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J. N. GROVES
CIRCUIT INTERRUPTER WITH INTERLOCK
MEANS AND TERMINAL COVER

3,368,053

Filed Sept. 14, 1966

2 Sheets-Sheet 1

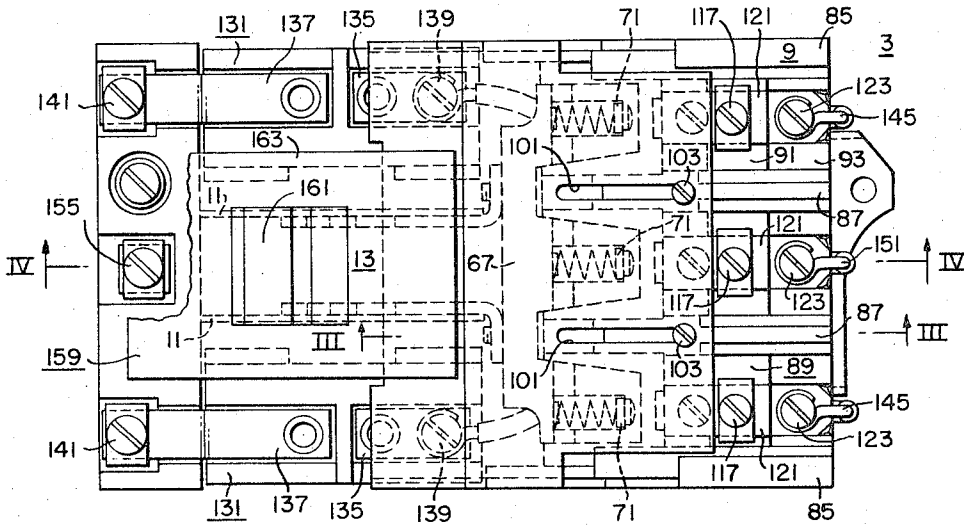


FIG. 1.

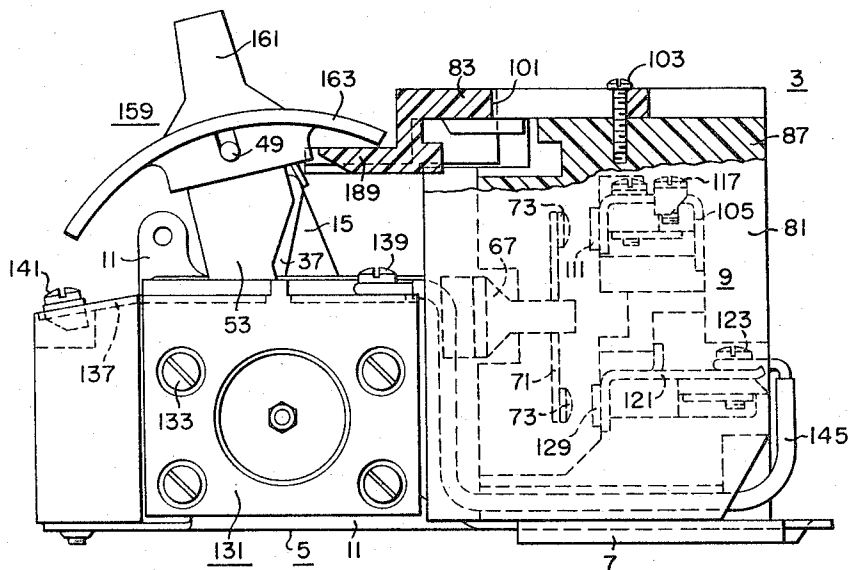


FIG. 3.

