No. 684,628. Patented Oct. 15, 1901.

W. A. CARRELL.

ELECTRIC RESISTANCE.

(Application filed June 21, 1901.)

(No Model.)

FIG. 1.

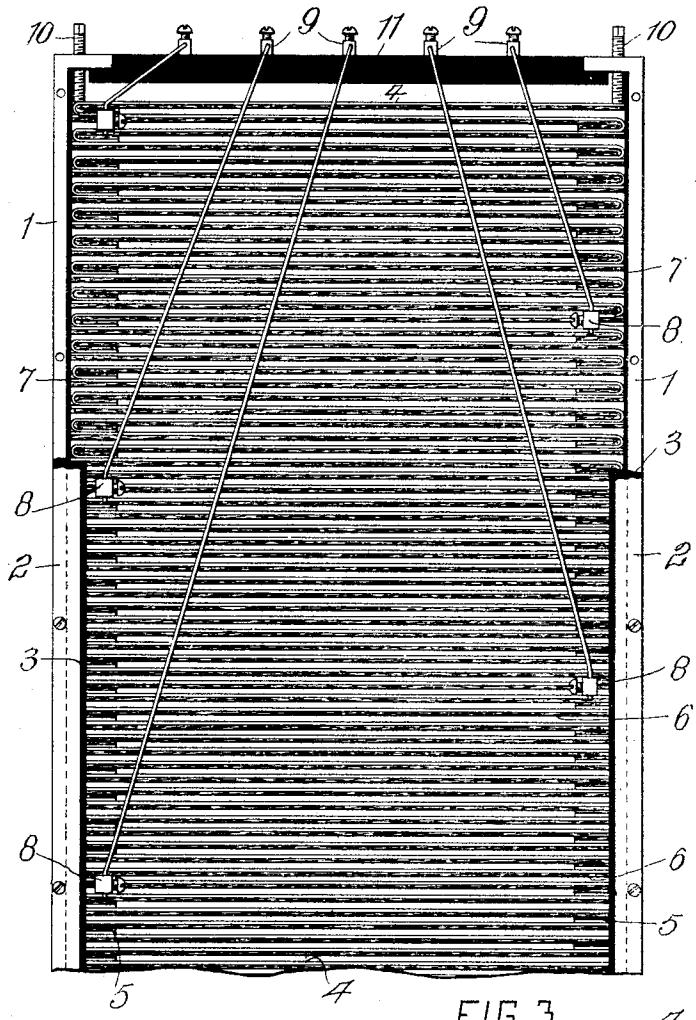


FIG. 2.

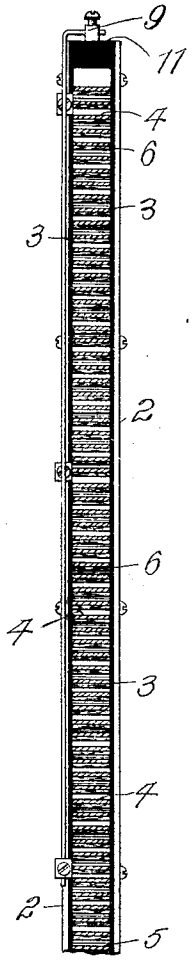


FIG. 3.

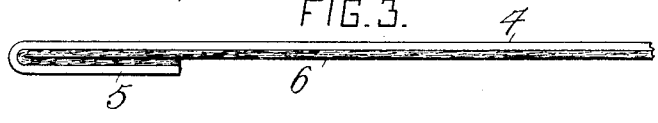
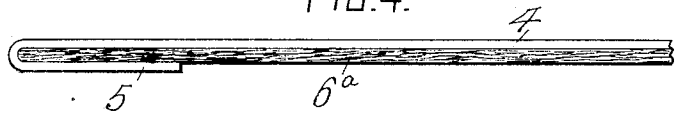


FIG. 4.



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UNITED STATES PATENT OFFICE.

WILBER A. CARRELL, OF WEST HOMESTEAD, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN O. HORNING, OF PITTSBURG, PENNSYLVANIA.

ELECTRIC RESISTANCE.

SPECIFICATION forming part of Letters Patent No. 684,628, dated October 15, 1901.

Application filed June 21, 1901. Serial No. 65,460. (No model.)

