Jan. 31, 1928. 1,657,486

W. M. SCOTT

SWITCHING MECHANISM

Filed April 21, 1924 4 Sheets-Sheet 1

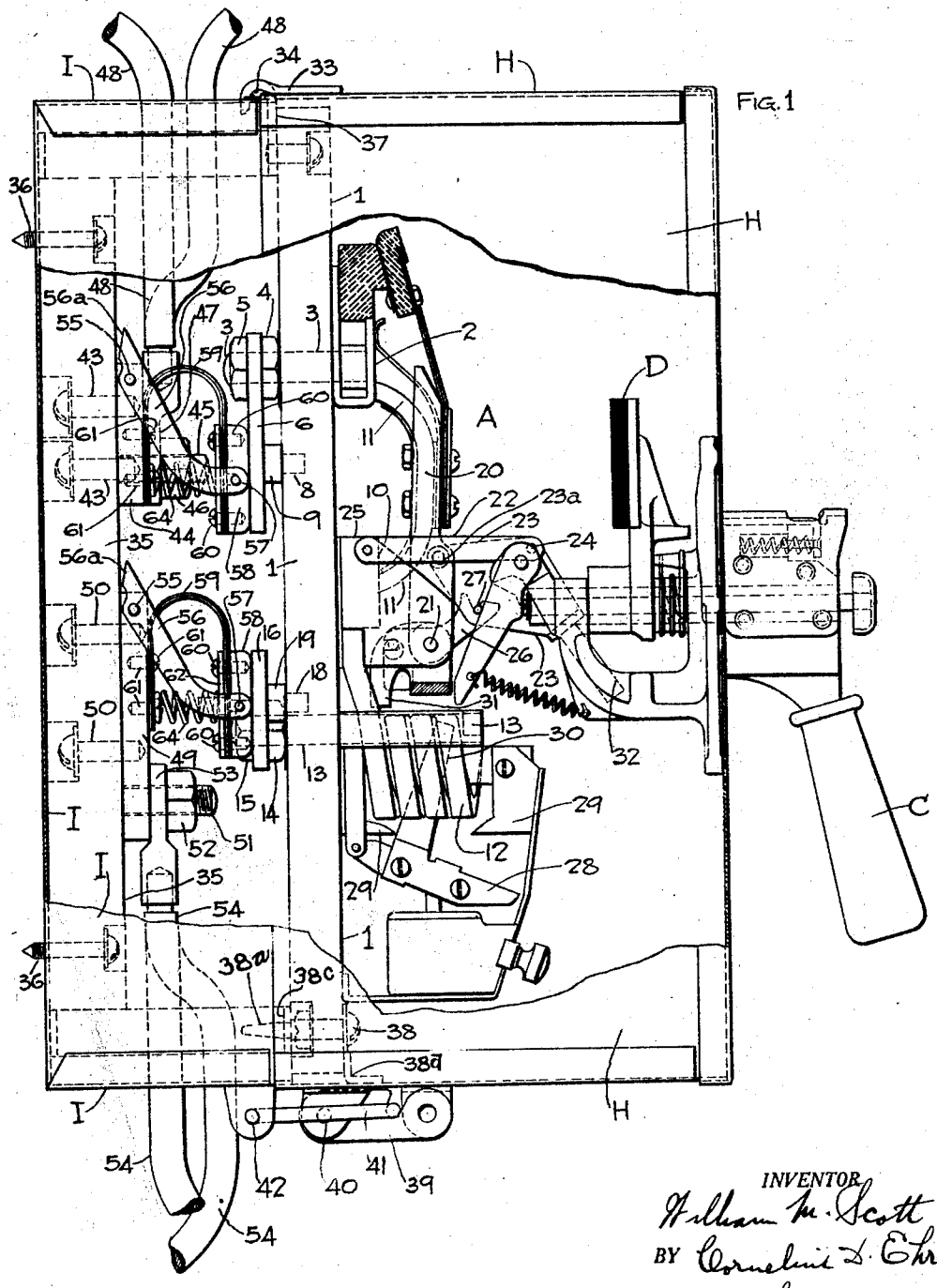


FIG. 1

INVENTOR
William M. Scott
BY Cornelius D. Ehret
His ATTORNEY

Jan. 31, 1928.

