

W. P. BURKE.  
FUSIBLE ELECTRIC CUT-OUT.

APPLICATION FILED FEB. 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig: 1.

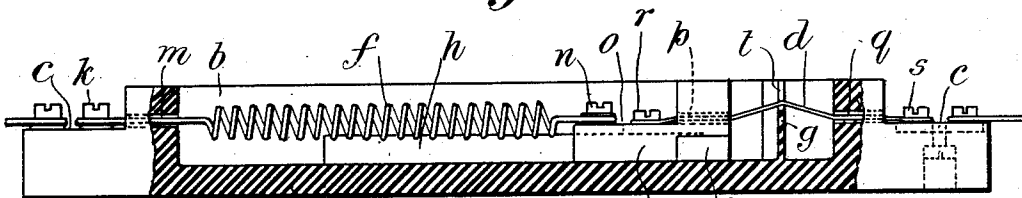


Fig: 2.

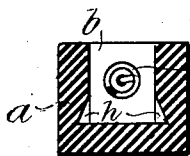
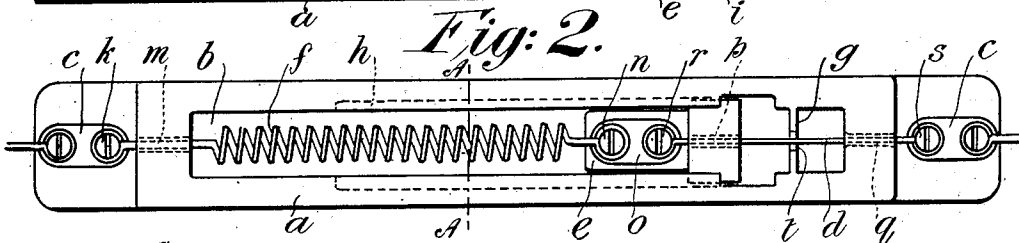


Fig: 3.

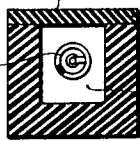


Fig: 5.

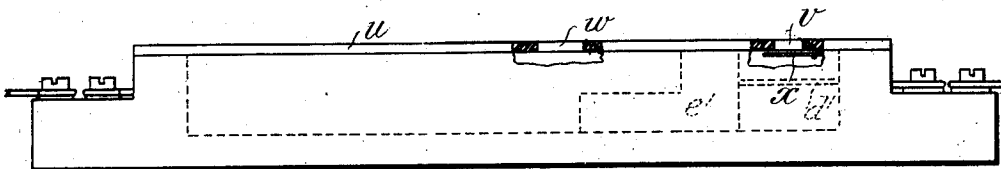


Fig: 4.

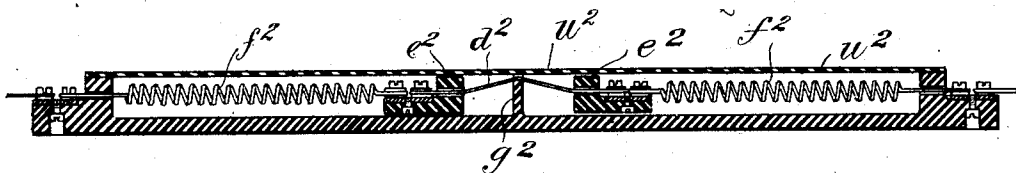


Fig: 6.

