April 24, 1934. S. S. GRADY 1,956,194

CIRCUIT BREAKER

Filed Dec. 6, 1930 2 Sheets-Sheet 1

Fig. 1

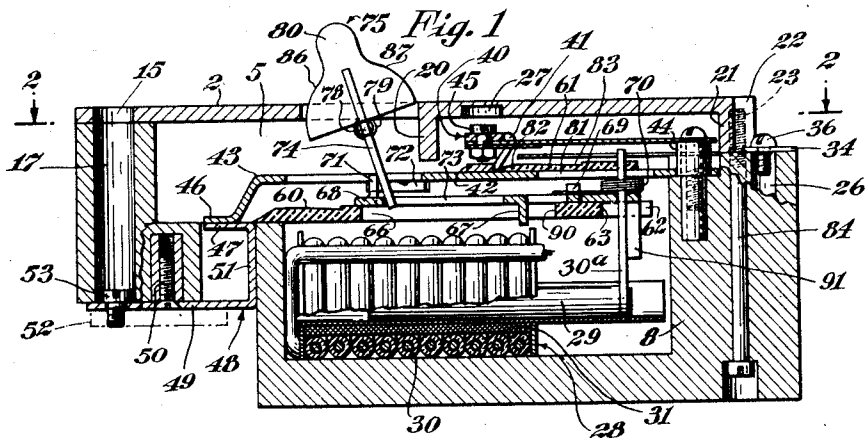


Fig. 2

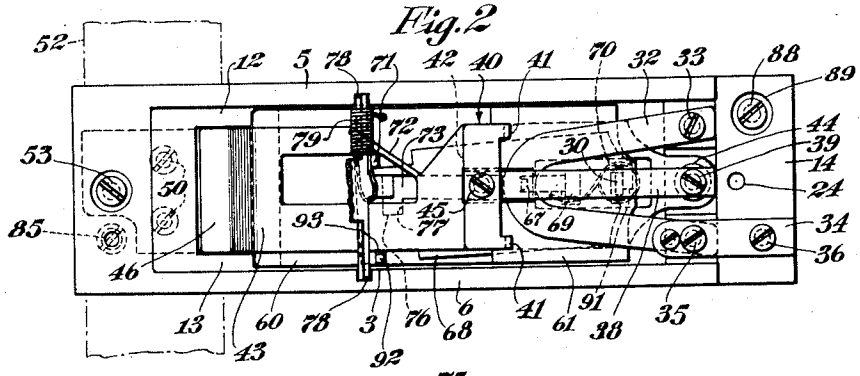


Fig. 3

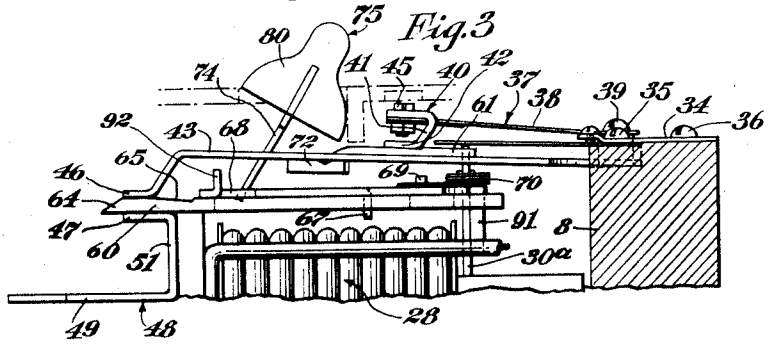
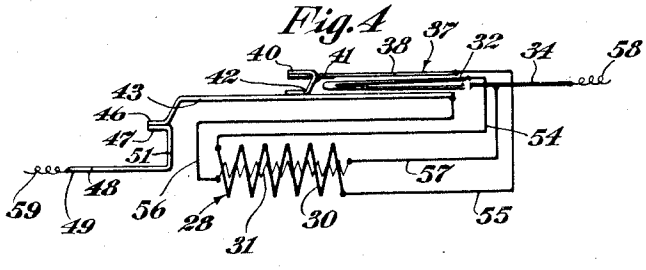


