H. L. TRUESDALE.

RHEOSTAT.

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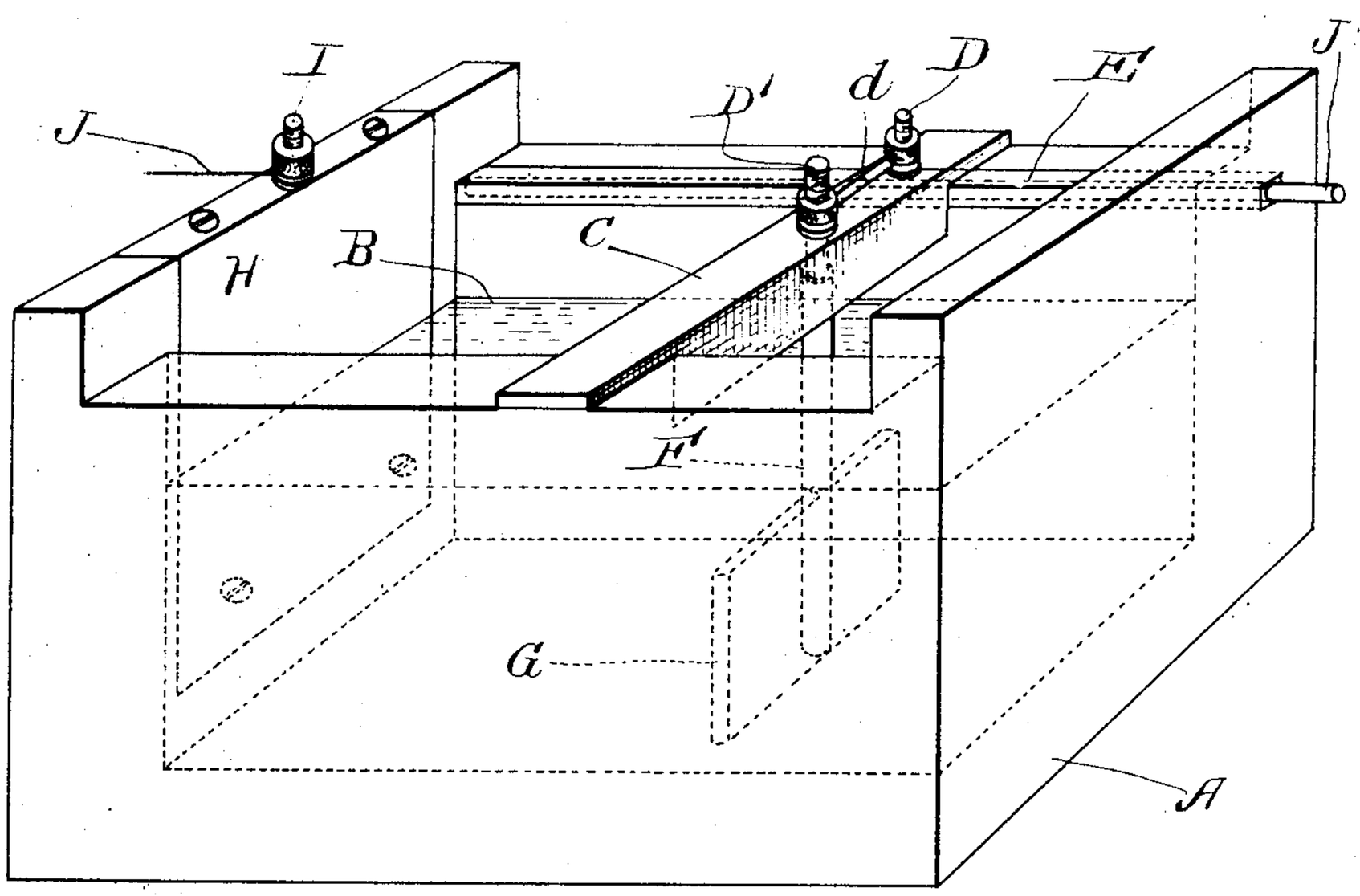
944,060. **Patented Dec. 21, 1909.**



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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

944,060. Specification of Letters Patent. Patented Dec. 21, 1909.

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To all whom it may concern:

Be it known that I, HERBERT LAWRENCE TRUESDALE, a citizen of the United States, and resident of Somerville, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to rheostats and its object is to provide certain improvements in the construction of rheostats wherein the resistant material is fluid instead of metal.

