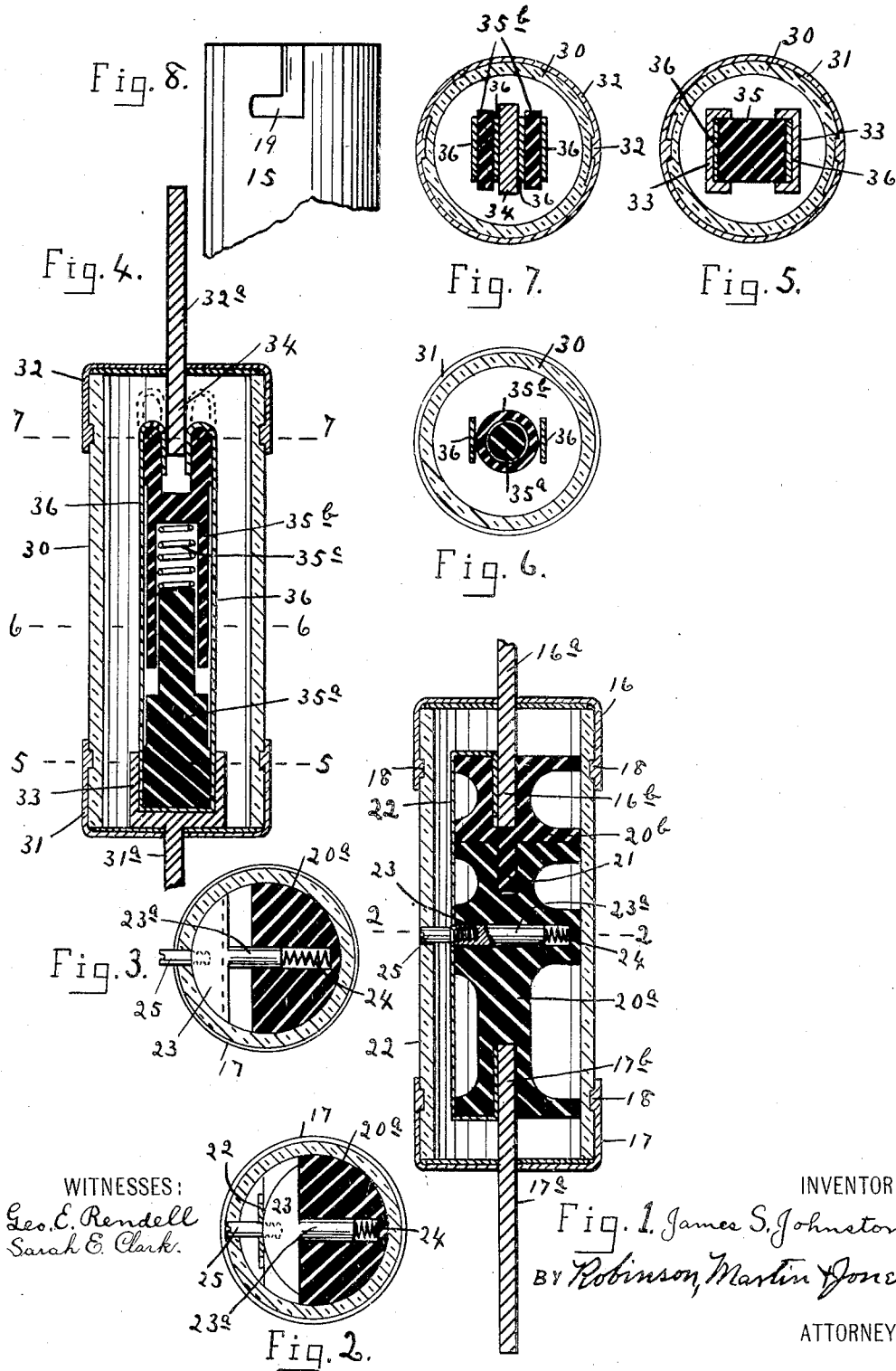


J. S. JOHNSTON.
ELECTRICAL FUSE PLUG.
APPLICATION FILED MAR. 15, 1909.

1,050,062.

Patented Jan. 7, 1913.



UNITED STATES PATENT OFFICE.

