

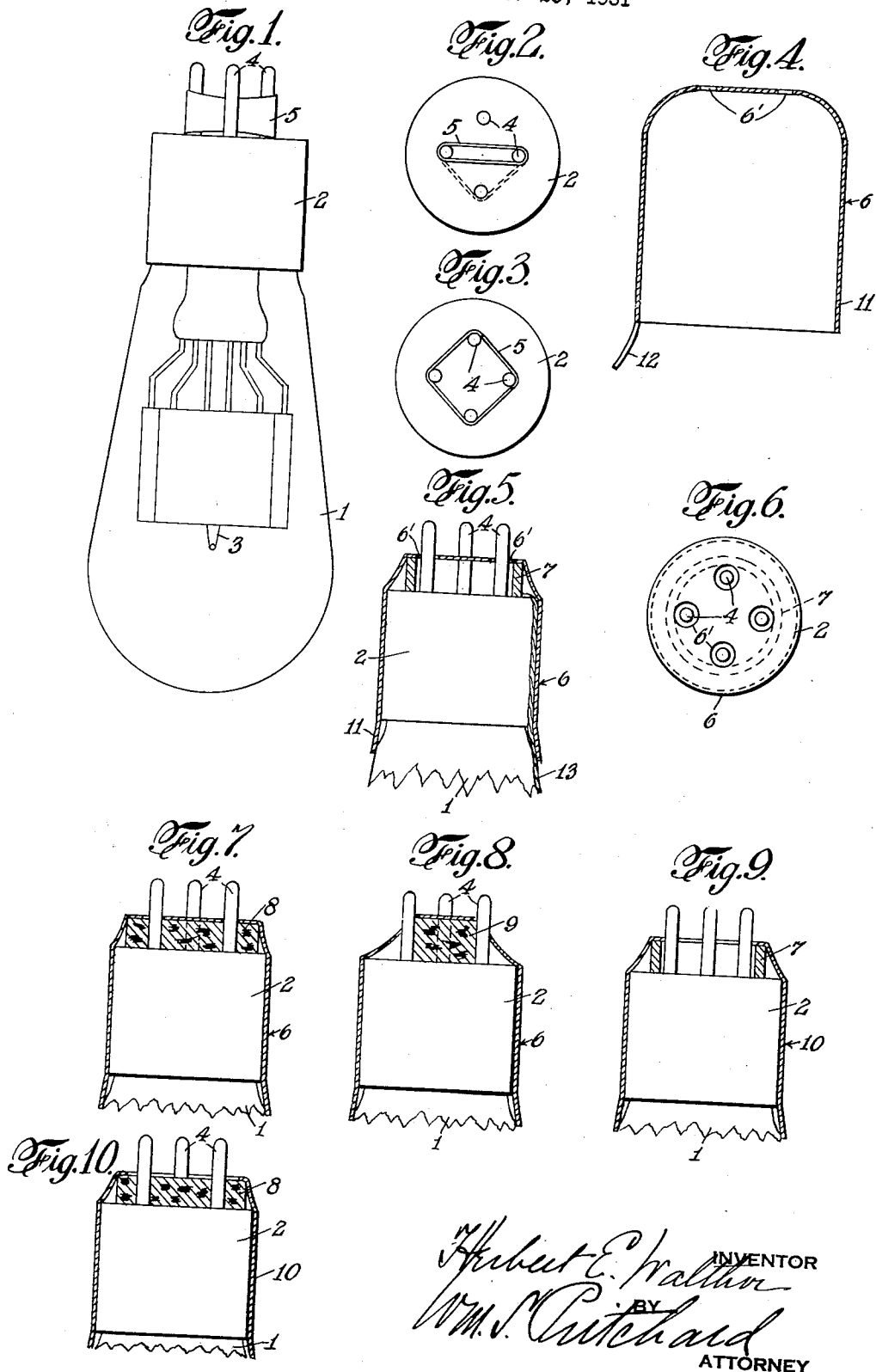
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H. E. WALTHOR

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TUBE

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UNITED STATES PATENT OFFICE

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TUBE

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22 Claims. (Cl. 250-27.5)

This invention relates to tubes, such as radio tubes, vacuum tubes and the like, and particularly to tubes provided with temporary coverings designed and constructed to permit exposure of a sufficient length of the contacts to allow testing, but insufficient to permit use without rupturing or mutilating said coverings.

