United States Patent

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[54] FUSE CLAMP
6 Claims, 6 Drawing Figs.

[52] U.S. Cl. ..... 339/64 R, 339/258 F, 339/262 F
[51] Int. Cl. H01r 13/62
[50] Field of Search 339/64, 147, 150, 258, 259, 262

[56] References Cited

UNITED STATES PATENTS

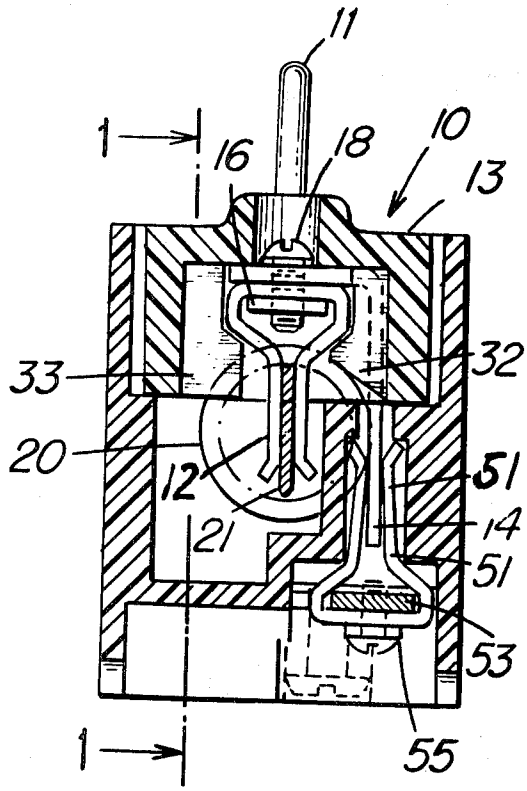
2,077,587	4/1937	Rowe	339/259 F
2,677,116	4/1954	Ritter	339/64 M

FOREIGN PATENTS

544,454	4/1942	Great Britain	339/150 F

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ABSTRACT: A fuse holder for cylindrical cartridge fuses having axially protruding terminal blades is provided with floating clamp members to grip and electrically connect with the fuse which allow for dimensional and alignment errors of the fuse or the holder.



