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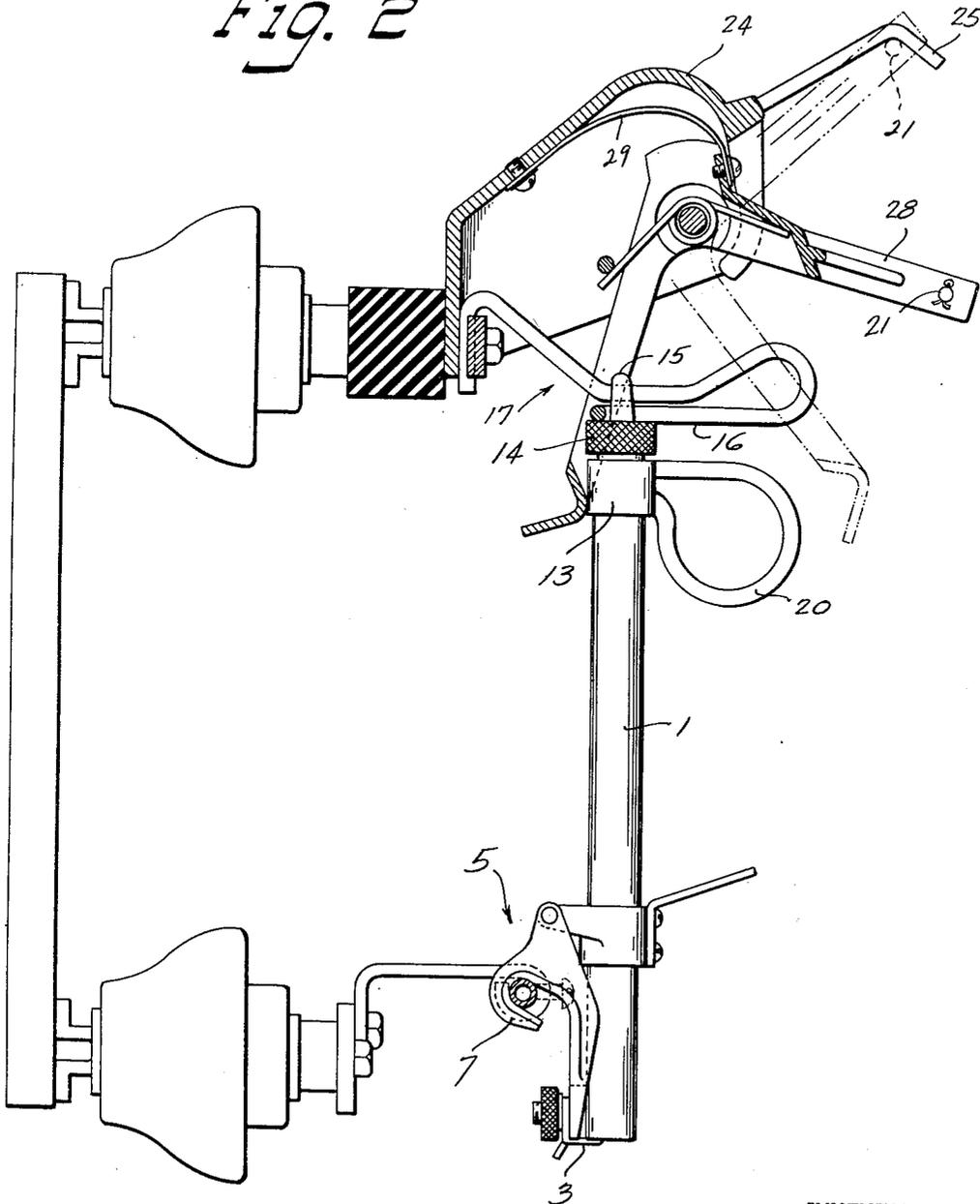
A. G. STEINMAYER
LOAD BREAK DEVICE

