Nov. 20, 1962 R. F. VANDEN BOOM ETAL 3,064,457

MULTI-LAMP UNIT

Filed Sept. 28, 1959

Fig. 1.

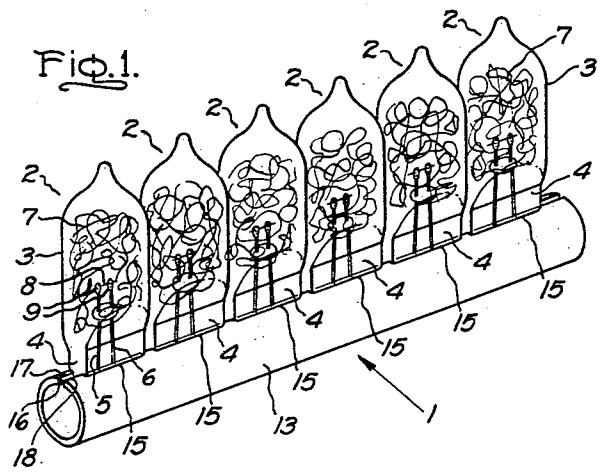


Fig. 2.

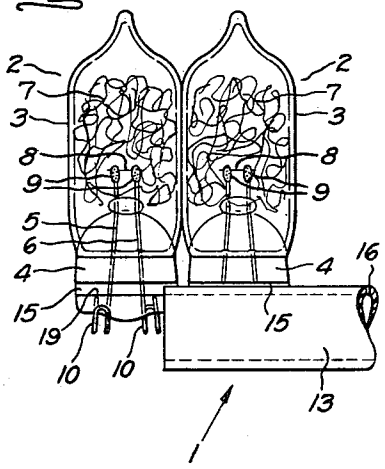
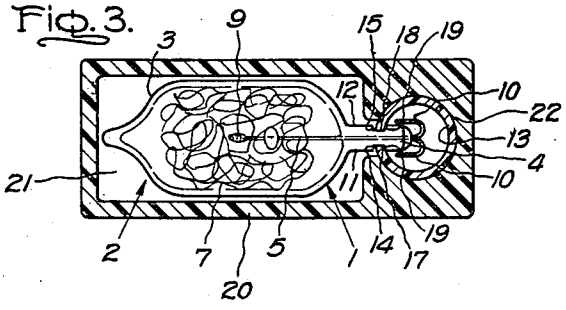


Fig. 3.



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MULTI-LAMP UNIT

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This invention relates to electric lamps or similar devices such as photographic flash lamps, for example, and to a multi-lamp unit comprising several such lamps supported in side-by-side aligned relation in a holder clip for magazine loading of the lamps into a suitable lamp fixture such as a photographic flash lamp holder.

There has recently become commercially available an extremely small size baseless type flash lamp designated the AG1 and described and claimed in U.S. applications Serial No. 808,981, Anderson et al., filed April 27, 1959, now Patent No. 2,982,119 and Serial No. 803,637, Vanden Boom et al., filed April 2, 1959, now Patent No. 3,016,727 both of which applications are assigned to the assignee of the present invention. As therein disclosed, such baseless type flash lamps comprise a small and preferably tubular-shaped glass bulb or envelope provided at one end with a protruding flattened glass stem press portion through which are sealed the two lead-in wires of the lamp. The said lead-in wires protrude from the stem press to form the terminal contacts for the lamp, and in their preferred form project endwise from the stem press and are bent around its opposite flat sides.

Because of their extremely small size and their protruding flattened glass stem press or base end structure, such baseless type flash lamps are particularly well suited for the magazine loading thereof into a flash lamp holder or other lamp fixture, the flattened stem press of the lamp serving as a convenient means for holding and guiding the lamps through the lamp holder. To this end, in order to insure a good and effective electrical contact of the aforementioned terminal wire contacts of the lamps with the socket contacts of the lamp holder device so as to assure the proper operation or flashing of each lamp when in its operating position, it is necessary that the wire contacts of the lamps not only be initially located uniformly in the same relative position on each lamp but also that they be maintained in such uniform position during the storage and handling of the lamps as well as during their insertion and index through the lamp holder. This requirement presents a problem, therefore, in the case of the particular baseless type lamp mentioned above due to the susceptibility of the wire contacts thereof becoming distorted or deformed out of position by virtue of their exposed hook formation which renders them likely to become caught on objects and also by virtue of their formation out of the lead-in wires of the lamp which are normally constituted of relatively small diameter wire which is capable of being bent. Accordingly, it is highly desirable that these wire contacts be adequately protected from any such distortion or displacement as would render the lamp inoperative in the lamp holder or fixture.

