L. KEBLER.

RESISTANCE UNIT.

APPLICATION FILED FEB. 15, 1919.

1,401,477. Patented Dec. 27, 1921.

Fig:1.

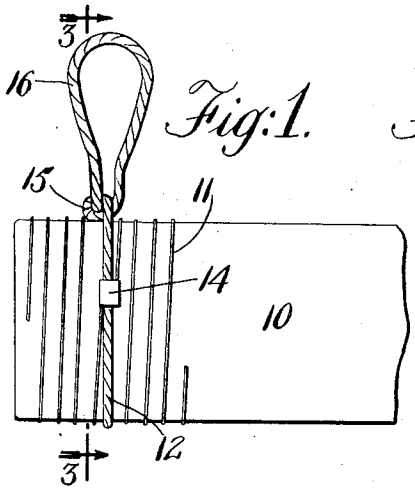


Fig:2.

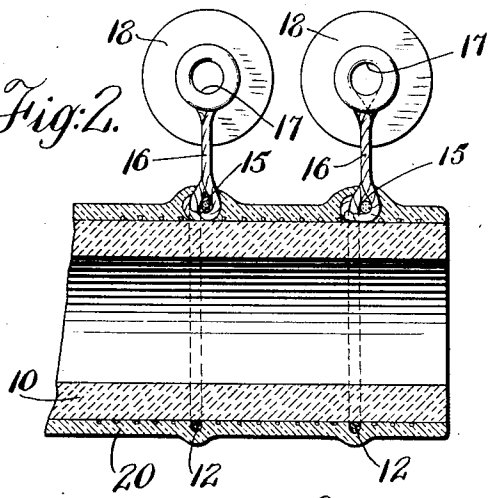


Fig:5.

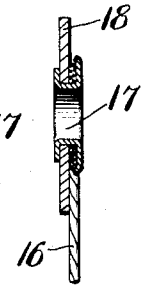


Fig:4.

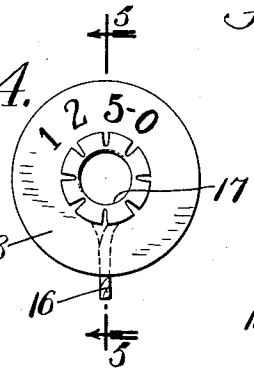


Fig:3.

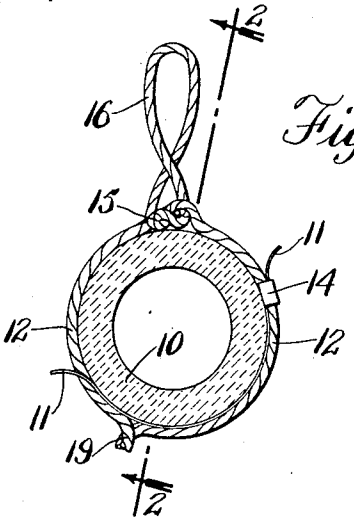


Fig:7.

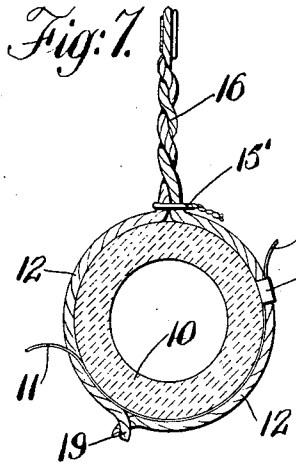


Fig:8.

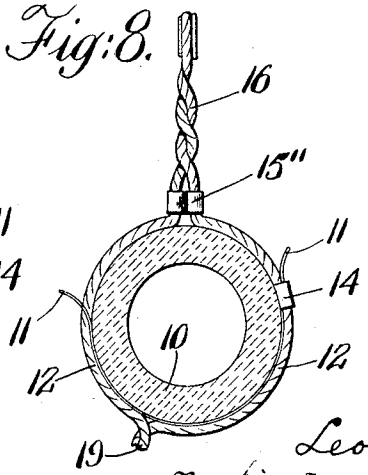
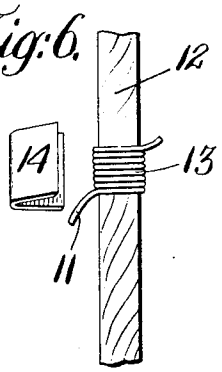


Fig:6.



