

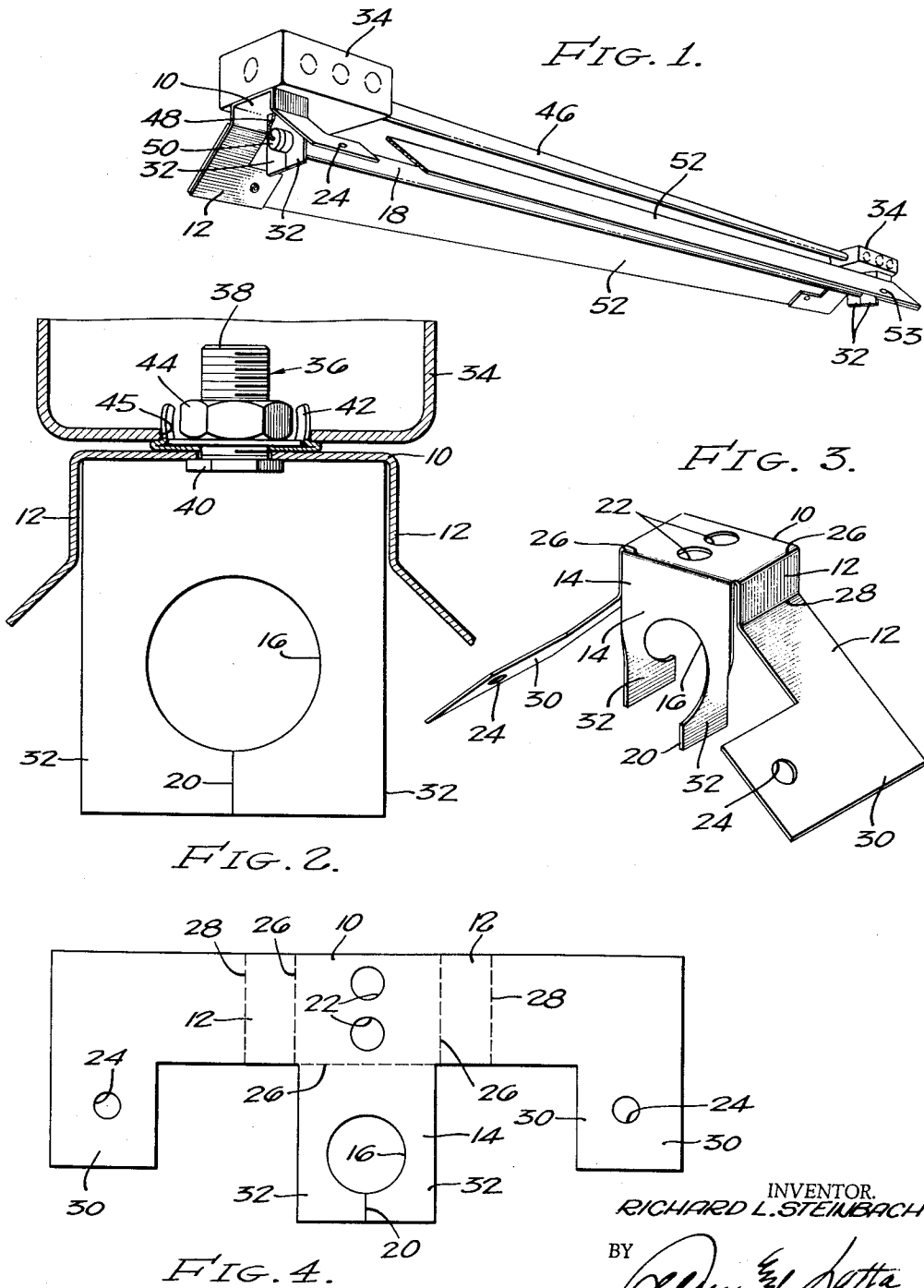
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MOUNTING BRACKET FOR INFRA-RED LAMPS

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**MOUNTING BRACKET FOR INFRA-RED LAMPS**

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The present invention relates to support bracket means for use in positioning tube type lamps in proper relationship to electric current sources and to reflector plates adapted to direct radiations emanating from the lamps. More specifically, the present invention relates to brackets for supporting reflectors and heat producing infra-red radiating lamps as used in infra-red drying ovens.

