

(No Model.)

L. J. CROSSLEY & J. J. HICKS.

INCANDESCENT ELECTRIC LAMP.

No. 341,997.

Patented May 18, 1886.

Fig. 2.

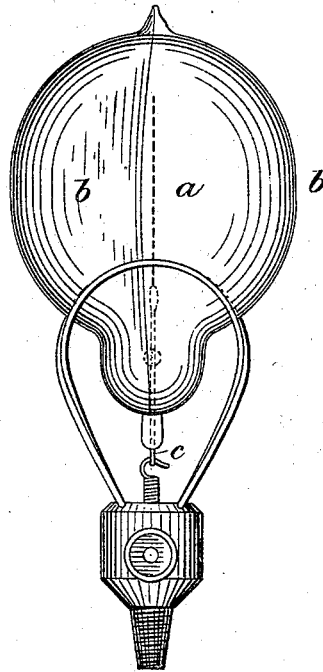


Fig. 1.

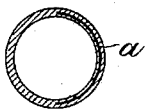


Fig. 3.

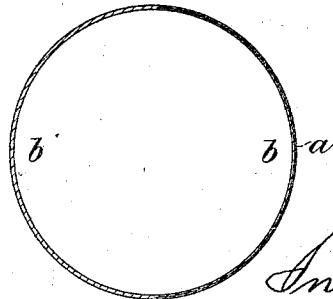


Fig. 4.



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# UNITED STATES PATENT OFFICE.

LOUIS J. CROSSLEY, OF HALIFAX, COUNTY OF YORK, AND JAMES J. HICKS,  
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## INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 341,997, dated May 18, 1886.

Application filed March 17, 1886. Serial No. 195,582. (No model.)

*To all whom it may concern:*

Be it known that we, LOUIS JOHN CROSSLEY, of Dean Clough Mills, Halifax, in the county of York, England, carpet-manufacturer, and JAMES JOSEPH HICKS, of 8 Hatton Garden, in the county of Middlesex, England, meteorological-instrument manufacturer, subjects of the Queen of Great Britain, have invented new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

Heretofore the bulbs or glasses of incandescent electric lamps have been made of glass which has been wholly clear or translucent, or they have been made of entirely semi-transparent or colored glass. They have also, in order to enable them to reflect the light, been made of clear glass, and have had one side or part of the bulb silvered, which is an expensive process, and at the same time produces an intensely-dazzling reflection.

Now, according to our invention, in order to produce a reflecting-lamp and to produce other effects, we form the said bulbs partly of clear glass and partly of white or colored enamel when the lamp is required to be provided with a reflective surface; but if it should be desired to enable the lamp to exhibit various-colored lights, then we form the bulb with sections of various colors and provide means whereby the lamps can be rotated, in order to bring any desired section into use.

In carrying our invention into effect in the construction of a reflecting glass or bulb, we first produce a tube, such as that represented in cross-section at Figure 1. This tube is made mainly of clear or translucent glass, but has embedded between two thicknesses of the same a strip, *a*, of white or other colored enamel or glass, extending the entire length of the tube, and of sufficient width to produce the desired extent of reflecting-surface in the finished glass or bulb. We blow a sufficient length of this tube into the form required for the bulb or glass *b*, as shown at Fig. 2. We then draw or cut off the bulb from the tube or cane, leaving a sufficient length of tube attached for the formation of the neck or bottom of the lamp, after which we seal the wires *c* in the

neck of such bulb or glass *b* and exhaust and seal the latter in the way now well understood.

A bulb or glass made in the manner above described will have the enamel *a* extending around the center thereof to about half its circumference, as shown at Fig. 3; but it may extend a less or greater distance, as may be required. By these means we produce an efficient reflecting-surface of the desired extent and shape.

For the purpose of producing a reflecting bulb or glass, as above described, we do not use the ordinary weak enamel employed in the manufacture of thermometer and barometer tubing, as in the operation of blowing the bulb or glass such weak enamel would lose its density and color to such an extent that it would consequently become ineffective for the purpose intended. We therefore use a denser and stronger enamel, which contains a larger proportion of arsenic, which, when a piece of tubing containing the same has been extended by blowing into the form of a bulb, will retain sufficient density and color to constitute an efficient reflector.

When it is required to manufacture incandescent lamp glasses or bulbs to produce various colored and other effects with or without the reflection, we first prepare a tube in a similar manner to that before described; but instead of having a single strip of white or other colored enamel embedded therein, as described with respect to Fig. 1, we embed within the thickness and extending along the length thereof two or more widths or strips of different-colored glass or enamel. At Fig. 4 we have represented a cross-section of such a tube, in which two widths or strips, *a'* *a''*, of different-colored glass or enamel are embedded within the substance of the clear glass forming the greater part of the tube, and a width or strip of clear glass, *b'*, is left, so that a lamp bulb or glass blown from such a tube will show through the part *a'* one color (say red) and through the part *a''* another color, (say blue,) while through the part *b'* the naked light will be shown. If desired, one of such widths or strips may be of white enamel, and another or others of other colored enamel or glass. In

larger glasses or bulbs a greater variety of designs can be produced.

If desired, incandescent lamp bulbs or glasses constructed with widths or strips  $a$  or  $a^2$ , according to our invention, may be mounted in holders or carriers in such manner as to enable the same to be rotated when desired, and when a number of such bulbs or glasses are employed they may all be simultaneously rotated by any suitable means—such, for instance, as a long rack or screw acting upon toothed or worm wheels fixed one on each lamp carrier or support.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is—

A bulb or glass for an incandescent electric

lamp blown from a length of tube in which one or more widths or strips of white or colored enamel or glass is or are embedded, substantially as herein shown and described, and for the purpose stated.

LOUIS J. CROSSLEY.  
JAS. J. HICKS.

Witnesses to the signature of the said Louis John Crossley:

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