May 11, 1943. C. WIENER 2,318,652

MAKING LAMP STEMS

Filed Dec. 30, 1938

Fig. 1.

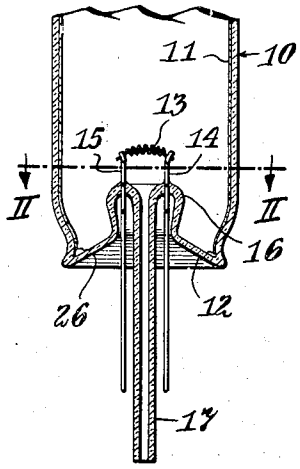


Fig. 2.

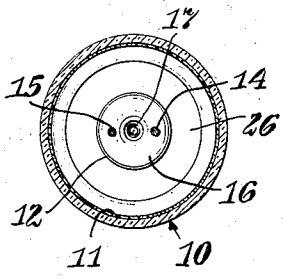


Fig. 3.

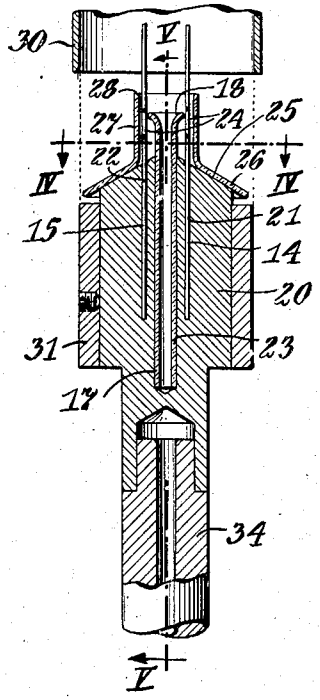


Fig. 4.

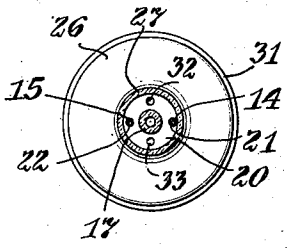


Fig. 5.

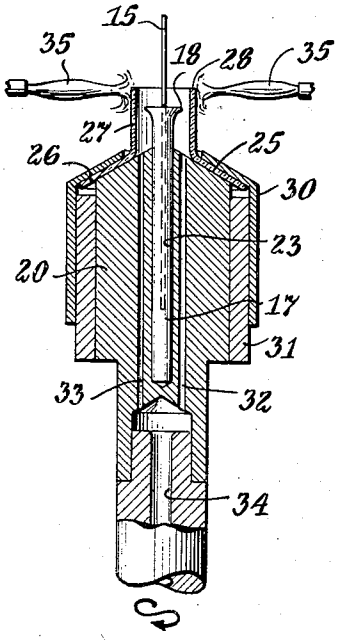


Fig. 6.

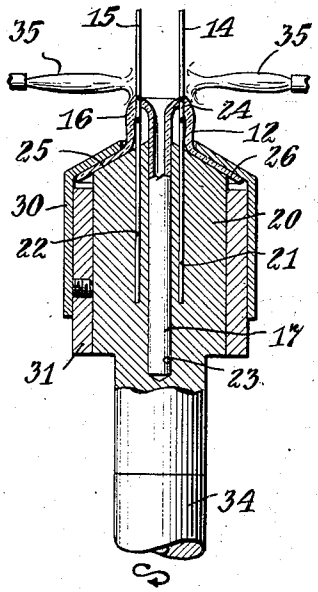
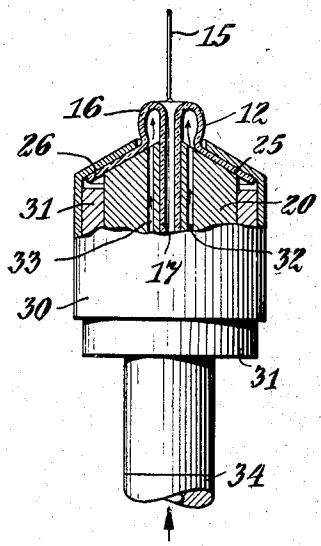


Fig. 7.



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MAKING LAMP STEMS

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2 Claims. (Cl. 49—78)

The invention relates to making lamp stems and especially to the making of vitreous or glass stems for tubes of the fluorescent type.

An object of the invention is to make lamp stems that are uniformly thin and which will not crack when heat is applied for sealing.

Another object is to adapt stem making apparatus for the production of uniformly thin glass stems.

Other objects and advantages of the invention will be apparent from the following description and drawing, in which:

Fig. 1 is a view in cross-section through one end of a fluorescent lamp illustrating the type of seal and stem accomplished by my invention.

Fig. 2 is a view on lines II—II of Fig. 1.

Fig. 3 is a cross-section through a spindle and associated apparatus with elements of the stem in place.

Fig. 4 is a view on lines IV—IV of Fig. 3.

Figs. 5, 6, and 7 are views similar to that of Fig. 3 illustrating various stages in forming the stem according to my invention.

Certain types of tubes require a thin and delicate stem. Such a type of tube is that of a fluorescent lamp where the requirements of beauty will not permit the usual thick glass press enclosed by the cumbersome screw-threaded base. The stems on these fluorescent tubes must be of a delicate formation especially where it is necessary that the tube itself present no outline of structure displeasing to the eye by an awkward connecting stem of the tube. Such use, being that of fluorescent tubes flanking the lateral edges of the mirror of a vanity where cumbersome ends on the fluorescent tube would spoil the pleasing effect presented by the rest of the object.