It has been a common expedient in the prior art to support tube type lamps in appropriate relationship with reflector means by utilizing clips or brackets adjacent the ends of such tubes. It has also been the practice to utilize the same bracket means to support the reflectors in such arrangements. The brackets used for such purposes have been of relatively complex construction, including a plurality of separately fabricated pieces which had to be welded or otherwise attached to one another. One adjunct of such constructions, involving the means for supporting the lamp tube, required either elastic clip means or mechanically hinged and relatively movable portions which could be spread or opened to hold the lamp tube, and such expedients further contributed to the costliness and complexity of the resulting bracket construction.

The present invention provides a simplified bracket formed of a single piece of material appropriately shaped and bent to provide novel flexible integral means to support the lamp tube, as well as means to support the reflector plates, all in appropriate relationship to the source of current. The lamp tube supporting means are individually advantageous through avoiding the use of resilient clips which are apt to lose their operating efficiency or be broken by bending past their elastic limit, and in avoiding the use of hinged arrangements which are excessively expensive and prone to breakage.

The present invention makes use of a single piece of material comprising a planar blank which may be deformed into the shape of the unitary bracket means.

It is an object of the present invention to provide an improved support bracket fixture for use with tube type lamp means.

A further object of the present invention is to provide an improved support bracket constructed of a single piece of material whereby to effect significant economies in production costs over prior known devices of this type.

Still another object of this invention is to provide support bracket means, including integral flexible tube engaging fingers, adapted to reliably engage and hold the ends of tubular lamps.

Still another object of the invention is to provide an improved bracket formed of a single piece of material and which provides means for supporting a tubular lamp as well as means for supporting reflector plates for directing radiations emanating from the lamp.

A still further object of the present invention is to provide an improved support bracket for use in infra-red drying ovens, said support bracket being formed of a single piece of material and being adapted to be supported in relation to electric circuit means and to support a tubular type infra-red lamp and reflector means in proper relationship to one another to reflect the infra-red radiations of the lamp in a desired direction.

Yet another object of this invention is to provide a novel blank shape of sheet material adapted to be bent into a unitary support bracket of the class described.

Other objects and many of the attendant advantages

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of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIGURE 1 is a perspective view of a tube type lamp installation according to the present invention, with a portion of one reflector element broken away for clarity of illustration;

FIGURE 2 is a transverse cross-sectional view taken through one of the support brackets of FIGURE 1 at the fitting which connects to a junction box, showing the tube supporting fingers but with the lamp tube removed;

FIGURE 3 is a perspective view of the novel bracket means of the present invention with the lamp tube supporting fingers bent into their open and tube receiving position; and

FIGURE 4 is a plan view of the blank from which the bracket of FIGURE 3 may be formed.

It is a feature of the present invention that the integral support bracket may be formed from an easily fabricated flat blank thereby eliminating the necessity of joining separately fabricated pieces. Attention is directed first to FIGURE 4 showing a plan view of a flat blank stamped from relatively ductile material into the configuration shown from which it may be formed into the unitary support bracket construction of the present invention. The blank comprises a central base portion 10 having outwardly or longitudinally extending wing portions 12 and a downwardly or laterally extended tab portion 14. The tab 14 is provided with a hole 16 of appropriate size to accommodate a desired size of tube type lamp means and is slit at 20. The blank is also formed with a pair of apertures 22 in central base portion 10 and with weakened bend lines 26 at the line of juncture of the base portion 10 with the L-shaped wing portions 12, 12 and tab 14. Additional weakened bend lines 28 extend across the tabs 12 as shown by dotted lines in FIGURE 4. Openings 24 are provided in the wing portions 12 to serve as a means for securement of reflector plate means thereto as will be later described.

The blank construction described is adapted to be bent into the form shown in FIGURE 3 to provide the support bracket of the present invention. Thus, the wing portions 12 and the tube support portion 14 of the blank are bent generally perpendicular to the base portion 10, along the bend lines 26, as shown in FIGURE 3. The wing portions 12 are further bent angularly outwardly along the bend lines 28 to form angularly related supporting surfaces for attachment of reflector means. While portions 12 may be of constant width, preferably they are formed with widened extremities as at 30 to provide extended support for the reflector means.

The tab portion 14 forms a lamp tube supporting means comprising deformable fingers 32 upon opposite sides of the hole 16 and the slit 20. Fingers 32 are readily deformable from the "closed" position shown in FIGURES 1, 2 and 4, to the "open" position shown in FIGURE 3. The fingers 32 at their narrowest point are considerably narrower than any other portion of the bracket and with metal of the stamping being of suitable ductility characteristics they may be deformed easily by twisting to the position shown in FIGURE 3 without distortion of the remainder of the bracket.

