

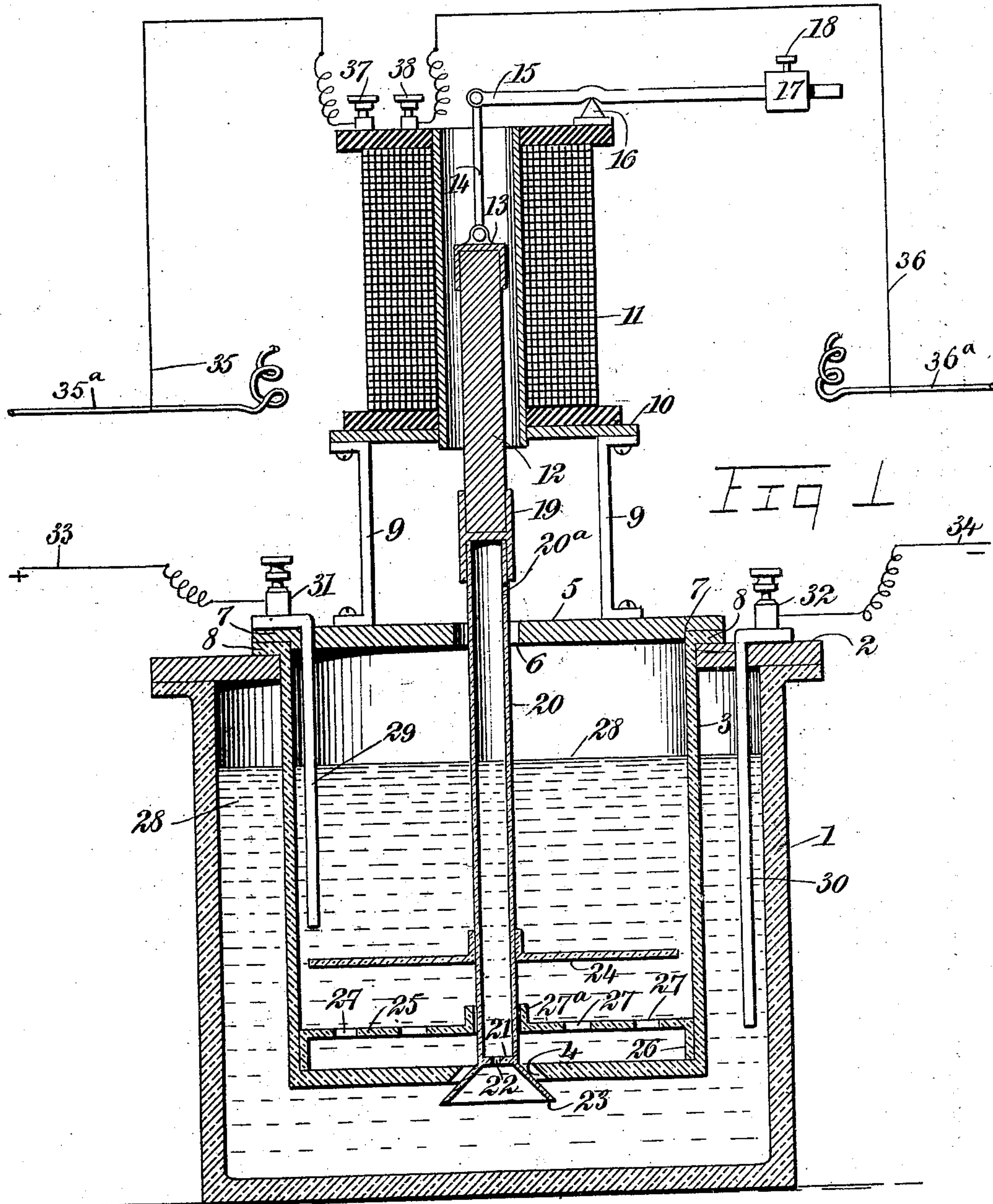
No. 756,605.

