

Sept. 23, 1941.

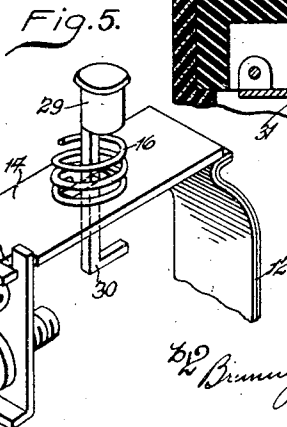
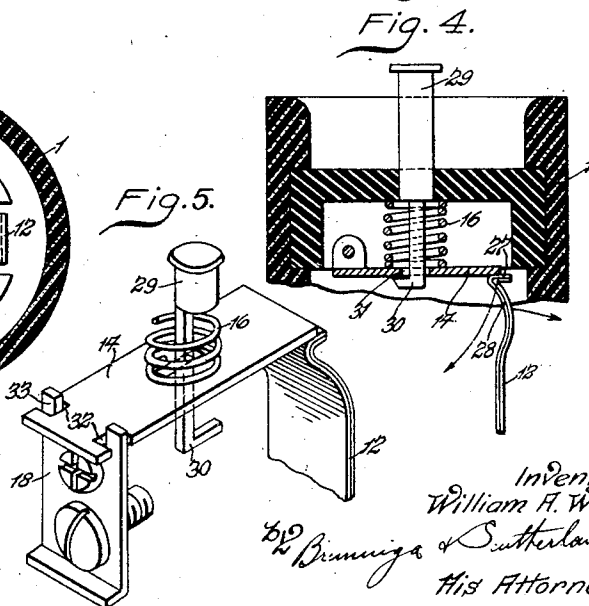
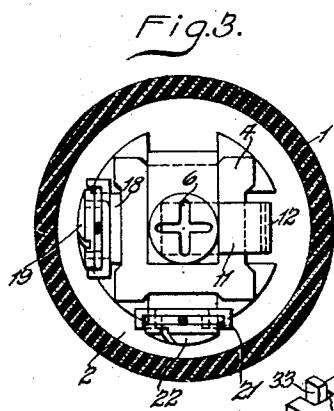
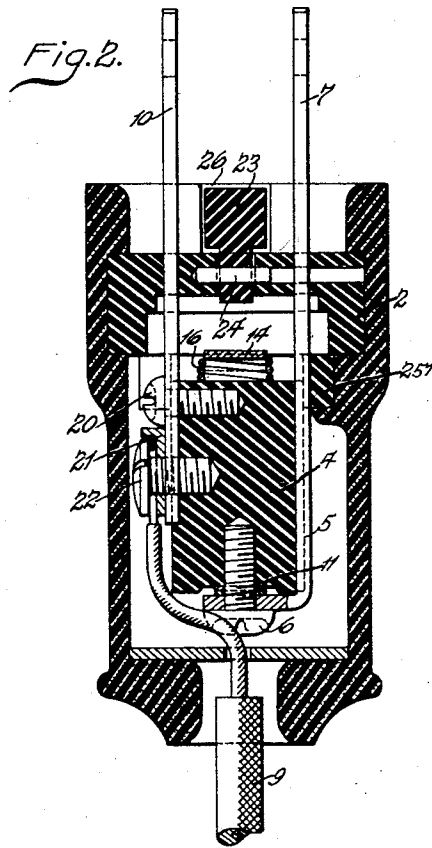
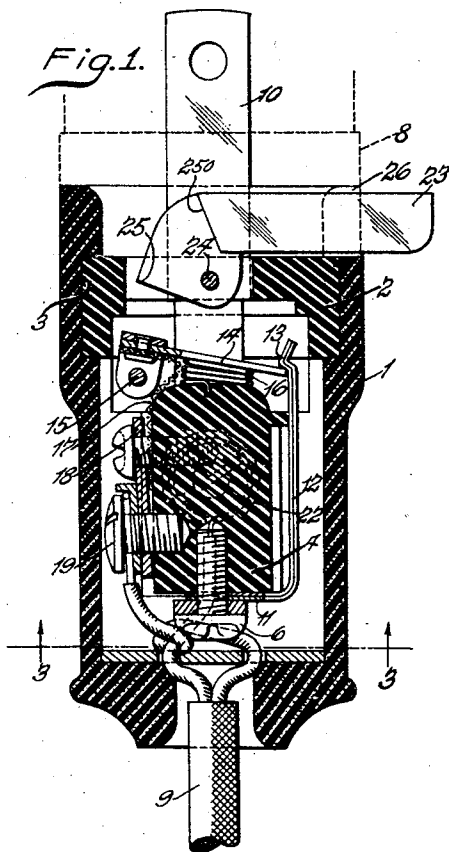
W. A. WULLE

2,256,537

CIRCUIT BREAKER ATTACHMENT PLUG

Filed March 16, 1939

3 Sheets-Sheet 1



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Sept. 23, 1941.

