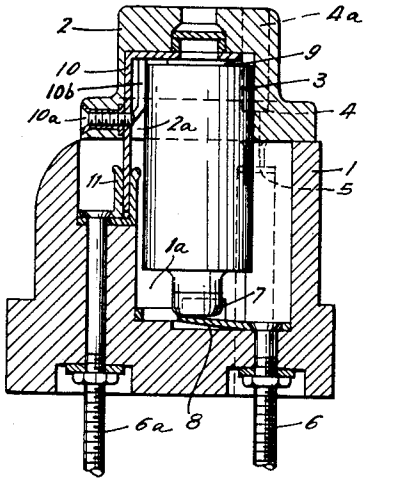
Nov. 24, 1959 P. ERDTMANN ET AL 2,914,638

FUSE MOUNTING ASSEMBLY FOR CARTRIDGE AND AUTOMATIC FUSES

Filed Feb. 21, 1957 3 Sheets-Sheet 1

FIG. 1



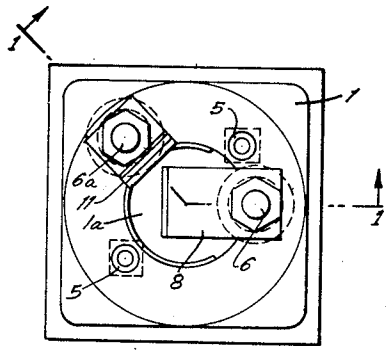
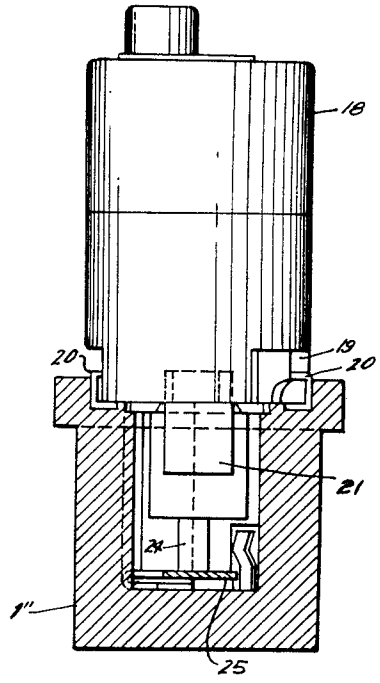


FIG. 2

FIG. 7



INVENTORS.
PAUL ERDTMANN
WILLY RAUCHE

Nov. 24, 1959 P. ERDTMANN ET AL 2,914,638

FUSE MOUNTING ASSEMBLY FOR CARTRIDGE AND AUTOMATIC FUSES

Filed Feb. 21, 1957

3 Sheets-Sheet 2

FIG. 3

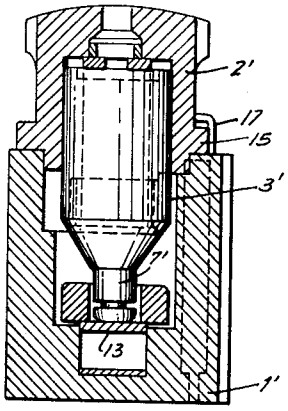
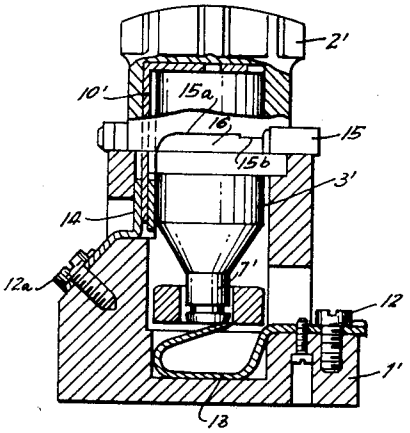