Conventional type flash lamp holders, moreover, in common use at present are adapted to receive only one flash lamp at a time so that after each flash exposure the photographer is required to remove the used flash lamp and replace it with an unused one before taking the next exposure. This is disadvantageous not only because of the inconvenience and time wasted, but also because there are occasions when it would be desirable to take a series of flash light pictures in fairly rapid succession. In addition to the disadvantage resulting from the actual time required to reload the flash holder, the photographer's

attention is distracted from the subject being photographed while he is reloading the flash holder.

It is an object of our invention, therefore, to provide a multiple lamp unit comprising an assembly of a group of baseless type electric lamps provided with protruding terminal contacts and mounted in a lamp holder protectively enclosing the terminal contacts of the lamps.

Another object of our invention is to provide a multiple lamp unit comprising a plurality of baseless type electric lamps provided with terminal contacts protruding from one end thereof and supported at their said ends in side-by-side relation within a tubular lamp holder for sliding movement therethrough, with the lamp holder protectively enclosing the terminal contacts of the lamps mounted therein.

Still another object of our invention is to provide a multi-flash lamp unit comprising a plurality of baseless type miniature flash lamps having protruding flattened stem press portions at one end and supported by their stem press portions in side-by-side relation in a holder clip for free sliding movement therethrough.

Briefly stated, in accordance with one aspect of our invention, a group of flash lamps or other similar type electric devices, formed with protruding flattened stem press portions from which project the terminal contacts of the lamp, are slidably supported by their stem press portions in side-by-side relation within a longitudinal slit in a tubular mounting clip or holder device for free sliding movement therethrough, with the terminal contacts of the respective lamps enclosed within the tubular holder device so as to be protected thereby against damage.

According to a further aspect of our invention, the stem press portion of each lamp is formed with a pair of aligned parallel guide grooves in its opposite flat sides and extending thereacross, and the stem press of each lamp is inserted in a longitudinal slit in a tubular holder clip formed of an elastic material having a slippery surface characteristic, with the protruding terminal contacts of the lamp enclosed within the tubular holder clip and the longitudinal edges of the slit in the holder clip entered in the guide grooves in the stem press of the lamp and elastically gripping the stem press with sufficient force to support the lamp in place in the holder clip while permitting free sliding movement therethrough.

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

In the drawing,

FIG. 1 is a perspective view of a multiple lamp unit comprising our invention.

FIG. 2 is a fragmentary elevation of a multiple lamp unit comprising our invention and illustrating the manner in which the individual lamp elements are inserted into the holder clip therefor, and

FIG. 3 is a sectional view through a lamp magazine chamber of a flash holder showing a multi-flash lamp unit according to the invention inserted in place therein.

Referring to the drawing, the invention is there illustrated as embodied in a multiple lamp unit 1 the individual lamp elements 2 of which are constituted by miniature size flash lamps of the type such as are used for taking photographic flash pictures. It should be understood, however, that various other types of lamps or electrical devices, such as incandescent lamps or gaseous discharge devices, for instance, may be utilized in the multi-lamp unit according to the invention.

The particular flash lamps 2 illustrated are of the miniature size baseless type described and claimed in the aforementioned patent applications Serial Nos. 808,981 and 803,637 and comprising a small tubular-shaped glass envelope or bulb 3 provided at one end with a protruding

