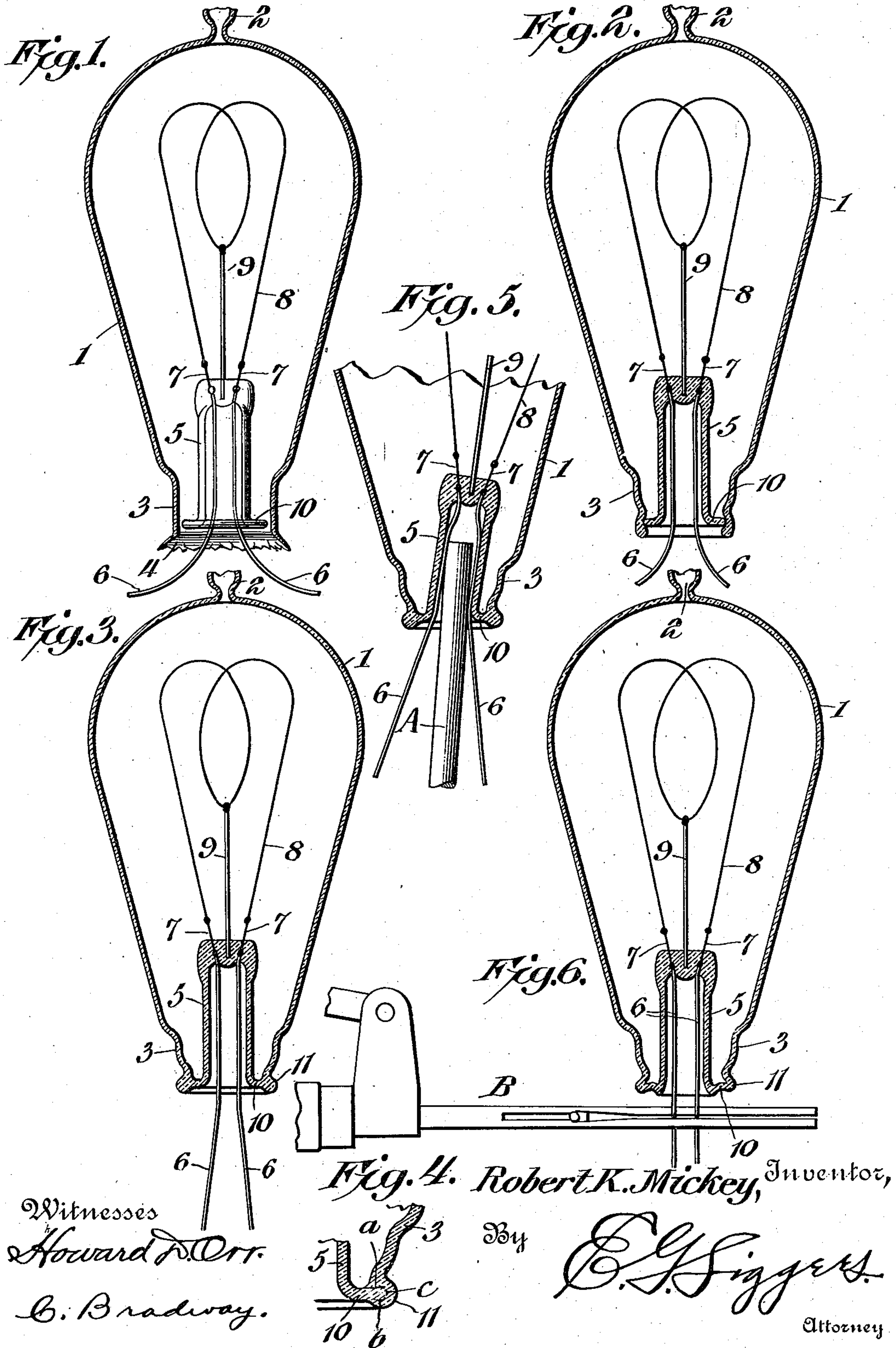


R. K. MICKEY.  
METHOD OF MANUFACTURING INCANDESCENT LAMPS.  
APPLICATION FILED DEC. 14, 1909.

966,571.

Patented Aug. 9, 1910.





