Aug. 4, 1942. A. RAMSEY ET AL. 2,292,341

DROPOUT FUSE

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Fig. 3.

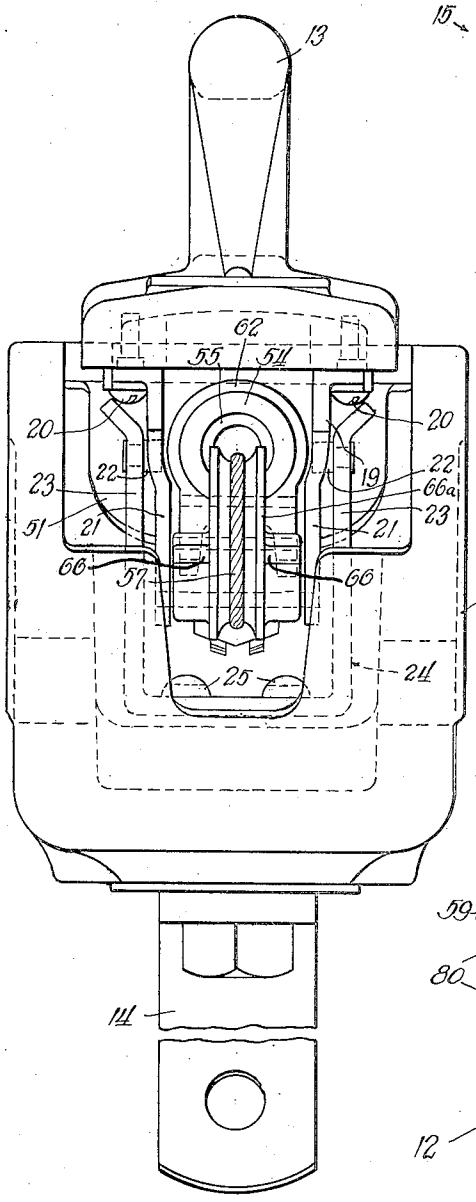



Fig. 1.

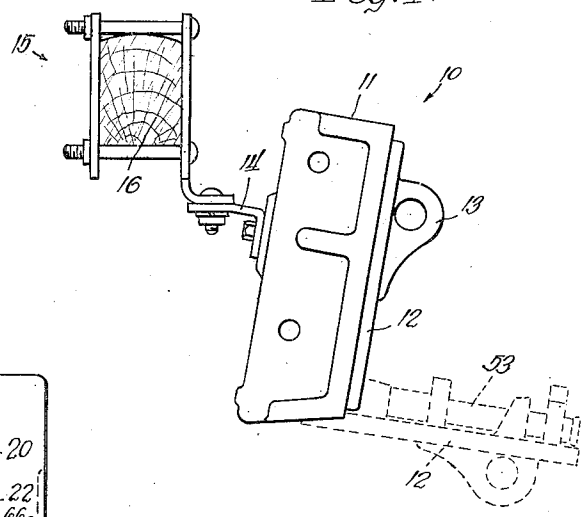



Fig. 9.

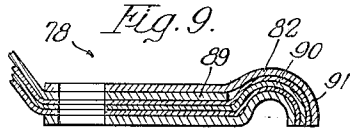
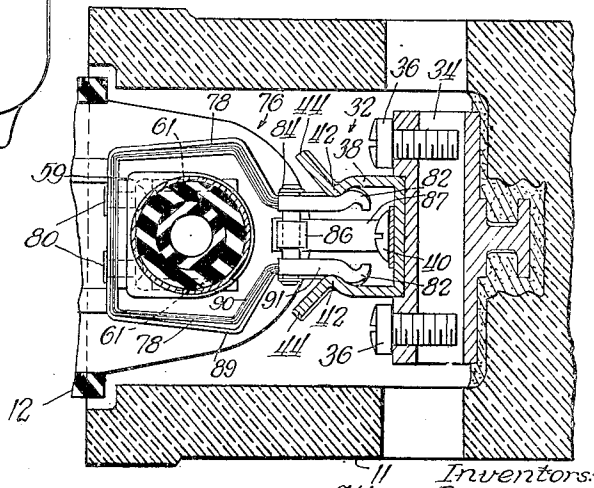



Fig. 11.




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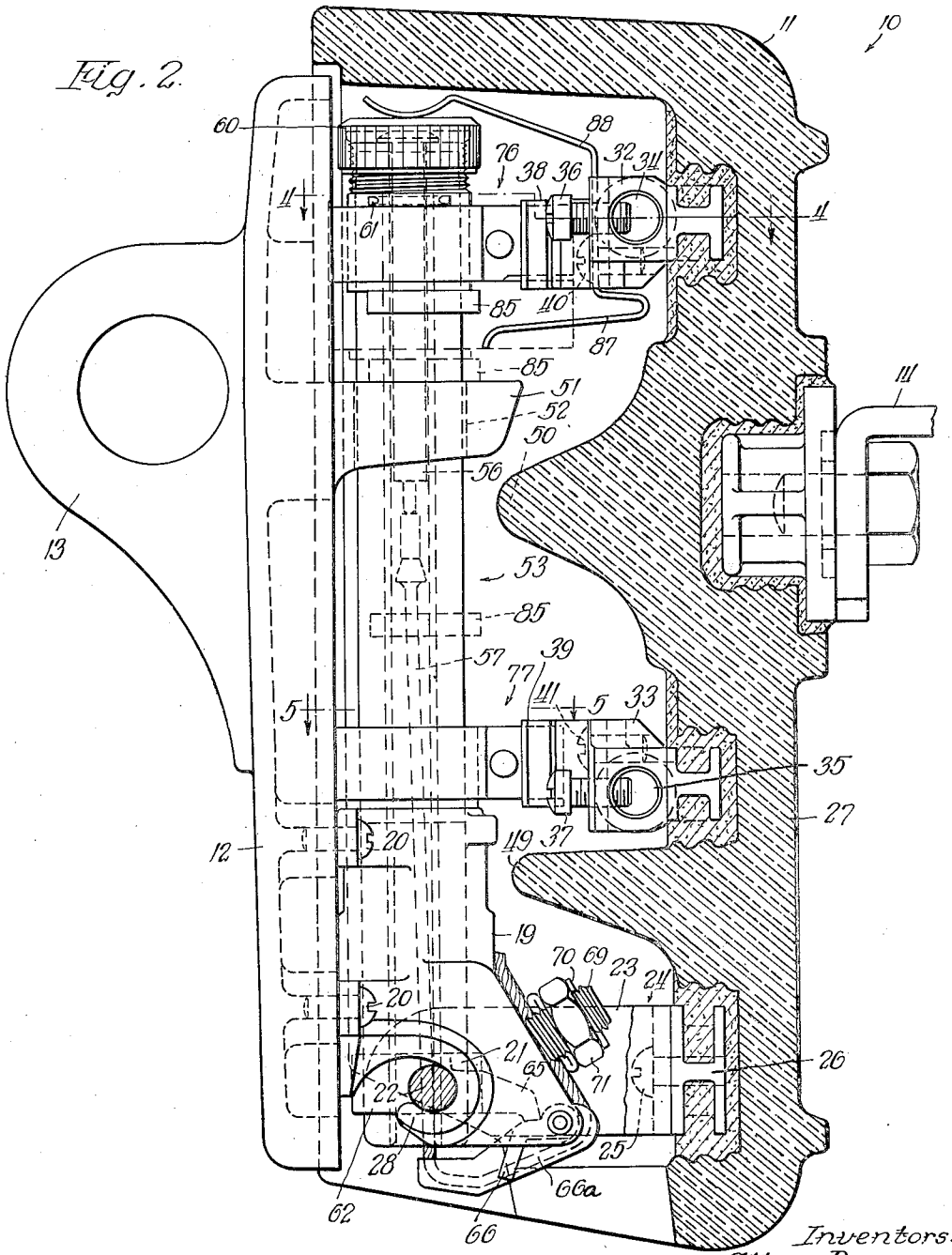
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DROPOUT FUSE

Filed Dec. 14, 1936 4 Sheets-Sheet 2

Fig. 2.