1,657,486

W. M. SCOTT

SWITCHING MECHANISM

Filed April 21, 1924

4 Sheets-Sheet 2

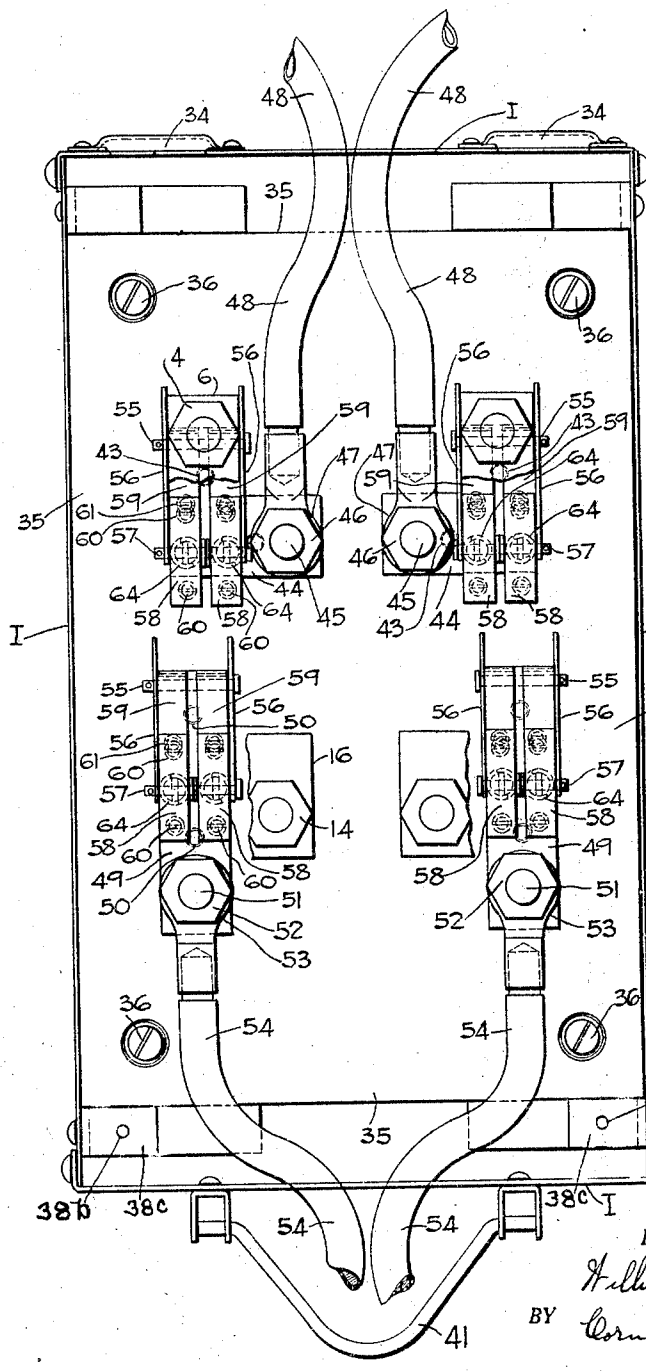


FIG. 2

INVENTOR

William M. Scott

BY Cornelius D. Ethet

his ATTORNEY

Jan. 31, 1928. 1,657,486

W. M. SCOTT

SWITCHING MECHANISM

Filed April 21, 1924 4 Sheets-Sheet 3

FIG. 4

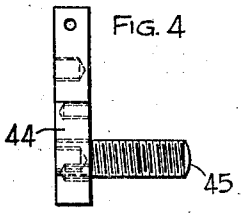


FIG. 5

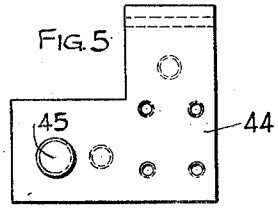


FIG. 7

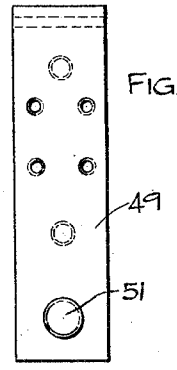


FIG. 6

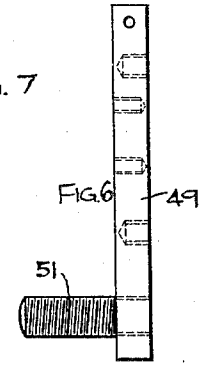


FIG. 11

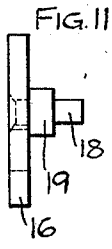
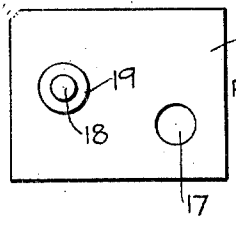


FIG. 10



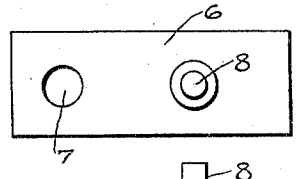


FIG. 8

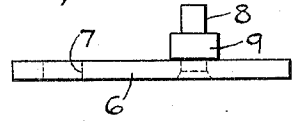


FIG. 9

FIG. 3

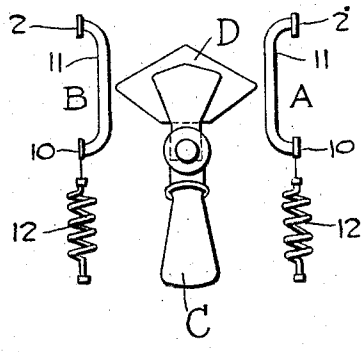


FIG. 14

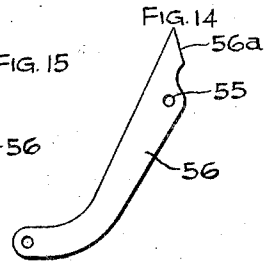


FIG. 15



FIG. 13

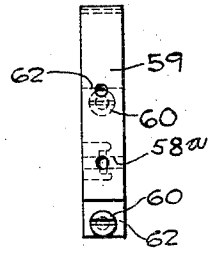
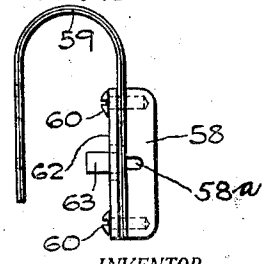


