May 17, 1966 A. MOSS 3,252,125

FLUORESCENT LAMPHOLDERS AND FITTINGS

Filed March 6. 1963 3 Sheets-Sheet 1

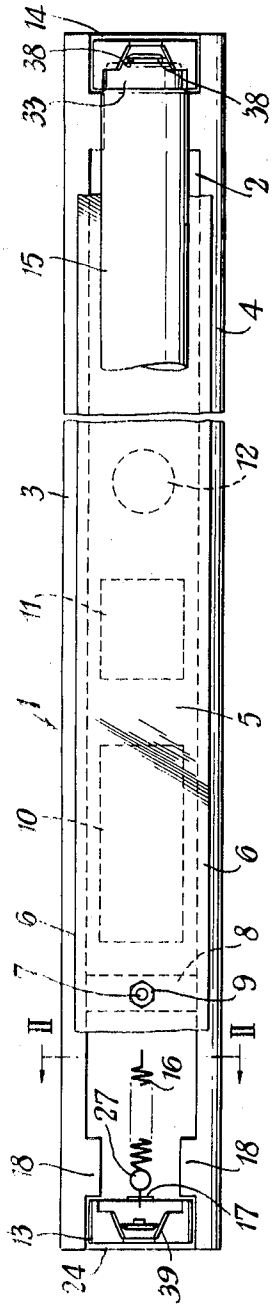


FIG.1

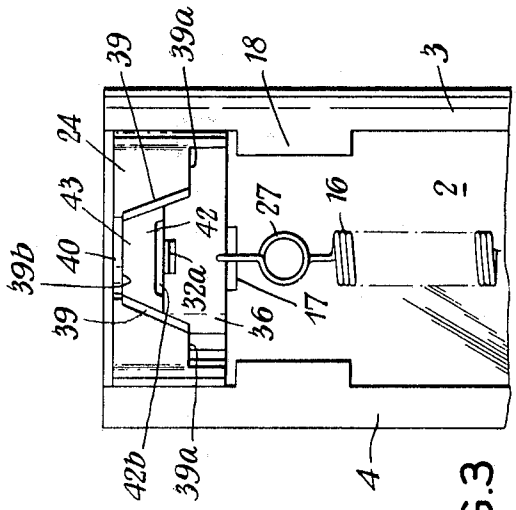


FIG.3

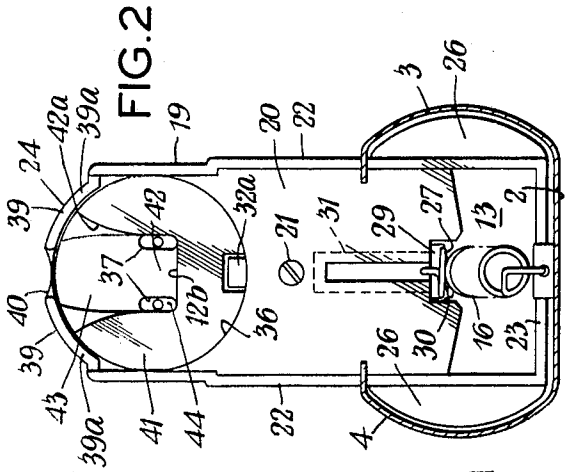


FIG.2

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FLUORESCENT LAMPHOLDERS AND FITTINGS

