

No. 797,369.

PATENTED AUG. 15, 1905.

W. D. POMEROY.  
WATER RHEOSTAT.  
APPLICATION FILED DEC. 1, 1903.

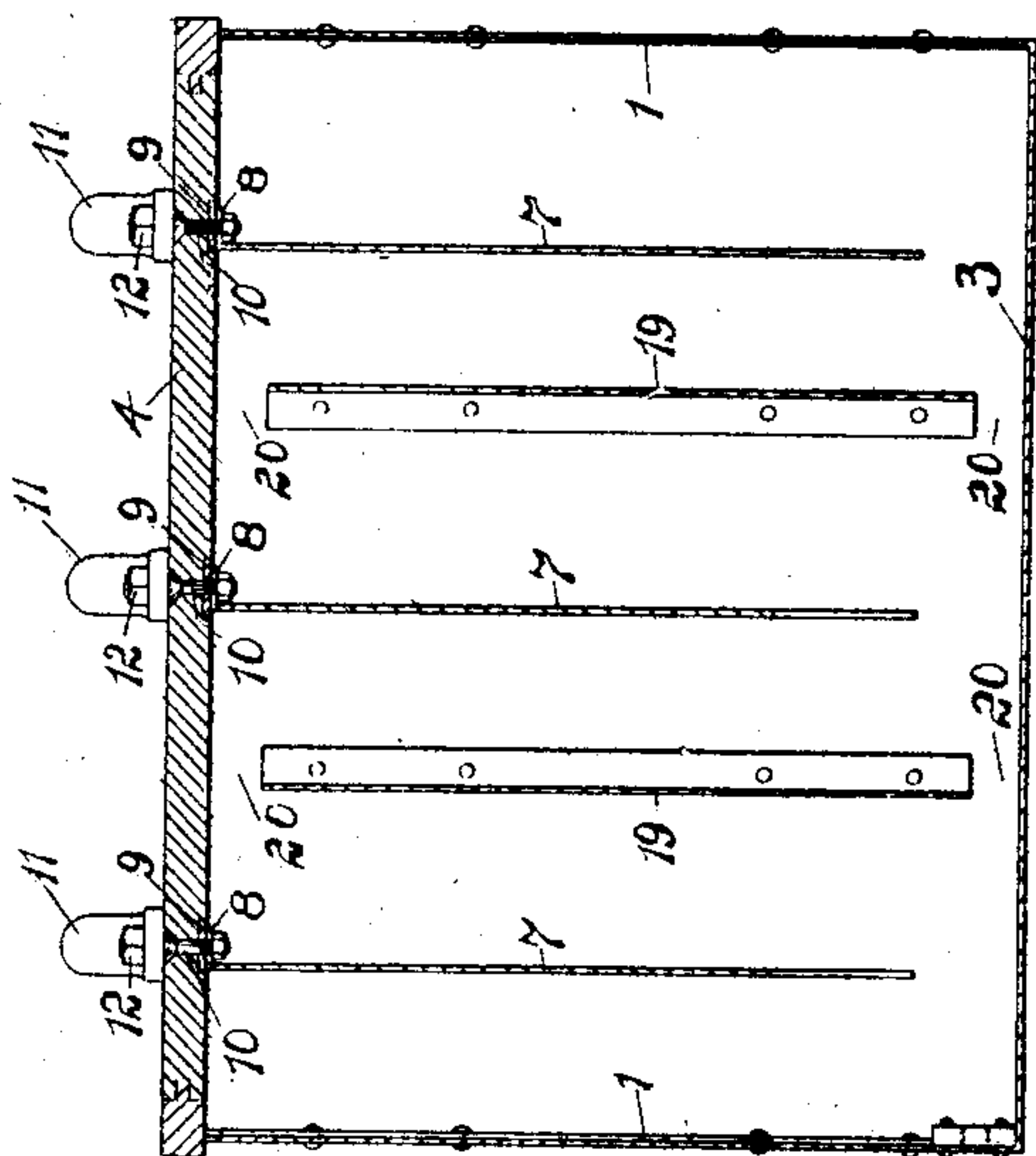


Fig. 3.