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SHEET 1 OF 2

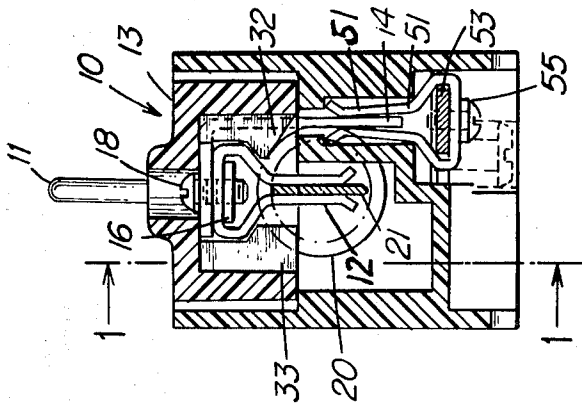


FIG. 2

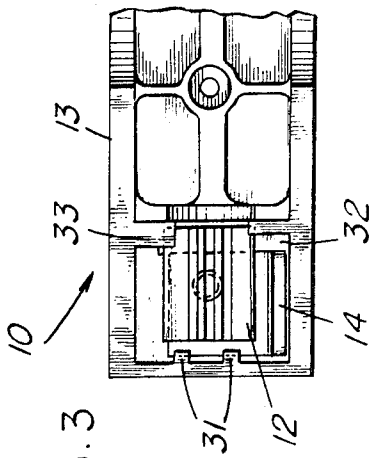


FIG. 3

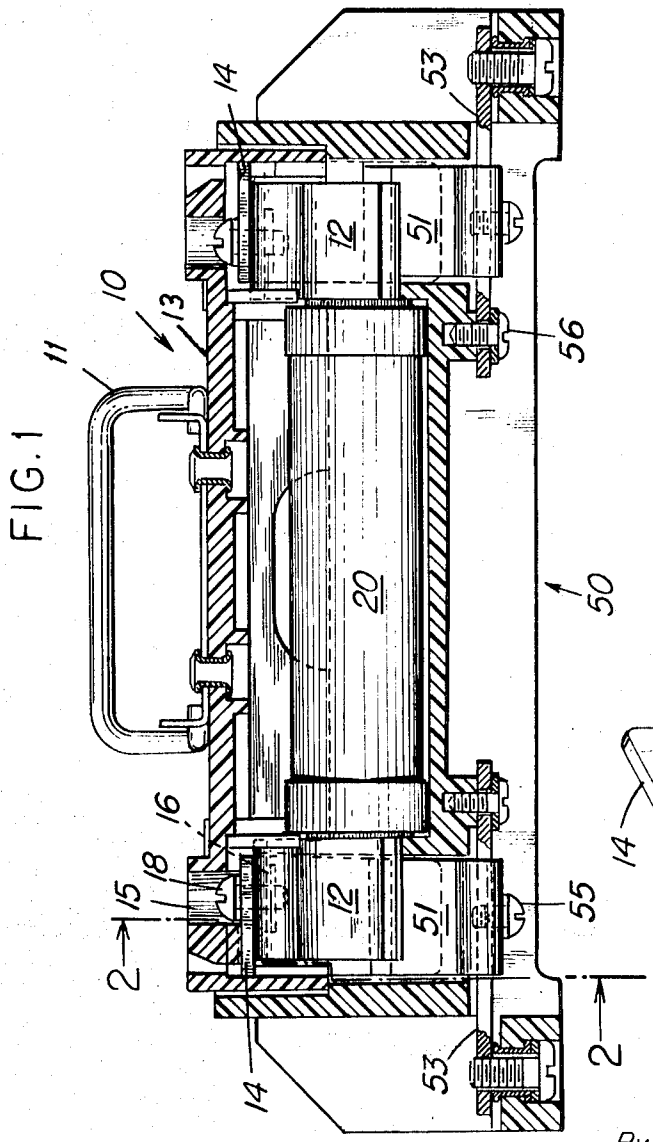


FIG. 1

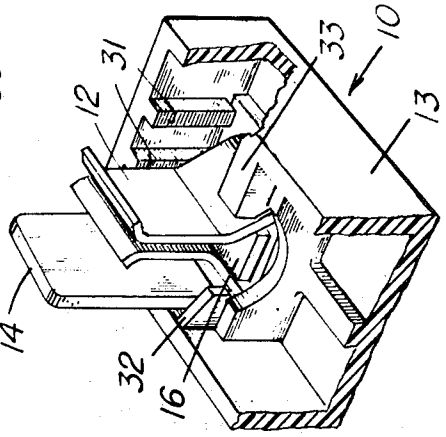


FIG. 4

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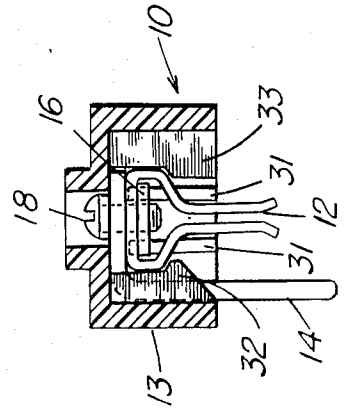


