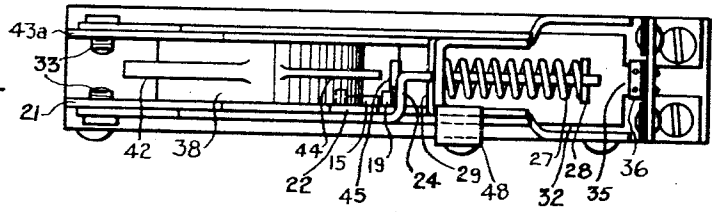
June 9, 1942. W. H. FRANK ET AL 2,285,770

CIRCUIT BREAKER

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Fig-1



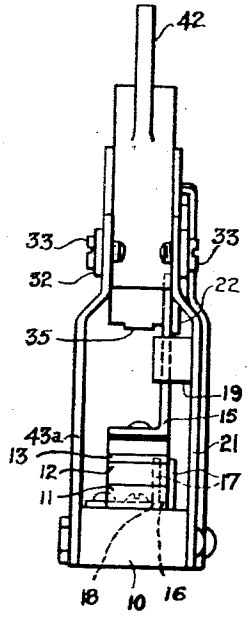


Fig-3

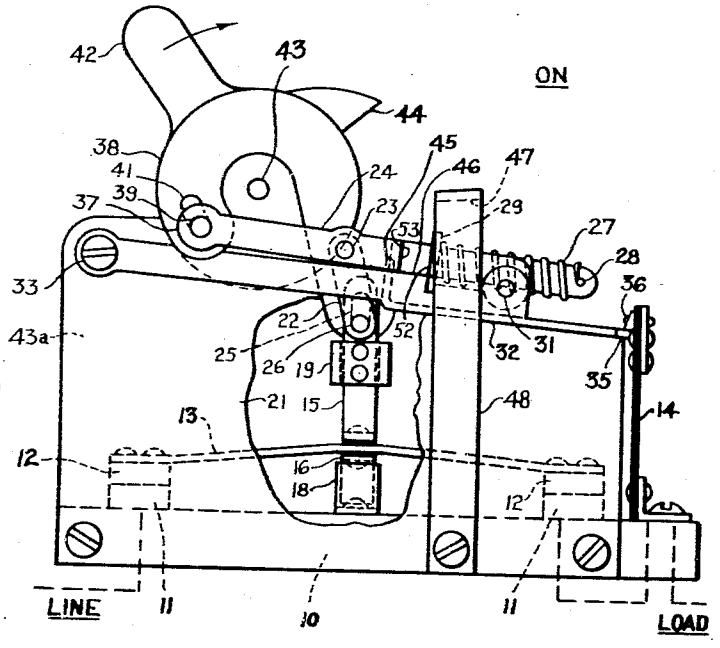


Fig-2

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June 9, 1942. W. H. FRANK ET AL 2,285,770

CIRCUIT BREAKER

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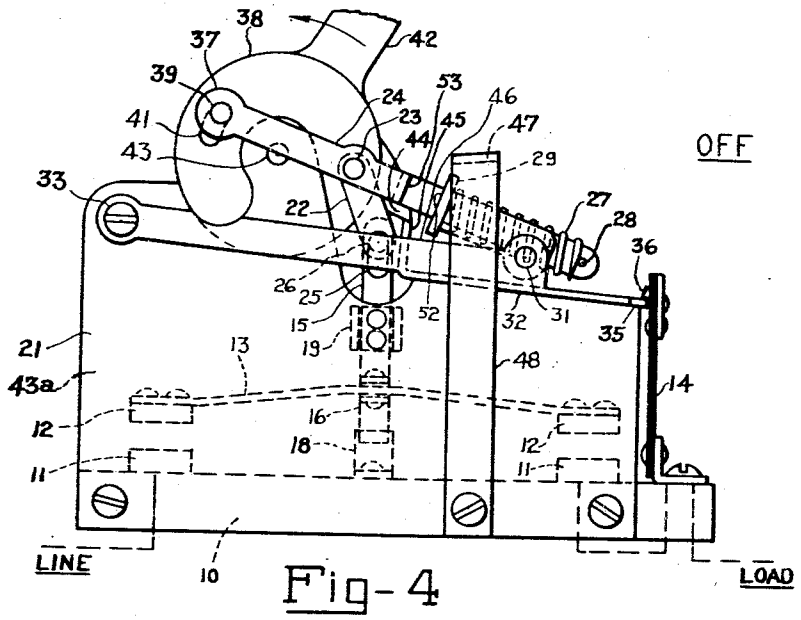


