C. C. BADEAU.

AUTOMATIC CIRCUIT BREAKER.

APPLICATION FILED FEB. 17, 1911.

1,166,650.

Patented Jan. 4, 1916.

Fig. 1

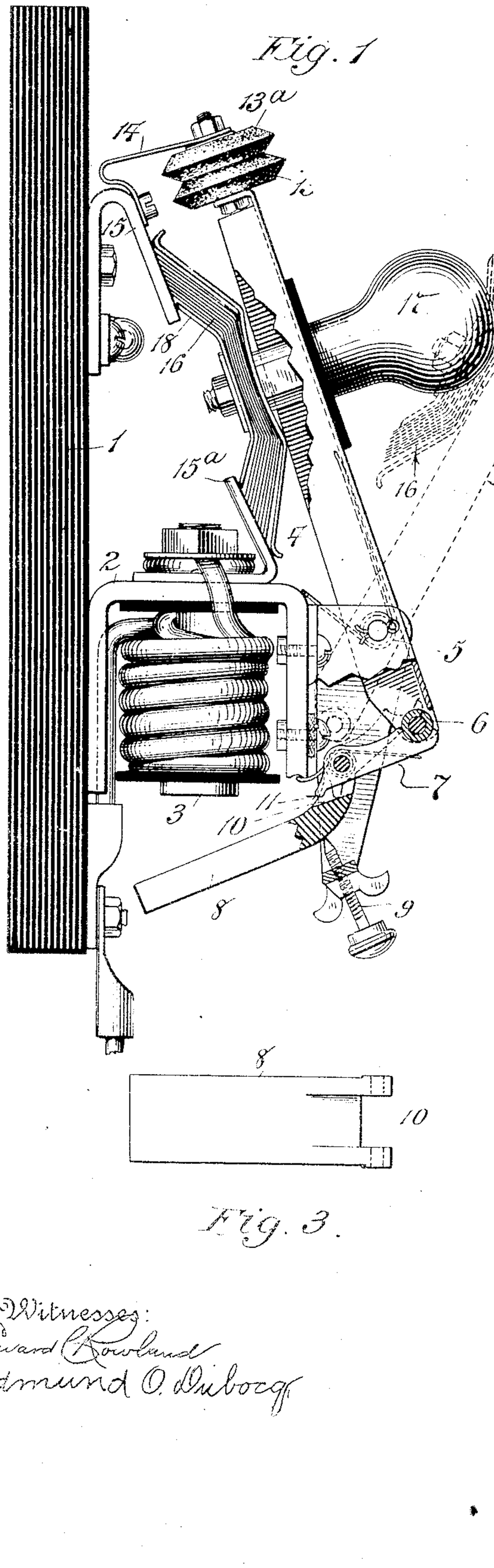


Fig. 2.

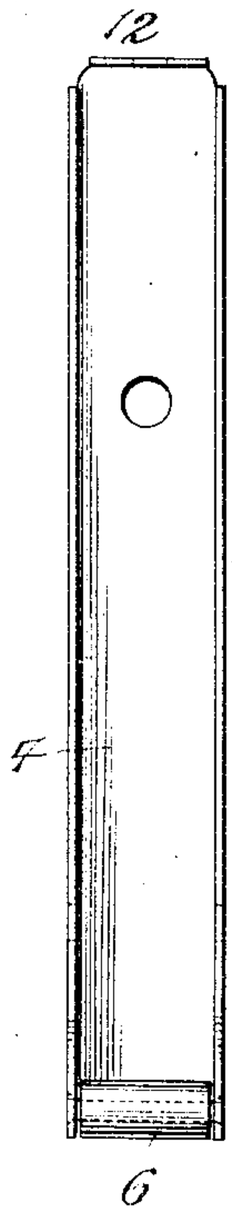
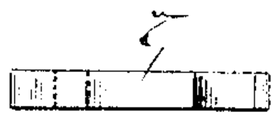


Fig. 3.

Fig. 4



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UNITED STATES PATENT OFFICE.

CHARLES C. BADEAU, OF WINTHROP, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

AUTOMATIC CIRCUIT-BREAKER.

1,166,650. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed February 17, 1911. Serial No. 609,131.

To all whom it may concern:

Be it known that I, CHARLES C. BADEAU, a citizen of the United States, residing at Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Circuit-Breakers, of which the following is a full, clear, and exact specification.

This invention relates to an automatic switch or a circuit breaker of durable construction, efficient operation and simplicity and cheapness of manufacture.

