April 11, 1967 J. A. KLUGMAN 3,313,931

TELESCOPING RECESSED LIGHTING FIXTURE

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Fig. 1.

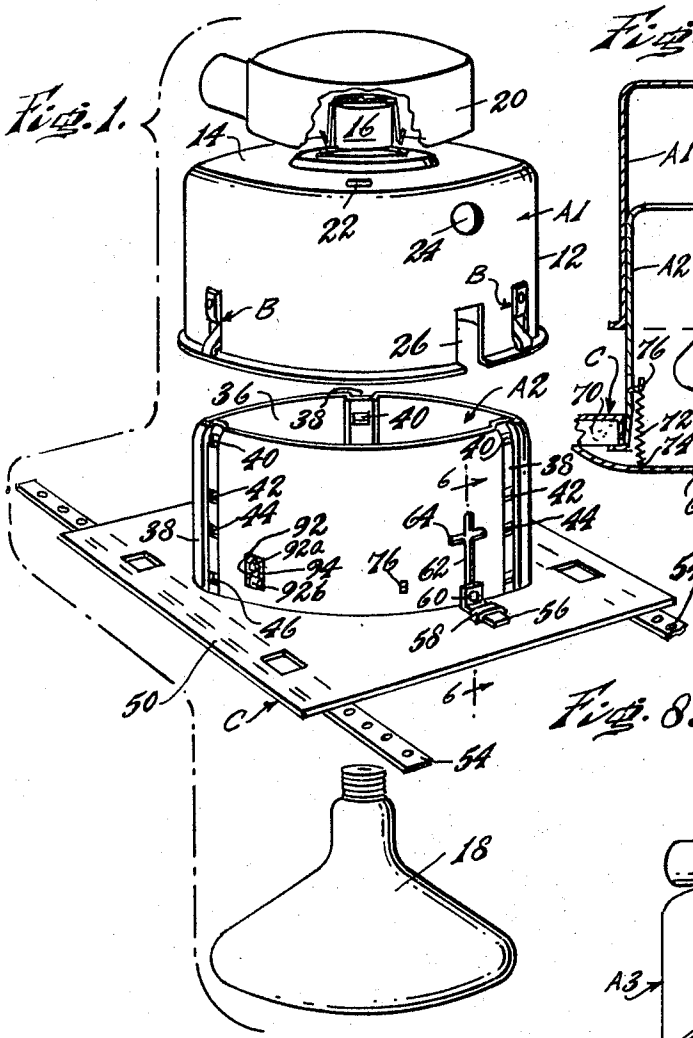


Fig. 7.

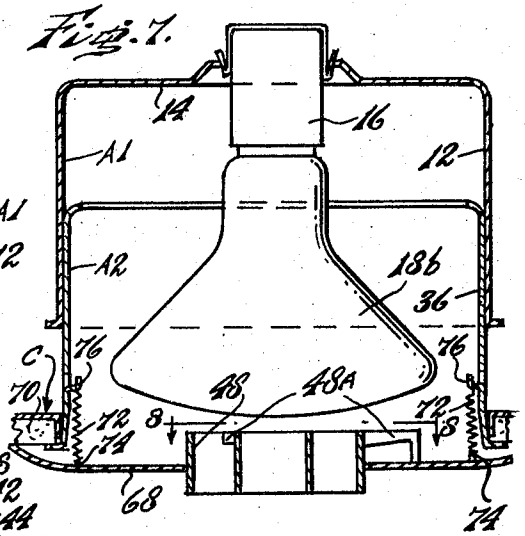


Fig. 8.

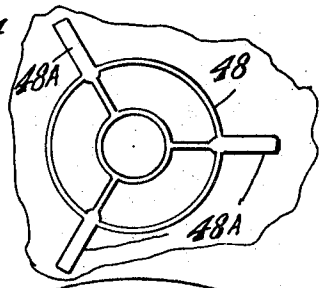


Fig. 6.