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3 Sheets-Sheet 2

Fig. 2



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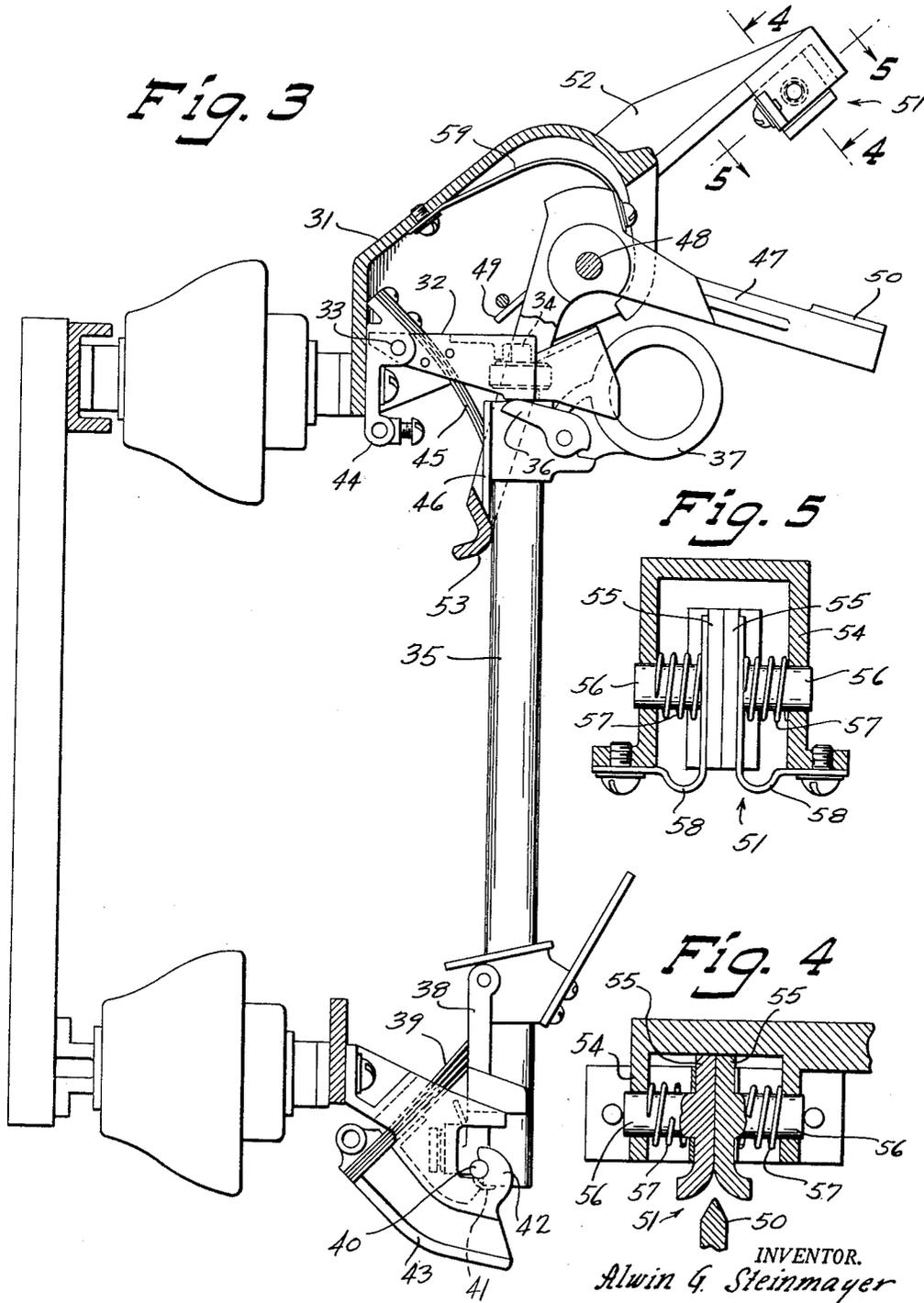
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LOAD BREAK DEVICE

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5 Claims. (Cl. 200—126)

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This invention relates to a load break device. Objects of this invention are to provide a load break device which is particularly useful in sectionalizing a power line and which also provides automatic overload protection in its normal functioning without sacrificing any of its operability for sectionalizing use.

