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J. A. DONOHUE
INCANDESCENT LAMP STEM
Filed May 18, 1929

1,908,736

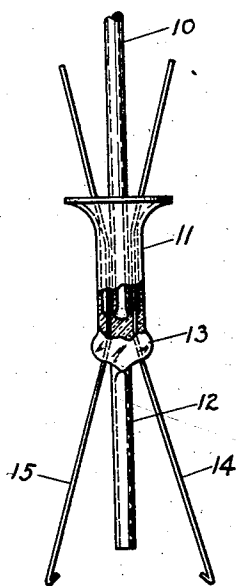


FIG. 1.

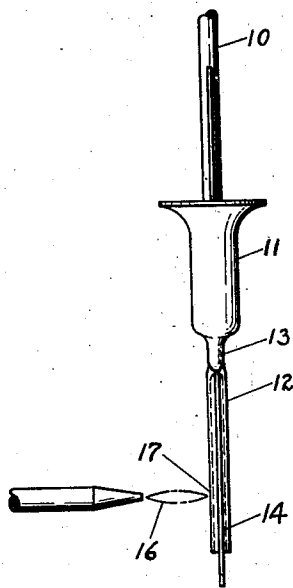


FIG. 2.

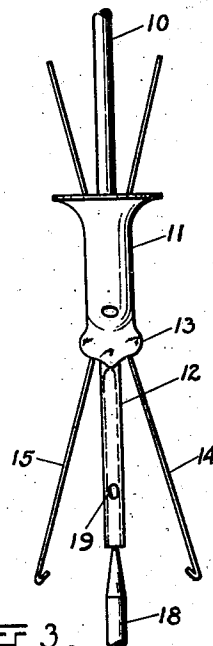


FIG. 3.

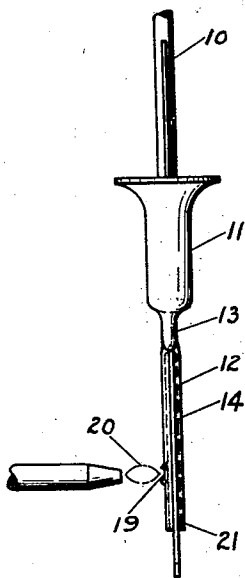


FIG. 4.

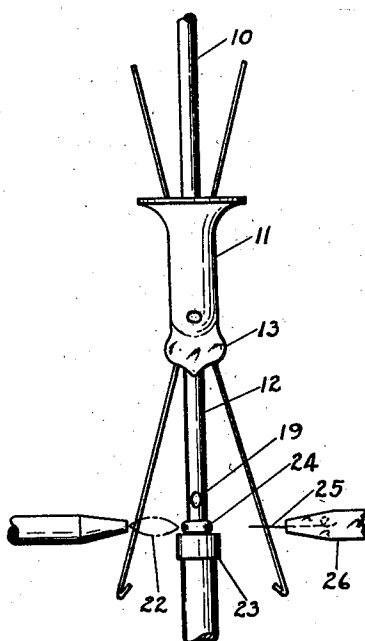


FIG. 5.

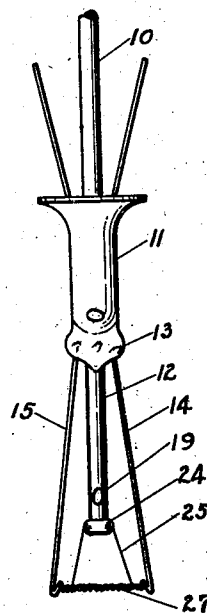


FIG. 6.

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INCANDESCENT LAMP STEM

Application filed May 18, 1929. Serial No. 364,116.

This invention relates to the manufacture of stems for incandescent electric lamps or similar devices.

The manufacture of incandescent electric lamps includes an envelope or bulb into which is sealed what is termed a lamp mount. The mount usually consists of a flare tube, an exhaust tube, an arbor, as well as a pair of leading-in conductors all of which are consolidated in what is termed a press to constitute a unitary structure. This structure is termed a stem and is ready to have support wires inserted into the arbor and a filament mounted on the support wires. After the support wires and the filament are in place and the filament is connected with the leading-in conductors the structure is termed a mount.

The present invention is concerned with the manufacture of stems to be completed as mounts to constitute the internal structure of electrical devices, such as incandescent electric lamps.

It has been proposed to construct a lamp stem by supporting a length of glass tubing disposed in axial alignment with the longitudinal axis of a glass flare tube. A pair of leading-in wires are also positioned within the flare tube and heat is applied adjacent to the unflared end of the flare tube at which time the said end is compressed, forming what is termed a press so as to fuse and consolidate the flare tube and the internally supported tube together, as well as to seal-in the leading-in wires at the press portion.

Means are provided for directing a jet of air under pressure into one end of the centrally supported tube, while the portion termed the press is still plastic so that the wall of the flare tube is punctured and an aperture is provided for communication between the internally supported tube and the interior of a lamp bulb for exhaust purposes after the stem has been sealed to the bulb.

When constructing a lamp stem as above described the portion of the central tubular member extending from within the flare tube is utilized as the exhaust tube and the end of the tubular member projecting outwardly from the press is utilized as an arbor to re-

ceive support wires. For the purpose of obtaining material to receive the ends of support wires, which carry the filament, an end of the arbor is rendered plastic and compressed into what is termed a button at which time means are provided for leaving the top of the button open so as to afford communication to the interior of the hollow arbor. This is necessary so that when the bulb is exhausted all gases will be drawn out of the arbor as well as the bulb.

