CIRCUIT BREAKER WITH IMPROVED TERMINAL MEANS

Filed Dec. 30, 1963

Fig. 1.

Fig. 2.
A more general object of this invention is to provide an improved double-type circuit breaker that is dependable, relatively inexpensive, and relatively easy to manufacture and assemble.

The novel features that are considered characteristic of this invention are set forth in particular in the appended claims. The invention, both as to structure 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 which:

FIGURE 1 is a side sectional view taken generally along the line 1—1 of FIG. 3;

FIG. 2 is a view similar to FIG. 1; except that the parts are shown in the tripped position;

FIG. 3 is an end view, on a smaller scale relative to FIGS. 1 and 2, of the double-type circuit breaker;

FIG. 4 is an exploded perspective view, on an enlarged scale relative to FIGS. 1, 2 and 3, of the two separate line terminals and the biasing means seen in FIGS. 1, 2 and 3;

FIGS. 5 and 6 are side and end elevational views respectively of the line terminals and biasing means of FIG. 4 in the assembled position;

FIG. 7 is a plan view of the blank from which the biasing member seen in FIGS. 4—6 is formed; and

FIG. 8 is a bottom view of the biasing member formed from the blank seen in FIG. 7.

The general operation and certain parts of the circuit breaker disclosed herein are described more specifically in the above-mentioned patent to Earl Bullis, Jr., Patent No. 3,200,217.

Referring to FIG. 3 of the drawings, a double-type circuit breaker 9 is shown therein comprising an insulating housing that is composed of two molded insulating parts, 11 and 13, forming two compartments. Each of the parts 11 and 13 comprises a back portion molded integral with four sides forming an open front. The open front of the part 11 is covered by the back portion of the part 13 which serves as an insulating barrier between the two compartments and the open front of the part 13 is covered by a molded insulating cover 15. The three molded insulating portions 11, 13 and 15 of the housing are held rigidly together by three rivets 18 (FIGS. 1 and 2).

The housing parts 11, 13 and 15 form two insulating compartments housing two circuit breaker mechanisms which are identical in construction and operation, each of which mechanisms operates independently of the other. For this reason, only the mechanism enclosed by the housing part 11 will be specifically described, it being understood that, unless otherwise mentioned, the description applies to both of the mechanisms of the double-type circuit breaker.

Referring to FIG. 1, the circuit-breaker mechanism, which is enclosed by the housing part 11 and the back portion of the housing part 13, comprises a stationary contact 21, a movable contact 23, a supporting metal frame 25, an operating mechanism 27 and a trip device 29.

The stationary contact 21 is welded, or otherwise rigidly secured, to a line terminal 31 that will be hereinafter more specifically described. The stationary contact 21 for the circuit breaker mechanism that is housed in the housing part 13 (FIG. 3) is welded, or otherwise rigidly secured, to a line terminal that is similar to the line terminal 31 except that it is constructed to be connected to a different side of a generally rigid and flat conducting slab that the terminals 31 and 37 can be plugged onto. The line terminals 31 and 37 are independent in that each is a part of a separate independently functioning circuit-breaker mechanism and each
separately electrically feeds the separate circuit-breaker mechanism in the associated compartment.

Referring to FIGS. 1 and 2, the stationary contact 21 cooperates with the movable contact 23 that is welded or otherwise rigidly secured to a generally C-shaped contact arm or switch arm 41. A bearing member 42 is provided with a slot that is complementary with a slot in the upper part of the contact arm 41 and the bearing is provided with two upper leg portions that fit into suitable slots in a molded insulating operating member 47. The bearing 42 transmits motion from the operating member 47 to the movable contact arm 41 when the breaker is manually operated, and, as will be hereinafter explained, from the movable contact arm 41 to the operating member 47 when the breaker is tripped automatically in response to an overload current condition.

The operating member 47 is a molded insulating member having an arcurate trunnion 51 molded at each side thereof. The trunnions 51 fit and rotateably ride on two arcuate surfaces 55 that are formed on the metallic supporting frame 25. The operating member 47 is supported between the surfaces 55 of the frame 25 and the bearing 42 which is supported by the contact arm 41. The operating member 47 has a handle part 59 molded integrally therewith, which handle part extends through an opening 61 (FIG. 2) in the insulating housing to permit manual operation of the circuit breaker. Arcuate surfaces 63 on opposite sides of the handle 59 substantially close the opening 61 in all positions of the operating member 47.

