Nov. 16, 1943. J. B. GRIFFITH 2,334,550

FUSE BLOCK

Filed Aug. 14, 1942

Fig.1.

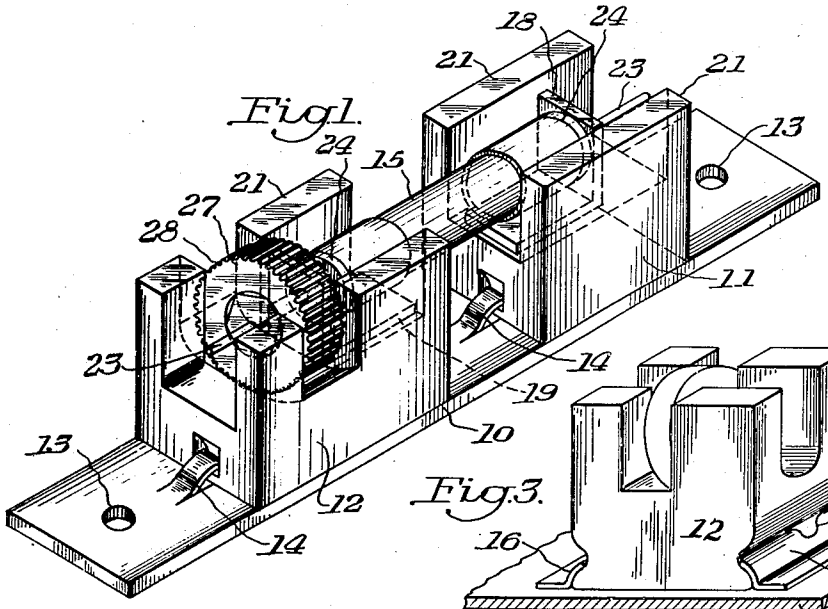


Fig.3.

Fig.2.

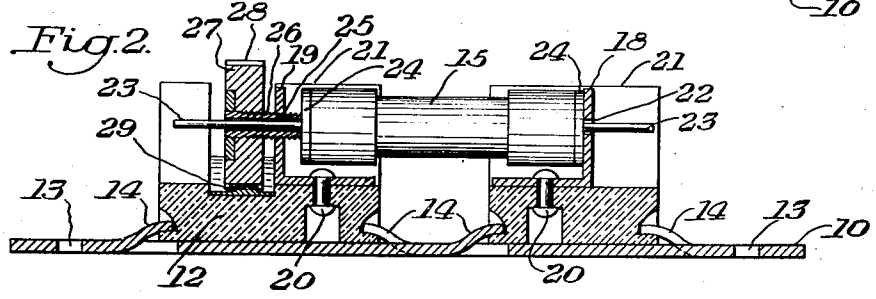
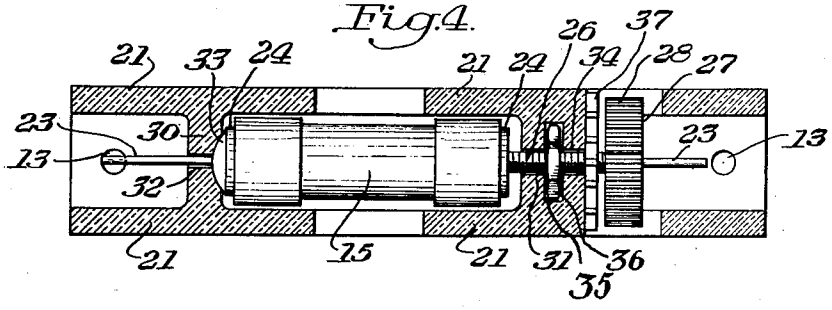


Fig.4.



INVENTOR.
John B. Griffith,
BY Edward A. Laurence.
his attorney.

Patented Nov. 16, 1943 2,334,550

UNITED STATES PATENT OFFICE

2,334,550

FUSE BLOCK

John B. Griffith, New York, N. Y.

Application August 14, 1942, Serial No. 454,791

12 Claims. (Cl. 200—134)

This invention relates generally to fuse blocks and more particularly to the open or exposed type block for a cartridge fuse with terminals for properly connecting it in an electric circuit and the method of making the electrical connection therewith.

