L. P. HYNES.
RESISTANCE UNIT.
APPLICATION FILED JULY 13, 1921.

1,415,240. Patented May 9, 1922.

Fig. 1.

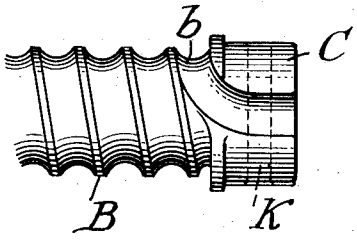


Fig. 2.

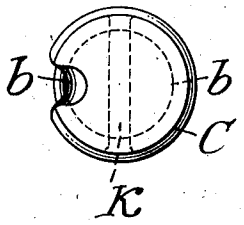


Fig. 3.

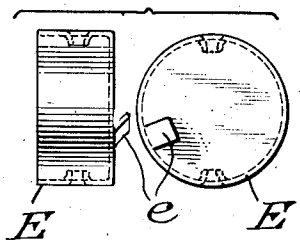


Fig. 4.

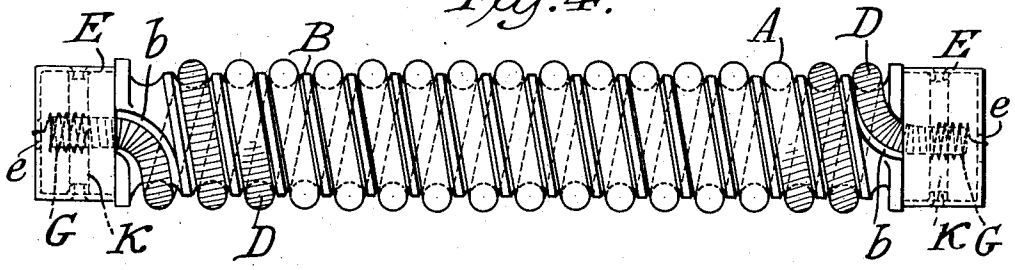


Fig. 5.

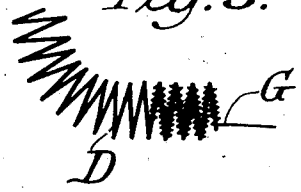
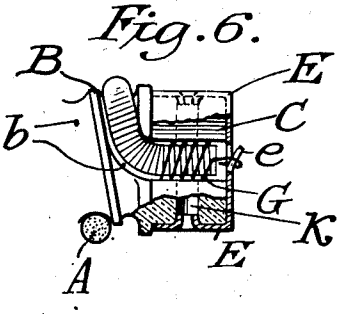


Fig. 6.



Lee P. Hynes Inventor

By his Attorney
E. M. Bentley

UNITED STATES PATENT OFFICE.

LEE P. HYNES, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, OF ALBANY, NEW YORK, A CORPORATION OF WEST VIRGINIA.

RESISTANCE UNIT.

1,415,240. Specification of Letters Patent. Patented May 9, 1922.

Application filed July 13, 1921. Serial No. 484,405.

To all whom it may concern:

Be it known that I, LEE P. HYNES, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Resistance Units, the following being a full, clear, and exact disclosure of the one form of my invention which I at present deem preferable.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawings forming a part thereof, wherein

Figs. 1 and 2 are side and end views of the porcelain core.

Fig. 3 is a side and end view of the end-cap.

Fig. 4 shows the completed unit.

Fig. 5 is a modification and

Fig. 6 a detail.

My invention relates to resistance units such as are provided with metallic ends adapted to be received by spring clips like those commonly employed for fuses. It resides in certain arrangements for securing a better, stronger and more sightly connection of the resistance wire with the terminal caps at each end and a protection for such connection.

I have illustrated my invention as applied to a resistance of the form shown in McElroy Patent 982,735 of Jan. 24th, 1911, wherein an asbestos cord on which a fine resistance wire is closely wound, is coiled on a helically grooved refractory core preferably of porcelain.

Referring to Fig. 4, A represents the asbestos cord on which the fine wire D is closely wound. The cord is coiled on a grooved porcelain core B, which is shown separately in Figs. 1 and 2. To the core B, I add at each end a cylindrical extension C into and across which the groove *b* of the core is continued somewhat diagonally. The groove is made considerably deeper where it traverses the said extension so that the coil which follows the groove, and lies normally on the outside of the core, is brought down below the level of the core surface at the extension C. Over said extension C and the wire-surrounded cord A embedded therein, is passed a metal cap E of cylindrical form, which is secured to the porcelain by being bent into each end of a hole K which passes diametrically through the extension C. At one point in the flat face of the cap a lip *e* is struck up from the metal and a copper wire G is wound over wire D on cord A (see Fig. 6) to make a good connection therewith, and its terminal then wound around the said lip *e*. The lip is then pressed down flush with the face of cap E, being soldered if desired. All that part of cord A, whereon wire G, is wound comes under the cap E, being secured by the bend of the cord and by the cap. That relieves all stress on the copper wire G and keeps it confined in place on the cord. Moreover the concealment of the connection gives a neat and workmanlike appearance to the completed unit while insuring the connection between resistance wire D and the terminal cap E. In Fig. 5 I have shown a wire coil without the presence of the asbestos cord A, this being used when the wire D is of a larger size. In that case the connecting copper wire G may be wound around the individual turns of the coil or may be omitted and the wire D itself wound on the lip *e*.

What I claim as new and desire to secure by Letters Patent is:

1. A resistance unit comprising a refractory core on which the resistance wire is wound and an extension thereof, together with a metallic terminal-cap embracing said extension and the end of said resistance wire and connected electrically to said wire at a point inside the contact surface of the cap.

2. A resistance-unit comprising a refractory core and extensions thereof provided with a helical groove that is deeper at the extensions, a coil of resistance wire laid in said groove and metallic caps, embracing said extensions and the coils therein and connected respectively to the two ends of the coil.

3. A resistance-unit comprising a refractory core and extensions thereof provided with a helical groove that is deeper at the extensions, a refractory cord wound with resistance wire laid in said groove and continued into the deeper parts of the groove in the said extensions, and metallic caps connected electrically to the ends of said resistance wire and embracing said extensions and the wire-wound cord therein.

4. A resistance-unit comprising a refractory core, a resistance wire thereon and metallic end caps on said core provided with

projecting lips to which the respective ends of the resistance wire are connected.

5. A resistance-unit comprising a refractory core, a resistance wire thereon and metallic ends on said core each having a lip struck up from the metal on which the respective ends of the resistance wire are wound.

6. A resistance-unit comprising a refractory core, a resistance wire thereon and hollow metallic caps embracing the ends of the core and the wire thereon and provided with lips struck up from the ends of said caps around which are wound wires forming the electrical terminals of said resistance wire.

7. A resistance unit comprising a refractory core and extensions formed with a helical groove, a coil of resistance wire in said groove, metallic end caps embracing said extensions and the coil ends therein and intermediate wires connecting the ends of the resistance wire to the respective caps.

8. A resistance-unit comprising a refractory core helically grooved, a resistance coil in said groove and end caps, embracing the ends of the core and the coils thereon and connected electrically to the respective ends of the coil with a depressed portion of the caps entering an opening in the core to retain them in position.

Signed at Albany, county of Albany, State of New York, this 9th day of July, 1921.

LEE P. HYNES.