It is also important that where uniformly thin stems are utilized that these stems have a shape that will be strong and also that the method of assembling these stems be suitable for mass production. My invention accomplishes all of these objects in providing, by method suitable for mass production, a glass stem for fluorescent lamps especially those that are both uniformly thin and yet strong enough for the purpose for which they are made.

In Fig. 1, I have illustrated one end of a fluorescent tube having a tubular casing 10 with an interior fluorescent coating 11 thereon. This tubular member is sealed to a stem designated in general by 12 and composed of a filament 13 having two leads 14 and 15 sealed through an annular reentrant portion 16 about the tubulation 17.

In Fig. 3, I have illustrated the modification of stem making apparatus to accomplish the formation of the stem according to my preferred method and also the elements of the stem awaiting assembly thereon. The spindle 20 of the stem making device has two holes 21 and 22 drilled on opposite sides of a central larger hole or pocket 23. These two holes 21 and 22 are of a diameter to act as pockets to contain the conductors 14 and 15 therein and the central pocket 23 contains the tubulation 17 which preferably has a preformed conical flare 18 at the upper portion thereof. The depths of the bottom closed holes or pockets 21, 22, and 23 are such that the rim of the flare 18 of the tubulation almost touches the portion 24 of the conductors 14 and 15 and this portion is preferably of the familiar copper clad nickel-iron alloy commonly referred to as "Dumet." The upper portion of the conductors may be of nickel as may also be the portion below the "Dumet" portion 24. This lower portion can also be of any other suitable conducting material such as copper. The spindle 20 has a conical upper surface 25 adapted to receive the frusto-conical portion of a flare tube 26 having a tubular or generally cylindrical collar 27 which is of such a diameter that it closely surrounds the wires 14 and 15 held in their pockets 21 and 22. The tubular collar 27 terminates at its rim 28 a short distance above or beyond the flange 18 of the tubulation tube 17. When the flare tube 26 has been put in place and a perforated thimble 30 fits over the top surface, then this thimble centers said tube by closely fitting both it and the spindle 20 or a sleeve 31 secured thereto.

The spindle has one or more, preferably two, openings 32 and 33 as disclosed in Figs. 4 and 5, which are not pockets but extend from the upper conical surface of the spindle between the tubulation 17 and the contact of the flare tube 26 therewith to a conduit 34 having a gaseous medium such as air under regulated pressure. These two openings 32 and 33 may be located symmetrical with the pockets or bottom closed holes 21 and 22 for the conductors 14 and 15 as illustrated in Fig. 4.

As disclosed in Fig. 5, the spindle 20 is revolved and heat such as for example, a gas flame 35, directed against the upper edge 28 of the tubular collar portion 27.

The heat from the flame 35 melts down the upper edge portion 28 of the glass, against the "Dumet" portion 24 of the conductors 14 and 15 and also against the adjacent edge of the

flare 18 of the tubulation 17 as disclosed in Fig. 6. The application of the heat, accordingly, forms a seal between the tubulation 17 and the flare tube 26. Normally this seal would be in the form of a sharp, inverted V with thick sides. Such a V-shaped seal would be very weak and apt to crack easily in the crotch of the V. Furthermore the annealing of the glass forming the seal would be very slow because of the thickness of the melted glass and strains might exist in the seal as a result.

The application of air or of other gases such as the inert gas nitrogen under pressure, through the openings 32 and 33 will round out the annular portion 16 while still soft, as disclosed in Fig. 7, into a gentle arched or toroidal curve that avoids strains present in the seal. Furthermore this gaseous pressure accomplishes the result of providing a uniformly thin wall in the annular portion where the conductors are sealed therein. Due to the thickness of the wall, the glass will have a rapid rate of annealing and this rapid rate of annealing will remove the possibility of strains remaining in the glass.

It is apparent that modifications may be made in the specific form and arrangement of the various elements and the method of their assembly.

I claim:

1. The method of making a stem for a lamp comprising disposing a vitreous flare tube having a frusto-conical portion and a generally cylindrical collar portion around a vertically disposed vitreous exhaust tube having its upper end portion open and flared, with the frusto-conical portion of the flare tube encircling an intermediate portion of said exhaust tube and the generally cylindrical collar portion extending above the upper flared end portion of said exhaust tube, disposing lead-in conductor means between said collar and flared portions, applying heat adjacent the upper edge of said collar portion sufficient only to draw said upper edge portion inwardly and unite it by fusion with said open flared end portion of said exhaust tube, to form a seal, and rounding and thinning the fused vitreous seal between said portions by applying fluid pressure between said exhaust tube and collar, whereby the junction therebetween is thinned to approximately the normal thickness of the parts.

2. The method of making a stem for a lamp comprising heating and expanding the upper end portion of a vitreous exhaust tube to form an outwardly flared open end portion, disposing a vitreous flare tube having a frusto-conical portion and a generally cylindrical collar portion around said exhaust tube when vertically disposed with the frusto-conical portion of the flare tube encircling an intermediate portion of said exhaust tube and the generally cylindrical collar portion extending above the upper portion of said exhaust tube, disposing lead-in conductor means between said collar and flared portions, applying heat adjacent the upper edge of said collar portion sufficient only to draw said upper edge portion inwardly and unite it by fusion with said open flared end portion of said exhaust tube, to form a seal, and rounding and thinning the fused vitreous seal between said portions by applying fluid pressure between said exhaust tube and collar, whereby the junction therebetween is thinned to approximately the normal thickness of the parts.

CHARLES WIENER.