F. N. CONANT.

INCLOSED ELECTRIC FUSE.

APPLICATION FILED FEB. 28, 1910.

1,081,213. Patented Dec. 9, 1913.

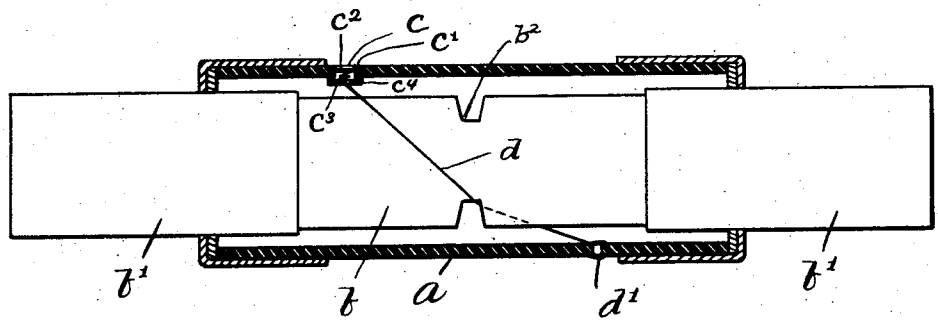


Fig. 1.

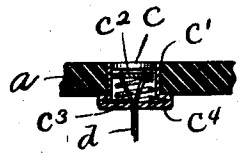


Fig. 2.

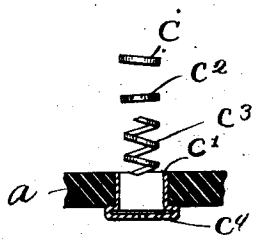


Fig. 3.

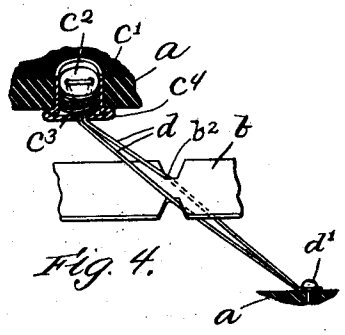


Fig. 4.

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UNITED STATES PATENT OFFICE.

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INCLOSED ELECTRIC FUSE.

1,081,213. Specification of Letters Patent. Patented Dec. 9, 1913.

Application filed February 28, 1910. Serial No. 546,431.

To all whom it may concern:

Be it known that I, FRANKLIN N. CONANT, of Newburyport, in the county of Essex and State of Massachusetts, have invented an Improvement in Inclosed Electric Fuses, of which the following is a specification.

This invention relates to inclosed electric-fuses, and particularly to improvements in the indicator which is employed for indicating when the fuse has blown.

Among the different types of fuse-indicators those having springs for actuating them possess certain advantages over those actuated by explosives, in that they may be more cheaply manufactured and easily applied to the fuse.

This invention has for its object the production of a spring indicator having an isolated indicating plug adapted to be expelled by pressure exerted upon it, an isolated actuating-spring therefor, adapted for self-expulsion when pressure upon it is relieved, both contained in a cylindrical case which is arranged in a hole in the fuse-case, an indicator controlling-wire and removable means connected with said wire for holding the actuating-spring compressed, which means also serves as a seat for localizing the indicating plug, whereby when the fuse blows and the indicator controlling-wire is disrupted all of the parts contained in the case will be expelled.

Another object of the invention is the provision of a disk having two holes through it, which is arranged above the isolated actuating-spring, and an indicator controlling-wire made as a loop and extended through the holes in said disk and through the spring which acts to hold said disk in position to hold the actuating-spring compressed.

Figure 1 is a longitudinal section of an inclosed electric-fuse having a spring-indicator and means, embodying my invention, for holding its actuating-spring under tension. Fig. 2 is an enlarged sectional view of the spring-indicator. Fig. 3 is an enlarged view of the spring-indicator as it leaves the fuse-case when the fuse blows. Fig. 4 is a modification to be referred to.

a represents a fuse-case, and *b* a fusible-strip connected with the conducting-terminals *b'*, of any usual or suitable form of inclosed electric-fuse. The fuse-strip has notches b^2 at its sides at the arc-forming point.

The spring-indicator here shown comprises an indicating-plug *c*, preferably circular in form, contained in a hole *c'* in the fuse-case and differing in color from the exterior of the fuse-case or label thereon, immediately surrounding said hole. When placed in the hole it occupies a position within the line of or outside surface of the wall of the fuse-case, and therefore is not liable to be rubbed off or injured in shipment. Said plug *c* is adapted to be expelled by pressure exerted upon it, but it is not attached to its expelling-means, and hence is herein referred to as isolated. A disk c^2 is located beneath the plug, which is arranged on or adapted to bear against the end of a spiral-spring c^3, and said spiral-spring is loosely contained in, but is not attached to, a cylindrical flanged case c^4, arranged in said hole in the fuse-case. The actuating-spring is therefore isolated. The actuating-spring is compressed by a pressure upon the disk, which causes a bodily movement of said disk, and, when the pressure is relieved, said spring is caused to extend and by its reaction against its support to bodily fly away from the case c^4, expelling the disk which bears upon it and also the indicating-plug. The case c^4 is preferably made long enough to extend entirely through the wall of the fuse-case to its exterior surface, and the actuating-spring and disk and indicating-plug are, in such instance, all contained in said case c^4.