WITNESSES

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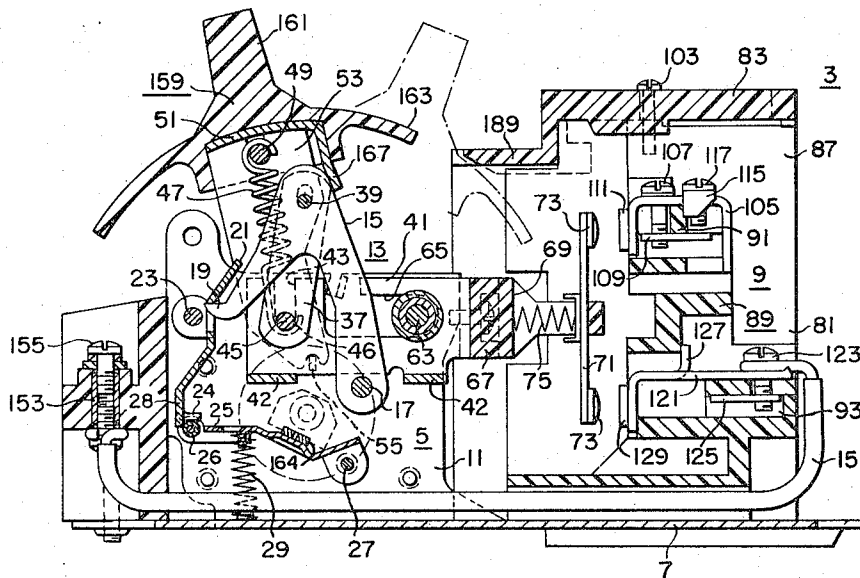


FIG. 4.

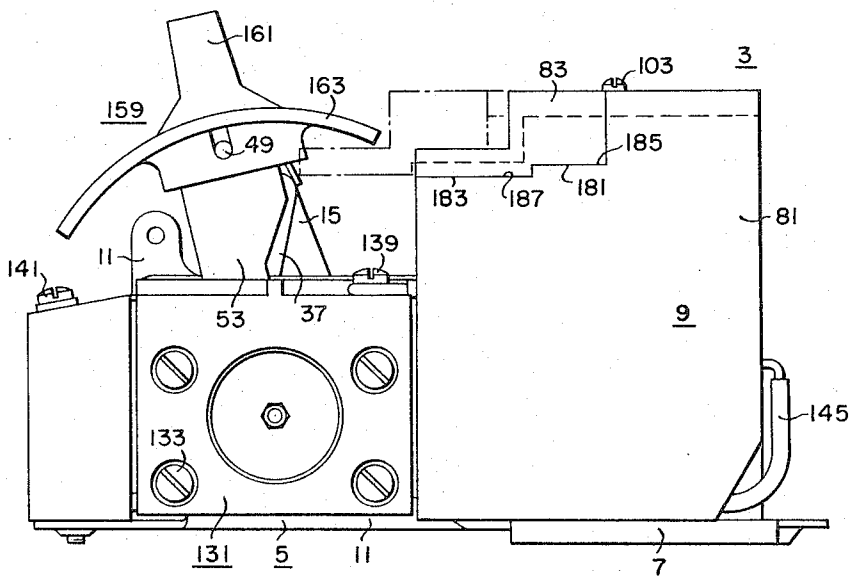


FIG. 2.

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CIRCUIT INTERRUPTER WITH INTERLOCK MEANS AND TERMINAL COVER

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13 Claims. (Cl. 200—168)

ABSTRACT OF THE DISCLOSURE

An improved circuit interrupter comprises an insulating cover member movable from a position covering certain terminals to a position exposing the terminals for connection, inspection and adjustment. Interlock means is provided to prevent closing of the interrupter when the terminals are uncovered and to prevent uncovering of the terminals when the interrupter is closed. The terminals are positioned such that they are accessible for adjustment from the front of the interrupter when the cover is positioned to expose the terminals. An improved circuit interrupter comprises an insulating cover member movable from a position covering certain terminals to a position exposing the terminals for connection, inspection and adjustment. Interlock means is provided to prevent closing of the interrupter when the terminals are uncovered and to prevent uncovering of the terminals when the interrupter is closed. The terminals are positioned such that they are accessible for adjustment from the front of the interrupter when the cover is positioned to expose the terminals.

For certain applications of circuit interrupters, it is desirable, in order to reduce the possibility of accidental contact with live terminals, to cover the terminals with an insulating cover that may be movable to an uncovering position to permit wiring of the terminals and to permit inspection and adjustment of the terminals. For safety reasons, it is desirable to provide that the circuit breaker will not be in the closed position when the terminals are uncovered.

Thus, an object of this invention is to provide an improved circuit interrupter comprising an insulating cover that is movable from a first position covering certain terminals to a second position uncovering the terminals, which circuit interrupter comprises improved means for preventing operation of the circuit interrupter to the closed position when the terminals are uncovered.

