April 25, 1933. J. SACHS 1,905,004

FUSE DEVICE

Filed June 10, 1932 3 Sheets-Sheet 1

Fig. 1

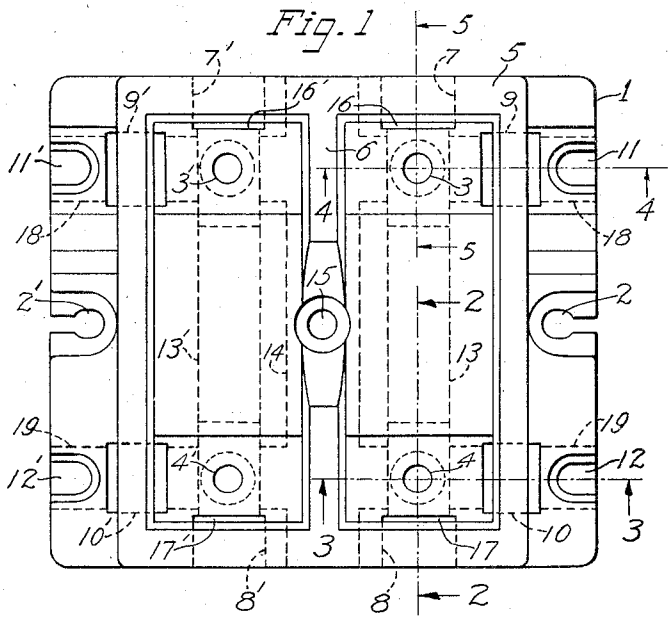


Fig. 2

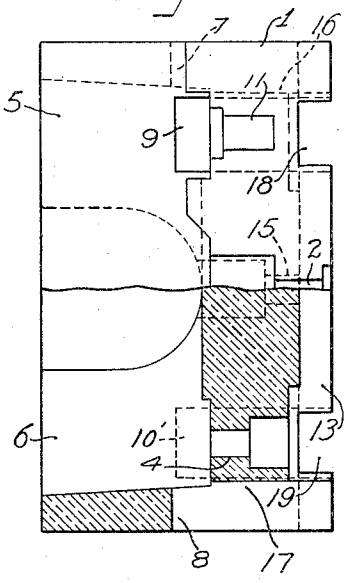


Fig. 4

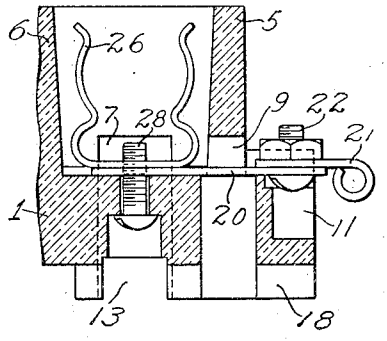


Fig. 3

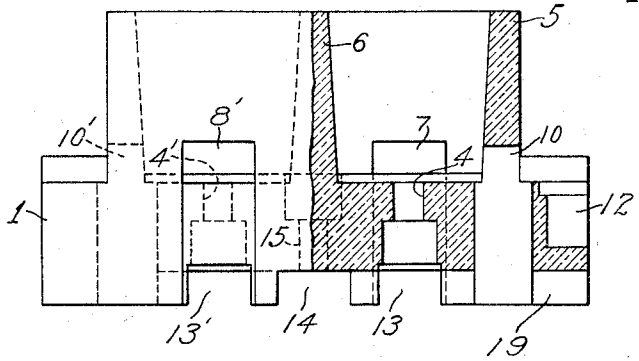
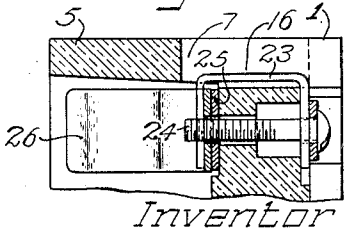


