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BASE END STRUCTURE FOR ELECTRIC LAMPS OR SIMILAR DEVICES

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Fig. 1.

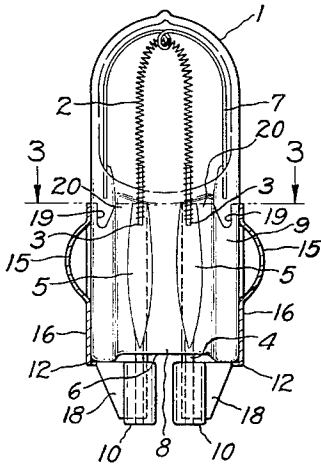


Fig. 2.

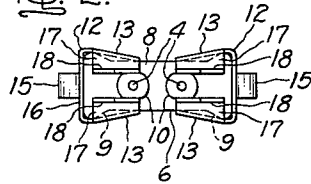


Fig. 3.

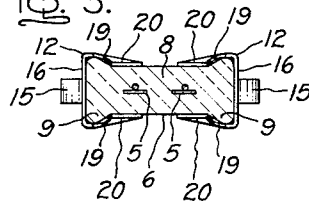
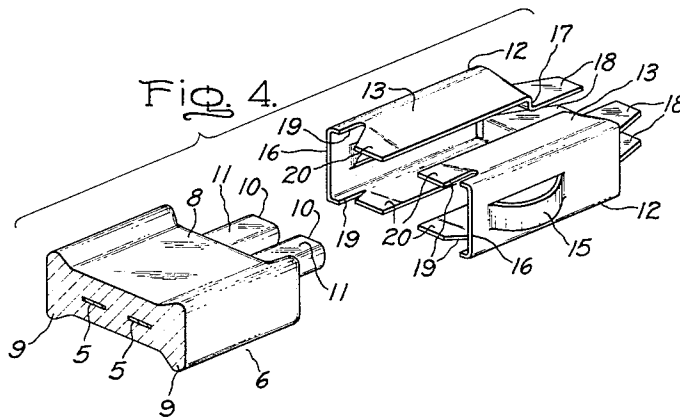


Fig. 4.



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BASE END STRUCTURE FOR ELECTRIC LAMPS OR SIMILAR DEVICES

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4 Claims. (Cl. 339-144)

This invention relates, in general, to a base end structure for electric lamps or similar devices, and more particularly to a base or metal terminal contact construction for electric lamps or similar devices of the type in which the vitreous envelope of the device is provided at one end with a protruding flat press seal portion.

Certain types of electric incandescent lamps known at present employ a so-called ribbon seal for the lamp lead-in conductors wherein each conductor is formed with a thin ribbon-like portion which is sealed within a protruding flattened press seal portion on the vitreous bulb or envelope of the lamp. The flattened press seal portion of the lamp envelope is preferably formed of I-shaped transverse section, and the ribbon portions of the two lamp lead-in conductors are sealed into the flattened web portion of the press seal and terminate at their outer ends in thicker outer lead or terminal contact portions of wire or rod-like form which protrude endwise from the press seal.

In accordance with customary practice, it is desirable to provide such a type electric lamp with a suitable form of base construction, preferably of the so-called slide type, for permitting ready insertion of the lamp into a suitable socket. Particularly in the case, moreover, of lamps of the type which are designed to operate at exceedingly high bulb wall temperatures, such as is true for example of the well-known iodine cycle type incandescent lamps, it is preferable in such case to employ a base of the so-called mechanical or cementless type which does not require the use of any basing cement to fasten the base in place on the lamp bulb.

In copending application Serial No. 364,099, S. C. Ackerman, filed of even date herewith, there is disclosed a form of base structure suitable for use on electric lamps or similar devices of the type mentioned above having envelopes provided with a protruding press seal portion of I-shaped transverse section. The base structure therein disclosed is comprised essentially of a pair of channel-shaped sheet metal contact members snugly slip-fitted over the respective side flange portions of the I-shaped press seal and having their respective sides bent at an angle toward one another or toed-in to thereby mechanically hold the contact members in place on the stem press against unwarranted sidewise removal therefrom. The channel members are rigidly secured, as by welding for example, to the outer end portions of the lead-in conductors, which protrude endwise from the press seal, to thereby hold the channel members in place on the press seal against endwise sliding disengagement therefrom.