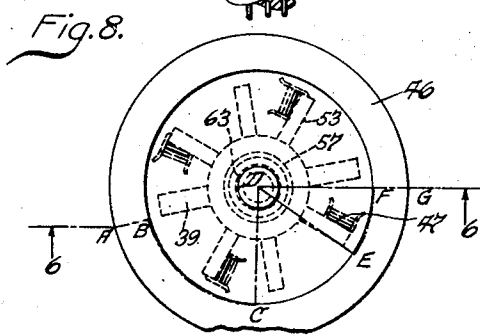
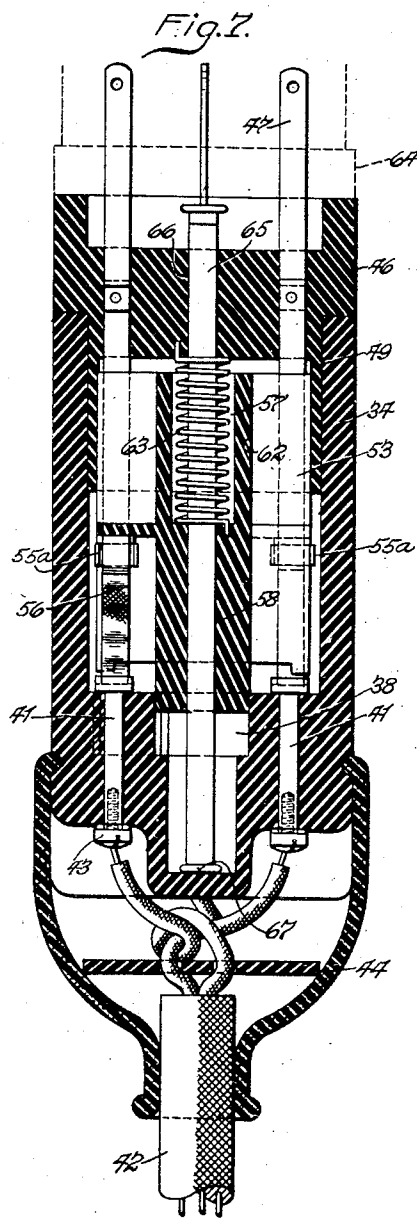
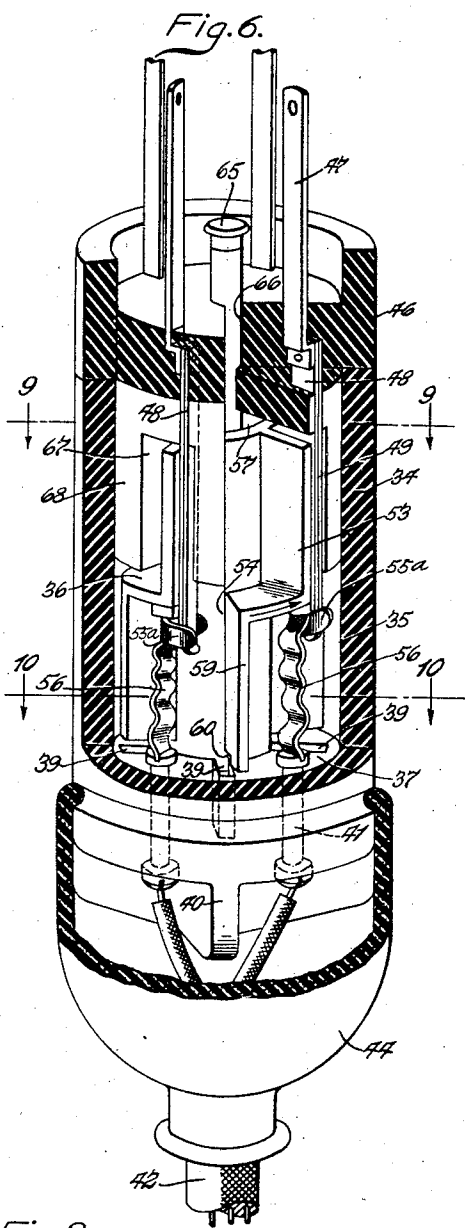
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2,256,537