FIG. 12



INVENTOR

William M. Scott

BY

Cornelius L. Ehret

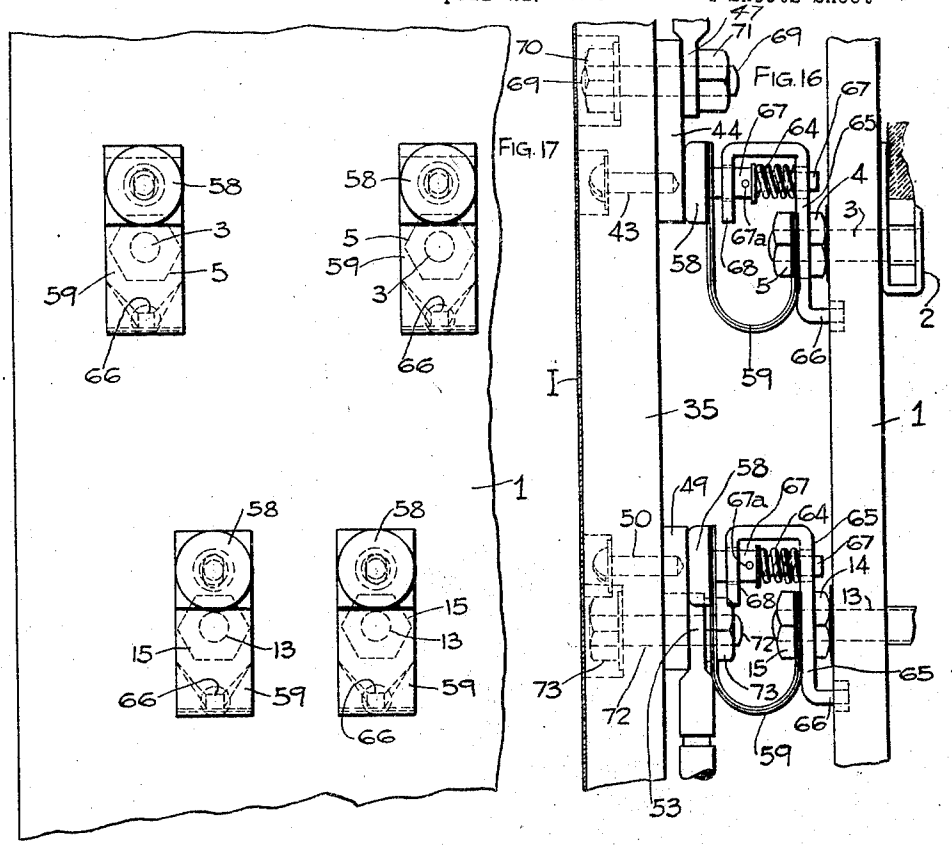
Its ATTORNEY

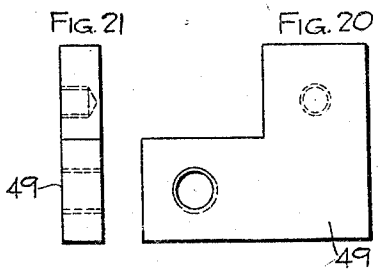
Jan. 31, 1928. **1,657,486**

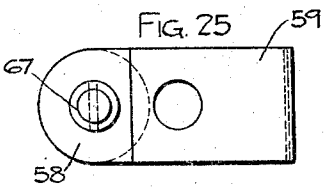
W. M. SCOTT

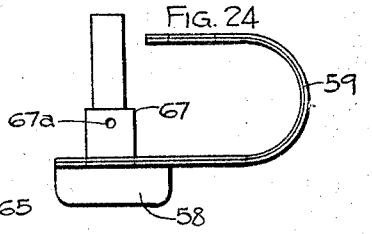
SWITCHING MECHANISM

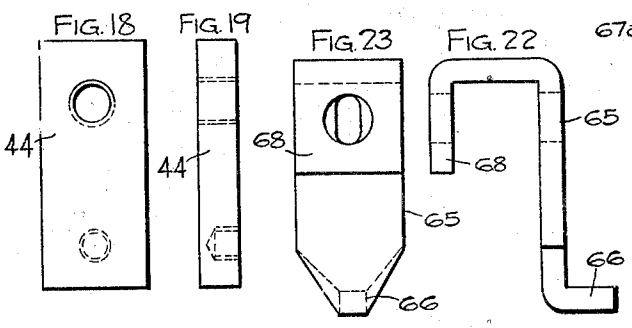
Filed April 21, 1924 4 Sheets-Sheet 4











INVENTOR
William M. Scott
BY Cornelius D. Ehret
his ATTORNEY

Patented Jan. 31, 1928. 1,657,486

UNITED STATES PATENT OFFICE.

WILLIAM M. SCOTT, OF TREDYFFRIN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA.

SWITCHING MECHANISM.

Application filed April 21, 1924. Serial No. 707,887.

My invention relates to electrical switching mechanism utilizable for controlling circuits carrying current for power, lighting and other purposes.