Witnesses  
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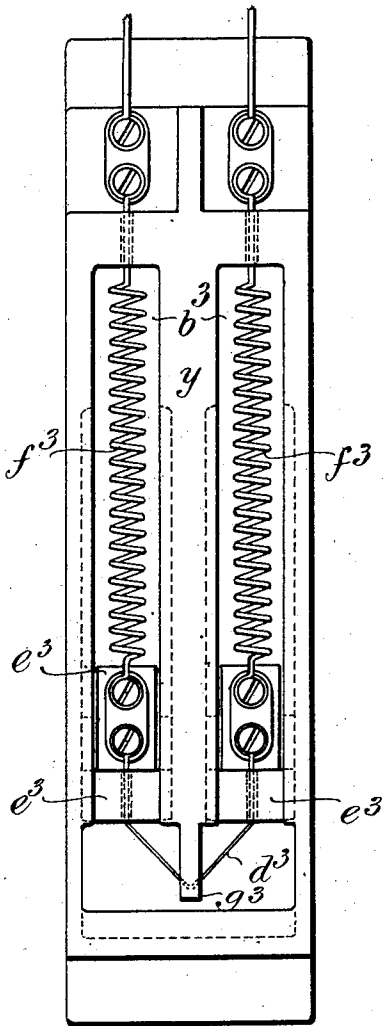
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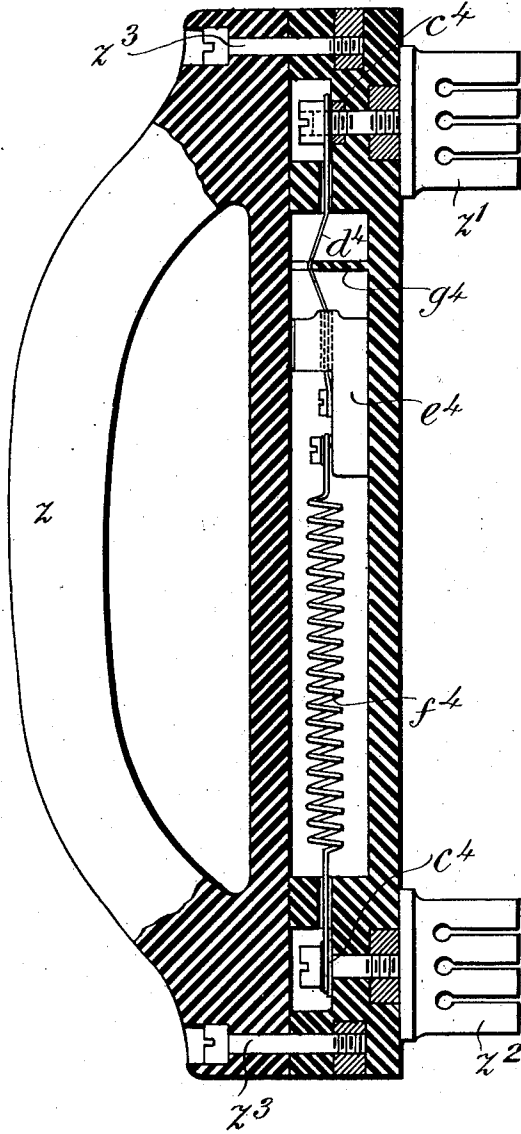
NO MODEL.

2 SHEETS—SHEET 2.

*Fig: 7.*



*Fig: 8.*



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# UNITED STATES PATENT OFFICE.

WILLIAM PETER BURKE, OF FETHARD, IRELAND.

## FUSIBLE ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 729,729, dated June 2, 1903.

Application filed February 24, 1903. Serial No. 144,908. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM PETER BURKE, electrical engineer, a subject of the King of Great Britain and Ireland, and a resident of Grove House, Fethard, county Tipperary, Ireland, have invented certain new and useful Improvements in and in Connection with Fusible Electric Cut-Outs, of which the following is a specification.

My invention relates to fusible electric cut-outs, and comprises improvements whereby the cutting-out action is insured without there being any possibility of an arc being formed, while the device in construction is very simple.

According to my invention I provide a fuse-wire which is preferably stretched over a suitable bridge-piece and is connected to a movable plug, a spring being provided which tends to draw the plug aside immediately the fuse-wire gives way. The spring aforesaid forms part of the electrical circuit.

In the accompanying drawings are shown some forms of construction of my apparatus.