flattened glass stem press portion 4 through which are sealed the two lead-in wires 5, 6 of the lamp. The envelope or bulb 3 contains a quantity of combustible light-producing material which, in the particular case shown, comprises a loose filling of filamentary metallic material 7 of a readily combustible character, for instance, filamentary zirconium, magnesium, or aluminum, or alloys thereof, either in the form of fine wire or in the form of ribbon such as that commercially known as shredded foil. The envelope 3 also contains a filling of oxygen or other combustion-supporting gas at a suitable pressure which, on ignition of the combustible material, reacts therewith to produce a momentary flash of actinic light. Interiorly of the bulb 3, the lead-in wires 5, 6 are connected to the opposite ends of a tungsten filament 8 and they are provided, at their junctions with the filament, with small beads or coatings 9 of a suitable primer or fulminating material which, on passage of an electric current through the filament 8 to heat the same, is ignited to thereby initiate the combustion of the light-producing material 7. The lead-in wires 5, 6 project endwise from the stem press 4 of the lamp and are retroverted or doubled back upon themselves, with their free ends re-entered and anchored in the stem press, to thereby form more or less rigid open loop-shaped wire terminal contacts 10 for the lamp. As shown, the loop-shaped wire terminal contacts 10 of each lamp are bent around the end of the stem press 4 to extend back alongside the opposite flat sides 11 and 12 thereof.

In accordance with the invention, the multi-flash lamp unit 1 comprises a plurality of flash lamps 2 such as described above slidably supported by their stem press portions 4 in a row, and in contiguous side-by-side relation, within a tubular holder or clip 13 for free sliding movement longitudinally therethrough, the tubular holder or clip 13 enclosing the outer ends of the stem press portions 4 of the lamps as well as the wire terminal contacts 10 protruding therefrom so as to protect the same from damage. To this end, the stem press 4 of each lamp 2 is provided with holder-engaging parallel guide grooves 14, 15 in its opposite flat sides 11, 12 extending thereacross and located approximately opposite one another. As shown, the said guide grooves 14, 15 extend completely across the full width of the stem press 4, in a direction transversely of and preferably normal to the bulb axis, and they are completely unobstructed from end to end so as to permit free sliding movement therethrough of a slide track or guide rail means on the tubular holder or clip 13 during the index movement of the lamp therethrough.

The tubular holder or clip 13, in which the lamps 2 are slidably mounted, is formed of a suitable elastic material having a slippery or unctuous surface characteristic, and it is formed with a longitudinal slit 16 extending the full length of the tubular holder into which slit the grooved portion 14, 15 of the flat stem press 4 of each lamp 2 is forcibly inserted, with the outer end of the stem press and the wire terminal contacts 10 positioned within the hollow interior of the tubular holder and the slit edges 17, 18 entered in the guide grooves 14, 15 in the stem press of each lamp, to thereby spring apart the said edges 17, 18 of the tubular holder which define the said slit 16. The sprung apart edges 17, 18 of the holder clip 13, which are thus entered in the guide rooves 14, 15 of the lamp 2 to form a slide track or guide rail therefor, are thereby caused to elastically grip the stem press 4 of each individual lamp 2, within the grooves 14, 15 therein, with sufficient force to hold the group of lamps in substantial side-by-side row alignment within the holder clip while permitting free or unrestrained sliding movement of the lamp therethrough. The engagement of the longitudinal edges 17, 18 of the slit 16 in the holder clip 13 with the side walls of the guide grooves 14, 15 in the stem press 4 of each lamp serves to lock the lamp in place in the holder clip against sidewise withdrawal therefrom. Moreover, because they are enclosed by and concealed within the hollow interior of the holder clip 13, the protruding wire terminal contacts 10 of each lamp are therefore effectively protected by the holder clip against damage.

The guide grooves 14, 15 on the stem press 4 of each lamp are preferably so constructed as to have a close but free sliding fit with the longitudinal edges 17, 18 of the slit 16 in the holder clip 13 so that the group of flash lamps 2 mounted within the holder clip will be effectively supported and held in place in a row within the holder clip, and so that each lamp will be guided through the holder clip in the same relative position therein during the translatory index or feeding movement of the lamp therethrough. To this end, the outward side wall 19 of each guide groove 14, 15 in the lamp stem press 4 is formed as a substantially flat locating wall disposed in a plane normal to the bulb axis to thereby provide a sharp shoulder on the lamp stem press for enabling positive gripping or engagement thereof by the longitudinal edges 17, 18 of the slit 16 in the holder clip so as to secure and hold each lamp in place in the holder clip in the same predetermined position therein lengthwise of the lamp axis. In this manner, the terminal contacts 10 of each lamp are properly aligned with the electric current supply contacts (not shown) of the lamp socket portion of the flash holder 20 in which the flash lamp unit 1 is to be inserted so as to insure the proper contact of the terminal wire contacts 10 with the said lamp socket contacts when each lamp 2 is indexed out of the end of the holder clip 13 and into the lamp socket portion of the flash holder.