In accordance with my invention, switching mechanism in general, including automatic circuit breaking mechanism, is mounted upon a base or support, and the circuit connections are made with terminals carried by another base or support, and means are provided for making connections between terminals carried by the bases when the bases are brought into co-operative relation with respect to each other and for severing the connections when the bases are separated, whereby the switching or circuit breaker mechanism may be placed in or removed from its operating position, or quickly supplanted by another switch or circuit breaker mechanism, without need for access to or connection or disconnection of the supply and consumption circuit conductors, which remain permanently connected to terminals on the second named base.

My invention resides in features of structure and combination hereinafter described and claimed.

For an illustration of some of the various forms my invention may take, reference is to be had to the accompanying drawing, in which:

Fig. 1 is a side elevational view of apparatus embodying my invention.

Fig. 2 is a front elevational view of the rear housing and its contents.

Fig. 3 is a fragmentary view, partly diagrammatic, illustrating the two poles of the circuit breaker mechanism.

Figs. 4 and 5 are, respectively, side and rear elevational views of an upper terminal upon the rear base.

Figs. 6 and 7 are, respectively, side and rear elevational views of a lower terminal upon the rear base.

Figs. 8 and 9 are, respectively, front elevational and plan views of an upper rear terminal on the switch base.

Figs. 10 and 11 are, respectively, front and side elevational views of a lower rear terminal upon the switch base.

Figs. 12 and 13 are, respectively, side and rear elevational views of a connector member.

Figs. 14 and 15 are, respectively, side and edge views of a link comprised in the connector structure.

Fig. 16 is a fragmentary side elevational view of a modified form of my invention.

Fig. 17 is a rear elevational view of the switch base of Fig. 16.

Figs. 18 and 19 are, respectively, front and side elevational views of an upper terminal on the rear base of Fig. 16.

Figs. 20 and 21 are, respectively, front and side elevational views of a lower terminal on the rear base of Fig. 16.

Figs. 22 and 23 are, respectively, side and rear elevational views of a bracket carried by the front base of Fig. 16.

Figs. 24 and 25 are, respectively, side and face views of connector structure.

Referring to Figs. 1 to 15 inclusive, 1 is the front base, of insulating material, upon whose front side, the right, Fig. 1, is mounted the switching mechanism, which, in the example illustrated, is a "double arm" circuit breaker comprising the two poles or arms, A and B, Fig. 3, having common resetting mechanism comprising the operator's handle or lever C which actuates the actuator or resetting member D.

In Fig. 1 only one of the arms or poles, to wit, A, is shown. Both are preferably similar, and a description of one will suffice for both.

Upon the front of the base 1 is secured the upper circuit breaker terminal 2, held by the stud 3 to the base 1, through which the stud extends to the rear, where there is threaded thereon the nut 4, between which and the nut 5 is held the upper rear circuit breaker terminal 6, shown separately in Figs. 8 and 9. The stud 3 extends through the hole 7 and the stud 8 extends into a hole in the base 1, a spacer member 9 being provided to prevent deflection of the terminal 6 toward the base 1. Secured to the base 1 is the lower front circuit breaker terminal 10, which and the terminal 2 are bridged by the movable laminated contact member 11. The terminal 10 connects to one terminal of the overload tripping coil 12, whose other terminal connects to the stud 13 abutting against the front face of the base 1 and having a portion extending through the base and having threaded thereon at the rear the nut 14, between which and the nut 15 is held the lower rear circuit breaker terminal 16, shown separate-

ly in Figs. 10 and 11, having the hole 17 for passage of the stud 13 and having the stud 18 entering a hole in the base 1 and provided with the spacer member 19.

The movable contact member 11 is carried by an arm 20, pivoted at 21 and operated by the toggle comprising the links 22 and 23, pivoted to each other at 24, and the link 22 pivoted at 25 to a bracket or housing carried by the base 1, and the link 23 pivoted to the arm 20 at 23^a. The toggle for the circuit closing position indicated is undertravelled, but held extended by the latch 26, which engages a pin or roller 27 upon the member 23 to lock the circuit breaker in circuit closing position. The latch is automatically actuated by the armature 28, which is attracted upwardly toward the pole pieces 29 when the current traversing the winding 12 attains a predetermined magnitude, the armature 28 carrying the member 30 which engages and operates the latch actuator 31, which in turn actuates the latch 26 to move it in clockwise direction to trip or free the breaker structure.

The member 23 carries the pin or arm 32, adapted to be engaged and depressed by the member D, upon operation of the handle C, to reset the circuit breaker arm after it has been tripped. Motion of the member D in opposite direction, by movement of the handle C in opposite direction, causes depression of the corresponding member 32 of the other arm B to move it to circuit closing position for resetting it after having been tripped.

The circuit breaker mechanism described is enclosed within a housing H, of sheet metal or other suitable material, having the hook members 33, by which it is hooked and pivoted upon pins 34 carried by the rear housing I, of sheet metal or other suitable material, enclosing the aforesaid rear circuit breaker terminals 6 and 16 and the rear base 35, of insulating material, which latter and the housing I are secured to any suitable fixed support by screws 36, by which the entire structure, including the base 1 and the circuit breaker mechanism, is supported.

