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3,143,627

MULTIPOLE CIRCUIT BREAKER WITH THREE PART INSULATING CASING

Filed April 15, 1960

3 Sheets-Sheet 1

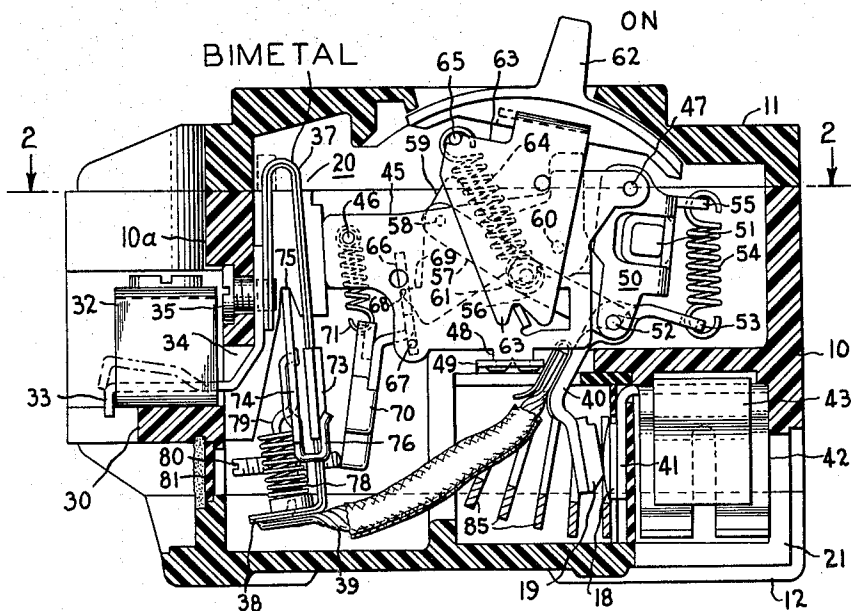


FIG. 1

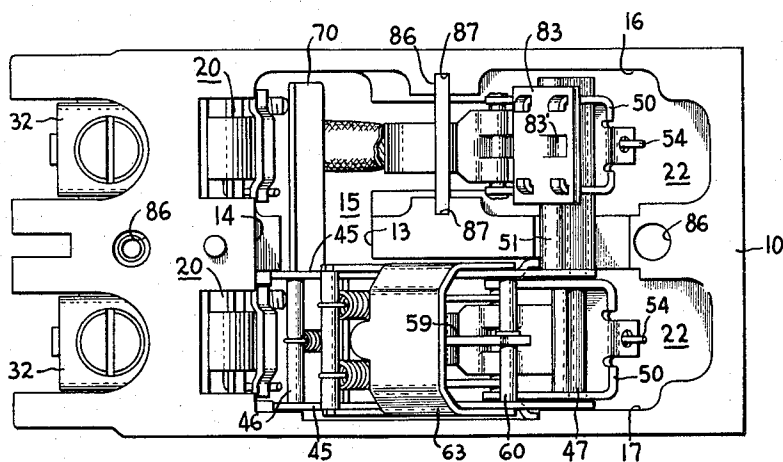


