

June 10, 1930.

A. L. HOSNER

1,762,298

RECLOSING MECHANISM FOR CIRCUIT BREAKERS

Filed Dec. 27, 1926

6 Sheets-Sheet 1

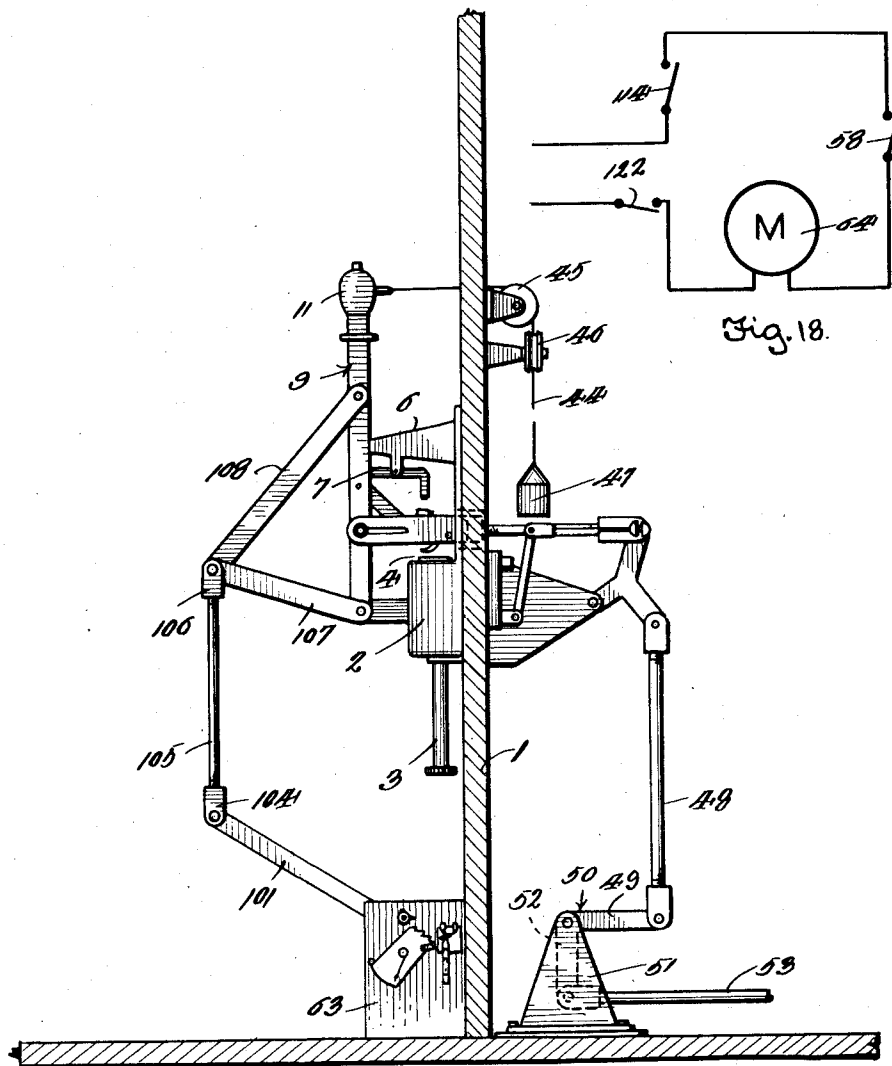


Fig. 1.