While such a means of mechanical attachment of the metal contact members to the press seal ordinarily is sufficiently secure to obviate the necessity of employing basing cement as additional fastening means, it has been found that where the metal contact members are, for reasons of economy, formed of comparatively thin sheet metal such as not to possess the requisite stiffness, the mechanical attachment of the base against sidewise removal from the press seal is in such case not sufficiently positive to dispense with the need of basing cement as an additional fastening means. As a result, much time and added labor are then involved in applying, baking, and cleaning the excess cement off the assembled base end structure. Also, the cement frequently fails to hold the base in place on the press seal because of the fact that

only a thin layer of the cement can be employed between the snugly fitting contact members and press seal, such a thin layer not affording a bond of the requisite adhesive strength. Moreover, during the baking of the completed lamp assembly to cure the basing cement, the envelope of the lamp, where made of quartz such as is customarily the case with most iodine-cycle type incandescent lamps, becomes somewhat discolored or grayish in appearance and cannot be restored to its initial sparkling clear condition. Likewise, the metal base contact members also tend to become discolored, less attractive and difficult to apply markings onto.

It is an object of my invention, therefore, to provide an electric lamp or similar device having a novel cementless type base end structure which is of simple and inexpensive construction and easy to assemble.

Another object of my invention is to provide a novel form of cementless base structure for an electric lamp or similar device of the type having a vitreous envelope or bulb provided with a protruding press seal portion of I-shaped transverse section.

Briefly stated, in accordance with one aspect of the invention, each of a pair of channel-shaped sheet metal base members snugly slip-fitted over the respective side flange portions of an I-shaped press seal on the vitreous envelope of an electric lamp or similar device have at least one of their opposed sides formed, adjacent their inner end extremities, with indented tongue portions arranged to catch inside and engage the respective side flange portions of the press seal to thereby securely lock the channel contact members in place at their inner ends on the press seal against sidewise removal therefrom.

In accordance with a further aspect of the invention, at least one of the opposite sides of each channel-shaped contact member is notched inwardly from its innermost end, at the inboard side of the side flange portion of the press seal over which the contact member is fitted, to form a locking tongue thereon as described above which is indented toward the opposite side of the contact member to thereby securely hold or lock the contact member in place at its inner end on the press seal, against sidewise removal therefrom.

Further objects and advantages of the invention will appear from the following detailed description of a species thereof and from the accompanying drawing.

In the drawing, FIG. 1 is an elevation of an electric incandescent lamp having a base end structure comprising the invention, the base being shown in section.

FIG. 2 is an end view of the base end of the lamp shown in FIG. 1.

FIG. 3 is a sectional view on the line 3-3 of FIG. 1, and

FIG. 4 is an exploded perspective view of the base end structure comprising the invention.

Referring to the drawing, the invention is there illustrated as embodied in an electric incandescent lamp comprising a hermetically sealed vitreous envelope or bulb 1 which contains a coiled-coil tungsten filament 2 connected at its ends to respective lead-in conductors comprising inner and outer portions 3 and 4 of tungsten and molybdenum, respectively, and intermediate molybdenum foil or ribbon sections 5 which are hermetically sealed in spaced apart relation in a compressed protruding pinch seal portion 6 formed on one end of the envelope, the seal portion 6 being pressed to an I-shaped section as shown in FIG. 2 and the outer portions 4 of the lead-in conductors protruding endwise from the press seal 6. It should be understood, however, that the invention may be embodied in any type of electrical device having a vitreous envelope 1 formed with a press seal 6 of the I-shaped section as described above.

The particular electric incandescent lamp illustrated is

of the well-known iodine-cycle type as described and claimed in U.S. Patent 2,883,571, Fridrich and Wiley, the envelope 1 for such purpose containing, in addition to a suitable gas filling such as argon, krypton or xenon at a substantial pressure of, for example, 600 mm. Hg or above, a small amount of iodine vapor which functions as a regenerative getter during lamp operation to combine with tungsten vaporized from the filament 2 onto the envelope wall to thereby form a tungsten iodide which migrates back to the vicinity of the filament where it then dissociates to redeposit tungsten onto the filament and release iodine for continuation of the cycle. Since such iodine-cycle lamps ordinarily operate at relatively high envelope or bulb wall temperatures, the envelope 1 of the lamp is preferably made of a high melting point vitreous material such as fused quartz or hard glass. The coiled-coil filament 2 is arranged within the envelope 1 in U or hairpin shape as shown, and it is additionally supported at its mid-region, at the bend therein, by a supplementary U-shaped wire support 7 the legs of which are embedded and supported at their free ends in the press seal 6.

