

(No Model.)

D. MACFARLAN.
RHEOSTAT.

2 Sheets—Sheet 1.

No. 526,867.

Patented Oct. 2, 1894.

Fig: 1

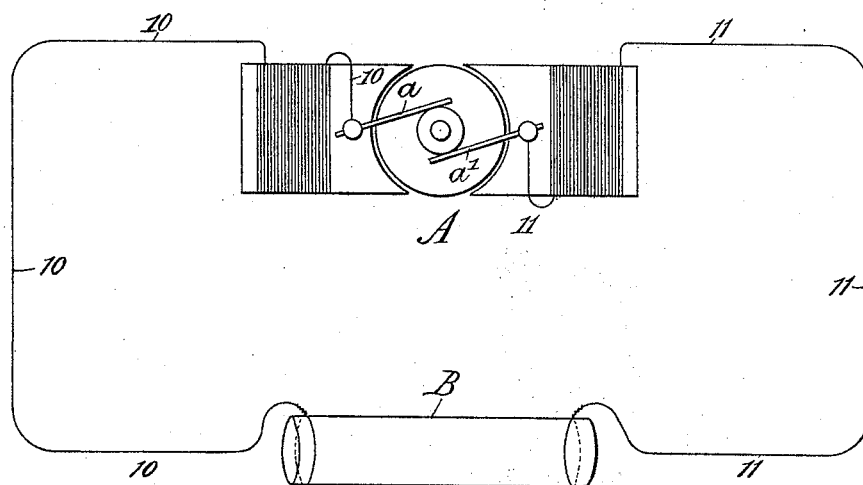
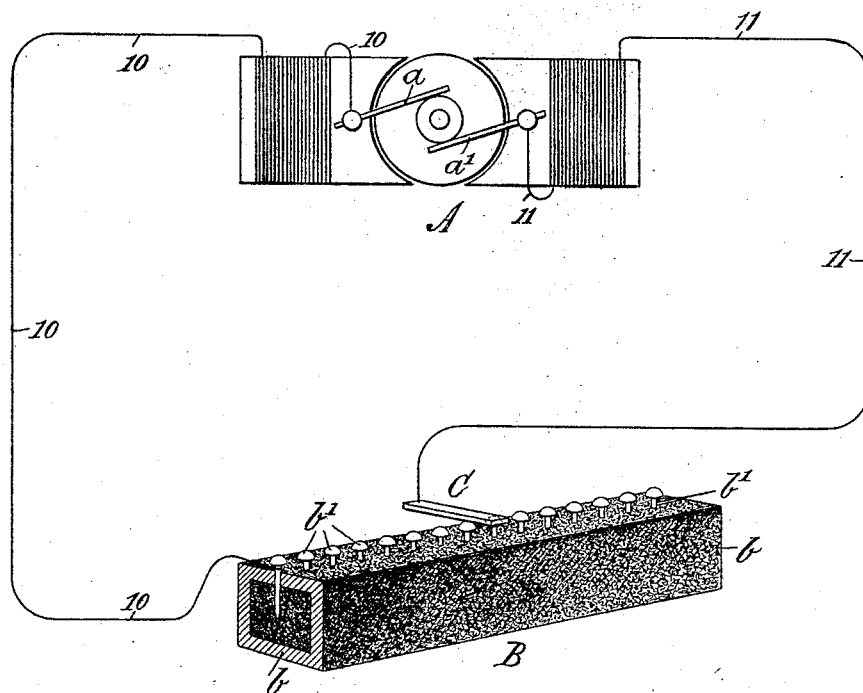