In the sale of radio tubes and the like, it is the customary practice to test the tube in the presence of the purchaser in order to assure him of securing a perfect tube. Many used tubes when tested give a positive result with the consequence that they are sold as new. When a used tube is sold it becomes exhausted during a period of time considerably less than its guaranteed life. As a consequence, the user complains to the manufacturer and demands replacement. Again, many unscrupulous dealers quite frequently return to the manufacturer used or burned-out tubes as defective ones. It is apparent that these practices not only are expensive to the manufacturer but also tend to destroy the good will built up by it.

Recently, there has been devised a means for combating these practices. According to the proposed remedy, there is disposed on the base of the tube a temporary protective cap which intimately and snugly adheres to the base and completely covers the contact prongs. To test a tube provided with such a cap, it is necessary to puncture, rupture or remove the cap whereby the prongs are exposed. This performance is, of course, rather inconvenient.

Radio tube manufacturers in almost all instances carry a large stock of tubes so that orders may be rapidly filled. While the tubes are maintained in stock, it is customary to test representative samples thereof at periodic intervals to determine whether or not there has been any deterioration or loss of life. When the tubes are covered as above described, exposure of the contacts must be secured, and this is achieved by puncturing, rupturing or removing the cover. Before the samples tested can be distributed to the dealer a new cap must be provided. This causes great inconvenience and, depending upon the number of tubes tested, the cost is proportionally increased.

I have found that I can overcome the malpractices of the dealer in selling used tubes or retuning used tubes as defective ones, as well as overcome the puncturing or removal of the caps completely covering the prongs, by providing the contact prongs with a suitable device, such as a cap or band of a material, which, when in position, cooperates with the contact elements to expose a

sufficient length thereof to permit testing but in sufficient to permit actual use.

It is therefore an object of this invention to provide a tube having contact prongs in the base thereof, whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements within the tube energized, with a temporary element cooperating with the contact prongs and exposing a sufficient length of the prongs to permit testing but insufficient to permit use without disrupting or mutilating said element.

Another object of this invention is to provide a temporary protecting element consisting of a cap or band, shrunk in position, and cooperating with the contact elements to expose a sufficient length thereof to permit testing, but insufficient to permit use without disrupting or mutilating said element.

A further object of this invention is to provide a temporary element consisting of a band shrunk in position and cooperating with the contact element, the width of said band being of such dimensions that it permits sufficient exposure of the contacts for the purpose of testing but insufficient to permit use without disrupting or mutilating said band.

A still further object of this invention is to provide a temporary element consisting of a punctured cap or band cooperating with a suitable positioning member to permit positioning of said cap or band on the base whereby a sufficient length of the contacts will be exposed to permit testing but insufficient to permit use without disrupting or mutilating the cap or band and/or protective element.

Additional objects will appear from the following description, appended claims and accompanying drawing forming a part of this specification in which:

Figure 1 illustrates a side elevation of a radio tube illustrating one form of an element cooperating with the prongs.

Figure 2 is an end elevation of the tube illustrated in Figure 1.

Figure 3 is an end elevation of a tube showing a modified form of band.

Figure 4 is a sectional view of a punctured cap constituting another modification of the element.

Figure 5 illustrates one modification showing a punctured cap and a positioning element in position on a tube, the latter being cut away.

Figure 6 is an end view of the structure shown in Figure 5.

Figures 7 and 8 are modified forms of positioning elements cooperating with punctured caps.

Figure 9 and 10 illustrate embodiments of the invention wherein bands are used in conjunction with the positioning elements.

As set forth in the objects the present invention seeks to provide an element positioned on radio tubes and particularly the contact prongs thereof, whereby the tube may be tested in the usual manner but is incapable of being used without destroying the element. The element may be formed of a band or punctured cap, the holes of said cap being in alignment with the prongs, whereby the latter may be exposed for the purposes described.

