Nov. 13, 1934. D. K. WRIGHT ET AL 1,980,840

SEAL FOR ELECTRIC LAMPS AND SIMILAR ARTICLES

Filed Feb. 28, 1931

Fig. 1

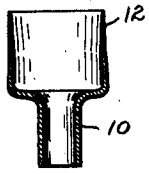


Fig. 2

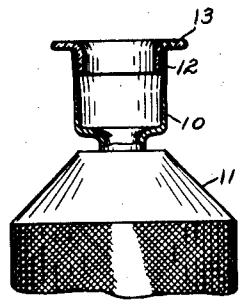


Fig. 3

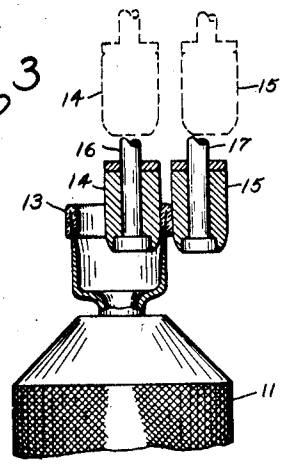


Fig. 4

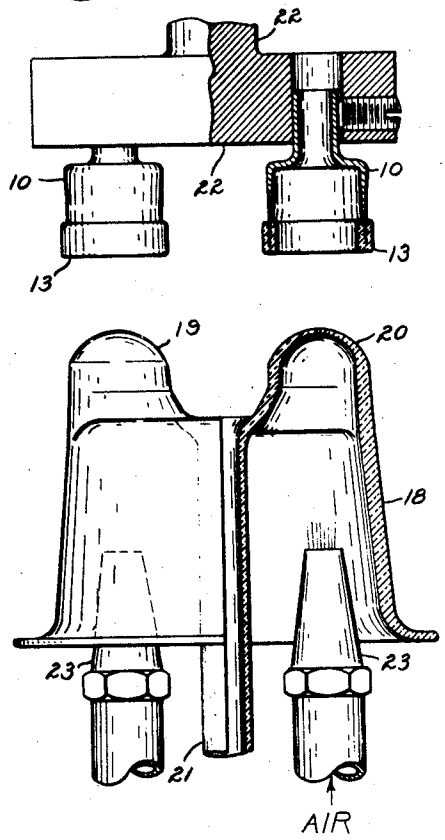
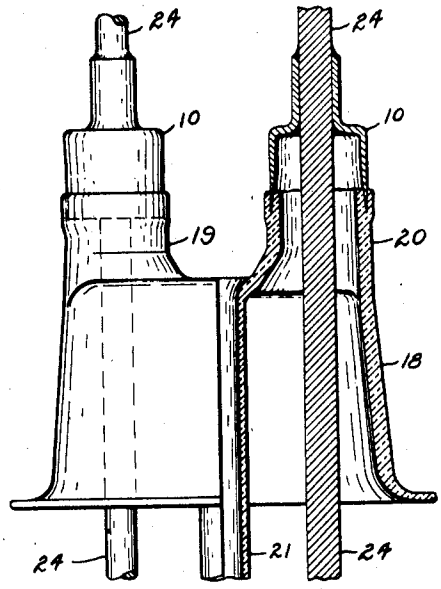


Fig. 5



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SEAL FOR ELECTRIC LAMPS AND SIMILAR ARTICLES

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Application February 28, 1931, Serial No. 518,988

2 Claims. (Cl. 49—81)

Our invention relates to methods of sealing metal elements to the glass parts of devices comprising sealed containers. More specifically, our invention relates to methods of uniting leading-in conductors to glass stems and parts of electric lamps and other electrical devices which comprise a bulb or other sealed container. Still more particularly, our invention relates to seals such as those disclosed in Kruh and Wolf Patent 1,564,690 and Houskeeper Patent 1,294,466. The object of our invention is to provide a method of manufacture which will be efficient in producing an air-tight seal and which can be practised economically. A feature of our invention is that a collar of glass is first very firmly secured to a metal thimble, and then the collared portion of the thimble is secured to the flared stem tube or other glass part which is afterwards united to the bulb or other container. Other features and advantages of our invention will appear from the following description of species thereof and from the accompanying drawing.

In the drawing, Fig. 1 is a vertical section through the metal thimble used in this type of stem; Figs. 2 to 4 inclusive are side elevations partially in section showing portions of stem parts at various stages of manufacture; and Fig. 5 is an elevation partly in section of the completed stem.

According to our invention, the thimble 10 shown in Fig. 1, which is preferably of a metal such as copper which will readily adhere to glass, is placed in the rotatable chuck 11, as shown in Fig. 2, and a number of fires (not shown) are caused to play on its rim 12. The rim 12 has a very thin tapered wall section. For instance, we have used a thimble having a wall thickness of three thousandths of an inch at the edge and nine thousandths of an inch five sixteenths of an inch back from the said edge. The fires are directed on the outside and inside surfaces of the thimble as it rotates causing an even coating of oxide to form thereon. The glass flare 13, which becomes the collar 13, is then placed over its edge, as shown in Fig. 2. Heat is applied to soften the flare and it is bent so that it forms a collar having portions in contact with the inside and outside surfaces respectively of the rim 12. The collar is heated, preferably to a white heat, and, as shown in Fig. 3, rollers 14 and 15 are caused to press against the inside and outside portions as the thimble is rotated so that the collar is very firmly secured to the rim. The rollers 14 and 15 turn freely upon the spindles 16 and 17 and are lowered while the thimble rotates, thus bending the flare to form the collar. The rollers are then caused to move closer together to press the soft glass against the rim of the thimble and to secure a very firm seal.

The next step is to secure the collared thimble to the glass flare 18, as shown in Fig. 4. The said flare comprises the hollow protuberances 19 and 20 and the exhaust tube 21. The collared thimbles are placed in a holder 22 and fires (not shown) are caused to play on the protuberances 19 and 20 until the glass is softened. The glass covered rims of the thimbles are also heated by fires playing thereon and the holder 22 is lowered so as to force one of the collars 13 into contact with the protuberance 19 and the other into contact with the protuberance 20. The fires continue to play on these parts to cause a thorough fusion and welding together. Air is then blown through nozzles 23 causing the crowns of the protuberances to swell which assists in the making of a tight joint. This also produces a thinning of the said glass crowns. After cooling, the crowns may be broken through which allows a passage through the flare and thimble. Leading-in conductors 24 are then each extended through a flare and thimble, and a portion thereof is welded or soldered to the said thimble.

As a modification of this portion of our method, the thimbles may be united to a flare having open ended protuberances, in which case a collared rim of a thimble is simply caused to abut against the edge of a protuberance, the glass of said edge and said collar having been thoroughly fused. The butt seal made in this way has proven very satisfactory, and this method has the advantage that it is simpler than that first described.

What we claim as new and desire to secure by Letters Patent of the United States, is,—

1. The method of uniting a metal thimble with a tubular glass body which consists in first firmly uniting a glass collar to the end of said thimble, then heating to fusion a closed end portion of the tubular glass body and the said collar and then bringing said collared thimble end against said fused end portion and blowing said closed tube end to expand it and to form a tight joint.

2. The method of forming a composite metal and glass seal which consists in firmly uniting a glass collar on the end of a metal thimble, placing said collared end upon the fused closed end of a tubular glass body, fusing said collar to the walls of said body while blowing said closed end to expand the same, allowing the parts to cool and finally breaking through the closing glass end wall.

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