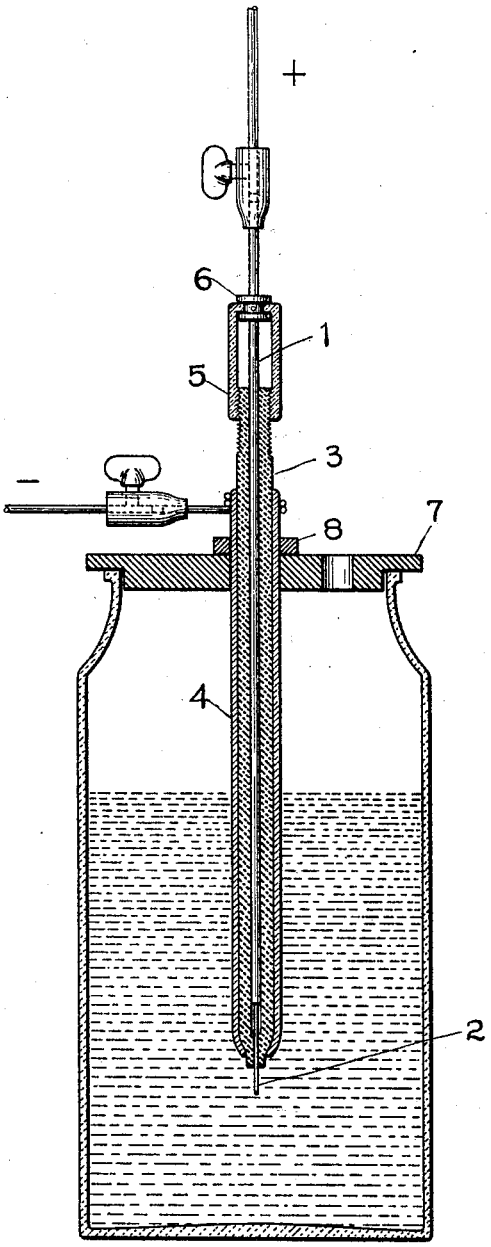
No. 649,015. Patented May 8, 1900.

E. THOMSON & R. SHAND.

CURRENT INTERRUPTER.

(Application filed Mar. 8, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, AND ROBERT SHAND, OF LYNN, MASSACHUSETTS, ASSIGNORS TO THE GENERAL ELECTRIC COMPANY, OF NEW YORK.

CURRENT-INTERRUPTER.

SPECIFICATION forming part of Letters Patent No. 649,015, dated May 8, 1900.

Application filed March 8, 1900. Serial No. 7,780. (No model.)

To all whom it may concern:

Be it known that we, ELIHU THOMSON, residing at Swampscott, and ROBERT SHAND, residing at Lynn, county of Essex, State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Current-Interrupters, (Docket No. 1,271,) of which the following is a specification.

This invention relates to automatic interrupters for electric currents, commonly called "electrolytic" interrupters, the object being to provide an organization of great simplicity of construction and facility of adjustment of the anode-surface of the interrupter, compact relation of the operating parts, and facility of introducing or withdrawing them from the liquid conductor.

In carrying out our invention we mount the anode and cathode on a common frame so related that both electrodes may be withdrawn from the liquid and cleaned or inspected and adjusted relatively to one another, so as to vary the extent of the anode exposure. The construction we prefer to employ consists of a non-conducting supporting-tube, such as hard rubber, through which extends a copper rod or wire, terminating at its end in a platinum tip of smaller cross-section, which protrudes through a closely-fitting opening in the end of the insulating supporting-tube, a lead tube or other metal tube constituting the cathode surrounding the outside of the insulating-support and having its lower end in close proximity to the platinum anode. The upper end of the insulating supporting-tube is screw-threaded and coöperates with a nut connected with a grooved ring fastened to the rod or wire, the organization being such that when the nut is turned the copper rod, and with it the platinum anode, is shifted in the supporting-tube, permitting the extent of its exposure to the liquid conductor to be varied. Each of the electrodes is provided with a terminal, by which the interrupter may be included in an electric circuit, and a washer of soft rubber is provided on the outside of the tubular cathode, by which the extent of immersion of the interrupting element may be varied in the liquid conductor. As thus organized the interrupter element may be mounted on a wooden cover or other support, by which it may be suspended within a wide-necked bottle or jar, in which the liquid conductor or electrolyte may be placed. By such an organization the essential parts of the interrupter are reduced to a very small compass, and the device may be readily inspected or cleaned for adjustment or removal from the conducting-bath and an organization very convenient for storage when not in use is provided.