# UNITED STATES PATENT OFFICE.

ROBERT K. MICKEY, OF EMPORIUM, PENNSYLVANIA, ASSIGNOR TO NOVELTY INCANDESCENT LAMP COMPANY, OF EMPORIUM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## METHOD OF MANUFACTURING INCANDESCENT LAMPS.

966,571.

Specification of Letters Patent.

Patented Aug. 9, 1910.

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*To all whom it may concern:*

Be it known that I, ROBERT K. MICKEY, a citizen of the United States, residing at Emporium, in the county of Cameron and State of Pennsylvania, have invented a new and useful Method of Manufacturing Incandescent Lamps, of which the following is a specification.

This invention relates to incandescent lamps, and more particularly to the method of sealing the filament-supporting stem in the neck of the bulb.

The principal object of the invention is to provide an improved method of forming the joint between the flanged base portion of the lamp stem and the neck of the bulb, whereby an annular bead or anchorage is formed around the base portion of the bulb to securely hold the base of the lamp on the neck and whereby the percentage of leaky lamp bulbs will be reduced to a minimum.

Broadly speaking, the process consists of placing the stem with its filament in the lamp and so positioning the base flange of the stem with respect to the neck that it will be located inwardly from the outer edge of the latter an eighth of an inch, more or less, and then so directing the fusing flames upon the bulb and stem during continuous rotation thereof that the neck of the bulb will first soften and cave in at a point above the flange of the stem, while the outer edge or marginal portion of the neck folds under the flange, so that when the two parts weld or fuse together, an annular anchoring bead or flange will be formed around the exterior of the neck for affording a firm attachment with the base of the lamp, and besides, the area of contact between the neck and stem is so large that the possibility of leakage is reduced to the greatest possible extent.

Another object of the invention is to carry out the steps of the method in such manner that the forming of the weld is substantially entirely automatic, it being merely necessary for the operator to exercise care in properly positioning the lamp stem in the neck of the bulb, while the flame-blast will cause the glass, as it softens, to shape itself over the flange of the stem

to form an effective seal and an annular anchoring bead, and hence, owing to the simplicity of the method the lamps can be quickly and economically made.

With these objects in view and others, the invention comprises the novel method herein described in connection with the accompanying drawing, in which,

Figure 1 is a sectional view, showing the manner of positioning the filament-supporting stem in the neck of the lamp. Fig. 2 is a similar view, showing the seal or joint between the stem and neck partially formed. Fig. 3 is a sectional view of the lamp, showing the seal completed. Fig. 4 is an enlarged fragmentary view of the seal, showing the manner in which the neck folds over, around and under the flange of the stem to form the seal and the anchoring bead of the neck. Fig. 5 is a fragmentary sectional view, showing the manner of centering the stem when the initial positioning of the latter is faulty. Fig. 6 is a sectional view of the lamp, showing the manner of drawing out the stem when the filament is too near the bulb.

Similar reference characters are employed to designate corresponding parts throughout the views.

The lamp bulb 1, prior to the stem sealing stage, is provided with the usual tubulature 2 and the neck 3 is trimmed to the proper length and the end thereof blown open, whereby the ragged flange 4 is produced. The bulbs are in this condition when brought to the stem sealing operator and the stems 5 are also complete with their leading-in wires 6, and platinum conductors 7, filament 8, and anchoring wire 9. The sealing machine may be of any approved construction to support the bulb and stem in proper relative position to each other while both are rotated simultaneously at the same speed. The bulb and stem are positioned in the machine and so adjusted that the flange 10 of the stem will be located an eighth of an inch, more or less, inwardly from the outer edge of the neck 3. While supported and rotated in this position, a plurality of flame blasts are directed on the neck at different points around the same so as to melt the