The base 1 is also provided with hook members 37, which hook upon pins 34 carried by the rear housing I, whereby the housing H, which carries the resetting mechanism D, may be removed independently and separately from the base 1, which is also removable from the rear housing I.

Adjacent the lower end of the base 1 are secured thereto screws 38, Fig. 1, having the unthreaded tapered dowel ends 38^a which enter the holes 38^b. Fig. 2, in the members 38^c secured to the rear housing structure I. As the base 1 swings upon the pivot pins 34 adjacent its upper end, the dowels 38^a enter the holes 38^b and so guide the base 1 to definite and proper relation with respect to the rear housing I. The entry of the dowels 38^a into the holes 38^b guides the lower end of the base 1 to proper position and prevents upward slipping or movement at the hinges 37, 34. The housing H has secured to its bottom one or more angle members 38^d, Fig. 1, which engage the front face of the base 1, forcing it to the position indicated in Fig. 1 when the housing H is swung upon the pivot pins 34 to the position indicated in Fig. 1 in which it is locked by the structure hereinafter described. The construction is such that after the base 1 has been hung by its hinge hooks 37 upon the hinge pins 34, the base will rest with the supplemental rear circuit breaker terminals 6 and 16 in engagement with their co-acting terminals, hereinafter described, with the dowels 38^a entering the holes 38^b. The base 1 will not be in its final or operative position indicated in Fig. 1, but its lower end will be somewhat to the right of its final position indicated. However, upon moving the housing H upon its hook hinges 33 in clockwise direction, the rear housing structure I, the base 1 and the housing H will be brought into final and proper position indicated in Fig. 1, the lugs 38^d forcing the base 1 to its final position indicated.

The housing H is held and locked in the position indicated by the toggle comprising the link 39, pivoted to the housing H at 40, and the bail or link 41 pivoted at 42 to the rear housing I, the links 39 and 41 being slightly overtravelled in the position indicated, and thereby holding and locking the housing H.

Secured to the front of the rear base 35 by screws 43 are the upper terminals 44, shown separately in Figs. 4 and 5, having the threaded studs 45, upon which thread the nuts 46 which firmly hold the terminals 47 of the supply (or consumption) circuit conductors 48, which extend through the upper end wall of the housing I.

Secured to the front of the rear base 35 are the lower terminals 49, shown separately in Figs. 6 and 7, held to the base 35 by the screws 50 and provided with the threaded studs 51, upon which are threaded the nuts 52 which firmly hold to the terminals 49 the terminals 53 on the consumption (supply) circuit conductors 54, which extend through the lower end wall of the housing I.

Pivoted to each of the upper and lower terminals 44 and 49, at 55, is a pair of links or lever arms 56, shown separately in Figs. 14 and 15, and carrying at their lower and forward ends a pivot pin 57 engaging in the slot 58^a in the rear face of the contact member or block 58. As indicated in Figs. 12 and 13, the slot 58^a has a width, vertically, substantially equal to the diameter of the pivot pin 57, and has a depth materially greater than its width, whereby the block 58

will suitably align itself. The blocks 58 abut against and electrically connect with the rear circuit breaker terminals 6 and 16. Electrical connection is made between the blocks 58 and their terminals 44 and 49 by the flexible laminated U-shaped metal conductors 59 secured to the blocks 58 by the screws 60 and secured to the terminals 44 and 49 by the screws 61. Between the heads of the screws 60 and the connector structure 59 is a plate 62 carrying the stud 63, received into one end of the helical spring 64 disposed between the plate 62 and the rear leg of the U-shaped member 59, each spring 64 pressing forwardly and thereby pressing its associated block 58 against the associated rear circuit breaker terminal 6 or 16. The members 59 may be springs alone pressing the contacts 58 forwardly, or assisting the springs 64 in so pressing the contacts 58 forwardly. The spring 64 is so located by lug 63 with respect to a block 58 that the pressure of the spring 64 is exerted upon the rear of the block 58 opposite the middle of its contact surface, the contact being completely self-aligning, and the contact pressure between a block 58 and its co-acting supplemental rear circuit breaker terminal is so great as to ensure high conductivity at their contact.

The pivots 55 and 57 for the contact blocks 58 are so disposed with respect to the pivotal axis 34 of the base 1 that in swinging the base in clockwise direction, Fig. 1, toward the rear housing structure I, the supplemental circuit breaker terminals 6 and 16 engage the blocks 58, pressing them rearwardly and at the same time wiping or rubbing upon them to effect high conductivity at their contacts.

When for any reason, as for quick substitution or replacement of one switch or circuit breaker unit or mechanism for another, it is necessary or desirable to remove the circuit breaker or switch unit, the housing H is removed, by first rotating the toggle link 39 in clockwise direction, Fig. 1, to position where the link 41 disengages from the notch in the link 39, thereby unlocking the housing H, which may then be swung in counterclockwise direction and unhooked and removed from the pins 34. Thereupon the lower end of the base 1 is freed, and it with the attached circuit breaker mechanism may be swung about and rotated in counterclockwise direction and unhooked from the pins 34.