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Aug. 4, 1942. A. RAMSEY ET AL 2,292,341

DROPOUT FUSE

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Fig. 6.

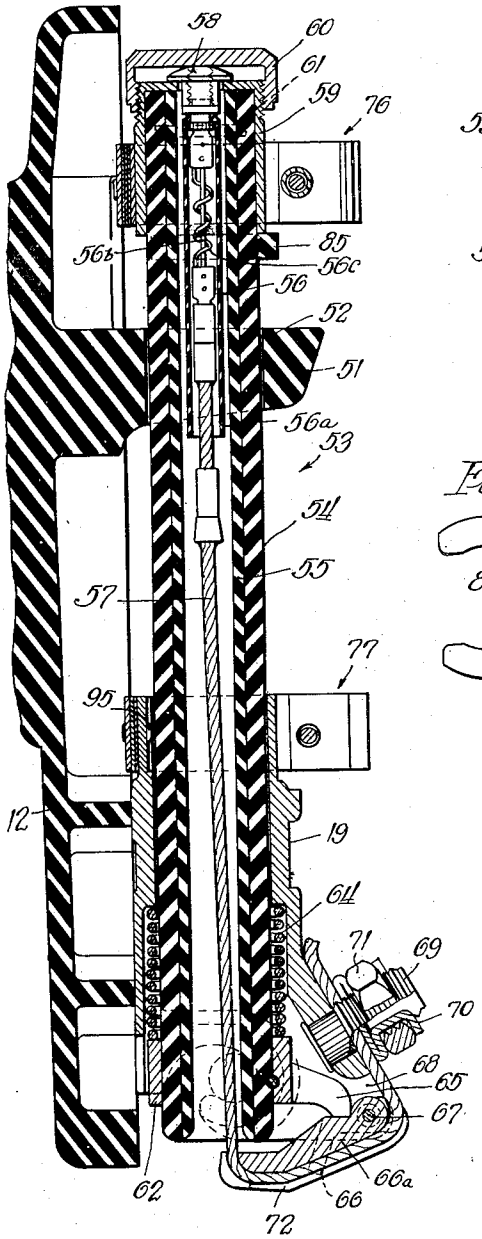



Fig. 5.

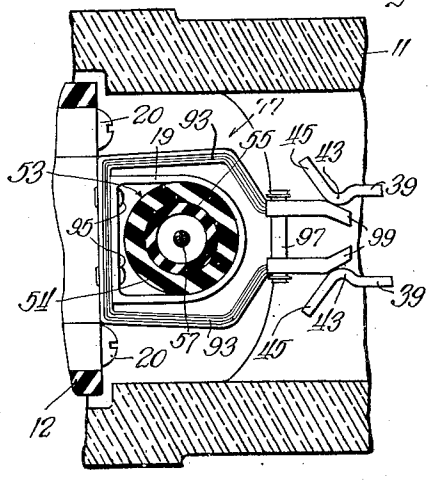



Fig. 8.

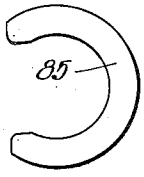
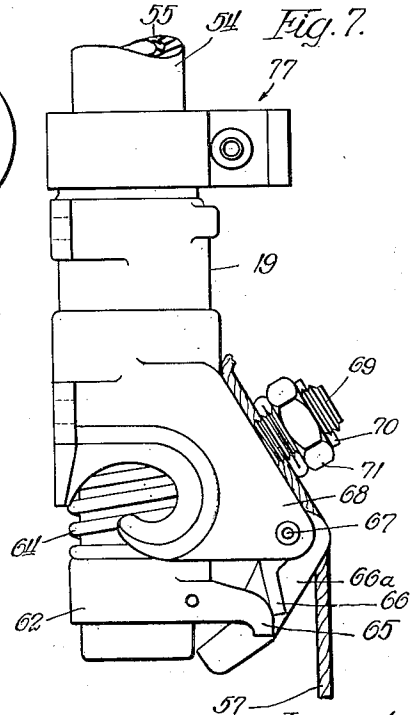



Fig. 7.




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Aug. 4, 1942. A. RAMSEY ET AL 2,292,341

DROPOUT FUSE

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Fig. 10.

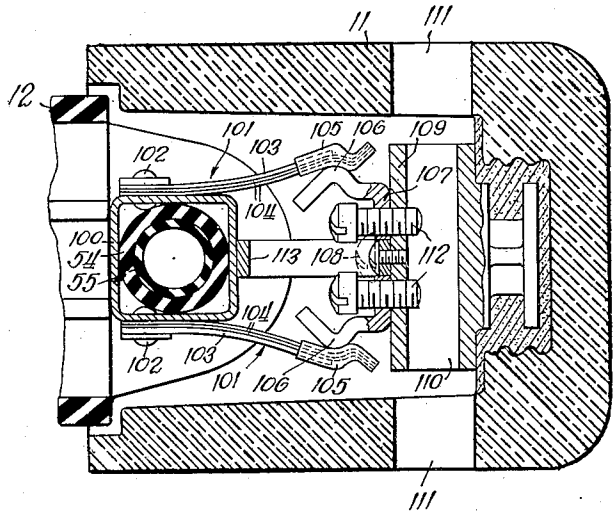
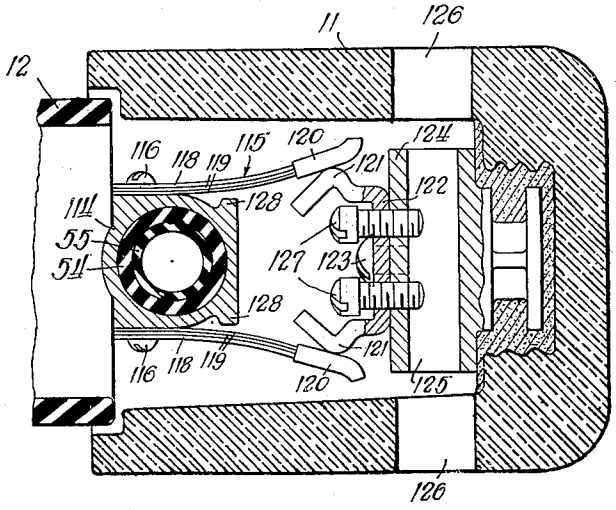



Fig. 11.




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Patented Aug. 4, 1942 2,292,341

# UNITED STATES PATENT OFFICE

2,292,341

## DROP-OUT FUSE

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Application December 14, 1936, Serial No. 115,690

41 Claims. (Cl. 200—114)

This invention relates, generally, to circuit interrupters and it has particular relation to fuse devices of the dropout type.

In the copending application of Allan Ramsey, one of the joint inventors of the invention disclosed herein, Serial No. 559,846, filed August 28, 1931, and assigned to the assignee of this application, now Patent No. 2,091,452, a fuse device of the expulsion type is disclosed which is mounted detachably on the cover of a box that is removably hinged at its lower end to close the front side of the box. On the rear wall of the box stationary terminals are provided to which the circuit connections may be made. The stationary terminals are in the form of blocks the opposite sides of which are engaged by flexible contact fingers in the form of spring wires that are located on and carried by each end of the fuse device and constitute its terminals. This construction provides simple rigid terminals in the box and facilitates removal of those parts that are most likely to require adjustment and replacement and leaves a minimum of live parts in the box when the cover is open. With a view to limiting the movement toward each other of the spring wire fingers when the device is in the open position, stop members are provided which limit the movement of the contact fingers so that their contact engaging portions will be positioned slightly within the path of relative movement with the stationary terminals. When the device is operated to the closed position, it is only necessary to move the contact fingers slightly out of engagement with the stop members and the full resiliency of the fingers will then be available to provide the relatively high contact pressure for each of the small area contact engaging portions.

The object of the present invention, generally stated, is to embody the principles of contact construction disclosed in said copending application in a fuse device of the dropout type.

An important object of the invention is to provide, in a dropout fuse device of the rotary type, interacting contact fingers and jaws which serve not only as a circuit connection but also as a means for restraining the fuse device from rotation to the open position.

