

No. 747,821.

PATENTED DEC. 22, 1903.

H. B. WILSON.
STARTING RHEOSTAT.

APPLICATION FILED AUG. 21, 1902.

NO MODEL.

Fig. 1.

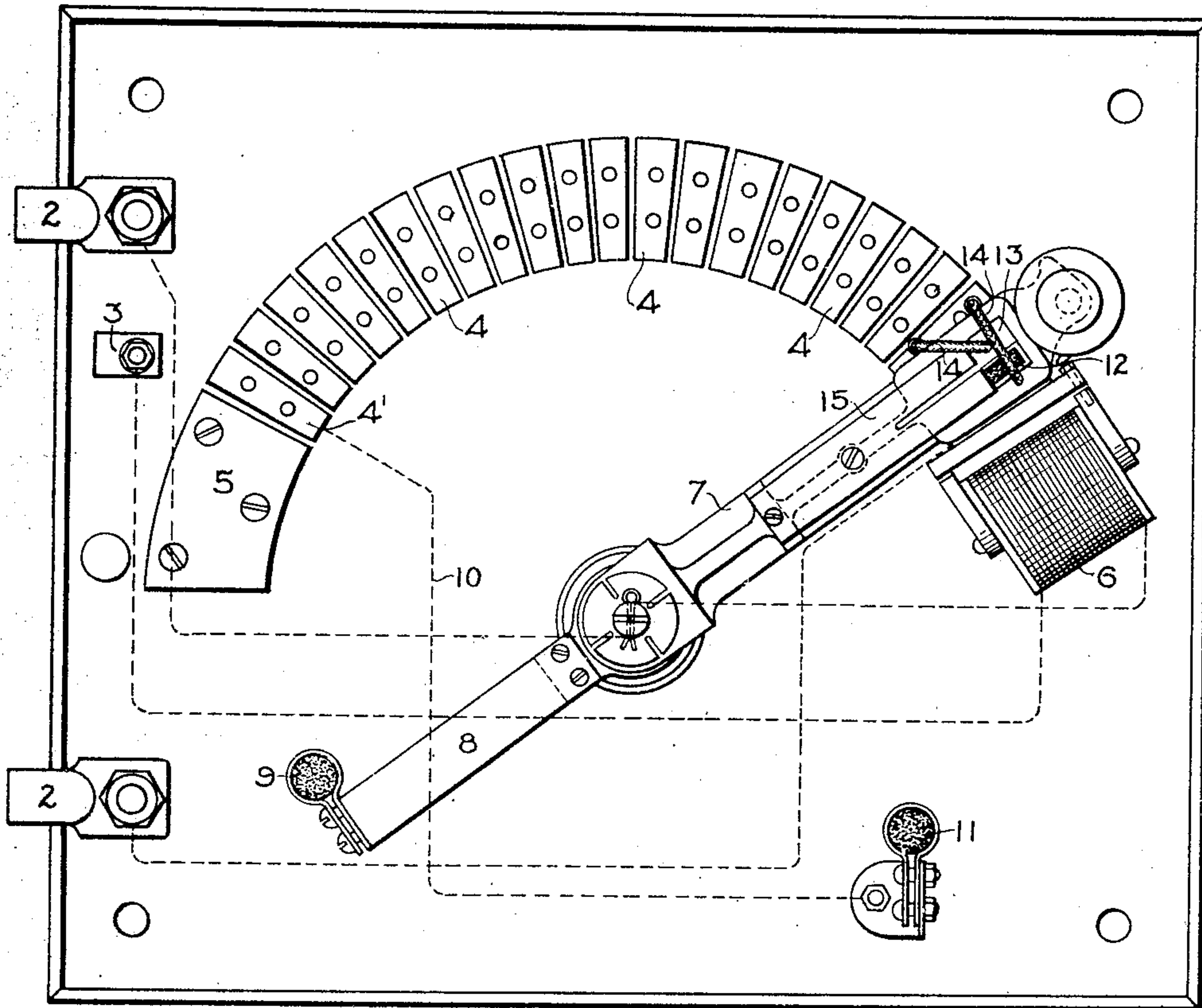


Fig. 2.