As the base 1 swings outwardly as described, the blocks 58 carried by the rear base follow the rear circuit breaker terminals 6 and 16 until the ends 56^a on the links 56 engage the front face of the rear base 35, whereupon the forward movement of the members 58 under the influence of the springs 64 is arrested. The circuit breaker carried by the base 1 is removed from the rear housing I and simultaneously disconnected from the supply and consumption circuit conductors 48 and 54.

In replacing the unit, or substituting another unit, the base 1 is first hooked upon the pins 34 and then swung in clockwise direction, bringing the rear circuit breaker terminals 6 and 16 into engagement with the forwardly held contacts 58, and as the base is moved to the position indicated in Fig. 1, it is guided into position by the dowel ended screws 38, and the contact blocks 58 recede and compress the springs 64, but maintain good electrical contact with the rear circuit breaker terminals, this backward yielding of the contacts 58 being accompanied by a clockwise rotation of the links 56 upon their pivots 55 to the position indicated in Fig. 1, this movement being accompanied by a wiping or rubbing engagement of the supplemental circuit breaker terminals 6 and 16 upon the contact blocks 58, and by self-aligning movements of the block 58 as permitted by their slots 58^a in co-action with the pivot pins 57. During the above described movements of the contact blocks 58, they are maintained in perfect electrical connection with the rear terminals 44 and 49, and therefore with the contacts 48 and 54, by the flexible connectors 59.

By the construction described, there are accordingly provided rear terminals or contact blocks for the switch or circuit breaker unit which engage with yielding contact blocks carried by the rear base 35 which carries terminals to which the supply and consumption circuit conductors are permanently connected. Accordingly, to remove or replace a switch or circuit breaker unit it is not necessary to have access to or connect or disconnect the supply and consumption circuit conductors which heretofore have been connected directly to the switch or circuit breaker studs 3 and 13, necessitating disconnection of the supply and consumption circuit conductors from those studs upon removing the switch or circuit breaker unit from the rear housing or other support.

In Figs. 16 et seq. there is illustrated a modified construction having in general, however, the same principle of operation. In this case the yielding contact structure is carried by the switch or circuit breaker base and co-acts with simple terminals carried by the second base or rear housing.

Between the nuts 4 and 5 on each stud 3, and between the nuts 14 and 15 on each stud 13, is held the bracket 65, shown separately in Figs. 22 and 23, on the rear of the base 1 and having a lug 66 extending into the base 1 properly to locate the bracket and prevent it from turning. Between each of the nuts 5 and 15 and the bracket 65 is held

one end of the flexible laminated conductor 59, shown separately in Figs. 24 and 25, U-shaped as before, and connected at its free end with the contact button or block 58 having the stem 67 slidable normally to the rear face of the base 1 in the bracket 65 and its U-shaped extension 68, a spring 64 being confined between the bracket 65 and a shoulder on the stud 67 and opposing movement of the block 58 toward the right, as viewed in Fig. 16. The springs 64 press the blocks 58 into engagement with the supply and consumption circuit terminals 44 and 49 secured, respectively, by screws 43 and 50 to the front face of the rear base 35. There extend through the upper terminals 44 the bolts 69, upon each of which is threaded the nuts 70 and 71, holding the terminal 44 to the base 35 and clamping the supply circuit terminal 47 to the terminal 44. Similarly, each lower terminal 49, shown separately in Figs. 20 and 21, is held by the bolt 72 and nuts 73 to the front face of the rear base 35, the bolt and nuts serving also to clamp the terminal 53 of a consumption circuit conductor to the terminal 49.

In this modification the rear switch or circuit breaker terminals, as 58, are yieldingly mounted and engage the fixed or unyieldingly mounted supply and consumption circuit terminals 44 and 49.

The operation is similar to that hereinbefore described in that the circuit breaker or switch mechanism carried by and forming a unit with the base 1 is removable and replaceable without need for access to or connection or disconnection of the supply and consumption circuit conductors, the springs 64, when the base 1 is swung towards the right, Fig. 16, moving the contacts 58 toward the left until the pins 67ª engage the legs 68 of the brackets 65. In returning the switch or circuit breaker unit to normal position, or in applying a substitute, the base 1 is moved into the position indicated, the contacts 59 engaging the terminals 44 and 49, and yielding in opposition to the springs 64. Here again the conductors 59 maintain good electrical contact between the switch or circuit breaker studs and the contacts 58.

It is accordingly characteristic of my invention that a switch or circuit breaker unit is provided, in addition to the usual fixed and movable contact members of the switch or circuit breaker, with one or more terminals or contacts engaging and electrically connecting with contacts or terminals with which the supply and consumption circuit conductors are connected, whereby the switch or circuit breaker unit is detachable or removable and replaceable as such without need for access to or connection or disconnection of the conductors of the circuit in which the switch or circuit breaker is connected.

In accordance with my invention, the terminals or contacts, such as 44 and 49, are in effect permanently secured in place and the circuit conductors in effect permanently connected thereto, whereby the terminals 44 and 49 are in effect a part of the permanent wiring of the circuit or system.

What I claim is:

1. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base movable with respect to said housing and terminal structure, switching mechanism secured upon one side of said base, supplemental terminal structure carried by said base on the opposite side thereof from said switching mechanism and connected with said switching mechanism, and means holding said terminal structures in engagement with each other comprising a second housing detached from and abutting against said base, and means for holding said second housing in predetermined position with respect to said housing and first-named terminal structure.

2. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base movable with respect to said housing and terminal structure, switch mechanism secured upon one side of said base, supplemental terminal structure carried by said base on the opposite side thereof from said switching mechanism and connected with said switching mechanism, a second housing enclosing said switching mechanism and thrusting against said base, and means holding said second housing in predetermined position with respect to said first-named housing and terminal structure and thereby holding said terminal structures in engagement with each other.

3. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base carried by and movable with respect to said housing, switching mechanism secured upon one side of said base, supplemental terminal structure carried by said base on the opposite side thereof from said switching mechanism and connected with said switching mechanism, and means for holding said terminal structures in engagement with each other comprising a second housing for said switching mechanism carried by said first housing and movable with respect thereto and with respect to said base, and means holding said second housing in predetermined position with respect to said housing.

4. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base carried by and movable with respect to said housing, switching mechanism secured upon one side of said base, supplemental terminal structure

carried by said base on the opposite side thereof from said switching mechanism and connected with said switching mechanism, a second housing carried by and movable with respect to said first-named housing and with respect to said base, and means holding said second housing in engagement with said base and to said first-named housing and thereby holding said terminal structures in engagement with each other.

5. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a pivoted contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a spring effecting movement of said contact toward said other of said terminal structures, and means for limiting the movement of said contact toward said other of said terminal structures.

6. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, and a pivoted link supporting said contact.

7. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, and a link pivoted upon one of said terminal structures and to said contact.

8. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a pivoted link supporting said contact, a spring effecting movement of said contact toward said other of said terminal structures, and means on said link for limiting said movement of said contact.

9. The combination with a switch unit comprising a base and switching mechanism carried thereby on one side thereof, of supplemental terminal structure on the opposite side of said base and connected with said switching mechanism and comprising a terminal having a contact face substantially parallel with the rear face of said base, and terminal structure with respect to which said base is movable connected with the circuit conductor system and movable in the same direction of and lateral to said contact face, detachably engaging and wiping upon said contact face of said terminal.

10. The combination with a switch unit comprising a base and switching mechanism carried thereby on one side thereof, of supplemental terminal structure on the opposite side of said base and connected with said switching mechanism and comprising a terminal having a contact face substantially parallel with the rear face of said base, and terminal structure with respect to which said base is movable connected with the circuit conductor system and movable in the same direction of and lateral to said contact face comprising a yielding contact abutting against and wiping upon said contact face of said terminal.

11. The combination with relatively fixed terminal structure connected with the circuit conductor system, of a detachable base pivotally movable with respect to said terminal structure, switching mechanism carried by said base, a housing for said switching mechanism pivotally movable with respect to both said structure and said base, supplemental terminal structure carried by said base connected with said switching mechanism and adapted to engage said first-named terminal structure, spring means opposing movement of said base after engagement of said terminal structures with each other, and means for detachably holding said terminal structures in engagement with each other in opposition to said spring means.

12. The combination with relatively fixed terminal structure connected with the circuit conductor system, of a base movable with respect to said terminal structure, switching mechanism carried by said base, supplemental terminal structure carried by said base connected with said switching mechanism and adapted to engage said first-named terminal structure, spring means opposing movement of said base after engagement of said terminal structures with each other, a housing enclosing said switching mechanism and movable with respect to said base and engaging said base, and means holding said housing in predetermined position with respect to said first-named terminal structure and thereby holding said terminal structures in engagement with each other in opposition to said spring means.

13. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base carried by and detachable and movable with respect

to said housing, switching mechanism secured upon one side of said base, supplemental terminal structure carried by said base on the opposite side thereof from said switching mechanism and connected with said switching mechanism, spring means opposing movement of said base after engagement of said terminal structures with each other, means for holding said terminal structures in engagement with each other in opposition to said spring means and a second housing member detachably carried by said housing and movable with respect thereto and with respect to said base, said second housing and base being also detachable with respect to each other.

14. The combination with a housing, of terminal structure therein connected with the circuit conductor system, a base carried by and movable with respect to said housing, switching mechanism carried by said base, supplemental terminal structure adapted to engage said first-named terminal structure carried by said base and connecting with said switching mechanism, spring means opposing movement of said base after engagement of said terminal structures with each other, a second housing movable with respect to said base and engaging the same to hold said terminal structures in engagement with each other in opposition to said spring means, and means for holding said second housing in predetermined position with respect to said first-named housing.

15. The combination with relatively fixed terminal structure connected with the circuit conductor system, of a base movable with respect to said terminal structure, switching mechanism carried by said base on one side thereof, supplemental terminal structure carried by said base on the opposite side thereof and connected with said switching mechanism and adapted to electrically connect with said first-named terminal structure, a pivoted contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a spring pressing said contact toward said other of said terminal structures and opposing movement of said base, and means detachably holding said base in predetermined relation to said first-named terminal structure to thereby hold said contact and said other of said terminal structures in engagement with each other in opposition of said spring.