PATENTED APR. 5, 1904.

E. DYSTERUD.
CURRENT REGULATOR.
APPLICATION FILED JUNE 9, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

H. Walker
W. Harrison

INVENTOR

Emil Dysterud

BY

Munn & Co.
ATTORNEYS.

No. 756,605.

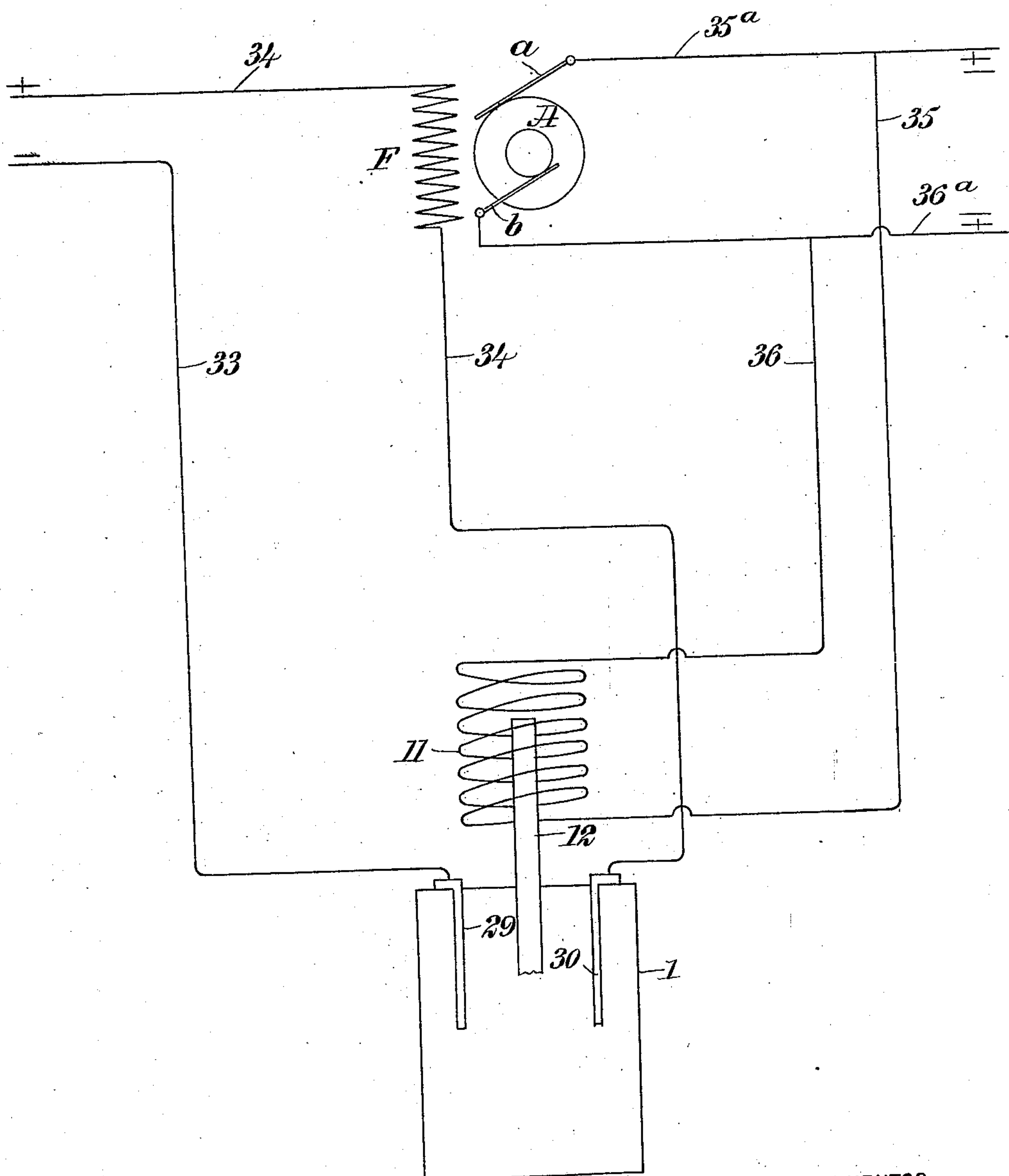
PATENTED APR. 5, 1904.

