No. 892,576. PATENTED JULY 7, 1908.

W. W. BROWN.

TIME LIMIT CIRCUIT CLOSER.

APPLICATION FILED DEC. 26, 1907.

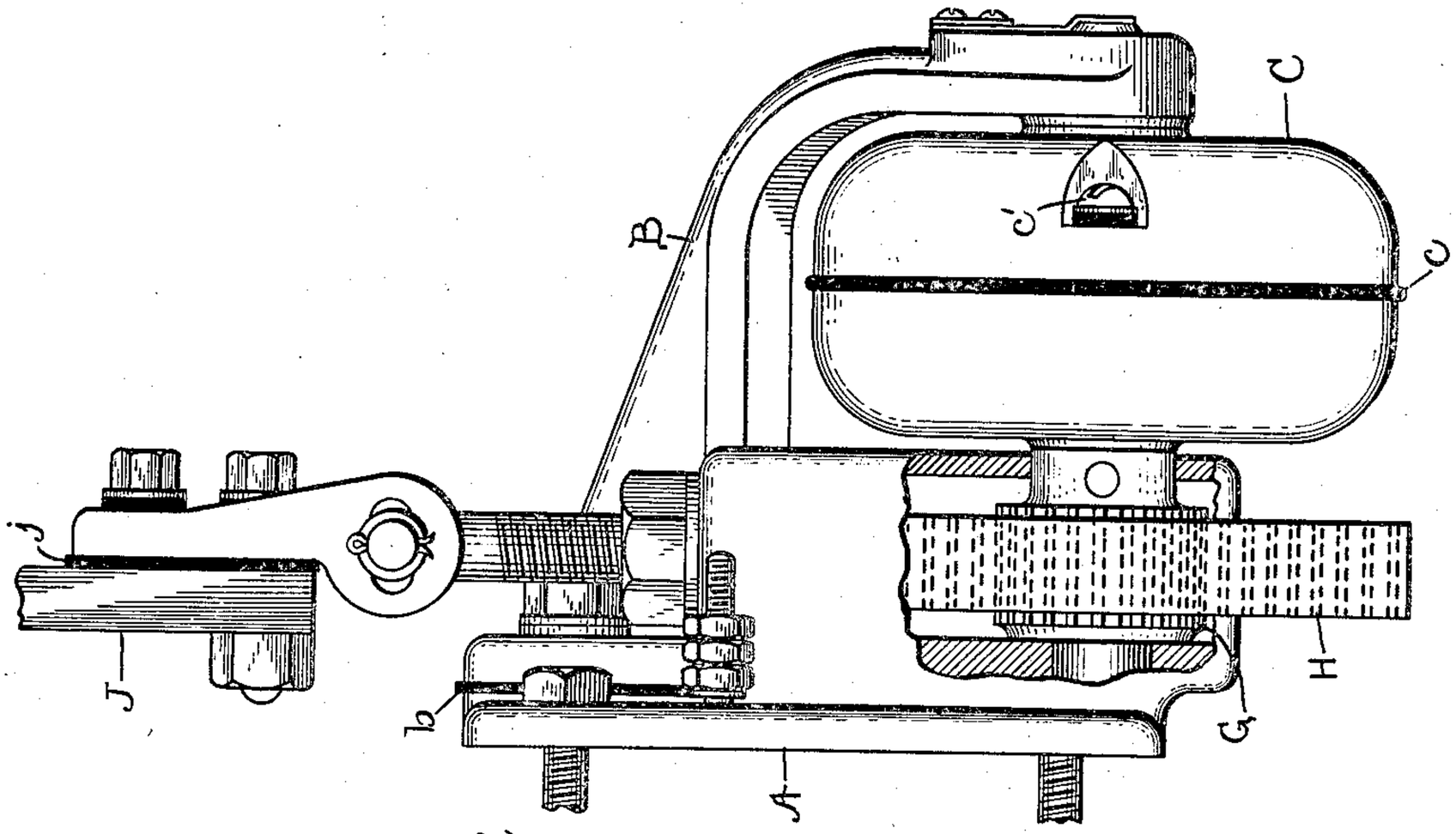

Fig. 2

Fig. 1

WITNESSES:
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UNITED STATES PATENT OFFICE.

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TIME-LIMIT CIRCUIT-CLOSER.

No. 892,576. Specification of Letters Patent. Patented July 7, 1908.

Application filed December 26, 1907. Serial No. 408,175.

To all whom it may concern:

Be it known that I, WALTER W. BROWN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Time-Limit Circuit-Closers, of which the following is a specification.