For reasons which will become apparent, the caps or bands are formed of materials which possess the property of shrinking to a considerable degree upon conversion from the wet to the dry state. As a few illustrative examples of materials which possess this property may be mentioned regenerated cellulose, cellulose acetate and gelatin.

The caps and bands are made oversize, and usually produced by molding, and are maintained in the wet state until used. For example, when the cap or band is to be made of regenerated cellulose, one procedure may comprise coating a mandrel by immersing it in a viscose solution and then subjecting the coated mandrel to a coagulating and regenerating bath, whereby the cellulose is regenerated. The regenerated cellulose article may, if desired, be subjected to the desulfuring, bleaching and washing steps, after which they are placed in water and kept there until used.

It is apparent that the cap or band may be transparent or opaque as well as variously colored. When an opaque cap or band is desired the finished article may be appropriately treated or the result may be achieved by introducing into the molding solution an opacity-inducing agent. It is, of course, understood that by opaquing the cap or band with colored pigments or other coloring agents it will also be colored. When the cap or band is to be transparent and colored, it may be dyed either before or after it is disposed on the tube or a suitable dyestuff of the desired hue incorporated in the molding solution.

The cap or band may be provided with any identifying or advertising indicia, such as the name of the manufacturer, patent numbers, trade names or the like.

Referring now to the drawing wherein several specific embodiments of the invention are illustrated and wherein like reference numerals designate like parts, the numeral 1 designates the bulb of a radio tube carried on a base 2, surrounding the filaments 3 and their appurtenant parts which are also mounted on the base 2. The exposed end of the base 2 is provided with a plurality of contact prongs 4 by means of which, when positioned in the sockets, the tube is placed in the electrical circuit. Disposed in cooperative relation with the prongs 4, as by circumscribing and snugly fitting around two, three, four or more thereof, is a band 5 formed of a material previously described (see Figures 1-3 inclusive). In accordance with this invention, the band 5 is positioned in place while it is in a wet condition and then permitted to dry, or be subjected to a drying treatment, whereby, due to the aforementioned characteristic, it shrinks to a considerable extent and intimately and snugly grips and adheres to the prongs which it contacts.

The band 5 is of such dimensions as to permit sufficient lengths of the prongs 4 to project therefrom, whereby the tube may be tested in the usual manner prior to sale and during storage prior to shipment, but insufficient to permit insertion and use in an electric circuit, such as a radio receiving set, without mutilation or destruction thereof. If a tube without a band, or having a mutilated band, were displayed or shown to a prospective customer, he would immediately recognize it as being used or defective and could refuse it, insisting upon one having the band intact.

The above described modification admirably serves the purpose for which it is intended. However, there are many unscrupulous dealers who by reason of the small cost of the bands would not hesitate to remove the bands from the tubes after they have been sold, and place such, or other similar bands, on used or defective tubes. Again, such dealers may buy such bands and position them on used or defective tubes in accordance with the features of this phase of the invention. To overcome and prevent frauds and malpractices, the present invention also contemplates an element which does not permit the removal and replacement of the protective elements without the destruction thereof. Several modifications of this phase of the invention are illustrated in Figures 5 to 10 inclusive.

In accordance with this phase of the invention, there is provided a cap 6 having holes 6' in one end thereof, said holes being in alignment with the contact prongs whereby the latter project from said cap. If the punctured cap were disposed in its wet condition on the base of a radio tube, as just mentioned, and shrunk in position, the top of the cap would conform to the shape of the base and in even contact with the top of the base, with the result that substantially the entire length of the prongs would be exposed. Thus, the purpose of the device would be entirely defeated. Since the invention contemplates the exposure of only a sufficient length of the prongs to permit testing and insufficient to permit actual use, there is provided means which prevents the top of the cap from contacting with the top of the base and properly position said cap to allow sufficient length of projection therethrough.