Another object of this invention is to provide an improved circuit interrupter comprising an insulating cover that is movable from a first position covering certain terminals to a second position uncovering the terminals with improved means preventing movement of the insulating cover to the second position when the circuit interrupter is in the closed position and for preventing operation of the circuit interrupter to the closed position when the insulating cover is in the second position.

A further object of this invention is to provide an improved circuit interrupter comprising terminals that are spaced from front to back in the interrupter with an insulating cover member that is positioned at the front of the interrupter and movable from a position covering the terminals to a position uncovering the terminals, which terminals are also spaced in a direction generally normal to the direction from front to back of the circuit interrupter so that a worker can readily connect wires to the terminals and adjust the terminals from the front of the circuit interrupter with a tool such, for example, as a screwdriver when the insulating cover member is in the uncovering position.

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This invention is particularly advantageous in the art of enclosed circuit interrupters wherein workers must, on occasion, have access to the inside of the enclosure to wire the interrupters and to adjust the connections. This invention is particularly effective in this art because the worker generally has access only through the front of the enclosure and the terminals, which are safely covered from the front, are readily exposed for wiring, adjustment and inspection from the front when the worker moves the terminal cover to an uncovering position. The interrupter may be enclosed in a sheet metal enclosure in the manner disclosed in the patent to Pierce et al. No. 2,265,004 issued Dec. 21, 1941 and assigned to the assignee of the instant case.

A more general object of this invention is to provide an improved relatively inexpensive and compactly constructed circuit interrupter.

The invention, both as to construction and operation, together with additional objects and advantages thereof, will be best understood from the following detailed description when read in conjunction with the accompanying drawings.

In said drawings:

FIGURE 1 is a top plan view, with parts broken away, of a circuit interrupter constructed in accordance with principles of this invention, which interrupter is shown with the insulating cover member in the uncovering position;

FIG. 2 is a side elevational view of the circuit interrupter of FIG. 1 with the insulating cover member being shown in the covering position in full lines and in the uncovering position in broken lines;

FIG. 3 is a side elevational view, with parts broken away generally along the line III—III of FIG. 1, of the circuit interrupter of FIG. 1; and

FIG. 4 is a sectional view taken generally along the line IV—IV of FIG. 1 with part of the operating member being shown in broken lines in the closed position.

Referring to the drawings, there is disclosed therein a three-pole circuit interrupter 3 comprising a metallic supporting plate 5. The supporting plate 5 (FIG. 3) comprises a flat front part at one end 7 thereof for supporting an insulating contact and terminal enclosure 9. Two side plate portions 11 (only one of which is seen in FIG. 4) are formed integral with the supporting plate 5 in proximity to the other end of the supporting plate 5 to provide a generally U-shaped support part for supporting an operating mechanism 13.

The operating mechanism 13 comprises a trip member 15 that is pivotally supported between the side walls 11 on a pivot pin 17. The trip member 15 is latched at the other end 19 thereof by means of a latch member 21 that is pivotally supported intermediate the ends thereof on a pivot pin 23 that is supported between the side walls 11. The latch member 21 comprises a bent-over latch part 24 at the lower end thereof that is latched by means of a latch member 25 that is pivotally supported on a pivot pin 27. The part 24 of the latch 21 rests on a roller 26 at one end of the latch 25. A lower part 28 of the latch 21 serves as a stop to prevent movement of the latch part 24 off of the roller 26 under normal current conditions. The latch member 25 is biased in a clockwise direction about the pin 27 to the latching position by means of a compression spring 29. A toggle link 37 is pivotally connected to the trip member 15 at one end thereof by means of a pivot pin 39. A U-shaped drive member 41, that comprises a pair of side plate parts connected by a bight part 42, is provided with a pair of slots 43 in the side plate parts at one end thereof. A pin 45, that is connected to the lower end of the link 37, fits in the slots 43 to operatively connect the drive member 41 with the link 37. An