JAMES S. JOHNSTON, OF UTICA, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO JOHNSTON MANUFACTURING COMPANY, OF UTICA, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRICAL FUSE-PLUG.

1,050,062.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed March 15, 1909. Serial No. 483,344.

To all whom it may concern:

Be it known that I, JAMES S. JOHNSTON, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Electrical Fuse-Plugs; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The object of my present invention is to provide an electric safety fuse plug, which is simple in construction, efficient, can be readily renewed as to the fuse and restored to its working condition, and in some of the forms of construction shown is adapted to cut off any tendency to arcing when the fuse blows out. There is also an indicator for indicating the fact that the fuse has blown.

Figure 1 shows a longitudinal sectional view of a fuse plug embodying the features of my invention. Fig. 2 shows a cross sectional view taken on line 2—2 of Fig. 1, showing the device in its normal working condition. Fig. 3 is a similar cross sectional view showing the device after the fuse has blown. Fig. 4 is a longitudinal sectional view of a modified form of construction. Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 4. Fig. 6 is another cross sectional view taken on line 6—6 of Fig. 4. Fig. 7 is another cross sectional view taken on line 7—7 of Fig. 4. Fig. 8 is a side elevation of one end of the tubular case employed in the construction as shown in Figs. 1 and 4.

Referring to the reference letters and figures in a more particular description, 15 indicates a tubular casing of insulating material and preferably transparent glass. Covering the ends of the casing are metallic caps 16 and 17 detachably secured to the casing preferably by being provided with internal projections, as 18, engaging in bayonet catch recesses 19 in the walls of the casing adjacent to and running out to the ends.

As to the form of construction shown in Fig. 1, the caps are provided with externally projecting blades 16^a and 17^a adapted

to be inserted in spring clamps as on a switch board in the usual manner of fuse plugs of this character. The blades 16^a and 17^a are carried to the interior in internal extensions 16^b and 17^b. The casing is adapted to receive a fuse holder of insulating material made, as shown in Fig. 1, preferably in two parts, 20^a and 20^b, swiveled or pivoted for relative rotation on an axial pivot or pintle 21. In general form the fuse holder is a cylinder flattened along one side to provide a passage for the fuse strip 22. Each end of the fuse holder is provided with a slotted recess adapted to receive the internal extensions 16^b and 17^b of the conductor blades. The ends of the fuse strip 22 are folded around the ends of the fuse holder and also inserted in the recesses which receive the internal extensions 16^b and 17^b. In fact, the latter are inserted last into these sockets or recesses, and serve to wedge or bind the ends of the fuse strip within the socket, as well as make electrical contact at this point. Substantially in the middle of the fuse holder, there is provided a recess extending out to that side which is flattened off to receive the fuse strip, in which is located a cut-off gate or plate 23 of a segmental form on its outer edge, substantially conforming to the circle of the inner face of the casing, and provided with a stem 23^a entering a suitable socket or extension of the recess and backed by a spring 24 tensioned to force the gate or cut-off outwardly from the recess. The gate 23 is preferably provided with an indicator pin 25, which is removably secured in the edge of the gate or plate 23 by being screw-threaded therein, and the projecting end of which passes into or through a hole in the casing arranged at a suitable point. The fuse strip 22 will be provided with a perforation at the point where the indicator pin 25 is located, and the arrangement will preferably be such that the cross sectional area of the fuse strip will be the smallest at this point.

The parts may be assembled by applying the fuse strip to the fuse holder when removed from the casing, the part 23 being forced by hand into its recess and the tension on the fuse strip as it is held taut along the side of the fuse holder being sufficient to hold it retired in its recess. The indicator

pin 25 having been removed, the fuse holder may be applied to one of the caps as 16 or 17 by forcing the extension thereof into the socket with the end of the fuse and this cap applied to one end of the casing. The other cap may then be applied, the extension 16^b or 17^b, as the case may be, being forced into its recess in the end of the fuse holder. The swivel in the fuse holder will allow the caps 16 and 17 to be relatively rotated in engaging them in the bayonet catch recess and locking them on the ends of the case. The arrangement of all parts will be such that at the final limits of their movement, the flat sides on the two parts of the fuse holder will register and the fuse be held taut in a true plane. When the parts are thus assembled, the indicator pin 25 will be inserted through the opening in the casing and secured in the gate or cut-off plate 23. The length of this pin 25 will preferably be such as to not project from the outer wall of the shell when the parts are all in normal working condition. The pin 25 may also serve as a guide for the plate 23.