Fig-4

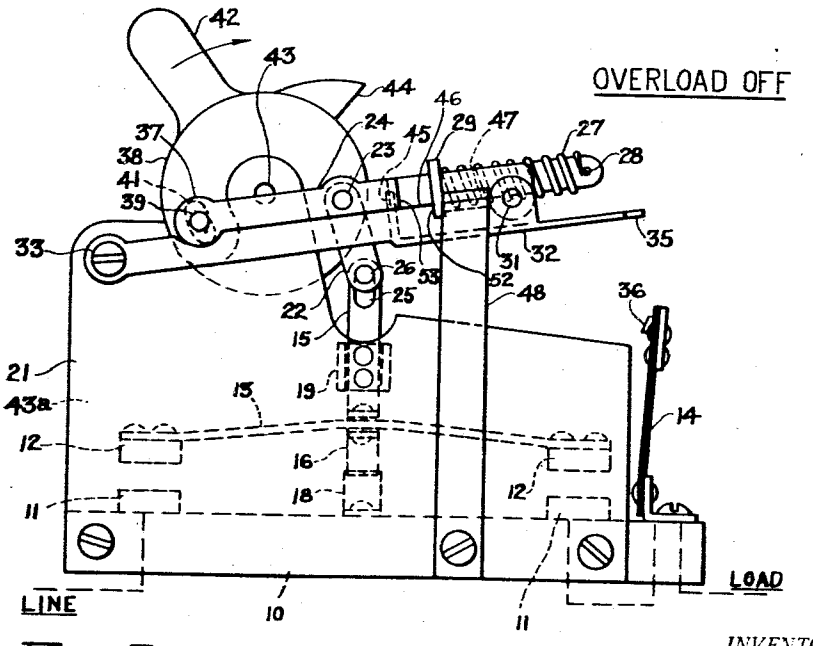


Fig-5

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Patented June 9, 1942

2,285,770

UNITED STATES PATENT OFFICE

2,285,770

CIRCUIT BREAKER

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Continuation of application Serial No. 59,631, January 17, 1936. This application September 14, 1939, Serial No. 294,808

17 Claims. (Cl. 200—116)

This application relates to circuit breakers and is a continuation of a prior application, Serial No. 59,631, filed January 17, 1936.

For an understanding of the breaker herein disclosed, reference should be had to the following specification and the appended drawings. In these drawings,

Figs. 1–3 are plan, elevation, and end views respectively of a breaker shown in "on" position;

Figs. 4 and 5 show the breaker in "off" position and "overload off" position respectively.

In the drawings there is shown a circuit breaker having three positions, "on" (Fig. 2), switch "off" (Fig. 4) and overload "off" (Fig. 5).

The device includes a base 10 having a pair of contacts 11 which are to be butt pressure engaged by the contacts 12 on the ends of a resilient bridging contact arm 13. One of the contacts 11 is connected to the line, and the other is connected to one leg of the thermostatic or bimetallic warping element 14, the other leg of the latter being connected to the load. When the contact arm 13 is in "on" position, current flows through contacts 11 and 12, contact arm 13 and warping element 14.

To the vertically moving contact arm 13 is rigidly secured an upwardly projecting sliding link 15 and a downwardly projecting guide plate 16, these being insulated from arm 13, as shown.

The lower end of the guide plate 16 slides between two spring jaws 17 of a lower guide block 18 firmly fastened to base 10. The sides of the sliding link 15 snugly fit into an upper guide block 19 rigidly secured to a vertical front plate 21.