FIG. 2

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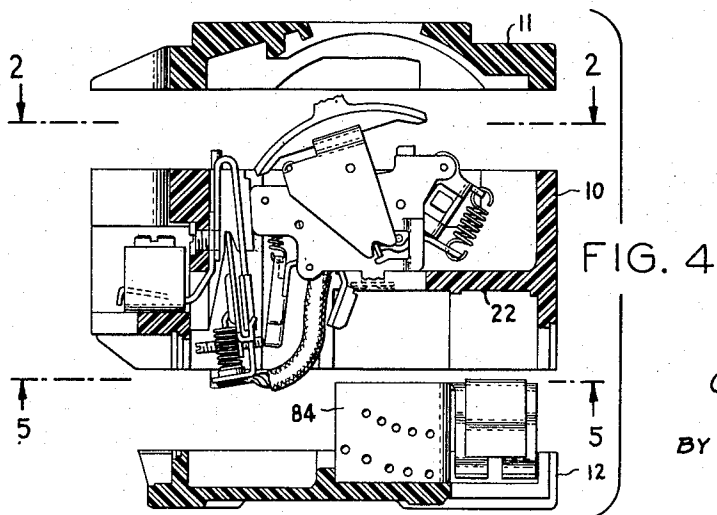
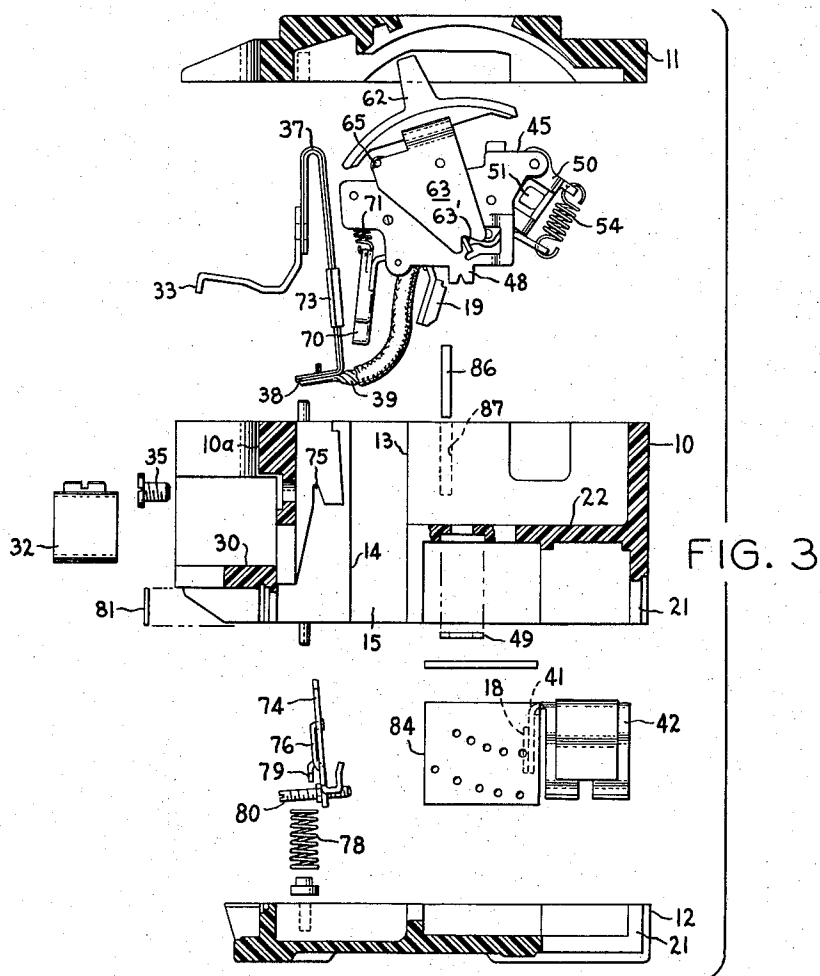
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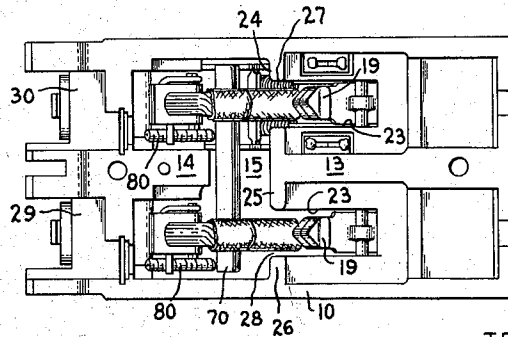