Another important object of the invention is to provide for prestressing a pair of contact fingers carried by a fuse device of the dropout type by biasing them apart and limiting the movement apart to position them slightly within the path of relative movement with a cooperating stationary contact member comprising a pair of upstanding substantially inflexible arms.

Still another important object of the invention is to slidably mount a fuse device having a pair of prestressed contact fingers in a hinge member attached to the cover of a box and to permit first a translatory movement of the fuse device on blowing of its fusible element to effect separation of the fuse terminals and interruption of the arc during the initial part of the translatory movement and to disengage the contact fingers by the completion of the translatory movement and then to permit a rotary movement of the fuse device, hinge member and cover to introduce an air gap in the circuit in addition to that provided by the blowing of the fusible element.

Another object of the invention is to provide a mechanical barrier of insulating material between the lower contact clip and the cover hinge support to prevent accidental contact between the clip and support.

Still another object of the invention is to facilitate the sliding of a fuse device having prestressed contact fingers on blowing of its fusible element from engagement with a terminal clip and to release it for rotation to open position.

A still further object of the invention is to permit a limited movement of the fuse tube of a dropout fuse device relative to its support for the purpose of separating the terminals of the fuse link and extinguishing the arc without releasing the catch that holds the fuse device against rotary movement.

Other objects of the invention will, in part, be obvious and in part appear hereinafter.

The invention, accordingly, is disclosed in the embodiment thereof shown in the accompanying drawings, and it comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the appended claims.

For a more complete understanding of the nature and scope of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a view, in side elevation, of the novel dropout fuse device, illustrating how it may be mounted on a cross-arm;

Figure 2 is a view, partly in side elevation and partly in section, showing the details of construction of the dropout fuse device;

Figure 3 is a bottom plan view of the device illustrated in Figure 2;

Figure 4 is a sectional view taken generally along the line 4—4 of Figure 2;

Figure 5 is a detail sectional view taken generally along the line 5—5 of Figure 2;

Figure 6 is a sectional view showing the details of construction of the fuse tube, fuse link and the associated operating parts and contact fingers;

Figure 7 is a fragmentary view, in side elevation, of the lower end of the fuse tube and the hinge member in which it is slidably mounted;

Figure 8 is a view, in top plan, of a spacer that may be optionally used to prevent the cover of the box from rotating when the fuse device blows;

Figure 9 is a detail sectional view showing, at an enlarged scale, the details of construction of one of the flexible contact fingers that is carried by the upper end of the fuse tube; and

Figures 10 and 11 are views, similar to Figures 4 and 5, showing alternate forms of contact fingers.

Referring first to Figure 1 of the drawings, it will be observed that the reference character 10 designates, generally, a fuse device of the drop-out type which comprises a box 11, formed preferably of porcelain, and a cover 12, formed preferably of a suitable molded insulating material, and having integrally formed therewith an eye 13 to permit operation of the cover from a remote position by a hook stick. The cover 12 is arranged to be hingedly mounted with respect to the box 11 for movement from the closed position to the alternate position shown by the broken lines.

The box 11 is provided with a rearwardly extending L-shaped bracket 14 which may be secured by a suitable clamp, shown generally at 15, to a cross-arm 16 in the customary and well known manner. In some applications it may be desirable to mount the box 11 substantially horizontally rather than in the substantially vertical position, as shown in Figure 1. The cover 12 would then open downwardly and would not expose the interior of the box 11 directly to the weather on blowing of the fusible element. As will hereinafter appear, the cover 12 is so hinged to the box 11 that it will not be released from the box 11 even though it is placed in the horizontal position.

As illustrated more clearly in Figure 2 of the drawings, a sleeve 19, formed preferably by a single metallic casting, is secured by screws 20 to the inside of the lower end of the cover 12. The sleeve 19 is provided at its lower end with hook-shaped portions 21 on opposite sides thereof for mounting on trunnions 22 that extend inwardly from the outwardly extending arms 23 of a fulcrum member 24. The inner end of the fulcrum member 24 may be secured by screws 25 to an insert 26 which is cemented into a suitable recess in the rear wall 27 of the box 10, as shown. It will be noted that the ends 28 of the hook-shaped portions 21 encircle the trunnions 22 for a substantial portion thereof and to such an extent that they will not become detached even though the box 11 is mounted in the substantial horizontal position, as indicated hereinbefore.

Upper and lower stationary terminals 32 and 33 are cemented into suitable recesses in the rear wall 27 and they are respectively provided with longitudinally extending apertures 34 and 35 in which the circuit conductors may be positioned and secured by set screws 36 and 37. The apertures 34 and 35 are aligned with apertures in the side walls of the box 11 so that the circuit conductors may be readily introduced as will be readily understood. Upper and lower stationary contact clips 38 and 39 are mounted on the upper and lower stationary terminals 32 and 33 by screws 40 and 41 and they are provided, respectively, with inwardly extending shoulders 42 (Figure 4) and 43 (Figure 5) and out flared ends 44 and 45. It will be noted that the contact clips 38 and 39 are formed of relatively thick material, preferably copper strap, so that the outwardly extending arms carrying the inwardly projecting shoulders 42 and 43 are substantially inflexible.

With a view to preventing accidental contact between the lower stationary terminal 33 and the fulcrum member 24 when the cover 12 is open, the rear wall 27 is provided with an integrally formed inwardly extending barrier 49. In this manner the fulcrum member 24 is more effectively insulated from the stationary terminal 33 than would be the case if the barrier 49 were omitted. In like manner a barrier 50 is interposed between the terminals 32 and 33 to increase the electrical creepage distance therebetween and to reduce as far as possible the likelihood of a flashover. It will be understood that the barriers 49 and 50 are not only integrally formed with the rear wall 27 but also that they are integrally formed with the side walls of the box 11 to act as mechanical reinforcement therefor.

The cover 12 is provided with an integrally formed inwardly extending shoulder 51 having a transverse aperture 52 therein for slidably mounting a fuse device that is indicated generally at 53. The shoulder 51 acts not only as a guide for the fuse device 53 but also it serves to limit the downward movement thereof on blowing of its fusible element as will be presently apparent.

The fuse device 53, Figure 6, comprises a fuse tube 54 that is formed of a suitable insulating material and is provided with a fiber liner 55. A fusible element, designated generally by the reference character 56, is positioned inside of the fiber liner 55 and it has a flexible conductor 57 extending outwardly therefrom through the bore of the fiber liner 55. The fusible element 56 may be of any suitable type the terminals of which will be separated on blowing of a calibrated conductor when the current flowing therethrough exceeds a predetermined value. For example, it may comprise a tube 56a of insulating material in which are positioned a strain wire 56b and a fuse wire 56c, preferably formed of silver, that are fastened at one end to the flexible conductor 57 and at the other end to a head 58. The head 58 not only serves as a connection to a threaded ferrule 59 but also it positions the fusible element 56 in the upper end of the bore of the fiber liner 55. A threaded cap 60 is mounted on the threaded end of the ferrule 59 to cover the same. The ferrule 59 is secured to the upper end of the fuse tube 54 by transversely extending pins 61 that are more clearly shown in Figure 4. Before assembly of the ferrule 59 on the fuse tube 54 the holes for the pins 61 are drilled therein on the opposite sides. After the ferrule 59 has been positioned on the upper end of the fuse tube 54 a drill is run through the previously drilled openings in the ferrule 59 and through the tube 54 after which the pins 61 are driven into tight fitting relationship therein. In this manner the ferrule 59 is securely held to the upper end of the fuse tube 54 to pre-

vent the assembly from being blown off of the upper end of the fuse tube **54** when the fuse device **56** blows under short circuit conditions. In such case a considerable pressure is developed in the upper end of the fuse tube **54** and, unless a sturdy construction is provided for closing the upper end, the gases formed thereby may be blown out at this end with the result that damage to the box **11** and cover **12** and the contact members housed thereby in the upper end may be damaged.