16. The combination with a housing, of terminal structure fixed therein and connected with the circuit conductor system, a base carried by and movable with respect to said housing, switching mechanism secured upon one side of said base, supplemental terminal structure carried by said base on the opposite side thereof and connected with said switching mechanism, a pivoted contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a spring pressing said contact against said other of said terminal structures and opposing movement of said base, a second housing carried by and movable with respect to said first-named housing and enclosing said switching mechanism, and means detachably securing said housings to each other to thereby hold said contact in engagement with said other of said terminal structures in opposition to said spring.

17. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system and with respect to which said base is movable, a contact electrically connected with one of said terminal structures and engaging another of said terminal structures, a pivoted member upon which said contact is pivoted, and a pivotal support for said base, the pivotal axes of said member, contact and base being so disposed with respect to each other that upon pivotal movement of said base said contact and said other of said terminal structures wipe upon each other.

18. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system and with respect to which said base is movable, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a pivoted member upon which said contact is pivoted, and a pivotal support for said base, the pivotal axes of said member, contact and base being so disposed with respect to each other that upon pivotal movement of said base said contact and said other of said terminal structures wipe upon each other.

19. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and engaging another of said terminal structures, a movable support for said contact, and a loose mechanical connection between said contact and its support permitting self-alignment of said contact with respect to said other of said terminal structures.

20. The combination with a switch unit comprising a base and switching mechanism

carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and engaging another of said terminal structures, a movable support, and a pivot pin carried by said support, said contact having a slot receiving said pin, said slot having a depth materially greater than the diameter of said pin, whereby said contact is self-aligning in its engagement with said other of said terminal structures.

21. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and engaging another of said terminal structures, a movable support, a pivot pin carried by said support, said contact having a slot receiving said pin, said slot having a depth materially greater than the diameter of said pin, whereby said contact is self-aligning in its engagement with said other of said terminal structures, and a pivot for supporting said base and whose axis is parallel with the axis of said first named pivot.

22. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a movable support, said contact pivoted to said support, and a spring exerting a force upon said contact substantially at its pivotal axis and forcing said contact toward said other of said terminal structures, whereby said contact aligns itself with respect to said other of said terminal structures and presses thereagainst.

23. The combination with a switch unit comprising a base and switching mechanism carried thereby, of supplemental terminal structure carried by said base and connected with said switching mechanism, terminal structure connected with the circuit conductor system, a contact electrically connected with one of said terminal structures and abutting against another of said terminal structures, a movable support, said contact pivoted to said support, a spring exerting a force upon said contact substantially at its pivotal axis and forcing said contact toward said other of said terminal structures, whereby said contact aligns itself with respect to said other of said terminal structures and presses thereagainst, and a pivot for supporting said base and having its axis substantially parallel with said pivotal axis of said contact.

24. The combination with a support, of a base pivoted thereon, switching mechanism carried by said base, means coacting with said base and support for guiding said base in its pivotal movement with respect to said support, a housing member pivoted co-axially with said base for movement with respect to said support and said base and for engaging said base, and means co-acting with said support and said member for holding said member and base to said support.

25. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base, means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism and movable with respect to said base and said first named housing, and means on said second named housing adapted to engage said base for holding it to said first named housing.

26. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base, means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism and movable with respect to said base and said first named housing, means on said second named housing adapted to engage said base for holding it to said first named housing, and means co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

27. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base, means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism pivoted co-axially with said base and movable with respect to said base and said first named housing, and means on said second named housing adapted to engage said base for holding it to said first named housing.

28. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base,

means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism pivoted co-axially with said base and movable with respect to said base and said first named housing, means on said second named housing adapted to engage said base for holding it to said first named housing, and means co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

29. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base, means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism and movable with respect to said base and said first named housing, means on said second named housing adapted to engage said base for holding it to said first named housing, and toggle mechanism co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

30. The combination with a housing, of a pivoted base movable with respect thereto, switching mechanism carried by said base, means co-acting with said housing and said base for guiding said base to predetermined position with respect to said housing, circuit conductors extending into said housing and connecting with said switching mechanism, a second housing enclosing said switching mechanism pivoted co-axially with said base and movable with respect to said base and said first named housing, means on said second named housing adapted to engage said base for holding it to said first named housing, and toggle mechanism co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

31. The combination with a permanent wiring system comprising circuit conductors and permanently fixed terminal structures to which said conductors are connected, and a housing enclosing said terminal structures, of a base detachably supported with respect to said housing and terminal structures, a switch carried by said base, supplemental switch terminals carried by said base on the side opposite to said switching mechanism and detachably engaging said terminal structures, a second housing movable independently of said base and said first named housing, and means co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

32. The combination with a permanent wiring system comprising circuit conductors and permanently fixed terminal structures to which said conductors are connected, and a housing enclosing said terminal structures, of a base detachably supported with respect to said housing and terminal structures, a switch carried by said base, supplemental switch terminals carried by said base on the side opposite to said switching mechanism and detachably engaging said terminal structures, a second housing movable independently of said base and said first named housing, mechanism carried by said housing in detached relation to said switching mechanism for actuating said switching mechanism, and means co-acting with said housings for holding said base and said second named housing in predetermined position with respect to said first named housing.

WILLIAM M. SCOTT.