Referring to Figure 5, this means is exemplified by a collar 7, preferably, though not essentially, circular in shape and made of any suitable material, such as cardboard, glass, artificial resin, or other electrical non-conductor. In accordance with this modification, the collar 7 is of such diameter that it encompasses or circumscribes the prongs 4, as shown in Figures 5 and 6, although, of course, it may be of such diameter that it may be positioned so that it is bounded on the outside thereof by the prongs. The collar 7 is also of such a height that, after the cap 6 has shrunk in position, only sufficient lengths of the prongs will extend thereabove as necessary for testing purposes.

Figures 7 and 8 illustrate two other forms of positioning the cap with respect to the top of the base. The embodiment shown in Figure 7 comprises a disc 8 of any convenient shape, and formed of any suitable non-conductive material, such as cork, synthetic resin or the like, and provided with holes through which the prongs extend. The disc 8 is preferably circular in shape and of a diameter slightly smaller than the base 2, although the invention is not restricted thereto since different diameters, larger or smaller, 150

may be utilized with equal success. The disc 8 is also of such thickness as to permit the desired length of extension of the prongs 4 above the cap.

Referring now to Figure 8, the positioning means comprises a disc 9, preferably circular and formed of any suitable non-conductive material, disposed in such a manner that it is inscribed in a circle passing through the prongs 4. As in the previous forms, the disc 9 is of such a thickness that it positions and retains the cap 6 in the desired relationship with respect to the base.

Instead of using a cap 6, which is provided with a number of holes corresponding to the number of prongs, an element 10, such as a cap with a single large puncture, or a band capable of permitting all the prongs to project therethrough, may be utilized. Such constructions are illustrated in Figures 9 and 10.

Referring to Figure 9, the element 10, which may be a band or a cap with a single large puncture, cooperates with the collar 7 of the type previously explained. In Figure 10, the element 10 cooperates with the punctured disc 8.

In the devices illustrated in Figures 5 to 10, the skirt 11 of the cap, or height of the band, is of sufficient length so that it may extend over a considerable portion of the base 2 and, in many cases, may extend on to the bulb proper. By virtue of the shrinking in position of the cap or band, the positioning elements 7, 8 and 9 are securely fixed in place without the use of auxiliary means, although the latter may be used if desired.

The positioning elements 7, 8 and 9, cooperating with the caps, may be variously colored to contrast with the caps per se and/or provided with any decorative or advertising indicia.

The assembly of the caps and positioning elements is quite simple. After the tube has been fully completed, the positioning means is inserted in place, after which the band or punctured cap, while in the wet state, is applied. The wet cap or band is then permitted to dry or subjected to a drying treatment, during which it shrinks to a considerable extent and tightly conforms to the various elements with which it contacts. In the embodiments shown, it assumes approximately the forms illustrated. The tubes are then packaged in the usual manner.

In those embodiments of the invention wherein positioning elements are employed, the caps or bands by virtue of their shrinkage in position aid in maintaining and securing said elements in position.

When a purchaser desires to buy a tube, the dealer removes it from the box in which it is packed and the extending portions of the prongs inserted in a socket, or some other suitable device, whereby the tube may be readily tested. The purchaser, of course, observes the band or cap and can instantly determine if the tube is factory new.

To insert the tube in the circuit, the cap and positioning means are removed in any suitable way. They may be removed therefrom with the aid of an implement such as the ordinary pocket knife. On the other hand, they may be stripped therefrom merely by tearing them from the base. To permit more expeditious removal of the cap, it may be provided with a tab 12 which may be gripped by the user and upon the pulling thereof in an upward direction strip the cap from its support. If desired, the cap may be used in con-

junction with a rip string 13, whereby the cap may very easily be removed.

In the foregoing the caps were described as being maintained in the moist state until applied. It is to be understood that this is not necessary for carrying out the principles of this invention. For example, the caps or bands produced in the manner described may be dried and in such condition shipped to the factories or other places where the protective elements are to be applied. In such cases prior to the disposition of the protective elements on the tubes, the said elements are moistened with any suitable liquid so that they are caused to swell, in which condition they are applied to the desired article and subsequently treated as previously described.