At the lower end of the fuse tube **54** a ferrule **62** is secured by suitable means. The fuse tube **54** is slidably mounted in the sleeve **19**, as illustrated more clearly in Figure 6 of the drawings, and a coil spring **64** is interposed between the upper side of the ferrule **62** and the underside of a recessed aperture in the sleeve **19** to bias the fuse device **53** downwardly. The ferrule **62** is provided with a pair of integrally formed arms **65** that engage the upper sides of flanges **66** integrally formed with a lever or flipper **66***a* that is hinged on a pin **67** which extends transversely between a pair of ears **68** that are formed integrally with the sleeve **19**. The flanges **66** insure the proper positioning of the arms **65** relative to the lever or flipper **66***a* on refusing. A connector stud **69** is secured in an inclined wall of the sleeve **19** and it is longitudinally slotted to provide for slidably positioning therein a spacer **70** that is movable with a nut **71** that is threaded on the connector **69**. The spacer **70** is formed by bending to the desired shape a thin narrow strip of copper strap. The flexible lead **57** from the fusible element **56** is positioned in a relatively deep groove **72** in the underside of the lever **66***a* and then is drawn through the longitudinal slot in the connector **69** until the various parts assume the relative positions shown in Figure 6 of the drawings. The nut **71** is then tightened to secure the end of the flexible lead **57** in position.

It will be observed that the arm **65** engages the upper surfaces of the flanges **66** in close proximity to the pin **67** about which the lever or flipper **66***a* is fulcrumed. In this manner the fusible element **56** has a considerable mechanical advantage over the biasing force of the spring **64**. For the same reason, when the fusible element **56** blows, the terminals thereof between which the arc is drawn are separated at a very rapid rate because of the fact that the left hand end of the lever or flipper **66***a* moves at a high speed as compared to the speed of movement of the fuse tube **54** in the sleeve **19**. It will be understood that it is desirable to separate the terminals of the fusible element **56** at a high speed in order to extinguish the arc drawn therebetween as soon as possible. The relatively powerful spring **64** is arranged to operate at a mechanical advantage as described in order to separate the terminals with a minimum of delay and at the same time to move the fuse tube **54** to separate it from the stationary terminal **32** as will be presently apparent.

The construction of the lever or flipper **66***a* is important in order to make certain that it functions properly on blowing of the fusible element **56**. The deep groove **72** is provided in its under surface in order to insure that the lower end of the flexible lead **57** moves together therewith rather than possibly slipping off on operation of the fusible element **56**. Since the lever or flipper **66***a* must be moved on blowing of the fusible element **56** in order to separate its terminal, the inertia of the parts that must be moved should be reduced to a minimum. It is for this purpose that the connector **69** is stationarily mounted on the sleeve **19** rather than being positioned on the lever or flipper **66***a*. In this construction it is only necessary to accelerate the lever or flipper **66***a* and the flexible lead **57** in separating the terminals of the fusible element **56**. It will be observed that the lever or flipper **66***a* is positioned substantially at right angles to the longitudinal axis of the bore of the fuse tube **54** or the fiber liner **55** therein. It will also be noted that the lower end of this bore is substantially unobstructed so that the free egress of the gases that are evolved on the blowing of the fusible element **56** may take place. With this positioning of the lever or flipper **66***a* the flexible lead **57** is drawn directly outwardly of the bore during the initial movement rather than being drawn over the lower edge of the bore. In this manner the friction force that must be overcome during this initial movement is negligible and consequently the terminals of the fusible element **56** are rapidly separated. In Figure 7 of the drawings the relative positions of the various parts after the fusible element **56** has blown are illustrated.

In order to electrically connect the fuse device **53** across the stationary terminals **32** and **33** prestressed contact members **76** and **77** are provided for engaging between the outwardly extending jaws of the contact clips **38** and **39**. The contact members **76** serve to hold the fuse device **53** and the cover **12** on which it is slidably mounted in operative position while the contact members **77** are arranged to bias the fuse device **53** and cover **12** to the open position when the fusible element **56** blows.

The details of construction of the prestressed contact member **76** are more clearly illustrated in Figure 4 of the drawings. As there shown it comprises a pair of spring contact fingers **78** that are formed by a substantially U-shaped construction, the common portion being flattened and secured as by rivets **80** to a correspondingly flattened portion of the upper ferrule **59**. The spring fingers **78** are fastened to the side of the ferrule **59** remote from the contact clip **38** in order to provide a maximum resiliency therein with a minimum of depth of box **11**. Each of the contact fingers **78** has a double bend, as illustrated, in order to increase the flexibility thereof as well as to clear the fuse tube **54** and for positioning between the arms of the clip **38**. The inner ends of the contact fingers **78** are provided with outwardly extending shoulders **82** that are arranged to interfit with the inwardly extending shoulders **42** on the stationary contact clip **38**. A rivet **84** extends transversely through suitable apertures in the fingers **78** and the ends thereof are headed over to prevent movement apart of the inner ends of the contact fingers **78** beyond a predetermined distance. The rivet **84** is constructed, in accordance with the principles of prestressed contact construction set forth in the copending application hereinbefore referred to, so that the shoulders **82** are positioned slightly within the path of relative movement with the shoulders **42** on the jaws of the contact clip **38**. If the rivet **84** were not provided, the spring fingers **78** would move to positions apart under the influence of their inherent resiliency to such an extent that the guiding surfaces provided by the flared out ends of the contact clip **38** would have to be much longer to bring the parts into contact engagement when the cover **12** is closed. When the rivet **84** is provided, as illustrated, it is only necessary to move

the inner ends of the contact fingers 78 through a slight distance to relieve the rivet 84 and apply the force of the inherent resiliency to make a good contact engagement under relatively high pressure with the jaws of the contact clip 38. The arms of the contact clip 38 and the outer ends of the spring fingers 78 may be flared outwardly in a downward direction, as shown in Figure 4, in order to facilitate the downward movement of the shoulders 82 and the fuse device 53 after the fusible element 56 has blown.

The interengaging shoulders 42 and 82 are provided for holding the fuse device 53 and the cover 12 in the closed position as long as the fusible element 56 remains intact. Since the contact fingers 78 are substantially in the form of straps, it is possible to have them engage the contact clip 38 with a rotary movement and then to disengage it on blowing of the fusible element 56 with a sliding movement while still maintaining contact with the clip 38 until the terminals of the fusible element 56 have been separated and the arc extinguished. Sufficient clearance is provided between the fingers 78 forming the upper contact member 76 and the shoulder 51 to permit the shoulder 82 to slide downwardly out of engagement with the inwardly extending shoulders 42 of the contact clip 38. The fuse device 53 and the cover 12 are then free to rotate about the trunnions 22, as will be readily understood.

In order to insure that the contact fingers 78 bear with equal contact pressure against both of the inner surfaces of the outwardly extending arms of the upper contact clip 38, the fuse tube 54 is arranged to be rotatable in the sleeve 19 about its longitudinal axis for a limited extent. There will then be no tendency for a greater contact pressure to be applied to one of the contact fingers 78 than is applied to the other. Consequently each contact finger 78 will carry its share of the current and overheating of one of them will not take place.

Since it is essential that the fuse tube 54 move relative to the sleeve 19 in order to operate the lever or flipper 66a and separate the terminals of the fusible element 56, this movement must be provided for. In some cases it is undesirable to have the fuse device 53 and the cover 12 move from the closed position on blowing of the fusible element 56. In order to prevent this movement and at the same time permit the necessary movement of the fuse tube 54 in the sleeve 19, a spacer 85, Figure 8, formed preferably of insulating material, is provided for positioning between the upper ferrule 59, as shown in Figures 2 and 6 of the drawings, and the shoulder 51 that is carried by the cover 12. In this position the spacer 85 permits the fuse tube 54 to move downwardly a sufficient distance to effect the separation of the terminals of the fusible element 56. However it does not permit sufficient downward movement to cause the shoulders 82 to disengage the shoulders 42 and, consequently, the cover 12 remains closed.