CIRCUIT BREAKER ATTACHMENT PLUG

Filed March 16, 1939

3 Sheets-Sheet 2



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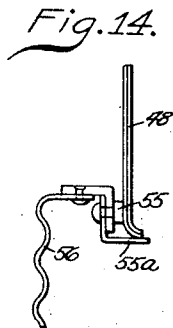
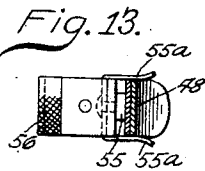
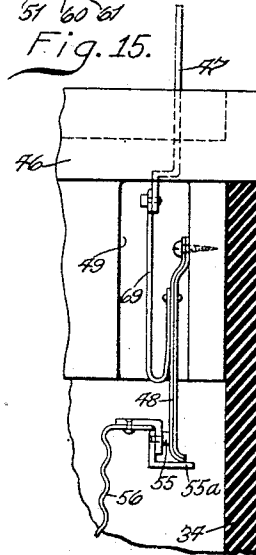
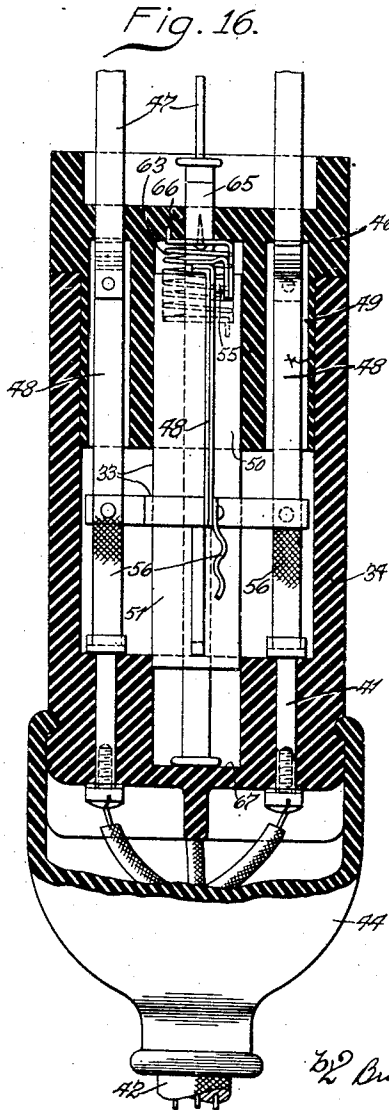
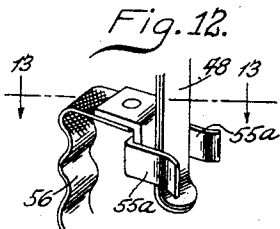
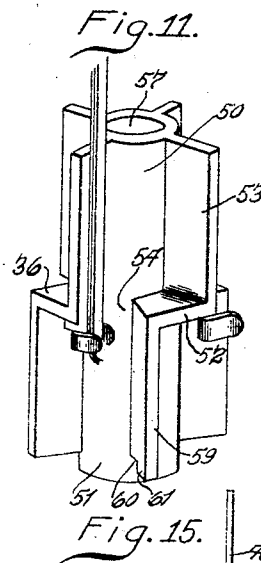
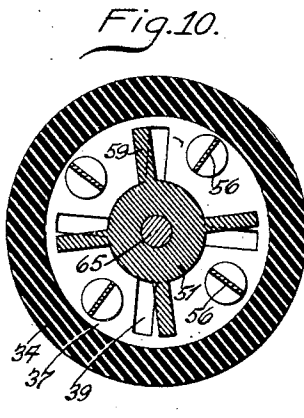
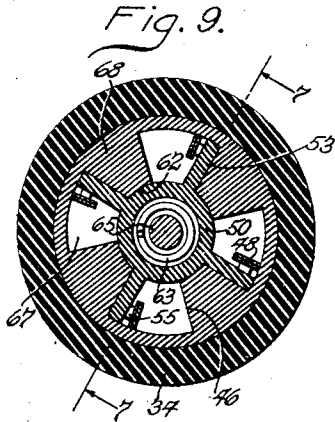
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CIRCUIT BREAKER ATTACHMENT PLUG

Filed March 16, 1939

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,256,537

CIRCUIT BREAKER ATTACHMENT PLUG

William A. Wulle, Chicago, Ill., assignor, by direct and mesne assignments, to William A. Wulle, as trustee

Application March 16, 1939, Serial No. 262,106

12 Claims. (Cl. 200—115.5)

This invention pertains to attachment plugs such as are used in connection with an electric cable or cord in order to attach the same to a source of current supply in order to establish a circuit therewith. More particularly the invention pertains to such an attachment plug provided with means for automatically breaking the circuit upon overload.

Attachment plugs of this type as heretofore constructed have been provided with means adapted for manipulation to reset the circuit breaking mechanism thereof so as to close the circuit. Such devices have, however, usually been subject to the objection that either the manipulating means or the circuit-opening mechanism itself may be blocked so that opening of the circuit under overload is prevented.

One of the objects of this invention, therefore, is to provide such a plug with automatic overload circuit-breaking mechanism which cannot be blocked against operation.

Another object is to provide such a plug with manipulating means for resetting the circuit-breaking mechanism so arranged that when the plug is inserted into a socket the manipulating means is limited to such a position as to leave the circuit-breaking mechanism trip-free. By this is meant that it is free to trip in order to open the circuit without possibility of any obstruction of this operation.

Another object is to provide such a plug with novel tripping and resetting mechanism.