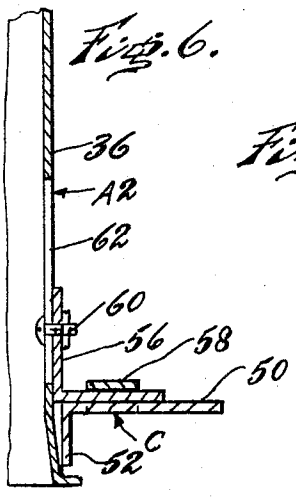


Fig. 10.

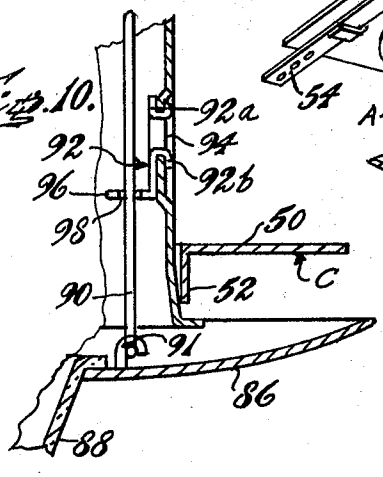
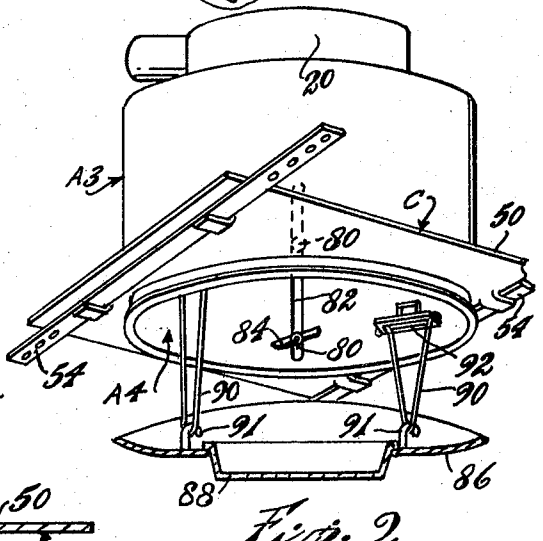


Fig. 9.



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TELESCOPING RECESSED LIGHTING FIXTURE

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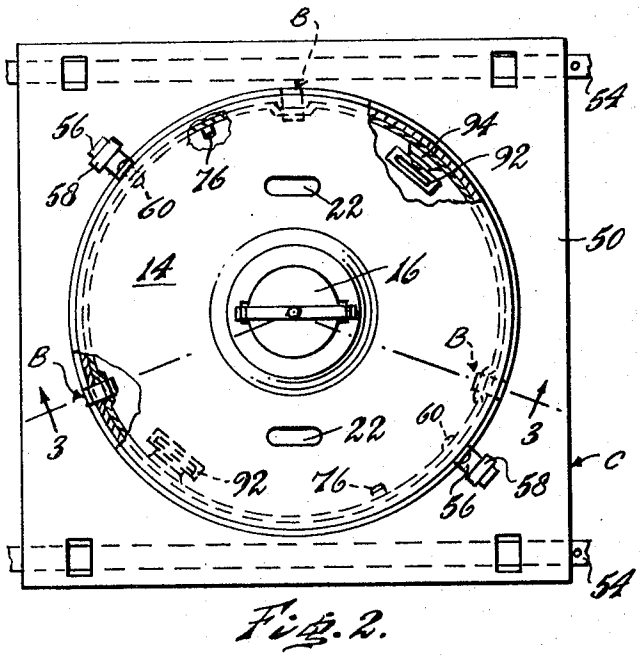


Fig. 2.