FIG. 5

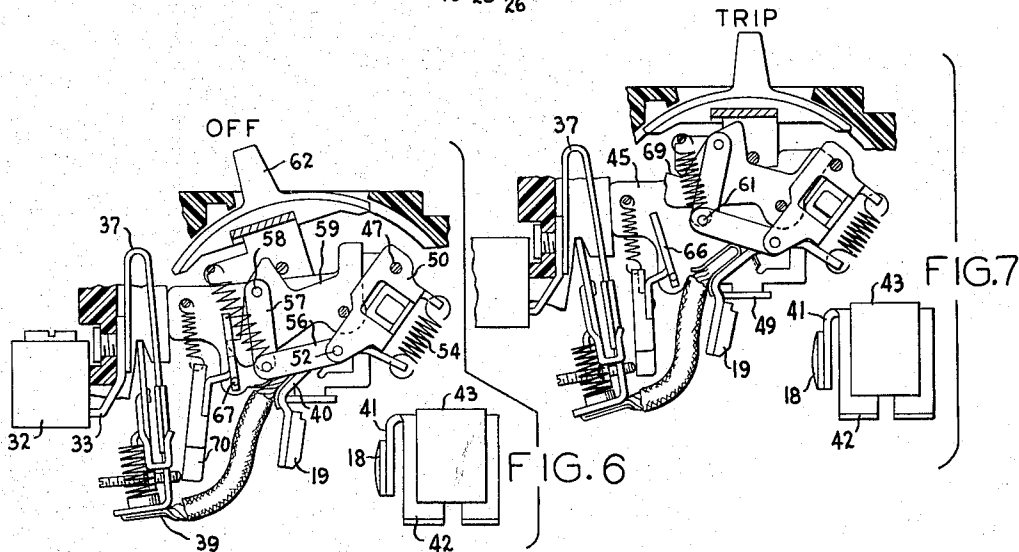


FIG. 6

FIG. 7

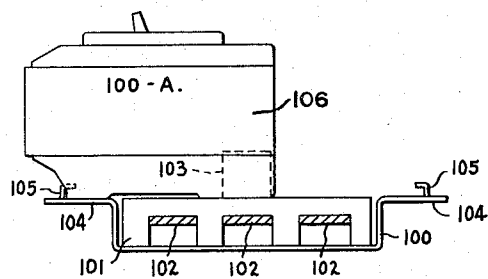


FIG. 8

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3,143,627

MULTIPOLE CIRCUIT BREAKER WITH THREE PART INSULATING CASING

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Filed Apr. 15, 1960, Ser. No. 22,483

7 Claims. (Cl. 200-168)

Our invention relates to electric circuit breakers and particularly to plug-in type multipole electric circuit breakers adapted for use in panel assemblies, such for example, as in the panel assembly shown in patent No. 2,738,446, W. J. Fleming, March 13, 1956, assigned to the same assignee as the present invention.

Electric circuit breakers of the type referred to herein are characterized by their extreme compactness. Such compactness is achieved in large measure by a particular arrangement of the basic component portions of the electric circuit breaker. Such electric circuit breakers, for example, comprise three primary component portions: (a) a pair of separable contacts and associated arc-cooling and extinguishing means for each circuit or "pole"; (b) operating mechanism for operating the contacts both manually and automatically upon the occurrence of overload conditions; and (c) current-responsive means for detecting the existence of such overload conditions and for initiating an actuation of the operating mechanism in response thereto. These components, in conventional circuit breakers, are ordinarily arranged within a molded enclosing case in a row, with the current-responsive means at one end of the casing, the operating mechanism next, and the contacts and arc extinguishing means at the opposite end. In the compact type of circuit breaker referred to herein, however, the overall length of the circuit breaker is significantly shortened by raising the operating mechanism and positioning the contacts and arc extinguishing structure below the operating mechanism so that these two components are in "stacked" relation.

It is relatively easy to provide a molded insulating case for such a circuit breaker in the single pole form, i.e., where only one set of separable contacts is involved. It is much more difficult, however, to provide a molded insulating casing for such an assembly when two or three poles or sets of separable contacts are involved. One approach to this problem is shown in our prior Patent No. 2,908,782, October 13, 1959, assigned to the same assignee as the present invention. In accordance with this prior approach, an insulating casing is provided including substantially equal top and bottom sections, each generally cup-shaped and having conforming recesses which meet to provide individual chambers for each of the poles of the circuit breaker. The operating mechanism is supported substantially entirely within the upper or top section, and the separable contacts and arc extinguishing means in the bottom section.

In the prior construction, however, the side walls of the casing are supported only at their peripheral portions. When it is attempted to extend the electrical rating of such circuit breaker to high values such, for example, as 100 amperes at 240 volts, the pressure developed during short-circuit interruption is often such as to cause rupturing of the side walls of the circuit breaker casing.

In such prior constructions, therefore, it has commonly been necessary to utilize relatively expensive, high strength molding materials in order to provide the strength needed, even for lower ratings.

In addition, in accordance with such prior construction, it is not readily feasible to securely and fixedly anchor the operating mechanism to the insulating casing. As a consequence, changes may be caused in the calibration or

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adjustment of the circuit breaker by small changes in the position of the operating mechanism.

Also, prior circuit breakers of this type, when used with a plug-in type panelboard, were arranged to utilize only one-half of the space of a contact blade on such panelboard. It was therefore customary to mount two of such circuit breakers in end-to-end relation on a single blade of such panelboard. When the electrical rating of such a circuit breaker is extended to higher values such, for example, as 100 amperes, the use of two of such circuit breakers in end-to-end relation on a single electrical stab of conventional panelboard construction would result in overloading and consequent overheating of the copper of the panelboard contact blade.

It is an object of the present invention to provide a compact electric circuit breaker of the molded case type which is characterized by a molded insulating casing of high structural strength.