The principal object of this invention is the method and apparatus for obtaining aligned positive pressure connections on the ends of a cartridge type fuse.

Another object is the provision of a fuse block that is readily accessible for the replacement of a cartridge fuse.

Another object is the provision of a cartridge fuse block provided with self-aligning terminals which engage and exert positive pressure upon the ends of the fuse.

Another object is the provision of cartridge fuse block terminals that produce positive pressure against the fuse ends and which may be locked against movement to prevent displacement accidentally or by vibration.

Another object is the provision of a cartridge type fuse block having rod posts arranged to be connected to the electric circuit.

Another object is the method of securing the fuse terminal blocks to a panel board or the like.

Other objects and advantages appear in the following description and claims.

In the accompanying drawing practical embodiments illustrating the principles of this invention are shown wherein:

Fig. 1 is a perspective view of an improved terminal block having a cartridge fuse mounted therein.

Fig. 2 is a vertical sectional view of the fuse block shown in Fig. 1.

Fig. 3 is a perspective view of a terminal block illustrating another form of mounting.

Fig. 4 is a horizontal sectional view through a terminal block illustrating another form of invention.

Referring particularly to Figs. 1 and 2, the cartridge type fuse block illustrated therein is made up of three principal parts, the base 10 and two terminal blocks 11 and 12 which are mounted in alignment on the base. The base 10 may be formed integral with the blocks 11 and 12, but in some installations it is preferred to have the block of insulating material and a metal base as shown in Figs. 1 and 2. If the fuse blocks are made up to receive a single cartridge fuse the metal base 10 is provided with some means, such as the holes 13 at each end thereof, for panel or board mounting. However a steel box or large panel may be used as the base 10 with the terminal blocks suitably positioned thereon for supplying the desired circuit arrangement.

In Figs. 1 and 2 the terminal blocks 11 and 12 are shown fastened to the metal base 10 by the tongues 14 struck from the base. If the cartridge fuse 15 is short, thereby placing the terminal blocks 11 and 12 relatively close together, the tongues 14 may have to be staggered as illustrated in Fig. 2 of the drawing. Any other suitable means may be employed for securing the terminal blocks to the base, such as set screws, rivets or the like.

A large panel or switchboard base having two sets of opposed flanges 16, as shown in Fig. 3, may be used for securing dovetailed portions of the terminal blocks 11 and 12. The opposed parallel flanges 16 in each set may be spot-welded or otherwise secured to the surface of the switchboard or panel 10 with sufficient clearance adjacent the end of each set to permit the dovetailed or grooved base of the blocks 11 and 12 to be inserted under the flanges and slid therealong until they are properly aligned with each other and with the circuit to be connected thereto. This provides a very good method for securing a series of terminal blocks in rows on a switchboard for connection with parallel circuits. The dovetail of each block is indented intermediate of its ends and the metal of the flange 16 is crimped into this indentation as shown at 17 to secure the block in position. The thickness of the terminal blocks determines the proper spacing for a compact series of fuses but they may be secured in spaced relation if there is adequate room on the panel. The novel method of building up a panel board or switch box has many advantages. The circuits may be set up in any desired manner and they may be changed or added to without destroying or replacing the original materials, which is an important object of this invention.

The terminal blocks 11 and 12 of Fig. 1, 2 or 3 may be made of any suitable electrical insulating material, such as fiber, porcelain, glass, or other suitable plastic or insulating material. The porcelain or the synthetic resins are believed to be most suitable for this purpose and less expensive to manufacture because they may be readily molded. These terminal blocks are shaped to receive and partially enclose the terminal supports which in Figs. 1 and 2 are the metal angle brackets 18 and 19. The horizontal flange of each angle bracket is provided with a

hole for receiving the rivet 20 which hole is larger than the rivet that loosely holds the angle bracket in the pockets between the upstanding walls 21 of the terminal blocks. The walls 21 are spaced apart sufficiently to permit the brackets to pivot through a small arc on each side of the axial center of the blocks.

The bracket 18 has an opening 22 in its upwardly extending leg to receive the stem 23 of the disk terminal member 24. The hole 22 is larger in diameter than the stem 23 to permit the latter to float therein.