Fig. 4



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Fig. 5

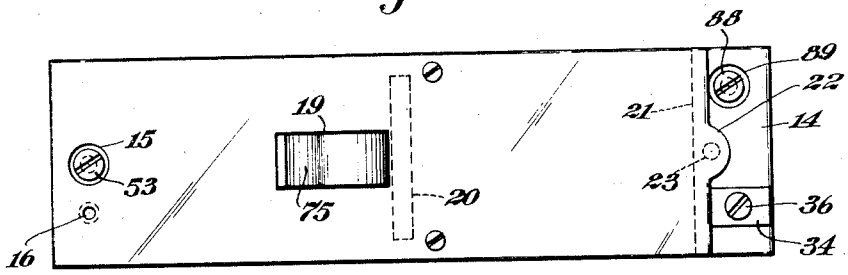


Fig. 6

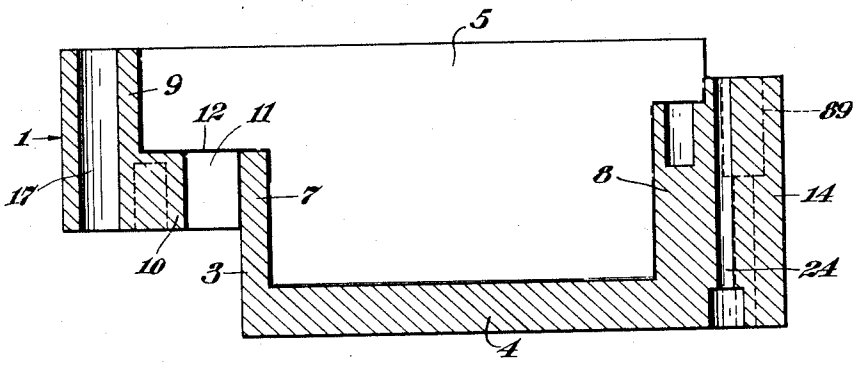
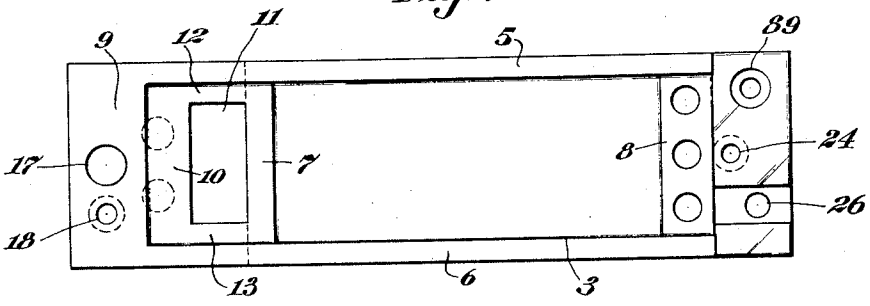


Fig. 7



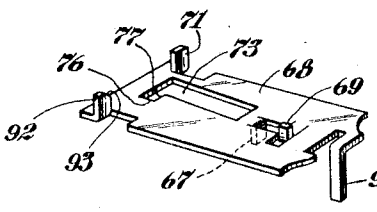


Fig. 8

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Patented Apr. 24, 1934

1,956,194

UNITED STATES PATENT OFFICE

1,956,194

CIRCUIT BREAKER

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Application December 6, 1930, Serial No. 500,503

10 Claims. (Cl. 200—111)

This invention relates to circuit breakers in general and more especially to the use of small circuit breakers in homes and the like.

Among the objects of the present invention, it is aimed to provide an improved circuit breaker for interrupting the current in a wiring system, both in case of light overloads and in case of heavy overloads.

It is another object of the present invention to provide an improved circuit breaker for interrupting the current of an electrical wiring system both in case of light overloads and in case of heavy overloads, which circuit breaker depends upon an electric motive force exclusively for actuating the interrupted elements, thereby dispensing with springs and the like heretofore so extensively used.

It is still another object of the present invention to provide an improved circuit breaker which can be compactly housed in a small casing to occupy a minimum amount of space.

