

L. S. CHAPMAN.

RHEOSTAT.

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917,000.

Patented Apr. 6, 1909.

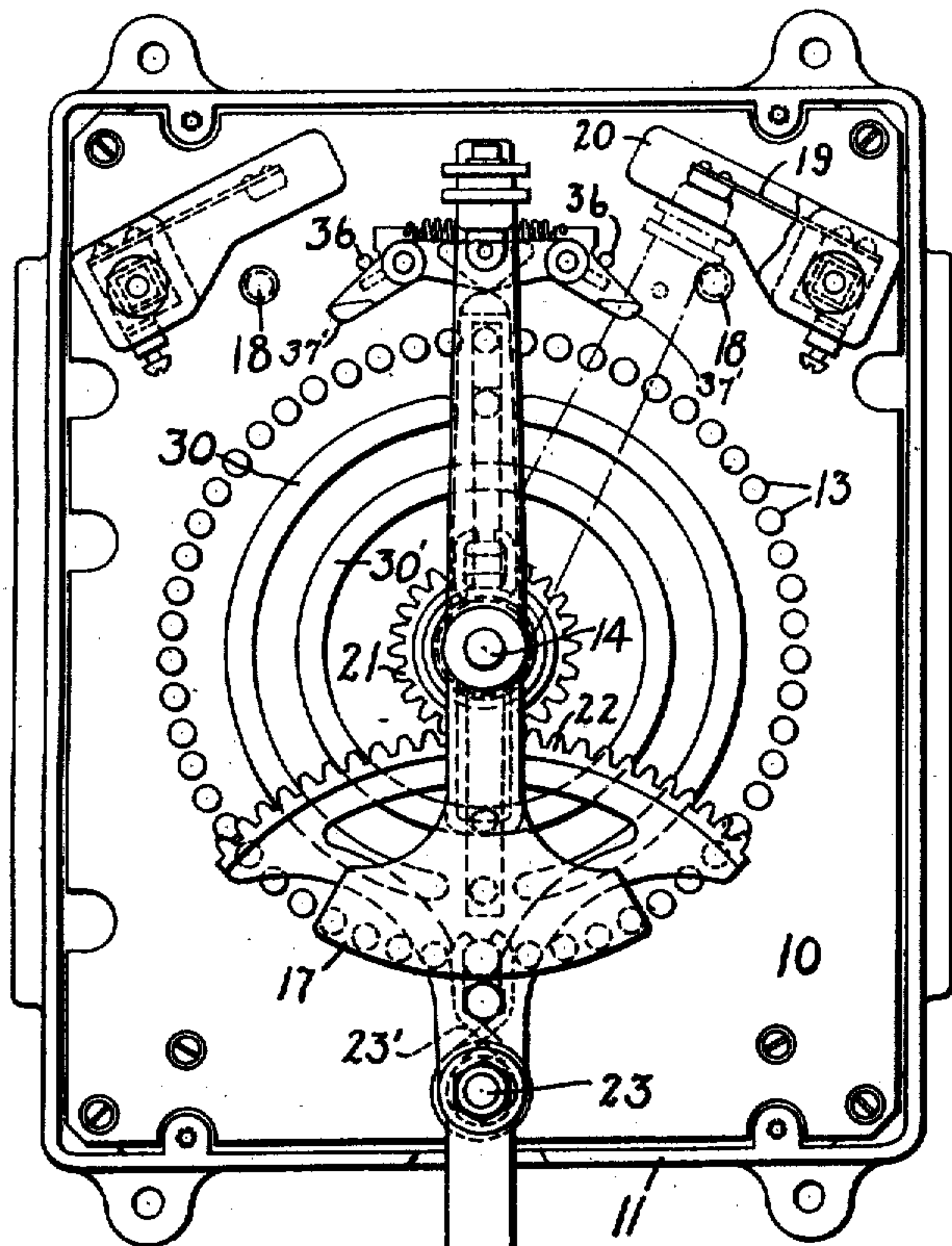


Fig. 1

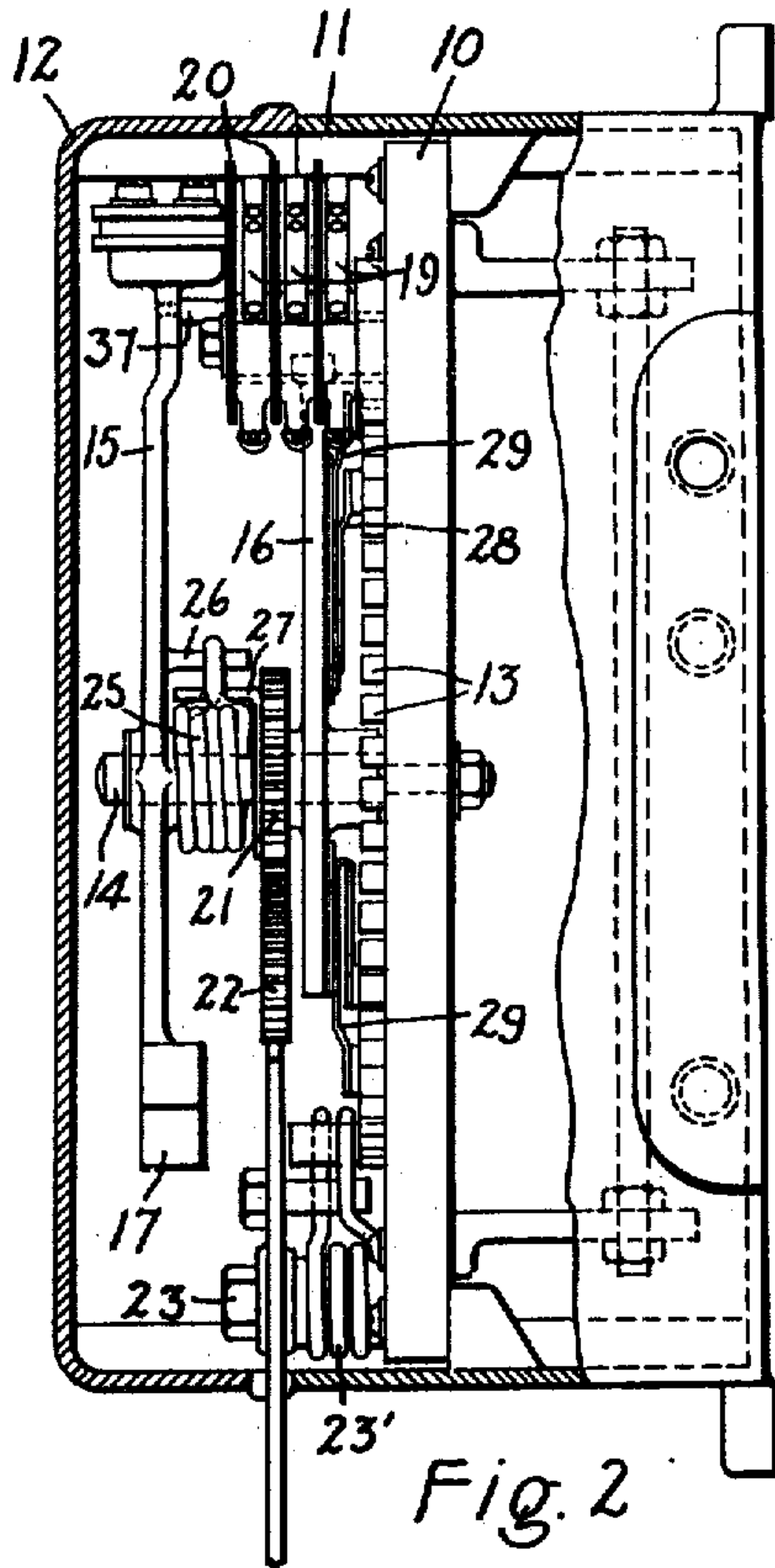


Fig. 2

24

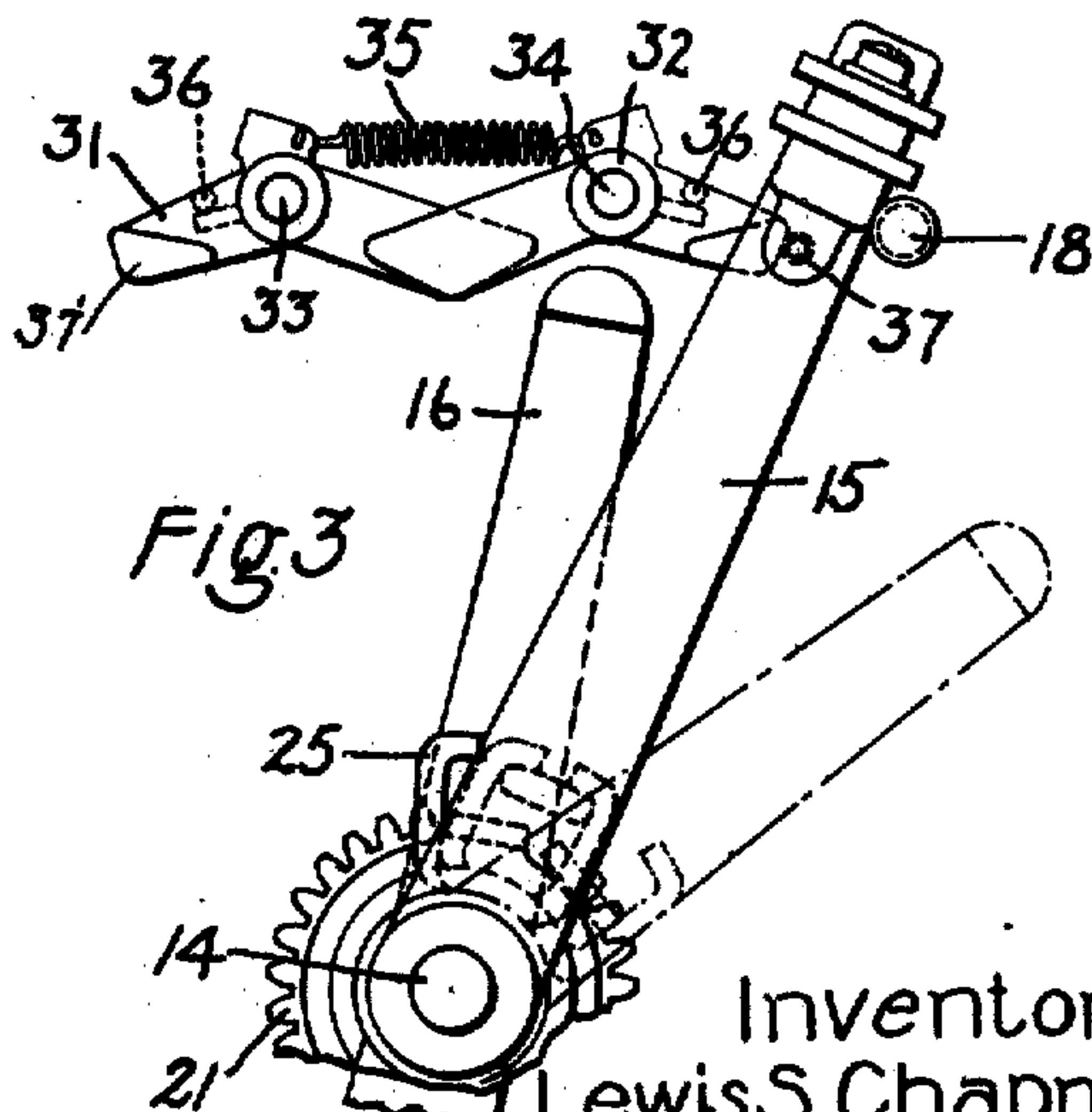


Fig. 3

Witnesses:

Lloyd C. Bush  
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Att'y.



# UNITED STATES PATENT OFFICE.

LEWIS S. CHAPMAN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## RHEOSTAT.

No. 917,000.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed June 24, 1908. Serial No. 440,075.

*To all whom it may concern:*

Be it known that I, LEWIS S. CHAPMAN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to devices for controlling electric circuits, and has for its object the provision of means whereby dynamo electric machines, such as motors and generators, may be controlled in a reliable and efficient manner.

In the accompanying drawing in which I have shown my invention embodied in concrete mechanism for purposes of illustration, Figure 1 is a plan view of the complete rheostat; Fig. 2 is a sectional view of the same; and Fig. 3 is a detail of the controlling arms and tripping mechanism.