The bracket 19 is provided with a threaded hole 25 for receiving the externally threaded sleeve 26. The bore of the sleeve 26 carries the stem 23 of the other terminal member 24 and is also sufficiently large in diameter to permit the terminal member to float therein. The outer end of the sleeve 26 has a disk 27 secured thereto which when turned between the thumb and finger causes the sleeve 26 to move into or out of the threaded opening 25 of the bracket 19.

The perimetral surface of the disk 27 may be fluted, as illustrated at 28, to facilitate revolving the same, and a flexible spring or other suitable friction catch 29 secured to the block 12 for engaging a selected fluted section to prevent accidental rotary movement of the sleeve.

The inner end of the sleeve 26 engages the head of the terminal member 24 and as the sleeve is rotated the cartridge fuse 15 becomes tightly clamped between the two terminal members. Any misalignment due to the mounting of the terminal blocks or the end ferrules of the cartridge fuse is readily compensated by the self-aligning pivoting action of the brackets and the floating action of the terminal members, thereby providing flat engagement with the fuse ends. The heads of the terminal members being flat permits them to properly engage the ends of the cartridge fuse and eliminates the difficulties of capped terminals. If the thread on the sleeve is provided with a small pitch the mechanical advantage of the force on the terminal members may be increased. High contact pressure between the terminals and the fuse member provides low resistance electrical contact, thereby improving the efficiency of the fuse and the circuit connected thereto.

The terminal members being made up of a head with an integral stem extending axially therefrom provide an ideal means for soldering or electrically connecting a wire thereto by means of a sleeve connector. This connection can be made wholly within the walls 21 of the block, thereby providing additional protection to those who are changing or otherwise required to work on the switch board while it is energized.

The structure shown in Fig. 4 illustrates a unitary fuse block wherein the blocks 11 and 12 are molded or pressed from a plastic or other similar insulating material. The brackets are replaced by the bridges 30 and 31 which are disposed transversely of the fuse block and connect the upwardly extending walls 21. The hole 32 in the bridge 30 takes the place of the hole 22 in the bracket 18, and the inner face of the bridge is provided with a socket arranged to receive the spherical surface 33 on the back of the head of the terminal member 24. Thus the terminal member 24 can adjust itself by means of this ball and socket arrangement to become properly aligned with the surface of the fuse end.

The bridge 31 corresponds to the bracket 19 and is provided with an enlarged axial opening for receiving the sleeve 26. An upwardly open recess 35 is provided in the bridge 31 and is shaped to receive the nut 36 and prevent it from turning. The nut 36 is dropped in the recess and the sleeve 26 is inserted in the hole 34 and threaded through the nut. A second nut 37 may be placed on the threaded sleeve and jammed against the face of the bridge 31 to lock the sleeve against accidental movement.

The integral block shown in Fig. 4 may be mounted in either method previously described. This block may be provided with a dovetailed base along the sides or on the ends thereof, depending which is most suitable for the installation.

Thus the cartridge fuse may be securely connected in an electrical circuit by a high positive pressure axially of the fuse which does not depend upon the flexing characteristics of a leaf or coil spring. This high contact pressure reduces the resistance of the circuit, thereby increasing the efficiency of the fuse. The high positive pressure is axially of the tubular cartridge fuse which is the dimension of its greatest strength. Again the fuse may be readily locked against accidental displacement due to vibration. These are particular advantages attainable by means of this improved structure and method of connecting a cartridge fuse in an electric circuit.

I claim:

1. In a fuse block, the combination of a pair of terminal blocks of insulating material disposed in spaced relation and having upwardly and outwardly opposed pockets arranged to receive the end portions of the fuse, supporting means in each pocket, a terminal member of conductive material carried by each of said supporting means and arranged to conductively engage the end surfaces of the fuse, and means for actuating one of said supporting means to move at least one of said terminal members toward and away from the other terminal member to clamp the fuse fixedly between them or to release the fuse for removal.

2. In a fuse block, the combination of a pair of terminal blocks of insulating material disposed in spaced relation and having upwardly and outwardly opposed pockets arranged to receive the end portions of the fuse, supporting means in each pocket, a terminal member of conductive material carried by each of said supporting means and arranged to conductively engage the end surfaces of the fuse, said terminal members being loosely held to compensate for misalignment, and means for actuating one of said supporting means to move at least one of said terminal members toward and away from the other terminal member to clamp the fuse fixedly between them or to release the fuse for removal.