It is a further object of the invention to provide a multipole circuit breaker of the type having its operating mechanism positioned in the upper portion of the casing, in which it is possible to securely anchor the operating mechanism to the insulating casing.

In accordance with the invention in one form, we provide a compact multipole circuit breaker comprising a generally rectangular insulating casing made up of a main central portion having recesses therein and having an open top and open bottom, and a top cover and a bottom cover for closing said open top and bottom portions respectively. The central portion of the insulating casing is provided with a longitudinally extending integral barrier dividing the central portion essentially into two elongated side-by-side recesses. The central portion furthermore includes an integral horizontally extending barrier or shelf in each pole recess for supporting the mechanism and for separating the mechanism from the arc chambers. The net result of this arrangement is to provide essentially isolated mechanism and arcing chambers, while at the same time providing an assembly in which the side walls of the insulating casing are reinforced at their central portion, thereby providing an extremely rugged and strong insulating casing.

In accordance with another aspect of the invention, the operating mechanism includes a pair of opposed side plates each provided with extending lugs, and one of the transversely extending barrier portions in the central portion of the insulating casing is provided with mounting holes receiving the lugs of the side frames, whereby the frame may be rigidly attached to and riveted to the insulating barriers.

Additional objects of the invention will in part become apparent and in part be pointed out from the following detailed description, and the scope of the invention will be pointed out in the appended claims.

In the drawings:

FIGURE 1 is a side elevation view, partially in section, of an electric circuit breaker embodying the invention;

FIGURE 2 is a sectional plan view taken generally on the line 2-2 of FIGURE 1;

FIGURE 3 is an exploded elevation view partially in section of the circuit breaker of FIGURE 1;

FIGURE 4 is a partially exploded elevation sectional view of the circuit breaker of FIGURE 1 showing the mechanism and current-responsive means in mounted condition;

FIGURE 5 is a sectional plan view of the circuit breaker taken generally on the line 5-5 of FIGURE 4;

FIGURE 6 is a fragmentary elevation view of the circuit breaker of FIGURE 1 showing the mechanism in the "off" position;

FIGURE 7 is a fragmentary elevation view of the cir-

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cuit breaker of FIGURE 1, showing the parts in the "tripped" position;

FIGURE 8 is an elevation view of a circuit breaker and panel assembly, utilizing an electric circuit breaker of the present invention.

Referring first to FIGURES 1-5, the invention is shown as embodied in a two-pole electric circuit breaker comprising an insulating casing of molded material including a central body portion 10 (see FIGS. 3 and 5) a top cover portion 11 and a bottom cover portion 12. As indicated particularly in FIGURES 2 and 5, the central portion 10 includes a longitudinally extending integral vertical barrier portion 13 and a shorter similar barrier portion 14 spaced apart therefrom to leave a space 15 for a cross or common trip bar to be described.

The longitudinal barriers 13 and 14 serve to essentially divide the inner space of the insulating casing into two elongated generally rectangular chambers 16 and 17. Each of the chambers 16 and 17 contains a pair of contacts comprising a stationary contact 18 and a movable contact 19 (only one pair of contacts shown). In addition, each of the chambers 16 and 17 contains a "trip device" current-responsive means indicated generally at 20 and to be described more fully hereinafter. In addition, the chamber 17 contains an operating mechanism serving to operate the movable contacts of both chambers manually and automatically in a manner to be described.

The central insulating casing portion 10 further includes an integral transversely extending horizontal barrier 22 (see FIGS. 3 and 4) in each of the chambers 16 and 17 and extending slightly more than one half the lengthwise distance of such chamber. Each of the barriers 22 has a portion thereof notched or cut away as at 23 to permit movement of the contact arm in a manner to be described.

The central casing portion 10 further includes transversely extending vertical barrier portions 24, 25, 26 which are in alignment and spaced apart to provide passages 27 and 28 for flexible conductors leading to the movable switch members (to be described).

It will therefore be observed that in effect, the generally rectangular space within the central insulating portion 10 is subdivided into two elongated chambers 16 and 17 by the longitudinal barriers 13 and 14, and that each of such chambers 16 and 17 is further subdivided. The horizontally extending transverse barriers 22 divide the forward portion of each of the chambers 16 and 17 into two substantially equal upper and lower portions. The transversely extending vertical barriers 24, 25, 26 serve to subdivide the lower portion of each of the chambers 16 and 17 into a forward and a rearward compartment. Thus in effect, each of the chambers 16 and 17 is divided into three portions: an upper and lower forward portion and a rearward portion. In addition, horizontally extending transverse barriers 29, 30 are provided, for a purpose to be described. All of the components of the circuit breaker according to the invention are supported on and substantially contained within the central insulating member 10. The cover portions 11 and 12 serve to enclose and shield such parts.