A link 22 is pivotally connected at 23 to a horizontal link or arm 24 and is slidably connected to the upper end of link 15, through an elongated slot 25 in link 15, receiving a pin 26 of link 22. A coiled compression resisting spring 27 is mounted on the right hand end of link 24, between a pin 28 thereon and the bight of a U-shaped, horizontally positioned spring compression link 29, which is pivotally connected at 31 to a pawl 32, the latter being pivotally connected by shouldered screws 33 on its left hand end to front plate 21 and vertical back plate 43a. As indicated, the link 24 passes through a slot in the bight of link 29, and these links move as a unit, around pivot 31. In the "on" position, the right hand or free end 35 of pawl 32 is held down by a tongue 36 of warping element 14.

The left hand end 37 of link 24 is pivotally connected to an operating bell crank 38 by a pin 39, the latter sliding in an arcuate slot 41 of the crank. The bell crank has an extension 42 forming an operating handle for the device, and is pivotally supported on the cross shaft 43, the latter connecting front plate 21 and the vertical back plate 43a.

The parts just described may be operated as a simple, quick make and break switch as follows: Assume the parts to be in "on" position (Fig. 2). When the handle 42 is moved to the right, the bell crank 38 rotates clockwise, carrying end 37 of link 24 along with it, thus moving links 24 and 29, together about the pivot 31, clockwise. This action pulls link 24 to the left a slight degree and builds up an increased compression in coil spring 27. All this while, the link 22 and its pin 26 travels the length of the slot 25 in sliding link 15, and link 15 and arm 13 do not move, link 15 being held by spring jaws 17 frictionally engaging guide part 16.

As soon as link 24 has passed over center (shaft 43) the coil spring operates, to move links 24 and 29 further past shaft 43, with a snap action, thus pulling contact arm 13 to its "off" position, for a quick break of the circuit, slot 41 permitting snap action movement of links 24 and 29, independently of the handle 42, so that quick break may be effected independently of the operator.

Handle 42 is so connected that it may move the sliding link 15, without the assistance of the spring 27, after having taken up the lost motion provided in slots 25 and 41. This permits the handle 42 to move the bridging arm 13 positively to the "off" position, and permits the operator to free the contacts 12 in case they should stick, and to move the switch positively to the "off" position, independently of the spring, in the event the spring should become broken or weakened too much to function of its own accord.

The bell crank 38 may be moved to the extreme "off" position as limited by the engagement of the reset lug 44 and stop 45 on pawl 32.

Reverse movement of handle 42, to the left, from the "off" position (Fig. 4) imparts a counter-clockwise movement to link 24 about pin 31. This action pulls link 24 to the left and compresses spring 27 between pin 28 and the bight of the spring compression link 29, until link 24 is past center (shaft 43).

All this while, the link 22 and its pin 26 travels the length of the slot 25 in sliding link 15, and link 15 and arm 13 do not move, being held by spring clips 17 frictionally engaging guide part 16. Then the compressive force of the spring re-

acts, giving a rapid counter-clockwise movement to link 24, forcing down link 22, sliding link 15, and arm 13, until the circuit is completed through contacts 11 and 12.

Slot 41 permits a snap action movement of links 24 and 29, independent of the movement of handle 42, in order to effect a quick make, independent of the operator. The bell crank may be moved to the extreme "on" position, as determined by the length of the slot 41, and the "on" position of link 24, as shown in Fig. 2.

The action just described is a quick make action, and takes place when spring 27 functions properly. At other times, the positive connection between handle 42 and link 15, as previously described, insures contact making.

During switch operation, travel of pawl 32, about its pivot screws 33 is prevented, by its end 35 being held by the tongue 36 of warping element 14.

It will be observed that slot 41 provides a lost motion connection between handle 42 and link 24, which permit movement of the latter, when overcenter and as influenced by spring 27, independently of the handle for accelerating the quick make and break action of the linkage 24, 22, 15, etc., the extent of this action being determined by the dimensions of slot 41 and the associated parts. A positive make and break action of the linkage is, however, assured by the positive (even though lost motion) connection between handle 42 and link 24.

