

Sept. 18, 1934.

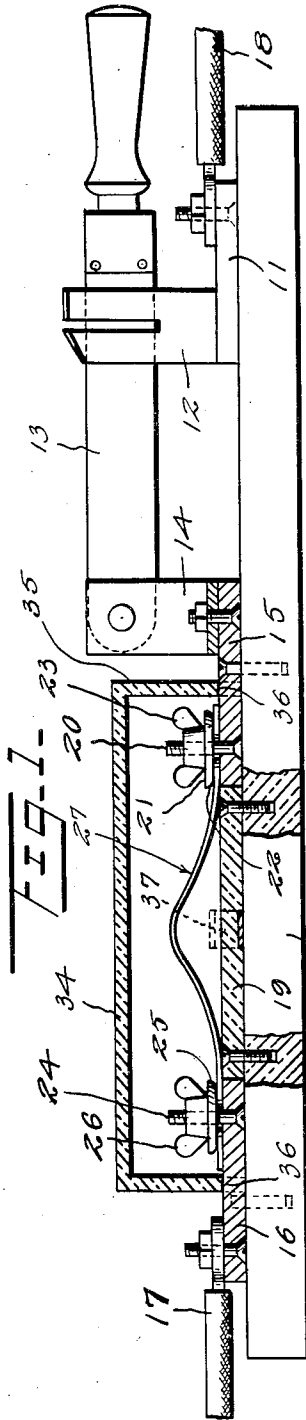
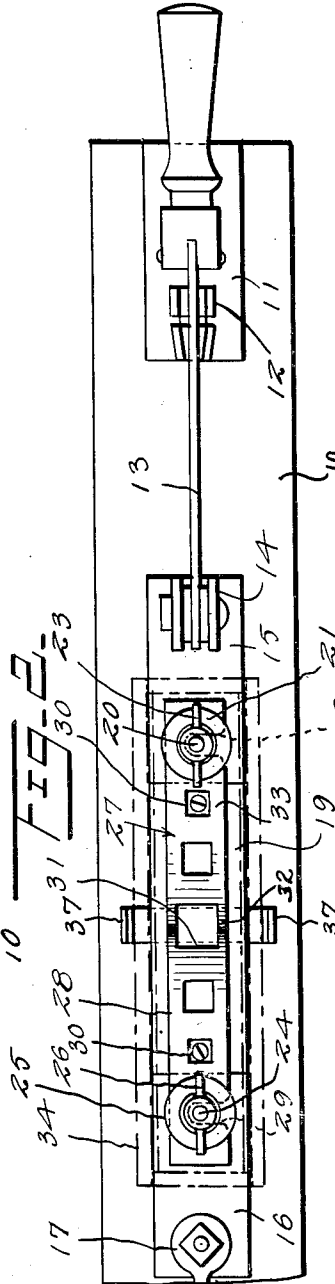
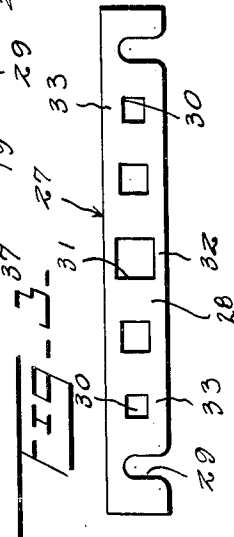
A. NAHER

