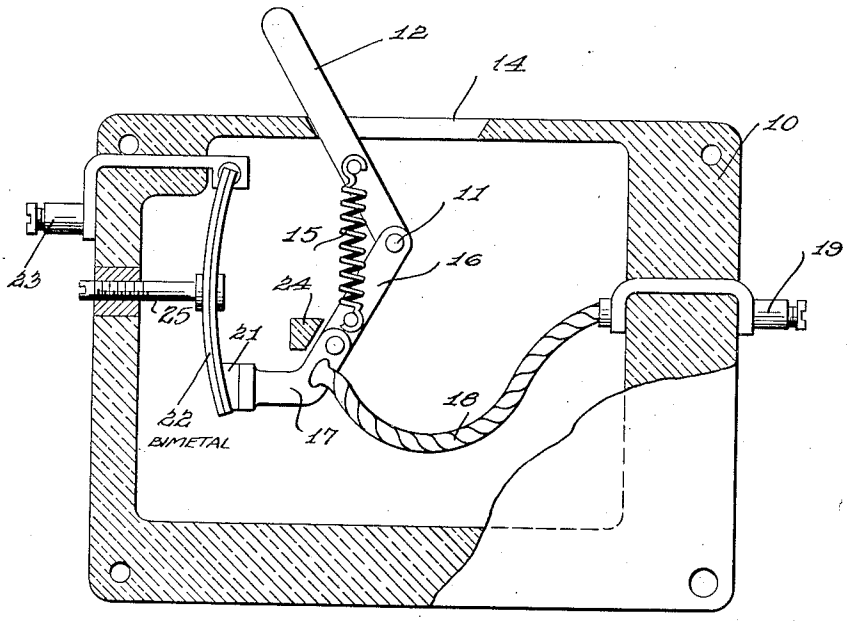
Oct. 7, 1941. R. L. FRANK 2,257,793

CIRCUIT BREAKER

Filed Feb. 3, 1940



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Patented Oct. 7, 1941 2,257,793

UNITED STATES PATENT OFFICE

2,257,793

CIRCUIT BREAKER

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Application February 3, 1940, Serial No. 317,095

12 Claims. (Cl. 200—113)

This application relates to switches or circuit breakers which are manually operable for normal circuit conditions and which open automatically on the arising of a circuit abnormality, such as overload.

A common type of circuit breaker or switch includes engaging contacts, a handle for moving one of them to and from the other, which is stationary, and a spring which tends to move the handle actuated contact out of closed circuit position. This action of the spring is inhibited by a circuit responsive latch which normally holds the contact, but which releases it for spring movement on the arising of an overload.

Another known type, as disclosed in the patent to Evans, No. 1,360,280, includes two movable engaging contacts, one of which is manually movable and the other of which is constructed normally to remain stationary for being engaged by the manually movable contact, but is arranged to move automatically out of its engageable position on the arising of an overload to open the circuit, the manually movable contact then remaining stationary.

This application discloses a breaker of the last mentioned type having novel and desirable features.

One feature is the mounting of the circuit responsive contact directly on a bimetal element, which is connected in circuit so as to be circuit responsive, the contact thus moving in response to circuit conditions.

The bimetal part which mounts the circuit responsive contact hereof is so constructed that its movement, and that of its contact, to and from its rest positions is a snap movement. Further, the bimetal part not only moves its contact out of engaging position automatically, but in addition, returns its contact to engaging position automatically.

Another feature is the provision of a snap action spring arrangement for the handle actuated contact.

The invention will readily be understood upon reference to the embodiment of the invention disclosed in the single figure of the appended drawing which shows a switch casing 10 pivotally mounting, at 11, a handle 12 riding in a slot 14 of the casing and connected by an over-center spring 15 to an arm 16 on which is insulatedly mounted the manually movable contact 17 connected by pig tail 18 to terminal binding post 19.

Adapted to be engaged by contact 17 is a circuit responsive contact 21 mounted on a bimetal snap disc 22 loosely secured at its center 25 to the casing and loosely connected to a binding post 23.

The casing is formed with a stop 24 for determining clockwise movement of arm 16.

In closed circuit position, spring 15 biases parts 12—16 in such directions as to establish contact at 17—21, with handle 12 abutting the end of slot 14.