Filed March 6. 1963 3 Sheets-Sheet 2

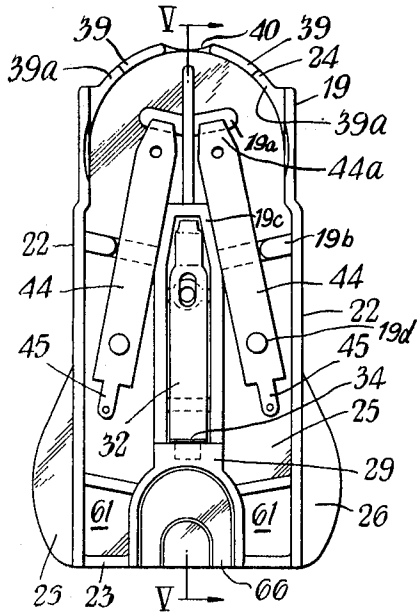


FIG.4

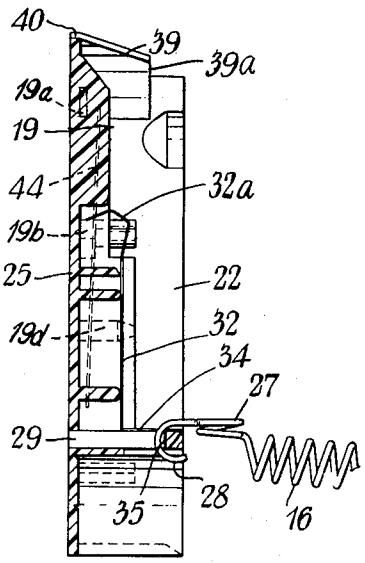


FIG.5

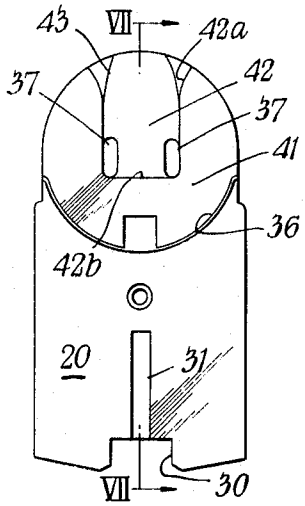


FIG.6

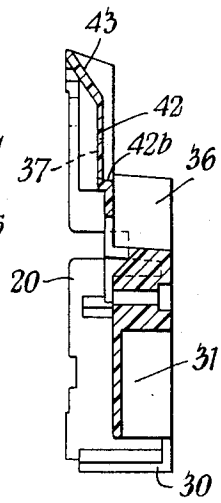


FIG.7

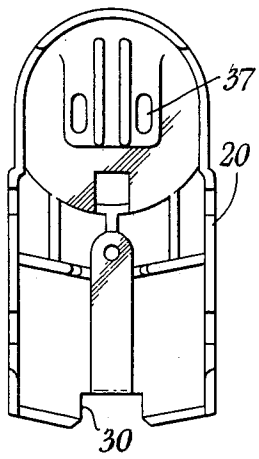


FIG.8

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May 17, 1966 A. MOSS 3,252,125