A primary object of this invention is to provide a load break sectionalizing device in which the operator may open the circuit by using a switch stick, for instance, by pulling a drop-out fuse out of place with the assurance that the arc will be confined to a predetermined zone in the device and will be substantially instantly extinguished without any possibility of flash-over, burning of the contacts, or any other harmful effects.

Further objects of the invention are to provide a sectionalizing load break device which may use standard parts, such for example as those employed in drop-out, repeating fuse constructions, as shown in the patent to Schultz et al., No. 2,265,765, of December 9, 1941, for Repeating Fuse Construction, assigned to the same assignee as the present invention, and to so construct the device that the fuse or other circuit interrupting member for each section of the device will only be replaceable in that particular section of the device, so that there will be no chance of getting the wrong size fuse for instance in a place where it does not belong when refusing the apparatus.

Embodiments of the invention are shown in the accompanying drawings, in which:

Figure 1 is a front view of one form of the device such view being partly broken away and partly in section.

Figure 2 is a sectional view through a portion of the left-hand part of the structure shown in Figure 1 showing in full lines the transfer switch in open position and in dotted lines in closed position.

Figure 3 is a view corresponding to Figure 2 showing a further form that the device may take.

Figures 4 and 5 are sectional views on the lines 4—4 and 5—5 of Figure 3.

Referring to Figures 1 and 2 it will be seen that the device comprises a pair of drop-out fuse tubes 1 and 2, one of which is provided with a relatively heavy fuse link 3 and the other of which is provided with a relatively small fuse link 4. The drop-out fuse tubes may be of the same construction as that shown in the above noted patent to Schultz et al. and may comprise a fuse tube previously described having hinge link mechanism at their lower end indicated generally

by the reference character 5 for the fuse tube 1, and 6 for the fuse tube 2. These hinged links may be of the same type as that shown in the above noted patent. However, it is to be noted that the hook portions 7 of the hinge link mechanism 5 of the fuse tube 1 are not as widely spaced as the hinge hook portions 8 of the hinge link mechanism 6 of the fuse tube 2. Also it is to be noted that the bracket 9 which clamps about the pintle pin or bar 10 adjacent the fuse tube 1 is narrower than the bracket 11 which clamps about the pintle pin 10 adjacent the fuse tube 2. In this way, it is impossible to put the large capacity fuse tube assembly in place of the small capacity fuse tube assembly. The fuse links 3 and 4 are clamped at their upper ends to the upper metal ferrules 12 and 13 of the fuse tubes 1 and 2 by means of upper caps 14. These upper caps are each provided with an upwardly projecting pin or member 15 which passes between the spring arms 16 of the upper contact assembly 17 of the fuse tubes. Also it is to be noted that the pins 15 of the upper contact of the fuse tubes are temporarily locked as described in the above noted patent by means of the spring arms 16 of the upper stationary contact assemblies 17, although the fuse tubes may be bodily pulled out of place by means of a switch stick when desired. Ordinarily, however, the fuse tubes remain in place until an overload occurs and then drop out as described in connection with the above noted patent.

The upper hoods 22 and 24 of the fuse tubes 1 and 2 are carried by an insulating, transverse bar 18. The pintle pin 10, however, is carried by a conducting bar 19 to which the load is connected. The line wire is connected to the hood 22.

When it is desired to sectionalize the line, the operator merely inserts the hook of a switch stick in the eyelet 20 of the fuse tube 1 and pulls the fuse tube out. It is to be noted that there is a spring pressed transfer switch 21 pivotally mounted within the hood 22 of the fuse tube 1 and this transfer switch has a lower portion 23 which bears against the upper end of the fuse tube 1 and is restrained by the fuse tube when the fuse tube is in place, as shown in Figure 1 of the drawings. However, when the fuse tube is pulled out, the spring pressed transfer switch suddenly snaps to the upper position shown in dotted lines in Figures 1 and 2 and connects the line with the upper hood 24 of the fuse tube 2 as the transfer switch contacts the stationary contacts 25 and 26 of the hoods 22 and 24, respectively.