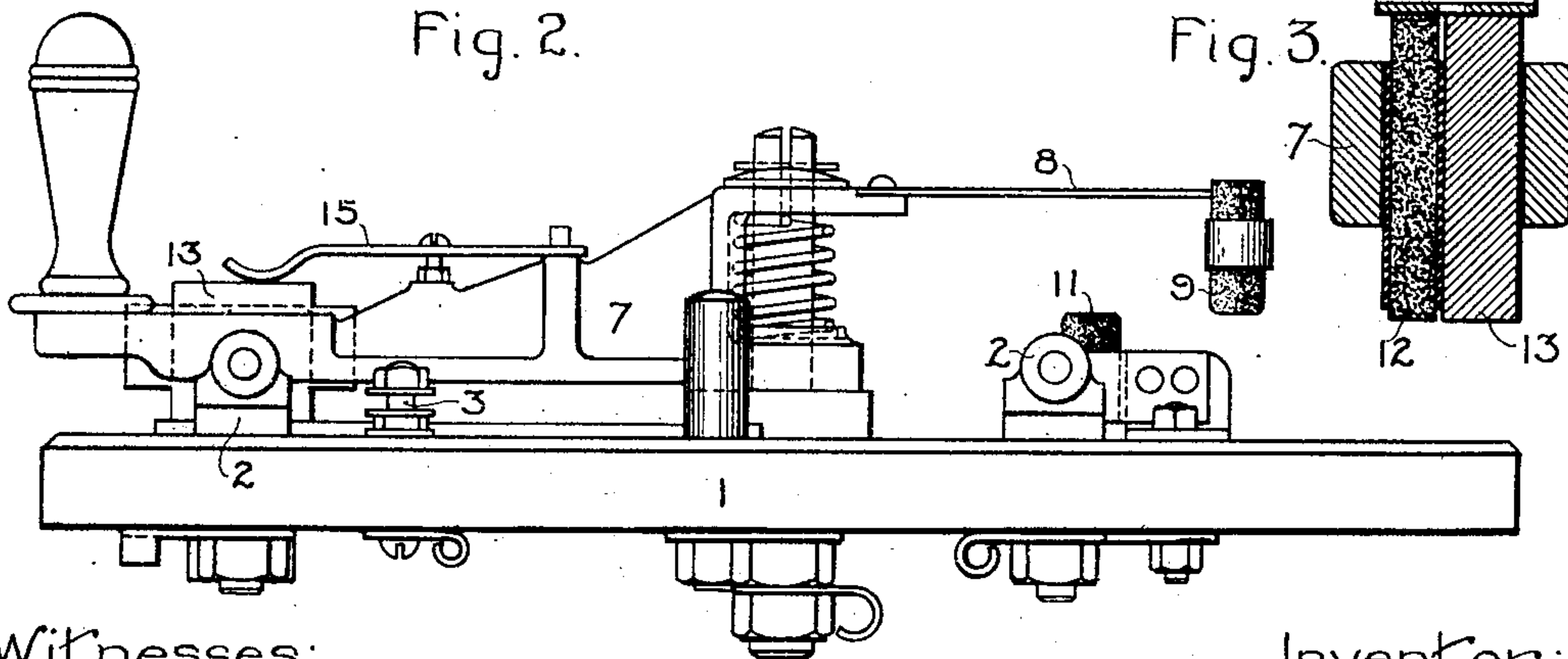
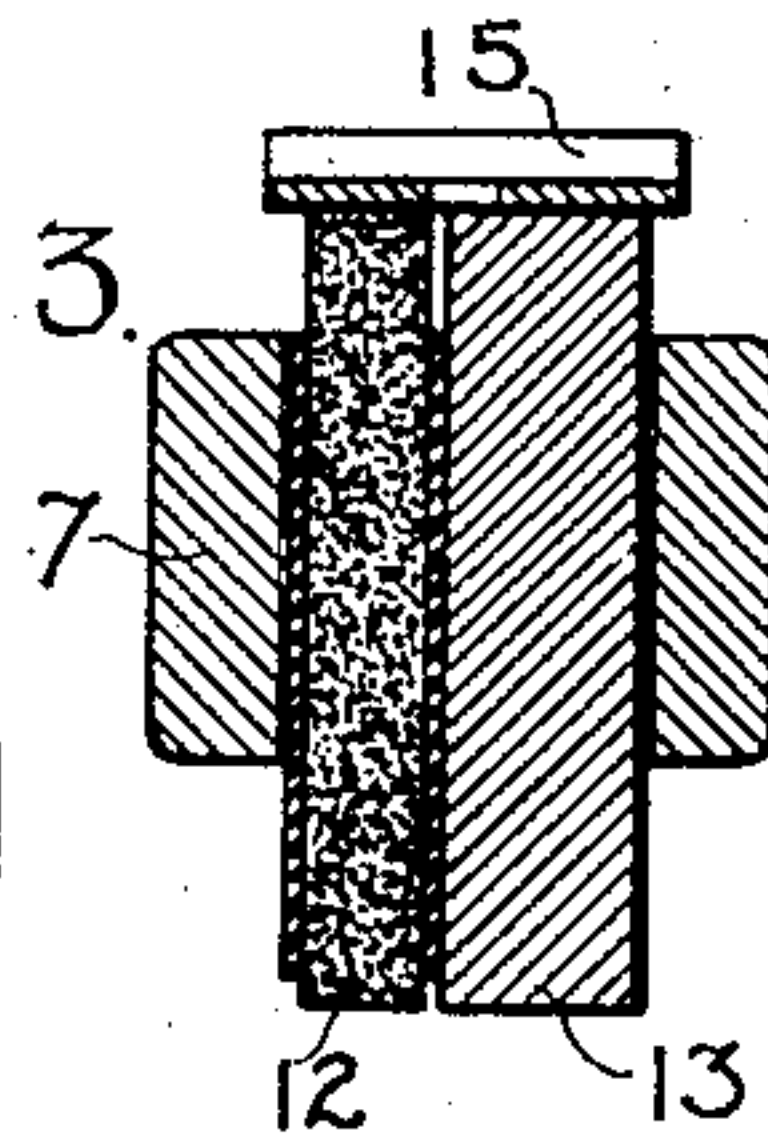


Fig. 3.