FLUORESCENT LAMPHOLDERS AND FITTINGS

Filed March 6, 1963 3 Sheets-Sheet 3

FIG.10

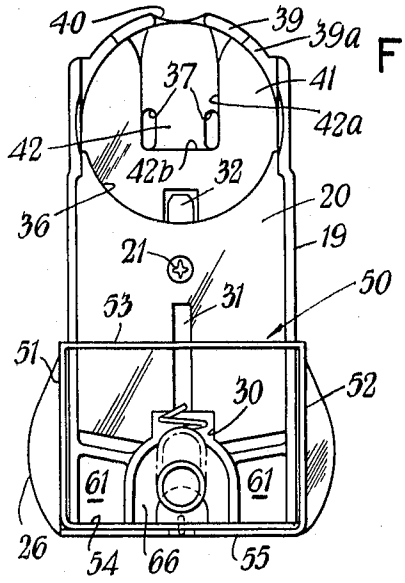


FIG.9

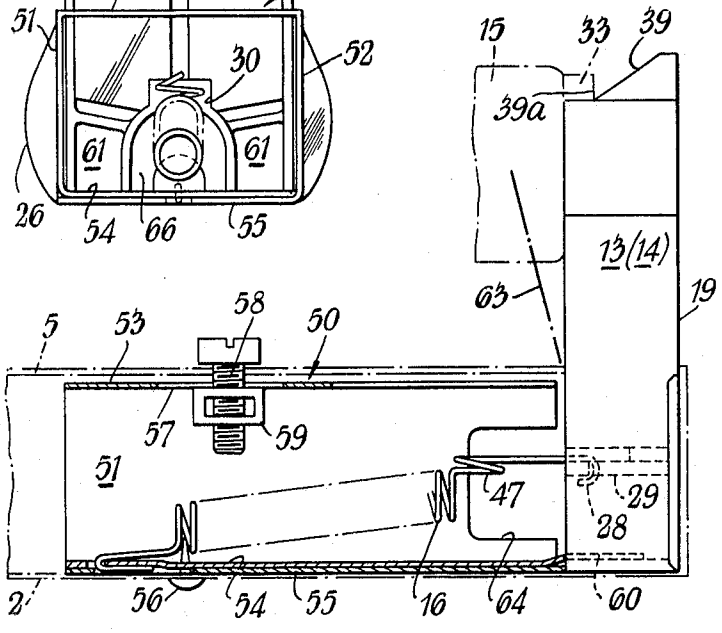
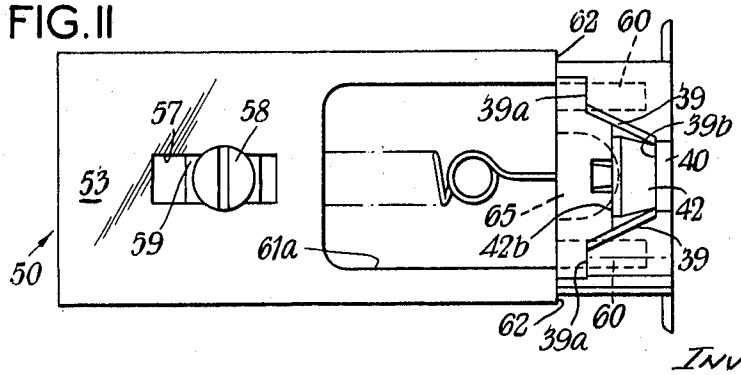


FIG.11



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FLUORESCENT LAMPHOLDERS AND FITTINGS

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Claims priority, application Great Britain, Mar. 16, 1962, 10,213/62
7 Claims. (Cl. 339—56)

This invention relates to fluorescent lamp holders and fittings.

In accordance with the invention there is provided a fluorescent lamp fitting having a casing and spring-loaded holders at opposite ends of the casing for engaging and supporting the contact pins of a fluorescent lamp, said holders each having guide means engageable with the end cap of a lamp when pressed against the holder, so as to guide the latter into a position in which the pins can engage corresponding electrical contacts of the holder.

The invention further provides a fluorescent lamp-holder having contacts for engagement by pins at one end of a fluorescent lamp, said holder having also guide means engageable with and adapted to guide the adjacent end cap of a lamp into a position in which contact pins at the adjacent end of the lamp can engage corresponding contacts of the holder.

For a better understanding of the invention and to show how it may be carried into effect, an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

FIGURE 1 is a diagrammatic plan view, partly broken away, of a fluorescent lamp fitting,

FIGURE 2 is an enlarged transverse sectional view taken along the line II—II of FIGURE 1 and showing the front of a lamp holder and an insert part,

FIGURE 3 is an enlarged detail view of the left-hand portion of FIGURE 1,

FIGURE 4 is a detail of FIGURE 2 with the insert part of the lamp holder removed to reveal the internal structure,

FIGURE 5 is a longitudinal section taken along the line V—V of FIGURE 4,

FIGURE 6 is a front view of the insert part of the lamp holder shown in FIGURE 2,

FIGURE 7 is a vertical sectional view taken along the line VII—VII of FIGURE 6,

FIGURE 8 is a rear view of FIGURE 6,

FIGURE 9 is a side view, partly in section, of an assembly according to the modified embodiment,

FIGURE 10 is a front view, and

FIGURE 11 is a plan view corresponding to FIGURE 9.

Referring to FIGURES 1 and 2, the first embodiment comprises a fluorescent light fitting indicated generally at **1**, including a trough or channel casing formed of sheet aluminum and having a flat base **2** and opposite side walls **3**, **4**, of substantially bulbous form. The open side of the casing is normally closed by a removable cover **5** extending from end to end of the casing, the cover having opposite longitudinal marginal portions **6** which are beveled or are of arcuate section so as to embrace the underlying curved portions of the side walls **3**, **4**. The cover **5** is held removably in position by screws, one of which is shown at **7**, each screw being carried by a block **8** fixed in the channel and the screw

2

extending through a corresponding hole in the cover and provided with a fixing nut **9**.

