

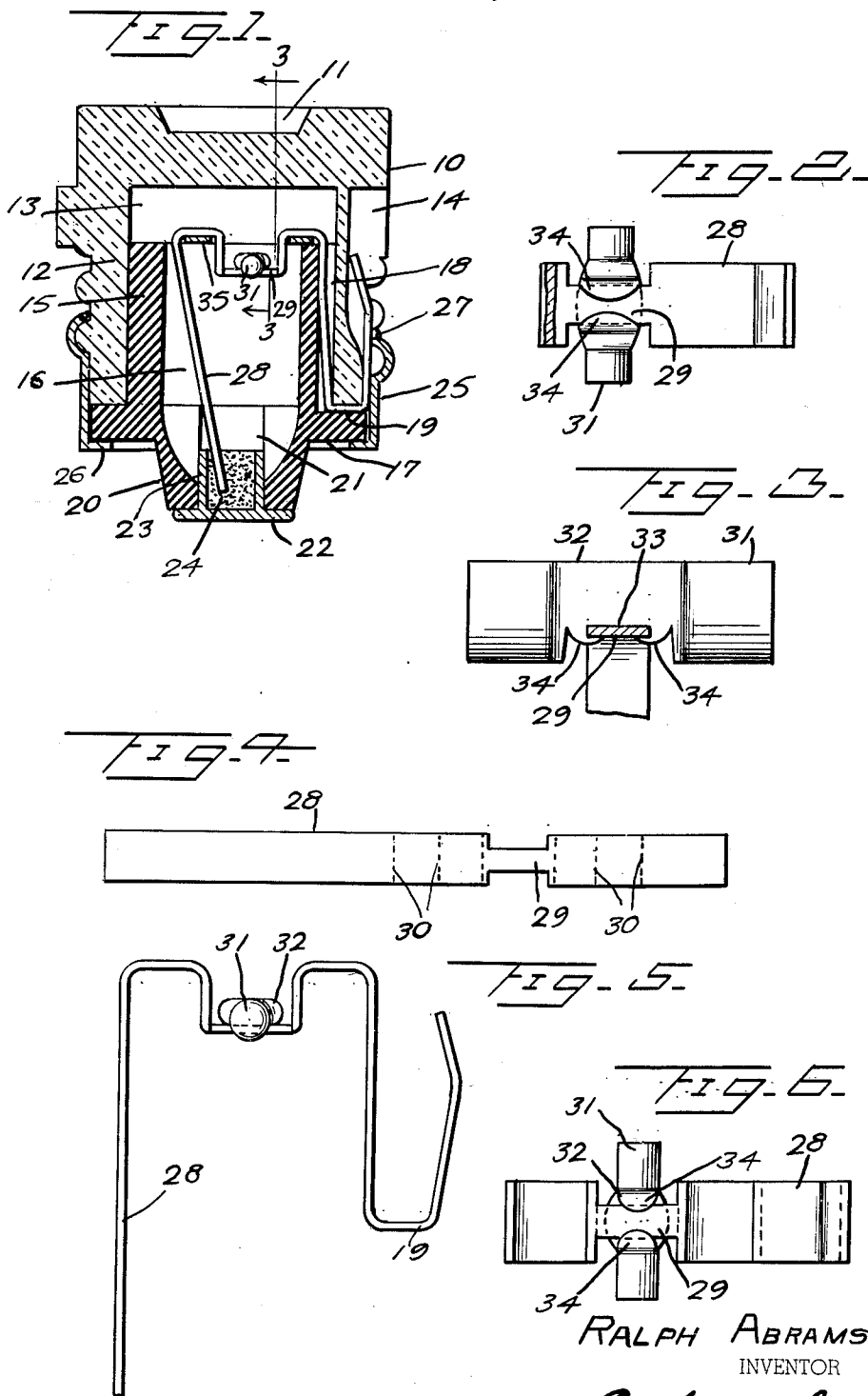
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TIME LAG FUSES

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TIME LAG FUSES

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This invention relates to time lag fuses of the plug type.

It is commonly known that surges occur on electrical power lines. These surges arise from different causes. A principal cause is the starting of small motors directly across the line. The excessive current at such times can be provided for by using overrated fuses. This expedient, however, discards the principal advantage of fuse protection, that is, the fuse rating should be slightly above the normal line load. Time lag fuses have, therefore, been developed that will handle overloads for relatively short periods of time.

It is an object of the present invention to provide a novel fuse link for a time lag fuse.

Another object of the present invention is to provide a novel attachment of a heat dissipating element to a fuse link.

A further object of the present invention is to provide a fuse link of novel shape having a depressed top section for the reception of the heat dissipating element, so as to space the latter below the glass or mica window, but still minimize the danger of breakage of the latter in case of a blow out.

Still other objects, advantages and improvements will become apparent from the following specification, taken in connection with the accompanying drawing, in which:

FIGURE 1 is a vertical sectional view through a time lag fuse of the plug type according to the present invention, showing a fuse link having a depressed top for receiving the heat diffusing element.

FIG. 2 is an under plan view of the fuse link and the heat diffusing element.

FIG. 3 is a vertical sectional view, taken on the section line 3-3 of FIG. 1 and looking in the direction of the arrows and showing the attachment of the heat diffusing element to the fuse link.

FIG. 4 is a developed view of the fuse link.

FIG. 5 is an elevational view of the fuse link as used in the assembly according to FIG. 1.

FIG. 6 is an under plan view of the fuse link according to FIG. 5, showing the manner of attachment of the heat diffusing element to the latter.

