B B.

Each fuse block D has at each of its ends a fuse terminal or clamp E fastened in a recess
10 *n*. Each block is formed with a sinuous groove *o*, and a central recess *g*, best shown in Fig. 3. The fuse is bent in the manner shown in Fig. 1, so that it lies in the sinuous grooves with its middle extending across the cavity *g*.
15 Its ends being bent into an eye, are engaged by the clamps or fuse terminals E E. The construction of these is best shown in Figs. 4, 8 and 9. A spring plate *q*, of metal, is bent upward and back to form an elastic conducting
20 plug. Between the base of this plate and a conducting plate *r*, is clamped one leg of a stiff leaf-spring *s*, consisting of a plate of metal bent together upon itself. The plates *r* *q* are fastened to the block D by a screw
25 *r'* (Fig. 4) or any other suitable fastening. Through the eye in the end of the fuse, passes a clamping screw *t*, which is screwed through holes in the spring *s* and base of plate *q* into the plate *r*. In screwing down this screw, the
30 spring *s* is compressed, its upper limb being pressed down close against its lower one, and by reason of its stiffness it exerts a constant upward tension against the eye of the fuse. This tension serves to compensate for any ex-
35 pansion or contraction due to changes in temperature, so that the fuse terminals are prevented from working loose.

When the fuse blocks are in place on the lid, and the latter is closed, the blocks D D
40 are brought close against the blocks B B, as shown in Fig. 5, a slight space being preferably left between them. At the same time the elastic plates *q* *q* are pressed tightly into the grooves *d* *d*, whereby the fuse terminals and the circuit terminals are brought into intimate metallic contact, thus completing the
45 circuit between the circuit terminals through the medium of the fuses. The cover is fastened in its closed position by a thumb screw
50 *u*, swiveled to the cover and screwing into a threaded socket *u'* in the box.

In case a fuse is blown, it is only necessary to turn down the cover as shown in Fig. 1 in order to disclose the fuses. The fuse terminals are thus disconnected from the circuit
55 terminals, so that the fuses are entirely out of circuit and may be handled with safety. In order to replace a fuse it is only necessary to slide this block out from its place in the
60 cover, and having a duplicate fuse block with a fuse ready attached to it, to slide the latter into place, whereupon by simply closing the lid the circuit is again completed. Thus a
65 fuse can be replaced very quickly and without the operator making use of any tools. The fuse block carrying the spent fuse can be taken to a repair shop or any convenient

place, and be refitted with a fuse by simply unscrewing the clamping screws, substituting a new fuse, and replacing the screws.

An important advantage of my invention is due to the construction of the fuse block with the grooves *o* *o* and recess *g*. The fuse wire by lying in the grooves *o*, is largely in
70 contact with the porcelain, so that the latter serves to conduct away the heat from it to an extent sufficient to insure that the middle portion of the fuse, which by reason of the cavity
75 *g* is out of contact with the porcelain, and which consequently is not thus cooled, shall be the first to become highly heated in case of an excessive current. It results from this
80 that the middle portion of the fuse wire is the first to fuse. By the coincidence of the cavities *g* and *g'* (see Fig. 5), a chamber is formed, 85 which when the wire begins to fuse becomes a gas chamber receiving the gases due to the vaporization of the lead by the intense heat. The gases thus generated blow out from this
90 chamber in all directions between the two blocks, but chiefly in the direction of the grooves *o* *o*. The result of this blowing of the gas is to blow out the arc. The objects of forming the grooves *o* *o* in curved form as
95 shown are, first, to insure that the fuse wire shall be in contact with the porcelain so that it shall be kept cool by conduction, and, second, so that the fusing portion of the wire shall be brought out of line between the metal
100 terminals, so that the arc cannot follow to the terminals.

My invention is applicable to either single-pole or double-pole fuse boxes. As applied to a double-pole box, the construction by
105 which the box is divided into two compartments has the important advantage that if one fuse alone blows, no arc can form across to the other side of the line, since all passage of gases from one compartment to the other is prevented by the middle partition.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. A fuse-box having circuit-terminals, a lid therefor, and an insulating fuse-block carrying the fuse and having fuse terminals formed with clamps to engage the fuse and constructed to connect with said circuit-terminals when the lid is closed, and detachably connected to the lid by a sliding connection formed in a
115 plane approximately parallel to the plane of the lid, and perpendicular to the movement of the lid in closing upon the box, whereby the block may be removed bodily from the lid when the lid is open, but cannot be displaced in the act of opening or closing the lid.

2. A fuse-box having circuit-terminals, a lid therefor having overhanging ribs, and an insulating fuse-block detachably held by said ribs, carrying the fuse and having fuse terminals adapted to connect with said circuit-terminals when the lid is closed, whereby it is detachably connected to the lid so that it may be removed bodily carrying the fuse with it.

3. The combination of a fuse-box A, insulated circuit terminals *c c* fixed thereto, a lid A' for said box having overhanging parallel ribs *i i*, a fuse block D of insulating material having parallel end projections *j j* adapted to make a sliding fit with said ribs, fuse C carried by said block, and fuse terminals E E carried by said block connecting with the ends of the fuse and adapted when the lid is closed to make contact with the circuit terminals *c c*.

4. A fuse-block of insulating material, having at its ends clamps for fastening the ends of the fuse, formed with a central cavity *g* and with communicating grooves *o o* extending thence to the clamps, adapted to receive the fuse, and reverse-curved to bring the middle of the fuse where it extends across said cavity out of line with the clamps, combined with another insulating block fitting over the face of the fuse-block to inclose said cavity, and out of contact with the middle of the fuse, whereby the fuse is caused to fuse in the cavity, and the gas therein generated by blowing therefrom through said grooves extinguishes the arc.

5. A fuse-block D formed with a central cavity *g*, and reverse curved grooves *o o* in its face extending beyond said cavity, and end cavities *n n* communicating with said grooves, combined with fuse clamps E E fastened in said end cavities and adapted to engage the ends of a fuse extended through the grooves and across said middle cavity.

6. In a fuse-box, the combination of the box

or case and its lid, an insulating block B fastened in the case, circuit terminals for receiving the wires fastened to said block and formed with grooves *d d*, a fuse-block D detachably connected to the lid, carrying the fuse, and having fuse terminals E E, said terminals formed with spring plates *q* adapted when the lid is closed to enter said grooves in the circuit terminals and complete the circuit.

7. A double-pole fuse-box comprising the box A having a dividing partition *h*, blocks B B of insulating material fastened in said box on opposite sides of said partition, two pairs of circuit terminals *c c* fastened to said blocks respectively, the lid A' adapted when closed to fit said partition, whereby the box is divided into two compartments, two fuse-blocks D D detachably connected to the lid on opposite sides of the central partition, so that when the lid is closed said blocks are inclosed in the respective compartments, the fuses C C carried by said blocks respectively, and two pairs of fuse terminals E E attached to said blocks respectively, and arranged and adapted when the lid is closed to coincide with and make electric contact with said circuit terminals.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES J. WOOD.

Witnesses:

K. STEINBRUNNER,
L. B. CALDWELL.