In most instances it is desired to have the fuse device 53 move to such position that the shoulders 82 and 42 will be disengaged for the purpose of introducing an air gap in the circuit in addition to that which is provided by the separation of the terminals of the fusible element 56. Such operation is desired in order to reduce to a minimum the creepage path that would otherwise be present through the fuse device 53 and the likelihood of a flashover between the stationary terminals 32 and 33. In such case the spacer 85 may be positioned below the shoulder 51 in the position indicated by the broken lines in Figure 2 of the drawings. In this same figure the manner in which the spacer 85 prevents the downward movement of the fuse device 53 to maintain the shoulders 82 and 42 in engagement is also shown by broken lines.

Referring again to Figure 4 of the drawings, it will be observed that a roller 86 may be loosely mounted on the rivet 84 between the ends of the fingers 78 for engagement with an arcing finger 87, formed preferably of resilient material such as phosphor bronze, that is secured to the contact clip 38 under the head of the screw 40. If any arcing persists after the fusible element 56 is blown and the fingers 78 are moved out of engagement with the jaws of the contact clip 38, it will take place between the roller 86 and the arcing finger 87, thereby avoiding pitting of the sliding contact surfaces. It will be noted that the arcing finger 87 is provided with an extension 88 that is arranged to engage the upper surface of the cap 60. This extension is provided in order to conduct readily the heat that is generated in the cap 60 and the ferrule 59 to the stationary terminal 32 but the force with which it biases the fuse device 53 downwardly is comparatively slight.

The details of construction of one of the contact fingers 78 are illustrated in Figure 9 of the drawings. As there shown the assembly comprises a resilient strip 89, formed preferably of stainless steel, and a plurality of conductor strips 90 that are formed preferably of copper. A sleeve 91 surrounds the outer ends of the spring strip 89 and the strip conductors 90 and is pressed thereon by suitable dies to the shape indicated to provide a substantially unitary construction. It will be understood that other forms of contact finger construction may be employed without departing from the scope of our invention.

The construction of the lower contact member 77 is similar to that of the upper contact member 76. As illustrated more clearly in Figure 5 of the drawings the lower contact member 77 comprises a pair of prestressed apart spring fingers 93 that are of substantially U-shaped construction the common portion of which is flat in order to suitably engage a correspondingly flattened portion of the upper end of the sleeve 19 and screws or rivets 95 may be provided for connection thereto. The spring fingers 93 have the double bends to increase their flexibility, as previously described. A rivet 97 loosely fits in aligned apertures adjacent the free ends of the fingers 93 and it serves to limit the movement thereof apart.

It will be observed that the extreme ends of the fingers 93 are turned inwardly and that they engage the out flared ends 45 of the lower clip 39. This construction serves to bias the sleeve 19 and the fuse device 53 and the cover 12 outwardly by reaction with the out flared ends 45 with a definite and predetermined force. This biasing force in addition to the force of gravity, when the box 11 is positioned in such location that it is inclined slightly from the vertical, as shown in Figure 1 of the drawings, is sufficient to insure that the rotation of the cover 12 takes place and at the same time produces a minimum of friction between the shoulders 42 and 82 at the upper end of the fuse device 53.

In the operation of the device it will be understood that the contact member 76 serves not

only to electrically connect the fuse device 53 to the upper stationary contact clip 38 but that it also serves to latch it thereto. The lower contact member 77 has only a rotary movement with respect to the lower contact clip 39 and it does not move with a translatory movement as does the upper contact member 76. With the prestressed contact finger construction a relatively high contact pressure is provided and at the same time a minimum of effort is required to move the fuse device 53 to the closed position. The prestressed contact finger construction on the movably mounted fuse device 53 permits a simplification in the design of the contact clips 38 and 39 and provides a maximum of contact pressure with a minimum of movement being required on the part of the contact fingers of each of the contact members 76 and 77.

A modified form of contact finger construction for the upper end of the fuse tube 54 is illustrated in Figure 10 of the drawings. As there shown the fuse tube 54 is provided with a ferrule having a generally rectangular portion 100 on the opposite sides of which flexible resilient contact fingers 101 are secured by rivets 102. Each of the contact fingers 101 comprises an outer strip 103, formed preferably of stainless steel and one or more inner strips 104 of copper to form a conducting path for the current. The outer ends of the contact fingers 103 have provided thereon sleeves 105 that are pressed thereon and to the shape indicated by suitable dies. It will be observed that the sleeves 105 forming the ends of the contact fingers 101 are provided with inner curved portions for engagement with shoulders 106 of an upper stationary contact clip 107. The contact clip 107 is secured by a screw 108 to a connector block 109 that has a transversely extending aperture 110 therein for receiving the line conductor. The terminal connector 109 may be cemented in the box 11 as illustrated. The transversely extending aperture 110 is aligned with apertures 111 in the sidewalls of the box 11 for directly receiving the line conductor therein. Set screws 112 extending through the clip 107 and the connector block 109 serve to hold the line conductor in position, as will be readily understood. A bracket 113, mounted on the contact clip 107 and secured underneath the head of the screw 108 serves to limit the inward movement of the fuse tube 54 so that the curved portions of the sleeves 105 will be accurately positioned in contact engagement with the shoulders 106.

As long as the fusible element in the inner bore of the fuse tube 54 remains intact the fuse tube 54 will be held in position by the shoulders 106. The door 12 will then remain closed. However, as soon as the fusible element blows, the fuse tube 14 will slide downwardly until the shoulders 106 are disengaged, at which time the fuse tube 54 and the door 12 will swing to the open position, as previously described.

It will be understood that the contact fingers 101 are limited in their movement toward each other when out of engagement with the contact clip 107 by engagement with the inner corners of the rectangular portion 100 of the ferrule at the upper end of the fuse tube 54. The resilient strips 103 are initially stressed in such manner that they tend to bias the contact fingers 101 inwardly beyond the movement that is permitted by the inner corners of the rectangular portion 100. In this manner the contact fingers 101 are prestressed toward each other.

In Figure 11 of the drawings a modified form of contact finger construction for connecting the lower end of the fuse device to the lower stationary terminal is illustrated. As there shown the fuse tube 54 is slidably mounted in a sleeve 114 which is similar in construction to the sleeve 19 previously described. Flexible and resilient contact fingers 115 are secured on opposite sides of the sleeve 114 by screws 116. Each of the contact fingers 115 comprises a spring strip 118, formed preferably of stainless steel, and one or more copper strips 119 to form the current path. Sleeves 120 are pressed on the outer ends of the contact fingers 115 in order to secure the strips 118 and 119 together.

The sleeves 120 forming the ends of the contact fingers 115 engage shoulders 121 of a lower stationary contact clip 122 which may be secured by means of a screw 123 to a terminal connector 124 having an aperture 125 extending transversely therethrough. It will be observed that the aperture 125 is aligned with apertures 126 in the side walls of the box 11 to readily permit insertion of the bared end of the line conductor. Set screws 127, which extend through the contact clip 122 and the connector block 124, are provided for securing the line conductor in position.

Since the contact fingers 115 are biased toward each other by the spring strips 118 and further since the sleeves 120 bear against the front side of the shoulders 121 a definite and predetermined biasing force is constantly applied to the fuse tube 54 through the sleeve 114 to urge it and the door 12 toward the open position. As long as the fusible element remains intact the fuse device will remain in the closed position as held by the contact fingers 101 in engagement with the shoulders 106, Figure 10. However, as soon as the fusible element blows, this restraining action will be released and the fuse device will be moved toward the open position by the combined effects of gravity and the resiliency of the contact fingers 118.

It will be observed that the sleeve 114 is provided with shoulders 128 on the side away from the screws 116. These shoulders 128 serve to limit the movement of the contact fingers 118 toward each other and, since the spring strips 118 are originally so formed as to bias the contact fingers 115 inwardly further than permitted by the shoulders 128, a prestressed construction is provided.

Since certain further changes may be made in the above constructions and different embodiments of the invention may be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim as our invention:

1. In a circuit interrupter, in combination, a stationary contact clip having a pair of substantially inflexible upstanding jaws, each of said jaws having inwardly extending projecting portions, a fuse device disposed to be connected to said contact clip, and a pair of prestressed apart contact fingers carried by said fuse device and having outwardly extending projecting portions for interfitting behind said projecting portions on said jaws.

