No. 848,148. PATENTED MAR. 26, 1907.

A. C. WOEHRLE.

CIRCUIT BREAKER.

APPLICATION FILED JUNE 16, 1906.

Fig. 1.

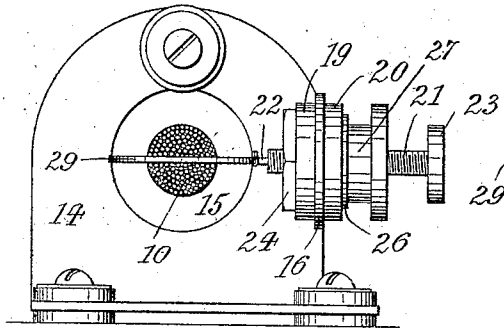


Fig. 2.

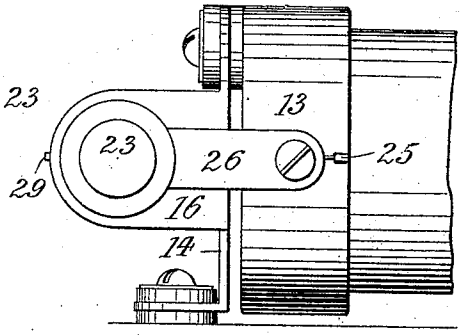


Fig. 3.

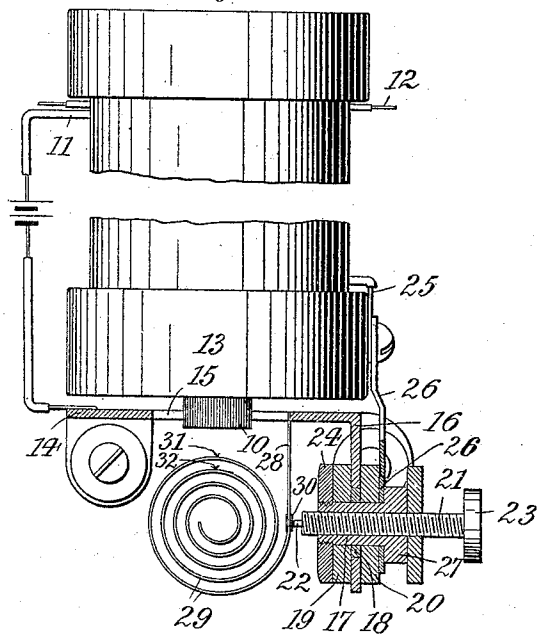


Fig. 4.

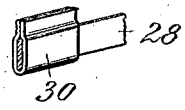


Fig. 5.

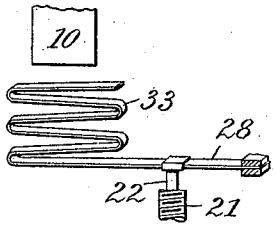
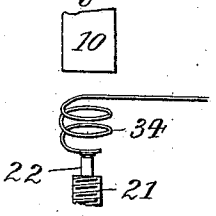


Fig. 6.



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ALBERT C. WOEHRLE, OF NEW YORK, N. Y.

CIRCUIT-BREAKER.

No. 848,148. Specification of Letters Patent. Patented March 26, 1907.

Application filed June 16, 1906. Serial No. 321,955.

To all whom it may concern:

Be it known that I, ALBERT C. WOEHRLE, a citizen of the United States, residing at New York city, Manhattan, county and State of New York, have invented new and useful Improvements in Circuit-Breakers, of which the following is a specification.

This invention relates to a circuit-breaker for induction-coils which is practically noiseless in operation and thus avoids the objectionable buzzing or humming sound heretofore generally inherent in circuit-breakers.

In the accompanying drawing, Figure 1 is a front view of an induction-coil provided with my improved circuit-breaker; Fig. 2, a side view, partly broken away, of the same; Fig. 3, a plan, partly in section, of Fig. 1; Fig. 4, a perspective view of the contact-piece, and Figs. 5 and 6 illustrate modifications of the circuit-breaker.