The details of the construction of the parts will be set forth in connection with the pole chamber 17. Referring to FIGURES 1 and 2, a load terminal or connector 32 is supported on the barrier 30, and is retained thereon by the down-turned lip of terminal strap 33. The terminal strap 33 extends through the connector 32 and through an aperture 34 in the end wall 10a of the casing portion 10, extends upwardly along the inner surface of the end wall, and is rigidly affixed to the end wall by means of the screw 35.

It will be observed that the connector 32 when in position blocks access to the screw 35. For this reason, the assembly of these parts is accomplished as follows: The terminal strap 33 is assembled by inserting it through the open top of the casing portion 10 and projecting the

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end thereof through the aperture 34. The terminal strap 33 as initially assembled is bent so that the projecting end thereof extends in the position shown in dotted lines in FIGURE 1. The screw 35 is then inserted and tightened. The connector 32 is thereafter slid onto the end of the strap 33 to the position shown. Following this, the end of the terminal strap 33 is bent down to its solid line position, trapping the terminal member 32 in place. This may be done by turning the clamping screw 36 down to its lowest position, or by other suitable means.

A reverse-bent elongated bimetallic strip 37 is rigidly attached to the terminal strap 33 by suitable means such as by welding. The bimetallic strip 37 has its free end portion 38 bent at right angles to its major intermediate portion. A flexible electrical connector 39 is connected to the end 38 of the bimetallic strip by suitable means such as by welding or brazing and has its other end similarly connected to the switch arm 40 carrying the movable contact 19. The movable contact 19 is adapted to contact the stationary contact 18, which is carried by the bent-over lug portion 41 of the generally U-shaped contact jaw assembly 42. In order to increase contact pressure of the socket 42, a resilient spring clip member 43 is placed over the outside of the socket member 42. The central casing portion 10 and the bottom cover portion 12 are provided with contiguous openings 21 forming corner slots in the casing to permit the insertion of contact blades in a manner to be described. The current path through this pole of the circuit breaker may therefore be traced as follows: from line terminal strap 33 to bimetallic strip 37, to flexible conductor 39, to switch arm 40, to movable contact 19, to stationary contact 18, to line socket 42.

In order to move the switch arm and movable contact 19 between open and closed circuit positions, an operating mechanism is provided, comprising a pair of opposed side frames 45 spaced apart by spacer pins 46 and 47. The side frames 45 are each provided with downwardly extending mounting lugs 48 which project through openings in the horizontal barrier portions 22. The lugs 48 are riveted or headed over against retaining plates 49 to securely mount the side frames 45 on the barrier 22. A generally U-shaped contact operating member 50 is pivotally supported on the spacer pin 47 and carries a contact cross-arm of insulating material 51. The switch arm 40 is pivotally supported on the pivot pin 52 carried by the operating member 50 and has a projecting end portion 53 connected by tension spring 54 to a projecting lug 55 of the operator 50. The spring 54 serves to resiliently urge the contact arm 40 for rotational movement in a counterclockwise direction about its pivot 52 and, in the closed position as shown in FIGURE 1, it urges the movable contact 19 into engagement with the stationary contact 18. Certain aspects of the circuit breaker mechanism construction disclosed, relating particularly to the contact arm construction, are the subject of our divisional application S.N. 246,035, filed December 20, 1962, and assigned to the same assignee as the present invention.

For the purpose of operating the operating member 50 about its pivot point 47 between open and closed circuit positions, a pair of toggle links 56 and 57 are provided. The link 56 is pivotally connected to the pivot pin 52, while the link 57 is pivotally connected at 58 to a normally stationary releasable member 59 pivotally supported between the plates 45 on spacer pin 60. The toggle links 56 and 57 are interconnected by a pin 61.

When the toggle links 56, 57 are in the extended position as shown in FIGURE 1, the contact operating member 50 is held in the "closed" position as shown. When the toggle links are moved to collapsed position, as shown for example in FIGURE 6, the contact operating member 50 is moved to the left or "off" position.

For the purpose of operating the toggle links, a manually operable member is provided including an insulating

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handle member 62 and a generally U-shaped metallic handle support member 63 which straddles the frame members 45 and is pivotally supported upon lugs 63' struck out from the sides of the frames 45. A pair of elongated tension springs 64 are supported between a pin 65 carried by the handle support member 63 and the knee pin 61 of the toggle links.