FIG. 4



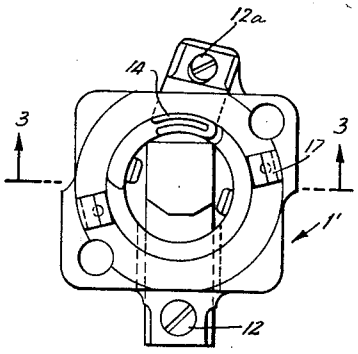


FIG. 5

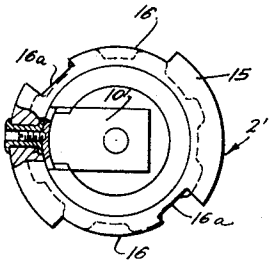


FIG. 6

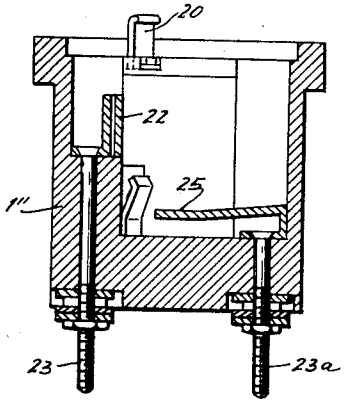
INVENTORS.
PAUL ERDTMANN
WILLY RAUCHE

Nov. 24, 1959 P. ERDTMANN ET AL 2,914,638

FUSE MOUNTING ASSEMBLY FOR CARTRIDGE AND AUTOMATIC FUSES

Filed Feb. 21, 1957 3 Sheets-Sheet 3

FIG. 8



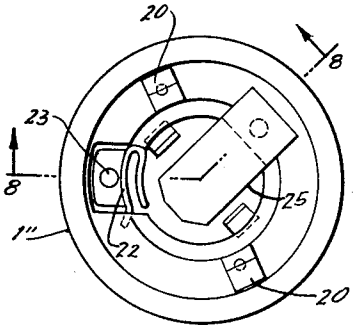
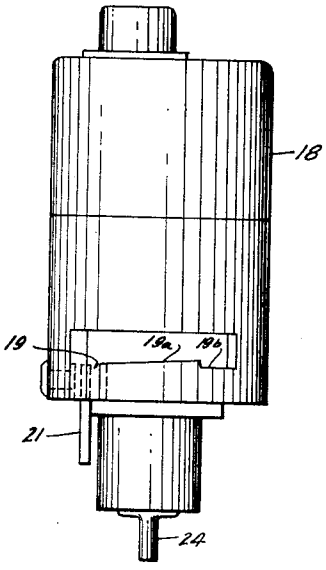


FIG. 9

FIG. 10



INVENTORS.
PAUL ERDTMANN
WILLY RAUCHE

United States Patent Office 2,914,638
Patented Nov. 24, 1959

2,914,638

FUSE MOUNTING ASSEMBLY FOR CARTRIDGE AND AUTOMATIC FUSES

Paul Erdtmann, Grossbreitenbach, Thuringia, and Willy Rauche, Gillersdorf, Germany, assignors to Georg Schade K.-G., Grossbreitenbach, Thuringia, Germany

Application February 21, 1957, Serial No. 641,630

Claims priority, application Germany May 23, 1956

2 Claims. (Cl. 200—133)

This invention relates to improvements in electrical fuses and in particular relates to a novel mounting and contact arrangement for mounting cartridge-type fuses and automatic fuses in their sockets.

In conventional fuse arrangements, a cartridge fuse is inserted in a socket, and is held in position by a plug, the outer surface of which is externally threaded for screw connection with a threaded inner sleeve of the socket. In such mounting, the screw thread serves not only as the means of physical connection but also serves simultaneously as the electrical connection between the fuse and the socket. The circuit is completed by a further electrical connection between the cartridge fuse lower terminal and a bottom contact in the socket.

It is well known that difficulties often arise in the installation of fuses by the fact that the threaded portions of the fuse plugs do not interfit properly with the threaded fuse sockets, in spite of standardized size tolerances. The exceeding of these tolerances cannot be avoided in commercial manufacture because of mass production methods. The departure from proper sizes causes difficulties in the servicing of fuse assemblies as well as improper electrical contact, and may also cause loosening of the threaded screw caps or plugs as a result of even small vibration.

An object of this invention is to provide an improved fuse mount assembly which will overcome the aforementioned shortcomings by avoiding the usual threaded connection of the fuse plug or cap with the fuse socket. In addition, the mounting assembly of the invention permits economizing on metal.

According to the invention, the fuse assembly is adapted to receive both the cartridge-type and automatic-type fuses which are inserted in a fuse socket in such a manner that the plug head or the body of the automatic fuse, respectively, is physically connected to the socket by mechanical coupling means on its circumference. The electrical connection is made with one terminal of the fuse by the usual bottom contact, and with the other terminal of the fuse by means of a separate threadless contact.

The coupling means may be in the form of screws or bayonet couplings, and the side contacts may be in the form of strips, sockets, wiping contacts or knife contacts.