The frame 25 supports an insulating pivot 65. A metallic trip member 79 is pivotally supported at one end 77 therewith on the pivot 65. The other end 82 of the trip member 79 has a latch surface 83 that rests (FIG. 1) in a ledge 85 (FIG. 2) on an armature 86 to support the trip member in the latched position seen in FIG. 1. The armature 86 is part of the trip device 29 which will be hereinafter specifically described. The ends 77 and 82 of the trip member 79 are offset and disposed in a plane that is parallel to the plane in which the main body portion of the trip member 79 is disposed. An overcenter spring 88 (FIGS. 1 and 2) is connected, under tension, at one end in an opening in the contact arm 41 and at the other end in a slot in a projection 93 extending from the trip member 79.

The movable contact arm 41 is connected by means of a flexible conductor 95 to the free end of a bimetal 97 that is attached at its other end to a load terminal conductor 99. A load terminal connecting screw 100, which is externally accessible, is provided at the outer end of the conductor 99 to enable connection of the circuit breaker in an electric circuit. The load terminal conductor 99 is welded or otherwise attached to a projection 101, extending out from the supporting frame 25. The terminal conductor 99 is given additional support by being looped over and welded to another projection 103 extending out from the supporting frame 25. Thus, the load terminal conductor is rigidly held in place within the housing part 11.

The closed electric circuit through the circuit-breaker mechanism extends from the line terminal 31 (FIG. 1) through the stationary and movable contacts 21, 23, the contact arm 41, the flexible conductor 95, the bimetal member 97, the load terminal conductor 99, to a conducting wire that would be electrically connected to the conductor 99 by means of the screw 100 when the circuit breaker is in operating position. Since the movable contacts 21, 23 extend downward from its pivot, the pivot 65 is established adjacent the bottom of the housing in an arc chute 111, one end of which is connected by a vent passage 113 to an opening in the end of the housing beneath the load terminal screw 100.

The circuit breaker is manually operated to open and close contacts 21, 23 by operation of the insulating handle 59. Movement of the handle 59 clockwise from the full-line "on" position (FIG. 1) to the "off" position in which it is shown in dot-and-dash lines, carries the upper end of the contact arm 41 to the left of the line of action of the spring 88 whereupon the spring acts to move the contact arm 41, with a snap action, to the open position shown partially in dot-and-dash lines in FIG. 1. A projection 109, molded integral with the housing part 11, acts as a stop to limit opening movement of the contact arm 41. To return the operating handle 59 in a counterclockwise direction from the "off" to the "on" position moves the upper end of the movable contact arm 41 to the right of the line of action of the spring 88 whereupon the spring operates to move the contact arm to the closed position seen in FIG. 1. Movement of the handle 59 in both directions is limited by the surfaces 115 (FIG. 1) which strike the frame 25 at the opposite sides of the pivot 51.

The trip device 29 is provided to effect automatic opening of the circuit breaker upon the occurrence of overload current conditions. The trip device 29 comprises the magnetic armature 86, the bimetal 97, a U-shaped magnetic member 117 that is secured to the bimetal 97 with the free ends thereof facing in the direction of the magnetic member 86 and a spring 119. The upper end of the bimetal 97 is welded or otherwise suitably secured to the terminal conductor 99 which is secured to the projecting member 96 of the circuit breaker. The flexible conductor 95 is welded or otherwise suitably secured to the lower or free end of the bimetal 97, and it electrically connects the bimetal 97 with the movable contact arm 41. The armature 86 is movably mounted on the bimetal 97 by means of a spring 119 that is secured at one end to the pivot 65 and at the upper end thereof to the armature 86.