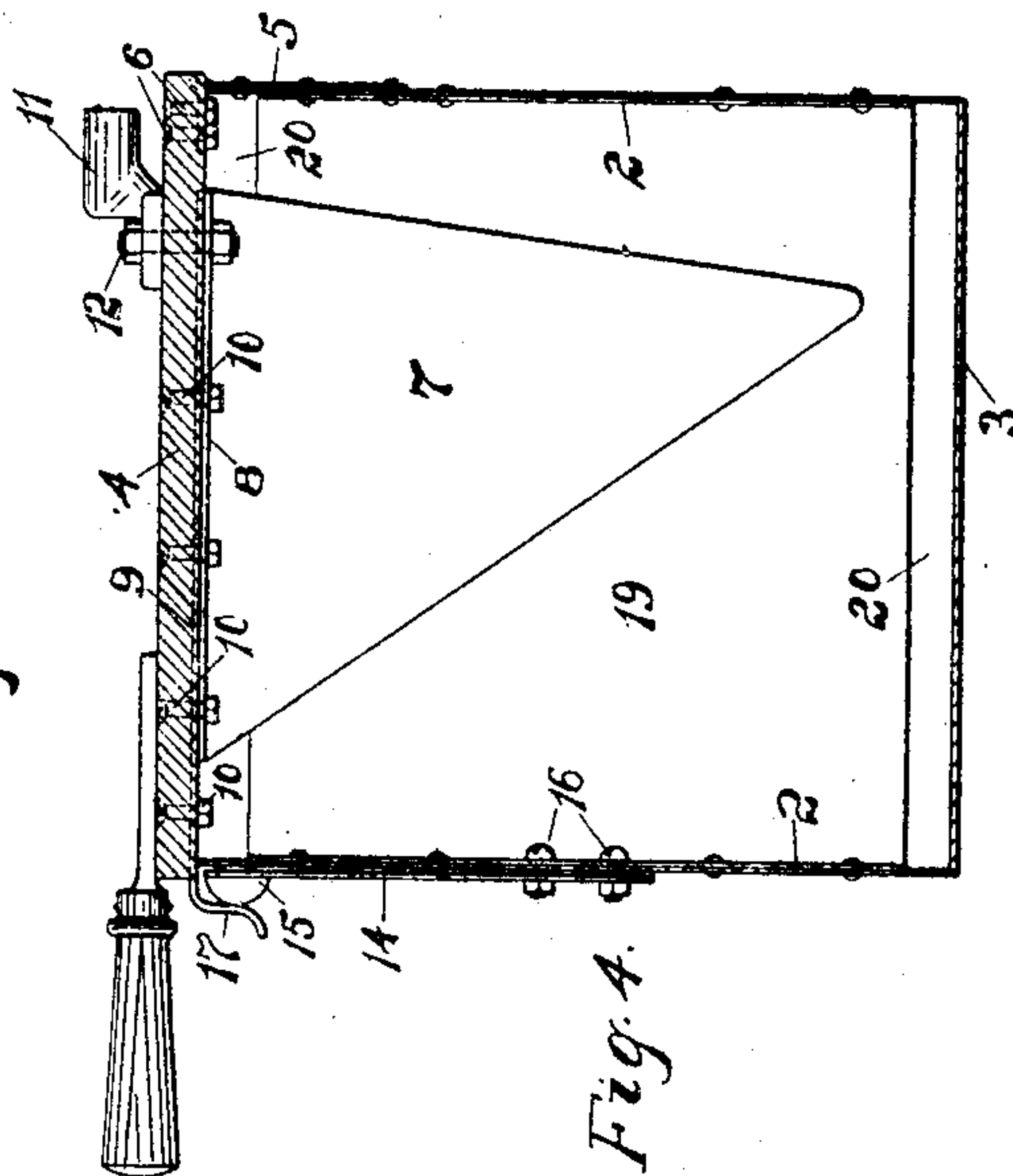


Fig. 4.