The hole *c'* in the fuse-case is located quite remote from the arc-forming point of the fuse-strip, being therefore near one end of the fuse-case, so that, when the fuse blows, there is a minimum danger of the vapors escaping through said hole, in which the indicator is placed.

A wire *d*, of German silver or other suitable material, or, in fact, any other kind of wire, is looped or otherwise attached to the disk c^2, and is extended through the center of the spring c^3 and through the end-wall of the indicator-case c^4, and said wire is then extended diagonally across the fuse-case to a point near the opposite end thereof, as at *d'*, where it is attached to the fuse-case by a plug, or other suitable means. I prefer to have this wire *d* doubled, as it

can be passed through two holes in the disk, thus easily attaching the disk to it, and then drawn taut and its ends attached more readily to the fuse-case. Said disk is thus held by said wire *d* against the spring with the spring compressed, and serves as a means to compress the spring, but it will be noted that it is not connected with the spring nor is the wire *d*, so that both the disk and spring are free when the wire ruptures and is nearly, if not entirely dissipated, to be expelled from the fuse-case, the disk being expelled by the spring and the spring being expelled by the reaction against its support incident to its suddenly expanding when pressure upon it is relieved. Furthermore, said disk serves as a seat or limiting-stop for the indicating plug which localizes or determines the position of said plug in the cylindrical case and causes it, when compressed into the opening at the end of said case, to occupy a position in the hole in the case and flush with the external surface thereof and to engage the edge of said hole all around its circumference instead of having a tendency to occupy angular positions with respect thereto with a tendency to engage only portions of the circumference and thus to fall out or by its angular position to deceive the operator. Furthermore, the indicating plug can be placed in position easily and quickly by an unskilled workman, as no skill or dexterous movement or manipulation is required for localizing it in the opening. It is simply placed into the opening against the seat and remains by frictional engagement with the edge of the hole until expelled by the spring when pressure upon the spring is relieved. Said wire crosses the fuse-strip and extends through one of the side notches formed therein at the arc-forming point, and is therefore arranged in juxtaposition to said strip, being partly on one side and partly on the other side thereof, and intersecting it at the arc-forming point. It will be observed that said wire is not connected with the fuse-strip, hence will not exert an appreciable strain thereupon, yet is in contact with it until the fuse blows. When the fuse blows said wire *d* is immediately ruptured and the actuating-spring released, and, as before stated, said spring and disk and indicating-plug are all immediately expelled from fuse-case.

In Fig. 4, the indicator-wire is likewise made double and is carried through two holes in the disk c^2, but its strands are arranged one on each side of the fuse-strip, intersecting it at the arc-forming point.

I claim:

1. In an inclosed electric-fuse, a spring-indicator consisting of a cylindrical case having a flanged head with a hole through its head, said case being arranged in a hole in the fuse-case, an indicating-plug contained in said case and held therein by frictional engagement therewith, an actuating spring loosely contained in said case and unattached thereto, an indicator controlling-wire extended through the hole in the head of the case and through the actuating-spring, and means coextensive with the area of the opening in the case which is arranged in the case beneath the indicating-plug and connected with said wire and which engages the outer end of said spring and is held by said wire in position to hold the spring compressed, and which forms a seat for determining the position of the indicating-plug in the case, substantially as described.

2. In an inclosed electric-fuse, a spring-indicator consisting of a cylindrical case having a flanged head with a hole through its head, said case being arranged in a hole in the fuse-case, an actuating-spring loosely contained in said case and unattached thereto, a disk coextensive with the area of the opening in the case which is arranged in the case above said spring, said disk having two holes through it, an indicator controlling-wire made as a loop which is extended through the holes in said disk and through the spring and through the hole in the head of the case, its ends being held fixed, said wire holding said disk with the actuating-spring compressed, and said disk adapted to be expelled by the actuating-spring when pressure upon said spring is relieved, substantially as described.

3. In an inclosed electric-fuse, a spring-indicator consisting of a case, an indicating-plug contained in said case and held therein by frictional engagement therewith, an actuating-spring loosely contained in said case and unattached thereto, an indicator controlling-wire extended into the case, and means contained in the case and connected with one end of said wire and engaging said actuating-spring to hold said spring compressed, said means forming a seat for determining the position of the indicating-plug in the case without exerting pressure thereupon while holding the actuating-spring compressed, substantially as described.

4. In an inclosed electric-fuse, a spring-indicator having an indicating-plug held in place by frictional engagement with its support, an actuating-spring, an indicator controlling-wire extended through the actuating-spring and a disk connected with one end of said wire above said spring and engaging said spring to hold it compressed, said disk forming a seat for determining the position of the indicating-plug without exerting pressure thereupon while holding the spring compressed and adapted to be expelled by the spring and to in turn expel the indicating-plug when pressure upon the spring is relieved, substantially as described.

5. In an inclosed electric-fuse, a spring-indicator having an actuating-spring, an indicator controlling-wire extended through the spring, a disk arranged above the spring and connected with one end of said wire and engaging said spring to hold it compressed, said disk being held by the wire a short distance below the level of the fuse-case, and an indicating-plug fitted into the space above said disk and held therein by friction, said plug bearing upon said disk, whereby its position is determined by said disk, substantially as described.

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

FRANKLIN N. CONANT.

Witnesses:
B. J. NOYES,
H. B. DAVIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."