over-center tension spring 47 is connected at the lower end thereof to the pin 45 and at the upper end thereof to a pin 49 that is connected to the bight portion 51 of an inverted generally U-shaped operating member 53. The inverted generally U-shaped operator member 53 is provided with notches at the inner ends of the legs thereof that engage support pins 55, that are supported on the side plates 11, to support the operating member 53 for pivotal movement about the support pins 55. A bearing support 63, that is supported between the side plates 11, is positioned in parallel slots or tracks 65 in the side plate parts of the drive member 41 to support the drive member 41 and to guide the drive member 41 for generally rectilinear back-and-forth horizontal (FIG. 4) movement. An insulating contact carrier 67, that extends across all three poles of the interrupter, is fixedly secured to the right end (FIG. 4) of the drive member 41. The contact carrier 67 is a molded insulating member having a separate window opening 69 therein at each of the three pole units of the circuit interrupter. A separate elongated movable bridging conducting member 71, having a pair of movable contacts 73 at the opposite ends thereof, is supported in each of the window openings 69 on the contact carrier 67. A spring member 75 is disposed in each of the openings 69 to bias the associated bridging contact member 71 to the right in the associated opening 69 to the position seen in FIG. 4, which movement is limited by the engagement of the bridging contact member 71 with part of the insulating contact carrier 67. As can be seen in FIG. 1, wherein the front of the circuit interrupter is shown in plan view, the contact carrier 67 supports three bridging contact members 71 for the three pole units of the circuit interrupter. As can be seen in FIGS. 1, 3 and 4, on each of the bridging contact members 71 the two contacts 73 are spaced in a direction from front to back in the circuit interrupter.

The insulating enclosure 9 comprises a molded insulating base or support member 81, that is fixedly secured to the front side of the generally planar part 7 of the metallic support 5, and a molded insulating cover member 83. As is best seen in FIG. 1, the insulating base member 81 is provided with a pair of opposite insulating side walls 85 and a pair of spaced insulating barrier parts 87 which serve to divide the enclosure base member into three adjacent compartment areas for the three pole units of the circuit interrupter. The internal part of the base member 81 is provided with molded insulating support means 89 (FIGS. 1 and 4) comprising a front insulating support 91 and a back insulating support 93. The parts 85, 87, 91 and 93 are molded together as an integral unit as part of the base member 81. The cover member 83 is provided with two spaced elongated slots 101 (FIGS. 1 and 3) over the insulating barrier parts 87 of the base member 81. Two screws 103 pass through the slots 101 and are threaded into tapped openings in the barriers 87 to secure the cover 83 to the base 81.

In each pole unit, an inverted generally U-shaped front conducting strip 105 is positioned over the front of the support part 91 and secured in place by means of a screw 107 that passes through an opening in the conducting strip 105 and that is threaded into a tapped opening in a plate 109 that is positioned in the cavity below the support part 91. A stationary contact 111 is supported on one of the legs of each of the stationary conducting strips 105. In each of the pole units, an inverted generally U-shaped conductor 115 is straddled over part of the associated conducting strip 105, and a connecting screw 117 is passed through an opening in the conductor 115 and threaded into the conductor 105. When it is desired to connect the conductor 105 in an electric circuit, a wire is passed under the conductor 115 and the terminal screw 117 is screwed down to provide a pressure type connection between the conducting wire and the conductor 105.

In each pole unit, a conducting strip 121 is supported

on the associated insulating back support 93 and fixed on the back support 93 by means of a terminal screw 123 that passes through an opening in the conductor 121 and that is threaded into a tapped opening in a lower support plate 125. An upstanding tab portion 127 of the conductor 121 engages part of the insulating support 89 to provide additional support for the conductor 121. A stationary contact 129 is supported on each of the conducting strips 121.

As can be seen in FIGS. 1 and 3, two overload relays 131 are mounted on opposite sides of the operating mechanism 13 and secured to the side plates 11 by means of a plurality of screw members 133. The overload relays 131 are well known types of relays comprising a bimetal snap disk that when heated a predetermined amount snaps inward toward the operating mechanism. The relays are constructed, and they operate, in the same general manner as that disclosed in the above-mentioned patent to Pierce et al., No. 2,265,004. Thus, the construction and operation of the relays are set forth only briefly in this case. As can be seen in FIG. 1, a pair of spaced conductors 135 and 137 are supported at the front of each relay. In each of the relays a suitable heating conductor is connected to bridge the associated conductors 135, 137 and to heat the bimetal disk of the relay in response to current flow through the relay. A terminal screw 139 (FIG. 3) is connected to each of the conductors 135, and a terminal connecting screw 141 is connected to one end of each of the conductors 137. As illustrated in FIGS. 1 and 3, in the two outer poles of the three pole interrupter an insulated conductor 145 is connected at one end to the stationary conducting strip 121 by means of a terminal screw 123 and at the other end to the conductor 135 of the associated overload relay 131 by means of a terminal screw 139. There are only two relays used in the illustrated three-pole interrupter. In the center pole of the three-pole circuit interrupter, an insulated conductor 151 is connected at one end thereof to the associated conducting strip 121 by means of the terminal screw 123, and at the other end thereof to a conducting tubular member 153 (FIG. 4) that is provided with a tapped opening therein for receiving a terminal screw 155.