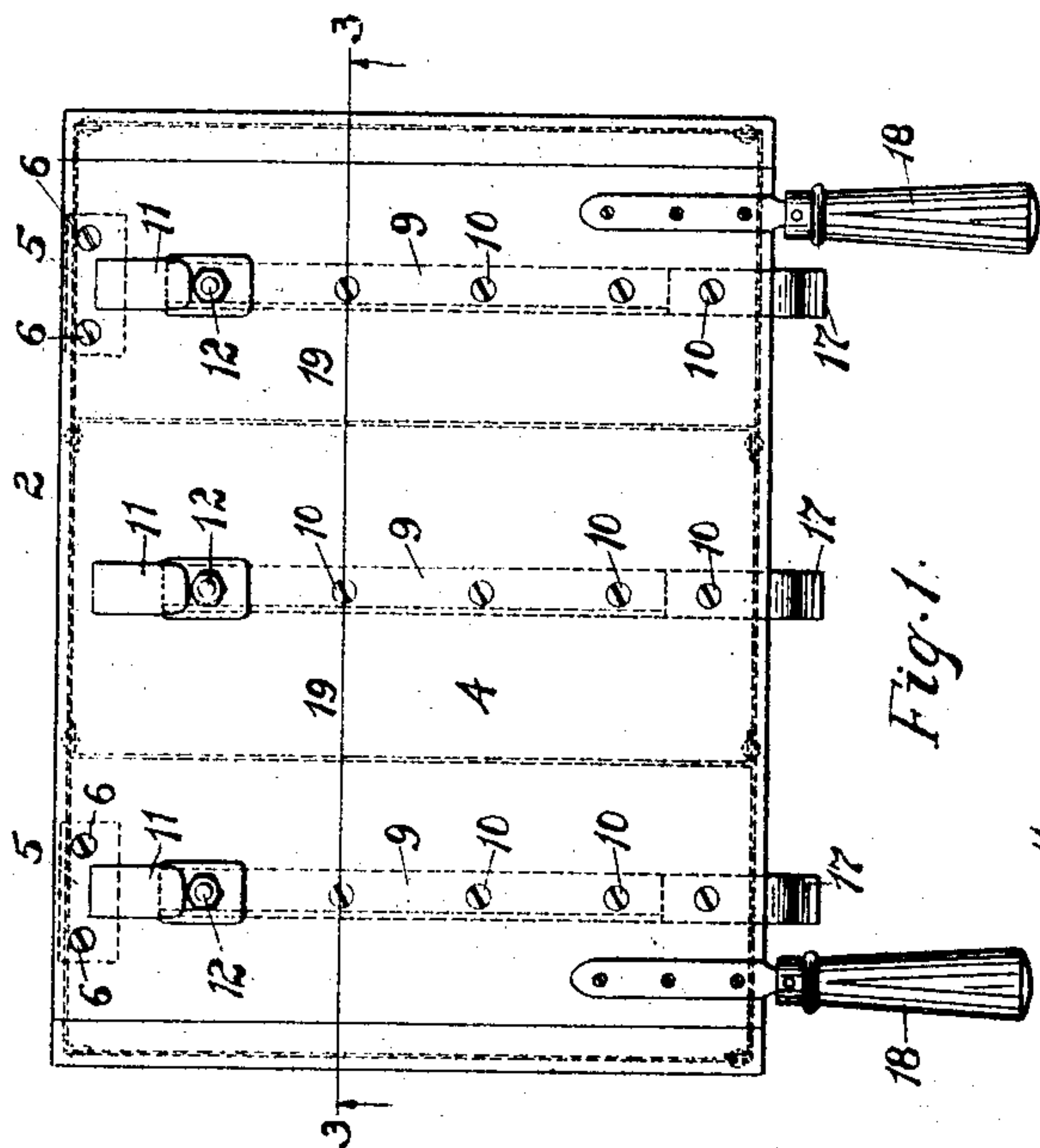


Fig. 1.