Within the channel casing there are arranged a fluorescent lamp choke or current-limiting device **10**, condenser **11** and a starter switch **12** of conventional form, these components being connected in circuit with fluorescent lamp holders **13** and **14** which are provided one at each end of the casing and which support therebetween a fluorescent lamp **15**.

The two holders are mounted in the channel casing for rocking movement about their lower ends each holder being urged resiliently inwardly by an associated spring **16**, the bottom of the holder normally engaging a stop **17** extending from the base **2** of the casing. Tongues **18** are bent inwardly from opposite side walls of the casing to provide abutments engageable with the adjacent holder so that when the tube **15** is removed, the opposite holders **13**, **14** will be supported substantially perpendicular to the base of the channel ready for reinsertion of the tube.

The two holders **13**, **14** are of identical construction and it will suffice therefore to describe one only of the holders in detail. Referring to FIGURE 2, each holder is of composite form and includes a body comprising an outer casing **19** and an insert **20**, both the casing and the insert being formed as moldings of a synthetic resinous material or other electrical insulating material. The insert **20** is held in position by a single fixing screw **21**. The casing **19** (FIGURES 4, 5) is in the form of an open substantially rectangular box having two opposite sides **22**, an inner end **23**, an outer shaped end **24**, and a backing wall **25**. The casing is formed also with side cheeks **26** co-planar with the backing wall and arranged to follow substantially the bulbous shape of the sides **3**, **4** of the fitting, there being sufficient clearance between the side cheeks **26** and the casing sides **3**, **4** to permit rocking of the lamp holders against the action of the springs **16**. The casing and insert could alternatively be formed in one-piece.

The tension spring **16** is secured at one end to the base **2** of the fitting and the opposite end of the spring has an extension including a loop **27** formed by one or two convolutions in a plane substantially parallel to the axis of the main coil of the spring **16**. The extension includes also at its free end a hook **28** (FIGURE 5) which engages in a slotted plate **29** integral with the casing **19**. The insert **20** (FIGURES 6, 7 and 8) has at its lower end a central cut-out **30** which receives the slotted plate **29**, the insert being formed also with a slotted web **31** which is open at the front, as shown in FIGURE 6, and which opens at its lower end into the cut-out **30**, thereby to act as a guide for the hook **28** of the spring **16**. The arrangement is such that when the spring is to be engaged, a screw-driver or like tool can readily be inserted into the loop **27** to facilitate the engagement of the hook **28** in the slotted plate **29**, the slotted web **31** of the insert acting as a guide for the hook. The single screw **21** which secures the insert in the casing **19**, serves also to locate in position an earthing strip **32**, FIGS. 4 and 5, having at one end a protruding tongue portion **32***a* for engagement with the adjacent metal end cap **33** of the fluorescent lamp **15**, the earthing strip having at its opposite end a forwardly bent part **34** (FIGURE 5) which is engaged by the lower slotted end of the web **31** and which is similarly slotted to receive

the hook 28 of the tension spring. The bent part 34 of the earthing strip has a tongue 35 which is normally urged by the spring hook 28 against the end of the slotted plate 29 thereby to ensure a satisfactory contact.

The insert 20 is formed in its front face with a recessed outer end portion defining a substantially semicylindrical ledge 36 which follows the curvature of the end cap 33 of the lamp and is adapted to form a stop therefor. The ledge 36 is slotted to enable the tongue of the earthing strip 32 to protrude for engagement with the lamp cap 33 (FIGURE 1). The recessed portion of the insert is formed with two slots 37 which correspond in spacing to, and are adapted to receive, the two pins 38 (FIGURE 1) at the adjacent end of the fluorescent tube, these pins 38 being partly obscured in FIGURE 1 by the holder 14.

The present embodiment is intended for use with fluorescent tubes having end caps of approximately 1.4 inches in diameter and 0.5 inch in axial extent, the pins 38 being approximately 0.1 inch in diameter, about 0.25 inch in length and spaced apart at approximately 0.5 inch.