It is a further object of the present invention to provide an improved circuit breaker of the class described which can be compactly housed in a small housing to occupy a minimum amount of space and in which the contacts are so separated by an interrupter when the circuit is broken that an arc can under no circumstances pass from one contact to the other.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of one specific embodiment thereof, illustrated in the accompanying drawings in which

Figure 1 is a longitudinal section of a circuit breaker made according to the present invention;

Fig. 2 is a plan of the same with the cover removed;

Fig. 3 is a fragmental side elevation showing the relative positions of the several parts when the circuit is interrupted;

Fig. 4 is a diagrammatic view of the several contacts and wiring arrangement with the casing removed;

Fig. 5 is a plan of the circuit breaker with the cover in place;

Fig. 6 is a vertical section of the casing with the cover and metallic parts removed;

Fig. 7 is a plan view of the casing with the cover and metallic parts removed; and

Fig. 8 is a perspective of one of the connecting parts.

In the embodiment illustrated, there is provided a main casing composed of a suitable insulating material, such as bakelite or the like, which, see Figs. 5, 6 and 7, preferably consists of a housing member 1 and a cover 2.

The housing member 1 preferably has a main trough portion 3 formed by the base 4, main side walls 5 and 6, intermediate end wall 7 and extension 8. To the rear of the intermediate end wall member 7, there is formed a rear end portion 9 which has at its lower end an extension 10. Between the intermediate wall member 7 and extension 10, there is formed an opening 11. To either side of the opening 11, there are formed extensions 12 and 13 extending from the side walls 5 and 6 respectively.

The upper surfaces of the intermediate wall 7, extensions 10, 12 and 13 are flush with one another and disposed in a plane below the upper edge of the end portion 9. The upper surfaces of the end portion 9 and side walls 5 and 6 are flush with one another. The lower surfaces of the end portion 9, extensions 10, 12 and 13, and side walls 5 and 6 to the rear of the intermediate wall portion 7 are preferably flush with one another as shown in Fig. 6 and disposed at a level above the level of the lower surface of the base wall 4.

The extension 8 is disposed at the rear end of the front portion 14 and extends from one side wall 5 to the other side wall 6. The upper surface of the portion 14 preferably is disposed at a level above the level of the upper surface of the extension 8 and below the level of the upper edges of the side walls 5 and 6.

The cover 2 preferably extends from the rear face of the rear end portion 9 to the rear face of the end portion 14, the sides of which resting on the upper surfaces of the side walls 5 and 6 and the rear portion resting on the extension 9.

The rear portion of the cover 2 is provided with two openings 15 and 16 to register with the openings 17 and 18 in the end portion 9. At about the middle of the cover 2, there is provided an elongated opening 19 through which the handle for resetting the circuit breaker extends. To the front of the opening 19, see Figs. 1 and 2, there is provided a downwardly projecting ledge or baffle 20. The front end of the cover 2 is provided with a downwardly extending flange 21 which extends down along the front ends of the portions of the side walls 5 and 6 protruding above the front extension 8. The lower face of the flange 21 rests on the upper surface of the portion 14 and is provided with a boss 22 having an opening 23 therein to register with the opening 24 in the end portion 14.

To either side of the opening 24 in the end por-

tion 14, there are also provided two larger openings 89 and 26 which will be hereinafter described.

To the front of the baffle 20, there is formed in the cover 2 a downwardly facing recess 27 hereinafter to be described.

The operative parts of the circuit breaker will now be described.

In the trough formed above the base 4, there is located an electromagnet 28 having a core 29 provided with an upwardly extending stem 30a. The electromagnet 28 is provided with a heavy winding 30 and a fine winding 31. The rear end of the heavy winding 30 in the present instance is connected to one end of the thermostat 32 preferably to the binding post 33 which connects one leg of the thermostat to the upper surface of the extension 8. The other leg of the thermostat is preferably connected to the bus bar 34 by means of the screw 35 which extends through the bus bar 34 and thermostat into the extension 8 through the upper end thereof. The bus bar 34 as shown in Figs. 1 and 2 extends from the screw 35 across the upper surface of the end portion 14 and is there provided with the binding post 36.

The other end of the heavy winding 30 is connected to one end of the horizontally extending member 37 which is provided with a spring arm 38, the front end of which is connected to the upper end of the extension 8 by the screw 39. The rear end of the spring arm 38 is provided with a cross piece 40 having lateral wing portions 41, the lower ends of which are connected to one another by the contact bar 42 adapted to engage the intermediate contact member 43, the front end of which is also connected to the upper end of the extension 8 by the screw 39 being insulated from the spring arm 37 by the insulated bushing 44.