Fig. 5



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Fig. 6

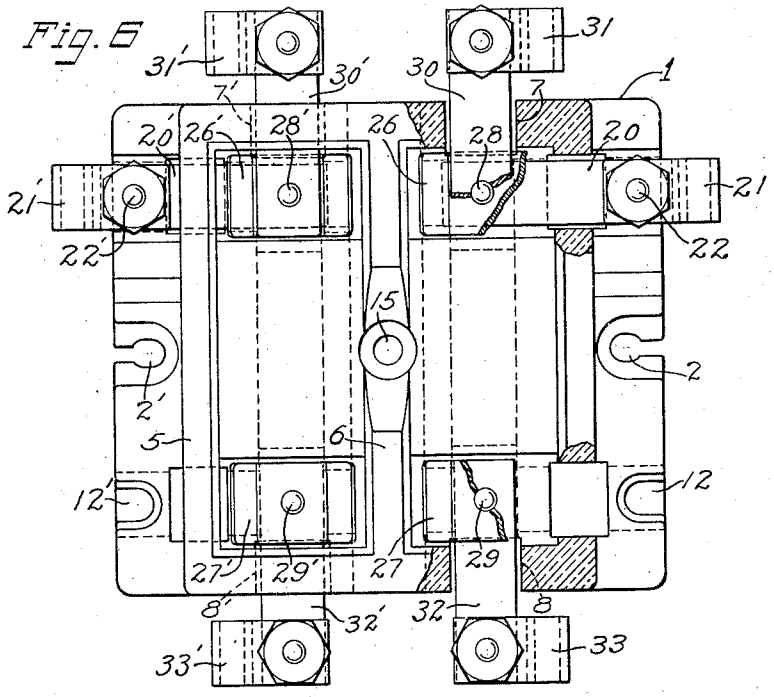


Fig. 7

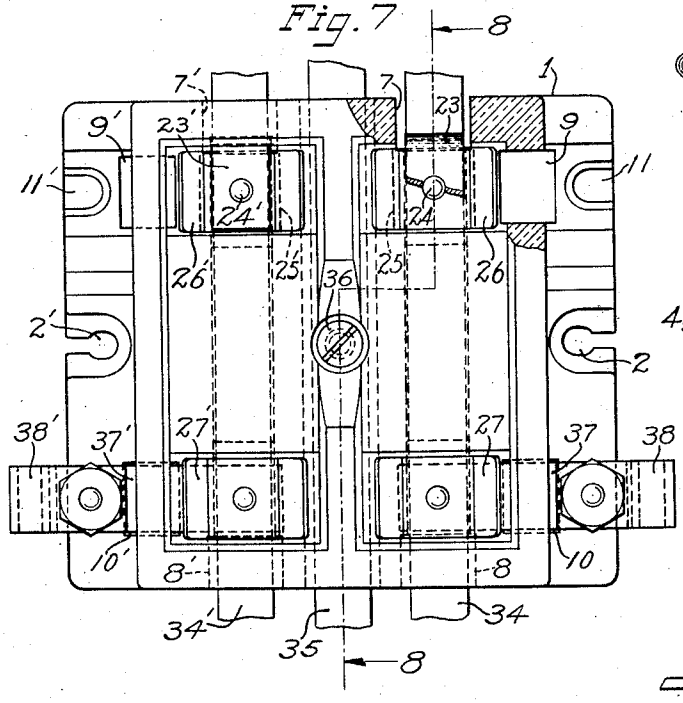
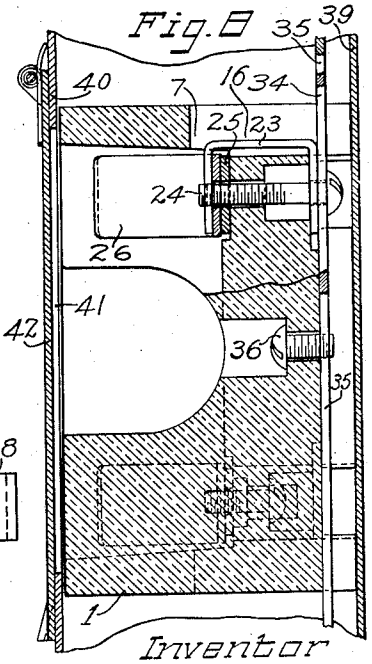