As the manually operable member 62 is moved from "on" to "off" position and vice versa, the upper end of the spring 64 is moved to one side or the other of the line of centers of the toggle knee and the relatively stationary pivot 58, thereby collapsing and straightening the toggle links.

For the purpose of releasably restraining the releasable member 59, a latch assembly is provided comprising a latch member 66 pivotally supported between the side frames 45 by projections 67. The latch 66 has an aperture 68 therein which is adapted to receive a latch projection 69 carried by the releasable member 59. The latch member 66 carries a transversely extending insulating trip bar 70 which extends into both of the chambers 16 and 17. The latch assembly, including the latch member 66 and the trip bar 70, is biased in a clockwise direction by tension spring 71 which is connected to the frame spacer pin 46.

When the trip bar 70 is moved to the right as shown in FIGURE 1, so as to rotate the latch member 66 in counterclockwise direction about its pivot point 67, the latch member 66 is withdrawn from the latch projection 69 of the releasable member 59. Upon release of the projection 69, the tension spring 64 acting through the toggle links 56 and 57, moves the releasable member to the fully tripped position as shown in FIGURE 7, causing automatic opening of the contacts and movement of the manually operable member to a mid or trip indicating position. The releasable member 59 may be re-engaged with the latch member 66 by moving the handle member 62 to the fully counterclockwise position coinciding with the "off" position as shown in FIGURE 6.

For the purpose of moving the trip bar to cause release of the releasable member in the manner described, upon the occurrence of predetermined conditions in the circuit, current-responsive means is provided. The current-responsive means includes the bimetallic strip 37 previously described. In addition, magnetic tripping means is provided including a magnetic field piece 73 which is rigidly attached to the bimetallic strip 37 by suitable means such as by welding. A magnetic armature member 74 is provided which is pivotally held in notches 75 in the side walls of the casing. The armature 74 comprises a generally flat plate of magnetic material. The armature 74 is loosely connected to the bimetallic strip 37 by means of a generally J-shaped wire clip 76 carried by the armature 74 and extending around in front of the magnetic field piece 73. The wire clip 76 is preferably constructed of nonmagnetic material. The armature 74 is biased away from the bimetallic strip 37 by means of a compression spring 78 extending between the bent-over portion 38 of the bimetallic strip and a lug portion 79 of the armature 74. The armature 74 is further provided with an elongated calibrating screw 80 which is threadedly engaged therein and is adapted to contact the insulating trip bar 70 in a manner to be described. The insulating casing comprising the center portion 10 and the bottom cover 12 are each formed to provide an aperture affording access to the calibrating screw 80. After assembly of the circuit breaker and calibration thereof, the aperture referred to is closed by suitable means, such as by an insulating closure 81. Passage of excess current through the bimetallic strip 37 causes the strip to deflect to the right as viewed in FIGURE 1. Such deflection causes the armature member 74 to follow because of the connection by the wire clip 76. This in turn moves the calibrating screw 80, which engages the trip bar 70, rotating the trip bar to cause tripping. Upon the occur-

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rence of an extremely high overload condition, a magnetic attraction is set up between the magnetic field piece 73 and the armature 74, moving the armature 74 to the right as viewed toward the bimetallic strip 37. This causes the calibrating screw 80 to engage the trip bar 70 in a similar manner to cause tripping.

While the construction has been described in detail for the parts supported in the pole space 17, it will be understood that corresponding parts, with the exception of the operating mechanism, are supported in the pole space 16. Thus the contact cross-arm 51 is extended into the pole space 16 and a second contact operator 50 is supported thereon, being clamped thereto by means of the retaining plate 83. The plate 83 has a lug 83' struck out and projecting into a recess in the cross-arm 51 to position the assembly laterally on the cross-arm. A switch arm and movable contact (not shown) are carried by the contact operator 50 in a manner similar to arm 40 and contact 19.

For the purpose of aiding in the extinction of electric arcs drawn by the movable contact, an arc extinguishing assembly is provided comprising a generally U-shaped fiber supporting wall 84, see FIG. 4, having a series of generally U-shaped plates of magnetic material 85 supported therein. An insulating barrier plate 86 is slid into notches 87 in the pole space 16 and serves to limit movement of the switch arm 40 in the contact opening direction in this pole space.

