R. JACOBY.

LEADING-IN CONDUCTOR.

APPLICATION FILED APR. 8, 1914.

1,265,665.

Patented May 7, 1918.

Fig. 3.

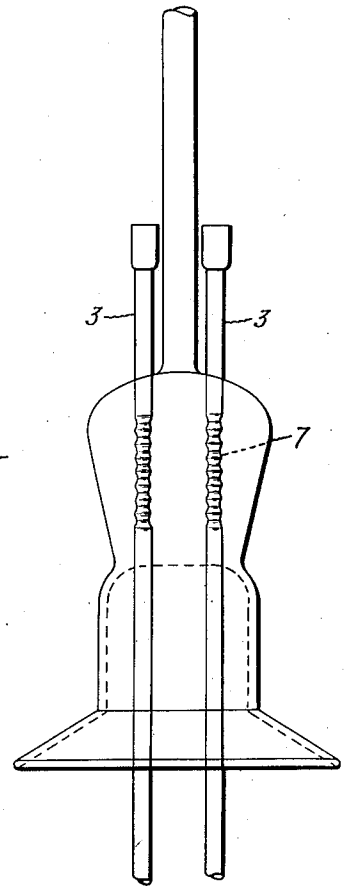


Fig. 2.

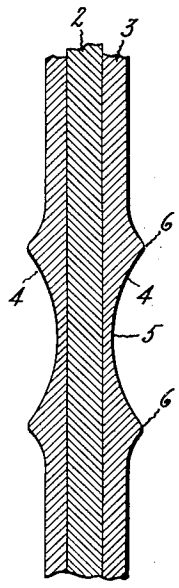
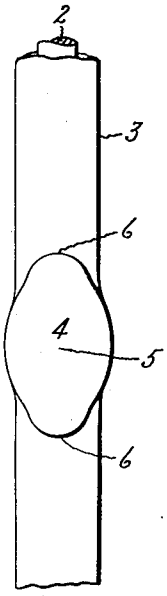


Fig. 1.



WITNESSES

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UNITED STATES PATENT OFFICE.

RICHARD JACOBY, OF BERLIN, GERMANY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

LEADING-IN CONDUCTOR.

1,265,665. Specification of Letters Patent. Patented May 7, 1918.

Application filed April 8, 1914. Serial No. 830,511.

To all whom it may concern:

Be it known that I, RICHARD JACOBY, a subject of the King of Prussia, residing at Berlin, Germany, have invented certain new and useful Improvements in Leading-in Conductors, of which the following is a specification.

My present invention relates to improvements in leading-in conductors for incandescent lamps, gas electric lamps, mercury rectifiers and apparatus of a similar nature in which a glass or vitreous envelop is used and in which it is necessary to provide means for conducting electrical energy from the power circuit to the space inclosed by the envelop.

By making a compound wire of two or more metals or by choosing suitable alloys, conductors have been prepared which have a temperature coefficient very nearly if not exactly the same as that of the material used for such envelops. In using such conductors, however, it has been found that if a perfectly straight portion having a smooth surface is employed to make the seal through the vitreous material, difficulty is sometimes experienced due to the fact that the conductor may be moved relatively to the envelop when tension is exerted upon the conductor. This difficulty may be due to two causes; the fact that the adherence of the material of the envelop to the conductor is not sufficiently tight to prevent such movement and the difficulty of making a conductor having exactly the same coefficient of expansion as the material of the envelop. I have found, however, that when a compound conductor is employed both of these disadvantages may be overcome by providing indentations in the outer sheath of the conductor at the portion which is to be sealed into the material of the envelop. By this means an anchorage for the conductor is obtained which absolutely prevents any movement relative to the envelop and I am also able to secure a conductor which will have at certain points a coefficient of expansion exactly the same as that of the material of the envelop.

My invention will be best understood by reference to the accompanying drawing in which Figure 1 shows an elevation of a short section of a conductor prepared according to my invention; Fig. 2 is a cross section taken through a plane at a right angle to that of Fig. 1, and Fig. 3 is an elevation of a seal for the leading-in conductors for an incandescent lamp. The conductor in this case consists of a core 2 of tungsten or a nickel-iron alloy having a coefficient of expansion less than that of ordinary glass and a sheath 3 of copper, cobalt or any other metal having a coefficient of expansion greater than that of glass and whose oxid is dissolved in glass at a relatively low temperature. The thicknesses of the core and sheath are so proportioned that the complete conductor has substantially the same coefficient of expansion as glass.

With a conductor of this nature indentations 4 on opposite sides of the conductor are made by hammering or pressing. It will be seen that, inasmuch as the sheath is softer than the core, practically all of the deformation may be made to take place in the sheath. The result will be that at one point 5 the sheath will be thinner while at points 6 on each side of 5 the sheath will be thickened. If the thicknesses of the core and sheath have been properly chosen therefore the coefficient of expansion of the compound wire at the point 5 will be less than that of the material of the envelop but at the points 6 it will be greater. Between these points there will be a place where the conductor will have the same coefficient of expansion as the material of the envelop.

It will be at once apparent that a great variety of methods may be employed for producing a variation in the relative cross-sectional area of the core and sheath at different points. In some cases it may be found desirable that the indentation shall take the form of a corrugation extending around the entire circumference of the conductor. This effect may easily be produced by pressing the conductor between two semicircular members shaped like halves of a die. If the conductor has a greater coefficient of expansion than the material into which it is to be sealed the desired result may be obtained by cutting a groove around the conductor. It will usually be found desirable to provide a plurality of these indentations or corrugations in the portion 7 of the conductor which is to form the seal, as shown in Fig. 3.

It will also be apparent that my invention will be useful when applied to a conductor composed of an alloy having substantially the same coefficient as that of the material of

the container. In this case the indentations in the surface of the conductor will provide an anchorage for the conductor so that when the seal has once been formed it will be impossible to move the conductor relatively to the surrounding envelop.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. An article of manufacture comprising a wall of glass having sealed therethrough a conductor composed of the same materials throughout its length and having at a plurality of points where surrounded by the glass a greater coefficient of expansion than the glass and at a plurality of other points where surrounded by the glass the same coefficient of expansion as the glass.

2. An article of manufacture comprising a body of glass and a conductor sealed thereinto having at one point a lower coefficient of expansion than the glass and at points on each side of that point the same coefficient of expansion as the glass.

3. An article of manufacture comprising a body of glass and a conductor sealed thereinto, said conductor having a coefficient of expansion at one point greater, at another point less and at an intermediate point the same as that of the glass.

4. An article of manufacture comprising a wall of glass having sealed therethrough a conductor composed of the same materials throughout its length and having at one point where surrounded by the glass the same coefficient of expansion as the glass and at other points where surrounded by the glass different coefficients of expansion.

5. A leading-in conductor for sealing into containers for electrical apparatus consisting of a core and a sheath having different coefficients of expansion, the thicknesses of the core and sheath being so proportioned that at one point in its length the coefficient of expansion has a value lower than that of the material of the container with which it is to be used and at other points has a value equal to that of the material of the container.

6. An article of manufacture comprising a wall of vitreous material having sealed therethrough a leading-in conductor, said conductor in the region where it is surrounded by the vitreous material having at one point a coefficient of expansion the same as that of the vitreous material and being composed of a core of uniform cross section and a sheath of varying cross section firmly adhering to the core, the coefficients of expansion of the core and sheath having different values.

In witness whereof, I have hereunto set my hand this 20, day of March, 1914.

RICHARD JACOBY.

Witnesses:

HANS GELM,

ERNST FRIEDERICK.