Fig. 8



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FUSE DEVICE

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Fig. 9

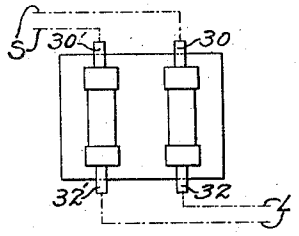


Fig. 10

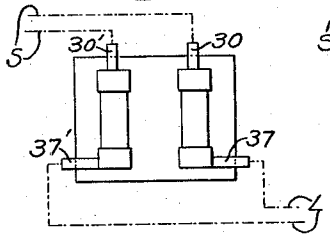


Fig. 11

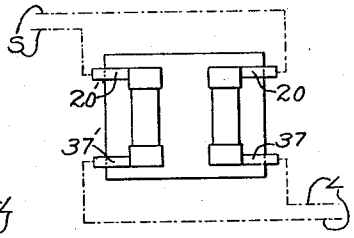


Fig. 12

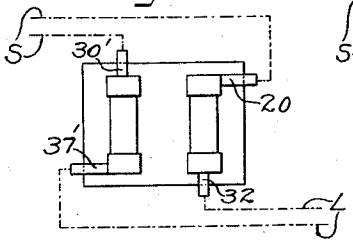


Fig. 13

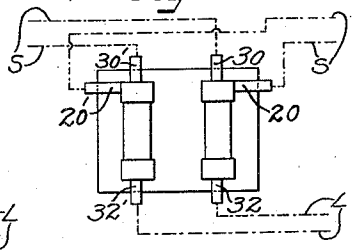


Fig. 14

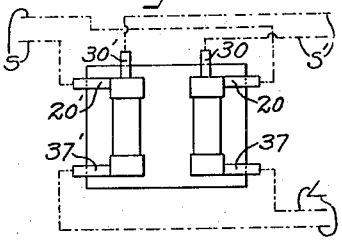


Fig. 15

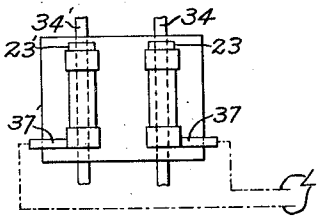


Fig. 16

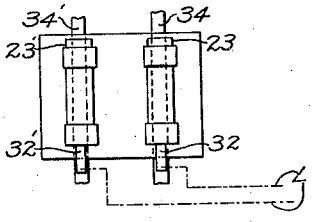


Fig. 17

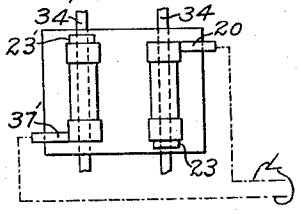


Fig. 18

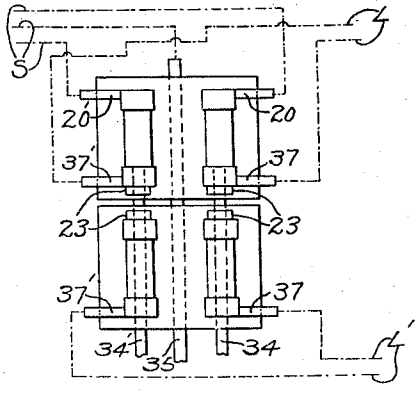


Fig. 19

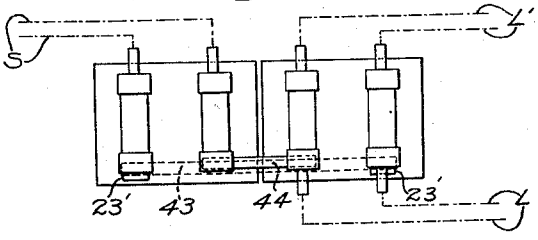
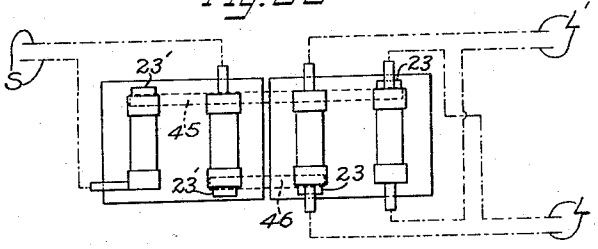


Fig. 20



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Patented Apr. 25, 1933 1,905,004

UNITED STATES PATENT OFFICE

JOSEPH SACHS, OF WEST HARTFORD, CONNECTICUT

FUSE DEVICE

Application filed June 10, 1932. Serial No. 616,405.