FIG. 6

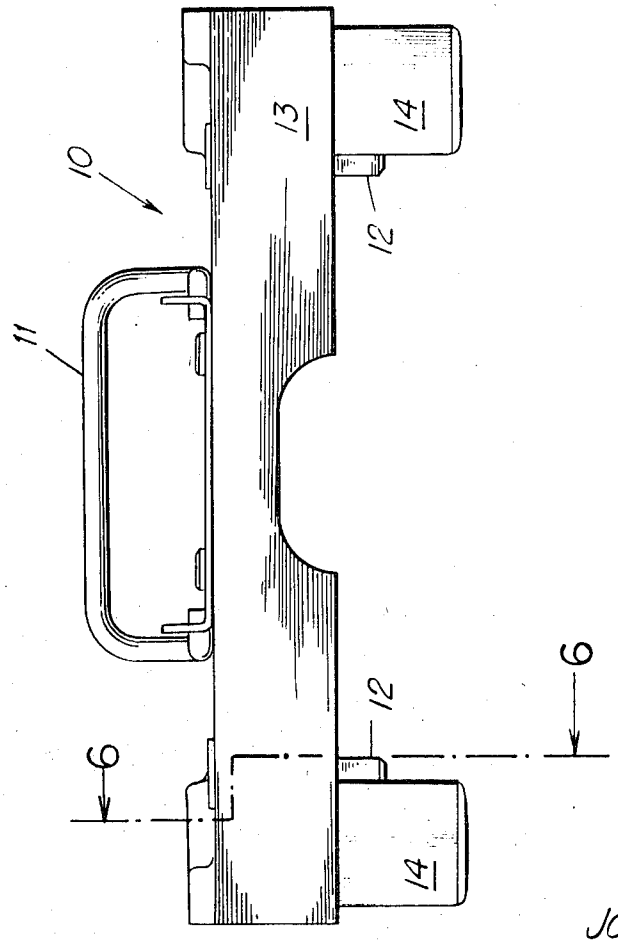


FIG. 5

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FUSE CLAMP

The present invention is concerned with improvements in fuse holder structures for use with cylindrical cartridge fuses of the type having axially protruding flat contact blade terminals. The holder comprises a base member and a fuse-retaining member. The base member is ordinarily secured to an electrical panel and the wires of the circuit to be fuse protected are connected to terminals on the base member. The fuse-retaining member fits within the base member and is provided with clamp means which retain the fuse by its terminal blades and is provided with contact blade members which engage with contact blade-receiving clamp members in the base portion to thereby secure the fuse-retaining member in position in the base member and to establish the electrical circuit through the fuse. The fuse-retaining member may be provided with an electrically insulated handle so that the fuse may be accessed for replacement by pulling the fuse-retaining member out of the base member. The fuse is then removed from the fuse-retaining member and the fuse link renewed or a new fuse cartridge substituted. The fuse retaining member including the new fuse is then returned to its position within the base member.

The manner in which the terminal blades of the fuse are received and gripped in the fuse-retaining member, and the manner in which the fuse-retaining member is received and secured in the base portion are of particular importance to the structure of the present invention. The various elements which perform these functions are arranged to be limitedly movable with respect to each other. This floating arrangement accommodates minor alignment and dimensional variations to improve ease of assembly and to reduce contact resistance heating of the various current carrying parts.

The structure of the present invention will be described with reference to the drawings in which:

FIG. 1 is an elevational view in section taken in the plane 1—1 of FIG. 2,

FIG. 2 is an end view in section taken along the line 2—2 of FIG. 1,

FIG. 3 is a view showing a portion of the underside of the fuse-retaining member,

FIG. 4 is a perspective view of a portion of the fuse-retaining member,

FIG. 5 is an elevational view of the fuse-retaining member, and

FIG. 6 is an end view in section taken along line 6—6 of FIG. 5.

The fuse holder of the present invention comprises a base member **50** and a fuse-retaining member **10**. The fuse **20** is a conventional cartridge-type fuse which has a cylindrical body with axially protruding contact blade portions **21** at either end. Such fuses are frequently designed so as to permit their disassembly for replacement of the fusible link which is enclosed within the cylindrical body of the fuse. The fuse **20** is retained in the fuse-retaining member **10** by means of spring acting clamp members **12** which grip the protruding terminal blade portions **21** of the fuse. The fuse retaining member **10** is provided with contact blades **14** which are received in spring acting clamp members **51** in the base portion **50**. Clamp members **51** are similar in construction to clamp members **12**. Electrical terminals **53** on the base member **50** permit the connection of wiring. The circuit through the fuse is established by electrical contact among the several clamp and blade members.

Each end of the fuse-retaining member **10** includes a spring acting clamp member **12** into which the terminal blade portion **21** of a fuse tightly fits. As is best seen in FIGS. **4** and **6**, the fuse clamp members **12** are secured by means of a screw **18** and nut **16** to protruding contact blade member **14** to form a rigid assembly. This assembly of fuse clamp member **12** and contact blade member **14** is not fastened to the plastic body **13** of the fuse-retaining portion **10**. The assembly is captured within the molded plastic body **13**, but is free to move limitedly with respect to the body **13**. A series of protrusions or lugs **31—33** are molded integral with the plastic body **13** and form therein a reentrant cavity to retain the assembly of the fuse clamp **12** and contact blade **13**. Clearances between each of the protruding members **31—33** and the assembly permit the latter limited movement with respect to the body **13** but prevent withdrawal of the assembly from the body. This limited freedom of movement of the assembly with respect to the body accommodates dimensional variation among fuses and between the fuse-retaining member **10** and the base member **50**. The floating action of the assembly of the fuse clamp and contact blade prevents the transmission of stress or force to the plastic body **13**. Similarly, the self-aligning ability of the various contacting members automatically establishes and preserves the best possible electrical contact. Heating of the contacting parts due to electrical contact resistance is reduced.

