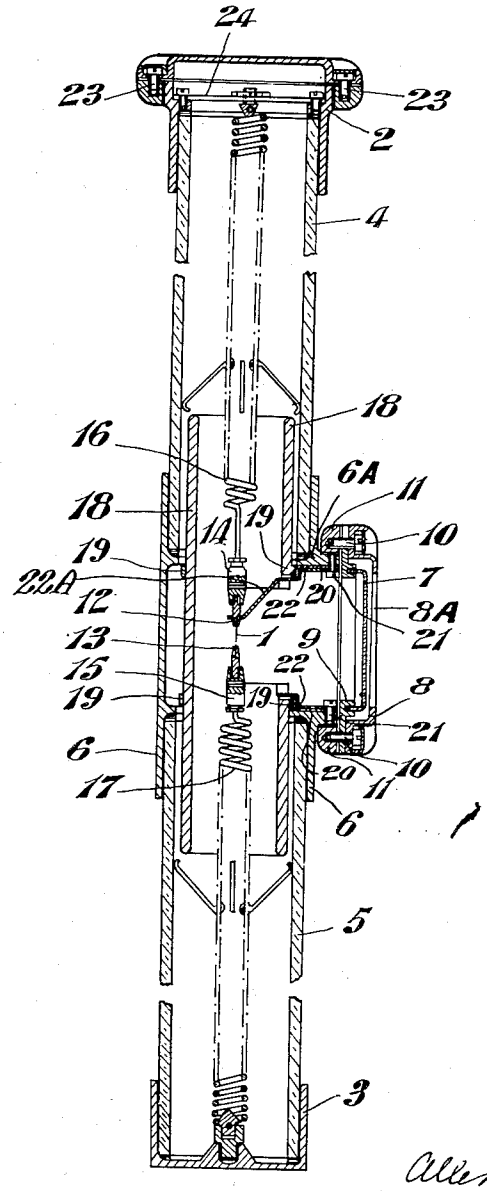
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ELECTRICAL FUSE

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ELECTRICAL FUSE

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This invention relates to electric fuses and refers more particularly to electric fuses of the so called chemical extinguisher type, that is electric fuses in which, upon the fuse blowing, the arc is extinguished by means of some flame extinguishing liquid. This operation gives rise to an increase of pressure in the vessel in which the fuse is contained and to protect this vessel against such increase of pressure it has been the usual practice to provide a vent cap which is intended to blow off at a given pressure.

It is the object of the invention to provide improvements in such fuses and the invention comprises the arrangement that the increased pressure consequent upon the extinguishing of the arc is relieved by the failure of a vent element located in the wall of the container at the side of the fuse element.

This vent element is preferably made of glass or like frangible material and its failure consists in the fracture thereof as distinct from its blowing away from its mounting. In this way it is ensured that the failure of the vent element will take place at a given suddenly applied pressure.

The invention further comprises the arrangement that the fuse element is maintained in tension by means of movable tension elements connected to it at both ends.

In order that the invention may be the more clearly understood a fuse in accordance therewith will now be described reference being made to the accompanying drawing which illustrates said fuse in sectional elevation.

Referring to this drawing the fuse element 1 is connected in circuit between two terminal contact ferrules 2 and 3 constituting the end caps of a tubular container in the centre of which said fuse is located. Said tubular container is constituted by means of two tubes 4 and 5 of glass and an intermediate central tubular connecting element 6 of metal connected to said tubes and overlapping the ends of said tubes for a considerable space to protect them from the force of the explosion. Said connecting element 6 is formed with a laterally projecting boss 6*a* whose axis is at right angles to, and intersects, that of the container. The open end of this boss 6*a* is closed by means of a disc 7 of glass or other frangible material which is protected by means of a cover 8 having an opening 8*a* through which said disc is exposed and which disc is adapted to fracture when the fuse is blown. As shown said disc 7 has its edge inwardly turned and secured within a circular groove in a ring support 9 and this ring support, together with the cover 8, is secured, by means of screws 10, to a ring connecting element 11 secured, say by screwing, around the boss 6*a*, or alternatively cast in one integral piece with said boss 6*a*.

The fuse element 1 is held at its two ends by means of clamps 12 and 13 and these clamps are connected by means of screw connecting elements 14 and 15 to the extremities of two tension coil springs 16 and 17 whose other ends are connected to the respective contact ferrules 2 and 3. In this way said fuse element 1 is maintained in tension and the necessary electrical connections are also established. In order to relieve the springs 16 and 17 of the major part of the current, additional flexible copper cables (not shown) may be provided connecting the contact ferrules 2 and 3 with the appropriate screw connecting elements 14 and 15.

In order to enable powerful springs to be employed the fuse itself consists of high tensile wire coated with silver.