E. DYSTERUD.
CURRENT REGULATOR.
APPLICATION FILED JUNE 9, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig 2



WITNESSES:
H. Walker
W. Harrison

INVENTOR
Emil Dysterud
BY *Mumme*
ATTORNEYS

UNITED STATES PATENT OFFICE.

EMIL DYSTERUD, OF MONTEREY, MEXICO.

CURRENT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 756,605, dated April 5, 1904.

Application filed June 9, 1903. Serial No. 160,704. (No model.)

To all whom it may concern:

Be it known that I, EMIL DYSTERUD, a citizen of the United States, and a resident of Monterey, in the State of Neuva Leon and Republic of Mexico, have invented a new and Improved Current-Regulator, of which the following is a full, clear, and exact description.

My invention relates to an automatic current-regulator, my object being to produce a neat, simple, and efficient form of regulator which will require a minimum of attention and which is not liable to get out of order.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows an outer containing vessel provided with a removable top or cover, preferably of annular form, as shown; and Fig. 2 shows a diagram of the wiring.

Mounted within a vessel 1, of insulating material, and depending from a cover 2 is an inner vessel 3, the said vessels being made of suitable material not easily attacked by the electrolyte. The bottom of the inner vessel 3 is provided with a frusto-conical cavity 4, forming a valve-seat, as hereinafter more fully described. The vessel 3 is provided with a cover 5, having a central aperture 6 and an annular groove 7 for engaging a flange 8, integral with the inner vessel 3.

Mounted upon supports 9 on the cover 5 is a plate 10, supporting a solenoid 11, provided with an iron core 12, which depends from a cap 13, this cap being supported by a pitman 14, which depends from a balanced beam or lever 15, supported upon a knife-edge 16. An adjustable weight 17, provided with a screw 18, is used for counterbalancing the core 12 and may be moved along the beam 15, so as to adjust the amount of current passing through the electrolyte with a given amount of current through the solenoids. Mounted upon the lower end of the core is a thimble connection 19, to which is rigidly connected a tube 20, of insulating material of a kind not readily attacked by the electrolyte. The lower end of this tube is provided with a partition 21, having an opening 22 therein, and is also provided with a frusto-conical valve 23, which loosely engages the frusto-conical open-

ing 4 in the inner vessel 3, and mounted upon the tube 20 is a dasher 24.

A false bottom 25 is provided for the inner vessel 3 and is supported immediately adjacent to the bottom thereof by an annular flange 26. This false bottom 25 is provided with openings 27, through which the liquid 28 in the vessel 3 is free to circulate, and is provided with an annular bead 27^a for guiding the tube 20.

Electrodes are shown at 29 and 30 and are provided, respectively, with binding-posts 31 32. The wires 33 34 are connected serially with the field-magnets of the dynamo and engage directly the binding-posts 31 32. A pair of parallel wires 35 36 run from the main wires 35^a 36^a to the binding-screws 37 38, which form the terminals of the solenoid 11. By this arrangement the solenoid is connected in parallel with the main circuit. I do not limit myself to this arrangement, however, for obviously the solenoid may be connected in any other manner desired.

The instrument may be connected with a current-meter, if desired.