Witnesses:

Harry H. Tilden
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Inventor:

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by *Albert B. Davis*
Att'y.

UNITED STATES PATENT OFFICE.

HOWARD B. WILSON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

STARTING-RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 747,821, dated December 22, 1903.

Application filed August 21, 1902. Serial No. 120,431. (No model.)

To all whom it may concern:

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

This invention relates to electrical apparatus in which current passes from a contact device to a plurality of separate contact-segments in succession; and the object of the invention is to divide the current into two substantially equal fractional parts, so that the sparking at the contacts may be cut down. I attain this result by equipping the contact device with two brushes arranged in tandem, or one behind the other, connected in parallel, and each bearing on its own separate segment, so that the current will pass through them simultaneously into two adjacent contact-segments as the device is moved relatively to the plurality of segments. The total current through any two adjacent contact-segments is thus divided into fractional portions, preferably equal, and the result is a great diminution of sparking. Where there is a drop in potential between the segments, I make the resistance of the branch including the leading brush sufficient to produce an equal drop, so that the current in the two branches will be as nearly equal as possible.

The invention is capable of a variety of applications—such, for instance, as commutator-brushes for dynamo-electric machines; but for the sake of simplicity I shall show and describe it in connection with a starting-rheostat for electric motors. In such a device I ascertain the average resistance between the steps and provide the switch-arm with two tandem brushes, the leading one of a material, such as carbon or graphite, offering a resistance equal to the average between the steps, and the other of a material of low resistance, such as copper. This causes the current to divide equally between the two brushes in flowing to the segment under the carbon brush, one half going by way of the carbon brush and the other half by way of the copper brush and the resistance-coil per-

manently connected between the two segments.

In the accompanying drawings, Figure 1 is a front elevation of a starting-rheostat embodying my invention. Fig. 2 is an edge view of the same, and Fig. 3 is a cross-section of the switch-arm through the brushes.

The insulating-base 1, line-terminals 2, shunt field-coil terminal 3, rheostat contact-segments 4, insulating dead-segment 5, no-voltage release-electromagnet 6, and movable switch member 7 are all as usual in devices of this kind and need no detailed description. The customary circuits are indicated by the dotted lines in Fig. 1. The movable member or switch-arm carries a tailpiece 8, on which is a contact-block 9, preferably of carbon, which closes the circuit 10 from the switch-arm to the stationary block 11 and thence to the first rheostat-segment 4' when the switch-arm is in the "off" position and the brushes rest on the dead-segment 5.

The brushes 12 and 13 carried by the switch-arm are composed, respectively, of high and low resistance material, such as carbon and copper. They are insulated from the arm and from each other, and each is connected with the arm by a short lead 14. A divided flat spring 15 presses them against the contact-segments 4. The carbon brush 12 is in front of the copper brush 13, so that the carbon is the first to make contact with the next segment as the arm is moved to cut out the resistance-coils of the rheostat.

The brushes bear on two adjacent segments, so that the current flowing through the switch-arm must divide between the two to reach the segment under the carbon brush. By making the resistance of the carbon brush equal to the average resistance of the rheostat-coils between the segments the fractional parts of the current will be substantially equal. The result is the same as if the rheostat were divided into twice as many steps, and the tendency to spark is reduced accordingly.

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

1. In electrical apparatus, the combination

with a plurality of contact-segments, of a relatively movable contact device comprising two brushes whose resistance differs as the resistance between the segments, the leading brush
5 having the higher resistance.

2. In electrical apparatus, the combination with a plurality of contact-segments, of a relatively movable contact device comprising two brushes arranged one behind the other and
10 connected in parallel, the leading brush having as much higher resistance than the one behind it as the drop in potential between the segments.

3. In a starting-rheostat, a movable switch
15 member provided with two tandem brushes insulated from each other and connected in parallel, the leading brush being of considerably higher resistance than the others.

4. In a starting-rheostat, a movable switch

member provided with two tandem brushes 20 insulated from each other and connected in parallel, the leading brush being of carbon and the other brush of metal.

5. In a starting-rheostat, the combination with a plurality of segments connected 25 through resistance-coils, of a movable switch member provided with two tandem brushes connected in parallel and adapted to bear on two adjacent segments respectively, the resistance of the leading brush being substan- 30 tially equal to that of the coil between the segments.

In witness whereof I have hereunto set my hand this 19th day of August, 1902.

HOWARD B. WILSON.

Witnesses:

BENJAMIN B. HULL,
JOSEPH A. L. ENDRES.