

E. L. GRAUEL.
FUSE SUPPORTING CONNECTION.
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972,362.

Patented Oct. 11, 1910.

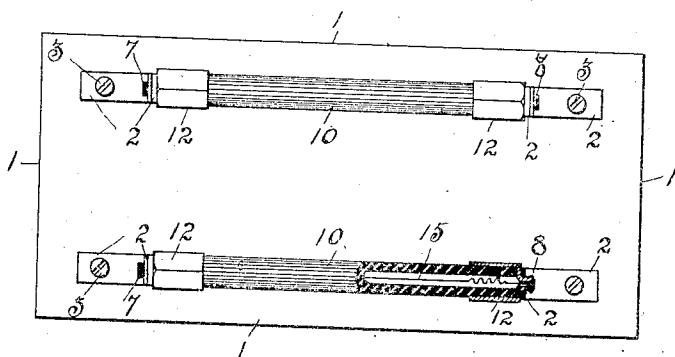


Fig. 1

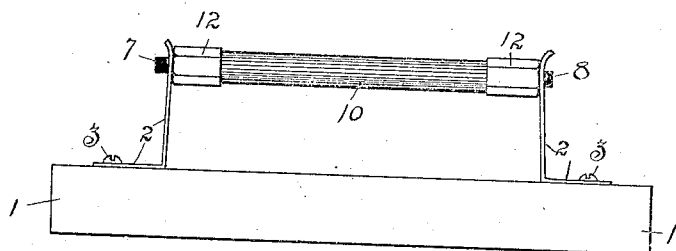


Fig. 2.

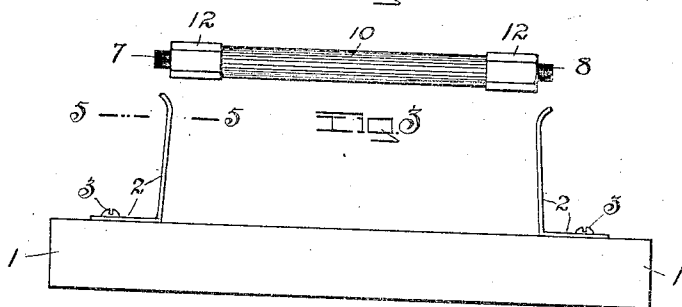
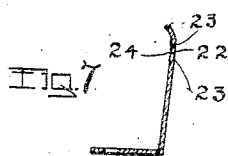


Fig. 3



WITNESSES

J. Donsbach
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Fig. 4

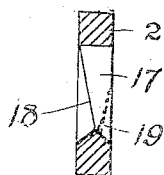


Fig. 5

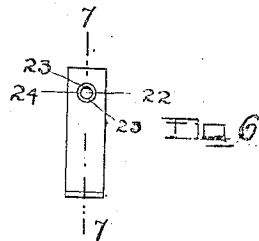


Fig. 6

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UNITED STATES PATENT OFFICE.

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FUSE-SUPPORTING CONNECTION.

972,362.

Specification of Letters Patent. Patented Oct. 11, 1910.

Application filed February 8, 1910. Serial No. 542,732.

To all whom it may concern:

Be it known that I, EDWIN L. GRAUEL, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Fuse-Supporting Connections, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

The object of the invention is to provide a simple, cheaply constructed and easily operated supporting mechanism for an electric-fuse which will insure a stable contact between the fuse and the conductors which it is intended to connect by the interposition of a safety fuse.

The invention consists of an electric-fuse with metallic terminals in the form of screw-threaded lugs, one terminal being screw-threaded to the right and the other terminal to the left, and a pair of yielding plate-like conductors, a portion of each conductor being thinner than the space between the screw-threads on the lugs, such thin portions being apertured, and the aperture-walls screw-threaded to receive and fit the threaded lugs, whereby the yielding plate-like conductors can be sprung apart to insert the ends of the lugs in the plate-apertures, and by turning the fuse the threaded lugs will enter the plate-apertures and draw the conductors into stable contact with metallic shoulders at the inner ends of the lugs, as hereinafter more fully described and subsequently pointed out in the claims.

Various forms of spring-clips have been employed to connect fuse-terminals with line-conductors, but it frequently happens that such mechanism is subjected to vibratory forces which impair such conductors, especially in telephone lines, causing the chattering or unpleasant noise in the receiver. By having such connections composed of screw-threaded parts which insure solid and permanent contact between the fuse-terminals and conductors, such objectionable features are wholly avoided.

I have ascertained that by employing plate-like conductors thinner at some portions than the space between the screw-threads on the fuse-terminals, such conductors can be apertured and screw-threaded at such thin portions to receive and fit either fuse-terminal, whether screw-threaded to the right or to the left. Such an arrangement greatly facilitates the operation of changing fuses, or inserting a new fuse for one blown out, as it makes no difference which fuse-terminal is inserted in either of the terminal-receiving apertures.

When the plate-like conductor containing the apertures is thinner than the space between two threads, it is obvious that a whole thread, that is, a thread making a complete circuit of the aperture, cannot be inserted in the aperture-wall, therefore the threads of the screw-threaded lug inserted in such aperture will catch and coact with the aperture-thread, whether the thread on the lug or terminal is cut to the right or the left.

By having the lugs provided one with a right and the other with a left-hand thread, it is only necessary to rotate them by rotating the fuse-body to which they are connected to insert such lugs in the threaded aperture and draw the plates and lug-shoulders into solid and permanent contact without the use of detachable screw-threaded nuts adapted to be screwed onto the ends of the lugs which project through the plate-like conductors.