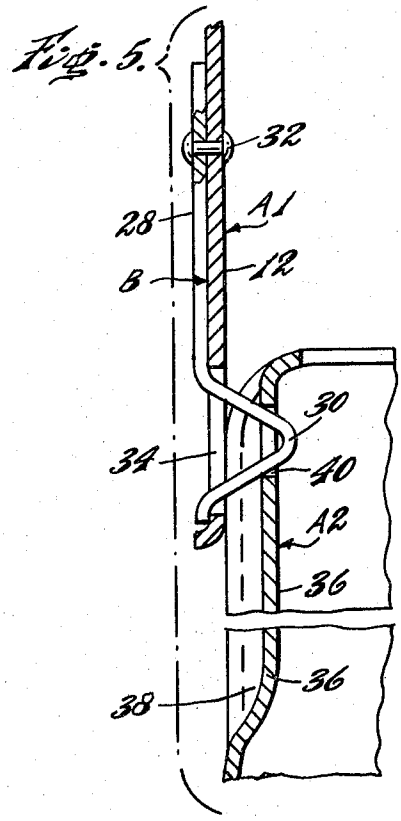


Fig. 5.

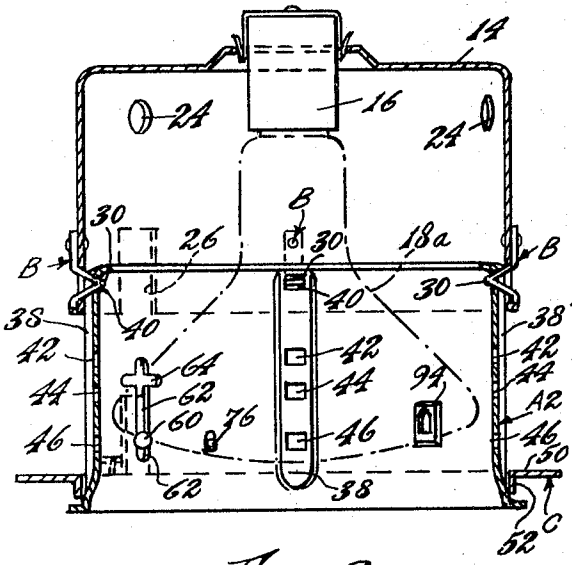


Fig. 3.

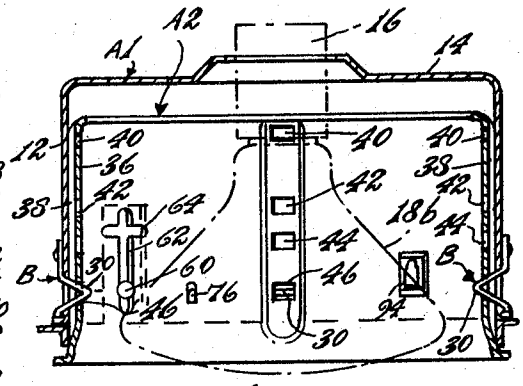


Fig. 4.

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TELESCOPING RECESSED LIGHTING FIXTURE

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Filed May 14, 1962, Ser. No. 194,259
2 Claims. (Cl. 240—78)

This invention relates to a recessed lighting fixture, and more particularly relates to the recessed lighting fixture commonly referred to in the trade as a "high hat."

The usual "high hat" recessed lighting fixture comprises a cylindrical sheet metal housing or can which is adapted to be mounted within the ceiling by a plaster ring hung to the ceiling joists or furring strips with straddling metal straps or bars. A reflector spot lamp, which is an outwardly flared bulb with an aluminized back and a generally convex face, is threaded into a socket in the top portion of the can so that the face of the bulb is substantially flush with the ceiling. The reflector spots are mainly of two types, one being a 75-watt lamp approximately 5½ inches long and designated R30, and the other being 150 watts approximately 6¾ inches long and designated R40. It has also been the practice in the electrical industry to make up a standard size housing corresponding to each of the two lamp sizes. However, if the user wished to change the illumination with respect to an already installed housing, the 75-watt bulb would be recessed too far within the larger standard fixture (5½" diameter by 8¼" deep) whereas the 150-watt lamp would project below the level of the can designated for the R30 lamp, the dimensions of the latter housing being standardized at 4½" diameter by 7½" deep.