The cross piece 40 is preferably connected to the spring arm 38 by a bolt 45 as illustrated in Fig. 1. The screw head of the bolt 45 extends above the upper surface of the cross piece 40 in alinement with the recess 27, the recess 27 being formed to provide clearance for this screw head when the spring arm 38 and cross piece 40 are deflected upwardly by the thermostat 32.

The rear end of the contact 43 is preferably bent downwardly to form the lip 46 extending rearwardly with its lower surface substantially in alinement with the upper surface of the extension 10 to engage the upper surfaces of the lip 47 formed on the contact plate 48. The contact plate 48 has its lower extended portion 49 secured to the extension 10 by the screws 50. This lower extension 49 is connected to the lip 47 by the downwardly extending portion 51 preferably resting along the rear face of the intermediate wall 7 as illustrated in Fig. 1.

The portion 49 of the contact plate 48 is preferably connected to the bus bar 52 provided in the wiring system to which the circuit breaker is to be connected. The bus bar 52 is connected to the extension 49 by the screw 53 which is passed through the extension 49 into the bus bar 52 through the registered openings 15 and 17 of the cover 2 and end portion 9 respectively.

In the diagram illustrated in Fig. 4, the end of the heavy winding 30 connected to the thermostat 32 is shown as connected by the conductor 54 and the end of the heavy winding 30 connected to the spring arm 38 is shown as connected by the conductor 55.

One end of the fine winding 31 is electrically connected to the front end of the intermediate contact 43. In Fig. 4 the conductor 56 is shown as the means for connecting such intermediate contact 43 with the fine winding 31. The other end of the fine winding 31 is shown in Fig. 4 as connected to the bus bar 34 by the conductor 57.

The bus bars 34 and 52 are of course connected to the main leads of the circuit, to wit 58 and 59 in the usual way for interrupting the circuit. In the present instance, there are provided two interposers, the main interposer 60 and the auxiliary interposer 61. The main interposer 60 is adapted to be actuated to space the lips 46 and 47 of the contacts 43 and 48 from one another and thereby disrupt or interrupt the current at this point.

The auxiliary interposer 61 is adapted to be actuated to space the contact bar 42 from the intermediate contact 43. The auxiliary interposer 61 is secured to the upper end of the stem 30a of the core 29. The main interposer 60 is provided with a recess 62 to receive the pin 30a which is adapted to co-operate with the shoulder 63 at the inner end of the recess 62 to move the main interposer 60 rearwardly when the core 29 is attracted by the magnet 28.

In the operation of the device, the interposers 60 and 61 are disposed in the position indicated in Fig. 1 with the core protruding from the magnet 28 when the circuit is closed. The current passes from the lead 58 through the bus bar 34, thermostat 32, conductor 54, heavy winding 30, conductor 55, spring arm 37 and cross piece 40 to the intermediate contact 43, fixed contact 48 and outgoing lead 59. Under such conditions, a current of normal strength will pass through the circuit, including the thermostat and magnet without affecting either sufficiently to move the core 29 rearwardly, and the circuit will remain closed. Thereupon, in case of a light overload, the thermostat will be energized by a slight excess of current and gradually deflect upwardly until it engages the arm 38 and separates the cross piece 40 from the intermediate contact 43. Thereupon, all of the current will be directed through the fine winding 31, that is from the bus bar 34 through the conductor 57, fine winding 31, conductor 56, intermediate contact 43, fixed contact 48 and lead 59, in turn to attract the core 29, in turn to cause the interposer 61 immediately to pass between the cross piece 40, and intermediate contact 43 and further to cause the interposer 60 to force the lips 46 and 47 from one another to interrupt the main circuit.

In the case of a heavy overload or a short circuit, where the current passing from the bus bar 34 through the magnet 28 by means of the windings 30 and 31 is sufficiently high to excite the magnet 28 to attract the core 29, the interposer 60 will immediately be actuated to space the lips 46 and 47 from one another to interrupt the main circuit at this point, that is the interposer 60 would then assume the position indicated in Fig. 3. At the same time, the auxiliary interposer 61 in the present instance, will also be actuated to separate the cross piece 40 from the intermediate contact 43, that is the interposer 61 would then assume the position indicated in Fig. 3.