It will be observed by reference to FIGURE 3 that virtually all of the parts of the circuit breaker are supported on the central insulating section 10. Thus the line terminal strap 33 and its associated parts comprising the terminal connector 32 and the bimetallic strip 37 are mounted on the end wall 10A. The armature member 74 is supported in notches 75 in the insulating casing being held therein by the compression spring 78. The operating mechanism with its associated parts comprising the contact arm and movable contacts extending into both pole spaces is supported upon the barriers 22 of the section 10. The arc extinguishing assemblies and line contact assemblies comprising the arc extinguishing members 84 and 85 and the plug-in line contact 42 are supported on the base portion 12 and contained within the chamber formed by the lower portion of the central section 10. The manner of assembly of the parts is clearly shown in the exploded FIGURE 3 of the drawings. Thus as indicated, the main operating mechanism and the line terminal strap and bimetallic strip are assembled from the top of the section 10, while the armature member 74, and the arc extinguishing assembly and line contact assembly are assembled from the bottom. Once these parts are assembled, the top and bottom covers are then put in place and the assembly held together by suitable rivets or bolts extending through the openings 86. This casing construction provides very effective mechanical reinforcement for the side walls of the center section 10, greatly contributing to its strength. In addition, the construction effectively isolates the arcing chamber from the remaining portion of the pole chambers.

In addition to the above advantages, this type of assembly has the important advantage that it is possible to mount all of the parts in their final positions, to calibrate, adjust, and examine the entire mechanism after it is in its finally mounted position, before adding the top and bottom covers. This is an important advantage in the manufacture of such devices.

In accordance with another aspect of the invention, an electric circuit breaker is provided of the plug-in type which is suitable for use in protecting higher rated circuits than customarily used in such plug-in panel assemblies. In accordance with this aspect of the invention, the circuit breaker is provided with an enlarged line contact socket which is adapted to cover the entire contact blade of such a panel assembly. This prevents the mounting of a second circuit breaker on such contact blade and

therefore avoids overloading of such a contact blade. In FIGURE 8 there is shown an endwise elevation view of a panel assembly utilizing circuit breakers in accordance with the invention. Such a panel assembly comprises a supporting base or pan 100 having an insulating base 101 supported therein by suitable means, not shown. The insulating base 101 serves to support a plurality of bus bars 102 for connection to a source of electric power. The bus bars 102 are also provided with a plurality of branch connecting straps, not shown, terminating in upstanding contact blades 103 aligned centrally of the support. The supporting pan 100 further includes outwardly directed flanges 104 provided with inturned retaining lugs or tangs 105. The circuit breakers 106 are mounted on this supporting base by hooking one end portion thereof under the retaining lugs 105; pivoting the circuit breaker about the lugs 105 and plugging them into contact with the central contact blade 103. In accordance with the invention, the circuit breaker is provided with a casing of sufficient length and with a contact socket of sufficient size to utilize the entire blade 103, making it impossible to mount another circuit breaker on the same contact blade. In addition to assuring that such contact blade will not be overloaded, this construction provides increased contact area for the 100 ampere circuit breaker.

Since the breaker 106 covers the entire contact blade 103, it is not possible to mount two breakers in end-to-end relation on a single blade as commonly done in the prior art (see the above-mentioned prior patents). Thus there is no danger of overloading such a blade by adding a second circuit breaker to a blade which already feeds a breaker drawing all the current which the blade should carry.

While the invention has been described as embodied in a two-pole circuit breaker, it will be appreciated that the invention is equally applicable to a three-pole circuit breaker, in which case an insulating casing is provided having three pole chambers and having a contact cross-arm 51 and trip bar 70 extended across all three such pole chambers.

While the invention has been shown in one specific embodiment, it will be readily apparent that many modifications thereof may be made without departing from the spirit of the invention. It is therefore intended by the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A multipole electric circuit breaker comprising a molded insulating casing including a main body portion having generally parallel side and end walls and an insulating barrier extending at least partly between said end walls parallel to said side walls and dividing said main body portion into at least two pole chambers, said main body portion having an open top wall and an open bottom wall, a pair of relatively movable contacts in each of said pole chambers, operating mechanism in at least one of said pole chambers for operating said movable contacts between open and closed circuit position, said operating mechanism including a member releasable to cause automatic opening of said contacts, current-responsive means in each of said pole chambers responsive to electric current passing through the corresponding pair of relatively movable contacts in such chamber, means operable by each of said current-responsive means to cause automatic opening movement of said operating mechanism, an integral insulating barrier extending horizontally parallel to said top and bottom walls at least partially across one of said pole chambers, said operating mechanism being supported on said horizontally extending barrier and rigidly attached thereto, and insulating top and bottom cover means for closing said open top and bottom walls respectively.