To all whom it may concern:

Be it known that I, WILBER A. CARRELL, a citizen of the United States, residing at West Homestead, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Electric Resistance, of which improvements the following is a specification.

The invention described herein relates to certain improvements in resistance for electric circuits; and in general terms the invention consists of a series of superposed plates or of plates arranged parallel with each other, but insulated from each other except at their ends, where each plate contacts with the adjoining plate on opposite sides.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in side elevation of my improved resistance, the resistance-pieces being arranged in a retaining case or frame. Fig. 2 is a vertical section of the same on a plane indicated by the line II II, Fig. 1. Fig. 3 is a detail view of a single plate or strip, on an enlarged scale; and Fig. 4 is a similar view illustrating a modification.

In the practice of my invention I provide a suitable U-shaped frame 1, having side retaining-pieces 2, detachably secured to the frame by screws or other suitable means. Within this frame are arranged a series of metal plates 4, insulated from each other by any suitable material, such as asbestos board, except at the ends, where each plate, while independent of adjoining plates, has a good electric contact with the adjoining plate on each side. It is preferred in order to effect this metallic contact and also to provide spaces between adjoining plates for purposes of ventilation to turn over one end, as 5, of each plate and to interpose between such turned-over portion 5 and the body 4 of the plate or strip one or more pieces of asbestos board or other non-conducting material, so that a current must follow the strip throughout or nearly throughout its entire length, but cannot pass directly across from the turned-over portion to the body of the strip. As clearly shown in Fig. 1, the strips are arranged with their turned-over ends alternately on opposite sides of the case or frame, so that a current must travel back and forth throughout the entire length of the resistance or any section thereof.

A convenient manner of forming the resistance consists in placing a strip 6 of asbestos cloth or board or other flexible insulating material on a metal strip and then turning over one end of the metal and insulating strip, as clearly shown in Fig. 3. This construction insures a double thickness of insulating material between the folded portions of the strip and would also insure a larger space between adjoining strips for purposes of ventilation. As shown in Fig. 4, a single strip of asbestos board may be employed, such strip 6^a extending to the end of the fold of the metal strip. It will be seen from Fig. 1 that the strip of insulating material not only separates the folded portion 5 from the body portion 4 of each strip, but will also insulate the body portion of each strip from the body portion of an adjoining strip on one side. As before stated, these strips are arranged within the frame one above the other or side by side, but are insulated from the frame by insulating material 7, lining the latter. The strips are held in position laterally by side bars 2, a piece of insulating material 3 being interposed between the side bars and the metal strips. The resistance formed of these metal strips can be divided into any number of sections each independent of the others by means of contact-plates 8, adapted to be pushed in between the bent-over portion 5 of one strip and the body portion 4 of an adjoining strip, thereby making contact with both strips. These contact-plates are provided with suitable means for connection to a wire which extends to a binding-post 9, secured in a bar 11, of non-conducting material, secured to the upper end of the frame. It will be readily understood by those skilled in the art that any number of these contact-plates may be employed, dividing the resistance into any desired number of sections, each section being of any desired resistance.

In order to insure a firm contact between adjoining strips and between the strips and the contact-plates 8, provision is made for

forcing the strips closely together at their ends by means of screws 10, passing through lugs 11 on the frame and bearing upon the plate or strip at one end of the resistance.

I claim herein as my invention—

1. A resistance consisting of a series of metal strips or plates each having one end bent over and making electric contact with an adjoining plate and insulating material interposed between the body portions of adjoining plates and between the body and bent-over portions of each strip, substantially as set forth.

2. A resistance consisting of a series of metal strips or plates each having one end bent over and adapted to make electric contact with adjoining plate and insulating material interposed between the body portions of adjoining plates and between the body and bent-over portions of each strip in combination with a contact-plate adapted to be interposed between adjoining plates and forming electrical connections between them, substantially as set forth.

3. A resistance having in combination a frame, a series of metal plates or strips, each having one end bent over and making electric contact with an adjoining strip, insulating material interposed between body portions of adjoining strips and between the body and bent-over portions of each strip, contact-pieces adapted to be interposed between and form contact with the bent-over portion of one strip and an adjoining strip, and means for forcing the strips and contact-plates firmly together, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILBER A. CARRELL.

Witnesses:

DARWIN S. WOLCOTT,

F. E. GAITHER.