Referring to the drawing, 10 is an insulating base of slate or soapstone mounted within a casing 11, preferably of metal, having a removable cover 12. A series of resistance contact studs 13 is mounted in a circle upon the base. At the center of this circle is a stud 14 upon which are mounted two controlling arms, one of which is a switch arm 15 and the other a controlling arm 16 adapted to engage the studs 13. The switch arm 15 is pivoted to move freely upon the stud 14 and is counterweighted at 17. The free end of this arm is arranged to close a circuit when moved in either direction against the stops 18. The particular form of contacts adapted to engage this switch arm forms no part of my invention, but for purposes of illustration I have shown three spring contacts 19 separated by insulating plates 20. The arm 16 likewise moves upon the pivot 14 and has secured thereto a gear 21 adapted to engage a segmental rack 22 having its center at 23 and adapted to be rotated by means of a handle 24. The rack is given a bias to the position shown in the drawing by means of the double-acting spring 23'. The two arms 15 and 16 are spring-pressed together by means of the double-acting spring 25 having its ends engaging the lugs 26 and 27 upon the arms 15 and 16 respectively. The arm 16 is likewise provided with spring contacts 28 and 29 adapted to engage the segments 30 and 30'. Situated adjacent to the initial position of the controlling arms is a latching mechanism

composed of two levers or latches 31 and 32. These latches are of the bell-crank shape and have their pivotal points 33 and 34 respectively on opposite sides of the initial position of the arm. The adjacent arms of these levers overlap each other and a spring 35 presses them against the stops 36, which is the position shown in Fig. 3. The inner arms of these levers are adapted to be engaged by the controlling arm 16 to move them against the tension of the spring 35. A pin 37 is mounted on the arm 15 so as to be engaged by the outer end of the levers to hold the arm against the stops 18. It will be noted that the outer ends of the levers are provided with raised portions 37' so placed that the pin 37 depending from the arm 15 passes freely above the levers except when in engagement with said projections.