The operation of my device is as follows: The several parts being arranged as shown and described, the field-current, which is ordinarily a direct current, passes in series through the wires 33 34 and by means of the electrodes 29 30 through the liquid 28. Another current, shunted from the current being generated, passes through the solenoid 11. This energizes the solenoid, causing the core 12 to ascend, thereby elevating the tube 20 and raising the valve 23. The dasher 24, working in connection with the inner vessel 3, acts as a species of dash-pot and prevents the valve 23 from closing too suddenly. The openings 27 in the false bottom 25 permit a free circulation of the liquid. The bead or guide-sleeve 27^a serves to maintain the tube 20 centrally within the opening 4. The partition 21, provided with the opening 22, likewise serves as a dash-pot, the idea being that a small portion of the liquid is in the tube 20, and this portion of the liquid must ooze gradually through the opening 22, though of course the column of liquid within the tube 20 may be lifted slightly with reference to the

liquid 28. An air-hole 20^a allows the liquid to move up and down relatively to the tube 20. The valve 23 now being open to an extent commensurate with the power of the current passing through the solenoid, the bulk of the series or exciter current is of course free to pass through the liquid 28, and this represents the normal condition of the device while the current is flowing. If now from any cause the power of the main current be increased, the solenoid 11 acts more powerfully upon the core 12, causing the same to ascend slightly, thereby virtually constricting the opening 4, and thus cutting down the area of the liquid surface through which the main current is free to flow. The result is that the direct or series current passing through the liquid 28 is cut down, its resistance being virtually increased by the partial closing of the opening 4. When, however, the strength of the main current drops down below a certain predetermined normal, the valve 23 opens wide, owing to the weakness of the pull by the solenoid 11 upon the core 20, and the opening 4 being thereby virtually enlarged by the lowering of the valve 23, the quantity of the available current passing through the instrument is virtually increased.

Of course the instrument works best where the variations in current strength are comparatively slight; but it may nevertheless be used to advantage whether the variations are considerable or are abrupt.

The instrument serves to render the potential of the current being generated substantially constant.

Of course, if desired, the wires 33 34 may constitute a shunt from the series or exciting current where such current is very heavy. This may be desirable where there is considerable electrolytic action upon the liquid 28, causing the same to disintegrate and form gases, thereby wasting such current as passes through the instrument.

The liquid 28 is preferably a dilute solution of sulfuric acid; but I do not limit myself to any solution for the purpose.

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

1. A current-regulator, comprising a plurality of vessels connected together by an opening and free to contain a conducting liquid, a portion of which is disposed within said opening, and electrically-operated mechanism controllable by variations in the current, for governing the capacity of said opening.

2. A current-regulator, comprising outer and inner vessels, the inner vessel being provided with an opening, current-operated mechanism for governing the capacity of said opening, and electrodes disposed in said outer and inner vessels respectively.

3. A current-regulator, comprising an outer containing vessel, an inner vessel depending into said outer vessel and provided with an opening, a movable member for partially obstructing said opening, magnetic mechanism controllable by variations in the strength of the current for actuating said movable member, electrodes connected with said outer and inner vessels respectively, and means for energizing said electrodes and said magnetic mechanism.

4. A current-regulator, comprising an outer containing vessel, a smaller vessel mounted within said outer vessel and provided with an opening, a movable valve for closing said opening, magnetic mechanism for actuating said movable valve, electrodes mounted within said inner and outer vessels respectively, and electric connections between said electrodes and the field of the machine to be regulated.

5. In a current-regulator, the combination of a plurality of vessels connected together by an opening and free to contain a conducting liquid, a valve for partially closing said opening, and dash-pot mechanism for preventing abrupt movements of said valve.

6. In a current regulator, the combination of electrolytic vessels connected together by an opening, a member for partially closing said opening, magnetic mechanism controllable by the current for actuating said member, and means, controllable at will, for governing the sensitiveness of said magnetic member.

7. In a current-regulator, the combination of a pair of vessels communicating with each other by means of an opening, a valve for partially closing said opening, magnetic mechanism provided with an armature for actuating said valve, a lever connected with said armature, and a slidable weight mounted upon said lever and adjustable relatively thereto, for the purpose of governing the sensitiveness of said armature.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL DYSTERUD.

Witnesses:

C. D. BAXTER,

MANUEL FREVINO LAGOS.