It is obvious that the device when assembled is capable of carrying electrical current by means of the fuse strip 22 from one of the contact blades 16^a to the other contact blade as 17^a or vice versa. In case of excessive current the fuse strip burns or "blows" at its point of smallest area, which will be opposite the cut-off plate 23. When this happens there is nothing to restrain the spring 24, and the cut-off plate 23 is forced outwardly completely closing the tubular opening through the casing at this point. The fuse holder may be largely cut out and recessed around its periphery, substantially as shown, whereby provision is made for the accumulation of some gases and products of combustion when the fuse blows without excessive internal pressure. When the cut-off plate or gate 23 is projected to close the tubular opening through the casing, any tendency to arc between the swiveled ends of the fuse strip is provided against or an arc forming at this point is cut off. It might be noted that the gate or plate 23 is preferably of insulating material.

At the time the plate 23 is operated, the outer end of the indicator pin 25 is projected, whereby it may be readily determined by observation or feeling that the fuse has been blown and the device is no longer operative as an electric current conductor. The parts may then be readily taken apart and the remnants of the old fuse strip removed and a new one supplied, and the parts re-assembled, when the device is ready for use again in as good condition as new. When the casing 15 is of transparent material, as glass, the condition of the fuse strip can be readily observed. The casing, however, may be made

of many other insulating materials which are not transparent, in which case the indicator pin 25 is particularly useful to determine the condition of the fuse without taking the parts down.

In the modified form of construction shown in Figs. 4 to 7 inclusive, a similar casing 30 is provided, having the removable caps 31 and 32 on each end, with the electric conductor blades 31^a and 32^a. Internally the cap 31 is provided with a socket 33 electrically connected with the blade 31^a, while the blade 32^a is extended internally of the cap in an extension or bit 34. The fuse holder shown in this form of construction consists of two parts, 35^a and 35^b, which are relatively rotatable or swiveled together by being provided with a pintle as to part 35^a, which enters a socket in the part 35^b, and are held extended longitudinally by a spring 35^c. The fuse strip 36, which, in this case, is used doubled, is folded around one end of the fuse holder and inserted in the socket 33, while the other ends of the fuse strip are folded into a notch or recess in the other end of the fuse holder and wedged and held therein by the bit 34. The tension on the fuse strip is sufficient to hold the spring 35^c under compression. The fuse strip makes electrical contact with the socket 33 at one end of the fuse holder, and at the other end of the fuse holder makes electrical contact with the blade 34, which, as before stated, is wedged in between the two ends of the fuse strip. It is obvious that this construction will carry electrical current from the contact blade 31^a to the contact blade 32^a or vice versa; that when the fuse is melted or blown, the spring 35^c will expand to quickly draw the severed parts asunder, thus obviating any tendency to arc between the severed ends.

In view of the description given of the prior construction, it may be here simply noted that the parts are readily taken apart to remove the remainder of a damaged fuse strip and replace it with another, when the device is in as good order as originally to perform its function of carrying the current.

It is obvious that other forms of modifications of constructions than those herein described may be made without departing from the invention hereinafter intended to be claimed.

What I claim as new and desire to secure by Letters Patent is:

1. The combination in an electric safety fuse of a tubular casing of insulating material, caps closing the ends of the casing and having internal means for making electrical connection, a fuse holder extending between said means, a fuse held by the holder in electrical contact with said means, and means operating in connection with the fuse holder to completely close the tubular

opening through the casing when the fuse blows, substantially as set forth.

2. In a fuse of the character described, the combination of a tubular casing, end members adapted to frictionally engage said casing, whereby the contents of said casing may be quickly removed, a fuse holder disposed in said casing, said fuse holder being cut out around its periphery, whereby to provide for the accumulation of gases to

prevent excessive internal pressure in said casing, and a fuse disposed in said fuse holder, substantially as described.

In witness whereof, I have affixed my signature, in presence of two witnesses, this 15 3rd day of February, 1909.

JAMES S. JOHNSTON.

Witnesses:

EMMA S. HESSE,
SARAH E. CLARK.