

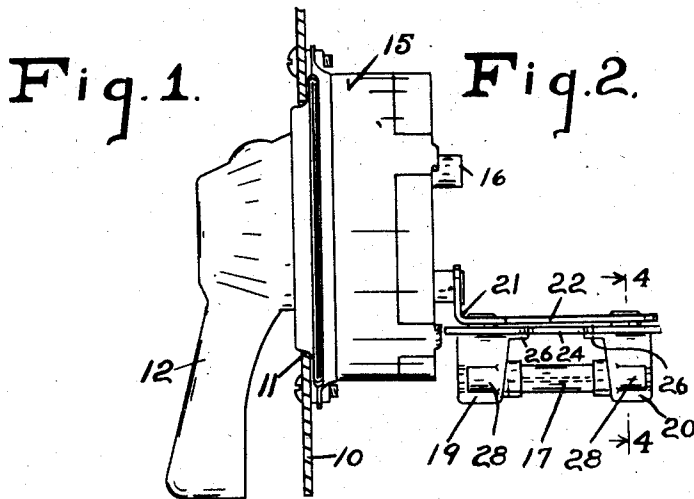
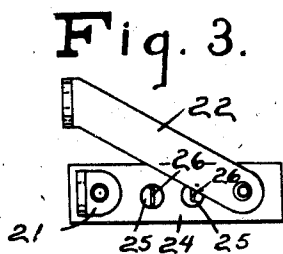
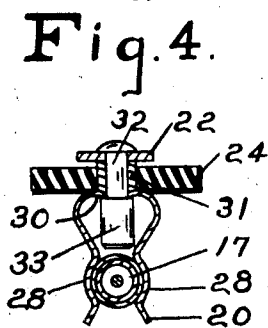
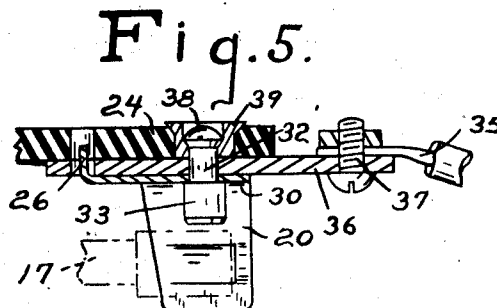
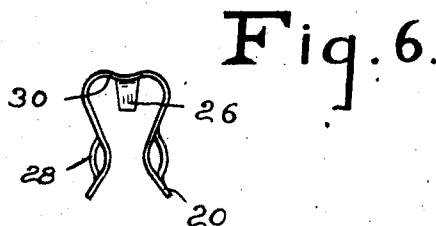
July 27, 1926.

1,593,738

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FUSE MOUNTING

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UNITED STATES PATENT OFFICE.

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FUSE MOUNTING.

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This invention relates to improvements in fuse mountings, and particularly to the art of providing suitable mountings for fuses in conjunction with the casings of switches, such as are commonly employed to control the relatively low voltage circuits of motor vehicles.

It has become common to centralize the instruments of a motor vehicle within a relatively small compass on the dash or control board thereof. This has led to congestion in the tubes, wires, rods, etc., leading to the control board and it is one of the primary objects of this invention to provide a fuse mounting such that a fuse may be conveniently and removably supported at the rear of a control board of a motor vehicle without materially interfering with the disposition of wires or other control members leading to such board.

One type of centralized control which has come into particularly common usage involves the provision of a single switch casing to which lead all of the wires controlling the electrical circuit of the vehicle. For example, the wires included in circuits leading to the sidelights, headlights, dimming resistances, tail-light, battery, generator, and horn, may all be led to a single switch casing on the control board of the vehicle. It is very desirable to have a fuse included in one or more of these circuits and have that fuse mounted rigidly in an accessible position sufficiently close to the terminals of the switch casing so that little or no additional wiring is necessary to connect the fuse with such terminals. Attempts have hitherto been made to fasten the fuse-retaining clips, directly to the terminals, in such a manner that the fuse might be positioned parallel to the rear face of the switch to extend from one of such terminals to another across the face of the switch. In this position, however, the fuse has frequently interfered seriously with the proper disposition of wires leading to the several terminals on the switch. It is, therefore, more specifically the object of this invention to provide a rigid mounting for the fuse, maintaining it in direct connection with the switch terminals without the interposition of wiring and yet so to support the fuse that it will project along a line normal to the face of the switch casing and will therefore interfere, to a minimum degree, with

access to the individual wires leading to the casing.