The interposer 60 as illustrated in Figs. 1 to 3 inclusive is beveled at its rear end 64 to facilitate separating the lips 46 and 47 when the interposer is actuated into circuit breaking position. To the front of the end portion 64 on the upper surface thereof, the interposer 60 is recessed as indicated at 65. Intermediate the length of the interposer 60, there is provided an opening 66 to receive the projection 67 of the connecting plate 68. The con-

necting plate 68 is pivotally connected to the stem 30a and is provided with an upwardly extending projection 69 adjacent to the stem 30a and to the rear thereof to form an abutment for the end of the coil spring 70 secured to the stem 30a and exercising a tension on the projection 69 to urge the plate 68 in the direction of the side wall 5.

The connecting plate 68 is provided with a cam pin or projection 71 extending upwardly therefrom at its rear end to engage the cam 72 extending downwardly from and formed on the intermediate contact member 43.

The cam 72, see particularly Fig. 2, inclines toward the wall 6 in its forward direction. As a result, due to the co-operation of the pin 71 with this cam 72 when the parts are disposed as shown in Figs. 1 and 2, the cam 72 acts on the pin 71 to hold the connecting plate 68 toward the wall 6, against the urge of the spring 70, and when the connecting plate 68 is moving rearwardly, the pins 71 is moved away from cam 72 and the connecting plate 68 swings about the stem 30a in the direction of the side wall 5. On the other hand when the connecting plate 68 moves forwardly, it swings about the pin 30a in the direction of the side wall 6.

The connecting plate 68 is provided with an elongated, longitudinally extending recess 73 to receive the lower end of the stem 74 of the resetting key 75. At the rear end of the opening 73, a notch 76 is formed as a continuation of the slot 73 in the direction of the side wall 6. The shoulder 77 formed by the notch 76 serves as a perch for the stem 74 so that when the key 75 is rocked about the pin 78 when the plate 68 is in a rearward position, the plate 68 will be moved forwardly by the engagement of such pin 74 with such shoulder 77.

Due to the co-operation of the pin 71 with the cam 72 when the plate 68 is so moving forwardly, the plate will be swung over toward the side wall 6 to move the shoulder 77 out of engagement with the pin 74. When the shoulder 77 has cleared the pin 74, then upon exciting the magnet 28, the plate 68 may move rearwardly with the interposers 60 and 61 without affecting the position of the key 75.

Thereupon to reset the plate 68, and interposers 60 and 61, it will be necessary to swing the key about its pin 78 so that the stem 74 moves rearwardly into the position indicated in Fig. 3 where the plate 68 will be free to swing toward the side wall 5 when the pin 74 will again enter the recess 76 to co-operate with the shoulder 77.

Preferably as indicated, a coil spring 79 is formed around the pin 78 connecting the key 75 with the interposer 60 to urge the handle portion 80 of the key forwardly, the position indicated in Fig. 3, when the interposer is actuated to circuit breaking position. Thus the pin 74 will be swung back through the slot 73 of the connecting member 68 and will again enter the recess 76 to cooperate with the shoulder 77.

The interposer 61 is adapted to slide on the upper face of the intermediate contact 43, the pin 30a to which the interposer 61 is connected extending through the opening 81 formed in the intermediate contact 43 and forming a path of movement for the pin 30a relative to the intermediate contact 43 backwardly with the core 29 and again forwardly during the resetting operation.

The rear end 82 of the interposer 61 is also beveled to facilitate moving the cross piece 40 upwardly when moved rearwardly. The upper surface of the interposer 61 forwardly of the rear end 82 is recessed at 83, as indicated in Fig. 1.

When the interposer 60 moves rearwardly during a circuit interrupting operation, the lower surface thereof will slide across the upper surface of the lip 47 and the upper surfaces of the extensions 12 and 13 over to and across the upper surface of the extension 10. When the interposer 60 is located in final circuit interrupting position, it would thus be apparent that the extensions 10, 12 and 13 absolutely prevent an arc to jump around the edge of the interposer 60 from the lip 46 to the lip 47.

