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D. S. GUSTIN

1,965,232

BULB FOR MECHANICAL BASING

Original Filed Dec. 28, 1929

Fig. 1.

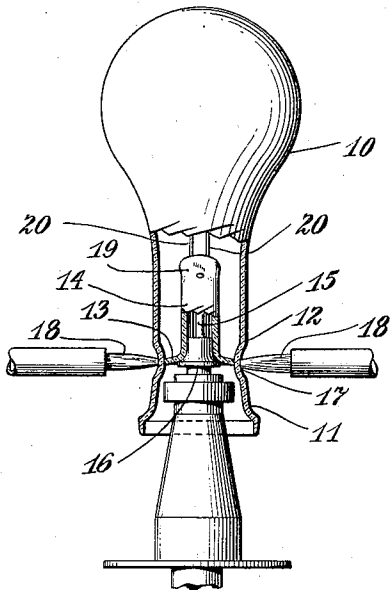


Fig. 2.

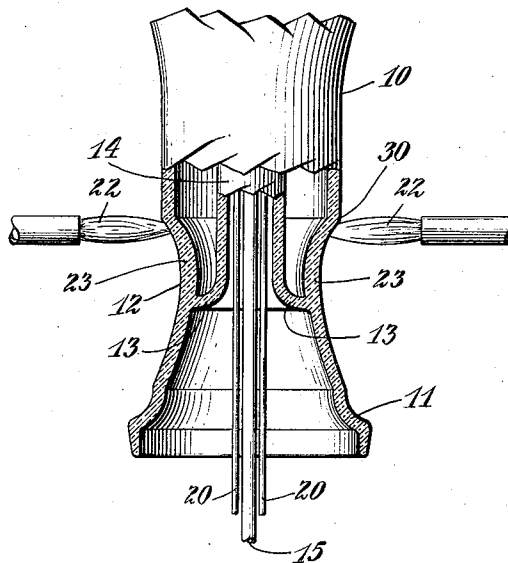


Fig. 4.

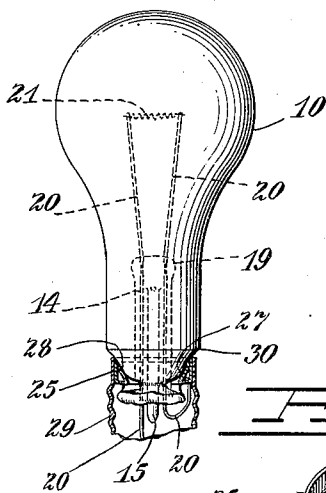


Fig. 3.

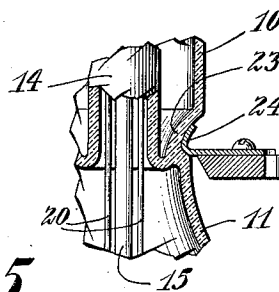
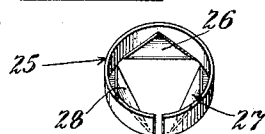


Fig. 5.



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UNITED STATES PATENT OFFICE

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BULB FOR MECHANICAL BASING

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417,106. Divided and this application May 20,
1933, Serial No. 671,969

3 Claims. (Cl. 176—32)

This invention relates to the manufacture of electrical devices such as incandescent electric lamps in which a base is secured to a lamp bulb by a mechanical connection between the base and the bulb neck as shown and described in my Patent 1,813,572 dated July 7, 1931 and is a division of my Patent 1,915,361 dated June 27, 1933 for Method of sealing-in.

In the manufacture of electrical devices such for example, as incandescent electric lamps, it is the practice to provide the lamp with a base in the form of a threaded shell or cap having one end open to receive the end or neck portion of a glass bulb. Bases of the above character have usually been secured to the bulb by means of a quantity of cement which is deposited in the base after which the bulb and base are disposed in the desired relation and the cement is subjected to a baking operation to harden and firmly secure the bulb and base in fixed relation.

The above construction has been extensively used but certain disadvantages attend this mode of manufacture since it is time consuming, relatively expensive and involves a heat treating operation.