The disposal of the fuse on a line normal to the rear of the switch casing, not only renders more accessible the wires leading to said casing but also makes it extremely easy to reach the fuse itself. Hitherto, when a fuse has required replacement, it has frequently been necessary for the operator to reach into the darkness behind his dash board and feel his way through a maze of wiring to the fuse. In so doing, the operator has frequently hitherto disturbed the wiring to such an extent as to loosen connections therein. It is one of the objects of this invention to mount the fuse in such a manner that it will be instantly accessible adjacent the lower portion of the switch and below the paths of the wires leading to the switch casing. To connect the fuse terminals directly through their supports with the switch terminals in such a manner that the fuse may be rigidly supported for ready removal and replacement is a further object satisfied by the invention hereinafter to be disclosed.

The life of a fuse clip is frequently shortened by the manner of its assembly upon a member designed for the support thereof or by its usage in service. The spring clips which retain the fuses can conveniently be riveted in place or secured in some like manner. The securing operation, however, usually involves the introduction of a tool between the resilient members of the clip, whereby such members are spread and tend to become displaced from their original positions to such an extent that they are no longer in position to act with sufficient pressure upon an interposed fuse. It is necessary subsequent to such an operation to restore the members of the clip to their original positions by bending them sharply toward each other and each such extreme bending weakens them and tends to produce crystallization. The same result may occur if the fuse is pressed too far into the clip when the clip is in use and means is provided by this invention to avoid both of the above abuses of fuse clips. More specifically stated, it is my object so to construct a spring clip that when it is secured in place by riveting, or in some like manner, it will assume a normal and proper position to receive a fuse without any subsequent bend-

ing operation. It is furthermore one of the objects of this invention to extend into the clip the rivets by which the clip is secured, the extensions on such rivets being adapted to act as stops to limit the inward movement of the fuse and thereby to prevent the clip from being injured in service.

In the drawings:—

Figure 1 is a side elevation of a standard type of switch mounted in a dash or control board and provided with an improved fuse mounting embodying this invention.

Figure 2 is a rear view of the switch casing shown in Figure 1 and the fuse mounting applied to such casing.

Figure 3 is a detail view, in plan, of the embodiment of the improved fuse mounting which is shown in Figures 1 and 2.

Figure 4 is a section taken on line 4—4 of Figure 1.

Figure 5 is an enlarged detail on a central longitudinal section, illustrating a modified form of clip mounting.

Figure 6 is a detail view of an individual clip prior to its attachment to a support with which it comprises a fuse mounting.

Like parts are identified by the same reference characters throughout the several views.

The dash or control board 10 is provided with an aperture 11 to receive the switch operating handle 12. The switch and switch casing forms no part of the present invention and may take any desired form. The switch assembly is designated in its entirety by the reference character 15. As indicated in Figure 2, it is provided on its rear face with a plurality of terminals 16 to which the various wire leads may be attached.