The principal object of the present invention is to provide a fuse device, and particularly an insulating fuse carrying base, which is so constructed that it may be connected and used in a large variety of ways, either alone or in conjunction with other similar devices or with different electrical devices. In accordance with the invention there is provided an insulating fuse carrying base so constructed that wire terminals, connecting conductors, bus bars and the like may be connected with fuse contacts on the base in many different ways.

In the accompanying drawings I have shown one form of insulating base embodying the invention and I have also shown the said base combined with several different arrangements of conductors so as to be adapted for several different circuit arrangements. It will be understood that the drawings are intended for illustrative purposes only and that there may be wide departure therefrom, particularly as concerns the arrangements of electrical conducting parts on or in association with the base. The drawings are not to be relied upon as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawings:

Fig. 1 is a front view of an insulating fuse base embodying the invention.

Fig. 2 is a combined side and sectional view of the base, the section being taken along the line 2—2 of Fig. 1.

Fig. 3 is a combined bottom and sectional view of the base, the section being taken along the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary sectional view taken along the line 4—4 of Fig. 1 and showing in place on the base a fuse contact, a conducting strap and a wire terminal on the strap.

Fig. 5 is a fragmentary sectional view taken along the line 5—5 of Fig. 1 and showing in place a fuse contact, a transverse conductor, and a connector between the said fuse contact and conductor.

Fig. 6 is a front view of the complete base with one arrangement of electrical conductors thereon, certain parts of the base and the conductors being broken away in order that other parts may be more clearly shown.

Fig. 7 is a front view showing the complete base with another arrangement of electrical conductors associated therewith, these conductors including vertical bus bars.

Fig. 8 is a vertical sectional view taken along the line 8—8 of Fig. 7.

Figs. 9 to 17 are diagrammatic views of the base combined with various conductors to provide various circuit arrangements.

Fig. 18 is a diagrammatic view showing two bases, one above the other and connected by means of vertical bus bars.

Figs. 19 and 20 are diagrammatic views each showing two bases arranged side by side and connected by means of transverse conductors.

The insulating fuse carrying base 1 to which the invention particularly relates is shown separately in Figs. 1, 2 and 3. The base is adapted to be connected to a rear supporting wall, such as the rear wall of an enclosing box, by means of screws extending through holes 2, 2′. The said base 1 has a forward facing portion adapted for the mounting thereon of at least one pair of spaced fuse clips or contacts adapted for receiving cartridge fuses. Preferably and as shown provision is made for mounting two similar pairs of such contacts, the contacts of the said pairs being held in place by means of screws extending through the holes 3, 4 and 3′, 4′.

The base 1 is provided with a forward projecting barrier 5 which preferably completely surrounds the fuse carrying portion of the base at the sides thereof and at the top and bottom. Preferably there is associated with the barrier a partition 6 which is positioned between the positions of the fuse contacts of the two pairs. Adjacent the position of each fuse contact there is at least one opening through the barrier 5 and preferably adjacent the position of at least one of the fuse contacts of each pair there are two such openings. Preferably and as shown there are two openings adjacent each fuse contact position. As shown the top wall of

the barrier 5 is provided with openings 7 and 7′ adjacent the positions for the upper fuse contacts. Similarly the bottom wall of the barrier 5 is provided with openings 8, 8′ adjacent the positions for the bottom contacts. The right side wall of the barrier 5 is provided with openings 9 and 10 adjacent the positions for the right hand contacts. Similarly the left side wall of the barrier 5 is provided with openings 9′ and 10′ adjacent the positions for the left hand fuse contacts. To facilitate molding, the several openings in the barrier 5 are formed by providing deep recesses which extend forward from the back of the base as clearly shown in Figs. 2 and 3.

Adjacent the respective openings 9, 9′ and 10, 10′ in the side walls of the barrier 5 are recesses 11, 11′ and 12, 12′. These recesses are for the purpose of providing clearance for screws which are used in connection with conductor straps on the base as will presently appear.

The base 1 is preferably provided at its rear face with one or more vertical grooves adapted to receive one or more vertically extending bus bars. The base as shown has two vertical grooves 13 and 13′ immediately behind the positions for the fuse contacts of the respective pairs and there is preferably also a third central vertical groove 14 for a neutral bus bar. A hole 15 is provided for a screw adapted to hold a bus bar in place in the groove 14.