Fig: 2



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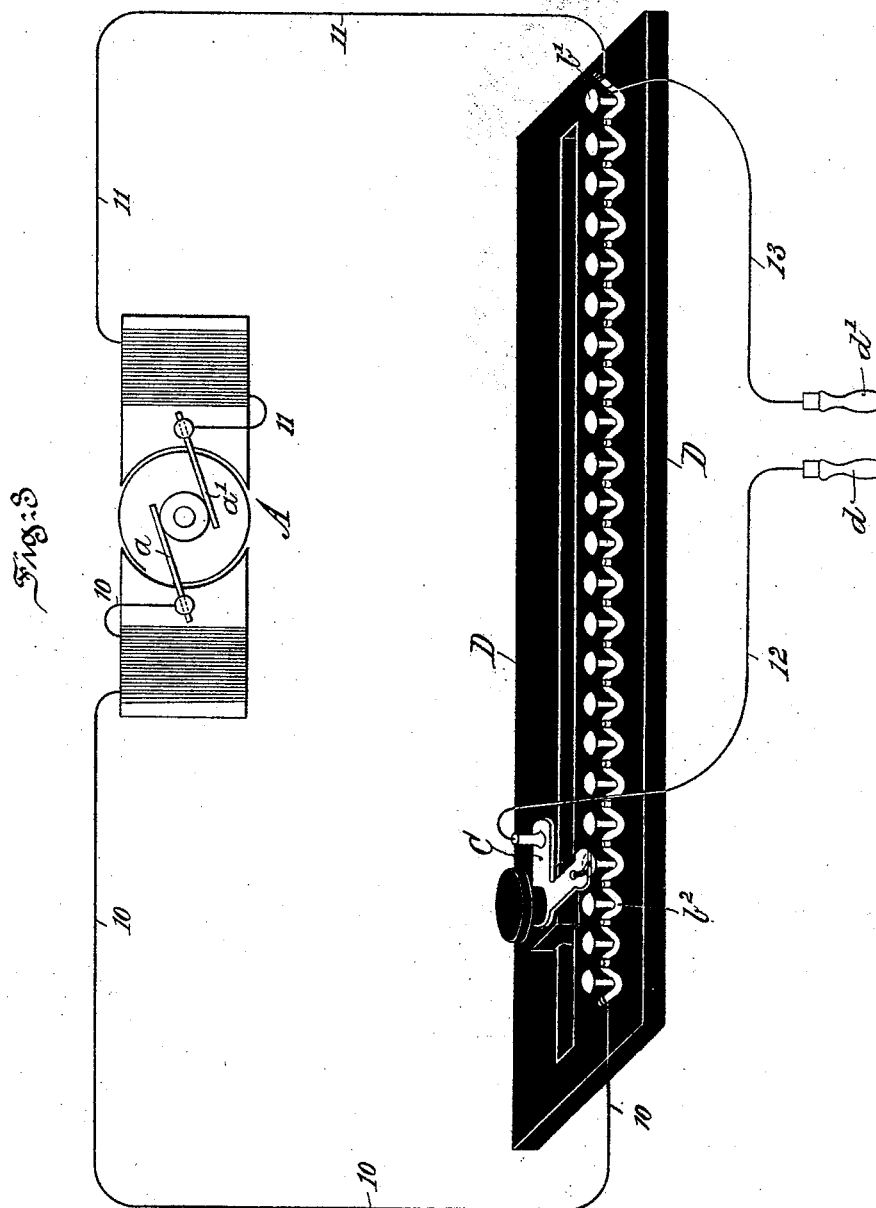
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UNITED STATES PATENT OFFICE.

DUNCAN MACFARLAN, OF PHILADELPHIA, PENNSYLVANIA.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 526,867, dated October 2, 1894.

Application filed May 18, 1894. Serial No. 511,643. (No model.)

To all whom it may concern:

Be it known that I, DUNCAN MACFARLAN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

My invention relates to a composition conducting and resistance structure designated as a rheostat for controlling or adjusting the voltage of an electric circuit; and it relates more particularly to the homogenizing of the materials entering into the same so as to produce a conducting and resistance structure which included in a circuit offers required resistance to a current around, about or through the same, whereby the current from a source of energy can be manipulated and collected off from the structure without dangerous heating, burning out or sparking at any part, point or portion so that perfect safety in the handling of an electric current is insured for various purposes.

The principal objects of my present invention are first, to provide a homogeneous composition structure or rheostat which in a circuit is adapted to regulate or adjust the voltage of a current in proportion to the resistance offered by the same to the current; second, to provide a rheostat composed of materials in which the atomic constituents of the same are so homogenized as to produce after thorough admixture or combination and baking a homogeneous structure and in a circuit from a source of energy will regulate or adjust the current thereof though offering required resistance substantially in proportion to the current through, about or around the structure, thereby insuring absolute safety in the handling of the same of any intensity for various purposes; and third, to provide a rheostat for electric currents composed of materials caused to assume a structure in the shape or form of a thread, bar, block or the like and which in a circuit is adapted to permit of the regulation of the voltage of a current around, about or through such a structure for different purposes with absolute safety and the current adapted to be varied *ad libitum* from wire or pin contacts at or about the

structure through the manipulation of a switch or similar device in the path thereof.

My invention consists of a rheostat, comprising a homogeneous composition structure constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and general scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is a diagrammatic view of a dynamo circuit with a rheostat of my invention included therein, and showing the wires coiled around the same from the source of energy. Fig. 2, is a similar view of a source of electric energy with conductors connected therewith and leading therefrom to a rheostat of my invention provided with a series of pin contacts and with a switch adapted to be manipulated in the path thereof; and Fig. 3, is a similar view of a dynamo circuit connected with a rheostat of my invention provided with pin contacts and a switch with wires therefrom having handling devices to adapt the same for employment for medical or other purposes.

Referring to the drawings with reference more particularly to Figs. 1 and 2, A, is a dynamo or source of energy provided with brushes or commutators *a* and *a'*, and having conductors 10 and 11 therefrom to the homogeneous composition structure B, constituting the rheostat of my invention to be hereinafter more fully described as to the material composition thereof, for controlling any voltage of a circuit *ad libitum* for permitting of the absolutely safe use of the same, for various purposes.

