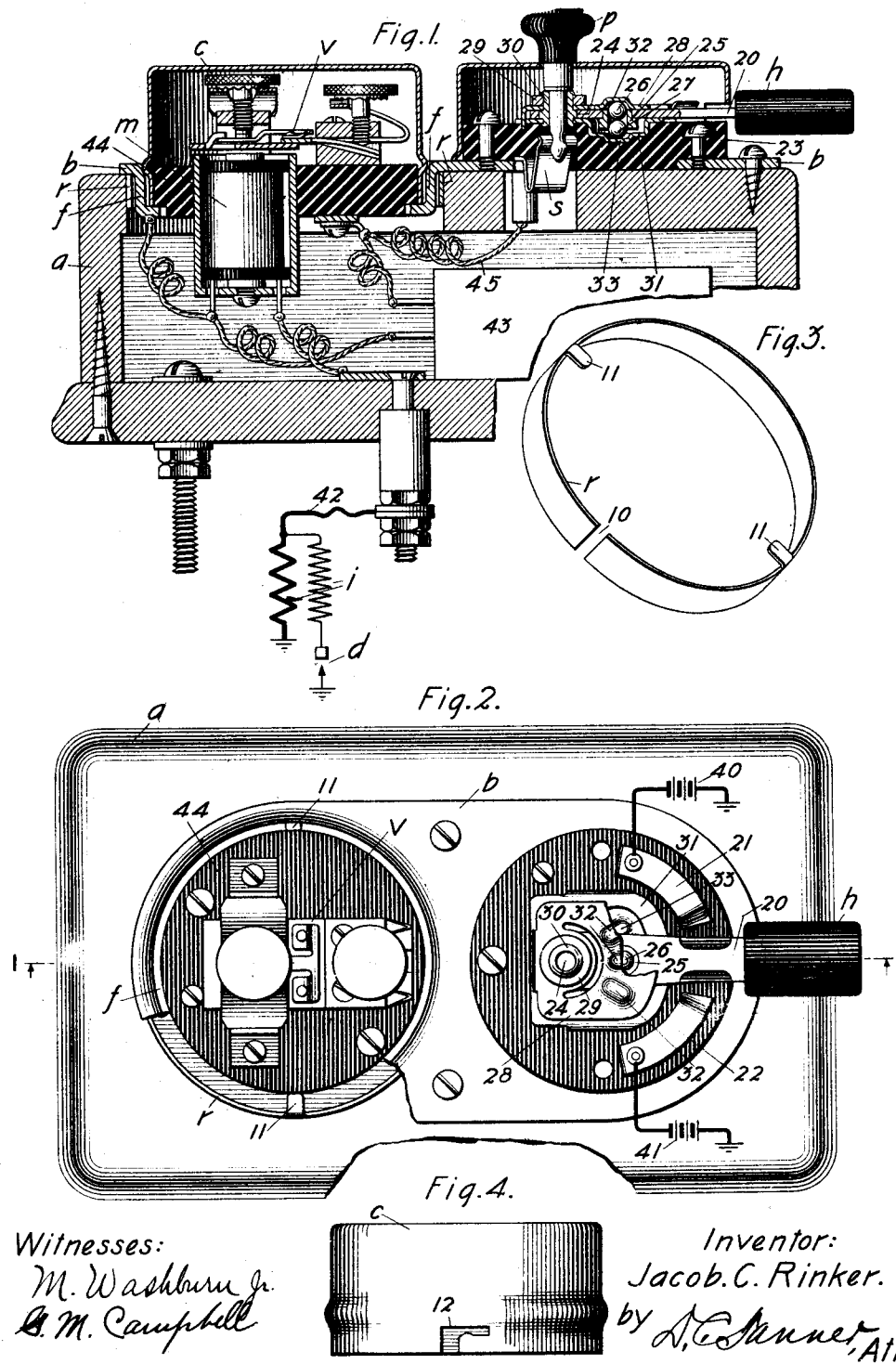


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ELECTRICAL SWITCHING APPARATUS.
APPLICATION FILED NOV. 1, 1910.

1,066,051.

Patented July 1, 1913.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL SWITCHING APPARATUS.

1,066,051.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed November 1, 1910. Serial No. 590,139.

To all whom it may concern:

Be it known that I, JACOB C. RINKER, citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Electrical Switching Apparatus, of which the following is in full, clear, concise, and exact description.

This invention relates to electrical switching apparatus.

The object of this invention is to provide a manually operated switch with ball bearings for the movable contact so arranged that said contact will hold any electrical contact position to either close or open a circuit.

Another object of the invention is to provide a novel means for applying a cover or inclosure for an electrical switching apparatus which may be dust and moisture proof, while it is easily removed and replaced, and may be held firmly in position.