One feature of the improvements involves the mounting of a trip magnet in a vertical position and supporting the switch lever and trip mechanism thereon outwardly from the panel or supporting board, and an arrangement of the fixed contact or contacts by which the circuit is made and broken at an inclined position with respect to the face of the support so that the switch arm in the closed position of the breaker folds inwardly toward the board, the result being that when the breaker opens a wide break is secured, without the arm projecting far beyond the plane of the switchboard. In other words, the breaker performs its functions with a wide angular movement within a small vertical and horizontal compass.

The invention embodies various structural features improving the operation and durability of the breaker, which will be more fully hereinafter described and which will be definitely pointed out in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of a circuit breaker embodying my improvements. Figs. 2, 3 and 4 are detached views of parts of the breaker.

Referring to the drawings, 1 represents a supporting panel of slate or other good fireproof insulating material. On the face of the panel is secured a copper yoke 2, on which is mounted a soft iron magnet core 3. On the outer side of the yoke 2 is a pivoted switch arm 4 journaled in a bracket mounted on the yoke, the arm being pivoted near its end so that the yoke may act as a stop to arrest the movement of the arm when released and thrown to its open position by a coiled spring 5, the free end of which bears against the support and the other is attached to the movable arm. The rear end of the arm is provided with a roller 6 coöperating with an arc-shaped recess in the end of a spring-pressed latch 7 to hold the switch arm in closed position. A gravity controlled armature 8 mounted on the same pivot as the latch 7 may be adjusted relatively to the field of the magnet 3 by means of a calibrating screw 9 supported in the outer end of the bracket. The armature 8 is forked, as indicated in Fig. 3, its arms being drilled to rock on a pivot and has a beveled face 10 lying, when the parts are assembled, in operative relation to the heel 11 of the latch 7. The latching mechanism thus described is of cheap construction but is rugged and very easily tripped, since the arc shaped shoulder lying at a right angle to the roller cannot be jarred loose, but when the armature is attracted leaves the roller with complete freedom, making the latch easy to trip. The switch arm 4 is formed of sheet metal stamped in U-shape, as indicated in Fig. 2, and provided with a bent end 12 on which is fastened by a screw a disk of hard carbon 13 forming one of the shunt contacts. The coöperating shunt contact 13^a is mounted on a leaf spring 14 fastened to the fixed contact 15. The latter is bolted to the support or panel and has its engaging face lying at an incline to the face of the panel, as indicated in Fig. 1. The coöperating brush contact 15^a is mounted on the magnet yoke 2 and has a similar coöperating face also at an angle to the panel and in substantial alinement with the contact 15. The laminated brush 16 formed of a bundle of thin phosphor-bronze leaves is clamped on the switch arm, and a wooden knob or handle 17 carries a threaded stud on which the brush is bolted.

18 is a stiff piece of brass on the underside of the brush so supported that it forms a stop by engaging the contact faces of 15, 15^a and acts to prevent undue straining of the brush leaves when the breaker is forcibly closed. Thus, no matter how violent the operator's movement may be the brush can only be given a definite amount of strain when the stiff brass plate 18 will arrest further movement. This feature is of very great and practical importance, as circuit breaker brushes are very commonly weakened by forcible circuit closure, and the brush efficiency is very much reduced; moreover, a too forcible closure of the switch

arm cannot permit the roller to overshoot the proper engaging position for the latch, and the latter will always engage with certainty when the breaker is closed.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. An automatic circuit breaker comprising a trip coil mounted with its magnetic axis parallel to the supporting board, a U-shaped frame embracing and supporting said coil, one side of said frame being secured to the supporting board, the other side extending outwardly from the supporting board, a switch arm pivoted on said frame, a laminated bridging member carried by said switch arm on one side thereof, a handle stationarily carried by said switch arm on the opposite side thereof, a contact fixed to said frame and having its engaging surface inclined to the face of the supporting board, a second contact fixed to the supporting board and having its engaging surface in substantially the same plane as the engaging surface of said first named contact, said contacts coöperating with said laminated bridging member, a spring pressed latch pivotally supported by said frame, and a pivoted gravity armature in the magnetic field of the coil and carried by said frame.

2. A circuit breaker provided with a switch arm, a laminated brush, and a stiff leaf in the brush adapted in full closing position of the circuit to form a stop to prevent the brush being strained and arrest the breaker in latching position.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES C. BADEAU.

Witnesses:

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