1,974,119

RENEWABLE FUSE

Filed May 25, 1933

2 Sheets-Sheet 1



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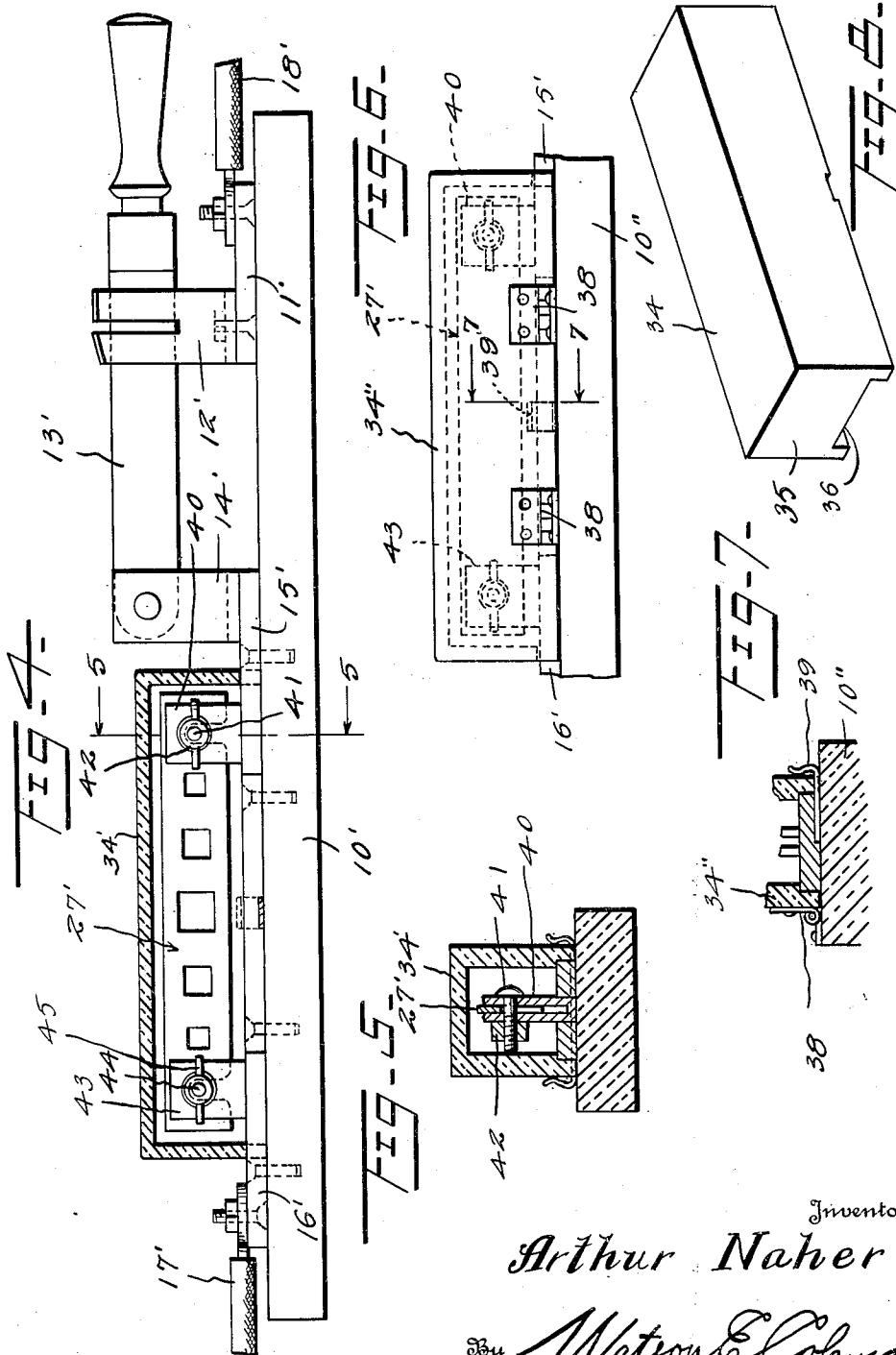
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UNITED STATES PATENT OFFICE

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RENEWABLE FUSE

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Application May 25, 1933, Serial No. 672,884

1 Claim. (Cl. 200—135)

This invention relates to fuses and more particularly to a renewable fuse and a combined fuse and switch block.

An object of this invention is to provide an improved type of fuse which is positioned closely adjacent a switch and electrically connected thereto, the fuse being so constructed that it can be readily removed for replacement.