It is to be noted that the hood 22 is provided

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with a slot 27 through which the arm 28 of the transfer switch projects. If desired, the transfer switch may be electrically connected to the hood in a more advantageous manner by the use of a flexible connector or jumper 29.

As soon as the fuse tube 1 is pulled out, the load is immediately transferred to the smaller capacity fuse which blows within the fuse tube 2 and thus clears the line as the fuse tubes each have an expulsion action.

It is impossible in renewing the device to get the large capacity fuse tube in the wrong place, since its hook portions 7 are more closely spaced than the width of the bracket 11 adjacent the small fuse tube 2.

Also it is to be noted that when the device is refused and the tube 1 is rocked into place, that it immediately engages the portion 23 of the transfer switch and resets the transfer switch. Thereafter, the fuse tube 2 may be rocked into place. If desired, only a fragment of an eyelet portion 30 may be used with the fuse tube 2 so as to prevent the lineman from inadvertently hooking the switch stick in the wrong eyelet. In other words, the eyelet portion 30 may be only a half eyelet instead of a full eyelet as an additional precaution.

It is to be noted also that although the device may be used for sectionalizing a line, while the line is under load as hereinabove described, that the normal overload protection afforded by these drop-out fuses is still available for protecting the line. Obviously, if an overload occurs, the fuse tube 1 blows and drops out and immediately the fuse tube 2 blows and drops out. Thus it will be seen that the device not only provides a means for sectionalizing a line in a very simple manner and confining the resulting arc, when this sectionalizing occurs under load, to a predetermined restricted zone where expulsion action takes place with ready clearing of the line, but also provides overload protection in the normal manner.

It is to be noted also that standard parts, such as shown in the above noted prior patent may be employed for this device.

In the form of the invention shown in Figures 3, 4, and 5, the same ideas are followed. However, the drop-out fuses are constructed slightly differently as will now be explained. One of the drop-out fuses has been illustrated which corresponds to the left-hand one of Figure 1. In this construction, the upper hood is indicated by the reference character 31 and is provided with a downwardly biased latching member 32 which is hinged as indicated at 33 and which hooks over the upper pin 34 of the cap of the fuse tube 35, thus retaining the fuse tube in position under normal conditions. The latch may be lifted by means of a pawl 36 rigid with a manipulating ring 37, so as to allow the fuse tube to be manually detached and rocked downwardly. The fuse tube is supported by means of a hinge link support 38 which is pressed outwardly by means of the yielding contact members 39. This hinge link is hinged to the fuse tube and is provided with trunnions 40 which fit within hook-like members 42 of the lower support 43. The hinge link supporting member 38 is normally retained in place by means of the fuse link 41 as previously described. This lower support is adapted to receive the load conductor. The line is connected to the hood 31 as by means of the connector 44, for instance, and preferably a yielding contact member 45 bears against the flat face 46 of the upper contact portion of the fuse tube 35.

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The transfer switch is indicated by the reference character 47 and is hinged as indicated at 48 and is biased towards closed position by means of the spring 49. This transfer switch is provided with a switch blade portion 50 which is adapted to engage the stationary contact structure indicated generally by the reference character 51 supported from an arm 52 rigid with the housing of the next fuse tube, not shown. It is to be noted that the transfer switch is provided with bifurcated arms which have a transverse portion 53 which bears against the upper portion of the fuse tube 35 and normally holds the transfer switch in open position. When the fuse tube 35 is pulled out, as previously described, the transfer switch is released and snaps to closed position, thus transferring the circuit to the smaller fuse, not shown.