In order that any one of the fuse contacts may be electrically connected with a bus bar in the corresponding groove 13 or 13′ there are provided adjacent the respective positions of the fuse contacts openings extending through the base from front to rear thereof and each adapted to receive a suitable connecting conductor. Adjacent the positions for the upper fuse contacts are openings 16, 16′, and adjacent the positions for the lower fuse contacts are openings 17, 17′. When the aforesaid openings 7, 7′ and 8, 8′ through the barrier walls are formed by means of deep recesses extending from the back of the base as shown and described, these same recesses, or at least the inner portions thereof, may serve as the said openings extending through the base from front to rear thereof. In other words, as will be readily apparent from an inspection of Fig. 2, the front portions of the recesses constitute the openings through the barrier walls and the inner portions, that is, the upper and lower portions of the said recesses, constitute the said recesses from front to rear. This construction not only facilitates molding of the bases but also facilitates the positioning of connecting conductors in the said openings 16, 16′ and 17, 17′ as will presently appear.

In addition to the grooves 13, 13′ and 14 for vertical bus bars, or as an alternative arrangement, the base may be provided with horizontal or transverse grooves 18 and 19 adapted to receive horizontally extending bus bars or connectors. These grooves 18 and 19 are so located that the upper groove 18 is in register with the positions for the upper fuse contacts and the lower groove 19 is in register with the positions for the lower fuse contacts.

In Fig. 4 I have shown the manner in which a conducting strap 20 may extend through one of the barrier openings and into engagement with a fuse contact mounted on the base 1. The strap 20 as shown in Fig. 4 extends through the barrier opening 9 and engages at its inner end with a fuse contact, the said strap and fuse contact being both held in place by a screw 28 extending through the hole 3 in the base. At the outer end of the strap 20 is a wire terminal 21 held in place by a screw 22 with a nut thereon. The aforesaid recess 11 in the base provides clearance for the head of the screw 22. The said recess 11 is made deep enough to also provide clearance for a screw reversed in position from that shown and having the head at the front.

In Fig. 5 I have shown a U-shaped conductor 23 providing a connection between a fuse clip on the base and a transverse conductor in the upper transverse groove 18. In lieu of the screw 28 shown in Fig. 4 there is provided a longer screw 24 which extends through the transverse conductor, through the opening in the rear leg of the conducting connector 23, through the fuse contact and into the threaded front leg of the said conductor 23. A spacing washer 25 may be provided between the base and the fuse contact. It will be observed that the screw 24 serves to hold all of the said conducting parts in place and that the said conductor 23 provides an efficient electrical connection between the bus bar and the fuse contact.

The connecting conductor 23 and screw 24 as shown in Fig. 5 may also be used to connect a fuse contact with a vertical bus bar in one of the grooves 13 or 13′. It will be observed that the positions of the said grooves are such that the construction as shown in Fig. 5 may be used without any change whatsoever, other than the positioning of the bus bar vertically instead of horizontally. This is shown in detail in Fig. 8.

The base 1 is normally provided with two pairs of fuse contacts 26, 27 and 26′, 27′, these being held by screws 28, 29 and 28′, 29′ located respectively in the holes 3, 4 and 3′, 4′. Various arrangements of conductors and wire terminals may be provided in association with the said fuse contacts, and in order that the invention may be fully understood I have shown in detail two representative arrangements. One of these is shown in Fig. 6 and the other in Figs. 7 and 8.

In Fig. 6 I have also shown conducting straps 20 and 20′ in place in the openings 9 and 9′, these straps carrying wire terminals 21 and 21′. Conducting straps 30 and 30′ are in place in the openings 7 and 7′, these being provided with wire terminals 31 and 31′. The straps 20 and 30 both engage the fuse contact 26, being held by the before-mentioned screw 28. As illustrated the strap 20 is behind the fuse clip and the strap 30 is in front of the fuse clip. Similarly the straps 20′ and 30′ engage the fuse contact 26′, being held by the screw 28′. Conducting straps 32 and 32′ are in place in the openings 8 and 8′, these being provided with wire terminals 33, 33′. The straps 32, 32′ respectively engage the fuse contacts 27, 27′ and are held respectively by the screws 29, 29′.