Another object is to provide such a plug which may be constructed so as to be capable of establishing a plurality of contacts with overload tripping mechanism in the circuit of each contact.

Another object is to provide such a plug adapted to handle a plurality of circuits or conductors with overload tripping mechanism whereby an overload in one of said circuits or conductors will open all of them.

Another object is to provide novel construction for such a plug adapted to handle a plurality of circuits.

Another object is to provide arc breaking chambers for each break in order to prevent an arc from jumping from pole to pole when the circuit or circuits are opened.

Further objects will appear from the following description taken in connection with the accompanying drawings in which

Figure 1 is a longitudinal sectional view of a single circuit attachment plug embodying this invention;

Figure 2 is a similar view taken at right angles to that of Figure 1;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a fragmentary sectional view taken in the same plane with Figure 1, showing a modified form of tripping and resetting device.

Figure 5 is a perspective detail view showing still another form of tripping and resetting device.

Figure 6 is a partial sectional view taken about on line 6—6 of Figure 8, the upper part along the line ABCDG and the lower part along the line ABCDEFG, showing an attachment plug embodying this invention as applied to the control of a plurality of circuits;

Figure 7 is a longitudinal sectional view of the plug shown in Figure 6 but taken on line 7—7 of Figure 9.

Figure 8 is a plan view of Figure 6.

Figure 9 is a section about on line 9—9 of Figure 6.

Figure 10 is a section about on line 10—10 of Figure 6;

Figure 11 is a detailed elevation of the contactor shown in Figures 6 and 7 shown in relation to its complementary contact.

Figure 12 is a perspective detail of a modified form of contact;

Figure 13 is a section on line 13—13 of Figure 12;

Figure 14 is a side view of another form of contact;

Figure 15 is a sectional detail showing means for heating the bi-metallic elements; and

Figure 16 is a sectional view, similar to Figure 6, showing another embodiment of the invention.

The devices illustrated in the accompanying drawings are selected for the purpose of description of the invention and to show its application to the different types of plugs illustrated. It is obvious, of course, that the invention is not limited to these types of plugs since various changes may be made in the details of construction or application within the scope of the appended claims without departing from the spirit of this invention, and that, therefore, the invention is not limited to the specific details shown and described.

Referring first to the embodiment illustrated in Figures 1 to 3, inclusive, 1 designates a body or shell of insulating material providing a housing for the mechanism. This body may be constructed of any suitable insulation as, for instance, of mouldable plastic materials such as

Bakelite. In the embodiment illustrated, however, this housing is formed of soft rubber so as to be pliable to a certain extent. Mounted within the body 1 is a core 2 which carries the mechanism involved in carrying the circuit through the device and in breaking the same upon overload. The housing 1 may be provided with an annular internal socket or groove 3 within which the base of the core 2 may be lodged. The assembly of these parts may be accomplished by simply stretching the rim of the housing 1 to pass it over the base of the core member 2 and a locating key 251. The core 2 is provided with a longitudinally extending shank 4 provided with grooves or depressions in its side and end faces to accommodate contact strips. One of these strips 5 extends from the lower end of the shank 4 at which it is provided with a retaining screw 6, upwardly along a side groove passing outwardly through the base of the core to provide a contact blade 7 projecting from the plug in a position for insertion into a socket. Such a socket which may be of any suitable type is indicated at 8. The blade 7 and the strip 5 carry one leg of the circuit through the attachment plug without interruption to the retaining screw 6. The screw 6 serves to bind the strip 5 against the turned-over end 11 of a bi-metallic thermostatic element 12. The end of the element 12 is bent to form a contact 13 which at the same time provides a seat for a circuit-breaking contactor 14. The contactor 14 is hinged on a pin 15 and is urged upwardly in Figure 1 by a spring 16 bearing against the contactor and against the shank 4 of the core member. A flexible conductor ribbon 17 connects the contactor 14 with a terminal 18. A suitable terminal screw 19 serves to connect the terminal 18 to a conductor of a cable or cord 9.

A second contact blade 10 positioned opposite to the blade 7 and similarly adapted for insertion into a socket 8 is secured by a screw 20 to the shank 4 of the core member and is provided with a terminal 21 to which the other conductor of the cable 9 may be connected by means of a suitable terminal screw 22.