Another object of this invention is to provide in a combination of this type a renewable fuse element which is so constructed that when the fuse has blown or melted, the remaining portions of the fuse will be spaced apart a distance sufficient to prevent arcing.

A further object of this invention is to provide a combination of this type which is so constructed that it will be possible to readily determine which fuse has blown, and the renewable fuse element can be replaced without the use of tools of any kind.

A still further object of this invention is to provide a removable cover or enclosure for a fuse which is of non-conducting construction.

The above and various other objects and advantages of this invention will in part be described and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings wherein:—

Figure 1 is a detail side elevation partly broken away and partly in section of a device constructed according to the embodiment of this invention.

Figure 2 is a fragmentary top plan view of the device.

Figure 3 is a detail side elevation of one of the fusing elements.

Figure 4 is a detail side elevation partly in section of a modified form of this device.

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a fragmentary side elevation of a further form of this device.

Figure 7 is a fragmentary sectional view taken on the line 7—7 of Figure 6.

Figure 8 is a perspective view of the cover used to enclose the fusible element.

Referring to the drawings wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a base of desired size constructed in the form of a plate or the like and constructed of insulating material. This base 10 has secured adjacent one end thereof a metallic contact member 11 provided with a pair of spring contacts 12, which extend upwardly and between

which a pivoted blade 13 carried by upstanding lugs 14 is adapted to engage. The lugs 14 are secured to a metallic base member 15 which is positioned intermediate the metallic base member 11 and another metallic base member 16. The metal parts 11 and 16 constitute means by which connectors 17 and 18 may be connected to the switch hereinbefore described. This knife switch comprising the spring contacts 12 and the pivoted blade 13 is of conventional structure.

The two metal bases 15 and 16 are spaced apart a desired distance and the space between these two members is filled by a dielectric element 19, and the metal plates or base members 15 and 16 also constitute bases for the fuse element hereinafter described.

In the form disclosed in Figure 1, the metal plate 15 is provided with a threaded post 20 about which a washer 21 is disposed, and this washer 21 is provided with a beveled lower face 22, the purpose for which will be hereinafter described. A wing nut 23 is threaded onto the post 20 and provides a means whereby the washer 21 can be manually tightened or loosened without the use of a tool. The plate 16 is also provided with a post 24 having a washer 25 similar to the washer 21 mounted thereon and a wing nut 26 is threaded onto this post 24. A fusing element, generally designated 27, is adapted to engaged the posts 20 and 24 and to be disposed between the washers 21 and 25, respectively, and to bridge the space between the two metal base members 15 and 16.

This fuse element, as shown in Figure 3, is constructed of a single piece of fusible metal 28 of substantially rectangular configuration in plan and provided adjacent each end thereof with notches 29, which open through the same edge of the plate 28. The notches 29 are adapted to engage about the bolts 20 and 24. The plate 28 is provided with square or rectangular openings 30 at a point inwardly from the notches 29, and these openings 30 may be graduated and increasing in size toward the center of the plate 28. That portion of the plate 28 on opposite sides of the cut out portions 30 constitutes the fusible element.

The plate 28 at the longitudinal center thereof is provided with a relatively large opening 31, and the metal between the outer edges of the opening 31 and the adjacent edge of the plate 28 constitutes a central fusible means 32, which is smaller in size than the fusible elements 33 on the opposite sides of the openings 30 so that this central fusing means is adapted to melt first but if this central fusing means does not melt,

any one of the fusible elements 33 will melt under excess load. The central portion of the plate or fusible element 27 is adapted to be raised, as shown in Figure 1, of the drawings so as to permit the circulation of air about the fuse so that the fuse will not unduly heat under an ordinary load.