Upon the occurrence of an overload current below a predetermined value, the bimetal element 97 is heated, and when it is heated a predetermined amount, it deflects, with a time delay, to the right shown in FIG. 1 to effect a thermal tripping operation. The armature 86, which is supported on the bimetal 97 by means of the spring 119, is carried to the right with the bimetal to release the trip member 79. When the trip member 79 is released, the spring 88 acts to rotate the trip member clockwise about the pivot 65 to the tripped position seen in FIG. 2. During this movement, the line of action of the spring 88 moves to the right of the pivot 42 of the contact arm 41 whereupon the spring biases the contact arm in an opening direction and moves the contact arm so that the line of action of the force exerted by the spring on the contact arm is at the pivot 65 whereupon the spring 88 actuates both the contact arm 41 and the operating member 47 to the tripped position in which these parts are shown in FIG. 2. In order to provide a visual indication that the breaker has been automatically tripped open, movement of the operating member 47 is stopped in an intermediate position (FIG. 2) when a projection 127, molded integral with the operating member 47, strikes the projection 93 which extends from the trip member 79. The parts are shown in the tripped open position in FIG. 2. The circuit breaker is trip-free in that the breaker will trip upon the occurrence of an overload even if the handle 59 is held in the "on" or closed position.

Before the contacts can be closed following an automatic opening operation, it is necessary to reset and relatch the mechanism. This is accomplished by moving the operating handle 59 clockwise from the tripped open position to an "on" or "closed" position. During this movement, due to the engagement of the projection 127 of the operating member 47 with the projection 93 of the trip member 79, the trip member is moved counterclockwise about the pivot 65 until the latch point 83 is against supported in the latched position on the ledge 85 of the armature 86. Thereafter, the circuit breaker can again be manually operated in the same manner hereinafter described.
The circuit breaker is magnetically tripped automatically and instantaneously in response to overload currents above the predetermined value. Upon the flow of current through the bimetal 97, a magnetic flux, which is induced around the bimetal, takes the path of least reluctance through the magnet 117, across to the air gap and through the armature 86. When an overload current above the predetermined value occurs, the pull of the magnetic flux is of such strength that the armature 86 is attracted to the magnet 117 whereupon the spring 119 flexes permitting the armature to move relative to the bimetal 97 to the right. This movement releases the trip member 79, and the contacts are opened in the same manner hereinafter described with respect to the thermal tripping operation.

Referring to Figs. 4–6, the two separate line terminals 31 and 37, for the two separate circuit-breaker mechanisms, are biased toward each other by means of a one-piece spring steel biasing and supporting member 125. The member 125 is formed from a generally flat sheet-metal blank 127 (Fig. 7) that is folded over at 129 to provide an upper part 131 and a lower part 133. Referring to Fig. 7, the upper part 131 is folded over at 137 to provide a flaring part 135 (Figs. 4 and 5). The lower part 133 (Fig. 7) is bent over at 141 to provide a biasing part 143 (Figs. 4–6). The lower part 133 (Fig. 7) is also bent-over at 145 to provide another biasing part 147 (Figs. 4–6). As is seen in Fig. 8, the biasing parts 143 and 147 are on opposite sides of a slot 149 in the lower part 133.

Each of the terminal members 31 and 37 (Figs. 4–6) comprises a generally resilient conducting member comprising a generally flat planar contact part 151 and a generally flat planar support part 153 that is bent over to provide a generally normal to the contact part 151. The contact parts 151 are bent at the lower ends thereof to form flaring parts 155. Each of the terminal members 31 and 37 is bent over to provide a generally flat planar contact carrying part 157 to which the associated stationary contacts 21 are welded or otherwise rigidly secured. As is seen in Figs. 4–6, the plane of the contact carrying part 157 is generally normal to the planes of both the support part 153 and the contact part 151.

The member 125 is a hardened and treated spring steel member with a very high annealing temperature so that it is unaffected by any of the possible temperature changes that will arise in the circuit breaker.