In Figs. 7 and 8 I have shown vertical bus bars 34 and 34′ occupying the grooves 13 and 13′, and I have also shown a bus bar 35 occupying the groove 14 and held in place by a screw 36 in the hole 15. The fuse contacts 26 and 26′ are connected with the respective bus bar 34 and 34′ by means of U-shaped connectors 23 and 23′, these being held in place by means of screws 24 and 24′. The construction and mounting of the connectors 23 and 23′ have already been described in connection with Fig. 5. Conducting straps 37, 37 are positioned in the barrier openings 10, 10′, these being connected with the fuse contacts 27, 27′ and being provided with wire terminals 38, 38′.

A fuse device incorporating the invention, in whatever way connected and arranged, is well adapted to be mounted in an enclosing cabinet or box as illustrated for instance in Fig. 8. The base is secured to the rear wall 39 of the box by means of screws extending through the holes 2, 2′. The barrier 5 and partition 6 may extend into engagement with or at least into close proximity to the front cover 40 of the box. The said cover 40 may have an opening 41 therein of such size as to permit access to the fuse contacts on the base 1. This makes it possible for the fuses to be put in place or removed without opening the said cover. The opening 41 in the cover 40 may be normally closed by a hinged flap 42.

While for the sake of convenience I have applied different reference characters to the several conducting straps for connecting the fuse contacts with wire terminals it will be understood that all of the said straps are or may be of the same shape and size so that they may be used interchangeably. The U-shaped connectors for providing connections between the fuse contacts and rear bus bars or conductors may also be of the same shape and size so that they can be used interchangeably. It will thus be apparent that with only two styles of conductors or connectors the base 1 can be provided with a wide variety of circuit arrangements.

In Figs. 9 to 14 I have illustrated diagrammatically some of the various arrangements of conductor straps and wire terminals which may be provided. In each instance the line or service wires are indicated by S or S′ and the load wires are indicated by L. Fig. 13 will be recognized as showing diagrammatically the construction already shown in detail in Fig. 6.

In Figs. 15 to 17 I have shown some of the various arrangements that may be provided using vertical bus bars 34, 34′. Fig. 15 will be recognized as showing diagrammatically the arrangement which has already been shown in detail in Figs. 7 and 8.

In Fig. 18 I have shown an arrangement wherein there are two bases 1, 1 arranged one above the other and both associated with the same vertical bus bars 34, 34′ and 35. It will be observed that the load circuit L is connected through the upper fuses, and that the load circuit L′ is connected not only through the upper fuses but also through the lower fuses. The bus bars 34, 34′ and 35 may be connected at the bottom with another fuse block, or with any desired electrical device.

In Fig. 19 I have shown two bases 1, 1 arranged side by side. For connecting the lower fuse contacts of the two outer pairs there is provided a transverse connector 43 located in the grooves 19 of the two bases and connected with the respective fuse contacts by means of U-shaped connectors 23 and 23′. The lower fuse contacts of the two inner pairs are directly connected by a transverse conductor 44 extending through the barrier openings 10′ and 10 in the two bases.

In Fig. 20 I have shown an arrangement somewhat similar to that shown in Fig. 19. In this case, however, the upper fuse contacts of the two outer pairs are connected by a transverse connector 45 located in the upper groove 18 of the two bases and connected with the respective contacts by means of U-shaped connectors 23, 23′. The two lower fuse contacts of the inner pairs are connected by means of a transverse connector 46 located in the lower groove 19 of the two bases and connected with the respective fuse contacts by means of U-shaped connectors 23, 23′.

What I claim is:

1. A fuse block having a forward facing portion adapted for the mounting thereon of at least one pair of spaced fuse contacts and also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having at least one opening in each end wall and two openings in each side wall and each said opening being in register with a fuse contact position so as to be adapted to receive a conductor con-

nectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

2. A fuse block having a forward facing portion adapted for the mounting thereon of two similar pairs of spaced fuse contacts and also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having two openings in each end wall and at least one opening in each side wall and each said opening being in register with a fuse contact position so as to be adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

3. A fuse block having a forward facing portion adapted for the mounting thereon of two similar pairs of spaced fuse contacts and also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having two openings in each end wall and two openings in each side wall and each said opening being in register with a fuse contact position so as to be adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