The shaped end 24 of the casing 19 is arranged internally to follow the corresponding substantially semicircular end of the insert 20 and is cut away centrally to define at opposite side, guide edges 39. These guide edges 39 are mutually inclined and extend forwardly and in a direction inwardly or downwardly towards the ledge 36 from the ends of an arcuate rest edge 40 formed centrally at the outer end of the backing wall 25. The recessed face 41 of the insert is itself recessed in the region of the slots 37 to a depth of approximately 0.125 inch, to provide an inner stepped clearance face 42. The face 42 is curved outwardly and rearwardly at 43 so as to merge into the arcuate rest edge 40. The face 42 has lateral stepped edges 42*a* which are curved outwardly and laterally so as to merge into the corresponding guide edges 39 of the casing.

The edge 40 is rounded so as to conform substantially to the part of the circumference of the lamp cap 33. In this manner, the edges 40 of the two opposite holders serve conveniently to locate the opposite ends of the lamp in position preparatory to the insertion of the lamp into the fitting, the arcuate edges 40 serving to centre the lamp relatively to the holders. The lamp may now be shifted axially so that at one end, the cap 33 will slide inwardly along the lateral guide edges 39 of the adjacent holder, and during this movement the recessed face 42 and 43 will be prevented from damaging the extremities of the lamp pins 38. Moreover, the lateral guide edges 39 are so rounded that they cooperate with the rounded periphery of the cap 33 to ensure a smooth sliding of the cap into position within the holder. Thus the lamp pins are not subjected to any undue pressure during the manipulation of the lamp into position.

The curved ledge 36 of the insert has a radius somewhat greater than that of the lamp cap so that, during fitting of the lamp, the latter can be tilted slightly while being inserted into, or removed from, the holder. For this reason also, the slots 37 are of elongated form, as hereinafter more fully described, to accommodate the end pins during tilting of the lamp.

Assuming that the two pins are in alignment with the corresponding slots 37, the ends of the pins 38 will just touch the recessed face 42 as the pins enter the slots to engage corresponding electrical contacts. The latter comprise resilient leaf springs 44 which are conveniently mounted between the backing wall 25 of the casing and the interior of the insert 20, the outer or upper portion of the contact springs 44 being disposed at the back of the slots 37 in the insert 20. The contact springs 44 are provided at their inner ends with terminals 45 for the connection of electric leads (not shown) and, at their outer ends, the springs 44 are formed with tapered seatings 44*a* for engagement by the extremities of the lamp pins 38. The seatings 44*a* are spaced from inclined ribs 19*a* raised slightly from the backing wall 25 of casing 19. Ribs 19*a* are not operatively related to the tapered seatings 44*a*, except that the ribs could conceivably act as stops for the springs. Each contact spring 44 is located in the inclined position shown in FIGURE 4 by fitting into a recess between rib 19*b* and the inner wall 19*c* of casing 19. The lower end portion of each contact spring is formed with a hole therein which engages a peg 19*d*. The pegs 19*d* constitute integral parts of the casing molding. Should the lamp pins not be in alignment with the slots 37 as the first end of the lamp is inserted into its holder, the inward movement of the lamp may continue until one end of the pin engages the step of the face 42 or until the end cap 33 engages the ledge 36 which is approximately 0.450 inch in depth. The tube may then be rotated to bring the pins into position within their slots.

Having thus properly located one end of the tube in its holder, it is necessary merely to press the tube inwardly, together perhaps with a slight axial pressure in a direction towards the engaged end of the tube, so that the cap 33 at the second end of the tube will slide along the lateral guide edges 39 towards the ledge 36 and will, at the same time resiliently displace the holder against the action of its spring 16. During this movement, the pins are again protected from pressure until they engage the face 42 just as they enter the slots 37. The spring loading of the two holders provides the necessary pressure to maintain the tube in position between the holders with the pins properly engaged at each end of the tube with the corresponding contact springs 44.

It is to be noted that during rotary adjustment of the tube, the end cups will be supported laterally by the adjacent portions of the side walls 22 of the casing 19. Moreover, the inward movement of the tube at each end will normally be arrested by engagement of the tip of a connecting pin with the step which defines the inner limit of the recessed face 42. The tube may then be rotated until the pins are properly located. Should the inward movement continue past the inner step of the recessed face 42, the ledge 36 will engage the cap to arrest such movement of the tube.