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Witnesses

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6 Sheets-Sheet 2

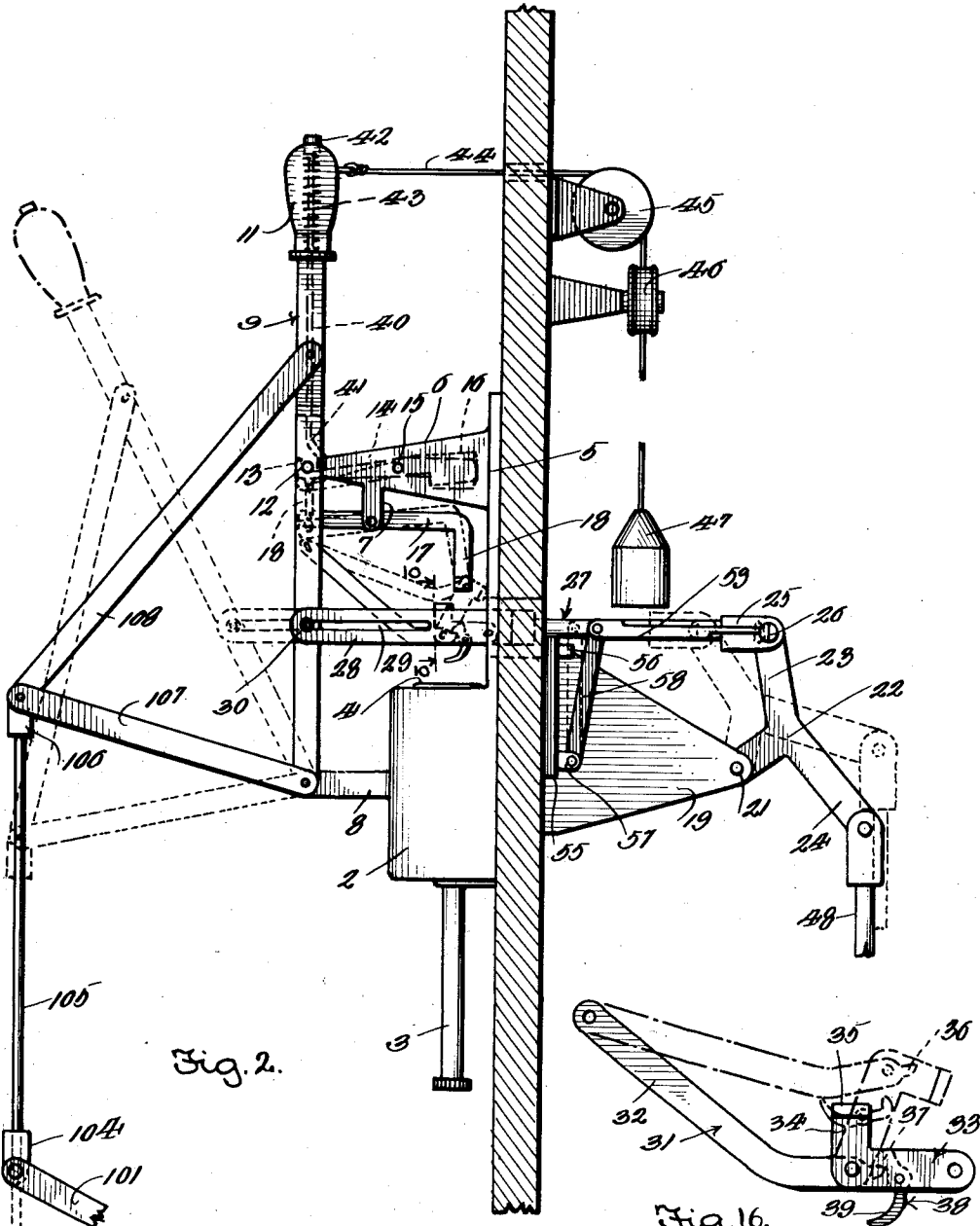


Fig. 2.

Fig. 16.

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RECLOSING MECHANISM FOR CIRCUIT BREAKERS

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6 Sheets-Sheet 3

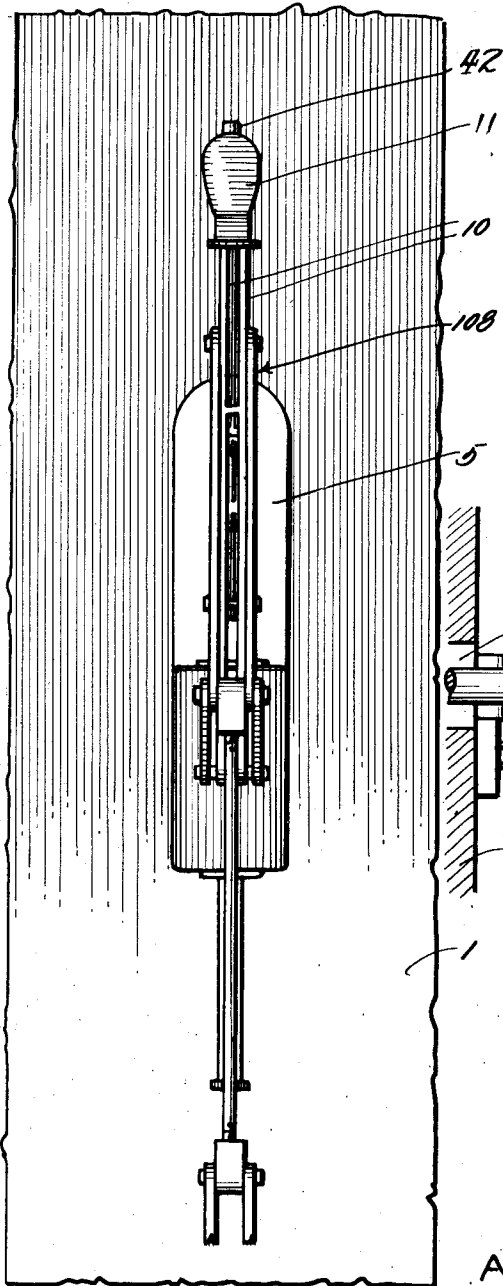


Fig. 2.

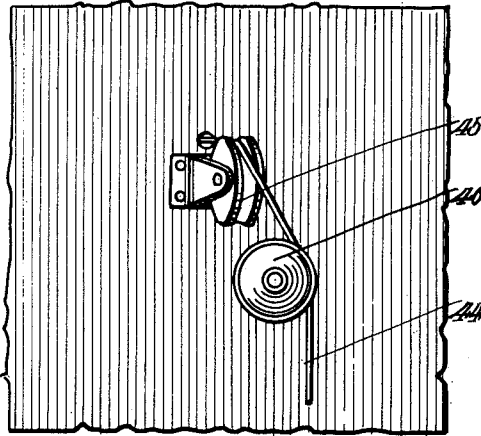


Fig. 9.

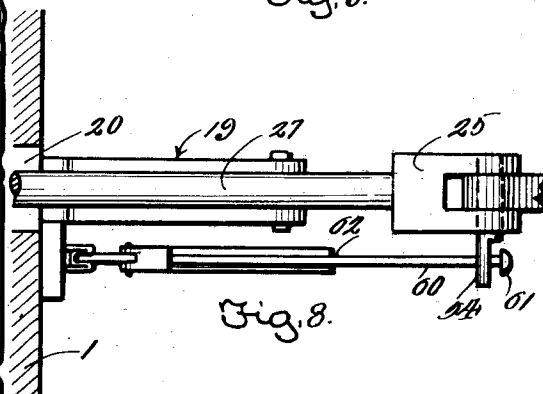


Fig. 8.

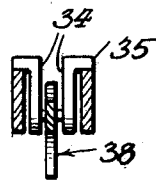


Fig. 10.

