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STATIONARY CONTACT STRUCTURE FOR ELECTRICAL CIRCUIT BREAKERS

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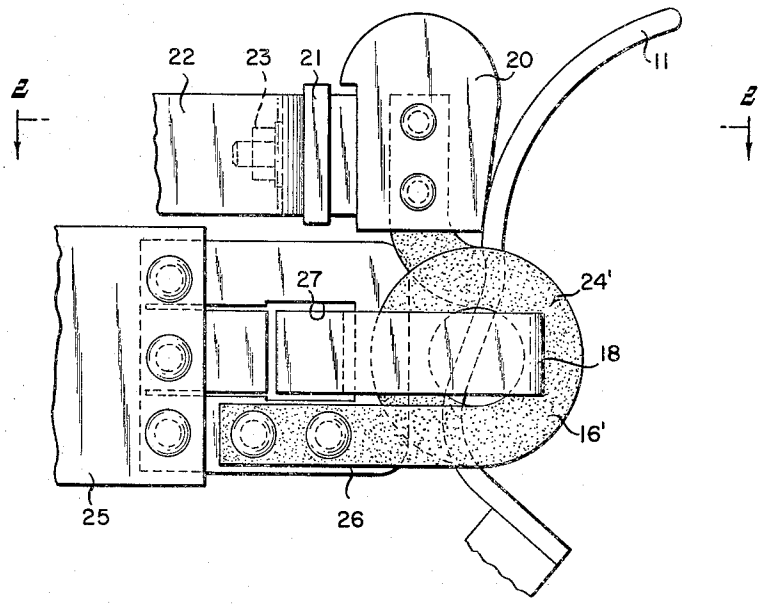
Fig. 1



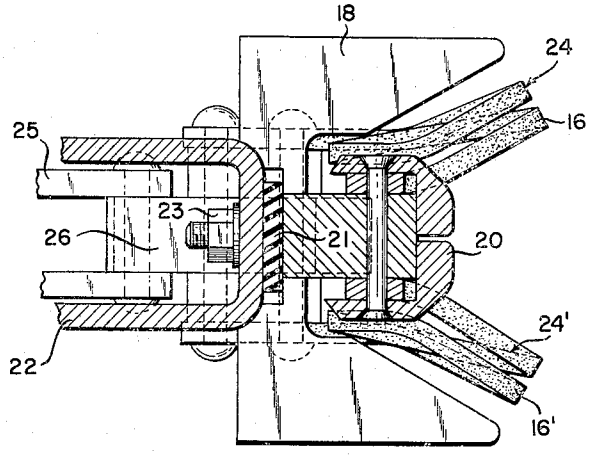


Fig. 2

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3 Claims. (Cl. 200—87)

This invention relates to stationary contacts for electrical circuit breakers and more especially to stationary contacts for high breaking capacity circuit breakers.

In circuit breakers for high breaking capacities, the movable part of the circuit breaker has considerable inertia due to its bulky structure.

To avoid the bruising of the stationary sparking contact and its progressive destruction, under the influence of the shocks imparted by the movable contact, it has been proposed to provide the stationary terminal with a movable contact member supported by said terminal and which can be a main or/and arcing contact bias means whereby electrical connection means are provided between the movable member and the stationary terminal. This stationary contact structure has given good results in absorbing the shock of the movable contact of the circuit breaker, but is unsatisfactory in the case of a circuit breaker having a very high breaking capacity where the spring bias is unable to absorb the total of the kinetic energy of the movable contacts, and cannot eliminate bouncing of the same.

It is an object of the present invention to provide an improved stationary contact structure in which the dangers of bruising and bouncing of the contacts are eliminated or reduced.

With this main object in view, the structure according to the invention includes a contact member resiliently supported by the conductor or conductors electrically connecting said member to the stationary terminal, a resilient abutment being provided so that the kinetic energy imparted to this contact member by the shock of the movable contact at the end of its circuit closing movement is absorbed simultaneously by the resilient conductors and by the resilient abutment.

Another object of the invention is to increase the contact pressure in the closed position of the circuit breaker without further means except these supporting conductors to urge magnetically the movable contact of the circuit breaker toward the stationary contact structure.

The invention will best be understood from a consideration of the following specification of a preferred embodiment thereof given by way of example, and referring to the accompanying drawings, in which:

FIG. 1 shows an elevational view of the pressure contacts according to the invention.

FIG. 2 represents a section along the line II—II of FIG. 1.

The circuit breaker to which the invention is applied comprises a movable contact **11** and a stationary contact **20** which may be shaped as an arcing contact and which is so mounted on the insulator **22** by a bolt **23** that it can perform a limited movement in a direction parallel with the plane in which the movable contact moves. A rubber ring **21** is interposed between the insulator and the contact **20**. The weight of the contact **20** is supported by the upper ends of the conductors **24** and **24'**, each of which is bent to form two turns covered by a layer of insulating material **16**, **16'**. The opposite ends of the conductors are rigidly connected respectively to the contact

20 and to the terminal **25** through the intermediary of a support member **26** having an opening **27** through which a U-shaped magnetic circuit **18** plate passes. The insulator **22** may be independent or may be solidly connected to the terminal **25** or to the insulator supporting the terminal. The stationary conductors **24**, **24'** are so designed, that their elasticity ensures a limited mobility to the contact member **20**. As already known, the current flow in the winding formed by the conductors **24**, **24'** and the current flow in the movable contact **11**, in the closed position of this contact, develop electrodynamic forces which urge the movable contact **11** toward the contact **20**. The number of turns of the winding is chosen in accordance with the desired degree of closing pressure. The magnetic circuit **18** allows the concentration of a magnetic field in the useful part between the windings, where the arc is formed, and tends to displace the arc toward the arcing portions of the contact **11** and **20**.

What is claimed is:

1. A shock absorbing contact for the movable contact arm of a circuit breaker comprising:

(a) a first fixed support

(b) a contact bearing resiliently mounted on said first fixed support and axially reciprocable on said support

(c) a second fixed supported mounted below said first fixed support

(d) resilient spring conductor means connected at one end to said fixed support and at the other end to said contact bearing and extending from said second fixed support to said contact bearing

(e) said spring conductor means having its said other end reciprocable with said contact bearing and its said one end stationary with respect to said second fixed support

(f) said resilient conductor means including coil means positioned between the connected ends of said spring conductor means

(g) said coil means lying in a plane generally projected in the direction of travel of said movable contact arm.

2. A shock absorbing unit as in claim **1** and wherein:

(a) said coil means includes a first coil connected at one end to the right side of said contact bearing and connected at the other end to the right side of said second fixed support

(b) a second coil connected at one end to the left side of said contact bearing and connected at the other end to the left side of said second fixed support

(c) said first and second coils being axially spaced from each other.

3. A shock absorbing unit as in claim **1** and including:

(a) a magnetic core mounted on said second fixed support and having arms extending laterally and alongside said coil means.

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