The lead-in conductors comprised of the inner and outer portions 3 and 4 and intermediate ribbon seal portions 5 are sealed through the web portion 8 of the press seal 6 inboard of the side flange portions 9 thereof and preferably symmetrically on opposite sides of the longitudinal axis of the envelope 1, with the plane of the intermediate ribbon seal portions 5 disposed parallel to the plane of the flattened web portion 8 of the press seal 6, as shown in FIG. 2. Immediately outward of the press seal 6, the outer leads 4 are provided with enlarged rod or bar-like terminal connector or contact portions 10 which are preferably constituted of nickel and may be formed, for example, by crimping and flattening nickel sleeves onto the protruding outer lead portions 4 so as to be securely fastened thereto and present flat contact surfaces 11 disposed parallel to the plane of the web portion 8 of the press seal 6.

Mounted on the press seal portion 6 of the lamp envelope 1 is a base structure according to the invention comprising a pair of channel-shaped sheet metal terminal contact members 12, preferably of stainless steel of around .010" thickness for example, which are snugly slip-fitted over the respective side flanges 9 of the press seal 6 in spaced apart relation with the sides 13 of the respective terminal contact members facing inwardly of the press seal toward one another, as shown in FIGS. 2 and 3. Inboard of the press seal side flange portions 9, the sides 13 of the respective metal contact members 12 are bent inwardly or toed-in at a slight converging angle to thereby catch behind and engage the inboard sides of the side flange portions 9 and thus hold the contact members in place on the press seal against sideways disengagement therefrom such as might otherwise occur upon withdrawal of the lamp from a push-in pull-out type lamp socket. To provide a spring friction grip of the lamp in its socket such as to hold it firmly in place therein, the U-shaped metal contact members 12 may be formed with bowed-out spring tongues 15 struck out of their web portions 16 for spring pressure engagement with the lamp socket.

At their outer ends, the sides 13 of each metal contact member 12 are extended and offset toward one another to form small locating shoulders 17 thereon and a pair of opposed connector tab extensions 18 for connection to the protruding contact portions 10 of the outer leads 4. The locating shoulders 17 serve as limiting stops for engagement with the outer end of the press seal 6, during the sliding assembly of the metal contact member 12 onto the press seal 6 as shown in FIG. 4, to thereby locate the metal contact member in proper endwise position on the press seal. The connector tab extensions 18 on each U-shaped channel contact member 12 are disposed in spaced parallel relation to each other and are parallel to and symmetrically located on opposite sides of the longitudinal axial plane of the U-shaped channel member so

as to be in position to receive therebetween the outer end contact portions 10 of the outer leads 4 upon completion of the sliding assembly movement of the contact members 12 onto the press seal 6 of the lamp. As initially formed, each cooperating pair of connector tab extensions 18 are spaced apart a distance slightly greater than the thickness of the flattened outer end contact portions 10 of the outer leads 4 so as to freely receive the said contact portions therebetween during the sliding placement or assembly of the contact member 12 over the press seal 6 of the lamp. Upon completion of the sliding assembly movement of the metal contact members 12 onto the press seal 6, as determined by the engagement of the locating shoulders 17 thereon with the outer end of the press seal, the connector tab extensions 18 on the contact members 12 are then rigidly secured to the outer end contact portions 10 of the outer leads 4 in a suitable manner as, for example, by clamping them to the flattened surfaces 11 of the said contact portions 10 and preferably, in addition, welding them thereto, to thereby electrically connect the metal contact members 12 to the lead-in conductors of the lamp.

The welding or other rigid attachment of the metal contact members 12 at their outer ends to the contact portions 10 of the lead-in conductors serves to effectively prevent any sideways separation or removal of the outer ends of the contact members 12 from the press seal 6. However, where the contact members 12 are formed of comparatively thin sheet metal and do not possess adequate stiffness, the restraint of the inner ends of the contact members 12 against sideways separation or removal from the press seal 6 such as is normally afforded by the engagement of the toed-in sides 13 of the contact members 12 with the inside of the side flange portions 9 of the press seal, then is not of itself sufficiently positive to be entirely reliable at all times.

In accordance with the invention, therefore, the base contact members 12 are provided with additional locking means serving to afford a supplementary mechanical attachment of the inner end portions of the contact members to the press seal. To this end, one or both of the opposite sides 13 of each contact member 12 are notched inwardly from their innermost end extremities at the region of the inboard side of the press seal flange portions 9, as indicated at 19, to thereby form locking tongues 20 at the inner ends of the contact members 12. These locking tongues 20 are bent inwardly or indented toward the opposite channel side of the respective contact member 12 so as to catch inside of and engage the side flange portions 9 of the press seal 6 upon sliding assembly movement of the contact members onto the press seal. The indented locking tongues 20 thus afford a secure locking of the inner ends of the contact members 12 onto the press seal 6 such as effectively restrains their endwise separation or removal from the stem press in all cases, irrespective of the thickness and degree of stiffness of the sheet metal material of which the said contact members 12 are made.