A cover or shield 34 is adapted to engage about the fusing element 27 and to cover the wing nuts 23, 26. This shield or cover 34 also engages on the opposite sides of the metal plates 15 and 16, the ends 35 of the cover being recessed, as at 36, so that the cover or shield will closely engage about the fusing element 27 and the clamping or securing means therefor. The cover or shield 34 is of insulating construction and is removably secured to the base 10 by means of a pair of upstanding spring clips 37 which are integral one with another and extend through substantially the central portion of the insulating member 19. As shown in Figure 6, the cover 34' may be hinged by means of hinges 38 and the opposite edge of the cover secured as by a spring clip 39.

In the disclosure shown in Figure 4, the base 10' is similar to the base 10 and the switch structure including the fixed contact plate 11' with the upstanding spring contacts 12', which are engaged by the knife blade 13', are similar to that shown in Figure 1. The metal base member 15' is secured between the metal plate 11' and another metal plate 16'. A conductor 18' is adapted to be connected to the metal base or contact 11', and a conductor 17' is adapted to be secured or attached to the base 16'. The base 15' has secured thereto in upstanding spaced parallel relation a pair of clamping members 40, one of which has secured thereto a bolt 41, which bolt extends through the other clamping member, and a wing nut 42 is threaded onto this bolt 41 and is adapted to draw the two clamping members 40 toward each other. The base 16' has secured thereto in upstanding spaced parallel relation a pair of spring clamping members 43, one of which has secured thereto a bolt 44, which bolt extends through the other clamping member and has threaded thereon a wing nut 45.

A fusing element or member 27', which is constructed in a manner similar to that shown in Figure 3, is adapted to have each end thereof disposed between a pair of the clamping members and to be disposed in a position substantially at right angles to the base 10'. The fuse block shown in Figure 4 is also adapted to have a cover engaged therewith in the manner similar to that shown in Figure 1 and this cover may be either hinged as by hinges 38 and secured by a spring clip 39 or may be otherwise removably disposed about the fusing element.

It will, of course, be understood that the cover shown in the drawings may be either constructed of transparent or non-transparent material which is of insulating construction so that where the

cover is constructed of transparent material, it is not necessary to remove the cover in order to determine whether the fuse has blown or not.

In the use and operation of the fusing means hereinbefore described where the fuse shown in Figure 1 is used in connection with the switch, which switch may be either of the single pole or multiple pole type, the fusing element 27 may be slipped beneath the washers 21 and 25, and by reason of the beveled lower edge portions of these washers, the wing nuts 23 and 26 may be loosened only slightly and the elements 27 slipped beneath the washers without holding the washers away from the base members 15 and 16. When the fusing element 27 is positioned beneath the washers 21 and 25, the wing nuts 23 and 26 may be tightened and the central portion 32 will be disposed in spaced relation to the confronting or adjacent face of the insulating member 19. By providing the wing nut construction herein disclosed, the fusing elements may be securely tightened onto the spaced plates or contacts and this can be done in a manner to provide a satisfactory electrical connection and at the same time provide a connection where the fuse can be replaced or renewed without the use of any tool whatsoever.

Where the disclosure is used as shown in Figure 4, the wing nuts 42 and 45 may be loosened to permit the clamping members 40 and 43 to open whereupon the ends of the fusing element 27' may be slipped between these clamping members with the notched portions of the fusing element 27' engaging about the bolts 41 and 44.

It will be apparent from the foregoing that a fusible connection has been provided between a switch and a load carrying conductor which fusing element will be suitably protected so that there will be no danger of fire upon overloading of the conductor and the fusing element is such that when the overload occurs, a sufficient amount of metal will melt so that the remaining parts of the fusing element will be spaced apart a sufficient distance to prevent an arc occurring between these parts.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claim.

What is claimed is:—

As a new article of manufacture, a fusible element comprising an elongated flat strip of fusible material, said strip having a notch adjacent each end and opening through the same edge of the strip, said strip having a plurality of alined openings increasing in size from the ends of the strip toward the longitudinal center.

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