Additional objects and advantages of the invention will be apparent in the course of the following specification when taken in connection with the accompanying drawings which illustrate three preferred embodiments of the invention, and in which:

Fig. 1 is a longitudinal section through one type of fuse assembly containing a cartridge fuse and in which the plug head or cap is connected to the fuse socket by screw means, the section being taken substantially along line 1—1 of Fig. 2;

Fig. 2 is a top plan view of the fuse socket of Fig. 1, with the plug head and fuse cartridge removed to reveal the socket interior;

Fig. 3 is a longitudinal section, along lines 3—3 of

Fig. 5, through a modified type of fuse assembly for cartridge fuses in which the plug head is connected to the fuse socket by a bayonet coupling;

Fig. 4 is a longitudinal central section of the assembly shown in Fig. 3, with the assembly turned 90° from its position of Fig. 3, and with portions thereof shown in elevation;

Fig. 5 is a top plan view of the fuse socket shown in Fig. 3, with the fuse and plug head removed;

Fig. 6 is a bottom plan view of the fuse head shown in Fig. 3;

Fig. 7 is an elevational view of an automatic fuse shown mounted in a socket made according to the invention, the socket being shown in section;

Fig. 8 is a longitudinal central section of the socket of Fig. 7, as taken along line 8—8 of Fig. 9;

Fig. 9 is a top plan view of the socket shown in Fig. 7; and

Fig. 10 is an elevational view of the automatic fuse shown in Fig. 7.

In the embodiment of the invention shown in Fig. 1, the fuse assembly comprises a socket **1**, plug head **2**, and fuse cartridge **3**, these elements being operatively arranged in the usual general way. The plug head **2** is physically connected to socket **1** by means of screws **4** which are recessed in bores **4***a* of the plug head **2** and are received in threaded eyelets or sockets **5** of the socket **1**.

The socket **1** has a central bore **1***a* sized to receive the lower end of the cartridge fuse **3**. The plug head **2** also has a central bore **2***a* which registers with the socket bore **1***a* when the plug head is mounted on the socket, the plug head bore **2***a* receiving the upper end of the fuse **3**.

The cartridge fuse **3** is electrically connected in circuit with the terminal binding posts **6** and **6***a* of the socket **1** by means of strip-shaped contacts **8** and **10**. The bottom terminal **7** of fuse **3** abuts the spring contact **8** which is connected to binding post **6**, while the top fuse terminal **9** abuts an L-shaped contact strip **10** of plug head **2**. The L-shaped contact strip **10** is firmly affixed within the plug head **2**, as by screw means **10***a*, with its horizontal leg extending along the top of the plug head central bore **2***a* and its vertical leg extending along the side of bore **2***a* and depending below the bottom surface of plug head **2**. That portion of the vertical leg of contact strip **10** which projects below the plug head is sized and positioned to be received between the arms of a contact clip **11** which is mounted in socket **1**. The contact clip **11** is connected to the socket binding post **6***a*.

One or more flexible fingers **10***b* may be contained at the top of plug head bore **2***a* to receive and flexibly retain the upper end of the cartridge fuse **3** in an inserted position in the plug head **2** with its top terminal **9** in engagement with the L-shaped contact **10**.

Plug head **2** is assembled with socket **1** by axial movement toward the top of the socket after the cartridge fuse **3** has been inserted in the plug head. At the end of this axial movement the vertical arm of contact **10** has slid between the legs of contact clip **11** and the bottom terminal **7** of fuse **3** engages the contact strip **8**, thereby closing the electrical circuit through the fuse without causing any sparking. The plug head **2** is secured in its assembled position by insertion of the screws **4**.

In the embodiment of Figs. 3 to 6, the fuse mounting and contact assembly again comprises a fuse socket **1'**, a plug head **2'** and a fuse cartridge **3'**. The bottom fuse terminal **7'** engages a contact strip **13** which leads to the socket binding post **12**. Contact strip **13** is made of springy material and in a U-shape to increase its flexibility. The plug head **2'** is again provided with an L-shaped contact strip **10'** which is positioned to engage a spring

contact 14 in the socket 1', which contact 14 is connected to the binding post 12*a*.

In this embodiment, the mechanical connection of the plughead 2' with the fuse socket 1' is accomplished by means of a bayonet coupling. The plug head 2' is provided at its lower end with an annular peripheral bead or flange 15 which is cut away at two diametrically opposed portions to form a pair of bayonet grooves 16. The cut away portions 16 are recessed circumferentially, as shown in Fig. 6, and are each provided at one end with a recessed slot 16*a*. In addition the top wall of the flange 15 at the recessed portions 16 is cut away to provide an inclined surface 15*a* which slopes upwardly to terminate in a shallow groove 15*b*, as shown in Fig. 4.