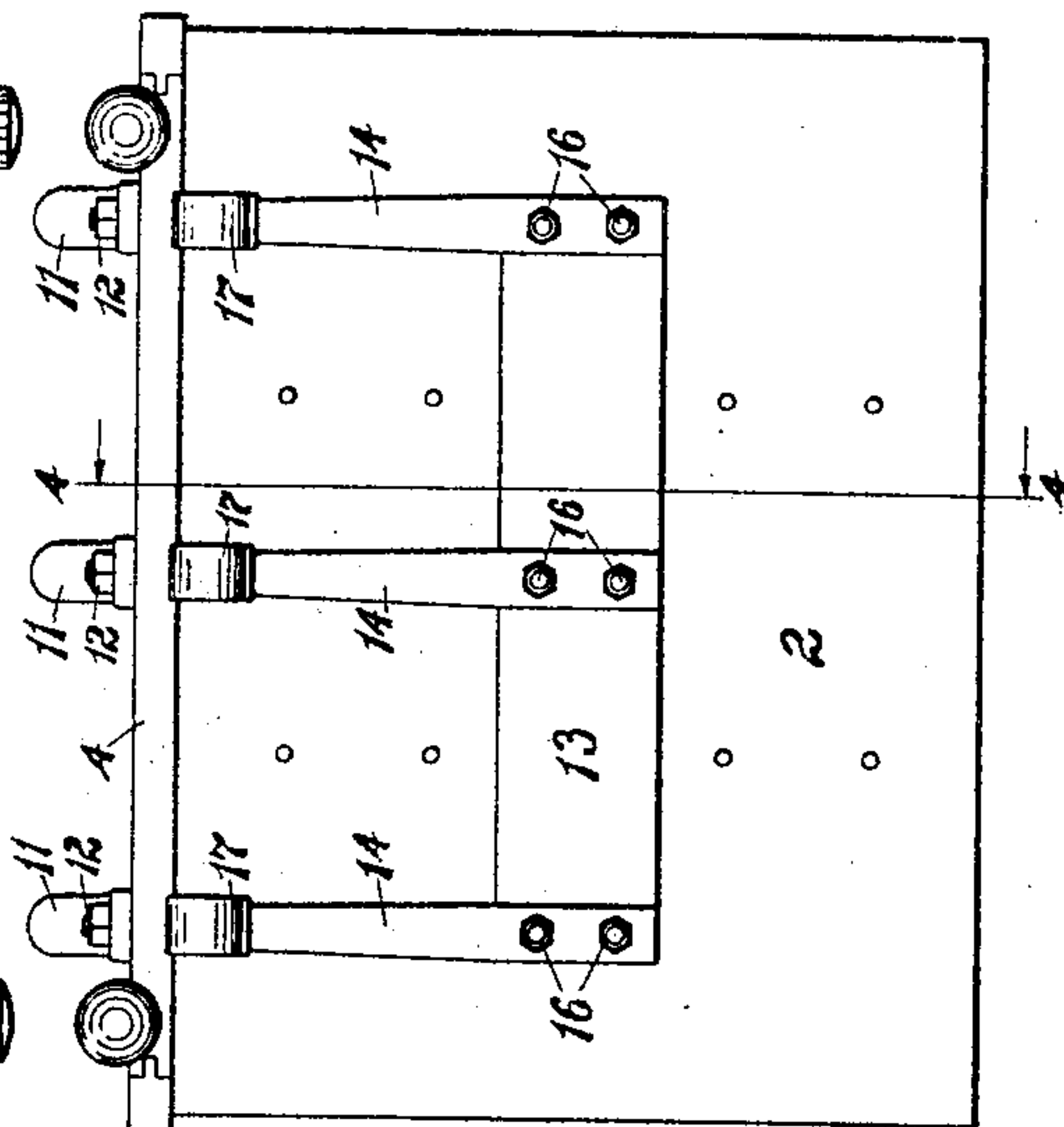


Fig. 2.

Witnesses

*L. H. Sager*  
*George H. Kerr*

Inventor  
William D. Pomeroy.  
By  
*C. V. Edwards.*  
Attorney.

# UNITED STATES PATENT OFFICE.

WILLIAM D. POMEROY, OF NORWOOD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BULLOCK ELECTRIC COMPANY, A CORPORATION OF OHIO.

## WATER-RHEOSTAT.

No. 797,369.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed December 1, 1903. Serial No. 183,319.

*To all whom it may concern:*

Be it known that I, WILLIAM D. POMEROY, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Water-Rheostats, of which the following is a full, clear, and exact specification.

My invention relates to water-rheostats, and although the same is capable of being used generally it is particularly applicable in connection with starting motors, and especially induction-motors.

Where currents of very large amperage are to be regulated or where a heavy load is to be placed upon a generator, such as is necessary in testing-machines, the water-rheostat presents many advantages. A small rheostat is capable of carrying very heavy currents, and where the water is continually changed, as when cold water is supplied to the bottom of the rheostat and the heated water passed off through an outlet at the top, a large amount of energy may be absorbed. Also the resistance is capable of being closely regulated by varying the depth of the plates in the water, and by adding salt to the water its resistance can be graduated from the very high resistance of pure water to a comparatively low resistance.

The object of my invention is to produce a rheostat very simple in construction, compact in form, and capable of gradual and rapid change in resistance. By my invention I use a tank in box form and mount the conducting-plates on the hinged cover. When the cover is open, no circuit is made; but by closing the cover the circuit is closed and the resistance gradually reduced. I also provide connections, so that when the cover is closed the rheostat is short-circuited and direct connection made between the terminals.

The details of my invention will be understood from the following description and accompanying drawings, and the novelty thereof will be more definitely set forth in the claims.

Figure 1 is a plan view of my improved rheostat. Fig. 2 is a front view thereof. Fig. 3 is a sectional view on line 3 3 of Fig.

1, and Fig. 4 is a sectional view on line 4 4 of Fig. 2.