2. A multipole electric circuit breaker comprising a

casing of molded insulating material, said casing including a main body portion having opposed parallel side and end walls respectively, and open top and bottom walls, an integral molded barrier of insulating material extending at least partly between said opposed end walls and parallel to said opposed side walls and dividing said main body portion into at least two pole chambers, a molded integral insulating barrier extending parallel to said top and bottom walls in each of said pole chambers and positioned intermediate said open top and bottom walls, a pair of relatively movable contacts in each of said pole chambers, current-responsive means in each of said pole chambers responsive to current passing through said corresponding relatively movable contacts, operating mechanism in at least one of said pole chambers for manually operating said relatively movable contacts between open and closed circuit position and for automatically moving said contacts to open circuit position upon actuation by at least one of said current-responsive means, said relatively movable contacts being positioned below said horizontally extending barrier and said operating mechanism being positioned above said horizontally extending integral barrier, and molded insulating cover means for closing said open top and bottom walls respectively.

3. A multipole electric circuit breaker comprising a casing of molded insulating material having a main body portion including opposed parallel side and end walls respectively and open top and bottom walls, a molded integral insulating intermediate barrier extending at least part way between said opposed end walls and parallel to said opposed side walls and dividing said main body portion into at least two pole chambers, a horizontally extending integral insulating barrier in each of said pole chambers and extending between said side wall and said intermediate barrier, insulating cover means for closing said top and bottom walls respectively comprising a top cover and a bottom cover, a pair of relatively movable contacts positioned in each of said pole chambers between said horizontally extending barrier and said bottom cover, operating mechanism for operating said contacts between open and closed circuit position manually and including a member releasable to cause automatic opening of said contacts, a contact cross-arm carried by said operating mechanism and extending across all of said pole chambers, above said horizontally extending barrier, a switch arm carried by said contact cross-arm and extending downwardly below said horizontally extending barrier and adapted to operate said movable contact in each of said pole chambers, current-responsive means in each of said pole chambers responsive to current passing through said relatively movable contacts in said pole chamber, and a common trip bar extending across all of said pole chambers and disposed and arranged to be operated by said current-responsive means in each of said pole chambers to cause release of said releasable member.

4. A multipole electric circuit breaker comprising a molded insulating casing having a main body portion with generally parallel side and end walls and open top and bottom walls, molded insulating cover means for closing said open top and bottom walls respectively, said main body portion having an integral longitudinally extending intermediate barrier extending at least partly between said opposed end walls and parallel to said side walls and dividing said body portion into at least two pole chambers, an intermediate integral insulating barrier in each of said pole chambers extending at least partly between said opposed end walls and parallel to said top and bottom walls, a transverse molded insulating barrier in each of said pole chambers extending between said intermediate barrier and one of said opposed side walls and parallel to said end walls, and a pair of relatively movable contacts in each of said pole chambers in the space defined by said bottom wall said end wall said horizontal barrier and said transverse barrier.

5. A multipole electric circuit breaker comprising a molded insulating casing having a main body portion provided with opposed parallel side and end walls and open top and bottom walls and molded insulating cover means for closing said open top and bottom walls respectively, said main body portion having a first integral insulating barrier extending at least partly between said opposed end walls and parallel to said opposed side walls and dividing said main body portion into a least two pole chambers, a second molded integral insulating barrier in each of said pole chambers extending between said first barrier and one of said opposed side walls parallel to said top and bottom walls and intermediate said top and bottom walls, a third integral insulating barrier in each of said pole chambers extending parallel to said end walls between said first barrier and one of said side walls, said first, second and third integral barriers cooperating with said bottom cover means to define a generally box-shaped arc chamber, a pair of relatively movable contacts positioned in said arc chamber, operating mechanism in at least one of said pole chambers outside of said arc chamber, current-responsive means in each of said pole chambers outside of said arc chamber and responsive to current passing through said relatively movable contacts in said pole chamber respectively, and common trip means extending across all said pole chambers and disposed and arranged to be actuated

by each of said current-responsive means to cause automatic operation of said operating mechanism.

6. A multipole electric circuit breaker as set forth in claim 5 wherein said circuit breaker also includes a plug-in type contact socket positioned within said arc chamber and wherein said bottom cover and said end walls include contiguous openings therein affording access to said contact socket.

7. An electric circuit breaker as set forth in claim 5 wherein said main body portion also includes a fourth integral insulating barrier in each of said pole chambers extending parallel to said top and bottom walls adjacent one of said end walls, and electrical connecting means supported on said fourth barrier in each of said pole chambers for connecting an electrical conductor thereto.

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