Figure 1 is a sectional elevation of one form of cut-out. Fig. 2 is a plan view of the same device, and Fig. 3 is a cross-section on the line A A of Fig. 2. Fig. 4 shows a modification in which a lid or cover is provided over the cut-out, and Fig. 5 shows a cross-section of the cut-out with the lid thereon. Fig. 6 shows a modification in which two springs are employed. Fig. 7 shows a further modification in which two springs are arranged parallel in the casing of the cut-out. Fig. 8 shows my invention as applied to a handle cut-out.

Referring first to Figs. 1, 2, and 3, *a* is a suitable casing, of porcelain or other insulating material, having a recess *b* therein. *c c* are the terminals. *d* is the fuse-wire, *e* the sliding plug, and *f* the spring, of conducting material. *g* is the bridge-piece. In this construction the cut-out is supposed to be open above, and the plug *e* is provided with means for holding it in the recess after the fuse-wire has burned out. These means consist of a pair of grooves *h*, in which projections *i* on the plug *e* are adapted to engage.

In setting the apparatus the end of the spring *f* is passed through a perforation *m* at the end of the recess *b* and is bound to the terminal plate by the screw *k*. The plug *e* is

inserted in the recess at the end nearest the bridge-piece, where the walls of the casing are cut back to enable the projection-pieces *i* to pass. The other end of the spring *f* is then bound by screw *n* to a plate *o* on the plug *e*. The ends of the fuse-wire are then passed through holes *p* and *q* in the plug and the end of the casing, respectively, and secured by screws *r* and *s* to the plate *o* on the plug *e* and the second terminal *c* of the cut-out. The central part of the fuse-wire is passed through a notch *t* in the bridge-piece *g*.

The action of this device is as follows: Normally a current passes from one terminal of the cut-out to the other by the fuse-wire *d*, plate *o*, and spring *f*. Should the current strength become dangerously high, the fuse-wire will give way at the point where it is stretched over the bridge-piece *g*, owing to the overheating. If desired, also, the wire may be slightly notched at this point to insure that it shall give way there. The spring *f* being under tension will then immediately draw back the plug *e* in the casing, widely separating the ends of the fuse and completely removing the possibility of the formation of an arc. Of course the grooves *h* may be of any desired form, and the shape of the other parts of the cut-out may be varied.

Figs. 4 and 5 show a device in which the casing has a cover *u* thereon. This cover serves as a guide for the sliding plug *e'*, and the grooves *h* and projections *i* may thus be dispensed with, as shown in Fig. 5. In order to allow of the escape of air from the casing and to allow air to enter when the fuse burns out, the cover *u* is provided with two openings *v* and *w*, the former of which is fitted with an inwardly-closing flap-valve *x*. In this case when the fuse burns out and the spring draws back the plug *e'* air is drawn in through the valve-opening *v*, thus cooling the fusing-space, and simultaneously air is expelled through the opening *w* until the end of the plug has passed said opening, when all the gases in the casing are free to escape by the opening *w*.

Fig. 6 illustrates a modification in which two springs *f*<sup>2</sup> and two plugs *e*<sup>2</sup> are employed, with the fuse-wire *d*<sup>2</sup> stretched between them over a bridge *g*<sup>2</sup>. The casing has been shown closed by a cover *u*<sup>2</sup>, and in such case any

suitable air-openings (not shown) would be provided. Of course the groove-and-projection arrangement shown in Figs. 1, 2, and 3 might also be used in this case for guiding the plugs if the cut-out were to have no cover. The object of using two springs is to insure a more rapid formation of a break or gap when the fuse burns out and a farther separation of the ends of the fuse-wire. This device would be suitable for use with currents of higher amperage. The other details of construction of this form of device are similar to those already described.