In my copending application above mentioned, I have provided a structure which eliminates the use of cement but at the same time utilizes the standard type of screw shell or base. The structure set forth in the said application includes a split or otherwise resilient collar having a circular outside perimeter and having its central or internal perimeter of non-circular form. The said collar snugly fits the interior surface of the base or shell and the non-circular perimeter grips the bulb neck.

It will be appreciated, however, that in order to obtain the proper gripping action between the non-circular perimeter of the collar and the bulb neck, that the said neck must be formed to a predetermined shape to conform with the formation of the internal perimeter of the collar so that when the base is applied over the collar the latter will be firmly pressed into contact with the accommodating formation in the bulb neck.

When the collar and base have been disposed in proper relation the said base and collar are secured together by solder or by a brazing operation. One of the lead wires of the lamp may be disposed between the collar and the shell while the other lead wire is secured to the usual bottom contact of the shell or base. In the production of incandescent electric lamps of the mechanically based type above described, it has been found that although satisfactory results

may be obtained by forming the depressions in the bulb neck by ordinary methods, a bulb having greater strength at the neck portion is obtained by performing the bulb shaping operation in accordance with the present method to be hereinafter described.

It is an object of the present invention, therefore, to provide a bulb having the neck portion shaped and strengthened to receive a retainer member.

Another object of the invention is to provide a bulb having the neck portion shaped to receive a retainer member and having the glass of relatively great thickness at the shaped portion.

Another object of the invention is to provide a bulb having the neck wall thereof of greater thickness than the remaining wall.

Other objects and advantages of the invention will be more fully understood from the following description together with the accompanying drawing in which

Fig. 1 is a view of a head showing a bulb and mount partly in cross section in position with fires for contracting the bulb neck about the flare tube of the mount to thicken the neck portion of the bulb;

Fig. 2 is a fragmentary view of a portion of the bulb neck showing the thickened glass after the neck has been shaped;

Fig. 3 is a fragmentary detail cross sectional view showing a jaw to form a depression;

Fig. 4 is an elevational view showing a bulb neck and base secured together by a retainer member, the latter being in cross section; and

Fig. 5 is a perspective view of a retainer ring employed for locking a base to the bulb neck.

A bulb embodying the present invention may be made in accordance with the method set forth in the above mentioned copending application and the present drawing and description show the important steps of this method sufficiently for a clear understanding of the invention claimed.

As illustrated, a bulb 10 having a collet 11 may be suitably supported with the neck portion 12 surrounding a flange 13 on a flare tube 14. The flare tube is, in practice, consolidated with an exhaust tube 15 which exhaust tube is usually inserted in a holder 16 for the purpose of disposing the flare tube in position to be sealed at 17 to the bulb neck by sealing fires 18.

After the flare tube and bulb neck are consolidated, the collet is severed. The fusing operation, serving to unite the flare tube to the

bulb, is termed a sealing-in and leaves the lamp ready for the exhausting operation. The flare tube and exhaust tube are united in what is termed a press 19' from which extend support wires 20 connected to the terminals of a filament 21. This internal structure of the lamp, including the flare tube, exhaust tube and supported filament, is termed a mount.

In the type of lamp to which the present invention relates, the flare tube is provided with the annular flange 13, as above pointed out, and in the usual practice the operation of sealing the bulb neck to the flare tube completes the lamp for the sealing-in operation. In accordance with the present invention, however, the wall of the bulb neck adjacent to the flare and extending therefrom is thickened and for this purpose shaping or softening fires 22 are provided. These fires, as shown in Fig. 2, are directed against the bulb neck at a point above the consolidation between the bulb and flare tube and serve to soften an appreciable portion of the glass above the flange of the flare tube and contract the bulb neck at which time the glass accumulates and results in a thickened portion 23. As will be noted, the plastic glass tends to flow downwardly and provides a thickened portion which extends from the flare tube upwardly and results in what may be termed a reinforced wall or strengthened neck portion on the bulb.

While the glass is still in a plastic condition a plurality of jaws such as jaw 24, are moved toward the bulb neck to shape the neck portion to such a form as to receive a retainer or collar 25, as shown in Fig. 4. The collar, as shown in Fig. 5, is in the form of a split ring having an interior perimeter comprising three straight surfaces 26, 27 and 28. In the present construction three jaws 24 may be provided of substantially the same shape as one of the straight edges of the collar 25 so that when the jaws have pressed the neck of the bulb to the proper depth, the straight edges 26, 27 and 28 of the retainer member will be accommodated by the depressions formed and the said edges will seat in the depressions so that the retainer member will snugly fit the shaped portion of the bulb neck and be ready to receive a base 29 which fits the collar and may be suitably secured thereto.