In Fig. 1, the conductors 10 and 11, are coiled around the rheostat B, because in practice such has been found to give most excellent results. This structure due to the thorough homogenizing of the materials entering into the composition thereof affords, as extended practice of my invention has demonstrated, requisite conductivity being offered to permit of the safe manipulation of the current of any voltage. This is determined by the fact, that the atomic constituents of the mass composing the structure are thor-

oughly mixed and baked, with the ulterior object in view of making the structure homogeneous, which as practice has demonstrated prevents all tendency to dangerous heating, burning out or sparking, and such a structure affords a quick, uniform and safe distribution or collecting off of the current therefrom by means of wires coiled around the same with suitable devices connected therewith or by such means connected with switch devices adapted to sweep over pin contacts embedded in or contacting with such conducting and resisting homogeneous structure B, for cautery and many other purposes.

In Fig. 2, the rheostat in the form of a rectangular block is provided with a surrounding insulating and fire proof covering *b*, of asbestos, mineral wool or other suitable material or materials. This homogeneous composition structure is also provided with a series of pin contacts *b'*, which project into the body of the compound mass and extend upward from the surface of the same.

C, is a switch of any suitable construction included in the dynamo circuit and arranged so as to be brought into the path of said pin contacts *b'*, for regulating or adjusting the current thereof, that is, from two thousand volts to the fractional part of a volt through the resistance which is offered by the said materials of the rheostat B, to the current in passage through or about the same. In fact, an electric current of any voltage may be collected off through a rheostat of my invention, due to the fact that the same is capable of withstanding any intensity of current without burning out.

My invention is well adapted for galvanic actions, cautery and other operations from such dynamo currents of any voltage with absolute safety and this can be effected by simply manipulating the switch C, in the path of the pin contacts *b'*, of the rheostat B, in substantially the manner illustrated in Fig. 2.

In Fig. 3, the rheostat B, in the form of a thread or cord *b²*, in zig-zag arrangement with an insulated block D, is connected by conductors 10 and 11 with the source of energy A, as hereinbefore explained, and the switch C, is moved in the path of the pin contacts *b'*. This cord or thread constituting the rheostat in this instance is composed of a resisting substance saturated with materials adapted to produce when baked an absolute homogeneous conducting and resisting structure.

12 and 13, are distributing or collecting off wires connected with said switch and with one end of the thread or cord *b²*, as shown. These wires 12 and 13, are provided with handles *d* and *d'*, for the application of the hands thereto, so that by the manipulation of the switch C, over the series of contacts *b'*, in succession, the strength of current for galvanic action in the treatment of medical cases and for other uses, may be readily obtained and safely applied to the intended purpose.

In Fig. 3, the rheostat is in the form of a

thread or cord, while in Figs. 1 and 2, it is in the form of a cylinder and a block, but such compounded composition structure constituting the rheostat of my invention, as hereinbefore described and for the purposes stated among many others, may be made in various other forms or shapes with most excellent results when included in a circuit from a source of energy.

The rheostat B, may be composed of asbestos, graphite or black lead bound together with a binder of dextrine or starch, molasses, gum or similar material or of mineral wool, graphite and sugar, or of asbestos, mineral wool, graphite or black lead and a binder, composed of one or more of the materials hereinbefore mentioned, or of mineral wool, black-lead, chloride of aluminium and kaolin or of asbestos, graphite or black lead, and sugar or of asbestos, graphite or black lead, silver and a binder, as a gum or sugar, or of asbestos or mineral wool, graphite or black lead and cement, or of mineral wool, chloride of aluminium, black lead, kaolin, or of chloride of aluminium, graphite, kaolin, silver, asphalt or coal tar and cement, or of asbestos or mineral wool, graphite and rubber or gutta percha, or of earthy matter, such as clays in combination with one or more of the hereinbefore mentioned materials or substances, these materials being employed in such proportions in the aforesaid different combinations, among others, with the required quota of water to permit of the admixture and the effecting of a thorough combination or compounding of the same so as to produce a homogeneous structure, when brought in a mortar or other suitable vessel to a dough-like consistency. The mass so homogenized is then baked to assume the form, shape or condition for the required use, as a rheostat in a circuit, in substantially the manner hereinbefore explained.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A rheostat, comprising a homogeneous baked composition structure for controlling or adjusting voltage of an electric circuit and provided with pin contacts, conductors from a source of energy in connection with said structure, and a switch adapted to be manipulated in the path of said contacts, substantially as and for the purposes described.

2. A rheostat, comprising a homogeneous composition cord or thread for controlling voltage of an electric circuit from a source of energy and having pin contacts connected therewith for establishing a circuit therefrom by the manipulation of a switch in the path of said contacts, substantially as and for the purposes described.

3. A rheostat, comprising an insulated homogeneous composition structure for controlling voltage of an electric circuit and provided with pin contacts, conductors from a source of energy connected with said structure

ure, and a switch movable in the path of said contacts, substantially as and for the purposes described.

4. A rheostat, comprising a baked composition structure included in a circuit from a source of energy for controlling the voltage of a current therefrom and provided with pin contacts, a switch adapted to be manipulated in the path of said contacts and current distributor or collecting off wires connected with

said switch and structure and having handling devices, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

DUNCAN MACFARLAN.

Witnesses:

THOMAS M. SMITH,
RICHARD C. MAXWELL.