2. In a circuit interrupter, in combination, a stationary contact member, a fuse device, and a pair of prestressed contact fingers forming one

terminal of said fuse device, said contact fingers being arranged and adapted to engage said stationary contact member with a substantially longitudinal movement and to disengage said stationary contact member with a substantially transverse movement.

3. A circuit interrupter comprising, in combination, a support member, a pair of spaced apart contact members carried by said support member, a fuse device adapted to receive a fuse link for bridging said contact members, means for rotatably and slidably mounting said fuse device on said support member, said fuse device being released to slide from one position to another on blowing of said fuse link, and a pair of prestressed contact fingers forming each terminal of said fuse device for individually engaging said contact members.

4. A circuit interrupter comprising, in combination, a support member, a pair of spaced apart contact members carried by said support member, a fuse device adapted to receive a fuse link for bridging said contact members, means for rotatably and slidably mounting said fuse device on said support member, said fuse device being released to slide from one position to another on blowing of said fuse link, and a pair of prestressed contact fingers forming each terminal of said fuse device for individually engaging said contact members, said contact fingers being arranged and adapted to engage the respective contact members with a movement substantially longitudinally thereof and to disengage one of them with a movement substantially transversely thereof.

5. A circuit interrupter comprising, in combination, a support member, a pair of spaced apart contact members carried by said support member, a fuse device adapted to receive a fuse link for bridging said contact members, means for rotatably and slidably mounting said fuse device on said support member, said fuse device being released to slide from one position to another on blowing of said fuse link, a pair of prestressed contact fingers forming each terminal of said fuse device for individually engaging said contact members, and catch means interacting between one of said contact members and the corresponding pair of contact fingers for holding said fuse device against rotation, said catch means being released by the sliding of said fuse device on blowing of said fuse link.

6. A circuit interrupter comprising, in combination, a pair of contact clips disposed in insulated spaced relation each comprising a pair of substantially inflexible upstanding jaws, a fulcrum member disposed in insulated spaced relation with one of said contact clips, a fuse device adapted to receive a fuse link and rotatably and slidably mounted on said fulcrum member for bridging said contact clips, and a pair of prestressed apart plate-like contact fingers carried by and constituting one terminal member of said fuse device for engaging one of said contact clips with a rotary movement and disengaging it with a translatory movement.

7. A circuit interrupter comprising, in combination, a pair of contact clips disposed in insulated spaced relation each comprising a pair of substantially inflexible upstanding jaws, a fulcrum member disposed in insulated spaced relation with one of said contact clips, a fuse device adapted to receive a fuse link and rotatably and slidably mounted on said fulcrum member for bridging said contact clips, two pairs of prestressed apart plate-like contact fingers constituting the terminal members of said fuse device for engaging said contact clips with a rotary movement and disengaging one of them with a translatory movement, and catch means interacting between the jaws of one of said contact clips and the contact fingers engaging therewith for holding said fuse device against rotation, said catch means being released by sliding of said fuse device on blowing of said fuse link.

8. A circuit interrupter comprising, in combination, a housing having rear, top and side walls of insulating material, a door hinged to the lower end of said housing for closing the front of the same, a fuse device adapted to receive a fuse link and slidably mounted on said door, resilient means biasing said fuse device relative to said door and restrained by said fuse link, a pair of contact members mounted on said rear wall, two pairs of prestressed plate-like contact fingers constituting the terminal members of said fuse device for engaging said contact members with a rotary movement and disengaging one of them with a translatory movement, and catch means interacting between one of said contact members and the contact fingers engaging therewith for holding said fuse device and door against rotation, said catch means being released by sliding of said fuse device under the influence of said resilient means on blowing of said fuse link.

9. A circuit interrupter comprising, in combination, a housing having rear, top and side walls of insulating material, a door hinged to the lower end of said housing for closing the front of the same, a fuse device adapted to receive a fuse link and slidably mounted on said door, resilient means biasing said fuse device relative to said door and restrained by said fuse link, a pair of contact members mounted on said rear wall, two pairs of prestressed plate-like contact fingers constituting the terminal members of said fuse device for engaging said contact members with a rotary movement and disengaging one of them with a translatory movement, catch means interacting between one of said contact members and the contact fingers engaging therewith for holding said fuse device and door against rotation, said catch means being released by sliding of said fuse device under the influence of said resilient means on blowing of said fuse link, and stop means interposed between said fuse device and said door whereby limited movement of the former relative to the latter is permitted on blowing of said fuse link, said limited movement being insufficient to release said catch means.

10. A circuit interrupter comprising, in combination, a housing having rear, top and side walls of insulating material, upper and lower contact clips mounted on said rear wall and each comprising a pair of substantially inflexible upstanding jaws, a fulcrum member mounted on said rear wall below said lower contact clip, a cover for closing the front of said housing, a tubular hinge member detachably and rotatably mounted on said fulcrum member and secured to said cover, a fuse device adapted to receive a fusible element and slidably mounted in said tubular hinge member, resilient means biasing said fuse device relative to said hinge member, a lever pivoted on said hinge member, a flexible conductor extending from said fusible element and disposed to hold said lever in such position as to prevent movement of said fuse device under the influence of said resilient means, said lever acting on blowing of said fusible element to separate the terminals thereof, two pairs of pre-

stressed apart plate-like contact fingers constituting the terminal members of said fuse device for engaging said upstanding jaws of said contact clips with a rotary movement and disengaging said upstanding jaws of said upper contact clip with a translatory movement, and catch means interacting between said upper contact clip and the contact fingers engaging therewith for holding said fuse device and cover against rotation, said catch means being released by sliding of said fuse device under the influence of said resilient means on blowing of said fusible element.

11. A circuit interrupter comprising, in combination, a housing having rear, top and side walls of insulating material, upper and lower contact clips mounted on said rear wall and each comprising a pair of substantially inflexible upstanding jaws, a fulcrum member mounted on said rear wall below said lower contact clip, a cover for closing the front of said housing, a tubular hinge member detachably and rotatably mounted on said fulcrum member and secured to said cover, a fuse device adapted to receive a fusible element and slidably mounted in said tubular hinge member, resilient means biasing said fuse device relative to said hinge member, a lever pivoted on said hinge member, a flexible conductor extending from said fusible element and disposed to hold said lever in such position as to prevent movement of said fuse device under the influence of said resilient means, said lever acting on blowing of said fusible element to separate the terminals thereof, two pairs of prestressed apart plate-like contact fingers constituting the terminal members of said fuse device for engaging said upstanding jaws of said contact clips with a rotary movement and disengaging said upstanding jaws of said upper contact clip with a translatory movement, catch means interacting between said upper contact clip and the contact fingers engaging therewith for holding said fuse device and cover against rotation, said catch means being released by sliding of said fuse device under the influence of said resilient means on blowing of said fusible element, and stop means interposed between said fuse device and said cover whereby limited movement of the former relative to the latter is permitted on blowing of said fusible element, said limited movement being sufficient to move said lever to rapidly separate said terminals of said fusible element but insufficient to release said catch means.

12. In a circuit interrupter, in combination, a support member, a contact clip having a pair of substantially inflexible outwardly extending jaws mounted on said support member, a fuse device slidably and rotatably mounted on said support member, said fuse device being released for sliding movement on blowing of a fusible element therein, a pair of prestressed apart contact fingers carried by said fuse device for contact engagement with said contact clip, and interacting shoulders on said jaws and contact fingers restraining said fuse device from rotary movement, said jaws and contact fingers being slightly inclined to the vertical to facilitate downward movement of said fuse device on blowing of said fusible element.