Witnesses
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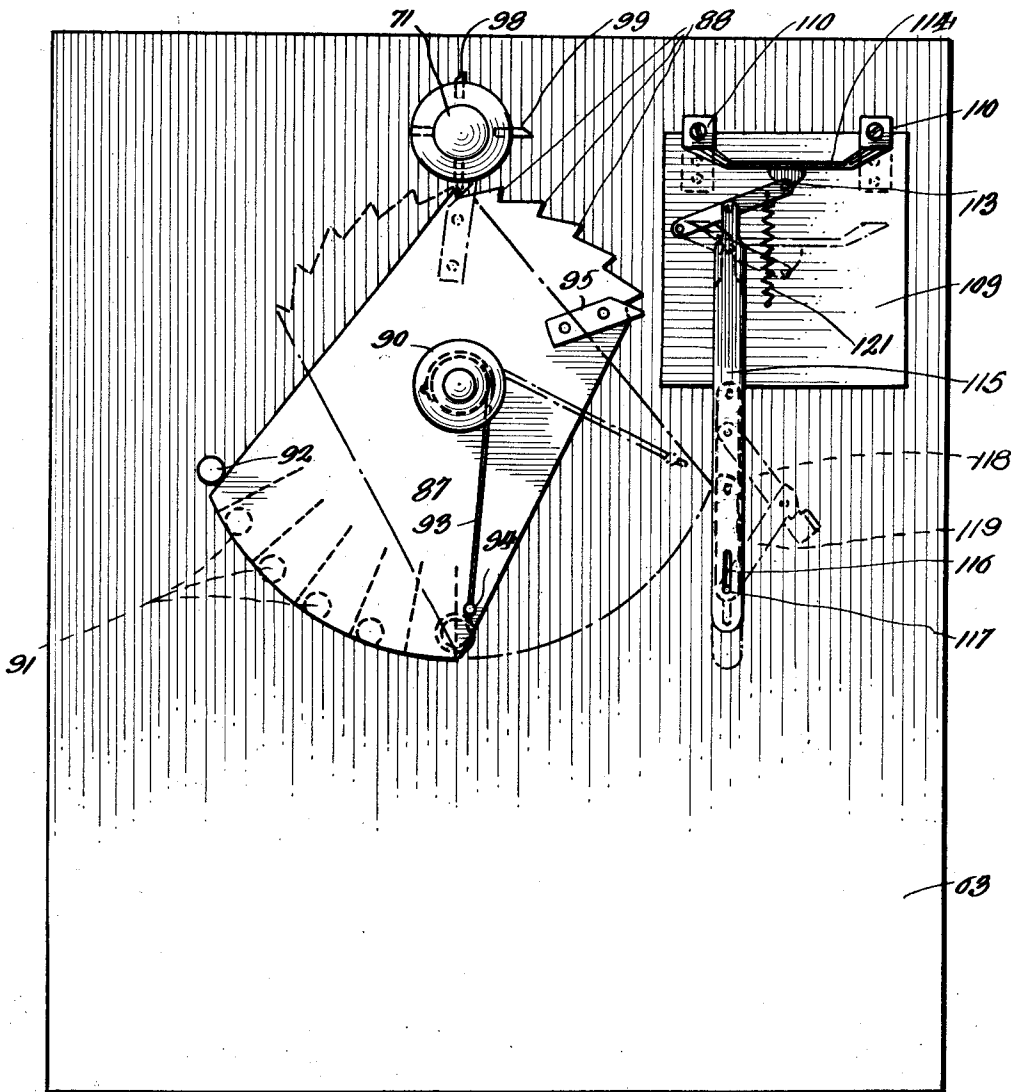
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RECLOSING MECHANISM FOR CIRCUIT BREAKERS

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6 Sheets-Sheet 4



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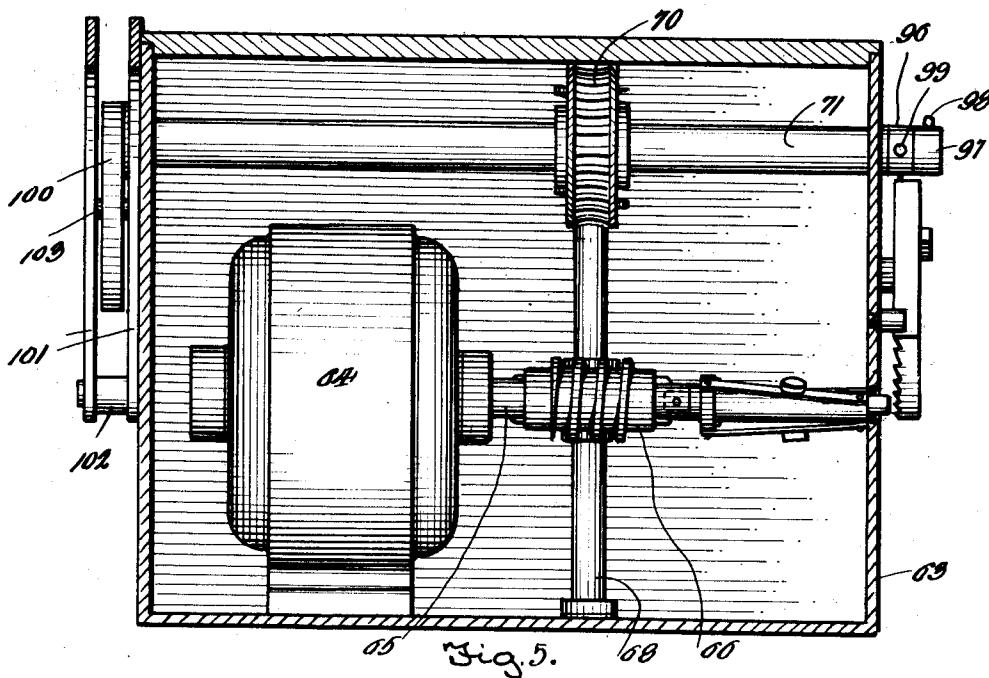
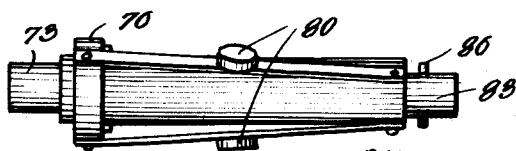
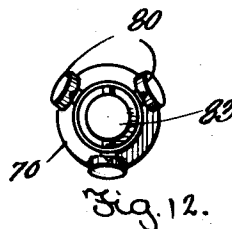
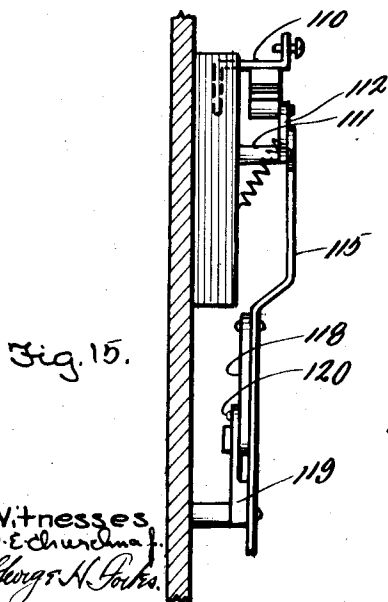
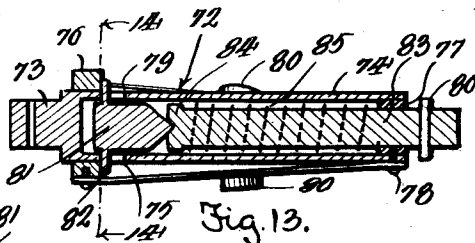
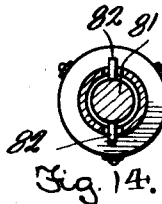
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RECLOSING MECHANISM FOR CIRCUIT BREAKERS