The bracket of the present invention may be secured to a support or junction box in the manner shown in FIGURE 2 by a fitting or connector generally designated by the reference numeral 36. Fitting 36 includes a hollow-bodied externally threaded bushing 38 adapted to be inserted through the bracket aperture 22 and having

a flanged end or head 40. Fitting 36 includes a snap ring 42 secured to the outer face of the bracket base 19 by a nut 44 threaded on stud 33. Snap ring 42 includes a plurality of circumferentially arranged fingers which are adapted to extend through an adjacent opening and make frictional sealing engagement therewith. This arrangement enables the support bracket element to be snapped into supporting engagement with a junction box 34 by the insertion of the snap ring 42 into one of the knock-out openings 45 of the junction box.

The bracket means described is adapted for use with various types of tube lamps, whether of the so-called inert gas fluorescent type, or an incandescent heat or light lamp in tube form. In the specific example herein described the invention is shown applied to a tube lamp adapted to radiate infra-red heat rays being of the type used in infra-red drying ovens, and attention is directed to FIGURE 1 in which there is illustrated a typical lamp construction used in infra-red drying ovens incorporating the novel support bracket means of the present invention. Such constructions include spaced junction boxes 34, connected by a conduit 46 and adapted to be suitably supported in or relative to the drying oven and house electrical wiring connected to an external source of electrical energy. Lead wires 48 pass through hollow stud elements 38 and have terminal socket means 50 engaged with the contact ends of tube lamp 18. Reflector plates 52 are secured to the wing portions 12 at the widened end portions 30 by means of rivets or bolts 53 extended through the adjacent opening 24.

As may be seen from a comparison of FIGURES 2 and 3, the fingers 32 of the support bracket are deformable from the open position of FIGURE 3, suitable for the insertion of the lamp tube 18 into the aperture 16, to the closed position shown in FIGURES 1 and 2, in which they serve to support and retain the lamp tube in position. With the lamp tube in place the connector sockets 50 are connected to the ends of the lamp tube to complete the assembly of FIGURE 1. Upon energization of the lamp tube 18 the radiations emanating therefrom are reflected by the reflectors 52.

Brackets of the type disclosed are usually used together in pairs but are suitable for use singly or in multiples in alignment. The exact material of which the bracket is formed is not of the essence so long as it has sufficient strength and rigidity to perform the intended supporting function and yet is sufficiently ductile and deformable to make the fingers 32 to be deflected a large number of times without failure. The blank from which the bracket is formed can readily be stamped from sheet or strip material and the shaping of the bracket to its final form can also be a stamping operation.

It should be understood, of course, that the foregoing disclosure is directed to a preferred embodiment of the invention and that modifications and alterations may be made therein without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. Support bracket for tube type lamps, said bracket being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion, and a reflector plate supporting portion, said tube supporting portion and said reflector plate supporting portion being angularly arranged relative to each other and to said base portion and being integral extensions of said base portion.

2. Support bracket means for tube type lamps, said bracket means being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion formed of an extension of the base portion and disposed laterally thereof, and a reflector plate supporting tab formed of an extension of the base portion in a direction perpendicular to the extension forming said tube supporting portion and being disposed angularly to the plane of the base portion.

3. Support bracket means for tube type lamps, said bracket means being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion formed of an extension of the base portion and disposed perpendicularly thereto, said tube supporting portion being flat and plate-form and having an aperture therethrough to accommodate the cross-section of a tube type lamp, and a slit in said tube supporting portion extending from the outer edge thereof to said aperture to provide at least one flexible finger movable out of the plane of said aperture to allow insertion of said lamp and movable back into the plane of said aperture to support said lamp in assembled relation with the bracket.

4. Support bracket means for tube type lamps, said bracket means being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion formed of an extension of the base portion and disposed perpendicularly thereto, said tube supporting portion comprising a flat plate having an aperture therein and a slit extending radially from said aperture to the edge of the plate most remote from the base portion to provide a pair of flexible fingers, said fingers being deformable from their normal plane to an open position to permit the insertion of a tube into said aperture and then back into their normal plane to a tube-supporting position.

5. Support bracket means for tube type lamps, said bracket means being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion formed of an extension of the base portion and disposed perpendicularly thereto, and a pair of reflector plate supporting wings formed of extensions of the base portion and extended in a direction perpendicular to said tube supporting portion, and also having end portions disposed angularly to the plane of the base portion, said tube supporting portion having an aperture therein and a slit extending radially from said aperture to the edge of said portion most remote from the base portion to provide flexible fingers defining the aperture, said fingers being deformable from the plane of the aperture in said position to an open position to enable a tube to be inserted into said aperture and then back into the plane of the aperture to a tube supporting position.