Inventor

Leonard Kebler

By his Attorneys

Edwards Sager & Richmond

UNITED STATES PATENT OFFICE.

LEONARD KEBLER, OF BRONXVILLE, NEW YORK, ASSIGNOR TO WARD LEONARD ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

RESISTANCE UNIT.

1,401,477. Specification of Letters Patent. **Patented Dec. 27, 1921.**

Application filed February 15, 1919. Serial No. 277,123.

To all whom it may concern:

Be it known that I, LEONARD KEBLER, a citizen of the United States, residing at Bronxville, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Resistance Units, of which the following is a specification.

The principal object of my invention is to provide a new and improved enameled resistance unit. Another object is to provide suitable terminals or taps for such a unit. Another object is to provide such a unit with terminals or taps that will permit handling and use without breaking the enamel around their roots. These and other objects of my invention will become apparent upon consideration of the specific disclosure given by way of example in the following specification and accompanying drawings. It will be understood that modifications may be made within the scope of the invention.

Referring to the drawings, Figure 1 is an elevation of one end of my improved unit before the enamel coat is applied thereto;

Fig. 2 is a longitudinal section on the line 2—2 of Fig. 3 after the enamel coat is applied and the taps have been completed;

Fig. 3 is a cross section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged view of one of the completed taps;

Fig. 5 is a section of the same on the line 5—5 of Fig. 4;

Fig. 6 is a perspective view of a detail showing the manner of assembly of certain elements, and

Figs. 7 and 8 are views corresponding to Fig. 3 but showing modifications.

In the manufacture and utilization of enameled cylindrical resistance units they always require some kind of terminals for the attachment of conductors and in many instances intermediate taps are desirable so that connections can be made to definite portions of the resistance conductor wound on the whole tube. Difficulty has been experienced with the terminals or taps in making them simple and inexpensive, but at the same time serviceable and fool-proof. If the taps are flexible, it has been a matter of some difficulty to secure them in such a way that repeated flexing will not loosen the enamel at their roots. These difficulties and others have been overcome by my invention,

Referring to the specific embodiment of the invention shown in the drawings, the tubular earthenware base 10 has wound thereon in a helix from end to end a suitable length of resistance conductor 11. Each tap or terminal consists of a stranded flexible conductor 12 around which the resistance conductor is wound closely at one point 13 (Fig. 6) in the course of manufacture. A little metal plate 14 is shaped as an open V and slipped over the joint 13 and then pinched tightly together to secure the parts in the desired relation. The tap conductor 12 is knotted at 15 so as to form a loop 16. The end portions of the tap conductor 12 extending from the knot 15 are drawn tightly around the tube 10 and the extremities twisted together at 19. Each terminal or tap is applied in the same way and after the parts have been assembled as shown in Fig. 1, a coat of insulating enamel 20 is applied as shown in Fig. 2, which not only insulates the resistance conductor 11, but also holds the parts rigidly in the proper relation.

In applying the enamel 20, it may be most convenient to apply it to all the exposed parts so that upon the completion of the enameling process, the taps and terminals 16 will all be coated with enamel. This coating of enamel on the terminals or taps 16 can all be broken off very quickly by flexing them as by means of the thumb and fingers of the operator. The branches of the loop 16 being anchored together at 15, the flexure described will not extend beyond the point 15 and will not disturb the enamel coat 20. After the enamel has been removed from the loops, eyelets 17 are put in the extremities and secured by twisting the sides of each loop together to draw the loop tight around the eyelets. Also the edges of the eyelets may be bent around the lead so as to hold the eyelet in place without twisting, or both means may be employed concurrently to secure the eyelets in the loops. The washer 18 may be secured with the eyelet 17 or as a part of it and on this any desired characters may be stamped as shown for example in Fig. 4 where "125—O" means 125 ohms resistance.