13. A circuit interrupter comprising, in combination, a box open at the front, upper and lower contact clips each having a pair of substantially inflexible outwardly extending jaws mounted on the back wall of said box, a cover hinged to the lower end of said box for closing the same, a fuse device slidably mounted on said cover and restrained from sliding by a fusible element therein, a pair of prestressed apart contact fingers constituting the terminals of said fuse device and disposed to engage said upper and lower contact clips on rotation of said cover to close said box, and interacting shoulders on the jaws of said upper contact clip and on the contact fingers in engagement therewith restraining said cover and fuse device from rotary movement, the ends of the other pair of fingers being turned inwardly to cooperate with the jaws of said lower contact clip to bias said fuse device and cover for rotation to the open position on disengagement of said shoulders.

14. A circuit interrupter comprising, in combination, a box open at the front, upper and lower contact clips each having a pair of substantially inflexible outwardly extending jaws mounted on the back wall of said box, a cover for closing the front of said box, a metallic sleeve mounted on the lower end of said cover and hinged to the lower end of said box, a pair of lower contact fingers carried by said sleeve for engaging said lower contact clip, a fuse device slidably mounted in said sleeve and restrained from movement relative thereto by a fusible element therein, a pair of upper contact fingers carried by said fuse device for contact engagement with said upper contact clip, and interacting shoulders on the jaws of said upper contact clip and on said upper contact fingers restraining said fuse device and said cover from rotary movement.

15. A circuit interrupter comprising, in combination, a box open at the front, upper and lower contact clips each having a pair of substantially inflexible outwardly extending jaws mounted on the back wall of said box, a cover for closing the front of said box, a metallic sleeve mounted on the lower end of said cover and hinged to the lower end of said box, a pair of prestressed apart lower contact fingers secured to said sleeve for engaging said lower contact clip and having the ends turned inwardly to cooperate with the jaws of said lower contact clip to bias said sleeve and cover for rotation to open position, a fuse device slidably mounted in said sleeve and restrained from movement relative thereto by a fusible element therein, a pair of upper prestressed apart contact fingers carried by said fuse device for contact engagement with said upper contact clip, and interacting transverse shoulders on the jaws of said upper contact clip and on said upper contact fingers restraining said fuse device and said cover from rotary movement until after said fusible element blows.

16. In a dropout fuse device, in combination, a sleeve, a fuse tube slidably mounted in said sleeve and adapted to receive therein a fusible element having a flexible conductor secured thereto, a lever rotatably mounted on said sleeve and normally extending substantially at right angles to the longitudinal axis of said fuse tube, said flexible conductor extending over said lever, and clamp means mounted on said sleeve to secure said flexible conductor thereto for holding said lever in its normal position so as to restrain said fuse tube against sliding in said sleeve until said fusible element blows, said lever when released on blowing of said fusible element withdrawing said flexible conductor substantially in line with said fuse tube.

17. In a dropout fuse device, in combination, a

sleeve, a fuse tube slidably mounted in said sleeve and adapted to receive therein a fusible element having a flexible conductor secured thereto and extending out of one end of said fuse tube, a spring encircling said tube and biasing it relative to said sleeve, a lever rotatably mounted on said sleeve, an arm at said one end of said fuse tube operatively engaging said lever near its fulcrum point, said flexible conductor being positioned over said lever, and clamp means mounted on said sleeve to secure said flexible conductor thereto for holding said lever in such position as to prevent said fuse tube sliding in said sleeve under the influence of said spring until said fusible element blows.

18. In a dropout fuse device, in combination, a sleeve, a fuse tube slidably mounted in said sleeve, a fusible element fastened at one end inside of said fuse tube, a lever rotatably mounted on said sleeve and disposed substantially at right angles to said fuse tube and having a longitudinal groove therein on the side away from said fuse tube, an arm on said fuse tube engaging said lever adjacent its axis of rotation, a spring biasing said fuse tube relative to said sleeve, connector means carried by said sleeve, and a flexible conductor connected to the other end of said fusible element and extending outside of said fuse tube, said flexible conductor being positioned in said groove and fastened to said connector means to hold said fuse tube against the biasing force of said spring.

19. A circuit interrupter comprising, in combination, a pair of contact clips disposed in insulated spaced relation each comprising a pair of substantially inflexible upstanding jaws, a fulcrum member disposed in insulated spaced relation with one of said contact clips, an insulating barrier between said fulcrum member and the adjacent contact clip, a fuse device including a fusible element rotatably and slidably mounted on said fulcrum member for bridging said contact clips, and a pair of prestressed apart plate-like contact fingers carried by and constituting one terminal member of said fuse device for engaging one of said contact clips with a rotary movement and disengaging it with a translatory movement.

20. A circuit interrupter comprising, in combination, a pair of spaced apart circuit terminals, a dropout fuse device bridging said terminals, said dropout fuse device normally acting to open the circuit and to move longitudinally to an alternate position after its fusible element blows, and means for rendering said fuse device incapable of moving longitudinally to said alternate position after blowing of said fusible element.

21. A circuit interrupter comprising, in combination, a pair of spaced apart circuit terminals, a dropout fuse device bridging said terminals, said dropout fuse device normally acting to open the circuit and to move longitudinally to an alternate position after its fusible element blows, and readily detachable means cooperating with said fuse device for rendering it incapable of moving longitudinally to said alternate position after blowing of said fusible element.

22. A circuit interrupter comprising, in combination, a pair of spaced apart circuit terminals, a dropout fuse device interconnecting said terminals, said dropout fuse device normally acting to open the circuit between said terminals and being movable longitudinally to disengage at least one of them after its fusible element blows, and readily detachable means cooperating with said fuse device for rendering it incapable of disengaging said one terminal by longitudinal movement after said fusible element blows.

23. In a circuit interrupter, in combination, a terminal member having a pair of oppositely facing contact surfaces, a fuse device including a fuse tube, and a pair of plate-like flexible prestressed contact fingers mounted on opposite sides of said fuse tube and extending transversely therefrom for contact engagement with said contact surfaces.

24. A circuit interrupter comprising, in combination, a pair of spaced apart contact members each having oppositely facing contact surfaces; a fuse device including a fuse tube and a fusible element; and a pair of contact finger assemblies constituting the terminals of said fuse device for engaging said contact surfaces, each of said assemblies comprising a pair of plate-like contact fingers prestressed toward each other and positioned on opposite sides of said fuse tube in planes parallel to the longitudinal axis thereof and extending transversely therefrom.

25. A circuit interrupter comprising, in combination, a pair of spaced apart contact members each having oppositely facing contact surfaces, a fuse tube adapted to receive a fusible element, means for slidably and rotatably mounting said fuse tube, means restraining said fuse tube from sliding as long as said fusible element remains intact, and a pair of contact finger assemblies constituting the terminals of said fuse device for engaging said contact surfaces, each of said assemblies comprising a pair of plate-like prestressed contact fingers positioned on opposite sides of said fuse tube in planes parallel to the axis thereof and extending transversely therefrom, the contact fingers of one of said assemblies cooperating with its contact member to hold said fuse device against rotation until after said fusible element blows and the remaining contact fingers cooperating with the remaining contact member to bias said fuse device for rotation.

26. In a dropout fuse device, in combination, a sleeve, a fuse tube slidably mounted in said sleeve, a spring biasing said tube for movement relative to said sleeve, a fusible element secured in said tube, a flexible conductor fastened to said fusible element and extending outwardly of said tube, a pair of arms extending transversely from said tube at one end, a lever pivoted on said sleeve and having a portion extending between said arms toward the bore of said tube, said arms operatively engaging said lever close to its pivot axis and said lever cooperating with said flexible conductor for preventing said movement of said fuse tube under the influence of said spring, and flanges extending laterally from said lever into the path of said arms to insure proper positioning of said lever on re-fusing.

27. In a dropout fuse device, in combination, a sleeve, means for rotatably mounting said sleeve, a fuse tube slidably mounted in said sleeve, a spring biasing said tube for movement relative to said sleeve, said fuse tube being adapted to receive a fusible element to be tensioned by said spring and restrain said tube from movement in said sleeve, and resilient latch means holding said tube and sleeve against rotation, the stress applied to said fusible element being independent of and unaffected by the resilient force applied to said latch means, said latch means being released after said fusible element blows and said tube slides to a predetermined position.