6. A unitary support bracket for tube type lamps, said bracket being formed of a single blank of ductile material and comprising a base portion having an aperture adapted to cooperate with a hollow fitting for attachment to a fixed support and to permit passage of electrical lead wires, a pair of opposed longitudinal wing portions formed of extensions of said base portion and having end portions angularly disposed to said base portion to provide support means for the ends of a reflector plate, and a lamp tube supporting portion formed of an extension of the base portion and disposed in a direction perpendicular to said base portion, said tube supporting portion having an aperture therein adapted to support a tube type lamp adjacent an end thereof in position for the end cap of said lamp to be engaged by said electrical lead wires.

7. In tube type lamp constructions wherein a plurality of bracket means are attached to spaced junction boxes for support and for passage of electrical lead wires therethrough, said bracket means including means for supporting tube type lamp means adjacent the ends thereof in position to be engaged by said lead wires, said brackets including wing means for supporting reflector plates laterally to either side of a lamp mounted in said bracket means and in position to reflect radiations from said tube type lamps; the improvement consisting of said bracket means being formed of a single piece of ductile material and comprising a base portion, a tube supporting portion and reflector plate supporting portions, said tube supporting portion and said reflector plate supporting portions being integral extensions of the material of said base portion.

8. A supporting assembly for tube type lamps and for

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reflector plates for such lamps, said assembly comprising a support bracket and a fitting for detachably connecting said bracket to an apertured supporting structure, said support bracket being formed of a single plate of ductile material and comprising an apertured base, a lamp supporting member, and reflector plate supporting tabs, said lamp supporting member and said reflector plate supporting tabs being integral extensions of the material of said base and being angularly disposed relative to the lower side of said base, said fitting comprising a hollow threaded stud suitable as a wiring conduit extending upwardly through the aperture in said base, said stud having an enlarged flange at the end thereof engaging the lower surface of said base to provide a clamping bearing around the edge of the said aperture, an annular snap ring closely fitting said stud and having a flat portion bearing against the upper surface of said base, said flat portion having bowed spring fingers around its periphery extending upwardly from the plane of the flat portion, and a nut threaded on said stud within the confines of said spring fingers and bearing against the flat portion of said snap ring to clamp the said flat portion to the upper surface of said base, whereby said support bracket may be detachably attached to a supporting structure having an appropriate opening therein by insertion of said snap ring into said opening so that the bowed spring fingers of the snap ring resiliently engage the edges of the surfaces defining the said opening.

9. A lamp bracket for detachably supporting a tubular lamp in a suitable operating environment during the normal service life of the lamp, said lamp bracket comprising a sheet metal member of generally E-shape having a base provided with means for securing the same to a support therefor, the other leg of said E-shaped bracket having a large bore opening therethrough of a size readily accommodating the lamp to be supported therein, said other leg having a slit extending into said opening from the end of said leg and cooperating with said opening to divide the adjacent portions of said leg to either side of said opening into wings, said wings normally lying in a common plane with said opening to lock a lamp in place in said opening but being deflectable away from one another to provide room for the insertion and removal therethrough of a lamp.

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10. A tubular lamp supporting fixture comprising a lamp bracket formed from a single piece of sheet metal, said bracket having a flat base, an upright tab formed with a large diameter opening to receive a lamp body therethrough, and a pair of wings lying in diverging planes at right angles to the plane of said upright tab, said wings being adapted to support deflectors positioned laterally to either side of a lamp supported in said tab.

11. A lamp fixture as defined in claim 10 characterized in that the base of said one-piece bracket has a large opening therethrough, a bushing extending through said opening, a snap-ring keeper assembled over the outer end of said bushing on the end thereof remote from said upright tab, means holding said snap ring and bushing assembled to said bracket, and said snap ring having spring keeper means adapted to be seated and resiliently retained in an outlet opening of a junction box and to frictionally interlock with the edges thereof to hold said bracket detachably assembled to said junction box.

12. A support bracket for a tubular element formed of a single piece of deformable sheet material and comprising a base portion and a single upright tab integral with one edge of said base portion, said single upright tab having a pair of co-planar wings cooperating to form a single aperture co-planar therewith, characterized in that one of said wings is adapted to be deflected from said co-planar relationship to permit a tubular element to be positioned in said aperture and thereafter returned to said co-planar relationship to lock said element assembled to said bracket.

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