The fuse element is surrounded by a tube 18 of arc resisting material whose extremities extend, as shown beyond the ends of the element 6 and which has a hole in it which registers with the bore hole of the boss 6*a*. The diameter of this tube is such that an annular space remains between it and the container in which the arc extinguishing liquid may freely flow. This tube is supported by means of two rings 19 of strip metal which surround it and which are connected to a tubular element 20 of sheet metal secured, in the manner of a lining within the bore of the boss 6*a*, by means of screws 21. The same screws also secure a second tubular element 22 whose lower end is continued to form a lining for the hole in the tube 18 and thereby constitute a guide confining the impulse of the explosion and directing it straight on to the disc 7. This latter element has a projection 22*a* which forms a loose support for centering the clamp 12.

As shown the end portion of the contact ferrule 2 is separate from the skirt portion and is connected thereto by means of screws 23. This is in order that the end portion may be removed for filling, replenishing or replacing the arc extinguishing liquid. This necessitates that the spring 16, instead of being connected, like the spring 17, direct to the end portion of the contact ferrule is connected to a cross bar or spider 24 mounted on the skirt portion.

What we claim and desire to secure by Letters Patent is—

1. In an electric fuse of the chemical extinguisher type, a separate vent member located in the wall of a fuse container and facing the side thereof, said vent member being adapted to fail under the influence of pressure within said fuse container less than that required to fracture said container consequent upon the generation of the arc.

2. In an electric fuse of the chemical extinguisher type, a separate frangible vent member located in the wall of a fuse container, said separate vent member being adapted to fracture under the

influence of the increased pressure within said fuse container consequent upon the generation of the arc.

3. An electric fuse according to claim 2 wherein said separate vent member is of glass.

4. In an electric fuse of the chemical extinguisher type, a separate frangible vent member located in the wall of a fuse container, and facing the side thereof, said separate vent member being adapted to fracture under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

5. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes, an intermediate connecting portion joining said tubes and closure members for the outer ends of said tubes, and a separate vent member located in the wall of said intermediate connecting portion, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

6. An electric fuse according to claim 5 wherein said two separate tubes are of glass and said intermediate portion is of metal.

7. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes of glass, an intermediate connecting portion joining said tubes and overlapping the ends of said tubes for a considerable space to protect them from the force of the explosion, closure members for the outer ends of said tubes, and a separate vent member located in the wall of said intermediate connecting portion, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

8. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes, an intermediate connecting portion joining said tubes having a laterally projecting boss, closure members for the outer ends of said tubes, and a separate vent member closing the extremity of said boss, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

9. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes, an intermediate connecting portion joining said tubes, closure members for the outer ends of said tubes, tension springs connecting the two ends of the fuse respectively to the two closure members, and a separate vent member located in the wall of said intermediate connecting portion and opposite said fuse, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

10. In an electric fuse of the chemical extinguisher type, a container having a fuse therein, the said container having a vent member in the side thereof communicable with the atmosphere, and a fracturable closure for the vent adapted to fail under the influence of pressure within said fuse container consequent upon the generation of an arc less than that required to fracture the said container.

11. In an electric fuse of the chemical extinguisher type, a fuse container, a separate vent member located in the wall of the fuse container and facing the side thereof, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc, and a tube of arc resisting material surrounding the fuse and spaced from the wall of the container, said tube of arc resisting material having a hole in it opposite said vent member.

12. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes, an intermediate connecting portion joining said tubes and having a laterally projecting boss, closure members for the outer ends of said tubes, and a separate vent member closing the extremity of said boss, said vent member being adapted to fail under the influence of the increased pressure within said fuse container consequent upon the generation of the arc, a tube of arc resisting material surrounding the fuse and spaced from the wall of the container, said tube of arc resisting material having a hole in it opposite said vent member, and a guide extending from said hole to said boss for confining the impulse of said increased pressure and directing it straight on to the vent member.

13. In an electric fuse of the chemical extinguisher type, a fuse container, a separate vent member located in the wall of the fuse container and facing the side thereof, and guiding means for confining the impulse of the increased pressure consequent upon the generation of the arc and directing it on to said vent member, said vent member being adapted to fail under the influence of said increased pressure.

14. In an electric fuse of the chemical extinguisher type, a tubular container for the fuse element having a laterally projecting boss opposite said fuse element, a separate vent member closing the extremity of said boss, a tube of arc resisting material surrounding the fuse element and spaced from the wall of the container, said tube of arc resisting material having a hole in it between said fuse element and said boss, and a guide extending from said hole to said boss for confining the increased pressure consequent upon the generation of the arc and directing it on to said vent member, said vent member being adapted to fail under the influence of said increased pressure.

15. In an electric fuse of the chemical extinguisher type, a fuse container constituted by two separate tubes, an intermediate connecting portion joining said tubes and closure members for the outer ends of said tubes, and a separate frangible vent member located in the wall of said intermediate connecting portion, said vent member being adapted to fracture under the influence of the increased pressure within said fuse container consequent upon the generation of the arc.

16. In an electric fuse of the chemical extinguisher type, a fuse container, a separate frangible vent member located in the wall of the fuse container and facing the side thereof, and guiding means for confining the impulse of the increased pressure consequent upon the generation of the arc and directing it on to said vent member, said vent member being adapted to fracture under the influence of said increased pressure.

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