Instead of stocking two sizes of housings, some of the high hat manufacturers have proposed to standardize on just the larger can with means incorporated therein to vertically adjust the socket downwardly to compensate for the smaller size R30 lamp which would otherwise be too greatly recessed in the large housing. Some examples of means to vertically adjust the socket alone may be seen in U.S. Patent No. 2,518,936 or No. 2,855,503. However, it is readily apparent that the inclusion of a vertically adjustable socket may necessarily result in an increase in the overall dimensions of even the larger fixture itself. In this regard, space limitations of a particularly shallow ceiling depth may be a restriction already against the use of just the standard large size can alone. If the fixture can will not fit in the ceiling, certainly socket adjustability could not remedy the situation.

Other considerations which dictate against the use of a single size fixture housing are the many variations in ornamental or functional trim design at the face of the high hats. Some of the most popular trim designs currently employed are: pin hole cover plates, louvers, flush diffusers, drop diffusers, spot diffusers, and rotatable projectors, commonly called "eyeballs." Each of these trim faces would require same alteration or adjustment in the housing dimensions with a particular lamp. Thus, it is evident that a plurality of standard cans would be necessitated for even the trims enumerated.

Furthermore, with all of the possible variations, the distributor or retailer must presently stock and minutely catalog a great variety of components to insure that a given accessory will coincide with a fixture selected by the purchaser. Otherwise, the manufacturer would be required to package a specified lamp with a specified housing with the specified trim in an appropriate size carton. It is significantly important that the overall size of the container for the fixture be maintained as small as practical both from the standpoint of minimizing shipping charges as well as storage economy.

It is therefore an object of this invention to provide

an adjustable recessed lighting fixture wherein a single housing will accommodate for variations in lamp size, in ceiling depth, and in face trim design.

Another object of this invention is to construct a recessed lighting fixture whose housing components will telescope within a wide range of adjustment.

Another object of this invention is to provide a telescoping recessed lighting fixture in which adjustment may easily be accomplished in situ after installation.

Another object of this invention is to construct a high hat recessed lighting fixture which will permit maximum interchangeability of face trim without modifying the installation itself.

Still another object of this invention is to provide a telescoping recessed lighting fixture which will meet the requirements of all prevailing electrical codes.

Yet another object of this invention is to provide a recessed lighting fixture which may be packaged, shipped and stocked in a single size carton of minimum dimensions.

A further object of this invention is to provide a recessed lighting fixture which is adapted for rapid and efficient installation in new construction or in the remodeling of existing constructions.

Other objects of this invention are to provide an improved device of the character described that is easily and economically produced, which is sturdy in construction, and which is highly effective in operation.

With the above and related objects in view, this invention consists of the details of construction and combination of parts as will be more fully understood from the following detailed description when read in conjunction with the accompanying drawing in which:

FIG. 1 is an exploded perspective view of telescoping recessed lighting fixture embodying this invention.

FIG. 2 is a top plan view thereof, partly broken away.

FIG. 3 is a sectional view taken along lines **3—3** of FIG. 2 and showing the fixture in fully extended position.

FIG. 4 is a side sectional view showing the fixture in fully collapsed position.

FIG. 5 is an enlarged fragmentary sectional view of a latching means embodied in this invention.

FIG. 6 is a sectional view taken along lines **6—6** of FIG. 1.

FIG. 7 is a side sectional view of the fixture showing one means for incorporating face trim thereon.

FIG. 8 is a fragmentary bottom plan view of the face trim shown in FIG. 7.

FIG. 9 is a perspective view of a modified form of this invention, and further showing another means for incorporating face trim thereon.

FIG. 10 is a sectional view taken along lines **10—10** of FIG. 9.

Referring now in greater detail to the drawings in which similar reference characters refer to similar parts, I show a recessed lighting fixture comprising telescoping housing members A1 and A2 which are variably positioned longitudinally with respect to one another and detachably restrained in such positions by latch means B. The entire fixture is adapted for mounting within a ceiling by adjustably orienting the member A2 vertically in a plaster ring bracket C so that the face of the fixture is essentially flush with the ceiling.