Movement of handle 12 to the right, reverses parts 12—16 with a snap action to move contact 17 from contact 21. Return movement of handle 12 returns contact 17 to contact 21 with snap action.

On overload, disc 22 will snap and its free part will reverse its position, to separate contact 21 from contact 17. Such action will take place even if the handle 12 be held, mischievously or otherwise. Thereafter, disc 22 when cooled, will snap and return contact 21 to contact 17.

Stop 24 prevents contact 17 from following contact 21 when the latter moves on overload, but permits wear adjustment of the contacts.

Now having described the switch and circuit breaker herein disclosed, reference should be had to the claims which follow:

I claim:

1. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload.

2. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip being so constructed as to impart a snap action movement to the first contact in moving it out of its normal position.

3. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the operating mechanism being so constructed as to give a snap action movement to the second contact in its movements.

4. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal positon on the arising of an overload, the bimetal strip being so constructed as to impart a snap action movement to the first contact in moving it out of its normal position, the operating mechanism being so constructed as to give a snap action movement to the second contact in its movements.

5. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the spring of said mechanism constantly tending to bias the second contact towards and against the first contact when the handle of said mechanism is in the closed circuit position, said mechanism being arranged to permit said second contact to move a limited extent while in engagement with the first contact, towards and beyond the normal closed circuit position of the first contact to compensate for wear of the parts, and a stop for arresting movement of the second contact, while the handle of the mechanism is in circuit closing position, beyond a predetermined point, whereby the second contact will not follow the first contact when the latter is moved away from the second contact on overload.

6. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed circuit position.

7. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed circuit position, with a time delay occasioned by the time which is required for the bimetal strip to cool before it can return the first contact to its normal position.

8. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed circuit position, the spring of said mechanism constantly tending to bias the second contact towards and against the first contact when the handle of said mechanism is in the closed circuit position, said mechanism being arranged to permit said second contact to move a limited extent while in engagement with the first contact, towards and beyond the normal closed circuit position of the first contact to compensate for wear of the parts, and a stop for arresting movement of the second contact, while the handle of the mechanism is in circuit closing position, beyond a predetermined point, whereby the second contact will not follow the first contact when the latter is moved away from the second contact on overload.

9. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed

circuit position, with a time delay occasioned by the time which is required for the bimetal strip to cool before it can return the first contact to its normal position, the spring of said mechanism constantly tending to bias the second contact towards and against the first contact when the handle of said mechanism is in the closed circuit position, said mechanism being arranged to permit said second contact to move a limited extent while in engagement with the first contact, towards and beyond the normal closed circuit position of the first contact to compensate for wear of the parts, and a stop for arresting movement of the second contact, while the handle of the mechanism is in circuit closing position, beyond a predetermined point, whereby the second contact will not follow the first contact when the latter is moved away from the second contact on overload.

10. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the operating mechanism being so constructed as to give a snap action movement to the second contact in its movements, the spring of said mechanism constantly tending to bias the second contact towards and against the first contact when the handle of said mechanism is in the closed circuit position, said mechanism being arranged to permit said second contact to move a limited extent while in engagement with the first contact, towards and beyond the normal closed circuit position of the first contact to compensate for wear of the parts, and a stop for arresting movement of the second contact, while the handle of the mechanism is in circuit closing position, beyond a predetermined point, whereby the second contact will not follow the first contact when the latter is moved away from the second contact on overload.

11. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip being so constructed as to impart a snap action movement to the first contact in moving it out of its normal position, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed circuit position.

12. In a switch, a contact, a bimetal strip directly determining its position, whereby the contact will move automatically on the arising of a circuit overload out of its normal position, a second contact, a spring and handle actuated operating mechanism for moving the second contact to and from the normal position of the first contact, the operative connection between the handle and the second contact being so arranged that the handle thereof may be held without restraining automatic movement of the first contact away from its normal position on the arising of an overload, the bimetal strip being so constructed as to impart a snap action movement to the first contact in moving it out of its normal position, the bimetal strip operating thereafter for automatically returning the first contact to its normal position, in engagement with the second contact, provided the handle of said mechanism has not been moved out of closed circuit position, with a time delay occasioned by the time which is required for the bimetal strip to cool before it can return the first contact to its normal position.

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