The operation of the device is as follows: When the handle 24 is turned in either direction, as for instance to the right in Fig. 1, the gear 21 will be rotated carrying with it the arm 16 as well as the arm 15. As soon as the arm 15 moves against the stop 18 so as to close a circuit at the contacts 19, the latch will be moved up by the spring 35 so as to hold it in position shown in Fig. 3. The rotation of the arm 16 will now be continued in the same direction as shown in dotted lines in Fig. 3, thereby putting a tension upon the spring 25. The arm 16 may be moved 180°, if desired, over the studs to vary the resistance. If the handle 24 is released or is moved so as to bring the parts back to their initial position, the arm 15 will be held by the latch until the arm 16 returns to its initial position thereby passing the arm 15 and reversing the tension of the spring. When the arm 16 reaches the initial position, the latch is moved to the position shown in Fig. 1 thereby releasing the arm 15 and allowing it to return to the initial position with a quick movement. This causes the circuit of contacts 19 to be quickly broken so as to avoid the drawing of a long arc. The same sequence of operations will occur if the handle is moved in the opposite direction.

While I have shown my invention embodied in concrete mechanism and operating in a definite manner for purposes of illustration, it should be understood that I do not limit my invention thereto except in so



far as it is limited by the scope of the claims annexed hereto.

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

5 1. A rheostat comprising a pair of circuit controlling arms yieldingly held together, mechanism for moving said arms together up to a predetermined position and then continuing the movement of one arm, and a  
10 latch arranged to prevent the return of one arm from the predetermined position until the other arm returns and trips the latch.

2. A rheostat comprising a switch arm and a controlling arm yieldingly held together,  
15 a switch member arranged to be engaged by the switch arm after a predetermined movement, mechanism for moving both arms together until the switch is closed and then continuing the movement of the controlling  
20 arm, and a latch for the switch arm arranged to be tripped by the controlling arm.

3. A rheostat comprising a pair of circuit controlling arms yieldingly held together, mechanism for moving said arms together  
25 up to a predetermined position and then continuing the movement with one arm in the same direction, and a latch arranged to prevent the return of one arm from the predetermined position until the other arm re-  
30 turns and trips the latch.

4. A rheostat comprising a pair of concentrically pivoted circuit controlling arms spring-pressed toward each other, mechanism for moving said arms together up to a  
35 predetermined position and then separating the arms against the spring tension, and means for holding one of said arms in a predetermined position until the other arm returns and reverses the tension of the spring.

40 5. A rheostat comprising a pair of concentrically pivoted circuit controlling arms yieldingly held together and both biased toward an initial position, mechanism for moving said arms together up to a predetermined  
45 position in either direction and then continuing the movement with one arm in the

same direction, and a latch arranged to hold the first arm in the predetermined position until the second arm reaches the initial position and trips the latch.

6. A rheostat comprising a switch arm and a controlling arm concentrically pivoted and spring-pressed toward each other, mechanism for moving said arms together until the switch arm is positively stopped in a prede-  
55 termined position to close a circuit and then continuing the movement of the controlling arm, and a latch for preventing the return of the switch arm arranged to be tripped by the controlling arm when the latter reaches  
60 the initial position.

7. A rheostat comprising a switch arm and a controlling arm concentrically pivoted and spring-pressed toward each other, mechanism for moving said arms together in either  
65 direction until the switch arm is positively stopped in a predetermined position to close a circuit and then continuing the movement of the controlling arm in the same direction, and a latch for preventing the return of the  
70 switch arm arranged to be tripped by the controlling arm when the latter reaches the initial position.

8. A rheostat comprising a switch arm and a controlling arm concentrically pivoted and  
75 spring-pressed toward each other, a spring-returned rack for moving said arms together in either direction until the switch arm is positively stopped in a predetermined position to close a circuit and then continuing  
80 the movement of the controlling arm, and a latch for preventing the return of the switch arm arranged to be tripped by the controlling arm when the latter reaches the initial position.

In witness whereof I have hereunto set my hand this 22nd day of June, 1908.

LEWIS S. CHAPMAN.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.