The eyelets 17 may be soldered in the surrounding stranded conductor 16 and they afford convenient rugged attaching means for conductors that are to be led away from the taps or terminals. In the process of attach-

ing such conductors to the eyelets 17, and otherwise in use, the taps 16 may be flexed repeatedly, but this will not loosen the enamel coat 20 on account of the anchoring at the point 15 already described.

In Fig. 7 the sides of the loop 16 are secured together by being wrapped around with wire 15′ and in Fig. 8 the anchoring is effected by pinching a flat band 15″ around the two sides of the loop.

In the following claims I use the term "tap" as applying whether the tap is terminal or intermediate, and the term "enamel" is intended to cover any other equivalent coating.

I claim:—

1. In combination, a cylindrical base of insulating material, a resistance conductor wrapped thereon, a stranded tap conductor around the said base connected with said resistance conductor and having a branch loop extended therefrom, means to fasten the parts of said tap conductor securely together at the point from which they extend each way around the base at the root of said branch, an eyelet fastened in the extremity of said loop, and a coat of enamel on the base covering said conductors but leaving said branch part extending therethrough.

2. In combination, a base of insulating material, a resistance conductor thereon, a flexible loop tap conductor connected with said resistance conductor, a coat of enamel over the resistance conductor and adhering to the base and leaving the tap conductor projecting therethrough, and means at the root of said tap securing the branches of the loop together.

3. In combination, a base of insulating material, a resistance conductor thereon, a flexible loop tap conductor connected with said resistance conductor, a coat of enamel over the resistance conductor and adhering to the base and leaving the tap conductor projecting therethrough, and an eyelet fastened in said loop.

4. In combination, a base of insulating material, a resistance conductor thereon, a flexible tap conductor connected with said resistance conductor, a coat of enamel over the resistance conductor and adhering to the base and leaving the tap conductor projecting therethrough, and means to receive and display information signs attached to said tap.

5. In combination, a base of insulating material, a resistance conductor thereon, a flexible loop tap conductor connected with said resistance conductor, a coat of enamel over the resistance conductor and adhering to the base and leaving the tap conductor projecting therethrough, an eyelet fastened in said loop, and a flange carried by said eyelet on which information signs may be made.

6. In combination, a base of insulating material, a resistance conductor thereon, a flexible loop tap conductor connected with said resistance conductor, a coat of enamel over the resistance conductor and adhering to the base and leaving the tap conductor projecting therethrough, means at the root of said tap securing the branches of the loop together, an eyelet fastened in said loop, and a flange carried by said eyelet on which information signs may be made.

7. In combination, a cylindrical base of insulating material, a resistance conductor wrapped thereon, a tap conductor around the said base connected with said resistance conductor and having a branch loop extended therefrom, and an eyelet soldered into the extremity of said loop with the sides of the loop twisted together and drawn tightly around the eyelet.

8. In combination, a cylindrical base of insulating material, a resistance conductor wrapped thereon, a tap conductor around the said base connected with said resistance conductor and having a branch loop extended therefrom, the two sides of the loop being knotted together adjacent to the base, and a coat of enamel on the base covering said conductors and the knot but leaving the branch part extending therethrough.

9. The method which consists in wrapping a resistance conductor on a cylindrical base, putting a tap conductor around said base and connecting it with said resistance conductor, projecting a loop branch portion from said tap conductor at a point adjacent to said base, anchoring said loop branch at said point, enameling the whole, and flexing the branch portion to remove the enamel therefrom.

10. The method which consists in wrapping a resistance conductor on a cylindrical base, putting a tap conductor around said base and connecting it with said resistance conductor, projecting a loop branch portion from said tap conductor at a point adjacent to said base, anchoring the two sides of the loop at said point and covering the said conductors with a coat of enamel.

11. The method which consists in wrapping a resistance conductor on a cylindrical base, putting a tap conductor around said base and connecting it with said resistance conductor, projecting a loop branch portion from said tap conductor at a point adjacent to said base, knotting the two sides of the loop together at said point, and enameling the said base and the conductors thereon.

LEONARD KEBLER.