The foregoing parts, in conjunction with other parts to be described below, serve to move contact arm from "on" position to a second or overload "off" position, when element 14 warps to the right due to an overload in the line, and also serve to enable the operator to reset the switch after it had been tripped on overload, by moving the various parts, linkages, and the pawl 32 from their overload "off" position to their normal "off" position without causing contact arm 15 to close the circuit and these operations are carried on as follows:

Assume the switch to be in "on" position. When the element 14 warps (to the right) its tongue 36 releases pawl end 35, permitting the compression in spring 27 to tend to move link 29, and consequently pin 31, to the left. Since link 29 is fixed to pawl 32 at 31, the movement of pin 31 to the left is on an arc whose center is pivot 33, and is necessarily accompanied by an upward movement of pin 31. The parts move up to the point where pawl 32 is engaged by the hooked ledge 47 on stop 48. Such movement causes pin 23 to be pulled upwardly. This movement, operating through links 22 and 15, raises contact arm 13 to the position shown in Fig. 5, known as "overload off," for breaking the circuit. Quick break is of course assured by the action of spring 27.

In view of the fact that this action can take place without interference from handle 42, due to the fact that the pivot 39 does not move on this action, the breaker cannot be prevented from tripping, merely by holding handle 42 so that pivot 39 can not move. In other words, the breaker will trip even though the handle be held. This characteristic places the breaker in the trip-free class.

When the parts are to be reset, that is to say, when contact arm 13 is to be moved from "overload off" (Fig. 5) to switch "off" (Fig. 4), handle 42 is moved to the right, rotating bell crank 38 clockwise until the stop lug 44 on bell crank 38 engages stop 45 on pawl 32, rotating the latter clockwise about screws 33 until its end 35 snaps under tongue 36 of warping element 14, resetting these parts to the switch "off" position of Fig. 4. During such movement of handle 42, the lower edge of elongated slot 41 comes in contact with pin 39 carrying it past center of shaft 43. The spring 27 then continues the clockwise movement of pin 39 pivoting link 24 about pin 31; this resets these parts also in "off" position.

By properly proportioning and connecting the parts, the action may be such that during movement of the handle 42, lug 44 can be resetting link 32 to its normal latched position, during the time that link 24 is moving overcenter to the "off" position.

It will be seen that the position of the contact arm 13 does not change while the other parts move from overload "off" position to switch "off" position (reset position). Accordingly, there is no danger of the circuit being closed, even momentarily, until the breaker is under the control of the warping element 14.

It will be observed at this time that the breaker described in the foregoing possesses certain novel and desirable characteristics. It is trip-free; it operates with a quick make and break action, both on normal switch operations, and on overload; it insures positive make and break, in addition to and without interfering with the quick make and break; and it can be reset after tripping, with a snap action.

In addition, in the event the spring 27 breaks, it will not fall into the live parts of the breaker, with consequent damage, but will remain upon the link 24 upon which it is mounted, being held between pin 28 and link 29.

Further, since the spring 27 does not have to be flexed to any great extent, due to the tangential relation of the link 24 and the crank 38, the life of the spring is relatively prolonged.

Further, it is to be noted that this circuit breaker employs only one spring for all its operation, this spring serving to perform the functions of quick make and quick break under normal switching, and quick break under overload tripping.

Further, since the spring 27 connects the operating link 24 and the pawl, it is free of the handle, and therefore does not interfere with positive make and break action of the handle, as contradistinguished from constructions wherein the spring connects the operating link or part to the handle.

It will be seen that the handle is connected to the pin 39 by means of a positive lost motion connection including the slot 41 in which rides the pin 39, and that this lost motion connection is constant in character, being no different on overload release than on normal operation.

It is also observed that the contact arm is connected by links to the operating mechanism at a point between its anchorage 35 and its anchorage 39 so that movement of link 24 of the operating mechanism about either anchorage as a pivot directly causes movement of the contact arm 13 with a lost motion connection assured by the pin and slot at 22—26.

These features result in a simple construction wherein actuation of the operating mechanism is reflected with great force in movement of the contact.

It will be observed that in the switch herein disclosed the spring means or operator, consisting of parts 24, 27, 29 and 32, establishes butt

contact pressure at contacts 12—11 because when the parts are in the closed circuit position, the spring 27 tends to rotate the operator as a whole radially around the pivot 43 and to the right, lowering the left end of the operator and moving it to the right and raising the right end of the operator and moving it to the right. This tendency of the spring is arrested by the contact pressure established at contacts 12—11 and by the latch engagement at 36.