Filed Dec. 27, 1926

6 Sheets-Sheet 5



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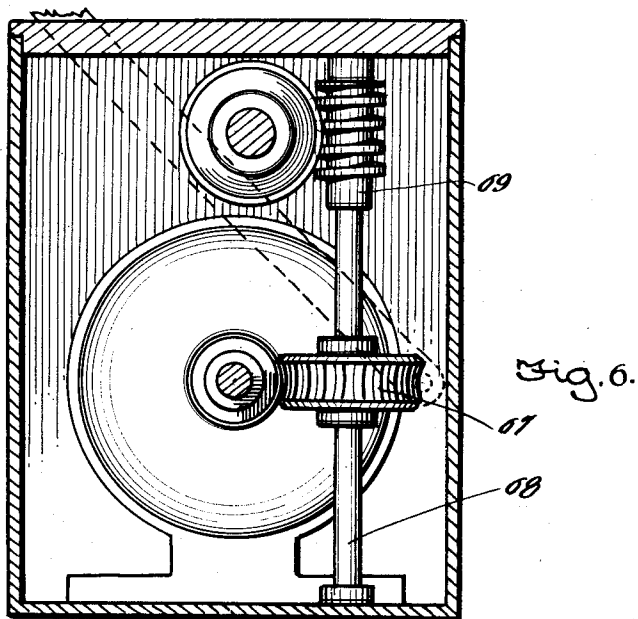
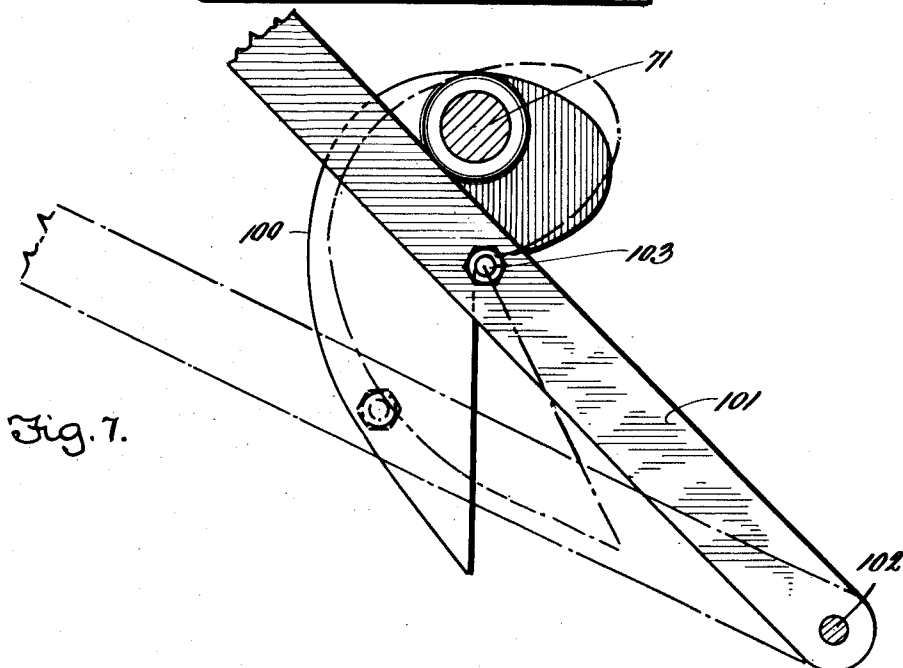
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1,762,298

RECLOSING MECHANISM FOR CIRCUIT BREAKERS

Filed Dec. 27, 1926

6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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RECLOSING MECHANISM FOR CIRCUIT BREAKERS

Application filed December 27, 1926. Serial No. 157,387.

This invention relates to the class of circuit makers and breakers and pertains particularly to a self-operating re-closing circuit breaker.

5 This invention has for its primary object the provision, in a manner as hereinafter set forth, of an electrical circuit breaker having means associated therewith for reversing the operation of the device to re-close the broken circuit.

Another object is the provision, in a manner as hereinafter set forth, of an electrical circuit breaker having means associated therewith whereby several attempts will be 15 automatically made for re-closing the open circuit.

Still another object of the invention is the provision, in a manner hereinafter set forth, of an electrical circuit breaker mechanism 20 having associated means set in operation immediately upon the breaking of the circuit, for at once automatically re-closing the circuit, or a plurality of times in the event that the short circuit in the line in which the device is used, continues for a short while, and further having means whereby, in the event the short circuit is permanent, the re-setting mechanism will be caused to cease operation.