From the above description, it will be apparent that I have provided a novel base structure, of very simple and inexpensive construction and extremely easy to assemble, for electric lamps and similar devices of the type having their envelopes 1 formed with protruding press seals 6 of I-shaped section. The only operational steps required for assembly of the base structure on the lamp envelope 1 are the sliding placement of the metal channel members 12 on the press seal 6 of the lamp envelope 1 followed by the clamping and/or welding of the tab extensions 18 to the protruding outer contact portions 10 of the lamp lead-in conductors. Moreover, because of its attachment to the I-shaped press seal portion 6 of the lamp envelope 1 by mechanical means such as obviates the need for any basing cement, the base end structure according to the invention is therefore particularly adapted for use on electric incandescent lamps of such I-shaped press seal

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construction which normally operate at relatively high envelope wall temperatures such as, for example, the well-known iodine-cycle type incandescent lamps.

Although a preferred embodiment of my invention has been disclosed, it will be understood that the invention is not to be limited to the specific construction and arrangement of parts shown, but that they may be widely modified within the spirit and scope of my invention as defined by the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical device comprising a sealed envelope of vitreous material having a protruding press seal portion of generally I-shaped transverse section, at least one lead-in conductor hermetically sealed through said press seal portion and protruding endwise therefrom, and a metal terminal contact mounted on said press seal and comprising a channel-shaped sheet metal member having a snug slip-fit over one of the side flanges of said press seal, said contact member being rigidly secured to the protruding portion of said lead-in conductor and having at least one of its opposite channel sides provided at its inner end with a locking tongue portion located inboard of said side flange, said locking tongue portion being indented toward the opposite channel side of the contact member to thereby engage the inboard side of said side flange to securely lock the inner end of the contact member in place on the press seal against sidewise removal therefrom.

2. An electrical device comprising a sealed envelope of vitreous material having a protruding press seal portion of generally I-shaped transverse section, at least one lead-in conductor hermetically sealed through said press seal portion and protruding endwise therefrom, and a metal terminal contact mounted on said press seal and comprising a channel-shaped sheet metal member having a snug slip-fit over one of the side flanges of said press seal, said contact member being rigidly secured to the protruding portion of said lead-in conductor and having at least one of its opposite channel sides notched inwardly from its innermost end, at the inboard side of said side flange, to form a locking tongue portion located inboard of said side flange, said locking tongue portion being indented toward the opposite channel side of the contact member to thereby engage the inboard side of said side flange to securely lock the inner end of the contact member in place on the press seal against sidewise removal therefrom.

3. An electrical device comprising a sealed envelope of vitreous material having a protruding press seal por-

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tion of generally I-shaped transverse section, a pair of lead-in conductors hermetically sealed through said press seal in spaced relation to one another and protruding endwise therefrom, and a pair of terminal contacts mounted on said press seal in spaced relation and comprising channel-shaped sheet metal members snugly slip-fitted over the respective side flanges of said press seal, said contact members being rigidly secured to the protruding portions of respective ones of said lead-in conductors, each of said contact members having at least one of its opposite channel sides provided at its inner end with a locking tongue portion located inboard of the respective side flange of the press seal, the said locking tongue portion of each contact member being indented toward the opposite channel side of the contact member to thereby engage the inboard side of the side flange to securely lock the inner end of the contact member firmly in place on the press seal against sidewise removal therefrom.

4. An electrical device comprising a sealed envelope of vitreous material having a protruding press seal portion of generally I-shaped transverse section, a pair of lead-in conductors hermetically sealed through said press seal in spaced relation to one another and protruding endwise therefrom, and a pair of terminal contacts mounted on said press seal in spaced relation and comprising channel-shaped sheet metal members snugly slip-fitted over the respective side flanges of said press seal, said contact members being rigidly secured to the protruding portions of respective ones of said lead-in conductors, each of said contact members having its opposite channel sides notched inwardly from their innermost ends, at the inboard sides of the respective side flange, to form locking tongue portions located inboard of said side flange, the said locking tongue portions of each contact member being indented toward one another to thereby engage the inboard sides of the respective side flange to securely lock the inner ends of the contact members in place on the press seal against sidewise removal therefrom.

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