This spring pressure, when the parts are in the "on" position, imparts a bias to the contact and to the operating unit above described which tends to move those parts to the overload released position of Fig. 5, such movement taking place only in the event of a release by the latch.

Thus in the closed circuit position the spring has three functions, (1) to establish contact pressure, (2) to establish and maintain latch engagement, and (3) to tend to move the parts to the position of Fig. 5 in the event of a latch release.

The unit consisting of parts 24, 27, 29 and 32 may be considered as a spring means or as a spring operator for the entire breaker. Considering it as a spring means or a spring unit, it will be observed that the unit as a whole has one end connected to the latch and the other end to the handle. The spring alone, namely spring 27, is not, however, properly considered as directly connected to the latch and handle, as is the spring unit, because the connection between the spring and the latch is established through the pawl 32 and the connection between the spring and the handle is established through part 24.

It will here be observed that the breaker hereof includes a spring means which is directly connected to the latch and the handle, that spring means consisting of the spring 27 and the links. In that spring means, however, the spring alone, namely spring 27, is not connected directly to the latch and the handle, but instead is connected indirectly to the latch and the handle through the medium of the link forming with the spring the entire spring means.

Here also may be contrasted the breaker hereof with that of a patent to Krantz, No. 1,726,233. In the Krantz patent the connection between the handle and the contact is established through a spring whereas in the instant breaker the connection between the handle and the contact is established positively through links or the like and not through a spring, the latter providing an operating force but not a connection between the handle and contact. In the instant breaker the handle is connected by links 24, 22, and 15 to the movable contact and that connection is a positive connection. Thus movement of the handle positively moves the movable contact to open and closed circuit positions regardless of the spring. Handle movement, however, meanwhile stresses the spring to provide snap action for the last part of each handle actuated movement of the contact.

It will be observed that unlike previously known breakers the spring hereof operates to provide a force which tends to hold the parts in either of the two handle actuated positions. For example, in the closed circuit position of Fig. 2 the spring provides a force which tends to hold the parts therein in their closed circuit position with contact pressure. On the other hand, when the parts are in the position of Fig. 4, the spring provides a force which biases the parts and tends to hold them in the position of Fig. 4. This contrasts favorably with known breakers wherein cams or the like are utilized to hold the parts in the open circuit position, with springs being utilized to hold the parts in the closed circuit position, the cams being manipulable to overcome the springs for open circuit movement.

It will also be observed that in the breaker herein disclosed the resetting or relatching movement of the handle, from the overload released open circuit position of Fig. 5 to the open circuit position of Fig. 4, relatches the spring means or spring operator without moving the contact to the closed circuit position. Thus it is impossible for the contact to be moved to the closed circuit position without its becoming controlled by the latch which can release and permit the parts to be moved by the spring to the open circuit position free of the handle.

It will also be observed that the spring means or spring operator as a whole pivots on the latch for handle actuation and pivots on the handle for overload release movement and that the contact moves with the spring means regardless of which end of the spring means is the then anchored end.

It will be observed that in the instant breaker, the interconnection between the movable contact 12 and the operating arm 24 is at a point 23 remote from the axis 39 for the arm 24 and is established directly, rather than, as in the case of the Thomson breaker of Patent No. 2,106,580, being at the axis 39 of the arm 24, and established through a normally held latch 119, which is released on overload after the main latch 14 releases arm 24 to be moved by the main spring 27 so that part 130 of pawl 32 can move to strike part 128 and release latch 119; and the arm 24, with its contact parts 12, 13, 15, 22, move as a unit, both on manual operation and on overload release operation.

We claim:

1. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, and a single spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, the movable contact and the arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker, the spring being connected to the contact operating arm free and independently of the handle, and also being operatively connected to the breaker frame, through a pawl which is held directly by the latch and through which the latch holds the arm.

2. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, and a single spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker, the spring being

connected to the contact operating arm free and independently of the handle.

3. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, and a single spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker, the spring being connected to the contact operating arm free and independently of the handle, and also being operatively connected to the breaker frame.