In order to lock the cover 2 to the casing 1, the screw 84 is provided extending through the opening 24 in the front end 14 of the casing 1 and engaging the threaded opening 23 in the projection 22 at the front end of the cover 2. The rear end of the cover 2 is secured to the casing 1 by the screw 85 extending up through the opening 18 in the casing 1 and engaging the threaded opening 16 in the cover 2.

The downwardly extending ledge or baffle 20 serves primarily to prevent the escapement of a spark through the opening 19 when an arc is formed between the cross piece 40 and intermediate contact member 43.

The handle portion 80 of the key 75 is concentric at 86 and 87 with the pin 78 and alines substantially with the ends of the opening 19 so that the lower portion of the key 75 will substantially close the opening 19 throughout its pivotal movement and in any position of the key 75.

From the foregoing, it will thus appear that the present invention provides a circuit breaker having a compact insulated casing for the active parts, fully enclosing the area in which any arc may be formed so that the sparks from such arc can under no circumstances escape out of the casing and the circuit breaker will thus be clearly within the usual requirements of underwriters for municipalities and the like.

It is also apparent from the foregoing that springs are entirely dispensed with for actuating the circuit breaker thus increasing the reliability of the device.

From the foregoing, it will be seen that the present circuit breaker may be supplied as a unit with the insulated housing ready to be installed. When so installed screw 88 is passed through the opening 89 in the end portion 14 of the casing 1 and then passed into the wall of the building in which the unit is to be attached. The other end of the casing is adapted to be attached to the bus bar 52 of the electrical equipment to which the unit is to be attached, in which case as already explained, the screw 53 is passed through the contact 48 into the bus bar 52. The circuit breaker is then completely and compactly enclosed in an insulated housing which prevents the escape of any sparks from the contacts both when the circuit is interrupted and when the key 75 is actuated before the emergency has passed.

When the circuit is closed, the key will assume the position indicated in Fig. 1, in which as indicated, the contact 40 engages the intermediate contact 43 and the lip 46 of the intermediate contact 43 engages the lip 47 of the fixed contact 48. The intermediate contact 43 is yieldable relative to the fixed contact 48 so that its lip 46 may with facility be deflected from the lip 47 of the fixed contact by the interposer 60.

In case of a light overload, the thermostat 32 will first be deflected to engage the spring arm 38 in turn to separate the cross piece 40 from the intermediate contact 43. Thereupon, the current will be forced to pass through the fine wind-

ing 31 and energize the magnet 28 sufficiently to attract the core 29 in turn to cause the interposers 61 and 60 to be moved rearwardly. When so moved rearwardly, the interposer 61 will of course merely pass under the cross piece 40 and thus prevent the circuit again from being closed between the contact 40 and intermediate contact 43 and furthermore break the circuit by separating the contacts 46 and 47 by the interposer 60.

In case of a heavy overload, or short circuit, the current passing through the windings 30 and 31 will sufficiently energize the magnet 28 to attract the core 29 without first waiting until the thermostat 32 has become heated and deflected. Here again the interposers 61 and 60 will be moved rearwardly to separate the contacts as aforesaid. For resetting the interposers and again closing the circuit, it is then only necessary to actuate the handle portion of the key 75 rearwardly. The stem 74 of the key 75 will then engage the shoulder 77 to move the connecting plate 68 forwardly, whereupon the interposer 61 being fixed to travel with such plate 68 by the stem 30*a*, will of course go forwardly and the projection 67 disposed in the path of movement of the shoulder 90 at the forward end of the opening 66 in the interposer 60, will engage such shoulder 90 and move the interposer 60 forwardly with it.

If the emergency has not passed, that is the cause for the overload or short circuit still exists, the key 75 will not prevent the interposers being thrust rearwardly again by the magnet 28 since the stem 74 will have disengaged the shoulder 77 and the connecting plate 68, the projection 71 as aforesaid co-operating with the cam plate 72 to cause the connecting plate 68 to move over toward the side wall 6, during the forward movement of the connecting plate 68. The spring 79 as indicated will yieldably serve to urge the key 75 to move with the interposer 60. On the other hand, due to this yieldable connection, after the key 75 is moved into circuit closing position, the position indicated in Fig. 1, and the emergency, to wit the overload or short circuit has not yet passed, the interposer will be free again to be actuated into circuit breaking position although the key 75 may be held in circuit closing position by an operator.