The invention provides a pair of anti-friction polished metal balls arranged to move with the movable contact and a track consisting of two metal surfaces, one of which is yielding or resilient. These are located above and below the path of movement of the balls and the track is notched or indented so that the balls enter registering depressions in the upper and the lower track, one of said track members yielding to permit the movement from one depression to another. The switch is provided with a split ring having a pair of diametrically opposite radial projections extending toward the center. This ring holds its position by reason of its friction with the surrounding wall in the base and is adapted to receive and removably hold a cover having notches adapted to engage with the described radial points or projections.

The accompanying drawings illustrate the invention:

Figure 1 is a vertical section of the switch and the cover, the latter applied to a vibratory circuit breaker; the section is taken on the section line shown in Fig. 2 looking in the direction of the arrows. Fig. 2 is a plan view of the switching apparatus with the covers removed. Fig. 3 shows the split ring and Fig. 4 shows the cover.

The switch has a plurality of contacts 20, 21, 22. 21 and 22 are fixed contacts composed of spring metal riveted to the base

piece 23. The movable contact 20 is pivoted at 24 on a cylindrical pivot through which passes the switch plug *p* to engage the flat spring *s*. The movable contact 20 is perforated to receive and firmly hold a cylindrical section 25 in which are superposed polished metal anti-friction balls 26 and 27. The ball 26 moves with the contact 20 in engagement with the surface of a track 28 of spring metal firmly held by the washer 29 and the cylindrical section 30 which is upset at its opposite ends like a rivet. This cylindrical section 30 constitutes the pivot on which the movable member 20 with its insulating handle *h* turns. The ball 27 moves in engagement with a metal track 31 formed of sheet brass bent to form a channel and set in the base 23. This base 23 is of insulating material and is located on a metal base piece *b* secured to the box *a* by screws. The box *a* is designed to contain a condenser and other apparatus to be referred to. At corresponding or registering points in the tracks 28 and 31 are notches, indentations, or depressions 32, 33, and these registering notches are located with respect to the electrical contact positions of movable contact 20 so that when contact 20 is in either the "on" or the "off" position it will be held against accidental movement, but in such a yielding manner that the pressure of the hand will easily change it. In passing from one position to another the superposed anti-friction balls press the resilient track 28 upward; these balls 26 and 27 sink into the notches or depressions, and resilient track 28 always maintains a suitable pressure on the balls so as to yieldingly confine them. Movable contact 20 is electrically connected to the vibratory circuit breaker *v*. The fixed contact 21 is connected to an electric generator 40 which is grounded, and the fixed contact 22 is connected to a generator 41 which is grounded, the purpose of the switch being to connect either one battery or the other, as required, in circuit with the vibratory switch *v*. This vibratory circuit breaker *v* is operated by the electromagnet *m* located in the box *a* and included in the circuit 42 with the induction coil *i*, operating an igniting device *d*. The vibratory switch or circuit breaker *v* automatically makes and breaks the circuit 42, and the vibratory break point is bridged by a condenser 43 to be located in the box *a* in a

more well understood. There is a flanged cover *c* inclosing the vibratory switch *v*, which is located on an insulating base 44 in a flange *f* of the sheet metal base *b*. There is a bayonet joint uniting this cover with the base *b* and for this purpose a flat split metal ring *r* (Fig. 3) having lugs 11, and a split or point of separation at 10 is employed. This is located in position and retained on the base where it encircles the flange *f*. The cover *c* is shown in Fig. 4 with the usual arrangement of notch for the bayonet joint. This notch is duplicated at diametrically opposite points and the two notches 12 engage with the lugs 11 projecting through flange *f*, while the split ring *r* yields to accommodate itself to its position on the flange *f*. Conductor sections, like 45, unite the various elemental parts in circuit with the vibrator *v*, in manner well known.

What I claim and desire to secure by Letters Patent is:—

1. The combination in a switching apparatus, of an electrical contact, a complementary, movable contact, means for con-

fining a pair of superposed balls on said movable contact with their opposite surfaces exposed, a track for said balls located on one side, and a resilient track for said balls located on the opposite side of the path of said balls.

2. In a switching apparatus, the combination of a plurality of contacts, one of said contacts being relatively movable, and means for holding said movable contact in either of two positions, consisting of a cell supported by said movable contact; a pair of superposed balls confined in said cell, a contact surface having notches or depressions on one side of said balls and a resilient contact plate having corresponding notches or depressions located on the opposite side of said balls.

In witness whereof, I, hereunto subscribe my name this 28th day of October A. D., 1910.

JACOB C. RINKER.

Witnesses:

IRVING MACDONALD,
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