The circuit through the center pole unit (FIG. 4) extends from a conducting line that would be connected to the conductor 153 by means of the terminal screw 155, through the conductor 153, the conductor 151, the conductor 121, the stationary contact 129, the movable contact 73, the bridging conductor 71, the stationary contact 111, the conductor 105 to a conducting line that would be connected to the conductor 105 by means of the terminal screw 117. The circuit through each of the outer pole units (FIGS. 1 and 3) extends from a conducting line that would be connected to the conductor 137 by means of the terminal screw 141 through the conductor 137, the heating conductor (not shown) of the overload relay, the conductor 135, the conductor 145, and then through the associated terminal strips and contact structures that are identical to those disclosed in FIG. 4, to a conducting line that would be connected to the associated conducting strip 105 by means of the associated terminal screw 117.

An insulating handle structure 159, comprising an insulating handle part 161 and an arcuate shield part 163, is fixedly secured to the bight portion of the operating lever 53 by means of the pin 49 (FIG. 4). The circuit interrupter 3 is of the type that is used at many installations in an enclosure of the type having an openable cover and an opening in the cover that receives the handle part 161 of the handle structure 159 for external manual operation. This type of structure is disclosed in the above-mentioned patent to Pierce et al No. 2,265,004. The arcuate shield 163 serves to close the opening in the outer enclosure cover in all positions of the handle structure 159.

The circuit interrupter 3 is shown in the "off" or

open position in FIG. 4. When it is desired to close the circuit interrupter, the handle structure 159 is mainly operated to move the operating member 53 about the pivot 55 in a clockwise (FIG. 4) direction from the "off" or open position to the "on" or closed position. During this movement, the line of action of the over-center tension spring 47 is moved to the right of the line between the pins 45, 39 whereupon the spring 47 serves to snap the toggle link 37 in a counterclockwise direction about the pin 39. During this movement, the pin 45 at the lower end of the link 37 moves to the right moving in the slot 43 in the drive member 41 to move the drive member 41 to the right. This movement is a generally rectilinear movement with the drive member 41 being guided by means of the pin 63 that fits in the tracks 65. Movement of the drive member 41 to the right moves the insulating contact carrier 67 to the right to thereby move all three of the bridging contact members 71 from the open position seen in FIG. 4 to a closed position wherein each pair of movable contacts 73 engage the associated stationary contacts 111, 129. Contact pressure is maintained by means of the springs 75 that permit the contact carrier 67 to move to the right a short distance after the movable contacts 73 have engaged the stationary contacts 111, 129. Reverse movement of the handle structure 159 from the closed position to the open position moves the line of action of the over-center tension spring 47 to the left of the line between the pins 45, 39 to thereby move the toggle 37 clockwise about the pin 39 which movement drives the drive member 41 to the left to move the insulating carrier 67 to the left to thereby move the bridging contact members 71 back to the open position as seen in FIG. 4. The insulating contact carrier 67 and bridging contact members 71 move back and forth in a direction generally normal to the direction from front to back, which front to back direction is the direction of spacing of the stationary contacts 111, 129 and the direction of spacing of the movable contacts 73.