The invention comprises, therefore, an element for a liquid current-interrupter in which the anode and cathode are mounted on a common frame relatively adjustable, so as to vary the extent of exposure of the anode. It comprises also an interrupter element of the kind described in which the anode is inclosed within the cathode and movable therein for purposes of adjustment to its exposed surface.

It comprises also other features, which will be more particularly hereinafter pointed out and will be definitely indicated in the claims appended to this specification.

In the accompanying drawing, which illustrates our invention, 1 represents a conducting rod or wire, which may be conveniently a copper wire, to the lower end of which is attached in good conducting relation, as by welding or soldering, a thinner wire 2, of platinum. A supporting-frame, which may be a tube of insulating material or a tube lined with insulating material, incloses the copper wire, as indicated at 3, the lower end of the support being provided with an opening forming a close fit for the platinum wire 2. We prefer to form this support of hard rubber, though any organization by which that part of the anode and its connected conductor which enters the conducting liquid is protected from contact with the liquid may be provided. The main portion of the inclosing tube might even be formed of soft rubber. The tip of the support 3 is contracted in diameter, and on the outside is carried a tubular shell 4, which forms the cathode of the interrupter and which may be made of sheet-lead or a leaden tube, the lower end of which is in close proximity to the tip of the support

through which the anode projects. The upper end of the support should be rigid and is provided with a screw-thread, coöperating with a corresponding thread, and an adjusting-nut 5, the upper end of which carries a yoke engaging a grooved collar 6, fastened to the copper wire. Thus an adjustment of the nut 5 moves the anode with relation to the support and permits the platinum tip to be protruded to a greater or less extent from the tip of the support. The amount of such protrusion varies the rate of interruption of the circuit in which the interrupter element is included. To the upper end of the cathode 4 is secured a conductor, which may be soldered or otherwise connected in good electric relation thereto. A simple and effective construction may be provided by winding a wire several times about the tube and soldering it fast. The circuit-terminals may be connected to the two electrodes by binding-posts or connectors, as indicated in the drawing. The element may be suspended in the conducting liquid by a cover 7 or any other form of support through which the element passes loosely and is held suspended by a soft-rubber washer 8. If a solid cover be employed, one or more openings may be made to permit escape of the gases formed when an electrolytic bath is employed. When using the element, it may be suspended over the neck of a wide-mouthed bottle or jar in which a conducting liquid is placed. The latter may be of any suitable character—such, for example, as a solution of sulfuric acid in water.

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

1. An element for an automatic current-interrupter comprising an anode and cathode mounted on a common frame, the former being protected from access of the liquid conductor except at its tip, and means for adjusting it to vary the extent of exposed surface.

2. An element for an automatic current-interrupter comprising an anode within a tubular inclosure, a cathode supported on the outside of said inclosure, means for insulating the two electrodes from one another, and adjusting devices for varying the extent of exposed anode-surface.

3. An element for an automatic current-interrupter comprising a tubular insulating-support, an anode extending therethrough, adjusting devices for varying the extent of projection of the anode from the support, and a tubular cathode mounted on the outside of the support.

4. An element for an electrolytic interrupter, comprising a tubular insulating-support, an anode extending therethrough, an adjusting-nut on the top of the support for varying the extent of projection of the anode, and a tubular cathode on the outside of the support having its lower end in juxtaposition to the exposed part of the anode.

5. An element for an electrolytic interrupter comprising an insulating supporting-tube, a conductor of base metal extending therein, a platinum wire mounted on the end of the conductor and extending through the insulating-support, means for adjusting the extent of protrusion of the platinum wire, and a cathode mounted on the outside of the tubular support.

6. An element for an electrolytic interrupter comprising a tubular cathode, an anode extending therethrough, but insulated therefrom, a perforated tip through which the anode extends, an adjusting device for varying its amount of protrusion, and an elastic washer on the outside of the anode to support the element on the cover of a vessel containing an electrolyte.

In witness whereof we have hereunto set our hands this 5th day of March, 1900.

ELIHU THOMSON.
ROBERT SHAND.

Witnesses:
DUGALD MCKILLOP,
JOHN MCMANUS.