30 Other objects and advantages of the invention will be seen as the description proceeds, and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings, but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention, as expressed in the appended claims.

In the drawings:

45 Figure 1 shows in side elevation a mechanism embodying this invention, as set up upon a switchboard.

Figure 2 shows in side elevation the upper portion of the mechanism embodying this invention, same being shown enlarged and also

being shown in dotted lines in operative position.

Figure 3 is a front view of the upper portion of a circuit breaking mechanism.

Figure 4 shows a part of the re-setting 55 mechanism and self-operative switch mounted upon one end of a motor housing.

Figure 5 shows the above mentioned motor housing in longitudinal section showing the mechanism within and attached to the ends 60 of the same.

Figure 6 is a transverse section through the motor housing showing certain details of construction therein.

Figure 7 shows in detail the re-setting cam 65 which is mounted upon one end of the motor housing, and the re-setting lever upon which the cam operates.

Figure 8 shows in top plan a portion of the circuit breaking mechanism located at 70 the rear of the switchboard.

Figure 9 shows the arrangement of certain weights and pulleys mounted upon the rear of the switchboard.

Figure 10 is a section taken on line 10—10 75 of Figure 2.

Figure 11 is an enlarged view, in side elevation, of the fly-ball mechanism operating upon the control motor shaft.

Figure 12 is an end view of the fly-ball 80 mechanism.

Figure 13 is a longitudinal sectional view of the fly-ball mechanism.

Figure 14 is a transverse section taken 85 upon the line 14—14 of the Figure 13.

Figure 15 is a side elevation of the operating switch.

Figure 16 is a detailed side elevation of the circuit breaker trip mechanism.

Figure 17 is a transverse section of the lower 90 portion of the ratchet plate, and

Figure 18 is the diagrammatic view of the mechanism operating motor circuit, showing certain control switches therein.

95 Referring now to the drawings in detail, wherein like numerals of reference indicate corresponding parts throughout the several views, the numeral 1 indicates a switchboard or panel upon which structures of the charac- 100

ter embodying this invention are usually mounted.

Upon the outer face of the switchboard 1 is mounted a tripping coil 2 having a longitudinally extending vertically reciprocating core 3 which carries on its upper end the hammerhead 4. Extending upwardly from the rear of the tripping coil 2, is a plate 5 which is secured to the face of the switchboard 1, and extending from the upper portion of this plate 5 is a pair of outwardly projecting spaced parallel arms 6, and depending from the lower edge of each of these arms 6, is an ear 7.

Extending forwardly from the body of the tripping coil 2 is a supporting arm 8 upon the outer ends of which is pivotally mounted an operating lever 9 which, as is clearly shown in Figure 3, is formed of a pair of spaced parallel members 10 joined at their upper ends by the hand grip 11. The operating lever 9 is normally arranged in vertical position as shown in Figures 1 and 2, the arm extending across the forward ends of the bracket arms 6.

Extending transversely between the members 10 of the arm 9 is the retaining pin 12 which pin is normally engaged by the hook end 13 of a latch finger 14 pivotally mounted intermediate its ends, upon the pin 15, and between the bracket arms 6. The inner end of the latch finger 14 may be weighted as indicated at 16 to cause the free end of the latch to remain in engagement with the pin 12.

Pivotally mounted between the depending fingers 7 of the bracket 6 is a trip lever 17, one end of which is turned at right angles downwardly as indicated at 18, and this trip lever is mounted between the depending fingers 7 substantially midway between the downturned end and the other end thereof. The straight free end of the trip arm 17 has a link connecting the same with the hook end of the member 14, as indicated by the numeral 18.

Mounted upon the rear of the switchboard or panel 1, is a two-armed bracket 19 and formed through the panel 1 adjacent the upper portion of the bracket 19 is a passage 20. Pivotally mounted as at 21, between the free ends of the arms of the bracket 19, is a bell crank member 22 provided with the arms 23 and 24, as shown in Figure 2.

Pivotally connected by the head 25 and pin 26, to the free end of the arm 23 of the bell crank, is a rod member 27 which extends through the aperture 20 in the panel 1 and terminates at its forward end in the elongated slot portion 28 provided with the longitudinally extending slot 29. A retaining pin 30 passes through the slot 29 and engages one side of the lever 9, and the pin 30 is designed to slide in the slot 29, as is readily apparent.

Pivotally attached to the lever 9 beneath the outer end of the swinging arm 17 is a trip element indicated generally by the nu-

meral 31. This trip element comprises a relatively long arm portion 32 which is attached at one end to the lever 9 as above described, and a short link portion 33 has one end pivotally attached to the extension 28 of the rod 27 adjacent the inner end of the slot 29, while the other end is attached to the inner end of the long arm portion 32. This short link 33 of the trip element has that end which is attached to the long portion 32 turned upwardly at right angles as indicated at 34, and this upturned portion 34 has a lateral extension 35 at the free end which is designed to strike the lower end of the downturned portion 18 of the swinging arm 17. The inner end of the portion 32 of the tripping element has extended therefrom a tongue 36 and this tongue is designed to be engaged by the latch 37 of a locking latch indicated generally by the numeral 38, which locking latch is provided with the depending tail portion 39. The tail portion 39 of the latch 38 is arranged directly over the hammer 4 to be struck thereby when the tripping coil 2 is energized. It will be readily seen that upon disengagement of the latch 38 from the tongue 36 the tripping element members 32 and 33 will be unlocked and the same may then be broken upwardly.