The housing member A1 is a cylindrical shell having a side wall **12** and closed top **14** which are integrally formed in a conventional manner by spinning or stamping a sheet metal blank. While the configuration illustrated is for a cylindrical high hat, it is to be understood that the principles of this invention would be equally applicable to any recessed lighting fixture including a rectangular housing. A lamp socket element **16** is secured to the top **14** and threadedly supports a reflector spot lamp **18** concentrically

within the shell A1. Externally attached to the shell is a junction box 20 which interfits over mounting holes 22 in the top and serves as a casing in which socket lead wires (not shown) may be coupled to a source of electrical power. However, attention is invited to the fact that the junction box disposition does not form an integral part of this invention since it may be mechanically isolated from the instant fixture or secured to the side wall 12 thereof if the available ceiling depth would preclude mounting the box to the top. A plurality of ventillation holes 24 allows the heat which is generated by the lamp 18 inside the housing to be readily dissipated. The shell A1 is further provided with relief notches 26 which act as clearance for plaster ring mounting members when the housing is fully collapsed as will be more fully described hereinafter.

The latches B, as shown in FIGS. 1 and 2, are circumferentially spaced about the outer periphery of the cylindrical side wall 12 and are adapted to detachably interlock with complementary portions in the lower cylindrical shell A2. In order to properly index the two telescoping shells A1 and A2 so as to avoid possible interferences of components during assembly, the latches B are not equilaterally disposed, but are preferably non-symmetrically oriented, 115°–115°–130° peripheral spacing being an example. As is best shown in FIG. 5, each of the latch members B comprises a flat spring steel arm 28 having a V-shaped uncinated finger 30 at one end. The upper end of the arm 28 is secured by a rivet 32 to the exterior of the side wall 12, and the uncinated finger is resiliently urged through and beyond side wall slot 34 into detachable engagement with any one of the slots 40, 42, 44 or 46 in the lower shell member A2. It is to be observed that the finger 30 may be released from its engaging slot simply by pressing upon its exposed end from the interior of shell A2 in the manner of a push-button.

The housing member A2 is also a sheet metal shell but has a side wall 36 which is open at each end. The external diameter of shell A2 is such as will produce a freely sliding fit within the interior of shell A1. It has been found to be quite practical to produce this sliding fit by reducing the diameter of the A1 shell in a stamping operation which deforms its side wall with a plurality of circumferentially spaced fluted channels 38. The fluted channels 38 in the shell A2 register with the spacing of the latches B about the periphery of the shell A1. The longitudinally spaced slots 40, 42, 44 and 46 are punched out of each of the channels 38 and selectively engage the corresponding latching finger B as desired. As may easily be seen, engagement of the latches B in slots 40 would cause the shell A1 to be in fully extended position with respect to shell A2 whereas the slots 46 represent the fully collapsed position of the two telescoping members. The position represented by the slots 40 would be appropriate to partially recess the large R40 bulb within the housing so that flush face trim could be mounted within the lower marginal edges of the shell A2. Refer to FIG. 3 as an example. The position of the slots designated by the numeral 42 would enable the face of the large bulb 18*a* itself to be flush with the face of the fixture and the ceiling. Correspondingly, the slots 46 are for flush mounting the small lamp 18*b* (R30), as shown in FIG. 4, whereas slots 44 position the shells A1 and A2 for flush mounting louver trim 48 with the R30 lamp, as shown in FIG. 7.