It has been found that lamp stems made in accordance with the above practice present certain disadvantages. Difficulty has been experienced in providing the aperture in the button since in forming this aperture it is necessary to employ a pointed tool which has a tendency to adhere to the glass throwing the button out of proper position with respect to the arbor and since any deformation with respect to the position of the button results in difficulties in connection with the insertion of the support wires, stems made in the above manner presented disadvantages from a manufacturing standpoint.

The support wire inserting mechanism operates to insert the support wires by movement through definite paths and when the button is not properly positioned the support wires will be inserted an insufficient depth or not inserted at all, with the result that the automatic mechanism which must operate at relatively high speed is attended by an appreciable amount of loss through defectives stems.

It is an object of the present invention to provide a lamp stem having a hollow arbor and a uniformly formed and accurately positioned button thereon.

Another object of the invention is to provide a lamp stem having a uniformly positioned button and an aperture for exhausting the arbor.

Another object of the invention is to provide a method of producing a lamp stem having a hollow arbor and a button for receiving support wires and for closing an end of said arbor.

Other objects and advantages of the invention will be more fully understood with reference to the following description together

with the accompanying drawing, in which

Fig. 1 shows a lamp stem having a hollow arbor ready to be provided with an aperture.

Fig. 2 is a side view of the stem shown in Fig. 1 with a flame in position for heating a portion of the wall of the arbor.

Fig. 3 is a view of a stem shown in Fig. 2 with an arbor having a hole therein and with a nozzle in position for directing air under pressure into the arbor.

Fig. 4 is a view similar to Fig. 2 showing an annealing fire directed upon an aperture in the arbor.

Fig. 5 is a view of a stem with means for forming a button at the end of an arbor, and

Fig. 6 shows an arbor constructed in accordance with the present invention and complete to support a lamp filament.

In practicing the present invention stems may be provided comprising an exhaust tube 10, a flare tube 11 and an arbor 12. The arbor and flare tube which are initially of a continuous tubular member are united to the flare tube at 13 in what is termed a press which results from pressure being applied to heated portions of the positioned glass parts. Lead wires or conductors 14 and 15 extend through the press and are sealed therein.

A stem constructed as above described may then be supported and heat provided by a flame 16 may be directed against a wall 17 of the arbor 12. When the wall is heated to the proper plasticity a nozzle 18 directs air under pressure into the arbor so as to puncture the wall thereof at the plastic portion, and an aperture 19 is provided. The perimeter of the aperture 19 may then be annealed by directing a flame 20 thereagainst.

The stem may then be properly supported and the exposed end 21 of the arbor may be heated by a flame 22 until plastic, at which time a pressure member 23 may be moved to engage the plastic end and form a button 24, at the same time closing the end of the arbor and producing a solid symmetrically positioned mass for the insertion of support wires 25 which may be applied by mechanism 26, comprising the usual inserting ram of a support wire inserting machine. After the support wires are inserted they may be bent upwardly as shown in Fig. 6 and a filament 27 may be mounted therein and the ends of the filament suitably secured to the lead wires 14 and 15.

A lamp stem constructed in accordance with the present method is provided with a hollow arbor having an end closure in the form of a button which is so positioned as to lie in a plane transverse to the longitudinal axis of the arbor. It is therefore possible to provide a glass mass into which the support wires may be securely and deeply embedded, and furthermore by reason of the provision of an aperture in the side wall of the arbor a larger opening is possible than

has heretofore been obtainable and a more complete exhaustion of the interior of the arbor is attained.

It will be understood that in the manufacture of an article such as an incandescent electric lamp it is extremely important that the various lamp parts be made with the proper degree of uniformity so as to meet the requirements of subsequent operations on other machines, and where a lamp part is made of such character that its physical accuracy cannot be depended upon considerable loss is incurred causing shrinkage and obviously increasing the cost of production.

By reason of the present invention a lamp stem is produced by a simple and convenient method and at the same time the required uniformity to meet practical manufacturing demands is attained.

Although a preferred embodiment of the invention is shown and described herein it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. The method of manufacturing a lamp stem having a hollow arbor which comprises applying heat to the wall of the arbor to render plastic a portion thereof, puncturing the wall at the plastic portion, heating the exposed end of said arbor, and compressing the heated portion to enlarge the same and close the said end.

2. The method of manufacturing a lamp stem having a hollow arbor closed at one end by the press of the stem which comprises applying heat to a portion of the wall of said arbor, directing air under pressure into the open end of the arbor to puncture the wall at the heated portion heating the open end of the arbor and compressing to close said heated end.

3. The method of manufacturing a stem having a hollow arbor closed at one end by the press of the stem which comprises heating a portion of the wall of the arbor directing fluid into the open end of the arbor to puncture the wall at the heated portion, annealing the perimeter of the puncture and heating and compressing to close the open end of the arbor by an enlargement.

4. The method of manufacturing a lamp stem having a hollow arbor which comprises applying heat to the wall of the arbor to render plastic a portion thereof, puncturing the wall at the plastic portion, heating the exposed end of said arbor, compressing the said portion to enlarge the same and close the said end and inserting support wires in the said enlarged portion.

In testimony whereof, I have hereunto subscribed my name this 14th day of May, 1929.

JAMES A. DONOHUE.