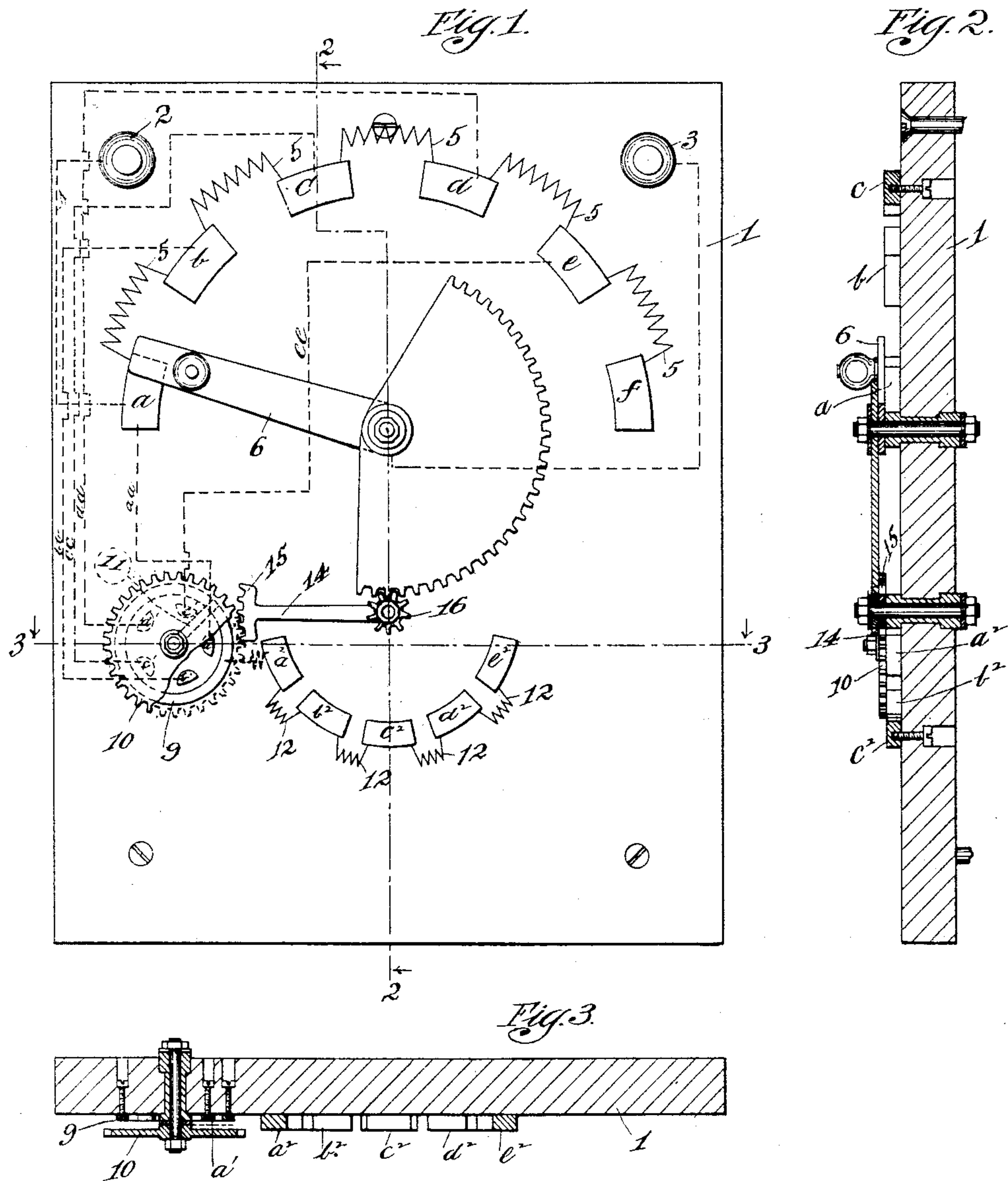


(No Model.)