Referring to Fig. 4, the member 125 is formed with a dimension, at 158 (Fig. 4), between the upper part 131 and the lower part 133 that is less than the thickness of the supporting parts 153 of the terminals 31 and 37. Thus, when the parts are assembled, there is an interference fit between the supporting parts 153 of the line terminals 31 and 37, and the folds 131 and 133 of the member 125. As is seen in Figs. 5 and 6, when the parts are assembled, the two biasing parts 143 and 147 of the member 125, which are staggered (Fig. 8), engage the outer sides of the contact parts 151 of the separate terminals 31 and 37 to bias the contact parts 151 of the terminals 31 and 37 toward each other. Thus, when the circuit breaker 9 (Fig. 3) is plugged into the conducting stab 38, the line terminal end thereof is forced onto the stab and the biasing parts 143, 147 (Fig. 6) of the member 125 bias the separate terminals 31 and 37 against the conducting stab 38 to provide contact pressure between the terminals and the conducting stab. The spacing and formation of these parts relative to the conducting stab is such that the flat contact parts 151 will generally parallel engage the parallel flat surfaces of the stab 38 in the connected position.

As is seen in Fig. 3, there is an opening at the inside lower corner of each of the insulating housing parts 11 and 13 to provide a general opening or cavity 161 in the insulating housing to thereby provide access for the conducting stab 38. The members 31, 37, 125 are placed in the cavity 161 during the assembly of the housing parts 11, 13, 15 and they are held in position by engagement thereof with the wall portions of the cavity 161. As is seen in Figs. 1 and 2, when the circuit breaker is moved into the connected position, the upper part of the member 125 will engage the upper surface 163 of the insulating housing parts 11 and 13 to limit upward movement of the members 31, 37, 125 to thereby permit the members 31 and 37 to be connected to the conducting stab 38 (Fig. 3) by forcing the line end of the circuit breaker 9 onto the stab 38.

For some applications only one circuit-breaker mechanism is utilized in only one compartment and the other compartment is empty. In these cases, only one of the separate terminals 31 or 37 will be necessary to conduct current to the one mechanism, although both of the terminals 31 and 37 can be used with the spring 125 to provide the plug-in or clip-on type connection with the stab 38.

As is seen in Figs. 1 and 2, the cavity 161 in the housing is of such a size that the members 31, 37, 125 can move to a limited extent so that the members can adjust to the position of the conducting stab 38 if the stab is not in alignment with the circuit breaker 9 when the circuit breaker is moved into the connected position. Thus, if the contact conducting stab 38 is not absolutely perpendicular to its general mounting surface so that it may not be in alignment with the circuit breaker, the members 31, 37, 125 can adjust or move to a limited extent in the cavity 161 so that the contact parts 151 of the terminals 31 and 37 can make good contact with the generally parallel flat surfaces of the stab 38. This is also true if the stab 38 happens to be rotated slightly about the vertical axis 169 (Fig. 3). In this case, the members 31, 37, 125 can rotate to a limited extent within the opening 161 to adjust for proper contact alignment and engagement.

The biasing member 125 does not cooperate with the insulating housing in order to provide the biasing force for contact pressure between the terminals 31, 37 and the conducting stab 38. Thus, if the insulating housing is relieved to some extent because of heat that may be generated in the circuit-breaker mechanism under excessive switching and short circuit conditions, this relief of the insulating housing will not affect the contact pressure between the terminals 31, 37 and the conducting stab 38.

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. In combination, two adjacent insulating compartments, a circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a stationary contact and a movable contact cooperable with the stationary contact to open and close an electric circuit, said mechanisms being independently operable, a separate externally accessible load terminal supported at one end of each of said compartments, a separate line terminal disposed at the other end of each of said compartments, and a separate utility spring member biasing said separate line terminals toward each other whereby said separate line terminals are connected to a common conducting stab said separate unitary spring member providing contact pressure between each of said separate line terminals and the common conducting stab.

2. A double-type circuit breaker comprising an insulating housing, a pair of separate circuit-breaker mechanisms disposed within said housing, said housing having a cavity therein at one end thereof, a pair of separate line terminals disposed generally within said cavity and
each electrically connected with a different one of said mechanisms, and a separate unitary spring member biasing said separate line terminals toward each other whereby said circuit breaker is plugged onto a common conducting stab at said one end said separate unitary spring member provides contact pressure between each of said separate line terminals and the conducting stab.

3. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a recess therein at one end thereof, two separate terminal members and a separate spring member disposed generally within said recess, each of said separate terminal members being connected in electrical series with a different one of said pairs of contacts, said separate spring member supporting said separate terminal members such that said separate spring member and said separate terminal members are movable as a unit within the confines of said recess, and said separate spring member functioning independently of said housing to bias said separate terminal members toward each other.

4. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a cavity therein at one end thereof, two separate line terminals and a separate spring member disposed generally within said cavity, each of said separate line terminals being connected in electrical series with a different one of said pairs of contacts, said separate spring member supporting said separate line terminals such that said separate spring member and said separate line terminals are movable as a unit within the confines of said cavity, said separate spring member and said separate line terminals being supported for limited universal movement within the confines of said cavity, and said separate spring member functioning independently of said housing to bias said separate line terminals toward each other.

5. A double-type circuit breaker comprising an insulating housing, said insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a recess therein at one end thereof, two separate line terminals and a spring member disposed generally within said recess, each of said separate line terminals being connected in electrical series with a different one of said pairs of contacts, each of said two separate line terminals comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member engaging the opposite flat surfaces of both of the support parts of said two separate line terminals comprising two biasing parts biasing said two contact parts toward each other, and said two separate terminal members and spring member being supported for limited unitary movement within the confines of said cavity whereby said contact parts can align with a conducting stab when said two separate terminal members are plugged onto the common conducting stab.

6. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a cavity therein at one end thereof, two separate terminal members and a spring member disposed generally within said cavity, means connecting each of said two separate terminal members in electrical series with a different one of said pairs of contacts, each of said two separate terminal members comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member engaging the opposite flat surfaces of both of the support parts of said two separate terminal members to support said two separate terminal members, said unitary spring member comprising two biasing parts biasing said two contact parts toward each other, and said two separate terminal members and spring member being supported for limited unitary movement within the confines of said cavity whereby said contact parts can align with a conducting stab when said two separate terminal members are plugged onto the common conducting stab.

7. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a recess therein at one end thereof, two separate line terminals and a spring member disposed generally within said recess, each of said two separate line terminals comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member comprising a folded over sheet-metal type member engaging the opposite flat surfaces of both of the support parts of said two separate line terminals comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member comprising a folded over sheet-metal type member engaging the opposite flat surfaces of both of the support parts of said two separate line terminals between the folded-over parts thereof to support said two separate line terminals, said spring member comprising two biasing parts bent-over from one of the folds thereof and biasing said two contact parts toward each other whereby when said two separate line terminals are connected to a common generally rigid conducting stab said two biasing parts provide contact pressure between each of said two separate line terminals and the conducting stab.

8. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a recess therein at one end thereof, two separate line terminals and a spring member disposed generally within said recess, each of said two separate line terminals comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member comprising a folded over sheet-metal type member engaging the opposite flat surfaces of both of the support parts of said two separate line terminals between the folded-over parts thereof to support said two separate line terminals, said spring member comprising two biasing parts bent-over from one of the folds thereof and biasing said two contact parts toward each other whereby when said two separate line terminals are connected to a common generally rigid conducting stab said two biasing parts provide contact pressure between each of said two separate line terminals and the conducting stab, and said spring member and said two separate line terminals being supported for a limited amount of unitary movement within said recess whereby said two separate line terminals can align with said conducting stab when said circuit breaker is connected to said conducting stab.