The operation of this embodiment of the invention is as follows: With the parts in the position shown in Figure 1 and the plug inserted in a socket 8, the current passes into the device at one of the contact blades, say 7, thence to the thermostatic element 12, through the contact 13 to the contactor 14, then by way of the ribbon 17 to the terminal 18 and out into the circuit of the cable 9. Returning from this circuit by the other conductor of the cable 9, the current passes by way of the terminal 21 to the blade 10 and thence back to the socket 8. The current thus traverses the thermostatic element 12. This element is so constructed that the heating effect of the current, when the latter reaches overload magnitude, causes the element 12 to bend outwardly to the right of Figure 1, thereby withdrawing the contact 13 from engagement with the contactor 14, whereupon the latter is forced by the spring 16 to snap upwardly in Figure 1, breaking the circuit at the contact 13. When the circuit has been broken, the thermostatic element 12, being relieved of the heating effect of the current, returns to its normal position, as shown in Figure 1. When overload conditions have been removed from the circuit 9, the contactor 14 may be reset. For this purpose a manipulating element 23 is provided. This element is hinged on a pin 24 in the core member 2 and is provided

with a projecting tip 25 adapted to engage the contactor 14 when the element 23 is moved upwardly in Figure 1 and a stop shoulder 250. This movement causes said element to rotate about the pin 24 bringing the tip 25 down against the contactor 14 and, as the movement is continued until arrested by a stop-shoulder 250 engaging the top of core 2, depressing said contactor until the latter engages the outwardly turned end of the element 12 and lodges behind the contact 13 thereof. Said contact also furnishes a seat to retain the contactor 14. It will be noted that the manipulating element 23 must be moved outwardly or away from the body of the attachment plug and toward the socket 8. Accordingly it cannot be moved in that way while the attachment plug is in the socket. This requires that the plug must be removed from the socket in order to reset the contactor 14. When the element 23 is returned to its normal position, it rests in a notch 26 in the rim of the housing 1. In this position it does not interfere with insertion of the plug in the socket 8. When the plug is so inserted in the socket 8, the element 23 is limited to the position shown in Figure 1 in which position a considerable space is established between the tip 25 and the contactor 14 to provide room for movement of said contactor to open the circuit when tripped. This arrangement, therefore provides a lost motion connection between the element 23 and the contactor 14 which, by thus providing space for movement of said contactor renders the latter free to move so that there can be no interference with its overload protection.

In the arrangement shown in Figure 4, the contactor 14 is arranged to move in the opposite direction from that of Figure 1 to open the circuit, as indicated by the arrow. In this case the element 12 is bent to a somewhat different shape with its extreme end bent at right angles to provide a contact 27, and an angular portion 28 provides for moving the element 12 outwardly when the contactor is reset. The spring 16 is now placed above the contactor 14 instead of below it. A manipulating element 29 in the form of a simple pull rod is provided with an elongated hook 30 whose shank passes through a slot 31 in the contactor 14. The element 29 is shown in Figure 4 in its extreme outer position assumed when resetting the contactor. In this position the end of the element 29 projects beyond the rim of the housing 1 in which position it would interfere with the socket 8. However, after resetting this element may be pushed downwardly in Figure 4 whereupon the shank of the hook 30 slides through the slot 31 so as to introduce lost motion between the contactor 14 and the hook, thereby rendering said contactor free to trip. The element 29 is limited to this position so long as the attachment plug is in the socket 8.

In the arrangement of Figure 5, the contactor 14 again abuts the end of the element 12 as in Figure 4. It is hinged, however, upon the terminal element 18 in such a manner that the spring 16, placed as in Figure 4, will maintain contact between the members 14 and 18. This is accomplished by simply notching the sides of the contactor 14 as shown at 32 to provide a reduced neck which is received in a notch 33 in the terminal member 18. In this case also the manipulating element 29 is provided with a hook 30 and a long shank adapted to introduce lost motion between it and the contactor 14 when in its normal position. It will be seen that this

structure renders unnecessary the conducting ribbon 17 shown in Figure 1.

Figures 6 to 15, inclusive, illustrate an embodiment of the invention as applied to an attachment plug adapted to handle a plurality of circuits and to provide the overload trip feature in each circuit.

In this embodiment, a body or housing 34 is provided with an internal chamber 35 within which a contactor 36 may operate. The chamber 35 has a floor 37 but the central portion of the chamber extends downwardly from the floor 37 to provide a central well 38, provided with side slots 39. The lower end of the body 34 is provided with radially extending partitions 40 providing insulating barriers between the ends of a plurality of conductors 41 extending upwardly into the chamber 35. The conductors 41 provide circuit connections for the several conductors of the cable or cord 42 which may be connected to the conductors 41 in any suitable manner as by means of screws 43. A flexible rubber cover or shield 44 may be arranged to cover these connections as shown in the figures.

Arranged to seat upon a shoulder 45 or otherwise suitably secured in the housing 34 is a plug 46. Both the housing 34 and the plug 46 may be constructed of any suitable insulating material. Molded plastics, such as Bakelite, provide a satisfactory material for these parts although other materials may be used. Mounted in the plug 46 is a plurality of conductors each comprising, in the illustrated embodiment, a contact blade 47 having connected thereto in any suitable manner a thermostatic element 48 similar to the element 12. Surrounding each of the elements 48 the plug 46 is provided with a well or chamber 49, providing a space wherein the element 48 may move in changing its shape with change of temperature.