The numeral 10 indicates the core, 11 the primary coil, and 12 the secondary coil, of an induction apparatus made in the usual manner. To head 13 of the coil is secured a plate 14, having a central opening 15, through which core 10 extends outwardly. Plate 14 is bent at right angles to form an arm 16, which is perforated for the reception of a threaded sleeve 17, such sleeve being insulated from the arm by a yielding washer 18. Arm 16 is flanked by a pair of additional resilient washers 19 20, that surround sleeve 17 and which, in conjunction with washer 18, are designed to form a resilient bearing for the sleeve. The contact-screw 21 is tapped into sleeve 17 and carries at its inner end the usual contact-pin 22, while the position of the screw 21 within sleeve 17 may be regulated by knob 23. A nut 24, fitted upon one end of sleeve 17 and bearing against washer 19, serves to hold the parts in proper position. The sleeve 17 is in metallic connection with end 25 of coil 11 by a metal arm 26, which is perforated to surround the sleeve and contacts with a head 27 of the latter. It will be seen that by the means described a resilient bearing is provided for the contact-screw.

The spring 28 of the circuit-breaker in lieu of carrying a solid or unyielding block, as heretofore, is provided with a curved and resilient head 29, that constitutes the armature. This head is constructed of a thin body of magnetizable material and is preferably integral with spring 28. In this way the armature does not swing as a compact mass, as heretofore, but vibrates within itself, so that the formation of objectionable sound-waves is prevented.

Experience has demonstrated that an armature constructed in the manner described is practically noiseless, the buzzing sound generally observed with the circuit-breakers now in use being entirely overcome. This noiselessness of the operation is assisted by the resilient bearing for contact-screw 21.

It is preferred to construct the armature 29 of a number of coils or folds, so as to obtain a body of magnetizable metal sufficient for the proper attraction by the core 10. Thus, as shown in Fig. 3, a hair-spring is used, which is arranged opposite to contact-screw 21 and with its convolutions in axial alinement with core 10, the number of armature-windings being determined by the power and size of the induction-coil. The contact-piece 30, coöperating with pin 22, is folded around spring 28, Fig. 4, opposite screw 21, and is held in position by being clenched to the spring. If a current is sent through the primary coil, core 10 will alternately attract or release armature 29 in the usual manner.

It will be readily understood that when the front end of core 10 becomes, say, a north pole there will be formed in the outermost or first winding of armature 29 at a point 31 a south pole, while at point 32 of the second winding there will be formed a north pole, and so on, until the whole spiral is magnetized. The magnetizing of spiral 29 will result in drawing the latter away from contact-pin 22, so as to break the circuit in the usual manner.

The form of the armature may be varied without departing from the spirit of my invention. Thus Fig. 5 shows a sinuous or folded spring-armature 33, while Fig. 6 shows a cylindrically-wound spring-armature 34, both of which will operate substantially noiseless.

What I claim is—

1. A circuit-breaker composed of a spring having a resilient and magnetizable head that constitutes the armature, substantially as specified.

2. A circuit-breaker composed of a spring having a curved resilient and magnetizable head that constitutes the armature, substantially as specified.

3. A circuit-breaker composed of a convoluted resilient and magnetizable body, substantially as specified.

4. An induction apparatus provided with a circuit-breaker composed of a convoluted resilient and magnetizable body, substantially as specified.

5. In an induction apparatus, a core and a contact-pin, combined with an armature having resilient convolutions opposite the core, substantially as specified.

6. In an induction apparatus, a core and contact-screw, combined with a yielding bearing for said screw, and with an armature having resilient convolutions opposite the core, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 14th day of June, 1906.

ALBERT C. WOEHRLE.

Witnesses:
WILLIAM SCHULZ,
FRANK V. BRIESEN.