9. A double-type circuit breaker comprising an insulating housing comprising two adjacent insulating compartments, a separate circuit-breaker mechanism supported in each of said compartments, each of said mechanisms comprising a pair of contacts relatively movable to open and close an electric circuit, said insulating housing having a cavity therein at one end thereof, two separate terminal members and a spring member disposed generally within said cavity, means connecting each of said two separate terminal members in electrical series with a different one of said pairs of contacts, each of said two separate terminal members comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, a unitary spring member engaging the opposite flat surfaces of both of the support parts of said two separate terminal members to support said two separate terminal members, said unitary spring member comprising two biasing parts biasing said two contact parts toward each other, and said two separate terminal members and spring member being supported for limited unitary movement within the confines of said cavity whereby said contact parts can align with a conducting stab when said two separate terminal members are plugged onto the common conducting stab.
separate line terminal members and a unitary spring member disposed generally within said recess, each of said two separate line terminal members comprising a generally flat planar support part, a generally flat planar contact part extending generally normal to the plane of the support part and a generally flat planar contact carrying part extending generally normal to the planes of both the support part and the contact part, each of said contact carrying parts supporting a different one of said stationary contacts, said unitary spring member comprising a sheet-metal type member folded over and engaging the opposite flat surfaces of both of the support parts of said two separate line terminal members between the folds thereof to thereby support said two separate line terminal members, one of the folds of said spring member comprising two bent-over biasing parts engaging said two contact parts of said two separate line terminal members to bias said contact parts toward each other, and said spring member and said two separate line terminal members being supported for limited unitary movement within said recess whereby when said circuit breaker is plugged onto a generally flat and generally rigid conducting stab said contact parts can align with the opposite flat surfaces of said conducting stab, and said biasing parts providing contact pressure between said contact parts of said two separate line terminal structure members and the opposite flat surfaces of said conducting structure members.

10. A circuit breaker comprising an insulating housing, a circuit breaker mechanism supported within said housing, said mechanism comprising a pair of contacts connectable to open and close an electric circuit, said housing having a recess therein at one end thereof, a line terminal structure disposed generally within said recess, said line terminal structure comprising two separate terminal members and a separate spring member, means connecting at least one of said separate terminal members in electrical series with said pair of contacts, said separate spring member supporting said separate terminal members and said separate terminal members are movable as a unit within the confines of said recess, and said separate spring member functioning independently of said housing to bias said separate terminal members toward each other.

11. A circuit breaker comprising an insulating housing, a circuit-breaker mechanism supported within said housing, said mechanism comprising a pair of contacts connectable to open and close an electric circuit, said housing having a cavity therein at one end thereof, a terminal structure disposed generally within said cavity, said terminal structure comprising two separate terminal members and a separate unitary spring member, means connecting at least one of said separate terminal members in electrical series with said pair of contacts, each of said separate terminal members comprising a generally flat planar support part and a generally flat planar contact part extending generally normal to the plane of the support part, said separate spring member engaging the opposite flat surfaces of the support parts of said separate terminal members to support said separate terminal members, said separate spring member comprising two biasing parts biasing said two contact parts toward each other, said separate terminal members and separate spring member being supported for limited unitary movement within the confines of said cavity whereby said contact parts can align with the opposite flat surfaces of said conducting stab when said separate terminal members are plugged onto a common conducting stab, and said separate spring member operating independently of said housing to provide contact pressure between said separate terminal members and said conducting stab.

12. A circuit breaker comprising an insulating housing, a circuit breaker mechanism supported within said housing, said mechanism comprising a stationary contact and a movable contact cooperable with the stationary contact to open and close an electric circuit, said housing having a recess therein at one end thereof a terminal structure disposed generally within said recess, said terminal structure comprising two separate terminal members and a separate spring member, each of said separate terminal members comprising a generally flat support part, a generally flat contact part extending generally normal to the support part and a generally flat additional part extending generally normal to both the support part and the contact part, at least one of said additional parts supporting said stationary contact, said separate spring member comprising a sheet-metal type member folded over and engaging the opposite flat surfaces of the support parts of said two separate terminal members between the folds thereof to thereby support said two separate terminal members, one of the folds of said separate spring member comprising two bent-over biasing parts engaging said two contact parts of said two separate terminal members being supported for limited unitary movement within said recess whereby when said circuit breaker is plugged onto a generally flat and generally rigid conducting stab said contact parts can align with the opposite flat surfaces of said conducting stab, said biasing parts providing contact pressure between said contact parts of said separate terminal members and the opposite flat surfaces of said conducting stab, and said contact pressure being effected independently of said insulating housing.

References Cited by the Examiner

UNITED STATES PATENTS

2,922,004 1/1960 Miller et al. __________ 200—116 X
2,953,650 9/1960 Johnson __________ 200—116 X
2,953,661 9/1960 Hammerly et al. __________ 200—116 X

ROBERT K. SCHAEPER, Primary Examiner.
KATHLEEN H. CLAFFY, Examiner.
H. O. JONES, Assistant Examiner.