4. A circuit breaker including a stationary contact and a movable contact, an operator arm therefor, a latch for pivotally supporting and holding said arm at one point, a handle positively connected to said arm at a second point for supporting and holding it and movable to cause the arm to swing around its latch held point and move the movable contact to and from the stationary contact, a spring biasing the arm to swing around the latch as a fulcrum under the control of the connection between the handle and the arm to cause and maintain contact engagement or to separate the contacts, and to swing around that connection as a fulcrum to move the movable contact and open the circuit in the event of latch release, even though the handle be held, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

5. In a circuit breaker, a stationary contact and a movable contact, a movable contact operating arm connected to and controlling movement of the movable contact to and from the stationary contact and thus controlling the engagement of the movable contact with the stationary contact, a latch for said operating arm, spring means for biasing the operating arm in a direction to insure its being held by the latch and the movable contact engaging the stationary contact, a pivotal axis for the operating arm, said axis and said spring means being relatively positioned to provide for rotation of said operating arm about said axis under the influence of the spring means when released by said latch to move the movable contact to a position separated from the stationary contact, and a handle for moving said axis against said spring means to move the operating arm in a direction to insure the movable contact leaving the stationary contact with the operating arm then being held by the latch, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

6. In a circuit breaker, a stationary contact and a movable contact, a movable contact operating arm connected to and controlling movement of the movable contact to and from the stationary contact and thus controlling the engagement of the movable contact with the stationary contact, a latch for said operating arm, spring means for biasing the operating arm in a direction to insure its being held by the latch and the movable contact engaging the stationary contact, a pivotal axis for the movable contact operating arm, said axis and said spring means being relatively positioned to provide for rotation of said operating arm about said axis under the influence of the spring means when released by said latch to move the movable contact to a position separated from the stationary contact, and a handle for moving said axis against said spring means to move the operating arm in a direction to insure the movable contact leaving the stationary contact with the operating arm then being held by the latch, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker, and for moving said operating arm into latching engagement with the latch after an automatic movement of the operating arm causing contact separation, whereby to relatch the operating arm by the latch.

7. A construction of the character described in claim 5 wherein the handle is separate from and independent of the spring means, each providing a force on the operating arm independent of the other.

8. A construction of the character described in claim 5 wherein the axis and the latch are near ends of the operating arm, and the connection between the latter and the movable contact is between the axis and the latch.

9. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, the handle and movable contact being so connected that movement of the handle in one direction causes the movable contact to withdraw from the stationary contact, and movement of the handle in the opposite direction causes the movable contact to approach the stationary contact, and a single overcenter spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, and for causing snap movement of the movable contact to its resting points in "on" and "off" positions, the spring being connected to the contact operating arm free and independently of the handle, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

10. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, the handle and movable contact being so connected that movement of the handle in one direction causes the movable contact to withdraw from the stationary contact, and movement of the handle in the opposite direction causes the movable contact to approach the stationary contact, and a single spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, and for causing movement of the movable contact to its resting points in "on" and "off"

positions, the spring being connected to the contact operating arm free and independently of the handle, the removable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

11. In a circuit breaker, a stationary contact, a movable contact, a spring means connected to the movable contact and arranged to bias it towards the stationary contact when the spring means is in normal stressed position, a latch directly connected to the spring means for holding it under stress in normal contact biasing position, a rotatably mounted handle connected to the spring means and manipulable by rotary movement out of its normal position to stress the spring means and move it bodily out of its normal position and towards the center of rotation of the handle so that when the handle is released after such movement the spring means will tend to relieve itself of its stress with a snap action, the relative arrangement of the parts being such that on such stress relieving movement of the spring means following such handle movement and subsequent release, the spring means will move bodily beyond the center of rotation of the handle and about the connection between the spring means and latch as a pivot, to move the movable contact away from the stationary contact, and also being such that on release of the latch, when the handle and spring means are in normal position, the spring means will tend to relieve itself of its stress with a snap action and in so doing will move bodily about its connection to the handle as a pivot and move the movable contact away from the stationary contact, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