4. A fuse block having a bus bar groove in its rear face and having a forward facing portion adapted for the mounting thereon of at least one pair of longitudinally spaced fuse contacts and provided with an opening from front to rear adjacent each fuse position for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the bus bar, the said block also having a forward projecting barrier at the ends and at both sides of the said fuse mounting portion, which barrier has at least one opening in each end wall and two openings in each side wall with each said opening in register with a fuse contact position so as to be adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

5. A fuse block having two parallel longitudinal bus bar grooves in its rear face and having a forward facing portion adapted for the mounting thereon of two pairs of longitudinally spaced fuse contacts and provided with an opening from front to rear adjacent each fuse position for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the corresponding bus bar, the said block also having a forward projecting barrier at the ends and at both sides of the said fuse mounting portion, which barrier has two openings in each end wall and two openings in each side wall with each said opening in register with a fuse contact position so as to be adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

6. A fuse block having two parallel transverse bus bar grooves in its rear face and having a forward facing portion adapted for the mounting thereon of two pairs of longitudinally spaced fuse contacts and provided with an opening from front to rear adjacent each fuse position for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the corresponding bus bar, the said block also having a forward projecting barrier at the ends and at both sides of the said fuse mounting portion, which barrier has at least one opening in register with each fuse contact position and adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

7. A fuse block having two parallel transverse bus bar grooves in its rear face and having a forward facing portion adapted for the mounting thereon of two pairs of longitudinally spaced fuse contacts and provided with an opening from front to rear adjacent each fuse position for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the corresponding bus bar, the said block also having a forward projecting barrier at the ends and at both sides of the said fuse mounting portion, which barrier has two openings in each end wall and two openings in each side wall and each said opening being in register with a fuse contact position so as to be adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

8. A fuse block having in its rear face two parallel longitudinal bus bar grooves and two parallel transverse bus bar grooves and having a forward facing portion adapted for the mounting thereon of two pairs of longitudinally spaced fuse contacts and provided with two openings from front to rear adjacent each fuse position and each adapted for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the corresponding bus bar.

9. A fuse block having in its rear face two parallel longitudinal bus bar grooves and two parallel transverse bus bar grooves and having a forward facing portion adapted for the mounting thereon of two pairs of longitudinally spaced fuse contacts and provided with two openings from front to rear adjacent each fuse position and each adapt-

ed for the reception of a conductor connectible at the front with the corresponding fuse contact and connectible at the rear with the corresponding bus bar, the said block also having a forward projecting barrier at the ends and at both sides of the said fuse mounting portion, which barrier has at least one opening in register with each fuse contact position and adapted to receive a conductor connectible at its inner end with a fuse contact and connectible at its outer end with a wire terminal or other electrical appurtenance.

10. A fuse block assembly comprising in combination, an insulating block having a forward facing fuse mounting portion and also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having at least one opening in each end wall and two openings in each side wall, a pair of spaced fuse contacts on the said fuse mounting portion of the block with each contact in register with two of the said openings in the barrier, and two interchangeably positionable conductors adapted to engage the respective fuse contacts and each adapted to extend through either of the said barrier openings adjacent the corresponding contact.

11. A fuse block assembly comprising in combination, an insulating block having a forward facing fuse mounting portion and also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having at least one opening in each end wall and two openings in each side wall, a pair of spaced fuse contacts on the said fuse mounting portion of the block with each contact in register with two of the said openings in the barrier, two conductors connected with one fuse contact and extending through the barrier openings registering with the said contact, and a conductor connected with the other fuse contact and extending through one of the barrier openings registering with the said other contact.

12. A fuse block assembly comprising in combination, an insulating block having a bus bar groove in its rear face and having a forward facing fuse mounting portion provided with an opening from front to rear communicating with the said groove, the said block also having a forward projecting barrier at the ends and at both sides of the said portion, the said barrier having at least one opening in each end wall and two openings in each side wall, a pair of spaced fuse contacts on the said fuse mounting portion of the block with each contact in register with two of the said openings in the barrier, and with one of them adjacent the said opening from front to rear, a bus bar in the said groove, a conductor extending through the opening from front to rear and connecting one fuse contact with the bus bar, and two interchangeably positionable conductors adapted to engage the respective fuse contacts and each adapted to extend through either of the said barrier openings adjacent the corresponding contact.

In testimony whereof I have hereunto set my hand this 8th day of June, 1932.

JOSEPH SACHS.