The contactor 36 is arranged for movement within the chamber 35. This element is illustrated in detail in Figure 11. It is generally cylindrical in shape having an upper shank 50 and a lower shank 51 separated by a series of intermediate radial flanges 52. Each of these flanges extends through only part of a circumference, the quadrants being separated by vertical flanges 53 upstanding from the flanges 52, and similar flanges 59 extending downwardly from the flanges 52. Each of the flanges 52 in the embodiment illustrated has a radial depth equal to that of the flange 53 but is interrupted so as to leave a radial gap 54 between each flange 53 and the succeeding flange 59. Arranged opposite the gap 54 and in line with each flange 53 is a button 55 connected by a flexible conducting ribbon 56 with the head of one of the conductors 41. The entire body of the contactor 36 may be of insulating material such as Bakelite so that the contacts 55 are insulated from one another. The upper shank 50 is provided with a central well 57 and a reduced bore 58 extends downwardly from the said well through the lower shank 51. The lower shank 51 is further provided with the radial fins or wings 59 adapted to fit loosely within the slots 39 in the body 34. One or more of the wings may be provided at its lower end with a notch 60 so as to provide a narrow tip 61 adapted to rest upon and slide upon the floor 37 of the chamber 35.

When the contactor 36 is assembled in the chamber 35 it rests at the tips 61 upon the floor 37 of said chamber. The shank 51 extends slightly below the floor 37 so as to enter the well

38 which serves to align the contactor in the chamber 35. The upper shank 50 extends into a bore 62 in the plug 46 so as to align the upper end of the contactor. In this position the wings 53 extend upwardly into sector-shaped cavities 67 in the cylindrical lower extension 68 of the plug 46. These cavities accommodate the movement of the wings 53 during rotation of the contactor. The fit of the shank 50 in its bore is loose enough to permit free rotation and endwise sliding movement without binding. When the contactor is in its elevated position, as shown in Figure 6, the several thermostatic elements 48 extend downwardly through the gaps 54 so that their lower ends engage the contacts 55. A spring 63 is housed in the well 57 and is anchored at its ends respectively to the contactor and to the plug 46 so as to provide a torsion spring tensioned to rotate the contactor in the direction indicated by the arrow in Figure 6 so as to move the contacts 55 into contact with the elements 48. The spring 63 at the same time provides a compression spring tending to force the contactor downwardly in Figure 6 so that when rotated until the wings 59 come into alignment with the slots 39 the contactor will move downwardly in the chamber 35, the shank 51 sinking into the well 38 and the wings 59 sliding in the slots 39.

Each contact 55 is preferably provided with one or more laterally-extending resilient wings 55a arranged to maintain contact with the element 48, as shown in Figures 13, 14, and 15, during rotation of the contactor 36, as described herein-after.

In the operation of this embodiment of the invention, the plug may be inserted in any suitable socket indicated at 64, adapted to receive the contact blades 47. The cord 42 may supply any desired number of conductors or circuits according to the number of contact blades 47. The circuits of one or more of the blades 47 may, however, be carried straight through the plug to the corresponding conductors 41 without being interrupted at the contactor 36. This provides for a ground lead or other circuit not to be opened upon overload. Said contact blades may also be arranged in particular angular relation to each other so that they must be inserted in the socket 64 in only one position so as to preserve the polarity of the circuits involved. With the contactor 36 in elevated position, as shown in Figure 6, the spring 63 tends to rotate the same so as to cause and maintain contact between the contacts 55 and the respective elements 48. In this condition a circuit is established through the attachment plug from each of the contact blades 47 to one of the conductors of the cable 42. Such a circuit may be traced successively through a contact blade 47, the corresponding thermostatic element 48 to the contact 55 in contact therewith, then by way of the corresponding ribbon 56 to the conductor 41 and then to the conductor of the cable 42 connected thereto. If now an overload occurs in any one of these circuits, the corresponding thermostatic element 48 will change its shape so as to cause it to bend in such a direction as to force the contactor 36 to rotate in the direction opposite to that of the arrow shown in Figure 6 and against the torsional effort of the spring 63. When this movement is sufficient to carry the wings 59 to the slots 39, the contactor is tripped and said wings move downwardly in said slots as the contactor slides downwardly under the pressure of the spring 63. This carries the contact 55 out of engagement with the con-

tacting ends of the elements 48 by a sliding movement and opens all of the circuits controlled by said elements at the same time. It will be noted that the elements 48 at their lower ends which form the contacts engageable by the contacts 55 for closing the circuits, extend somewhat below said contacts so that the circuit is broken at a point on said element displaced from the point at which the contact is maintained when the circuit is closed. Accordingly, any burning or corrosion due to arcing when the circuit is opened takes place at a different point on the contacts at the lower ends of the element 48 than that at which the circuit is maintained, and thus the latter point may be kept clean so as to make a good contact with the element 55.