Fig. 7 shows a modified form of cut-out, the casing of which has two parallel recesses  $b^3$  therein with a central piece  $\eta$  between them, terminating in a bridge  $g^3$ . In this case two plugs  $e^3$  and two springs  $f^3$  are employed, the fuse-wire  $d^3$  being stretched over the bridge  $g^3$  and connected to the plates on the plugs  $e^3$ , as before. This apparatus may also either be formed, as shown, to work without a cover, the plugs being guided by projections and grooves, or may be adapted to work with a cover similar to the one described above. In this case when the fuse gives way the plugs are both drawn back along their recesses, and the ends of the fuse-wire are separated by the insulating center piece  $\eta$ .

Fig. 8 is intended to illustrate the way in which my device may be applied to handle cut-outs or switches and similar devices. In this case,  $z$  is the handle;  $z^2$ , contacts electrically connected to the terminals  $c^4$  of the fusible cut-out. The bridge  $g^4$ , the fuse-wire  $d^4$ , plug  $e^4$ , and spring  $f^4$  are of the same form and operated in the same manner as described above. They therefore need no further explanation. The handle-piece  $z$  is secured to the cut-out and contact portion of the device by screws  $z^3$  after the fuse has been set.

It will be obvious that my device or any form thereof such as hereinbefore described may be applied in a similar manner to many other forms of electric cut-outs and switches. No further invention or description is necessary to enable the device to be so applied. In some cases the bridge-piece  $g$  may be dispensed with, as shown by dotted lines in Fig. 4; but I prefer to use it in order to insure that the fuse-wire shall give way at a predetermined point. Any of the forms of fusible cut-outs shown in Figs. 1 to 7 may be used on fuse-boards in either horizontal or vertical positions. If the latter, the cut-out is preferably so placed that when the fuse blows the spring draws the plug upward.

It will be seen that in all these devices the burned-out fuse-wire can be very quickly replaced by a new one in order to reestablish the circuit.

In conclusion I desire it to be understood that the forms of construction of my device hereinbefore described are intended merely

to serve as examples of the way in which my device can be applied.

It will be obvious that many other forms of construction of fusible cut-outs with springs and sliding plugs can be constructed without departing from the scope of my invention.

What I claim is—

1. In a fusible electric cut-out, the combination of an insulating-casing, terminals at the ends of said casing, a plug, means for guiding said plug longitudinally in the casing, a conducting-plate on said plug, a tensional spring in electric connection with one of said terminals and with the conducting-plate on the plug, a fuse-wire, and means connecting the ends of the fuse-wire to the other terminal and to said conducting-plate respectively.

2. In a fusible electric cut-out, the combination of an insulating-casing, a plug adapted to slide longitudinally in said casing, a terminal at each end of the casing, a tensional spring connecting one of said terminals with the conducting-plate on said plug, a fuse-wire, means connecting the ends of the fuse-wire to the other terminal and to said conducting-plate respectively, a cover for said casing, and openings in said cover, substantially as and for the object set forth.

3. In a fusible electric cut-out the combination of an insulating-casing, two plugs adapted to slide in said casing, two tensional springs connected respectively to said plugs, a bridge-piece, a fuse-wire passing over said bridge-piece, and means connecting the ends of said fuse-wire to said plugs.

4. In a fusible electric cut-out the combination of a casing, a plug adapted to slide longitudinally therein, a bridge-piece, terminals at each end of said casing, a conducting-plate on said plug, a spring connecting one of the terminals to said conducting-plate, a fuse-wire in such position as to lie over said bridge-piece, and means connecting the ends of the fuse-wire to the other terminal and to said conducting-plate respectively, substantially as and for the object set forth.

5. The combination of a handle-switch with a fusible electric cut-out, comprising an insulating-casing, terminals at the ends of said casing, a plug adapted to slide longitudinally in said casing, a conducting-plate on said plug, a tensional spring in electric connection with one of said terminals and with the conducting-plate on the plug, a fuse-wire, and means connecting the ends of said wire to the other terminal and to said conducting-plate respectively.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM PETER BURKE.

Witnesses:

KATHLEEN GALLIND,  
RICHARD BURKE.