In the present instance, the bus bar 34 will constitute one of the terminals of the circuit and the bus bar 52 the other terminal of the circuit to be connected by the circuit breaker.

To prevent tilting of the contact plate 68 when moving forwardly by the key 75, there is provided the projection 91 extending downwardly and resting against the front face of the stem 30*a*.

To insure the clearance of the shoulder 77 from the stem 74 at the end of the return movement of the plate 68 by the key 75, there is provided the upwardly extending projection 92 on the side of the contact plate 68 adjacent to the side wall 6.

This projection 92 has a cam face 93 to cooperate with the edge of the intermediate contact 43 so that the elasticity of the contact 43 when engaging this cam face 93 will act upon the same to move the connecting plate 68 the short distance required to permit the shoulder 77 to clear the stem 74 at the end of the return movement of the key 75.

It is to be noted that the contact member 42, with its supporting spring member 38, by which it is urged yieldingly against the intermediate contact member 43, acts as a trip for the auxiliary interposer 61, standing in the path of sliding movement of the latter, and so anchoring the same in circuit making position until the thermostat 32, which is sensitive to an overload, acts to raise the members 38 and 42 as hereinbefore described, thereby actuating said trip to release the interposer, and at the same time break the contact between members 42 and 43, to shut off the passage of current through coil 30 of electromagnet 28 and deflect the entire current through the fine winding 31, so that the core 29 is urged to actuate the interposers 60 and 61 into circuit breaking position.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker enclosed in said casing, said circuit breaker having a fixed contact, an electromagnet having a core, a yieldable contact normally in engagement with said fixed contact, conductors for connecting said electromagnet and said yieldable contact in series, and an interposer operatively connected to said core to separate said intermediate contact from said fixed contact when said electromagnet is actuated in turn to actuate said core, said casing having a shoulder to receive said interposer in circuit breaking position and thereby cut off a free passage around said interposer from the intermediate contact to the fixed contact.

2. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, a circuit breaker having a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer operatively connected to said core for separating said yieldable contact from said fixed contact when said electromagnet is excited, a connecting plate operatively connected to said core, there being a slot in said interposer, said connecting plate having a projection protruding into said slot, and a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position.

3. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, and a key pivotally connected to said casing and operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position.

4. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed

contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, and a spring for actuating said connecting plate out of engagement with said key in circuit closing position when said interposer and connecting plate are free to be actuated into circuit breaking position without affecting the position of said key.

5. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, and a spring for normally maintaining said key in circuit closing position.

6. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, a spring for actuating said connecting plate out of engagement with said key in circuit closing position when said interposer and connecting plate are free to be actuated into circuit breaking position without affecting the position of said key, and a second spring for normally maintaining said key in circuit closing position.

7. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, and a key pivotally connected to said casing and operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, the casing having a slot to permit the key to protrude therefrom.

8. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, the casing having a slot to permit the key to protrude therefrom, said key having outwardly extending arcuate surfaces to co-operate with the ends of said slot when pivoted thereby constantly to maintain the slot closed during movement thereof.

9. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, and a key pivotally connected to said casing and operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, the casing having a slot to permit the key to protrude therefrom, said casing having a baffle extending inwardly adjacent to said slot to prevent the escape of any sparks.

10. A circuit breaker device adapted to be included between suitable terminals in an electrical circuit, said device comprising, in combination, an enclosed insulated casing, a circuit breaker disposed in said casing and comprising a fixed contact, a yieldable contact normally in engagement with said fixed contact, an electromagnet having a core, conductors connecting said electromagnet and said yieldable contact in series, an interposer slidable relative to but actuatable by said core to separate said contacts from one another when said electromagnet is excited, a connecting plate connected to said core and operatively connected to said interposer, a key operatively connected to said connecting plate to actuate the same in turn to return said interposer into circuit closing position, means for actuating said connecting plate out of engagement with said key when actuated into circuit closing position, said means including a cam co-operating with said yieldable contact to snap said connecting plate out of engagement with said key, and a spring for moving said connecting plate into position for the co-operation of said cam with said yieldable contact.

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