Figure 15 illustrates an arrangement for rendering the bi-metallic elements 48 more sensitive in plugs adjusted for low-current overloads. In this case a resistance-heating element 69 is interposed in circuit between the elements 48 and the blade 47 and arranged to lie along the element 48 in order to heat the latter. The well 49 may be enlarged to accommodate the heating element 69.

In order to restore or reset the contactor so as to close the circuits again after an overload trip, a manipulating element is provided in the form of a pull rod 65. This rod extends through a bore 66 in the plug 46 and through the bore 56 in the contactor and projects downwardly into well 32 in its normal position. In this position a head 67 at its lower end is spaced a considerable distance below the lower end of the shank 51 of the contactor so as to introduce lost motion between the rod and the contactor when the latter is in its normal position, thus providing ample space for the downward movement of the contactor when the latter is tripped by an overload, thereby rendering the same free to trip. In order to reset the contactor, the upper end of the rod 65 is pulled upwardly to lift the contactor until the wings 53 disengage from the slots 39 and the spring 63 then rotates the contactor to its normal circuit closing position. It will be noted that when the rod 65 is thus pulled upwardly its upper end will project beyond the rim of the plug 46 in which position it interferes with insertion into the socket 64. Accordingly this rod must be pushed inwardly before the attachment plug is inserted in its socket. The resetting rod is thus limited in its position by the socket 64 so as to introduce sufficient lost motion between its lower head 67 and the contactor to permit full movement of the latter when tripped. Merely inserting the plug in the socket will automatically restore the rod 65.

In the embodiment of Figure 16, it is sometimes advantageous to mount the bi-metallic elements 48 on the contactor, and the contacts 55 on the plug 46. This puts the current-sensitive element on the contactor, which is easily removable from the assembly. The contactor assembly, with its bi-metallic elements and connections thereto, may then be manufactured in a series of different overload capacities, all of which will fit into the same plug. In this way a range of current capacities may be provided in the same size plug.

It will be seen, therefore, that this invention accomplishes its objects in providing an attachment plug with an overload trip device and a resetting manipulating device so arranged that the circuit opening contactor is always free to trip when the plug is inserted in a socket. The

arrangement is such that there is no way in which the manipulating element or the contactor may be blocked or secured in closed position and the plug inserted in a socket. It will be noted that in all of the embodiments a lost motion connection is provided between the resetting element and the contactor so that when the plug is inserted in a socket, the resetting element is limited to such a position as to introduce this lost motion. The introduction of such lost motion then provides space for the unobstructed movement of the contactor in opening the circuit.

While this invention has been described in each case as embodying a unitary device, it will be understood that various individual features or subcombinations thereof may be found useful without reference to other features or the complete combination and that the employment of such individual features or subcombinations, either by themselves or in different combinations with other features than those illustrated, is contemplated by this invention and within the scope of the appended claims.

Having thus described the invention, what is claimed is as follows:

1. A circuit-breaking attachment plug of the character described having a contactor movable to circuit-making and breaking positions, resilient means tensioning said contactor for movement to circuit-breaking position, means to retain said contactor in circuit-making position providing a limited range of movement for said contactor while so retained but constructed and arranged to release said contactor after a predetermined rotary movement of the latter transverse to the circuit-breaking movement, and a complementary contact positioned for engagement by said contactor when in circuit-making position and constructed and arranged to maintain such engagement during such rotary movement and until release of said contactor.

2. A circuit-breaking attachment plug of the character described having a contactor movable to circuit-making and breaking positions, resilient means tensioning said contactor for movement to circuit-breaking positions, means to retain said contactor in circuit making position constructed and arranged to release said contactor after a predetermined rotary movement of the latter transverse to the circuit-breaking movement, a complementary contact positioned for engagement by said contactor when in circuit-making position and constructed and arranged to maintain such engagement during such rotary movement and until release of said contactor, and means operating in accordance with the magnitude of the electric current in the circuit controlled to cause said contact to impose movement upon said contactor.

3. A circuit-breaking attachment plug of the character described having a contactor movable to circuit-making and breaking positions, resilient means tensioning said contactor in circuit-making position constructed and arranged to release said contactor after a predetermined movement of the latter, and a complementary contact positioned for engagement by said contactor when in circuit-making position and constructed and arranged to maintain such engagement until release of said contactor, said circuit-breaking movement of said contactor being in a direction transverse to said predetermined movement prior to release.

4. A circuit-breaking attachment plug of the character described having a contactor movable

to circuit-making and breaking positions, resilient means tensioning said contactor for movement to circuit-breaking position, means to retain said contactor in circuit-making position constructed and arranged to release said contactor after a predetermined movement of the latter, a complementary contact positioned for engagement by said contactor when in circuit-making position and constructed and arranged to maintain such engagement until release of said contactor, and means operating in accordance with the magnitude of the electric current in the circuit controlled to cause said contact to impose such predetermined movement upon said contactor, said circuit-breaking movement being in sliding relation to said contact substantially in the plane of contact.