The plaster ring C is conventional and includes a flat sheet metal flange 50 with a circular skirt 52 downwardly depending therefrom to define a framed opening for the housing member A2. A pair of straps or bars 54 are slidably supported in the flange 50 in the usual manner for spanning the ceiling joists so that the plaster ring C may be appropriately held in position. L-shaped mounting clips 56 are retained by one leg under a cincture 53 punched out of the flange 50. Sheet metal screws 60 which are slidable in vertical slots 62 threadedly engage

openings in the respective vertical legs of clips 56 whereby the entire housing may be adjustably supported to accommodate for ceiling face thickness. It is also to be noted that horizontal slots 64 crossing the vertical slots 62 provide a means for inserting the clips 56 through the housing wall 36 from the interior thereof when for example, access is not avilable as in remodeling existing ceiling constructions. While it is to be understood that the plaster ring itself does not form part of the instant invention, illustration thereof is merely shown to indicate the facility in which the telescoping shell members of my improved fixture can accommodate and be incorporated with existing standard electrical installations. Again, reference is made to the relief slot 26 in the housing A1 to provide clearance for securing the shell A2 to the clips 56 when the fixture is in collapsed position.

In further illustration of the adaptability of the telescoping fixture for use with different face trim designs, I show in FIGS. 7 and 8 an apertured face plate 68 which is spring loaded into abutment with the face of the plaster ceiling 70. Coil springs 72 secured to eyelets 74 on the plate 68 are hung in tension to lances 76 stamped out of the shell A2. Thus, the plate 68 is resiliently drawn over the mouth of the fixture, and access to the bulb 18 is obtained merely by pulling down on the plate or unhooking the springs 72 from the lances. The louver 48 may be an integral part of the plate (not shown) or it may have concentric rings separately die cast or stamped with radially extending legs 48*a* which detachably rest upon the upper surface of plate 68 as shown in FIGS. 7 and 8. There are, of course, many adaptable variations in even the louver design, and the single illustration shown is intended as being representative of the principles involved in the necessity of partially recessing the face of the lamp 18 when louver trim is employed. Accordingly, FIG. 7 shows the desired position of the telescoping members A1 and A2 when the R30 lamp 18*b* is utilized with louver trim, i.e.—the latches B would be in engagement with the slots 44. If the housing A1 were fully in the shell A2 (slots 46 engaged), the R30 lamp would be flush with the mouth of the fixture, and hence no space would be available for louver trim. The same principle is equally applicable when the large R40 lamp 18*a* is mounted.

In FIGS. 9 and 10, I show another embodiment of this invention wherein telescoping housing members A3 and A4 are adapted to be slidably positioned and continually adjustable throughout the range. The outer shell A3 has a pair of screws 80 which project interiorly and slidably engage longitudinally extending slots 82 in the side wall of the shell A4. Wing nuts 84 lock the two shells together in any position desired. In order to change the effective overall height of the fixture, the wing nuts 84 are loosened so that the shell A3 may be raised or lowered about the complementary shell A4. Note that there are no definite increments in adjustment imposed by this sliding slot modification although indexing markings may be incorporated adjacent the slots 82 for indicating the recommended position for any particular lamp or trim component.

FIGS. 9 and 10 also show still another means for mounting face trim, the application of which can readily be accommodated in the spring loaded latch embodiment. See the position of element 92 in FIGS. 1 and 3. The particular face trim shown in FIG. 9 is a drop diffuser having an apertured plate 86 with a downwardly convex diffuser element or lens 88 mounted therein. Torsion springs 90 having legs resiliently directed outwardly from each other are hooked to the plate 86 on clasp 91 and thereafter extend vertically into frictional engagement with holding brackets 92 which are detachably retained within detents 94 stamped in the lower shells. These torsion springs are fully described and illustrated in U.S. Patent No. 2,701,299 entitled Diffuser Holding Means of Lighting Fixtures. The brackets 92 are generally L-shaped in configuration, the vertical legs thereof having

resilient ears 92*a* and 92*b* which snap into the detents 94. Each of the horizontal legs 96 has a generally rectangular slot 98 into which the resiliently diverging arms of the spring 90 frictionally mount, and there is no interference with the telescoping action of the shell members themselves.

