March 20, 1928.

1,663,333

J. H. CARMEAN

FUSE

Filed Nov. 2, 1925

Fig. 1.

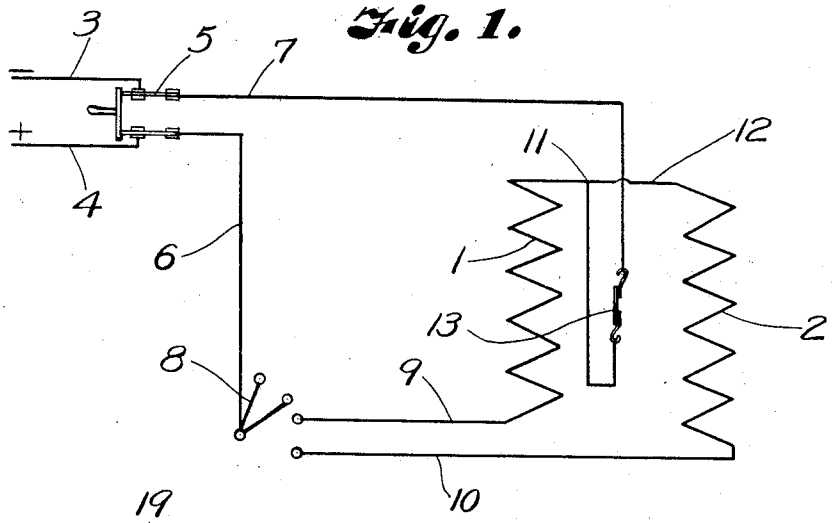


Fig. 2.

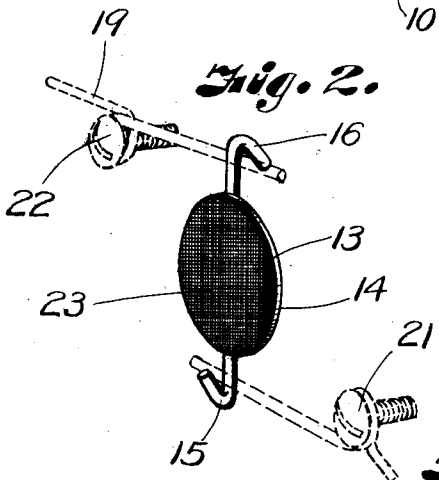


Fig. 3.

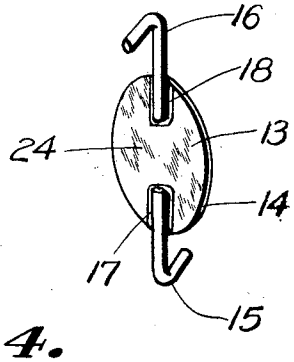
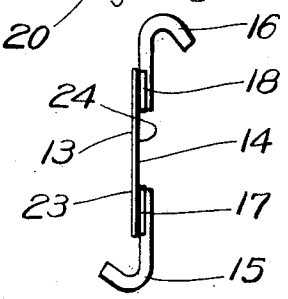


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES H. CARMEAN, OF KANSAS CITY, MISSOURI.

FUSE.

Application filed November 2, 1925. Serial No. 66,358.

My invention relates to an electric fuse and more particularly to one of that type adapted to function by absorption of heat from external sources, the principal object of the invention being to provide a fuse adapted for operation between two or more heating resistances, such as in an electric heater where two or more heat units are so employed as to operate independently of each other, or together for providing the degree of heat desired.

In accomplishing this and other objects of the invention I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings wherein:—

Fig. 1 is a diagrammatic view of two heating coils and their electric circuit, illustrating an adaptation of a fuse embodying my invention.

Fig. 2 is a detail perspective view of the fuse, showing its mounting in dotted lines.

Fig. 3 is a detail perspective view of the fuse from the side opposite that illustrated in Fig. 2.

Fig. 4 is a side elevational view of the fuse.

Referring more in detail to the drawings, 1 and 2 designate heat units comprising electric resistance coils receiving energy from an ordinary house lighting circuit comprising feed wires 3 and 4 connected by a switch 5 to the coil leads 6 and 7, the lead 6 being connected to a two point switch 8 adapted to connect the coils into circuit through wires 9 and 10 leading from the lower ends of the coils. The lead 7 is connected as at 11 to a wire 12 joining the other ends of the coils so that the coils are connected in parallel and either one or both of the coils may be energized, depending upon the position of the switch 8. Thus, if the switch is moved so that its first contact is in position to connect the wire 9, the coil 1 is in operation and the coil 2 is out of the circuit, but if the switch is moved so as to connect both wires 9 and 10 to the lead 6, both coils are in circuit to generate heat.

To prevent damage to the heater from excessive heat, a fuse 13, constructed according to my invention, is interposed in the lead 7 and preferably mounted between the coils 1 and 2 as illustrated in Fig. 1. The fuse comprises a metallic disk 14 carrying hooked terminals 15 and 16 fixed to the disk at diametrically opposite points by a fusible solder as at 17 and 18. The terminals of the disk may be connected to the wire 7 in any preferred manner, but I prefer to employ spring arms 19 and 20, the ends of which are fixed to screws or terminals 21 and 22 in electrical connection with the lead 7, and the free ends of the arms are spaced apart a greater distance than the length of the fuse, so that when the hooked terminals are applied to the arms as shown in Fig. 2, the arms will be put under tension to cause firmer contact between the terminals and the arms, and when the fusible material 17 and 18 is melted, the spring tension will help to pull the hooked terminals from the disk to break the circuit.

The fuse is so constructed that its fusing point is entirely under control of the coil 1, so that when both coils are in operation the coil 2 has no effect upon the fusing point of the fuse. This is accomplished by providing the face of the disk adjacent the coil 1 with a blackened and roughened surface 23, and the opposite face adjacent the coil 2 with a highly polished surface 24, so that it will readily absorb heat from the coil 1 but will reflect heat from the coil 2. This is an important feature, for if the fuse were so designed as to operate efficiently with the first coil in operation and the reflecting surface not provided, the fuse would "blow" upon the second coil coming into circuit, due to the fuse absorbing additional heat from the second coil, and if the fuse were so designed as to receive this additional heat without fusing, it would not "blow" when the first coil became overheated in operation independently of the other coil.

The fuse constructed as described, operates as follows:

Supposing the coil 1 is the only coil in operation, the disk absorbs heat from the coil, but under normal conditions not enough to melt the connections 17 and 18, but if an excessive amount of current flows through the coil or if it be in operation for too long an interval, the excessive heat will "blow" the fuse and interrupt flow of current to the coil, preventing damage to the heater.

If both coils are put into circuit, the additional heat from the second coil will not be absorbed by the fuse, but will be reflected

therefrom by the polished surface, and the fuse will continue to operate as if only the one coil were in circuit.

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

A cut-out element connecting terminals in an electrical heating circuit, comprising resilient members engaged with the terminals, and a link comprising a disk having opposite heat-reflecting and heat-absorbing surfaces and hooks fusibly attached to the disk and engaged with said resilient members, the hooks being tensioned by said members towards separation from said disk.

In testimony whereof I affix my signature.

JAMES H. CARMEAN.