When the circuit interrupter is in the closed position and an overload appears in one of the poles, one of the heaters in one of the relays 131 becomes heated sufficiently to actuate the associated bimetal whereupon the associated bimetal snaps to move a cam member 164 inwardly through an opening in the associated supporting plate 11 to thereby cam the latch 25 in a counterclockwise direction about the pivot 27 to release the latch 21 permitting the latch 21 to move in a counterclockwise direction about the pin 23 to thereby release the trip member 15. The released trip member 15 pivots in a clockwise direction about the pivot 17 under the force of the spring 47. During this movement the line of action of the spring 47 becomes positioned on the left of a line between the pins 45, 39, and the link 37 is moved in a clockwise direction about the pin 39. During this movement the pin 45 moves to the left and upward in the slots 43 coming against the edges of the slots 43 to drive the drive member 41 to the left to move the three bridging contact members 71 to the left to a tripped open position. During the tripping operation the handle structure 159 is stopped in a tripped position intermediate the "on" and "off" positions in a well known manner. The circuit interrupter is reset after a tripping operation by movement of the handle structure 159 to the complete "off" position. During this movement, a part 167 on the operating lever 53 engages the trip member 15 to pivot the trip member 15 in a counterclockwise direction about the pivot 17 moving the link member 37 and trip member 15 back to the position seen in FIG. 4. During this movement the latch member 21 is forced back into the latching position by the end 19 of the trip member 15. The spring 29 again biases the latch 25 and latch 21 into the latching position seen in FIG. 4 so that upon release of the handle structure 159 the parts are reset in the position seen in FIG. 4. There-

after, the circuit breaker can be operated in the same manner hereinbefore described.

If it is desired to wire the terminals 123, 117 or to inspect or adjust the connection at the terminals 123, 117, a worker can loosen the screws 103 (FIGS. 1-4) and slide the insulating cover 83 from the covering position seen in FIG. 4 to the uncovering position seen in FIGS. 1 and 3. As will be understood with reference to FIGS. 1 and 2, the cover 83 comprises generally planar track parts 181 at the opposite sides thereof and lower generally planar track parts 183 at the opposite sides thereof which planar parts 181, 193 rest and slide on planar parts 185 and 187 on opposite sides of the insulating enclosure part 81. Thus, the cover member 83 is slidable along the surfaces 185, 187 back to the uncovering position seen in FIGS. 1 and 3. During this movement, the screws 103 engage in the slots 101 (FIGS. 1 and 3) to guide the cover member 83 for generally rectilinear movement back to the uncovering position. With the cover 83 in the uncovering position seen in FIG. 3, a worker has access to the terminal screws 117, 123 (FIG. 1) from the front of the circuit interrupter and the worker can use an elongated screwdriver type tool extending inward normal to the plane of the paper as seen in FIG. 1 and normal to the front of the circuit interrupter to work the screws 117 and 123 to adjust or connect the terminal connections. It can be seen that in FIG. 1 a worker can visually inspect the connections at the terminals when the cover 83 is in the uncovering position seen in FIGS. 1 and 3. The circuit interrupter is in the "open" or "off" position in FIG. 1 and 3, and it can be seen that the part 189 of the insulating cover 83 is positioned under the part 163 of the operating handle structure 159 so that if an attempt is made to close the circuit interrupter when the cover 83 is in the retracted or uncovering position the part 163 of the handle structure 159 will engage the part 189 of the cover 83 to prevent movement of the handle structure 159 to the closed position to thereby prevent closing of the circuit interrupter when the cover 83 is in the retracted or uncovering position. After the terminals 117, 123 have been wired, adjusted, or inspected, a worker can slide the cover 83 back to the position seen in FIG. 4 and then tighten the two screws 103 to thereby secure the cover 83 in the covering position. Thereafter, the handle structure 159 can be freely moved between the closed and open positions in the manner previously described. It can be understood that the screws 103 can be tightened to secure the cover in the second position if desired.

As can be seen in FIG. 4, when the insulating cover 83 is in the covering position and when the handle structure 159 is in the closed position (shown in broken lines in FIG. 4), the part 163 of the handle structure 159 will engage the part 189 of the insulating cover 83 to prevent movement of the insulating cover 83 to the retracted or uncovering position. Thus, a worker must operate the circuit interrupter to the opening position to permit movement of the cover 83 from the covering position seen in FIG. 4 to the uncovering or retracted position seen in FIG. 3.

As can be seen in FIGS. 1-4, the contacts 73 are spaced from front to back and the contacts 111, 129 are spaced from front to back. The terminals 117, 123 are spaced from front to back and also lengthwise in the direction of movement of the bridging contact member 71 so that both rows of terminals 117 and 123 are accessible (FIG. 1) for inspection and for operation by means of a screwdriver type tool from the front of the circuit interrupter when the cover 83 is in the retracted or uncovering position seen in FIGS. 1 and 3.