The captured nature of the assembly of fuse clamp member **12** and contact blade **14** within the reentrant cavities of the fuse-retaining member **10** necessitates that the parts **12** and **14** of the assembly be individually placed within the body **13** and assembled in place. The individual pieces **12** and **14** can be manipulated into position within the confines of the cavity defined by protrusions **31—33** of the body **13**, but once assembled together with screw **18** and nut **16**, the assembly cannot be removed.

Base member **50** is a boxlike structure into which the fuse-retaining member **10** fits in the manner of a cover or lid. Base member **50** is provided with electrical terminals **53** which may include screws or bolts to which the wiring of the circuit to be protected by the fuse is connected. Terminals **53** are mechanically and electrically connected to clamp members **51** in the base portion and fastened thereto by conventional fastener means such as screw **55**. Terminal members **53** with the associated clamp members **51** are fastened into the base member **50** by means of screws **56** or the like.

The fuse-retaining portion **10** including the fuse **20** is received within base portion **50** and retained therein by the spring action of clamps **51** which frictionally engage contact blades **14** associated with the fuse-retaining member **10**. The fuse-retaining member **10** may include a handle **11** insulated from the current carrying portions of the structure to provide for ease of removal of the fuse-retaining member **10** from the base member **50** when necessary.

Dimensional and alignment variations between the fuse-retaining member **10** and the base member **50** are accommodated by the floating action of the contact blade members **14** which, along with fuse clamp members **12**, are free to float or move with respect to the body **13** of the fuse-retaining member **10**. The structure of the present invention, by virtue of the aforementioned floating action, insures the establishment of low-resistance electrical contacts between the fuse terminal blades **21** and clamps **12** as well as between base member clamps **51** and the contact blades **14** which they receive. This improved self-aligning feature improves electrical contact to reduce heating of the parts and assists in assembly and disassembly of the base with the fuse-retaining portion.

In previously known fuse holder structures the various metal contact pieces are simultaneously assembled together and affixed to the plastic moldings by attachment means such as screws or rivets. The thermosetting plastic-molding compounds employed in the manufacture of such electrical hardware tend to shrink with age thereby causing the assembly to loosen with the result of heat generation due to the increased contact resistance among the loosened pieces. The present invention avoids the consequences of age shrinkage of the plastic by rigidly assembling the metal contact pieces independently of the plastic moldings and affixing the rigid assemblies to the plastic moldings by entrapment within reentrant cavities in the moldings. Later shrinkage of the plastic has no effect upon the integrity of the assemblies.

I claim:

1. In a fuse holder for cylindrical cartridge fuses, said fuse holder comprising a fuse-retaining member and a base

member adapted to receive the fuse-retaining member, the fuse-retaining member having a pair of fuse clamp members adapted to spring engage the terminal ends of the fuse, the improvement which comprises associating the fuse clamp members with the fuse-retaining member by capture within reentrant cavities in the fuse-retaining member with clearance such that the fuse clamp members are permitted limited freedom of movement with respect to the fuse-retaining member, the fuse clamp members each comprising a rigid assembly of a fuse-engaging spring member and a further member, the assemblies being larger than the entrance of the reentrant cavities.

2. The fuse holder of claim 1 wherein the reentrant cavities of the fuse-retaining member each include a plurality of projecting lugs which overlie portions of each of the fuse clamp members to capture them within their cavities.

3. The fuse holder of claim 1 wherein the fuse-retaining member is provided with blade contacts electrically connected to said fuse clamp members and the base member is

provided with spring acting clamp members adapted to engage said blade contacts to thereby retain said fuse-retaining member within said base member, said base clamp members being electrically connected to wiring terminals on said base members.

4. The fuse holder of claim 3 wherein the blade contacts and the fuse clamp members are rigidly assembled together and that assembly is captured within the reentrant cavity.

5. The fuse holder of claim 4 wherein the reentrant cavities of the fuse-retaining member each include a plurality of projecting lugs which overlie portions of the rigid assemblies of blade contacts and fuse clamp members to capture the rigid assemblies within the cavities.

6. The fuse holder of claim 5 wherein the fuse to be held is a cylindrical cartridge fuse having axially extending terminal blades and the fuse clamp members are shaped so as to spring engage the terminal blades of the fuse.

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