The lever 9 is provided with means for manually disengaging the upturned end 13 of the pivoted element 14 which comprises an elongated rod 40 which extends downwardly between members 10 of the lever and terminates at its lower end in an offset portion 41 which overlies the member 14. The upper portion of the rod 40 passes through the hand grip 11 and terminates in a thumb button 42, projecting above the top of the hand grip as shown. A suitable spring element 43 operates to maintain the rod in raised disengaged position with respect to the member 14.

Attached to hand grip 11 is one end of a cable 44 which passes through the switchboard 1 and over a pair of pulleys 45 and 46 and carries at its other end the freely suspended weight element 47. The purpose of this weight element will be described hereafter.

The arm 24 of the bell crank 22 has pivotally and adjustably attached to the free end thereof a depending link member 48, the lower end of which is pivotally attached to one end of an arm 49, forming a part of a bell crank lever indicated generally by the numeral 50.

A bell crank lever 50 is pivotally mounted between the arms of upright bracket 51 and the other arm 52 of the bell crank lever has pivotally attached to the free end thereof the rod 53 which is adapted to engage the circuit controlling switches in connection with which this circuit breaker and re-closing mechanism is designed to be used. No particular struc-

ture of switch is shown in connection with this mechanism for the same can operate upon or in connection with any type of circuit controlling device in connection with which these structures are used.

The pivot pin 26 which connects the head 25 of the rod 27 with the arm 23 of the bell crank lever 22 is provided with an extension 54 which has an aperture formed there-through.

Mounted upon the back of the panel 1 is a switch base 55 having the contact points 56 and 57, to one of which points the knife switch 58 is pivotally attached to swing inwardly to engage with the other contact point. Pivotally attached to the free end of the switch blade 58 is an arm 59 which extends rearwardly and is formed to set up a reduced extension 60 at the free end thereof. This reduced extension extends through the aperture in pivot pin extension 54 and terminates in a head 61 while the point of joinder between the extension 60 and the arm 59 sets up an abutment 62 which will hereinafter be referred to.

Mounted beneath the tripping coil 2, either upon the board 1 or the floor from which the board 1 extends, is a housing 63 in which is encased an electric motor 64. Upon the armature shaft 65 of the motor 64, there is mounted a worm 66 which engages the worm gear 67 which is mounted upon a vertical shaft 68. The shaft 68 has its upper and lower ends mounted in bearings in the top and bottom of the casing 63 as shown in Figure 6, and upon the upper end of the shaft 68 there is mounted a worm 69 which meshes with a worm gear 70 which is mounted upon the cam and ratchet plate operating shaft 71 which extends horizontally and longitudinally through the casing 63. As is clearly shown in Figure 5 the shaft 71 has its ends extending through the end walls of the casing 63 in which it is mounted.

The free end of the armature shaft 65 has a fly-ball mechanism indicated generally by the numeral 72, mounted thereon. This fly-ball mechanism comprises a head portion 73 which is attached to the armature shaft, and extending from this head 73 is an elongated sleeve 74. The sleeve 74 is provided adjacent its inner end with the diametrically oppositely positioned short longitudinally extending slots 75.

Surrounding the head 73 is a collar 76, and this collar has slight longitudinal movement upon the head, as will be hereinafter explained.

Set in the forward end of the sleeve 74 is a collar 77 and this collar is secured to the sleeve by the screw members 78 as shown in Figure 13. Connecting between the collar 76 and the forward end of the sleeve 77 is a plurality of resilient members 79 each having one end secured to the collar 76 and the other

secured to the forward end of the sleeve 74, and each of these resilient members carries intermediate its ends a weight member 80.

Within the rear end of the sleeve 74 is a freely slidable body 81 having the laterally projecting ears 82 which extend through the slot 75. Forwardly of the body 81 within the sleeve 74 is an elongated plunger member 83, having a head 84 at the inner end thereof and against which the forward portion of the body 81 bears. Around the plunger 83 is a spring 85, one end of which bears against the collar 77 while the other end bears against the under side of the head 84, thus causing the plunger to be normally drawn into the sleeve against the body 81 in the manner shown. The outer end of the plunger 83 extends beyond the sleeve 74 and has a pin member 86 thereabout, and when the fly-ball mechanism is in position upon the end of the motor armature shaft 65 the end of the sleeve 74 bears against the inner side of the end wall of the casing 63 while the plunger extends through the wall and the pin 86 is normally drawn into the slot formed therefor in the outer face of the wall by the action of the spring 85, and is thus prevented from turning. As shown the plunger 83 projects a slight distance beyond the pin 86 and the purpose for this extension will be set forth hereafter.

Mounted upon the outer side of that end wall through which the fly-ball mechanism 72 extends is a ratchet plate element indicated generally by the numeral 87. As shown this plate 87 is elongated and has each end thereof of arcuate contour. One of these arcuate ends is formed to set up the plurality of ratchet teeth 88 while the opposite arcuate end of the plate has the inner face thereof formed to provide a plurality of beveled slots or teeth 89. The plate 87 is pivotally mounted upon the headed member 90 which revolvably secures the plate to the wall of the casing 63. The beveled slots 89 overlie and swing across the end of the plunger element 83, of the fly-ball mechanism as is shown in Figure 5. Formed through the wall of the casing 63 upon which the ratchet plate 87 is mounted, and formed upon the same arc as the lower edge of the plate, is a plurality of threaded apertures 91 into any one of which a stop pin 92 may be inserted. As shown in Figure 4 the stop pin 92 engages one side of the plate 87 and limits its swinging movement. Attached at one end to the member 90 about which the plate 87 moves is a spring 93 the other end of which is attached to the lowermost corner of the plate, at the point 94, and normally acts to maintain the plate in the position shown in full lines in Figure 4, the inoperative position. At the upper end of the plate 87 there is secured to the outer face thereof a tooth or lug 95 termed a "lockout" lug. This lug or tooth 95 has its point arranged beyond the

row of ratchet teeth 88 at the lower side edge of the plate, as shown.