Referring to the drawings,—Figure 1 is a top-plan view of an insulator-block having a pair of electric-fuses supported by electric-conductors by means of my improved supporting connections, one of the fuse-bodies being shown partly in central longitudinal section. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of the fuse-body detached from the conductors. Fig. 4 is a view similar to that shown in Fig. 2, with the fuse-body detached. Fig. 5 is a horizontal cross-section of one of the plate-like conductors, taken on the broken line 5—5 in Fig. 4, shown upon an enlarged scale. Fig. 6 is a front elevation of one of the plate-like conductors, detached, showing a modified form of screw-receiving aperture. Fig. 7 is a vertical section of the same, taken on the broken line 7—7 in Fig. 6.

1 is an insulator-block which may be made of porcelain or other insulating mate-

rial. The conductor-terminals, 2, preferably made of sheet-metal strips bent to form a right angle, are secured to the block as by the screws 3, and connected in any known manner with the line-conductors (not shown). The terminals, 4, similar to the terminals 2, are secured to the block as by screws, 5, and may be connected with installation-lines (not shown) in any known manner. The upper ends of the upright portions of the terminals 2 and 4 are apertured near their upper ends, and screw-threaded, as shown in Fig. 5, to receive the screw-threaded lugs, 7 and 8, which constitute the fuse-terminals. The fuses are composed of a tubular insulating body-part, 10, provided at each end with a metallic cap, 12, shown octagonal in cross-sectional form for the purpose of receiving a wrench to rotate the same. The caps are provided at their outer ends with trunnions or lugs, 7 and 8.

The fusible wire, 15, passes through the body 10, as seen in Fig. 1, and into the lugs 7 and 8, which are made hollow to receive the ends of the fuse-wire, each end having an electric-connection with one of the lugs, which may be formed by a drop of solder inserted through the outer ends of the apertures in the lugs. The lug 8 is screw-threaded to the left, that is, in a direction which requires the lug to be turned toward the left hand of the person facing the screw-threaded aperture, and the lug 7 is screw-threaded to the right, that is, in a direction which requires the lug to be turned toward the right hand of the person facing the screw-threaded aperture. It is obvious, therefore, that when the body 10, or the caps 12, are rotated in one direction, both the lugs will at the same time enter the screw-threaded apertures in the uprights 2 and 4, and when the fuse-body is turned in the opposite direction the lugs will be withdrawn from the uprights 2 and 4.

In Fig. 5, which is made on a large scale, is shown one of such screw-threaded apertures, 17, the screw-thread on the lower side of the aperture being represented by the solid line 18, and the screw-thread on the upper side of the aperture being represented by the dotted line 19. It is obvious from an inspection of this Fig. 5 that the thread 18 does not make a complete circuit of the aperture, thereby permitting the lug, screw-threaded either to the left, or the right, to be inserted therein by turning the same in the proper direction.

I have ascertained that when the plate-like conductors are made of exceedingly thin plates, or when the screw-receiving apertures therein are countersunk, it is not necessary to insert a tap in such apertures to produce threads for receiving the screw-threaded terminals of the fuse. I have shown in Figs. 6 and 7 such modified form of construction,

wherein the aperture 22 is countersunk on each of the opposite sides of the plate, thereby forming the beveled surfaces 23 and the extremely thin edge 24 surrounding the aperture. It is unnecessary to insert a screw-threading tap in such an aperture to adapt it to receive the right and left threaded fuse-terminals. The threads on such terminals will themselves produce the necessary conformation of the aperture-walls to cause such walls to coact with the screw-threads on the fuse-terminals. Such coaction of the parts causes the yielding conductors to approach each other, or recede, as the fuse-body is turned either in one direction or the other, in the same manner that thicker aperture-walls would do if they had been previously tapped and provided with screw-threads to correspond with the threads on the fuse-terminals. The yielding conductor-plates 2, are preferably formed of resilient metal, and normally extend convergently upward, as shown in Fig. 3, with their upper ends a distance apart somewhat less than the total length of the fuse, including the end-lugs 7 and 8. The upper ends of the conductor-plates thus require to be forced apart to permit the fuse to be introduced between them, and as soon as the lugs are brought opposite the respective apertures in the plates, 2, the resilient force of the plates will cause the screw-threads on the lugs to quickly bite or grip the walls of the apertures in the respective conductor-plates, and the farther said lugs are screwed into said apertures the greater will be the bite or grip of the screw-threads on the walls at the top and bottom of the apertures, due to the fact that the plates are drawn toward each other to a constantly increasing degree of obliqueness. By reason of the normal convergence of the plates, the screw-threaded lugs are not only caused to grip the walls of the apertures more quickly, but will effectively grip such walls even after the apertures have become considerably worn and enlarged by wear.

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

1. The combination with a pair of electric-fuse terminals consisting of metallic lugs, screw-threaded, one to the right and the other to the left; of a pair of yieldingly supported conductors apertured to receive and coact with the threaded lugs, respectively, and form stable contacts.

2. The combination with a pair of electric-fuse terminals consisting of metallic lugs, screw-threaded, one to the right and the other to the left; of a pair of yielding plate-like conductors, a portion of each conductor being thinner than the space between the screw-threads on the lugs, such thin portions being apertured, and the aperture-walls threaded to receive and fit the threaded lugs.

3. The combination with a fuse having:

oppositely screw-threaded terminals; of a pair of convergently arranged yielding resilient conductor-plates apertured to receive and coact with said terminals, respectively, and
5 supported with their apertured portions normally separated by a space less than the length of said fuse.

In testimony whereof, I have hereunto set my hand this 5th day of February, 1910.

EDWIN L. GRAUEL.

Witnesses:

I. S. FREEMAN;

W. J. GORMAN.