It is to be noted also that the length of each slot 37 is such that the distance between the normal centre of the pin and the inner end of the slot, will be somewhat greater than the distance between such centre and the outer end of the slot. In the present embodiment, for example, the inner distance is 0.20 inch while the outer distance is 0.15 inch. This arrangement is such that during the manipulation of the lamp into and from position between the holders, the lamp may be tilted relatively to a holder, in a plane perpendicular to the front of the holder, without the tips of the pins engaging or being damaged by the inner ends of the slots 37. This is particularly advantageous during the removal of a fluorescent lamp from the fitting.

The arrangement serves to facilitate the location of the lamp in position, even in a darkened room, the guide edges and recessed faces being such that the end caps only of the lamp will normally be engaged by the holders thereby to avoid or minimise possible damage of the pins.

In the aforedescribed embodiment, each holder 13, 14 is mounted directly in the casing of the light fitting. In the modified embodiment, however, of FIGURES 9 to 11, each holder is carried by a sub-frame indicated generally at 50 which is inserted into the end portion of an aluminum casing which is similar to that described with reference to FIGURES 1 and 2. The sub-frame 50 is formed of a blank of sheet steel which is folded to define a tubular member substantially square in cross-section and having two opposed sides 51, 52, a top 53 and overlapping base sections 54 and 55. The uppermost base section 54 is connected to side wall 51 and the lower base section 55 is connected to side wall 52. The sub-frame 50 is secured within the main casing of the fitting by screw 56

which passes through the bottom wall **2** of the casing and is threaded into the two base sections of the sub-frame. An elongated hole **57** formed in the top wall **53** of the sub-frame, is engaged by a screw **58** which passes through the cover **5** and is fitted with a clamping nut device **59**, so that, by tightening the screw, the cover **5** is securely clamped to the main part of the casing.

The upper section **54** of the base is formed at its upper end with a central projection **65** and two projecting tongues **60** (FIGURE 11). The projection **65** protrudes into a central recess **66** (FIGURE 10) at the lower end of the casing **19** of the lamp holder, and tongues **60** protrude into pockets **61** in casing **19**, thereby to locate the lamp holder in position at the end of the sub-frame. As in the first-described embodiment, the lamp holder is urged resiliently into a normally vertical position with respect to the main casing, by a spring **16** which engages at one end in the base sections **54**, **55** of the sub-frame and which, at the opposite end, is hooked onto a slotted part at the lower end of the lamp holder, substantially as already described in connection with the first embodiment. The top wall **53** is formed also with a rectangular opening **61***a* which provides access to the interior of the sub-frame and defines at opposite ends of the top wall, shoulders **62** engageable by the spring influenced holder **13**, **14** to maintain the latter in its normal substantially vertical position. The arrangement is such that before insertion of the fluorescent tube into the holder, the latter will be inclined inwardly slightly as indicated diagrammatically by the broken line **63** in FIGURE 9, whereas, after insertion of the lamp, the holder will assume an upright position as indicated in full lines in FIGURE 9.

Each side wall **51**, **52** is formed at its outer end with a cut-out **64**. The arrangement is such that for transit purposes, the adjacent holder can, when released from the spring **16**, be withdrawn and then inserted axially through the open end of the sub-frame, into a stowed position in which the side cheeks **26** of the holder are located within the cut-outs **64** of the sub-frame. This facilitates packaging of the fitting for transport purposes and protects the lamp holder from damage during transit. Moreover, the provision of the separate sub-frame **50** formed of sheet steel, provides a reinforced mounting for the lamp holder which is particularly advantageous when employing a main casing constructed of aluminum.

In the aforedescribed embodiments, each lamp holder is mounted at the opposite end of a main casing which extends over the full length of the fitting and accommodates the various components thereof. If desired, however, each spring-loaded holder may be arranged on an individual bracket or support adapted to be secured to a ceiling or other surface. In this manner, two individually mounted lamp holders can be secured to a ceiling or wall at a desired spacing depending upon the length of the fluorescent lamp to be supported by the holders.