28. In a dropout fuse device, in combination, a

sleeve, means for rotatably mounting said sleeve, a fuse tube slidably mounted at one end in said sleeve, a spring biasing said tube for movement relative to said sleeve, said fuse tube being adapted to receive a fusible element to be tensioned by said spring and restrain said tube from movement in said sleeve, a terminal carried by the other end of said tube, a stationary terminal adjacent said other end of said tube, and resilient contact means electrically interconnecting said terminals, the stress applied to said fusible element being independent of and unaffected by the resilient force applied to said contact means.

29. In a dropout fuse device, in combination, a sleeve, means for rotatably mounting said sleeve, a fuse tube slidably mounted at one end in said sleeve, a spring biasing said tube for movement relative to said sleeve, said fuse tube being adapted to receive a fusible element to be tensioned by said spring and restrain said tube from movement in said sleeve, a terminal carried by the other end of said tube, a stationary terminal adjacent said other end of said tube, and resilient contact means electrically interconnecting said terminals and arranged and adapted to maintain substantially constant contact pressure with one of them while said tube moves through said sleeve after said fusible element blows, the stress applied to said fusible element being independent of and unaffected by the resilient force applied to said contact means.

30. In a dropout fuse device, in combination, a sleeve, means for rotatably mounting said sleeve, a fuse tube slidably mounted at one end in said sleeve, a spring biasing said tube for movement relative to said sleeve, and fuse tube being adapted to receive a fusible element to be tensioned by said spring and restrain said tube from movement in said sleeve, a terminal carried by the other end of said tube, a stationary terminal adjacent said other end of said tube, contact means electrically interconnecting said terminals with the contact engagement taking place in planes substantially parallel to the axis of said tube, and resilient means biasing said contact means into contact engagement with one of said terminals, said resilient means acting in a plane substantially at right angles to the axis of said tube whereby said fusible element is unstressed thereby.

31. A detachable contact assembly for a fuse device or the like comprising, in combination, a terminal having a transverse aperture for receiving a conductor, a contact clip having a pair of upstanding arms carried by said terminal and aligned with said aperture, and a substantially U-shaped resilient contact member surrounding said fuse device and constituting one terminal thereof, the ends of said contact member being offset toward each other and biased apart for contact engagement with said arms of said contact clip.

32. A circuit interrupter comprising, in combination, support means, a pair of spaced apart line terminal members carried by said support means, a fuse device adapted to receive a fusible element for bridging said terminal members, means for rotatably and slidably mounting said fuse device on said support means, lever means controlled by said fusible element for holding said fuse device in the circuit closed position and adapted to release the same and lengthen the arc formed on blowing of said fusible element, contact means carried by said fuse device forming terminals for said fusible element and adapted to engage said line terminal members, said contact means being arranged and adapted to engage the respective line terminal members with a movement substantially longitudinally thereof and to disengage one of them with a movement substantially transversely thereof, and auxiliary contact means disposed to maintain circuit connection between said one line terminal member and its contact means on said fuse device while the same are being separated through a predetermined distance to prevent arcing therebetween.

33. A circuit interrupter comprising, in combination, a pair of terminal blocks positioned in insulated spaced relation and adapted to receive line conductors, a contact clip having a pair of substantially inflexible spaced apart contact jaws removably mounted on each terminal block, and a fuse device for interconnecting the contact clips including a fuse tube, and a pair of terminal members mounted on the side of said fuse tube remote from said contact clips and each comprising a pair of plate-like contact fingers biased in opposite directions and extending transversely alongside of said fuse tube and into individual engagement with the jaws of said contact clips.

34. A circuit interrupter comprising, in combination, a pair of terminal blocks positioned in insulated spaced relation and adapted to receive line conductors, a contact clip having a pair of substantially inflexible spaced apart contact jaws removably mounted on each terminal block, and means for interconnecting the contact clips including a longitudinally extending conducting member, and a pair of terminal members mounted on the side of said conducting member remote from said contact clips and each comprising a pair of plate-like contact fingers biased in opposite directions and extending transversely alongside of said conducting member and into individual engagement with the jaws of said contact clips.

35. In a dropout fuse device, in combination, a sleeve, a fuse tube slidable in said sleeve and adapted to receive a fuse link having a flexible lead, a lever rotatably mounted on said sleeve and normally extending substantially at right angles to the longitudinal axis of said fuse tube with the free end aligned with the bore of said fuse tube, said flexible lead being adapted to be looped over the free end of said lever but not fastened thereto, and means for anchoring said flexible lead independently of said lever for holding the same in its normal position, thereby restraining said fuse tube from sliding in said sleeve until said fuse link blows.

36. The combination, in a circuit interrupter having a slidably mounted fuse tube restrained from movement by a fuse link therein having a flexible lead, of a pair of arms extending transversely from said fuse tube, a lever extending between said arms for receiving said flexible lead and having a portion engaged by said arms for preventing said fuse tube from sliding as long as said fuse link remains intact, and means on said lever cooperating with said arms for insuring proper positioning of said lever on re-fusing.

37. The combination, in a circuit interrupter having a slidably mounted fuse tube restrained from movement by a fuse link therein having a flexible lead, of a pair of arms extending transversely from said fuse tube, and a lever having a central portion extending between said arms for receiving said flexible lead and oppositely extending flanges adjacent its pivot axis for receiving the ends of said arms to prevent said fuse

tube from sliding as long as said fuse link remains intact, said flanges having portions turned away from said arms for guiding the same onto said flanges on re-fusing.

38. A fuse construction comprising a housing having a pair of stationary contacts, a door for said housing, said door having a contact normally engaging one of said stationary contacts, a fuse tube slidably carried by the contact of said door and having a contact adjacent one end normally in engagement with the other of said stationary contacts, a fuse link within said fuse tube normally electrically connecting the contact of said fuse tube with the contact of said door, and means normally restraining said fuse tube against sliding motion and including fuse link extracting means carried by the contact of said door and controlled by said fuse link, said fuse link extracting means having a part located adjacent one end of said fuse tube and engaging the fuse link, and biased for motion away from and substantially in line with said fuse tube.

39. An automatic circuit interrupting switch comprising an insulating housing having spaced contacts, a door for said housing, an arcing tube slidably supported from said door and normally held against sliding motion, an expulsible conductor within said arcing tube normally electrically connecting said spaced contacts, means for holding said door closed irrespective of the sliding motion of said tube, mechanism for restraining said tube against sliding motion and for extracting said expulsible conductor, said mechanism including a part having motion directly outwardly substantially in line with said tube, and current controlled means controlling said mechanism.

40. A dropout fuse construction comprising, in combination, an insulating support carrying upper and lower stationary contact members, a fuse tube having upper and lower contact members for engaging said stationary contact members and being slidable relative to its lower contact member, said fuse tube being adapted to receive a replaceable fuse link having a flexible conductor adapted to extend out of the lower end of said fuse tube, means biasing said fuse tube downwardly, means on said lower contact member for receiving and holding said flexible conductor whereby said fuse tube is restrained from said downward movement as urged by said biasing means, and a lever pivoted adjacent the lower end of said fuse tube and normally extending substantially at right angles thereto over which said flexible conductor is passed, said lever being biased downwardly away from said fuse tube for withdrawing said flexible conductor therefrom on blowing of said fuse link.

41. A dropout fuse construction comprising, in combination, an insulating support carrying upper and lower stationary contact members, a fuse tube having upper and lower contact members for engaging said stationary contact members and being slidable relative to its lower contact member, said fuse tube being adapted to receive a replaceable fuse link having a flexible conductor adapted to extend out of the lower end of said fuse tube, means biasing said fuse tube downwardly, means on said lower contact member for receiving and holding said flexible conductor whereby said fuse tube is restrained from said downward movement as urged by said biasing means, and a lever pivoted adjacent the lower end of said fuse tube and normally extending substantially at right angles thereto over which said flexible conductor is passed, said lever being biased downwardly away from said fuse tube for withdrawing said flexible conductor therefrom on blowing of said fuse link, the under side of said lever having a groove aligned with the bore of said fuse tube for centering said flexible conductor with respect to said bore.

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