It is immaterial to this invention, in its broader aspects, between which of the terminals 16 the fuse 17 is connected. The important feature consists in the arrangement whereby the clips 19 and 20 for the metallic contacts at the ends of fuse 17 are directly supported by means of metallic brackets 21 and 22 from the switch terminals 16 between which the fuse is to be connected and that such clips are spaced from each other in such a manner that a fuse retained within the clips will be disposed along a line extending forwardly and rearwardly through the device. The fuse, although in its preferred position it stands substantially normal to the rear face of the switch casing, nevertheless receives its entire support from the conductors which connect it to the switch terminals. It will be noted that the bracket member 21 comprises a very small L-shaped fitting mounted upon that terminal of the switch casing marked "Bat" in the drawing. Similarly, the bracket member 22 includes a short arm mounted on that terminal 16 which is marked "Horn" in Figure 2 and a longer arm in-

tegrally connected with the shorter arm and extending directly outwardly therefrom and at an angle laterally toward the vertical longitudinal plane, including fitting 21. Thus the longer bracket 22 is made to terminate immediately ahead of bracket 21 and substantially in the plane thereof.

The clips 19 and 20 are mounted respectively on bracket members 21 and 22 and are electrically and mechanically connected thereby with the switch contacts referred to. At the same time they are spaced from each other and are so maintained by the brackets so that a fuse engaged within said clips will be operative for the purposes for which it was designed. Obviously the particular shape of the bracket will depend upon the question as to which of the several contacts 16 are to be interconnected by the fuse. If desired, the clips 19 and 20 and the terminal portions of the brackets carrying such clips may be spaced rigidly from each other by means of a strip 24 of fiber interposed between each clip and its supporting bracket and provided with apertures at 25 adapted to receive bent-over portions of the fingers 26 which are connected respectively with clips 19 and 20. The engagement of the bent portion of such fingers with the strip of fiber 24 serves to maintain the clips in the desired alignment with each other, even though each clip is secured by a single rivet to its respective support. The mechanical engagement of the fingers 26 would obviously be the same whether or not the apertured strip engaged was made of di-electric material.

Where the fiber is interposed the preferred means of attaching the clip to its support is illustrated in Figure 4. The clip 20, which retains fuse 17, is formed to provide a pair of spaced resilient arms having intermediate concave portions 28 adapted to engage a cylindrical fuse device of the ordinary type. The arms of the clip are integrally connected by a bowed and centrally apertured portion 30. The reason for making this centrally apertured portion arcuate lies in the fact that I have found that thereby, when the riveting pressure is applied to the clip and this arcuate portion 30 thereof is flattened, the arms which embrace the fuse are brought resiliently toward each other and tend to assume operative fuse engaging positions when the riveting tool is withdrawn from between them.

It is very desirable to have a rigid and permanent metallic connection between the bracket member 21 or 22 and the clip 19 or 20. For this reason the fiber strip 24 (which swells and shrinks in accordance with the humidity to which it is exposed) is not relied upon as a spacer between the ends of the rivet. On the contrary, a sleeve 31 is passed through the fiber strip 24 and serves

to space clip 20 or 19 from the bracket 22 or 21. The rivet 32 extends through the bracket, sleeve 31, and the aperture in portion 30 of the clip and is shouldered for engagement with the clip when the rivet is headed as indicated in Figure 4. The portion 30 of the clip is compressed to spring the arms thereof together in the manner above described. The sleeve 31 is preferably approximately 1/64 of an inch longer than the thickness of the fiber strip 24, whereby to permit swelling and shrinkage of the strip. This construction makes it possible to use effectively the fiber bracing member 24 without exposing the device to the disadvantages which would ordinarily be present if the fiber member were relied upon to receive compression between the ends of the rivet.

The rivet is preferably provided with an extension 33 projecting between the arms of the clip to the immediate proximity of the convex portions 28 of such arms. This extension makes it unnecessary to introduce a riveting tool as far between the arms of the clip as would otherwise be necessary and also performs a very important function in limiting the degree to which a fuse 17 may be pressed between said arms.