12. In a circuit breaker, a stationary contact, a movable contact, a spring means connected to the movable contact and arranged to bias it towards the stationary contact when the spring means is in normal stressed position, a latch directly connected to the spring means for holding it under stress in normal contact biasing position, a rotatably mounted handle connected to the spring means and manipulable by rotary movement out of its normal position to stress the spring means and move it bodily out of its normal position and towards the center of rotation of the handle so that when the handle is released after such movement the spring means will tend to relieve itself of its stress with a snap action, the relative arrangement of the parts being such that on such stress relieving movement of the spring means following such handle movement and subsequent release, the spring means will move bodily beyond the center of rotation of the handle and about the connection between the spring means and latch as a pivot, to move the movable contact away from the stationary contact, and also being such that on release of the latch, when the handle and spring means are in normal position, the spring means will tend to relieve itself of its stress with a snap action and in so doing will move bodily about its connection to the handle as a pivot and move the movable contact away from the stationary contact, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker, the spring means consisting of a spring and links which connect the spring to the latch and handle.

13. A circuit breaker including a movable contact, a stationary contact, a movable contact operating arm, a handle, and a latch for said arm, the handle and movable contact being so connected that movement of the handle in one direction causes the movable contact to withdraw from the stationary contact, and movement of the handle in the opposite direction causes the movable contact to approach the stationary contact, and a single overcenter spring for biasing the movable contact towards the stationary contact when the parts are in circuit closed position, and for biasing the movable contact away from the stationary contact when the arm is released by the latch, and for causing snap movement of the movable contact to its resting point in "off" position, the spring being connected to the arm free and independently of the handle, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

14. In a circuit breaker, a movable contact, a controlling arm therefor having a pivot point about which it is normally movable, a handle connected to said arm for moving it about said pivot point to the open and to the closed circuit position with a snap action, and support means for said pivot point on said arm including a latch operable upon overload to release and allow movement of said arm, said handle being operable to cause said arm to move into position to be retained by said support means following each release of said arm by said latch, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

15. A circuit breaker comprising fixed and movable contacts, a handle for causing movement of said contacts into engagement, a floating actuating arm between said handle and said movable contact, two points about which said arm may pivot, said arm pivoting about one pivot point during manual operation and about the other point during overload operation, spring means between said pivot points urging said arm to rotate about said points, a latch movable in response to overload currents to remove the support of one of said pivot points and permit pivoting of said arm about said other point and thereby carry said movable contact out of engagement with the fixed contact, said movement of the arm in response to overload currents taking place irrespective of the position in which said handle may be held, and said handle being movable to return said arm to position where it is again supported at said point where support was removed, the movable contact and arm being connected directly at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

16. A circuit breaker having a stationary contact, a movable contact, an operating arm therefor operatively connected at one point to a movable contact, a latch for a second point of said arm, a pivotal axis for said arm at a third point thereof remote from the contact and member interconnection point, spring means biasing said member to establish contact and latching engagement when the circuit is closed, said axis and biasing means being relatively positioned to provide for rotation of said arm by said biasing means about said axis when said arm is released by said latch to separate the movable contact from the stationary contact, and a handle for moving said axis against the influence of said biasing means to separate the movable contact from the stationary contact, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

17. A circuit breaker having a stationary contact, a movable contact formed for butt contact therewith, an operating arm therefor operatively connected at one point to the movable contact, a latch for a second point of said arm, a pivotal axis for said arm, spring means biasing said member to establish contact and latch engagement when the circuit is closed, the butt contact engagement providing a stopping abutment for the force of biasing means when the contacts are engaged, said axis and biasing means being relatively positioned to provide for rotation of said member by said biasing means about said axis when said member is released by said latch to separate the movable contact from the stationary contact, and a handle for moving said axis against the influence of said biasing means to separate the movable contact from the stationary contact, the movable contact and arm being connected directly, at a point remote from the connection of the arm to the handle, so that arm and contact move together on all breaker operations, with said latch comprising the sole overload control for the breaker.

WILLIAM H. FRANK.
JOSEPH A. MESSING.

Disclaimer

2,285,770.—*William H. Frank* and *Joseph A. Messing*, Detroit, Mich. CIRCUIT BREAKER. Patent dated June 9, 1942. Disclaimer filed Jan. 15, 1948, by the assignee, *Bulldog Electric Products Company*.

Hereby enters this disclaimer to claim 2 in said specification.

[*Official Gazette February 17, 1948.*]

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