It will be noted that a bulb made in accordance with the present invention is provided with the neck portion thickened substantially throughout the portion between the seal and the shoulder 30 at the end of the cylindrical portion of the neck. Usually a screw base when secured to the bulb is so positioned that the upper edge of the base is seated on or close to the shoulder. The cylindrical portion of the bulb is relatively strong since it has not been rendered plastic and worked as has the lower portion. Therefore, by thickening the wall between the seal and the shoulder an extremely strong wall is provided.

During the operation of shaping the bulb neck by means of jaws 24, air under pressure may be directed through the exhaust tube which communicates with the interior of the bulb so that the softened glass is forced firmly against the shaping jaws. In practice it has been found preferable to sever the collet by suitable cut-off fire after the forming jaws 24 have pressed and shaped the bulb neck. Suitable annealing fires may be employed to anneal the closed portion of the neck before the severing-off operation is performed. It has also been found desirable, during the severing operation, to direct

one or more jets of air against the shaped portion of the bulb neck to cool the same.

After the collet has been removed an operation termed a "pull-down" is performed. This operation consists in moving the mount relative to the bulb while the glass portion of the seal is still plastic. In lamp making machines the pull-down operation is accomplished by a downward movement of the holder or chuck which secures the exhaust tube. The plastic material at the seal is thus worked and internal stresses are removed. Means for causing the pull-down are not shown since this feature is well known in the lamp art. It is pointed out, however, that although the present bulb distinguishes from others in having the reinforced or thickened neck, it still may embody the pull-down feature to remove internal stresses, thus giving the desired strength and at the same time retaining the necessary practical form in which detrimental stresses are avoided.

In addition to the pull-down, however, it has been found desirable, when the bulb is ready to be exhausted, to direct an annealing fire against the union between the bulb and the flare tube and further to remove internal stresses.

In the manufacture of incandescent electric lamps the desirability of avoiding the use of a basing cement and mechanically attaching a base to a bulb has long been considered desirable. The manufacture of incandescent lamps, wherein it is necessary to seal or consolidate two glass parts, made the use of a mechanical base extremely difficult.

It will be appreciated that when a base is to be held to a bulb neck certain stresses are imparted upon the neck and since the glass of this portion of the bulb has necessarily undergone changes, due to working, it is less resistant to breakage than would be the case with a glass portion as originally received from a blowing operation.

The present invention provides a bulb with a neck portion which is not only shaped but strengthened to such extent that it provides a rugged support for the means which hold the base in position.

The bulb, as provided by the present invention, is not one wherein the neck is provided with a mass of glass but it is so constructed that the neck portion is strengthened by a distributed thickened glass portion. The wall, as clearly shown, is of increased thickness for an appreciable distance extending from the flange of the flare tube. This gives the wall of the neck strength not only in one direction, as in the case of a mass of glass around the lower portion, but the necessary strength in all directions to provide an effective and practical bulb which may be provided with a base mechanically secured thereto in such manner as to meet commercial requirements.

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. An incandescent electric lamp comprising a bulb for receiving a base retainer member, a flare tube having the flange thereof integral with the bulb neck, said bulb neck having the material of the wall thereof thickened at a point adjacent to said flange to strengthen the portion of the

wall about which the retainer member is disposed.

2. An incandescent electric lamp comprising a bulb for receiving a base retainer member, a flare tube having the flange thereof integral with the bulb neck, said bulb neck having the material of the wall thereof thickened at a point adjacent to said flange to strengthen the portion of the wall about which the retainer member is disposed, said thickened wall having depressions to receive portions of a retainer member.

3. An incandescent electric lamp comprising a

bulb having a cylindrical neck portion and an end portion, a flare tube having a flange integral with said end portion, the wall of said end portion extending between said flange and said cylindrical portion being of relatively great thickness as compared to the wall of said cylindrical portion and of gradually decreasing thickness toward the spherical wall of the bulb, said thickened wall having depressions shaped to receive a base retainer member.

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