In the accompanying drawing, which illustrates one embodiment of the invention, A represents a suitable rectangular vessel made of wood, glass or other non-conductive material. Contained within the vessel is a body of electrically conductive and resistant fluid B. This fluid preferably consists of a weak solution of salt, say a solution of one centigram of salt to from one to two quarts of water, which I have found possesses the desired electrical conductivity and electrical resistance. The water should be as nearly as possible pure and free from mineral matter suspended or in solution which might in itself act as a conductor. I recommend the use of distilled water, or if that is not available, of a carefully filtered or strained water.

Mounted upon the opposite walls of the vessel A, and spanning the vessel, is a slide C adapted to be moved lengthwise of the vessel. In the form herein shown the slide is made of non-conductive material such as wood, and is provided with a pair of binding posts D, D′ connected by a fuse wire *d*. The binding post D passes through the slide C and its lower end bears against a brass bar E which is insulated by the vessel from the electrode H and also from the fluid B and is rigidly secured to the margin of the vessel at right angles with the slide C as shown. To the lower end of the binding post D′, which also passes through the slide C, there is secured a zinc rod F, partly submerged in the fluid B and provided with a lead weight G. This weight serves to hold the slide C firmly upon its seat thus insuring the contact of the binding post D with the brass bar E, when the slide C is moved forward or backward upon its seat. The rod F forms one of the electrodes.

Upon one of the end walls of the vessel A, and partially submerged in the fluid B, there is secured a brass plate H, which forms the other electrode, having a binding post I mounted thereon, to which is secured one end of the service wire J, the other end thereof J′ being in contact with the bar E.

In the use of the rheostat, the current after passing from the service wire J′ through the brass bar E, binding post D, wire *d*, binding post D′ and electrode F, encounters the electrical resistance of the fluid B through which it passes to the plate H and thence to the wire J. The resistance through the fluid B is varied by moving the slide C toward or away from the plate H, thus decreasing or increasing the distance between the submerged terminals of the electrodes F and H and thereby varying the electrical resistance.

I claim:

1. A fluid rheostat comprising a vessel, an electrically conductive and resistant fluid in said vessel, a pair of electrodes having their terminals submerged in said fluid, a slide movably mounted on said vessel, supporting one of said electrodes and adapted to move the same relatively to the other electrode, a bar of conductive material secured to said vessel and insulated from the last named electrode and from said fluid, and a contacting part carried by said slide, connected with the electrode carried by the slide and having a movable engagement with said bar.

2. A fluid rheostat comprising a vessel, an electrically conductive and resistant fluid in said vessel, a pair of electrodes having their terminals submerged in said fluid, a slide movably mounted on said vessel, consisting of a cross bar spanning said vessel, supporting one of said electrodes and adapted to move the same relatively to the other electrode, a bar of conductive material secured to the margin of said vessel and insulated from the last named electrode and from said fluid, and a contacting part carried by said slide, connected with the electrode carried by the slide and having a movable engagement with said bar.

3. A fluid rheostat comprising a vessel, an electrically conductive and resistant fluid in said vessel, a pair of electrodes having their terminals submerged in said fluid, a slide movably mounted on said vessel, supporting one of said electrodes and adapted to move the same relatively to the other electrode, the other electrode consisting of a metal plate lining the wall of the vessel, a bar of

conductive material secured to said vessel and insulated from the last named electrode and from said fluid, and a contacting part carried by said slide, connected with the electrode carried by the slide and having a movable engagement with said bar.

4. A fluid rheostat comprising a vessel, an electrically conductive and resistant fluid in said vessel, a pair of electrodes having their terminals submerged in said fluid, a slide movably mounted on said vessel, supporting one of said electrodes and adapted to move the same relatively to the other electrode, a bar of conductive material secured to said vessel and insulated from the last named electrode and from said fluid, and a contacting part carried by said slide, connected with the electrode carried by the slide and having a movable engagement with said bar, said electrode carried by the slide being provided with a weight adapted to hold said contacting part in close engagement with said bar.

5. A fluid rheostat comprising a vessel, an electrically conductive and resistant fluid in said vessel, a pair of electrodes having their terminals submerged in said fluid, a slide, consisting of a cross bar of non-conductive material spanning said vessel and movably mounted thereon, one of said electrodes depending from said cross bar, a binding post at the top of the last named electrode, a contact bar of conductive material secured to the margin of said vessel, a binding post on said cross bar having sliding engagement with said contact bar, and a fuse wire connecting said binding posts, and the other electrode fixed in said vessel relatively to the electrode supported by said sliding cross bar.

Signed by me at Boston, Massachusetts, this sixteenth day of August, 1909.

HERBERT LAWRENCE TRUESDALE.

Witnesses:
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