As previously stated the shaft 71 extends at each end through the end walls of the casing 63 and that end which extends through the wall upon which the plate 87 is mounted is reduced and has secured thereto a pair of rings or collars 96 and 97, the same being secured to the shaft by set screws. Set in the periphery of the ring 97 is a ratchet pin 98 which, under certain conditions engages the lockout lug 95. A ratchet pin 99 is set in the periphery of the ring 96 and is designed to engage the teeth 88 when the shaft 71 is revolved and the lockout pin being set beyond the face of the plate 87 engages the lockout lug 95 when the plate has been swung around to that position which enables the ratchet pin 99 to engage the last one of the ratchet teeth adjacent this lug, as will be explained in the description of the operation of the device. As shown in Figure 4 the pins 98 and 99 are spaced 90 degrees apart about the collar.

Upon the other end of shaft 71, there is mounted, exteriorly of the casing 63, the cam body 100, this cam being arranged between the spaced parallel arms 101 the lower ends of which arms are secured together as indicated at 102 and further having extending therebetween a pin 103 which rests against the periphery of the cam and constitutes a cam seat. The upper ends of the arms 101 are pivotally attached by means of the head 104, to the link 105 which is adjustably attached to this head, and the upper end of this link is also adjustably attached to a head 106, to which head there is pivotally connected a pair of links 107 and 108. The link 107 is attached to the arm 8 which carries the lower end of the lever 9, and the link 108 has its other end connected to the lever 9 adjacent the upper end thereof as shown in Figures 1 and 2.

Mounted upon that end wall of the motor housing 63 upon which the ratchet plate 87 is positioned, adjacent the upper portion of the ratchet plate, is a body of insulation 109, the upper portion of which carries a pair of bracket electrical terminals 110. Pivotaly mounted at the outer end of an outwardly extending arm 111, upon the body 109, is an arm 112, one end of which is attached to this arm 111, while the other end thereof is pivotally attached to a body 113 which carries a series of elongated copper leaves 114, which, when raised upwardly reach between the terminals 110 forming an electrical conductor therebetween.

Attached at one end to the central portion of the arm 112 is a vertically reciprocating switch operating arm 115, the lower end of which is slotted as indicated at 116, and there extends through this slot a guide and retaining pin 117 extending outwardly from the

wall of the housing upon which this switch structure is mounted.

From the inner side of the switch operating arm 115 there is positioned a trip element comprising upper and lower members 118 and 119 respectively, the lower end of the member 119 being mounted to revolve about the pin 117 and the upper end of the member 118 pivotally secured to the arm 115. The elements 118 and 119 are pivotally connected together as indicated at 120, and when pressure is applied to this pivotal connection, the joint will be broken and will allow the arm 115 to drop back, pulling upon the link 112 to draw the contact element 114 away from the terminals 110. The downward movement of the terminal connecting member 114 is assisted by a spring 121, one end of which is attached to the link 112 and the other end to the body 109.

In Figure 18 there is shown diagrammatically a feed line to the motor 64, the self operating switch shown in Figure 4 having the connecting element 114, being shown and designated 114, and the switch operated by the bell crank 22, and acting through the knife blade 58 to close the points between the contacts 56 and 57 being here shown and indicated as 58. The other switch in this diagram, designated 122 is an auxiliary switch and may or may not be used as desired, to permanently disconnect the motor from the mechanism if it is desired to prevent the reclosing device from operating. However, if this is desired the self-operative switch may be opened to produce this result.

As the particular wiring means for this structure form no part of the present invention, wiring connections between the various electrical elements have been omitted, a description of the connection between the parts being thought sufficient.

This reclosing mechanism is especially adapted for use in connection with automatic circuit breakers. The rod 53 of the reclosing mechanism is adapted to be connected with the blades of a circuit breaker of this type in the usual manner. The tripping coil 2 is adapted to be connected to the line protected by the circuit breaker in such manner that it will be energized when an overload effects the opening of the circuit breaker. The energization of the coil 2 causes the core 3 to move upwardly with the result that the hammer 4 operates the trip member or trigger 38. This unlocks the member 32 and 33 causing this trip mechanism to break and fly upwardly as indicated in dotted lines in Figure 2, allowing the rod 27 to move through the board 1 toward the operating lever 9 with consequent movement of the attached link and rod 48 and 53. This movement of the rod 27 is caused by the opening of the circuit breaker due to the connection of the rod 53 with the blades of the circuit breaker. The inward

movement of the finger 54 with the rod 27 causes the finger to contact with the abutment 62 to close the knife blade 58 between the contacts 56 and 57. At the same time that the trip element 31 operates, the lateral extension 35 upon the trip member 33 strikes the downturned portion of pivoted arm 17 causing the same to pull down upon the upturned finger 13 and freeing the lever 9. When the knife blade 58 has made proper contact electrical current will be transmitted to the motor 64 to start the same and this will consequently cause a revolution of the shafts 68 and 71. At the same time that the motor starts the fly-ball mechanism will become operative and the weight element of this mechanism will be thrown outwardly by centrifugal force causing the outward projection of the plunger member 83 and causing the free outer end of this plunger member to engage in the grooved surface at the rear of the ratchet plate 87.

As the shaft 71 revolves with the starting of the motor, the cam 100 revolving in a clockwise manner will bear down upon pin 103 to draw down the arms 101 and 105. This will cause the outward and downward swinging of the lever 9 and will raise the weight 47. As the lever 9 swings outwardly the trip mechanism will be straightened and the elements 32 and 33 of the mechanism 31 will then become locked together in the manner shown in Figure 16. Co-incidental with the above described operation through the medium of the cam 100, the collars 96 and 97 will be revolved and the ratchet pin 99 will engage the first of the teeth 88 upon the plate 87. This will cause the plate to revolve about its retaining member 90 and reset grooves 89 will move across the outer end of the plunger 83 to position the plunger in the next one of the grooves. At approximately this point the cam 100 will have completed a revolution releasing the arm 101 and allowing the weight member to drop to again raise the lever 9 to upright position and as the trip mechanism has been straightened and the elements locked together, the rod 27 and the circuit breaker will be freed so as to permit the latter to close.

