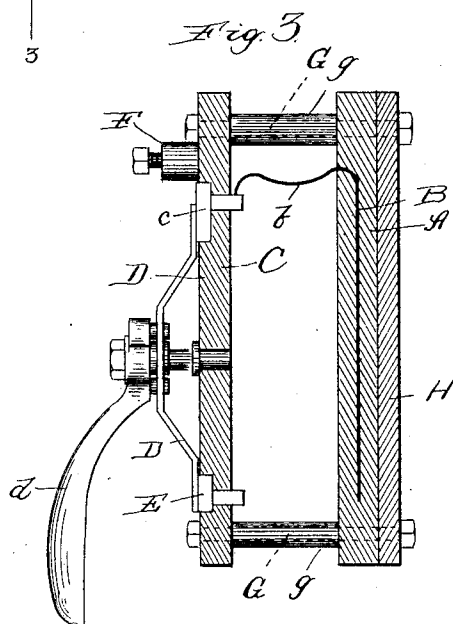
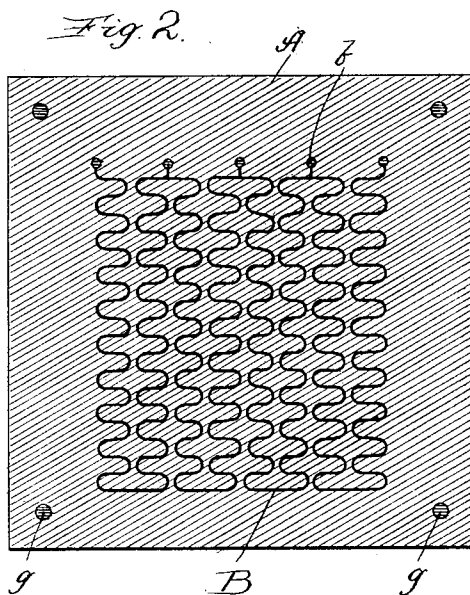
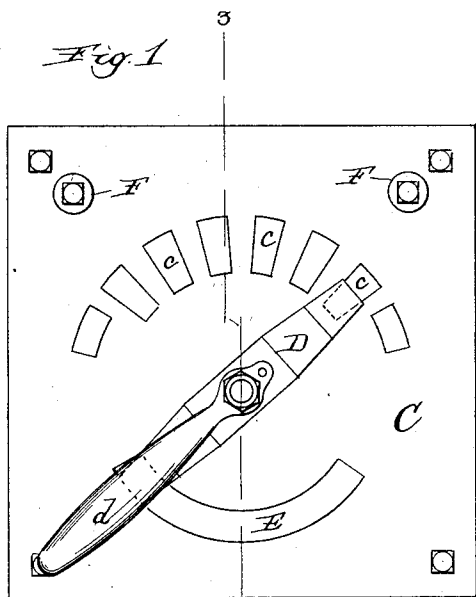


(No Model.)

G. K. CUMMINGS.
RHEOSTAT.

No. 477,247.

Patented June 21, 1892.



Witnesses:

Sam. C. Curtis
H. W. Munday

Inventor:

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His Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE K. CUMMINGS, OF CHICAGO, ILLINOIS.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 477,247, dated June 21, 1892.

Application filed December 11, 1891. Serial No. 414,663. (No model.)

To all whom it may concern:

Be it known that I, GEORGE K. CUMMINGS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electrical Regulators, of which the following is a specification.

This invention relates to devices for reducing or varying the quantity of current of electricity in any circuit into which it may be introduced.

The object of the invention is to so improve the construction as to render the device safer and more compact and practical than previous constructions.

In my invention I embed the electrical conductor of high resistance in electrical insulating material—such as cement, pure or mixed with sand, brick, marble, or granite dust, plaster-of-paris, silicates, porcelain, and the like—while such material is in a plastic or fluid condition. The material employed after the conductor has been embedded therein is allowed to harden naturally, or heat is applied thereto to cause it to become solid. I prefer to use some of the materials mentioned, not only because they are electrical insulators and can be reduced to a plastic state and afterward hardened, but also because they will withstand a very considerable degree of heat; but I do not wish to be limited to any particular material, it being only necessary that the material shall possess the properties just mentioned and also be capable of being molded into form and around the resistance-coil or other conductor.

The material while plastic should be molded into the form desired for the completed device or into some form which will render it capable of convenient use in the regulating device, and as the material may be of a friable nature or easily broken it may be inclosed in an outer shell or case.

My construction possesses the following advantages: It insulates the electrical conductor from all extraneous material which might otherwise come in contact with it, and also prevents different parts of the same conductor from coming in contact with each other so as to short-circuit the current; secondly, the conductor is excluded from the air and is ca-

pable of withstanding a high heat for a longer time than if exposed to the atmosphere; third, the molded material absorbs much of the heat from the surface of the electric conductor, so that its radiating-area is in effect much increased and enables it to carry a much greater current at a less temperature than it would were it not so surrounded with the molded material.

The details of my invention are fully shown in the accompanying drawings, wherein—

Figure 1 is a front view of a rheostat embodying my invention. Fig. 2 is a section of the molded block which forms the basis of my invention, showing the resistance-coil embedded therein. Fig. 3 is a section upon the line 3 3 of Fig. 1.

In said drawings, A represents the molded block containing any electric conductor—such, for instance, as the resistance-coil B. The block A, as will be understood from what has already been said, is made of some material adapted to be made plastic and afterward hardened, and which will act as an insulator and also to withstand heat. I find that Portland cement either with or without admixture of sand answers the purpose very well, though other materials may be employed with the same advantage. The conductor B is embedded in the block A, while the material of which the latter is composed is plastic, and after being thus embedded and the block has been hardened the latter may be attached to the face-plate C of the rheostat with the contact-points *c* connected with the coil by the wires *b*. D represents the brush operated by the handle *d* and connected to the plate E, which completes the circuit between the binding-posts F F.

It will be seen that in the construction illustrated the face-plate is separated by an open space from the block A. This gives opportunity for the dissipation of some portion of the heat imparted to the coil. The face-plate C may also be made of this material adapted to be molded into form while plastic, and the binding-posts and other metal parts which are usually attached thereto be embedded in the material at the time it is molded. When thus embedded, the molded material surrounds them and easily holds them in position. Bolts

and sleeves G g may be employed to unite the face-plate and the block or plate A. If desired, these plates or blocks may be faced or covered with metal, and thereby the danger of cracking off or breakage be reduced to a minimum. The materials being somewhat friable in their nature, it will often be advisable to thus surround them either wholly or partially with a metal covering. Such a covering is illustrated in the drawings at H. Of course the binding-posts and metal parts other than the electric conductor may be located outside of the molded material and suitably connected by wires or other electric connections.

I claim—

1. In an electric regulator or rheostat, an electric conductor of high resistance embedded in a block or plate of molded insulating material, substantially as set forth.

2. In an electric regulator or rheostat, an electric conductor of high resistance embedded in a block or plate of molded insulat-

ing and heat-resisting material, substantially as set forth.

3. In an electric regulator or rheostat, an electric conductor of high resistance embedded in a block or plate of molded insulating material, in combination with a metallic shell or cover, substantially as set forth.

4. The electric regulator or rheostat having a face-plate C, carrying the contact-points, binding-posts, &c., and formed of insulating material molded around the points, posts, &c., substantially as set forth.

5. In an electric regulator or rheostat, a face-plate formed of molded insulating material and carrying the contact-points, binding-posts, &c., and an electric conductor of high resistance embedded in a block or plate of similar material, substantially as specified.

GEORGE K. CUMMINGS.

Witnesses:

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