As mentioned previously, the holder clip 13 may be made of any suitable elastic material which will assure the independent gripping of each individual lamp 2 in the holder clip with the force necessary to hold the lamp in proper position, with the glass bulb 3 extending radially outward from the side of the tubular holder clip. In addition, it is preferable that the material employed for the holder clip 13 also possess a slippery or unctuous surface characteristic such as to permit free and easy sliding movement of the individual lamps 2 through the slit 16 in the holder clip. Certain synthetic resins such as polyethylene, for instance, possess such characteristics and are eminently satisfactory as materials for the holder clip 13. In the case of polyethylene, it is preferable to employ a colored variety thereof, i.e., one incorporating a coloring medium, rather than the natural or uncolored variety of polyethylene, inasmuch as the colored variety possesses a more unctuous surface characteristic such as affords greater sliding ease for the lamps through the slit 16 in the holder clip 13.

In the use of the multi-flash lamp unit 1 according to the invention, the entire lamp unit comprising the group of individual flash lamp elements 2 mounted in the tubular holder member or clip 13 may be inserted or slid into place within a magazine chamber 21 of a flash lamp holder 20 which may be conveniently made of a synthetic resin. As shown, the magazine chamber 21 is formed with a tubular portion 22 corresponding to and adapted to snugly receive the tubular holder member or clip 13 of the lamp unit 1. With the lamp unit 1 thus inserted in place in the magazine chamber 21 of the flash holder 20, the individual lamps 2 supported in the holder clip 13 may then be successively indexed or slid out of the holder clip by the lamp indexing means (not shown) of the flash holder to thereby position the lamp in the lamp socket of the flash holder in readiness for the flashing thereof.

Although a preferred embodiment of our 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 our invention as defined by the appended claims.

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

1. A multiple lamp unit comprising a group of lamps each comprising a sealed glass bulb having a protruding flat stem press provided with parallel unobstructed guide grooves in its opposite flat sides and lead wires having a small diameter susceptible of being deformed out of position sealed in and protruding from the stem press to form terminal contacts for the lamp, and means for holding the lamps in side-by-side alignment and protecting the lead-in wires from damage including a tubular member of elastic material having a longitudinal slit in the wall thereof with the edges of the tubular member defining said slit entered in said guide grooves of the lamps and elastically gripping the stem portions thereof and the enclosing walls of the tubular member being spaced away from the lead-in wires.

2. A multiple lamp unit comprising a group of lamps each comprising a sealed glass bulb having a protruding flat stem press provided with parallel unobstructed guide grooves in its opposite flat sides and lead-in wires having a small diameter susceptible of being deformed sealed in and protruding endwise from the stem press to form terminal contacts for the lamp, and means for holding the lamps in side-by-side alignment and protecting the lead-in wires from damage including a tubular member of an elastic and unctuous material having a longitudinal slit in the wall thereof with the edges of the tubular member defining said slit entered into said guide grooves of the lamps and elastically gripping the stem portions thereof and the enclosing walls of the tubular member being spaced way from the lead-in wires.

3. A multiple lamp unit comprising a group of lamps each comprising a sealed glass bulb having a protruding flat stem press provided with parallel unobstructed guide grooves in its opposite flat sides and lead-in wires having a small diameter susceptible of being deformed sealed in and protruding endwise from the stem press to form terminal contacts for the lamp, and means for holding the lamps in side-by-side alignment and protecting the lead-in wires from damage including a tube of an elastic synthetic resin of unctuous surface character having a longitudinal slit in the wall thereof with the edges of said tube defining said slit entered in said guide grooves of the lamps and elastically gripping the stem press portions thereof and the enclosing walls of the tube being spaced way from the lead-in wires.

4. A multiple lamp unit comprising a group of lamps each comprising a sealed glass bulb having a protruding flat stem press provided with parallel unobstructed guide grooves in its opposite flat sides and lead-in wires sealed in and protruding endwise from the stem press to form terminal contacts for the lamp, and means for holding the lamps in side-by-side alignment and protecting the lead-in wires from damage including a tube of polyethylene of unctuous surface character having a longitudinal slit in the wall thereof with the edges of the said tube defining said slit entered into the said guide grooves of the lamps and elastically gripping the stem press portions thereof.

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