I claim:

1. A fluorescent lamp fitting comprising: a casing of channel form having a base, two opposite side walls extending along the base, and a removable cover extending along an open side of said channel; holders at opposite ends of said casing for engaging and supporting the contact pins of a fluorescent lamp, said holders each having a body, means in said body for the reception of the lamp contact pins to establish electrical contact therewith, and guide means on said body for engaging and guiding the lamp into a position in which the pins thereof engage the pin-receiving means of the body; mounting means at opposite ends of said channel casing for said holders; and spring means for said holders engaged between the holders and said base for resiliently urging said lamp holders toward one another for engagement of a fluorescent lamp between said holders.

2. A fluorescent lamp fitting comprising a casing of channel form, a spring-loaded lamp holder mounted at each end of said casing for resilient rocking movement for engaging and supporting a fluorescent lamp, each holder including an outer casing, an insert removably secured within said outer casing, said insert having a recessed face engageable by an end cap of the fluorescent lamp to be supported by said holder, said recessed face presenting an arcuate ledge forming a stop for the end cap of the lamp when said lamp is applied to the holder, said holders further including means for receiving the lamp pins of said lamp for establishing electrical contact therewith, guide means engageable by the end cap of a lamp as the latter is pressed against the holder for guiding the end cap into a position in which it engages said ledge and in which the lamp pins of said lamp, positioned in the end cap, are electrically contacted within the holder, and means at the opposite ends of said channel casing for accommodating adjacent lamp holders, when said holders are released from their springs, for storage of the lamp holders within the casing for storage and transport purposes.

3. A holder for a fluorescent lamp, said holder comprising a body, electric contacts mounted in said body for engagement by lamp pins in an end cap at one end of the fluorescent lamp, guide means on said body for engagement by and guiding the adjacent end cap of the lamp to a position in which the lamp pins are in electrical contact with the corresponding contacts mounted in said body; said body including an outer casing, an insert removably secured within said outer casing, said insert having a recessed face for engagement by an end cap of the fluorescent lamp when applied to the holder, said recessed face being provided with a pair of apertures for the reception of the lamp pins to permit engagement of said pins with the electrical contacts in said body; mounting means at one end of said outer casing for supporting said holder for resilient rocking movement during engagement by a lamp; said outer casing having at the opposite end thereof, means including an arcuate edge engageable by part of the peripheral surface of the end cap of a fluorescent lamp to position said lamp preparatory to engagement of the lamp pins in said holder.

4. A lamp holder as claimed in claim **3**, wherein said guide means further includes mutually inclined guide edges extending from the opposite ends of said arcuate edge in a direction laterally inwardly and towards said one end of said casing, said mutually inclined guide edges being curved to guide a peripheral edge part of the end cap of the fluorescent lamp from said arcuate edge to a position in which the lamp pins of said lamp are located within said apertures in the lamp holder, said guide edges serving to maintain the end cap a desired distance from the face of said holder to prevent damage of the lamp pins during positioning thereof.

5. A lamp holder as claimed in claim **3**, wherein said insert is provided with a second recessed face formed in the region of said pair of apertures, said second face being inwardly recessed and extending from said apertures towards the arcuate edge of said holder.

6. A lamp holder comprising an outer casing, an insert removably secured within said outer casing, said insert having a forwardly directed recessed face for engagement by an end cap of a fluorescent lamp to be supported by said holder, said recessed face being provided with a pair of spaced apertures for the reception of the lamp pins of said lamp, electrical contact means mounted within said holder, said contact means registering with said apertures to permit electrical contact with the lamp pins when said pins are inserted into said apertures, the apertures being elongated to permit tilting of the fluorescent lamp during engagement with the holder; spring means for said holder for urging tthe holder into a lamp-engaging position, said spring means having a hooked end, a plate associated with said casing, said plate having a slot engaged by the hooked end of said spring; said insert including a centrally disposed web portion, said web

portion having a slot therein for guiding the hooked end of said spring into the slot of said plate.

7. A lamp holder as claimed in claim 6, wherein said insert is further provided with a cut-out portion, an earthing strip, a tongue at one end of said earthing strip which protrudes through the cut-out portion in said insert for engagement with the end cap of a fluorescent tube, said earthing strip having at the other end thereof a bent portion engaged by said hooked end of said spring.

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ALFRED S. TRASK, *Examiner.*