My invention relates to circuit-closers of the mercury type, and is particularly applicable to time-limit circuit-closers for use in connection with controlling apparatus for railway appliances, as described in an application for Letters Patent, Serial No. 400,646, filed by H. C. Williams and F. B. Harrington, November 4, 1907, assignors to the General Electric Company, although my invention is not necessarily limited to this particular application.

My invention consists of a novel construction of the circuit-closer, such that both flexible leads and sliding contacts are avoided, and that the circuit closer is not only completely inclosed to protect it from injury from outside, but is also so supported as to be protected from fracture by the movement of the mercury within the circuit closer.

My invention will best be understood by reference to the accompanying drawings, in which

Figure 1 shows a front elevation, partly in cross-section, of a circuit-closer constructed in accordance with my invention, and Fig. 2 shows a side elevation of the same.

In the drawing, A represents a supporting plate or base, on which is mounted a bracket B, which is insulated from the plate A by insulation *b*.

C represents the casing of the circuit-closer, which is formed in two cup-shaped metallic sections insulated from each other by a ring *c* of insulating material, and clamped together by insulated screws or bolts c^1. The metallic sections and insulated ring form together a completely closed casing protecting the circuit closer from external injury. The casing is rotatably mounted in bearings formed by the base A and bracket B, respectively.

D represents a vessel of glass or other suitable insulating material, which, as indicated in Fig. 1, is secured within the casing C by cement, which serves both to support the glass vessel and to protect it from fracture from internal impact due to the quick movement of the mercury from one end of the glass vessel to the other. This vessel D comprises two chambers connected by a large opening *d* and a restricted opening *d'*, and contains a quantity of mercury.

E represents circuit terminals extending into one of the chambers of the vessel D. When the circuit-closer is in the position shown in Fig. 1, the terminals E are electrically connected by the mercury. If the circuit-closer is rotated ninety degrees in a clockwise direction, the mercury flows through the large opening *d* into the other chamber quickly breaking the circuit. Then if the circuit-closer is returned to its original position, the mercury slowly returns through the restricted opening *d'*. By this arrangement of openings a time-element is introduced into the operation of the circuit-closer.

The circuit terminals E are electrically connected to the two opposite sections of the metallic casing C, and binding posts F F' are mounted on the plate A and bracket B, respectively. With this arrangement, if the binding posts are connected to the external circuit, current will flow through one bearing of the circuit-closer, and through one section of the casing to a terminal E of the circuit-closer. A similar circuit exists from the other binding post to the other terminal, so that the device is placed in circuit without flexible leads or collector rings.

The device may be operated in any suitable manner, as, for instance, by a pinion G attached to the casing C and a rack H connected to the operating member J, and insulated therefrom by the insulating plate *j*. Upon the upward or downward movement of the member J, the circuit-closer is rocked from one position to the other.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A circuit closer, comprising bearings insulated from each other, a device journaled in said bearings comprising a pair of metallic members secured to but insulated from each other, a ring of insulating material clamped between said members and forming therewith a completely closed casing, a mass of cement inclosed within said casing, a vessel embedded in said cement and containing circuit terminals and a conducting fluid, and

connections from said terminals to said metallic members.

2. A circuit closer, comprising bearings insulated from each other, a device journaled in said bearings comprising a pair of cup-shaped metallic members, and a thin ring of insulating material clamped between and separating said members and forming therewith a completely closed casing, a mass of cement inclosed within said casing, a vessel embedded in said cement and containing circuit terminals and a conducting fluid, and connections from said terminals to said metallic members.

3. A circuit closer, comprising bearings insulated from each other, a device journaled in said bearings comprising a pair of metallic members secured to but insulated from each other, a ring of insulating material clamped between said members and forming therewith a completely closed casing, a mass of cement inclosed within said casing, a vessel embedded in said cement and containing circuit terminals and a conducting fluid, connections from said terminals to said metallic members, and terminal binding posts secured to the bearing members.

4. A time-limit circuit-closer, comprising bearings insulated from each other, a metallic casing formed in sections insulated from each other, a vessel containing a conducting fluid and having two chambers connected by a large and a restricted opening, circuit terminals in one of said chambers, and connections from said terminals to the sections of said casing.

5. A time-limit circuit-closer, comprising a rotatably mounted metallic casing, a vessel embedded in cement within said casing containing a conducting fluid and having two chambers connected by a large and a restricted opening, and circuit terminals in one of said chambers.

In witness whereof, I have hereunto set my hand this 23rd day of December, 1907.

WALTER W. BROWN.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.