The upper surface of socket 1' is provided with a pair of upstanding L-shaped claws 17, as shown in Figs. 3 and 5. After receiving the fuse cartridge 3', the plug head 2' is moved axially into engagement with the top of socket 1' so that the recessed slots 16*a* receive the respective claws 17. When the plug head is seated upon the socket 1', it may be turned about its axis until the top horizontal legs of claws 17 grip the top surface of the peripheral flange 15. This turning movement of plug head 2' also causes the contact 10' to revolve until its vertical leg slides horizontally between the arms of contact clip 14. Further turning movement of plug head 2' is then prevented by engagement of the claws 17 with the non-recessed portions of flange 15.

Because of the inclined upper surfaces 15*a* of the peripheral flange 15, the plug head 2' is drawn firmly against the socket 1' when the plug head is turned to its secured position as above described. In the fully turned position of the plug head, the claws 17 come to rest in the shallow recesses 15*b* and are held therein by the upward biasing force of the bottom contact spring 13 against the plug head. Thus the plug head 2' is held by spring tension in its secured position against accidental turning due to vibration or the like.

Figs. 7 to 10 show a modified embodiment of the assembly which is adapted to receive and retain an automatic fuse. The automatic fuse 18 has a cylindrical body or envelope which is provided at its lower end with one or more bayonet grooves or slots 19 which engage with corresponding upstanding claws 20 at the top of socket 1'' to lock the automatic fuse 18 in said socket. The automatic fuse 18 also has depending from one side thereof a terminal in the shape of a thin strip which is positioned to be received within a contact clip 22 within socket 1''. Contact clip 22 is connected to binding post 23. A spring contact strip 25 is mounted in the cavity of socket 1'' to be engaged by the bottom terminal 24 of the automatic fuse 18, the contact strip 25 being connected to the socket binding post 23*a*.

The automatic fuse 18 is first moved axially into socket 1'' so that each claw 20 enters and moves upwardly through the vertical leg of the respective bayonet groove 19. When the fuse is seated on the socket, it is then turned in a direction to cause claw 20 to travel along the upwardly inclined lower surface 19*a* of the horizontal leg of groove 19. In this manner, the fuse 18 is drawn toward the socket. The fuse is turned until the claw 20 reaches the end of the groove and comes to rest in the shallow recess or nest 19*b*, the upward pressure of contact spring 25 insuring firm engagement of claw 20 in said recess 19*b*. In this fully turned position of the automatic fuse 18, the depending terminal strip 21 has entered the contact clip 22.

While preferred embodiments of the invention have been shown and described herein, it is obvious that numerous additions, changes, and omissions may be made in these embodiments without departing from the spirit and scope of the invention.

We claim:

1. A fuse mounting assembly comprising a socket member having a base and sides, a permanent cover member having means for holding a fuse of the cartridge type or resettable type adapted to be plugged into said socket member, said socket and cover members having a strip-shaped electrical contact and a counter contact engaging said strip-shaped contact, said contacts being fixed to said socket and cover members, respectively, one of said contacts being located at a side of and within said socket member, a connection in said cover member from the other contact to one terminal of said fuse, a bayonet joint between said members including a peripheral flange on one of said members and a cooperating claw on the other member so that relative turning of said members causes said claw to engage said flange, said socket member having another contact at the base thereof for engaging the other terminal of said fuse, said strip-shaped and counter contacts being disposed relative to said bayonet joint so as to enter into electrical engagement when said claw engages said flange of the bayonet joint, whereby said cover member and fuse are fixedly connected with the socket member and the side and base contacts engage the counter contact and the fuse terminal.

2. A fuse mounting assembly comprising a socket member having a base and sides, a permanent cover member having means for holding a fuse of the cartridge type or resettable type adapted to be plugged into said socket member, said socket and cover members having a strip-shaped electrical contact and a counter contact engaging said strip-shaped contact, said contacts being fixed to said socket and cover members, respectively, one of said contacts being located at a side of and within said socket member, a connection in said cover member from the other contact to one terminal of said fuse, a joint between said members including a peripheral flange on one of said members having retaining means at one end of the flange and a cooperating claw on the other member so that relative turning of said members causes said claw to engage said retaining means, said contacts being disposed relative to said joint so as to enter into electrical engagement when said claw engages said retaining means, said socket member having another contact at the base thereof for engaging the other terminal of said fuse, whereby said cover member and fuse are fixedly connected with the socket member and the side and base contacts engage the counter contact and the fuse terminal.

References Cited in the file of this patent

UNITED STATES PATENTS

1,012,145	Murray	Dec. 19, 1911
1,463,852	Stephens	Aug. 7, 1923
1,602,227	Hentschel	Oct. 5, 1926
1,634,905	Jones	July 5, 1927
1,849,744	Hart	Mar. 15, 1932