Though the invention has been described with specific reference to tubes having contact prongs, it is apparent that the principles thereof are equally applicable to other types of tubes. For example, the invention may be successfully used in combination with incandescent lamps. In such a case a punctured cap or band is disposed on the base of the lamp in such a way that the hole is in alignment with the contact element. The skirt of the cap or band is permitted to extend over a portion only of the threaded periphery of the base. By this means the contact element will be exposed and the tube may be tested prior to use. Due to the fact that the cap or band is disposed on the base, it will be necessary to remove the same before the lamp can be actually used.

In the claims it is to be understood that the expression "punctured cap" not only covers caps but also bands of the type described.

Since it is obvious that various modifications may be made in the above description without departing from the nature or spirit thereof, this invention is not restricted thereto except as defined in the appended claims.

I claim:

1. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a temporary protecting element cooperating with a plurality of the contact prongs and permitting the projection of a sufficient length of the contacts to permit testing but insufficient to permit use without destroying or mutilating said element, said element being shrunk in position.

2. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap disposed on said base with the prongs extending through the holes of said cap, and means disposed on said base and cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and cooperating means, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position.

3. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap disposed on said base with the prongs extending through

may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc disposed on said base and cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube insufficient to actually use the tube without destroying or removing said cap and cooperating disc.

9. In combination with

9. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc provided with holes disposed on said base and cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and cooperating punctured disc.

10. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap formed of regenerated cellulose and shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and means disposed on said base and cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and cooperating means.

11. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap formed of regenerated cellulose and shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a collar disposed on said base co-operating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and co-operating collar.

12. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap formed of regenerated cellulose and shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of

75 8. In combination with a tube having contact prongs on the base thereof whereby the tube

the tube to aid in securing said cap in position, and a disc disposed on said base cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and cooperating disc.

13. In combination with a tube having contact prongs on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap formed of regenerated cellulose and shrunk in position on said base with the prongs extending through the holes of said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc provided with holes disposed on said base and cooperating with said cap and prongs to permit the prongs to project for a length sufficient to test the tube but insufficient to actually use the tube without destroying or removing said cap and cooperating punctured disc.

14. In combination with a tube having contact elements on the base thereof whereby the tube may be disposed in an electrical circuit and the filament and appurtenant elements of the tube energized comprising a punctured cap shrunk in position on the base, whereby the contact elements are exposed sufficiently to permit testing but insufficient to permit use without destroying or mutilating said cap, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position.

15. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap disposed on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and means disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

16. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap disposed on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a collar disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

17. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap disposed on said base permitting access to said prongs, the skirt of said cap intimately contacting with and con-

forming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

18. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap disposed on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc provided with holes and disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

19. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap formed of regenerated cellulose and shrunk in position on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and means disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

20. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap formed of regenerated cellulose and shrunk in position on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a collar disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

21. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the filament and appurtenant elements of the tube may be energized, a punctured cap formed of regenerated cellulose and shrunk in position on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc disposed on said base and cooperating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means.

22. In combination with a tube having contact prongs on the base thereof whereby the tube may be inserted in an electrical circuit and the

filament and appurtenant elements of the tube may be energized, a punctured cap formed of regenerated cellulose and shrunk in position on said base permitting access to said prongs, the skirt of said cap intimately contacting with and conforming to the shape of at least a portion of the periphery of the base of the tube to aid in securing said cap in position, and a disc provided with holes and disposed on said base and co-operating with said cap and prongs to position the cap with respect to the prongs, whereby the tube may be tested but is incapable of actual use without destroying or removing the cap and cooperating means. 80

HERBERT E. WALTHOR.

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CERTIFICATE OF CORRECTION.

Patent No. 1,937,537.

December 5, 1933.

HERBERT E. WALTHOR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 56, for "in" read in-; page 4, line 21, claim 4, after "disc" insert the words disposed on said base and; and line 87, claim 8, after "tube" insert the word but; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of January, A. D. 1934.

F. M. Hopkins

(Seal)

Acting Commissioner of Patents.