The Figure 5 construction illustrates the manner in which a conductor 35 may be connected directly to one of the fuse terminals which, in such an event, may be insulated entirely from the contacts on the switch casing. In other words, the supporting arm 22 may be dispensed with and the fiber strip 24 may be made sufficiently strong to carry the outer clip 20 and the weight of the fuse. To permit a conductor to be directly connected with clip 20, a metallic strip 36 is interposed between the portion 30 of the clip and the fiber plate 24. The metallic strip 36 extends outwardly beyond the fiber and is there apertured to receive a securing bolt 37 by means of which the conductor 35 may be attached thereto. At another point the strip 36 is apertured to receive the tail portion 26 of the clip, such portion being bent inwardly as illustrated to secure the clip against rotation. A corresponding aperture may be made in the fiber member 24, in such manner that the clip, the strip 36, and the fiber will all be fixed against relative rotation about the axis of the single rivet which secures them together. The rivet 32' corresponds in general to that described above but, in the Figure 5 embodiment of this invention, the upset end of the rivet is preferably received within a recess 38 in the bushing 39. This bushing passes through an aperture in the fiber support 24 and is preferably provided with a tapered head in engagement with the fiber as indicated. The rivet 32' holds the clip, the metallic strip 36, and the bushing, in rigid connection. The peculiar shape of the bushing tends to maintain the metallic

parts above described in rigid connection with the fiber member 24, despite any swelling or shrinking which may occur in such member.

Thus it will be seen that either the fiber member 24 or a metallic bracket, similar to that shown at 22, may be relied upon in whole or in major part for the support of the forward end of the fuse from the switch casing. The use of the metallic bracket is of advantage where the outer end of the fuse is to be connected to a contact terminal on the casing. But the fiber support is of obvious advantage where the outer end of the fuse is to be attached to an independent conductor, such as shown at 35.

The particular type of switch casing or switch assembly which is here indicated is adapted to be secured to the inner or forward side of the dash or control board 10 and consequently must be inserted into aperture 11 from the inside of said board. There are many types of switch assemblies, however, which are introduced into the board aperture from the forward side thereof and in such devices the fuse mounting herein described will be found to be of particular advantage, since the fuse mounting projects from the switch casing in such a manner as to be readily introduced through the dash opening in advance of the switch casing and without interference with any of the numerous wires or conductors attached thereto.

In any event, the fuse is supported in such a manner that it interferes to no appreciable extent with the conductors leading to the casing. Furthermore, it is rigidly supported in a position where it is remarkably accessible to a person reaching beneath the lower margin of the dash or control board 10 and the construction may readily be adapted for service either to connect both ends of the fuse with switch contacts without extraneous wiring or to connect the outer or forward end of the fuse with an independent lead. It will be obvious, therefore, that the device herein disclosed satisfies the objects of this invention as hereinbefore specified.

I claim:

1. In a device of the character described, the combination with a switch casing adapted to be mounted behind a vehicle dash board in a compartment to which access is had from below, of a set of fuse clips individually connected with and supported from said casing and each including a pair of resilient fuse engaging arms opening downwardly and spaced from each other in substantially a horizontal plane whereby a fuse positioned in said clips may be inspected without removal of said casing from such a compartment and may readily be removed and positioned in said arms.