With the return of the rod 27 to its first position the finger 54 will hit the head 61 of the rod 60 and pull upon the same to open the switch 58 thus cutting off the current to the motor 64.

If the short circuit in the system is a temporary condition, such as might be caused by a discharge of lightning, then the circuit will be properly restored and the motor upon stopping will cause the fly-ball mechanism to stop and spring 85 will return the plunger 83 to its normal position, thus disengaging the plate 87. The spring 93 of the plate 87 will cause the same to swing backwardly in the position shown in Figure 4. If, however, the short circuit is caused by a perma-

nent ground, the instant the switch in the system, which was opened by the circuit breaker, is closed the tripping coil 2 will again operate to repeat the first described movement, again closing the knife blade between the points 56 and 57, thus setting up the operation of the motor as described. This action will be brought about so quickly that the slight centrifugal force imparted to the fly-ball mechanism will have caused the same to continue revolving and thus the motor will have started up again before the fly-ball mechanism stops moving, therefore, the forward end of the plunger 83 will not yet be disconnected from the grooved spaces 89 of the plate 87. The shaft 71 again revolving causes the tooth 99 to engage the next of the ratchet teeth 88 and will thus swing the plate 87 one point further and this opening and closing operation of the circuit breaker controlled switch will continue until the plate 87 has swung to the opposite position from that shown in Figure 4, whereupon when the tooth 99 engages the last one of the ratchet teeth 88 the lug 95 will then be in position to be engaged by the tooth 98 and the plate 87 will be swung far enough to break the joints between the members 118 and 119 and thus through the medium of this self-operating switch the circuit feeding motor 64 will be permanently broken and operation of the re-closing mechanism will be stopped. The lockout pin 98 will stop the plate 87 in that position where the cam 100 will be arranged to hold the arms 101 down, thus preventing the weight 47 from dropping and again releasing the circuit breaker. The plate 87 is here shown as being provided with six teeth and from this it will be apparent that six attempts will be made by the device to restore the circuit and if the ground is a permanent one each of the six attempts will fail, but, the device can be so set by fixing the pin 92 through any one of the holes 91, that a fewer number of attempts will be made by the mechanism to close the circuit and, therefore, permanent disconnection of the same will more quickly be made.

Having thus described my invention, what I claim is:

1. A re-establisher of the character described adapted for use with an electrical circuit, comprising a reciprocating bar, connecting means attached to one end of said bar for opening and closing a circuit, a trip member designed to maintain said bar in set position, means for moving said bar under a predetermined condition, a motor adapted to be energized upon the forward movement of said bar, a cam operated by said motor, means operated by said cam for resetting said trip, and means operating after the resetting of said trip to reverse the movement of said bar and connecting means to reclose said first-mentioned means.

2. A re-establisher of the character described adapted for use with an electrical circuit, comprising a reciprocating bar, connecting means attached to one end of said bar for opening and closing a circuit, a trip member designed to maintain said bar in set position, means for moving said bar under a predetermined condition, a motor adapted to be energized upon the forward movement of said bar, resetting said trip, and means operating after the resetting of said trip to reverse the movement of said bar and connecting means for deenergizing said motor.

3. A re-establisher, a normally vertically positioned pivoted lever, a reciprocable bar slidably connected at one end to said lever and adapted to connect at the other end thereof with a circuit control means, a trip arm connected between said lever and said bar, a motor adapted to be energized upon the forward movement of said bar, a cam member revolved by said motor, means operated by said cam for swinging said lever to reset said trip, and means operating upon said lever after resetting said trip to reverse the movement of said bar.

4. A re-establisher, a normally vertically positioned pivoted lever, a reciprocable bar slidably connected at one end to said lever, and adapted to connect at the other end thereof with a circuit control means, a trip arm connected between said lever and said bar, a motor adapted to be energized upon the forward movement of said bar, a cam member revolved by said motor, means operated by said cam for swinging said lever to reset said trip, and means operating upon said lever after resetting said trip, to reverse the movement of said bar, and means controlled by said motor whereby, in the event of a prolonged overload on said circuit, said bar will be shifted a plurality of times in an attempt to re-establish a circuit.

5. A re-establisher, a normally vertically positioned pivoted lever, a reciprocable bar slidably connected at one end to said lever, and adapted to connect at the other end thereof with a circuit control means, a trip arm connected between said lever and said bar, a motor adapted to be energized upon the forward movement of said bar, a cam member revolved by said motor, means operated by said cam for swinging said lever to reset said trip, and means operating upon said lever after resetting said trip, to reverse the movement of said bar, and means whereby a plurality of attempts will be made to automatically re-establish said circuit, and said motor adapted to be permanently deenergized after a plurality of attempts have been made to energize the motor, to leave said motor deenergized until the circuit controlling said motor is manually closed.

6. A mechanism for use in connection with a circuit breaker, for making a plurality of

attempts to re-establish a circuit, comprising a motor, means controlled by said motor for resetting said circuit breaker, a plate pivotally mounted adjacent said motor and having one edge provided with a plurality of teeth and further having the inner face adjacent one edge provided with a plurality of beveled grooves, a centrifugally controlled element adapted to revolve with said motor and designed to shift to engage in one of said beveled grooves, revolving means for engaging one of said teeth each time said circuit breaker is reset, said groove engaging element holding said plate momentarily through the momentum imparted thereto by the motor, and means designed to be tripped by said plate after failure of a plurality of attempts to reset the circuit breaker, for disconnecting the power to said motor.

In testimony whereof I affix my signature.
AVERY L. HOSNER.

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