5. In a circuit-breaking attachment plug of the character described, a contactor movable in rotation and to circuit-breaking position in a direction angular to the plane of rotation, resilient means tensioning said contactor for movement to circuit-breaking position, means to retain said contactor in circuit-making position constructed and arranged to release said contactor after a predetermined rotary movement of the latter, a complementary contact constructed and arranged to engage said contactor when in circuit-making position and to maintain such engagement during rotary movement to releasing position, and means operating in accordance with the magnitude of the electric current in the circuit controlled to cause said contact to rotate said contactor.

6. In a circuit-breaking attachment plug of the character described, a contactor movable in rotation and to circuit-breaking position in a direction angular to the plane of rotation, resilient means tensioning said contactor for movement to circuit-breaking position, means to retain said contactor in circuit-making position constructed and arranged to release said contactor after a predetermined rotary movement of the latter, a complementary contact constructed and arranged to engage said contactor when in circuit-making position and to maintain such engagement during rotary movement to releasing position, means operating in accordance with the magnitude of the electric current in the circuit controlled to cause said contact to rotate said contactor, and means for resetting said contactor to circuit-making position having a lost-motion connection therewith and located so as to be limited by insertion of the plug into a socket to a position introducing such lost motion so as to render said contactor free to trip.

7. In a circuit-breaking attachment plug of the character described, a plurality of contact blades adapted for insertion into a receiving socket to establish a plurality of electric circuits, a contactor movable to circuit-making and circuit-breaking positions adapted in the former position to close a plurality of said circuits, means for retaining said contactor in circuit-making position, means for moving said contactor to circuit-breaking position, means controlled by the magnitude of the current flowing in one or more of said circuits adapted to trip said contactor at a predetermined current value, and means for re-setting said contactor to circuit-closing position located so as to be limited by a socket in which the attachment plug is inserted to a position to positively clear said contactor for free movement to circuit-opening position.

8. A circuit-breaking attachment plug having a contact blade engageable in a complementary

socket, a relatively fixed contact connected with said blade, a contactor movable in different paths of which one is for making and breaking contact with said fixed contact, resilient means tensioning said contactor for movement to circuit-breaking position, means to retain said contactor in circuit-making position in engagement with said contact providing a limited range of movement for said contactor while in such engagement, and means operating in accordance with the magnitude of the electric current in the circuit controlled to cause a preliminary movement of said contactor in one of said paths and a final movement in said contact-breaking path to open the circuit.

9. A circuit-breaking attachment plug having a contact blade engageable in a complementary socket, a relatively fixed contact connected with said blade, a contactor movable in rotation and longitudinally of its axis of rotation to circuit-breaking position, means to retain said contactor in circuit-making position in engagement with said fixed contact, means operating in accordance with the magnitude of the electric current in the circuit controlled to cause rotary movement of said contactor to disengage said retaining means, and means to move said contactor to circuit-breaking position when disengaged.

10. A circuit-breaking attachment plug having a contact blade engageable in a complementary socket, a relatively fixed contact connected with said blade, a contactor movable in rotation and longitudinally of its axis of rotation to circuit-breaking position, means to retain said contactor in circuit-making position in engagement with said fixed contact, means operating in accordance with the magnitude of the electric current in the circuit controlled to cause rotary movement of said contactor to disengage said retaining means, means to move said contactor to circuit-breaking position when disengaged, and re-setting means for said contactor limited by engagement of said blade in the socket to a position positively introducing lost motion to render said contactor free to trip.

11. A circuit-breaking attachment plug of the character described having a housing, barriers in said housing providing a plurality of chambers, contact blades engageable with a complementary attachment socket, relatively fixed contacts in said chambers and connected respectively with said blades, a contactor having contacts engageable respectively with said fixed contacts and movable in rotation and longitudinally of its axis of rotation to circuit-breaking position, one or more barriers on said contactor cooperating with said housing barriers to provide arc-confining chambers for respective pairs of said contacts, said barriers being off-set to permit rotation of said contactor, means to retain said contactor in circuit-making position, means operating in accordance with the magnitude of the electric current in the circuit controlled to cause rotary movement of said contactor to disengage said retaining means, and means to move said contactor to circuit-breaking position when disengaged.

12. In a circuit-breaking attachment plug of the character described, a contactor movable to circuit-making and -breaking positions and having a metallic current-carrying contact-making part, tripping means operable under appropriate conditions to move said contactor to circuit-breaking position, a manipulating element engageable with said contactor to move the same

for re-setting, said element being positioned to be between the body of the attachment plug and a socket with which it may be engaged and mounted for movement outwardly from the attachment plug to a position to interfere with the socket while moving said contactor into circuit-closing position, and for movement inwardly to

non-interfering position after re-setting, said element being disengageable from said contactor so that by such inward movement lost motion is positively introduced between said contactor and said manipulating element when said plug is engaged in a socket.

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