It is therefore apparent that either modification of this invention may be employed with various sizes of lamps as well as with many different face trim designs. Either fixture embodiment may be shipped in fully collapsed position in a small package which occupies a minimum of storage and shipping space. At the same time, the fixtures are extensible to suit the needs of the customer.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting since the invention may be variously embodied and the scope of the invention is to be determined as claimed.

What is claimed is:

1. A recessed lighting fixture for attachment to a plaster ring within a ceiling comprising a lower housing member, an upper housing member in telescoping slidable engagement with said lower housing member, securing means for adjustably supporting said lower housing member within the plaster ring, guide means maintaining said upper housing member in fixed circumferential disposition with respect to said lower housing member, said guide means constituting three longitudinally-extending recessed fluted channels equally-spaced circumferentially in said lower housing member, longitudinally-spaced slots in each of said fluted channels disposed in a series of sets of three coplanar slots therein, latching means constituting three equally-spaced spring loaded fingers slidably received in said respective fluted channels and simultaneously engaging all of the slots of a given set at a time for detachably securing said upper housing member to said lower housing member against relative axial movement, said fingers being manually releasable from the interior of the fixture and automatically and selectively engaging another set of slots in the series upon displacement of the two housing members with respect to each other, face trim means resiliently coupled to said lower housing member, and lamp trim means downwardly projecting from the interior of said upper housing member whereby the overall depth of said housing is adjustable while the fixture is in the ceiling, and three cruciform slits equally-spaced circumferentially in said lower housing member intermediate said fluted channels, each of said cruciform slits including an elongate portion parallel with said channels and an intersecting portion transverse thereto, said elongate portion of said cruciform slits permitting vertical adjustment of said fixture with respect to the ceiling and said securing means for accommodating variations in ceiling thickness, said intersecting portion providing for insertion therethrough of said securing means from the interior of said fixture for suspending said fixture from the exterior thereof within an existing ceiling.

2. A recessed lighting fixture for attachment to a plaster ring within a ceiling comprising

a lower housing member,

an upper housing member slidable over said lower housing member within the plaster ring,

guide means maintaining said upper housing member in fixed perimetrical disposition with respect to said lower housing member,

a series of longitudinally separated sets of circumferentially spaced slots in said lower member, the slots of each set being located in a plane normal to the telescoping axis,

three latching fingers equally-spaced circumferentially on said outer housing member for engagement with all of the slots of any given set in said series at a time,

said guide means constituting three longitudinally-extending recessed fluted channels in said lower housing member and equally-spaced circumferentially thereabout, said fluted channels containing said slots and cooperating with said latching fingers,

spring means resiliently biasing said latching fingers radially inward so that when registration with respective slots occurs a portion of said fingers will snap therein and detachably secure said upper housing member against relative axial movement with respect to said lower housing member,

face trim means resiliently coupled to said lower housing member, and

lamp means downwardly projecting from the interior of said upper housing member,

whereby said latching fingers are readily detachable manually from a given set of slots through the bottom interior of said lower housing member and selectively falling into another set of slots automatically upon registration therewith as the upper housing is displaced with respect to the lower housing so as to facilitate the adjustment in overall depth of the fixture,

three cruciform slits equally-spaced circumferentially in said lower housing member intermediate said fluted channels, each of said cruciform slits including an elongate portion parallel with said channels and an intersecting portion transverse thereto,

said elongate portion of said cruciform slits permitting vertical adjustment of said fixture with respect to the ceiling to accommodate for variations in ceiling thickness,

said intersecting portion providing means for insertion therethrough of elements from the interior of said fixture for suspending said fixture from the exterior thereof within an existing ceiling.

References Cited by the Examiner

UNITED STATES PATENTS

932,834	8/1909	Torrey	240—132
1,015,455	1/1912	Neesham	220—8
2,620,082	12/1952	Harmon	220—8
2,741,695	4/1956	Schockett	240—73
2,802,933	8/1957	Broadwin	240—78
2,971,670	2/1961	McCormack	240—78
2,977,461	3/1961	Jones	240—78

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