F. KRAEMER & M. KRÜGER.
RHEOSTAT FACE PLATE WITH SUPPLEMENTAL RHEOSTAT.

No. 539,585.

Patented May 21, 1895.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK KRAEMER AND MAX KRÜGER, OF CHICAGO, ILLINOIS.

RHEOSTAT FACE-PLATE WITH SUPPLEMENTAL RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 539,585, dated May 21, 1895.

Application filed September 19, 1894. Serial No. 523,510. (No model.)

To all whom it may concern:

Be it known that we, FRANK KRAEMER and MAX KRÜGER, subjects of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Face-Plates for Rheostats; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in a rheostat, the object being to provide a rheostat by which the resistance introduced into the circuit can be nicely adjusted and graduated.

The invention consists in the features of construction and combination of parts hereinafter fully described and specifically claimed. In the accompanying drawings, illustrating our invention, Figure 1 is a face view of a rheostat constructed in accordance with our invention, with parts broken away for convenience of illustration. Fig. 2 is a sectional view of the same on the line of 2 2 of Fig. 1. Fig. 3 is a sectional view of the same on the line 3 3 of Fig. 1.

Referring now to said drawings, 1 indicates the face plate of the rheostat provided with the binding posts 2 and 3, by which the rheostat is brought into the circuit. The binding post 2 is connected by means of a conductor 4, with the first contact post a of a series of contact posts a, b, c, d, e and f arranged in a circular line and suitably spaced and provided with interposed resistances 5 of any convenient construction. The switch lever 6 is pivoted upon the face plate concentric with the said contact posts, and a conductor 7 leads from its pivotal end to the binding post 3. The other end of said switch lever 6 is arranged to pass over the said contact posts a to f , and to come in electrical contact with each. The said switch lever 6 carries a toothed segment 8 of conducting material and electrically connected with the same. The said switch lever in connection with the contact posts serves to bring into the circuit the resistances 5, but we have arranged devices whereby the amount of resistance of each of these resistances is subdivided so that the resistance in the circuit can be gradually increased until it reaches

the resistance of the next contact post in the series, and this device we term an auxiliary switching device and will now proceed to describe the same.

Mounted upon the face plate is a ring or annulus 9 of conducting material adjacent to which and preferably within the same is located a series of contact buttons a', b', c', d', e' . Concentric with said ring 9 is a revoluble gear-wheel 10 carrying a contact arm 11 constantly pressing upon said ring, and adapted to come in contact with the buttons a' to e' , as said contact arm turns. By means of the conductors aa, bb, cc, dd , and ee , the contact posts a to e are connected with the contact buttons a' to e' as shown. In said auxiliary switching device is a series of contact posts a^2, b^2, c^2, d^2 , and e^2 , arranged with resistances 12 between them and arranged in a circular manner. The first contact post a^2 , in this series, is connected with the ring 9 by a resistance 13.

Pivoted upon the base plate, and concentric with the contact posts a^2 to e^2 , is a switch lever 14 arranged to come into contact with each of said contact posts a^2 to e^2 , and provided at its outer end with a gear segment 15 adapted to intermesh with the gear-wheel 10 of the auxiliary switching device. The said switch lever 14 carries a gear pinion 16 that intermeshes with the gear segment 8 of the switch lever 6, and the said gear segment 8 and contact post a^2 can be electrically connected through the said switch lever 14 and pinion 16.