It is also to be noted that if it is desired to inspect the contacts 73, 111, 129, the cover 83 can be removed by removing the screws 103 and completely removing the cover member 83 whereupon a person can visually

inspect the contacts from the front of the circuit interrupter.

From the foregoing, it can be understood that there is provided, by this invention, an improved circuit interrupter comprising an insulating cover that covers certain terminals of the circuit interrupter in one position and that is movable to a retracted or uncovering position to expose the terminals for wiring, adjustment and inspection from the front of the interrupter. The circuit interrupter comprises an insulating contact support part that supports the bridging stationary contacts in two rows that are spaced from front to back and also lengthwise in the direction of movement of the bridging contact member whereby the six terminals of the two rows are exposed to a worker for front inspection and accessible to the worker who can wire or adjust the terminals from the front of the interrupter with a screwdriver type tool. Two screw members extend through elongated slots in the insulating cover to secure the cover to the front of the insulating support. When the circuit interrupter is in the closed position, the operating handle structure of the interrupter will engage the insulating cover to prevent movement of the insulating cover from the covering position to the retracted or uncovering position. When the circuit interrupter is in the open position, a worker need only loosen the two securing screws and slide the cover back to the retracted or uncovering position to expose the terminals. When the insulating cover is in the retracted or uncovering position, the insulating cover engages part of the operating handle structure to prevent accidental operation of the circuit interrupter to the "on" or "closed" circuit position. When the exposed terminals have been wired, inspected or adjusted, the worker can then move the insulating cover back to the covering position and tighten the screws to secure the parts in place. Thereafter, the circuit interrupter can be freely operated between the open and closed positions. When it is desired to inspect the contacts, the screws can be completely removed and the insulating cover can then be removed whereupon the contacts are exposed for inspection from the front of the circuit interrupter.

While the invention has been disclosed in accordance with the provisions of the patent statutes, it is to be understood that various changes in the structural details and arrangement of parts may be made without departing from some of the essential features of the invention. It is desired, therefore, that the language of the appended claims be given as reasonably broad an interpretation as is permitted by the prior art.

I claim as my invention:

1. A circuit interrupter having a front and a back, said circuit interrupter comprising insulating support means, a stationary contact structure supported on said insulating support means, a movable contact structure movable rectilinearly between opened and closed positions relative to said stationary contact structure, terminal means on said insulating support means for connecting said stationary contacts in an electric circuit, an operating mechanism comprising a manually operable handle structure, said handle structure being manually operable from the front of said circuit interrupter between an open position and a closed position to operate said operating mechanism between an open and a closed position to move said movable contact structure to open and close said contacts, an insulating cover on said insulating support means at the front of said circuit interrupter in a first position covering said terminal means, said insulating cover being movable on said insulating support means from said first position to a second position uncovering said terminal means, and said insulating cover in said second position cooperating with said operating mechanism to prevent operation of said operating mechanism to the closed position.

2. A circuit interrupter according to claim 1, said cover being movable from said first position to said second posi-

tion when said operating mechanism is in the open position, and said operating mechanism in the closed position thereof cooperating with said cover to prevent movement of said cover from said first position to said second position.

3. A circuit interrupter according to claim 1, securing means in a securing position to secure said cover in said first position on said insulating support means, said securing means being loosenable to a position to permit movement of said cover from said first position to a second position on said insulating support means, and said securing means being workable to a securing position to secure said cover in said second position on said insulating support means.

4. A circuit interrupter according to claim 1, said terminal means on said insulating support means being front-adjustable to effect an electrical connection between said stationary contact structure and a conducting wire, securing means in a securing position securing said insulating cover against movement in said first position on said insulating support means, said securing means being adjustable to a non-securing position, said insulating cover being slidable on said insulating support means from said first position to said second position when said operating mechanism is in the open position and said securing means is in said non-securing position, when said securing means is in said non-securing position and said operating mechanism is in the closed position said operating mechanism engaging said insulating cover to prevent movement of said insulating cover from said first position to said second position, when said insulating cover is in said second position on said insulating support means said front-adjustable terminal means being uncovered and accessible for front adjustment, and said insulating cover comprising stop means to engage said operating mechanism to prevent movement of said operating mechanism to the closed position when said insulating cover is in said second position.