Referring now to the drawings in detail and to FIG. 1 in particular, the plug fuse in the construction here shown is partially enclosed by glass top 10, which has a depressed central section 11. The top 10 is integral with a cylindrical barrel 12, which is exteriorly threaded for reception of a retaining shell, to be later described, and which has an internal bore 13. The outer threaded side wall of the barrel 12 has a channel 14 therein, which is positioned parallel to the axis of the barrel and is provided for a purpose to be later described.

A complementary housing section is formed of some suitable molded composition material, such as a phenolic condensation product, and is comprised by a sleeve 15, having a bore 16 therethrough, and which is adapted to be slidably received within the bore 13 of the top, a flange 17 and a frusto-conical base 20. The outer side wall of the sleeve 15 has formed therein a channel 18, which is positioned parallel to the axis of the barrel and is provided for a purpose to be later described. An axial bore 21 is formed through the frusto-conical base 20 and the flange 17. Within the bore 21 there is a central contact element 22, which is riveted in place by a rivet

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22. This contact element has a bottom flange and an integral barrel 23, which is received within the axial bore 21 of the frusto-conical base 20. A shell 25, preferably of brass, is internally and externally screw threaded and engages the threads on the cylindrical barrel 12, and at its bottom has an inwardly extending flange 26, which engages the flange 17 on the sleeve 15 of the complementary housing section to hold the parts in assembled relationship.

A ribbon type fuse link is shown at 28 in FIG. 5. It is preferably of zinc. A neck 29 is formed in the fuse link and this neck is calibrated so as to melt at an overload exceeding normal rating. Parallel bend lines 30 are formed transversely of the fuse link at spaced intervals, for a purpose that will be later described.

The heat diffusing element is shown at 31 in FIGS. 2, 3 and 6. This element is also known in the art as a heat sink and a metal lag block. It is comprised by a cylinder 31 of a metal of high heat conductivity, for instance copper. Short lengths of No. 10 A.W.G. of copper wire have been found to be satisfactory for fuses of average ratings. Of course, square or rectangular wires of equivalent cross-sectional area could as well be used. The cylinder 31 is first struck at its mid-section to form a transverse slot 32 chordally therein, at the same time being flattened at 32 at right angles to its axis by swaging. The neck 29 of the fuse link is received in the slot 33 and the side walls of the latter are staked over the neck at 34 by a staking tool having parallel edges spaced apart a suitable distance.

The fuse link 24 here has a depressed channel-shaped top section, which is formed by suitable right angle bends along the bend lines 30 at spaced intervals of its length. The base channel shaped top section is comprised principally by the neck 29. This depressed channel shaped top section is received within the opening of an apertured disc or washer 35 of paper or fibre, which is smaller in diameter than the sleeve 15 and is eccentrically positioned on the top thereof. This disc 35 also functions as a label, carrying any printed matter which the manufacturer may desire to place thereon. As so positioned the neck 29 of the fuse link is at a considerable distance below the depressed central section 11 of the glass top, and when the fuse blows, the glass top will not be broken by the burn out. One end of the fuse link is received in a blob of solder 24 in the barrel 23 of contact element 22. Beyond the depressed neck section 29 within the hole of the washer 35, the other end of the fuse link extends downwardly through the longitudinal channel 18 in the side wall of the sleeve 15, outwardly through a radially positioned notch 19 in the flange 17, and upwardly into the longitudinally positioned channel 14 in the barrel 12. Adjacent the latter end the fuse link is united to the inner wall of the shell 25 by a soldered joint 27.

It will be readily seen that when the electrical line in which the fuse is interposed is subjected to an overload, the neck 29 of the fuse link will become quite hot, due to its small cross sectional area and consequent high resistance. The heat developed will first be absorbed by the heat diffusing element 31, until the latter is raised to a temperature considerably above the ambient air. When the point is reached where heat is received from the fuse link 28 by the heat diffusing element 31 faster than the latter can radiate it to the ambient air, the fuse link will burn out.

Having now fully described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. The process of making a time lag fuse which consists in forming a fuse link with a narrow neck, swaging

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a slot across a short element of metal having a high heat conductivity and flattening across an area including the slot, inserting the neck of the fuse link in said slot, and finally staking portions of said fuse link adjacent to said slot, over said neck.

2. The process of making a time lag fuse which consists in forming a fuse link with a narrow neck, swaging a slot across a short cylinder of a metal having high heat conductivity at right angles to the axis of the cylinder and flattening the cylinder across the area including the slot, inserting the neck of the fuse link in the slot, and staking the sides of the slot over said fuse link.

3. A fuse construction comprised by an outer hollow cylindrical member having a transparent top, an inner hollow cylindrical member of shorter length than the outer cylindrical member received within the latter, a fuse link supported on the end of the inner hollowed cylindrical member having a narrow neck, and a cylindrical element of a metal having high heat conductivity flattened across its central section and formed with a slot along the flattened section for receiving said fuse link, portions of said cylindrical element adjacent to said slot, clamping said fuse link securing said fuse link in position.

4. A time lag fuse construction comprised by an outer hollow cylindrical member having a transparent top, an inner hollow cylindrical member of shorter length than

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the outer hollow cylindrical member and adapted to be received within the latter, a contact element at the outer end of the inner hollow cylindrical member, a metal shell over the outer hollow cylindrical member and having a flange engaging the inner hollow cylindrical member to hold it within the outer hollow cylindrical member, a washer over the inner end of the inner hollow cylindrical member, a fuse link having a neck therein depressed within the opening in said washer and connected at one end to the contact element at the outer end of the inner hollow cylindrical member and the other end connected to said metal shell, and an element of high heat conductivity connected across said neck within the opening of said washer.

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