glass in the regions surrounding the flange 10. As the glass softens under the influence of the flame, it will cave inwardly at a point above the base flange 10 of the stem and fold inwardly under the flange, Fig. 2 showing this action in its initial stage. The flange 10 of the stem is relatively cooler than the neck so that the flame is continued until the marginal portion of the flange fuses, and by this time the caving in of the neck above the flange and the folding of the neck under the flange is more accentuated, so that when the two parts finally weld together, a joint, as shown in Figs. 3 and 4, is produced, resulting in a decided annular bead 11 extending entirely around the neck. It will thus be seen that the weld takes place between the upper and lower surfaces of the stem flange and neck of the bulb at *a* and *b*, respectively, and between the edge of the flange and neck, as at *c*. The advantage of sealing in the stem in this manner is that a substantial anchoring flange or bead is formed and an effective joint between the parts produced so that the percentage of leaky lamps will be reduced to a minimum. The welding of the bulb and stem so as to form the anchoring bead, is done entirely by the machine, and when the bead forms itself as shown in Fig. 3, the operator removes the lamp from the flame. Fig. 3 represents the normal lamp wherein the stem is perfectly central and in proper longitudinal position. Occasionally, however, the stem of the lamp might be canted to one side so that it will be necessary to straighten the stem to throw the filament in central position. In doing this, an instrument A is employed, as shown in Fig. 5, the same being a meat skewer or similar instrument which is a non-conductor of heat. The end of the skewer is inserted in the hollow of the stem and tilted to one side or the other so as to centralize the stem while the glass is still soft at the seal. It has been found, in practice, that a wooden instrument such as a meat skewer is advantageous for the reason that it is a non-conductor of heat and consequently does not cause cracking of the relatively hot stem, as is often the case when a metal instrument is used. Should the filament be too close to the bulb, the stem can be drawn outwardly while the glass at the seal is still soft, and for this purpose a pair of pliers designated generally by B is employed to grip the leading-in wires for pulling the stem outwardly longitudinally, as shown in Fig. 6. This operation can be performed without, however, marring the shape of the anchoring flange 11. Very rarely do the stems have to be centered or drawn, as in most cases the lamp will come out of the machine perfect, as shown in Fig. 3. It will thus be seen that

the sealing of the stem is practically entirely automatic and all the operator has to do is to accurately position the stem in the bulb and properly direct the flame on the neck of the bulb and, of course, remove the sealed lamp at the proper time. In other words, no manual operation is required to form the anchoring flange on the neck of the bulb.

Instead of using a pair of pliers, as shown in Fig. 6, for the purpose of drawing out the filament-supporting tube, it is to be understood that the usual well known method of blowing into the tubulature or top tubing may be employed.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The herein described method of sealing the filament-supporting stem in the bulb of an incandescent electric lamp, which consists in positioning the stem in the bulb with the flange of the stem set inwardly longitudinally from the outer edge of the bulb neck, directing a fusing flame blast on the neck from the exterior to melt the neck in the region of the flange, and continuing the flame until the portion of the neck above the flange caves in upon and fuses to the latter and the portion below the flange folds under and fuses to the same to produce an annular anchoring bead.

2. The herein described method of sealing the filament-supporting stem in the bulb of an incandescent electric lamp, which consists in positioning the stem in the bulb with the flange of the stem set inwardly longitudinally from the outer edge of the bulb neck, first fusing the neck in the region of the flange by an inwardly directed flame blast to force or cave the neck inwardly at all points over the flange, and continuing the flame blast until the flange fuses to the caved-in portion of the neck and to the portion surrounding the flange for forming an anchoring bead.

3. The herein described method of sealing the filament-supporting stem in the bulb of an incandescent electric lamp, which consists in positioning the stem in the bulb with the flange of the stem set inwardly longitudinally from the outer edge of the bulb neck, directing a fusing flame blast on the neck from the exterior to melt the neck in the region of the flange, continuing the flame until the portion of the neck above the flange caves in upon and fuses to the latter and the portion below the flange folds under and fuses to the same to produce an annular anchoring bead, and centering the stem by a heat-non-conducting instrument inserted in the stem while the flange thereof is still soft.

4. The improved method of sealing a filament-supporting stem in the bulb of an in-



candescent electric lamp which consists in placing the stem within the neck of the bulb, and then directing a fusing flame blast exteriorly against the neck of the bulb to fold  
5 the same around the edge of the flange of the stem both above and below the same.

In testimony, that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT K. MICKEY.

Witnesses:

KATHRYN WELSH,  
HILDA HERTIG.