The rheostat is made up in the form of a rectangular box having the ends 1, sides 2, and bottom 3 of sheet-iron, the edges being bent over and riveted and all the joints carefully soldered. The cover 4, made of wood, is hinged to the back of the box by hinges 5, which are riveted to the back side and secured to the cover by stove-bolts 6. Secured to the under side of the cover are conducting-plates 7, three being shown in this instance. These are made of sheet-steel triangular in outline and have an edge 8 bent at right angles. Between each plate and the wooden cover is a rolled-copper contact-strip 9, and both of these parts are secured to the cover by several stove-bolts 10. Near the back edge of the cover and on the outside thereof are terminal lugs 11, which are connected with the conducting-plates 7 and strips 9 by stud-bolts 12, the stud being made of copper to secure good conductivity.

Upon the front of the rheostat is mounted a copper strip 13, and extending upward therefrom are the spring-fingers 14, made of hard rolled brass and having the tips 15. The fingers and copper strip 13 are secured to the front of the rheostat by the machine-screws 16. The strips 9 have the front ends 17 bent over, as shown, so that when the cover is closed they contact with the tips 15. The cover is provided with the handle 18 to open and close the same, and, if desired, a counterbalancing-weight may be connected to the cover, so that the latter may remain in any position placed. Extending across the rheostat are the stiffening-plates 19, of sheet-iron, having the front and back edges bent at right angles and riveted to the sides of the rheostat. The plates 19 do not extend the full depth of the rheostat, open spaces 20 being left at top and bottom.

The outside leads are connected to the terminals 11, and when the cover is wide open no circuit is made. Upon closing the cover the lower tips of plate 7 will first contact with the water and the circuit between terminals 11 will be closed through the plates and water,



which will offer a high resistance. As the cover is gradually closed the plates are submerged more and more, and owing to the triangular outline of the plates the resistance is reduced very rapidly. When the cover is finally closed, the ends 17 of the strips 9 contact with the tips of the fingers 14, and there is then a direct connection from the terminals 11, through studs 12 and strips 9, to fingers 14 and the copper strip 13. The rheostat is then short-circuited.

My invention is particularly applicable for starting motors, and the rheostat shown is adapted for starting a three-phase induction-motor, the three leads from the secondary winding of the rotor being connected to terminals 11, and as the motor speeds up the resistance is gradually decreased until it is entirely cut out. My invention is equally well adapted for general purposes, however, and one, two, three, or any number of terminals and plates may be used. In case one plate only is used one terminal would be connected to the plate and the other to the sheet-iron tank. I also wish it to be understood that I am not limited to the exact construction shown and that various modifications may be designed and still be within the spirit of the claims.

I claim as my invention—

1. In a water-rheostat, the combination of a receptacle for the water, a hinged cover therefor, two or more plates carried by said cover, and means for short-circuiting the plates when the cover is closed.

2. In a water-rheostat, the combination of a receptacle for the water, a hinged cover therefor, two or more plates carried by said cover, terminals connected to said plates, and means for short-circuiting the plates when the cover is closed.

3. In a water-rheostat, the combination of a receptacle for the water, a hinged cover therefor, two or more plates tapering in outline carried by said cover, terminals connected to said plates, and means for short-circuiting the plates when the cover is closed.

4. A water-rheostat including in combination a receptacle for the water, a hinged cover therefor, conducting-plates secured to said

cover, terminals connected to said plates, a conductor mounted on said receptacle, and conducting-strips connected to said plates which engage said conductor when the cover is closed.

5. A water-rheostat including in combination a receptacle for the water, a hinged cover therefor, conducting-strips and conducting-plates secured to said cover, terminals connected to said plates, a conductor mounted on said receptacle, fingers connected to said conductor, said fingers being engaged by said conducting-strips when the cover is closed.

6. In a water-rheostat, the combination of a receptacle for the water, a hinged element, one or more conductors secured to said element and adapted to be immersed in the contents of the receptacle, and means for short-circuiting the said conductor or conductors when the hinged element is in one extreme position.

7. In a water-rheostat, the combination of a receptacle for the water, a movable element, one or more conductors secured to said element and adapted to be immersed in the contents of the receptacle, and means outside of the receptacle for short-circuiting said conductor or conductors when said element is in one extreme position.

8. In a water-rheostat, the combination of a receptacle for the water, a movable element, one or more conductors secured to said element and adapted to be immersed in the contents of the receptacle, and means outside of the receptacle for short-circuiting said conductor or conductors when said element is in one extreme position.

9. In a water-rheostat, the combination of a receptacle for the water, a hinged element, one or more plates carried by said element, and means for short-circuiting the said plate or plates when the hinged element is in one extreme position.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM D. POMEROY.

Witnesses:

L. K. SAGER,  
SANFORD KLEIN.