5. A circuit interrupter according to claim 4, said insulating cover having a pair of parallel elongated slots therein, said securing means comprising a separate screw passing through each of said slots and threaded into tapped means in said insulating support means, and said screws and said slots serving as guide means to guide said cover for rectilinear back and forth movement between said first and second positions when said screws are in the non-securing position thereof on said insulating support means.

6. A circuit interrupter according to claim 1, said handle structure comprising a molded insulating handle member, and said insulating cover in said second position being in the path of movement of said molded insulating handle member to engage said handle member to prevent operation of said operating mechanism to the closed position.

7. A circuit interrupter according to claim 6, said cover being movable from said first position to said second position when said operating mechanism is in the open position, and when said operating mechanism is in said closed position said handle member being in the path of movement of said cover to engage said cover to prevent movement of said cover from said first position to said second position.

8. A circuit interrupter according to claim 6, securing means in a securing position to secure said cover in said first position on said insulating support means, said securing means being loosenable to a position to permit movement of said cover from said first position to said second position on said insulating support means, and said securing means being workable to a securing position to secure said cover in said second position on said insulating support means.

9. A circuit interrupter having a front and a back, said circuit interrupter comprising insulating support means, a pair of stationary conductors supported on said insulating support means in a spaced relationship spaced in a direc-

tion from the front to the back of said interrupter, a separate stationary contact on each of said stationary conductors, a terminal connector for each of said stationary conductors, each of said terminal connectors being workable to removably connect a conducting wire to the associated stationary conductor, a contact carrier, a bridging contact structure on said contact carrier and comprising a movable conductor and a pair of spaced movable contacts on said movable conductor spaced in the direction from the front to the back of said interrupter, an operating mechanism comprising a manually operable handle structure manually operable from the front of said circuit interrupter between two operating positions to effect back-and-forth movement of said movable contact carrier and said bridging contact structure in a direction generally normal to the direction from the front to the back of said interrupter to thereby move said movable contacts into and out of engagement with said stationary contacts, an insulating cover member supported on said insulating support means at the front of said circuit interrupter in a first position covering said terminal connectors from the front of said interrupter, said insulating cover member being movable to a second position wherein said terminal connectors are uncovered from the front of said interrupter, said terminal connectors in addition to being spaced in the direction from the front to the back of said interrupter being spaced in the direction of said movement of said movable contact carrier and said bridging contact structure whereby when said insulating cover member is in said second position said terminal connectors are both accessible for adjustment from the front of said interrupter.

10. A circuit interrupter according to claim 9, each of said terminal connectors comprising a terminal screw rotatable to effect an electrical connection between the associated stationary conductor and a conducting wire, and when said insulating cover member is in said second position said terminal screws being accessible to be worked by means of a screwdriver type tool that may be extended into said interrupter in the direction from the front to the back of said interrupter.

11. A circuit interrupter according to claim 9, said insulating cover member having a pair of elongated slots therein, securing means comprising a pair of screws passing through said slots and being in a securing position screwed into threaded means in said insulating support means to secure said insulating cover member to said insulating support in said first position, said screws being

screwable in said threaded means to a non-securing position on said insulating support means, said insulating cover member being movable from said first position to said second position when said screws are in said non-securing position, said screws and said slots cooperating when said screws are in said non-securing position to guide said insulating cover member for rectilinear sliding movement on said insulating support means between said first and second positions.

12. A circuit interrupter according to claim 9, securing means in a securing position to secure said insulating cover member against movement in said first position on said insulating support means, said securing means being adjustable to a non-securing position to permit movement of said insulating cover member on said insulating support means, said handle structure engaging said insulating cover member to prevent movement of said insulating cover member from said first position to said second position when said securing means is in said securing position and said handle structure is in the closed position, when said securing means is in said non-securing position and said handle structure is in the open position said insulating cover member being movable from said first position to said second position, and when said insulating cover member is in said second position said insulating cover member engaging said handle structure to prevent movement of said handle structure to said closed position.

13. A circuit interrupter according to claim 11, said handle structure in the closed position thereof engaging said insulating cover member to prevent movement of said insulating cover member from said first position to said second position, said handle structure in the open position thereof being clear of said insulating cover member to permit movement of said insulating cover member from said first position to said second position, and said insulating cover member in the second position thereof engaging said handle structure to prevent movement of said handle structure to the closed position.

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H. O. JONES, *Assistant Examiner*.