The parts being constructed and arranged as above described, the operation is as follows: When the parts stand in the position shown in Fig. 1 the current will pass from the binding post 2 through the contact post a and switch lever 6 to the binding post 3, as will be obvious. Now when it is desired to bring a resistance into the circuit, the said switch lever is moved across the contact post a , until it leaves the same, and during this movement the gear segment 8 turns the pinion 16 and switch lever 14 so that the gear segment 15, through the intermediacy of the gear-wheel 10, moves the contact arm 11 into contact with the button a' , thereby establishing a connection between said button a' , and the ring 9. When this connection is made

the connection between the switch lever 6 and contact post a is broken, and the switch lever 14 is in contact with the contact post a^2 . In this way it will be seen that the current is
 5 shunted so that it passes from the contact post a through the conductor aa to the button a' , thence through the contact arm 11 to the ring 9 and through the resistance 13 to the contact post a^2 , thence through the switch-
 10 ing lever 14, pinion 16, gear segment 8 and conductor 7, to the binding post 3.

The further movement of the switch lever 6 and until it comes in contact with the contact post b will, through the intermediacy of the gearing described, move the switch lever
 15 14 across and successively in contact with the contact posts b^2 , c^2 , d^2 , and e^2 , thereby bringing in the additional resistances 12, as will be clearly seen. When this movement is com-
 20 pleted the switch lever 14 leaves the contact post e^2 , while the switch lever 6 comes in contact with the contact post b and shunts the circuit through contact post a , the first re-
 25 sistance 5, contact post b , switch lever 6 and through conductor 7 to binding post 3. The resistances 13 and 12 are equal to approximately five-sixths of the total resistance of one of the resistances 5, so it will be seen that in this way the resistance brought into the
 30 circuit is gradually increased.

A further movement of the switch lever and until it leaves the contact post b will turn the switch lever 14 until its gear segment 15 in-
 35 termeshes with the gear-wheel 10 and moves the contact arm 11 to the next button b' , and brings the switch lever 14 in contact with the contact post a^2 . It will thus be seen that the circuit is again shunted so that it passes through the first resistance 5 and from the
 40 contact post b to the button b' to the ring 9 through resistance 13 to the contact post a^2 . As the switch lever 6 is moved across the space between contact posts b and c , it will be noted that the resistance heretofore intro-
 45 duced is maintained, while additional resistances are brought in as heretofore described. The operation continues in the manner above set forth until the entire resistance is brought in, or until the switch lever 6 reaches the con-
 50 tact post f , it being noted that the resistance is very gradually increased.

It is manifest that the number of the resistances in both the main and auxiliary switch-
 ing devices can be increased or diminished,

as well as the amount of resistance and the 55 relation between the main and auxiliary resistances, without departing from the spirit of our invention.

We claim as our invention—

1. In a rheostat, a main switching device, 60 and an auxiliary switching device controlled thereby and adapted to be intermittently brought in circuit therewith, substantially as described.

2. In a rheostat, a main switching device, 65 and an auxiliary device controlled thereby and adapted to be intermittently brought into circuit therewith, the total amount of resistance in said auxiliary switching device being approximately equal to the amount of resist- 70
 ance between two contact posts of the main switching device, substantially as described.

3. In a rheostat, a main switching device having a series of contact posts, interposed re-
 75 sistances and a switch lever, an auxiliary switching device having a corresponding series of contact buttons, conductors between the corresponding contact posts and buttons, a series of contact posts and interposed re-
 80 sistances in said auxiliary switching device adapted to be brought successively in circuit with said contact buttons, said switch lever controlling said auxiliary switching device and adapted to be intermittently in circuit
 85 with the contact posts thereof, substantially as described.

4. In a rheostat, a main switching device having a series of contact posts, interposed resistances, and a switch lever 6, an auxiliary
 90 switching device having a corresponding series of contact buttons, conductors between the corresponding contact posts and buttons, a contact arm adapted to move over a ring or annulus and said contact buttons, a series of
 95 contact posts and interposed resistances in said auxiliary switching device in circuit with said ring or annulus, a switch lever 14 adapted to be brought into contact with the contact posts of the auxiliary switching device and
 100 geared to said switch lever 6 and to said contact arm, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK KRAEMER.
 MAX KRÜGER.

Witnesses:

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 RUDOLPH W. LOTZ.