3. In a fuse block, the combination of a pair of opposed pockets of insulating material disposed in spaced relation and arranged to receive the end portions of the fuse, said pockets having transverse walls provided with aligned holes, a pair of conductive terminal members having heads arranged to engage the end surfaces of the fuse and also provided with axial stems extending rearwardly through the holes, a nut in one of said pockets held against rotation, an exteriorly threaded sleeve threadedly engaging the nut and extending through the hole in the associated wall, said sleeve arranged to abut against the head of the associated terminal member and surrounding the stem thereof, and means

for rotating the sleeve in the nut to cause the associated terminal member to move either toward or away from the other terminal member to either clamp the fuse fixedly between the terminal members or to release the fuse for removal.

4. In a fuse block, the combination of a pair of opposed pockets of insulating material disposed in spaced relation and arranged to receive the end portions of the fuse, said pockets having transverse walls provided with aligned holes, a pair of conductive terminal members having heads arranged to engage the end surfaces of the fuse and also provided with axial stems extending rearwardly through the holes, a nut in one of said pockets held against rotation, an exteriorly threaded sleeve threadedly engaging the nut and extending through the hole in the associated wall, said sleeve arranged to abut against the head of the associated terminal member and surrounding the stem thereof, means for rotating the sleeve in the nut to cause the associated terminal member to move either toward or away from the other terminal member to either clamp the fuse fixedly between the terminal members or to release the fuse for removal, and means for preventing accidental rotation of the sleeve to lock the fuse in place.

5. In a fuse block, the combination of a base of suitable material, a pair of upwardly and outwardly opposed pockets of insulating material detachably mounted on the base and arranged to receive the end portions of the fuse, a terminal support in each of said pockets, a sleeve arranged for axial movement in one of said supports, terminal members of conductive material having heads arranged to have flat surface engagement with the ends of the fuse, one terminal member carried by the sleeve and the other by the opposed terminal support, and means for actuating the sleeve to move the associated terminal member either toward or away from the other terminal member to clamp the fuse fixedly in place or to release the fuse for removal.

6. In a fuse block, the combination of a base of suitable material, a pair of terminal blocks of insulating material having opposed pockets, said terminal blocks mounted on the base and arranged for slidable movement thereon, means for retaining the terminal blocks with the pockets in aligned selected positions on the base, terminal members of conductive material carried by the pockets and having heads arranged to have flat surface engagement with the ends of the fuse, and means for moving one of the terminal members either toward or away from the other terminal member to clamp the fuse fixedly in place or to release the fuse for removal.

7. A fuse block consisting of a pair of insulated pockets disposed in spaced relation and arranged to receive the end portions of a fuse, terminal support means in each pocket having an opening therein, a terminal member in each pocket having a head for engaging the fuse end and a stem integral with the head and arranged to extend through said opening for connecting the terminal member to a circuit, and means for urging one terminal member toward the other to clamp the fuse between the heads thereof.

8. The structure of claim 7 wherein the insulated pockets are formed of blocks separated from each other and mounted in spaced relation.

9. The structure of claim 7 wherein the terminal support means are brackets pivotally mounted in the pockets.

10. The structure of claim 7 wherein the terminal members may swivel relative to the pockets to engage a greater area of the fuse ends and compensate for misalignment.

11. A fuse block consisting of a pair of insulated pockets disposed in spaced relation and arranged to receive the end portions of a fuse, a terminal support in each pocket, a sleeve extending through one terminal support, an opening in the other terminal support aligned with the bore of the sleeve, a terminal member in each pocket having a head for engaging the fuse end, an axially disposed stem integral with the head for connecting the terminal member to a circuit, the stem of one terminal member extending through the sleeve and the other through said opening, and means for moving the sleeve axially to engage the head and clamp the fuse between the heads of the terminal members.

12. The structure of claim 11 wherein the sleeve is threadably engaged in the terminal support and is provided with means for advancing and retracting the terminal member carried thereby.

JOHN B. GRIFFITH.