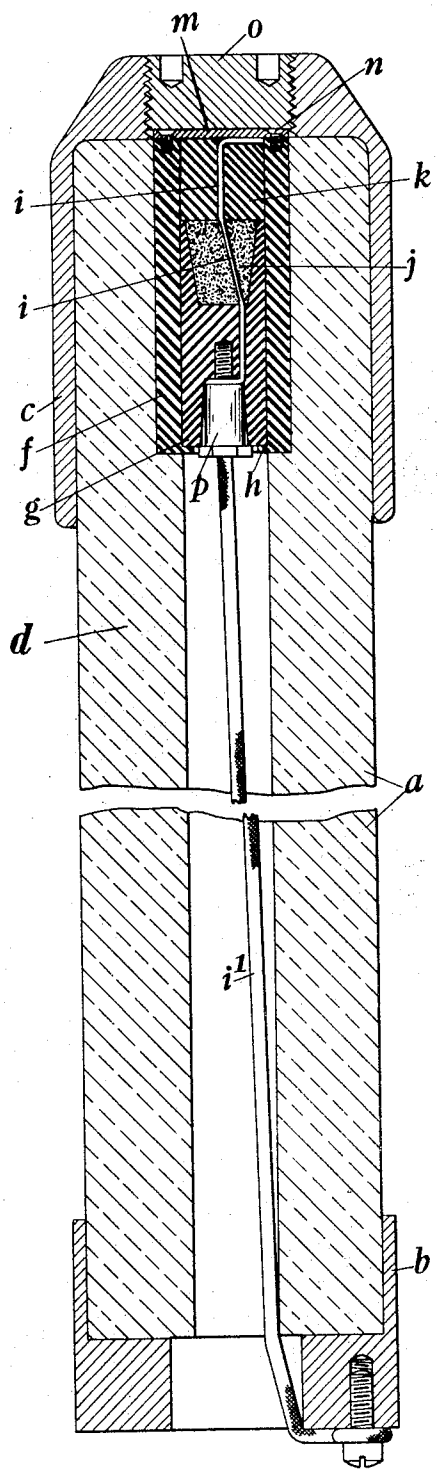
May 8, 1934. G. PAILIN 1,957,906

ELECTRIC CUT-OUT

Filed Jan. 5, 1933



G. Pailin
INVENTOR
By: Marks & Clerk
Attys.

Patented May 8, 1934

1,957,906

UNITED STATES PATENT OFFICE

1,957,906

ELECTRIC CUT-OUT

George Pailin, Higher Openshaw, Manchester, England, assignor to Ferguson, Pailin Limited, Higher Openshaw, Manchester, England, a British company

Application January 5, 1933, Serial No. 650,345
In Great Britain October 26, 1932

2 Claims. (Cl. 200—127)

This invention relates to electric cut-outs and particularly to cut-outs for high tension electric currents. Usually such cut-outs comprise a fusible wire tensioned by a long and relatively strong spring so that when fusion occurs there is a rapid and wide separation of the fused ends. This is necessary in order to prevent the establishment of an arc between such ends. It is usual also to provide around the fusible wire an atmosphere consisting of a gas or liquid which suppresses the arc which forms at the instant of fusion. With this arrangement described it is necessary to employ a relatively strong fuse wire to resist the pull of the relatively strong spring. This necessitates also that there shall be a high ratio between the normal current and the minimum current to effect fusion of the wire.

The object of my present invention is to provide an improved cut-out which is not dependent for its action upon the fusion of a wire and in which the ratio between the normal current and the "blowing" current can be any desired amount. A further object of my invention is to provide a cut-out in which the operative parts can be readily replaced at small cost.

In accordance with my invention, I utilize a conducting wire as a heating and ignition means for a body, such as gun powder, which on ignition develops with extreme rapidity a large volume of gas, the latter propelling a plunger to which the said wire is in part attached, so as to fracture the wire and effect a quick and wide separation of the fractured ends. With this arrangement, the conducting wire can be made of any desired reduced section where it is embedded in the combustible body so that it attains the requisite temperature to ignite such body for any predetermined rise in current passing through the wire. The evolved gas itself suppresses any arc which may tend to form when fracture of the wire occurs due to the rapid motion of the plunger.

The invention will now be described by way of example with reference to the accompanying drawing which is a sectional elevation of one form of cut-out constructed in accordance with my invention.

As shown, the cut-out comprises a long hollow cylindrical member *a* having the conducting flanged collars *b* and *c* shrunk thereon at its ends. The cylindrical member *a* presents an internal shoulder at *d* to receive the end of a short cylinder *f* within which a plunger *g* is located. The lower end of the cylinder *f* has an internal fillet or ledge *h* which supports the plunger. The conducting wire *i* extends through the plunger to which it is secured, through a space *j* in the plunger (where the gun powder or other gas evolving body is placed) and through a plug *k* in the top of the cylinder to the upper side of the latter where it is clamped by a plate *m* which is secured to the cylinder *f* by screws *n* and above which is a plug *o* screwing into the collar *c*. A flexible conductor i^1 extends from a plug *p* (to which the wire *i* is connected) secured in the plunger to the flanged collar *b* before referred to.

The conducting wire *i* is of reduced section within the gas evolving body at *j* and the plunger *g* rests upon the fillet or ledge *h* which supports it.

When heating of the part of the conductor *i* within the space *j* containing the gas evolving body above a predetermined temperature occurs, ignition of such body occurs, with the rapid evolution of a large body of gas. The pressure of the latter causes the plunger *g* to break away the fillet *h* which holds it in place and the plunger is propelled forward with great force causing fracture of the wire *i* and rapid separation of the fractured ends.

The electrical connections to the parts *b* and *c* are omitted as they are of ordinary or known construction and arrangement.

To make the cut-out again available for service, it is only necessary to replace the cylinder *f* and plunger *g*, and associated operative parts by a new set of such parts which can be done readily and at small expense.

The parts *a*, *f*, *g* and *k* may all be made of ebonite or like insulating material.

The cross sectional area of the wire *i* within the powder or like gas evolving material in the space *j* is proportioned to ensure the ignition of such material on a predetermined rise in temperature of the wire consequent upon a predetermined increase in current passing therethrough.

It will be seen that my improvement provides a thermostatic cut-out of great simplicity and reliability.

What I claim is:

1. An electric cut-out comprising a cylinder having an inwardly projecting fragile ledge, a conducting wire held at one end in the cylinder, a plunger within the cylinder resting on the ledge and having an explosive therein, said wire passing through the explosive and connected at either end in an electric circuit whereby when the wire is overheated in the circuit it causes ignition of the explosive and the propulsion of the

plunger past the broken edge of the cylinder with consequent rupture of the wire.

2. An electric cut-out comprising a cylinder the length of which is great in relation to the diameter of its bore into which a fragile ledge projects from the cylinder near one end of the latter, a plunger mounted within one end of said cylinder and resting upon said fragile ledge, an explosive within said cylinder, a long flexible conductor held at one end in said plunger and at its other end in the end of said cylinder remote from said plunger a relatively short conductor connected to said flexible conductor and to the other end of said cylinder, said short conductor passing through the explosive and together with said long flexible conductor being connected in an electric circuit whereby when said short conductor becomes overheated in the circuit it causes ignition of the explosive with rapid development of a large volume of gas which propels said plunger with extreme rapidity through the long, narrow bore driving the flexible conductor before it and causing rupture of said short conductor.

GEORGE PAILIN.