2. In a device of the character described,

- the combination with a switch casing provided with a plurality of electrical terminals upon one face thereof, of a first fuse engaging clip provided with a metallic support connecting it with one of said terminals, and a second fuse engaging clip operatively aligned with said first mentioned clip and at a greater distance from said casing and provided with a metallic support directly connecting it with another of said terminals.
3. In a device of the character described, the combination with a switch casing provided with a plurality of electrical terminals upon one face thereof, of a first fuse engaging clip provided with a metallic support connecting it with one of said terminals, and a second fuse engaging clip operatively aligned with said first mentioned clip and at a greater distance from said casing and provided with a metallic support directly connecting it with another of said terminals, together with a fiber strip connected with each of said clips and adapted to brace said supports from each other.
4. In a device of the character described, the combination with a switch casing, of a fuse normal to a face of said casing, and supports for the ends of said fuse connected independently with said face of said casing.
5. In a device of the character described, the combination with a switch casing having electrical terminals on a face thereof, of a conducting bracket arm mechanically and electrically connected with one of said terminals, a fuse clip supported from said arm and electrically connected therewith, a second conducting bracket arm mechanically and electrically connected with another of said terminals, and a second fuse clip electrically connected with said second bracket arm and supported thereby in operative alignment with said first mentioned clip on a line extending forwardly and rearwardly through said casing.
6. In a device of the character described, the combination with a support, a fuse clip having a base portion, and laterally spaced resilient arms provided with portions adapted to receive and frictionally engage a fuse, and a securing device connecting the base of the clip to said support and providing a stop projecting intermediate said arms to an extent greater than its width as measured along a line connecting said arms whereby to limit the movement of a fuse between said arms without impairing the freedom of resiliently yielding movement of said arms.
7. In a device of the character described, the combination with a support, a fuse clip having a base portion and laterally spaced resilient arms provided a substantial distance above said support with portions adapted to receive and frictionally engage a fuse, and stop means extended from the base of the clip and elongated to extend from the base of the clip and elongated to extend to a point in proximity to said fuse receiving portions to limit the insertion of a fuse therebetween.
8. In a device of the character described, the combination with a switch casing provided with a terminal on one of its faces, of an elbowed bracket connected with said terminal, a fuse clip connected with said bracket, an insulating strip extending from said clip and bracket away from said casing, and a second fuse clip connected with said strip in operative alignment with said first fuse clip and remote from said casing.
9. In a device of the character described, the combination with a switch casing provided with a terminal on one of its faces, of an elbowed bracket connected with said terminal, a fuse clip connected with said bracket, an insulating strip extending from said clip and bracket away from said casing, and a second fuse clip connected with said strip in operative alignment with said first fuse clip and remote from said casing, each of said clips being disposed below said insulating strip and opening downwardly therefrom.
10. In a device of the character described, the combination with a pair of brackets in spaced relation, and fuse clips electrically connected with said brackets and depending respectively therefrom in mutual alignment, of non-conducting means for the support of said brackets.
11. In a device of the character described, the combination with a set of brackets, of fuse retaining clips supported from said brackets in mutual alignment, and a single securing means operatively fastening each clip to its respective bracket in spaced relation thereto.
12. In a device of the character described, the combination with a set of brackets, of fuse retaining clips supported from said brackets in mutual alignment, and a single securing means operatively fastening each clip to its respective bracket in spaced relation thereto, together with a di-electric strip extending in the space between each clip and its respective bracket and apertured to receive said securing means.
13. In a device of the character described, the combination with a support, of a fuse clip provided with a base portion abutting said support, laterally spaced resilient arms extending above said base portion and provided with concave surfaces adjacent their extremities adapted to receive a fuse, and a securing device connecting said base portion and said support and comprising a shank extending through said base portion and support, and an elongated head extending upwardly between said arms to a position such as to be adapted to serve as a stop

for a fuse pressed between said arms beyond said concave portions, said head being of predetermined length and provided with a shoulder in direct contact with said base whereby to be adapted for use as a stop irrespective of the thickness of any other parts of the device.

14. In a device of the character described, the combination with a support, a fuse clip having a base portion and laterally spaced resilient arms provided with portions adapted to receive and frictionally engage a fuse, and a securing device connecting the base of the clip to said support and providing a cylindrical extension between said arms to abut a fuse introduced therebetween to limit its insertion.

15. As a new article of manufacture, a fuse clip provided with spaced resilient arms and an intermediate portion connecting said arms and upwardly bowed into the space be-

tween said arms, the lateral margins of said intermediate portion being free to flex, whereby securing means applied to said intermediate portion will flex said portion in a direction to spring said arms toward each other.

16. In a device of the character described, the combination with a fuse clip having a base and laterally spaced resilient arms provided with concave portions adapted to receive and frictionally engage a fuse, of a stop secured with reference to said base and having a portion in contact therewith, said stop being of predetermined length and extending between said arms to limit the movement of a fuse therebetween, whereby to prevent a fuse from being pressed beyond said concave portions to the injury of said arms.

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