

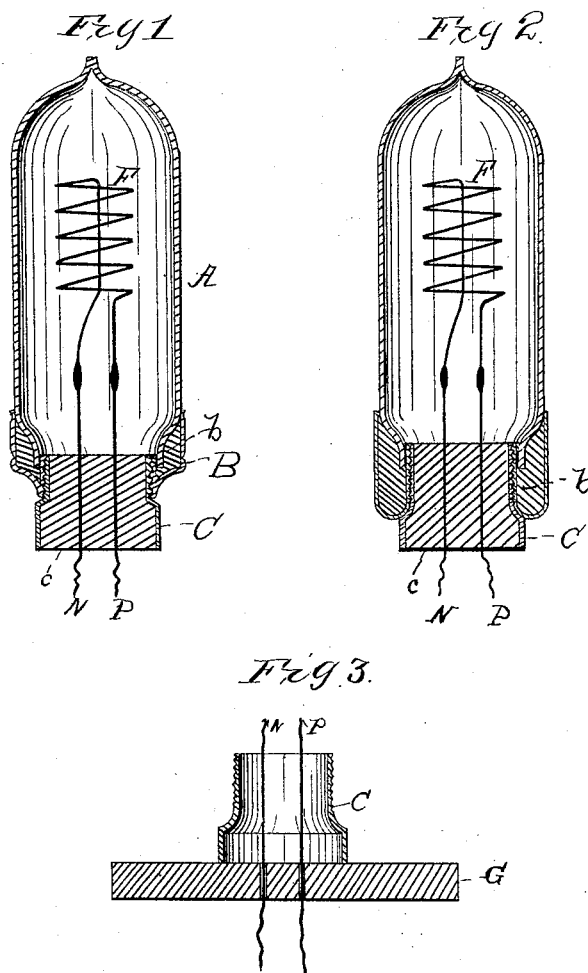
(No Model.)

G. W. HICKMAN & J. F. McCOY.

INCANDESCENT ELECTRIC LAMP.

No. 305,817.

Patented Sept. 30, 1884.



WITNESSES

Geo. H. Hawley  
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INVENTORS

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# UNITED STATES PATENT OFFICE.

GEORGE W. HICKMAN, OF WASHINGTON, DISTRICT OF COLUMBIA, AND JOSEPH F. MCCOY, OF RAHWAY, NEW JERSEY, ASSIGNORS TO THE VIADUCT MANUFACTURING COMPANY OF BALTIMORE CITY, OF BALTIMORE, MD.

## INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 305,817, dated September 30, 1884.

Application filed November 7, 1883 (No model.)

*To all whom it may concern:*

Be it known that we, GEO. W. HICKMAN, of Washington, District of Columbia, and JOSEPH F. MCCOY, of Rahway, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Incandescent Electric Lamps; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form part of this specification.

15 This invention relates to means for introducing and supporting in the bulbs the leading-in conductors of incandescing electric lamps, its object being to enable the use of cheap metal—such as copper—for the entire leading-in conductors, and to obviate the necessity for using platinum for those portions of the conductors which are sealed in the wall of the bulb. It has been the custom to use short lengths of platinum wire for those portions of the conductors which lead directly through the wall of the bulb, and to seal them in the wall by melting the glass and pressing it or allowing it to flow snugly around the wires to cool and form air-tight joints, this being the only metal found suitable for this purpose, because its ratio of expansion and contraction under changes of temperature is the same as that of glass, and therefore when the bulb and conductors are heated by the passage of the current and allowed to cool, when it ceases the bulb will not be ruptured or the seal broken by a differential expansion or contraction of the wires sealed into it. Platinum, however, is very costly, and its use adds very greatly to the expense of incandescent lamps. For this reason we have contrived a means for introducing and supporting the leading-in conductors, which enables the use of copper and any other metal at the points of direct passage through the wall, and for the sealing of such wires in a manner to completely prevent the passage of air around them.

Our invention will be fully understood from

the following particular description, in connection with the accompanying drawings.

Figures 1 and 2 are vertical central sections of incandescent electric lamps having the leading-in wires introduced and supported according to our invention, and Fig. 3 is a sectional view illustrating the mode of sealing in the leading-in wires.

The letter A indicates the glass bulb, which, when first completed, is open at its lower end and has a slight aperture at its top, in the usual manner, for enabling the bulb to be exhausted. B is an annular metallic cup, into which the lower end or mouth of the glass bulb is inserted and sealed with plaster-of-paris b, or a suitable compound in a well-known manner. The wall-surface which surrounds the central space of this annular cup is screw-threaded, and into this thread is screwed a cylindrical metallic shell, C, which is filled by a solid plug, c, through which pass the leading-in conductors P and N, which have attached to their inner ends the incandescing filament F in any well-known or suitable manner.

It is the novel composition of the plug c and its application as a seal and support for the leading-in wires which constitutes the important feature of our invention. The composition is formed of the following elements, viz: best stone lime, (commonly called "bottom lime," ) one part; plaster-of-paris, one part; cream of tartar, one-fourth of one part. We first add sufficient water to the lime to slake it and serve for mixing the other elements, and while it is slaking we add the cream of tartar, which cools the lime somewhat to keep it from burning itself, and also give a gloss to the finished composition, and then we immediately add the plaster-of-paris and mix the whole quickly and thoroughly to about the consistency of thick cream, or as plaster-of-paris is usually mixed for casting. This composition sets very quickly, and becomes very similar in appearance, hardness, and elasticity to polished bone.

In arranging the leading-in wires in place, we first take the empty shell C and set it on a base, G, as shown in Fig. 3, which has two holes formed through it, into which the leading-in

wires fit snugly. We then draw these wires through these holes, allowing them to project above the top of the shell a suitable length, and we then fill the shell with the composition, as above described, made to about the consistency of cream, or in the condition as used for taking stereotype-matrices. In a short time—ten or fifteen minutes—the composition will have “set,” and the whole may be then removed from the base and placed in an oven for thoroughly drying or baking the composition, which then forms a solid plug, closing the shell and sealing the wires perfectly air-tight. This composition we may also use for sealing the bulb in its annular base cup. We have found by experience that the seals of the wires and bulb formed as described do not become ruptured in the least, whatever may be the variations of temperature to which the said bulb and wires may be subjected, and it is

immaterial of what metal the leading-in wires are made. We may therefore use copper throughout, thus avoiding the expense of securing platinum leading-in terminals to the service-conductors, as is required when these terminals are sealed in the glass. 25

What we claim is—

In an incandescent lamp, the combination, with the mouth-piece, of the sealing composition described, composed of lime, plaster-of-paris, and cream of tartar, substantially as set forth. 30

In testimony that we claim the foregoing as our own and affix our signatures in presence of two witnesses.

GEO. W. HICKMAN.  
JOSEPH F. MCCOY.

Witnesses:

B. F. MORSELL,  
EDWARD E. ELLIS.