The stationary contact structure is indicated generally by the reference character 51 and may comprise a small housing 54 within which are movably supported contact members 55 which may carry pins 56 slidably passing through apertures in the sides of the housing 54 and urged towards each other by means of the spring 57. If desired, and as the preferable construction, flexible leaders 58 electrically join the stationary contact members 55 with the housing. Also it is preferable to provide a flexible leader 59, see Figure 3, which electrically joins the transfer switch to the housing 31.

The operation of this apparatus is identical with that previously described.

It will be seen that a very simple type of load break device has been provided by this invention which is composed of substantially standard parts like those disclosed in the above noted patent.

It will also be noted that the load break device can be opened manually under load and the circuit will be substantially instantly transferred by the quick acting transfer switch to the small capacity fuse tube resulting in the rupture of the small fuse link and the extinguishing of the arc in the small capacity fuse tube.

It will also be seen that overload protection is also afforded by this device.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. A load break device comprising a pair of terminals, a first fuse assembly normally electrically connecting said terminals, a second fuse assembly of less current carrying capacity than said first fuse assembly, and a quick acting transfer switch permanently biased towards closed position for connecting said second fuse assembly in circuit between said terminals, said first fuse assembly being manually movable to open position and said transfer switch having a portion directly engaging said first fuse assembly and being normally restrained thereby, said first and second fuse assemblies being normally in operative position as a permanent part of said load break device and said second fuse assembly being normally out of circuit and ready for instant use.

2. A load break device comprising a pair of terminals, a first fuse assembly normally electrically connecting said terminals, a second fuse assembly of less current carrying capacity than said first fuse assembly, and a quick acting transfer switch permanently biased towards closed position for

connecting said second fuse assembly in circuit between said terminals, said first fuse assembly being manually movable to open position and said transfer switch having a portion directly engaging said first fuse assembly and being normally restrained thereby, said first fuse assembly being assisted in its opening movement by the bias of said transfer switch, said first and second fuse assemblies being normally in operative position as a permanent part of said load break device and said second fuse assembly being normally out of circuit and ready for instant use.

3. A load break device comprising a pair of terminals, a first fuse assembly normally electrically connecting said terminals, a second fuse assembly of less current carrying capacity than said first fuse assembly, a quick acting transfer switch permanently biased towards closed position for connecting said second fuse assembly in circuit between said terminals, said first fuse assembly being manually movable to open position and said transfer switch having a portion directly engaging said first fuse assembly and being normally restrained thereby, latch means normally holding said first fuse assembly in closed position, and manually manipulable means for detaching said first fuse assembly from said latch means and for moving said first fuse assembly to open position, said first and second fuse assemblies being normally in operative position as a permanent part of said load break device and said second fuse assembly being normally out of circuit and ready for instant use.

4. A load break device comprising a pair of stationary terminal members, a circuit interrupting means normally electrically connecting said terminal members and manually movable to open position, an automatic circuit interrupter of less current carrying capacity than said circuit interrupting means, and a quick acting transfer

switch biased towards closed position for connecting said automatic circuit interrupter in circuit between said terminal members, said switch being restrained by said circuit interrupting means when said circuit interrupting means is in closed position, said circuit interrupting means and said automatic circuit interrupter being normally in operative position as a permanent part of said load break device, and said automatic circuit interrupter being normally out of circuit and ready for instant use.

5. A load break device comprising a drop-out fuse tube having a fuse link, means controlled by said fuse link for normally holding said fuse tube in circuit closing position, manually manipulable means for moving said fuse tube to open position, a second fuse tube having a fuse link of less current carrying capacity than said first fuse link, and a normally open quick acting transfer switch biased towards closed position for connecting said second fuse link in circuit, said transfer switch being controlled by said first fuse tube and being released when said first fuse tube moves to open position, supporting means for normally removably supporting said fuse tubes in operative position and means carried by said drop-out fuse tube coacting with said supporting means for preventing the positioning of said drop-out fuse tube in the place normally occupied by said second fuse tube.

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REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
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