

March 5, 1968

A. F. JACOBS

3,371,900

UNITARY DOUBLE-DETENT CONNECTOR FOR LIGHTING FIXTURES

Filed Feb. 14, 1966

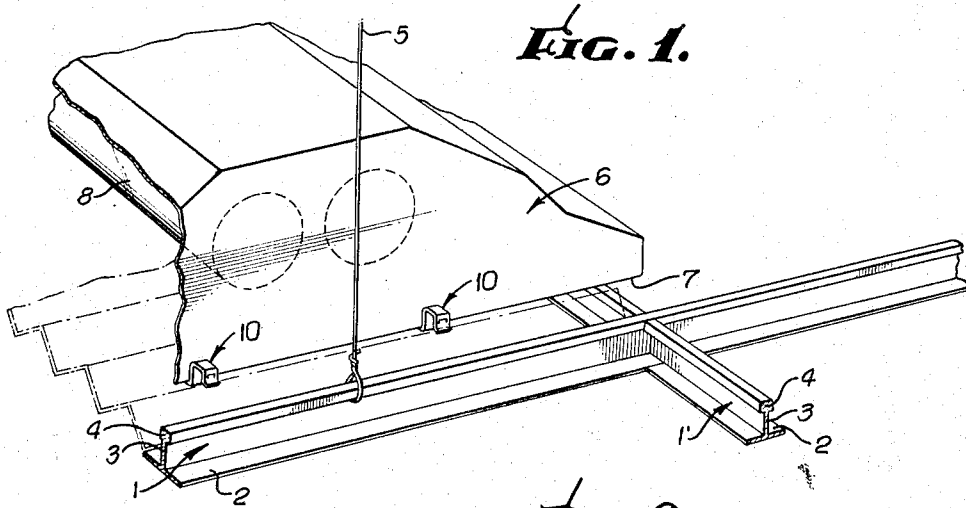


FIG. 1.

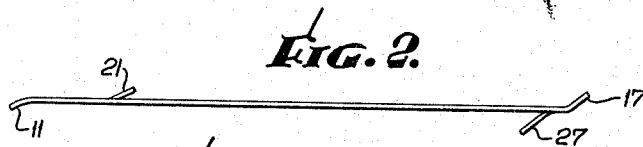


FIG. 2.

FIG. 3.

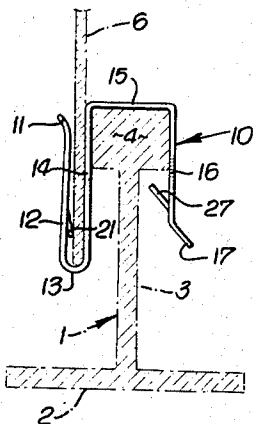


FIG. 4.

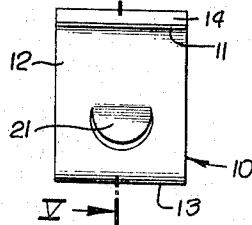


FIG. 5.

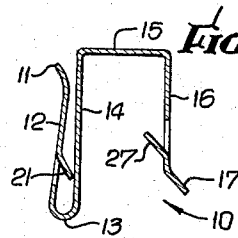


FIG. 8.

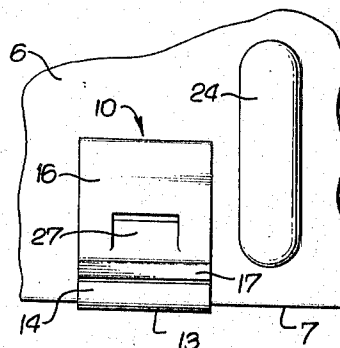


FIG. 7.

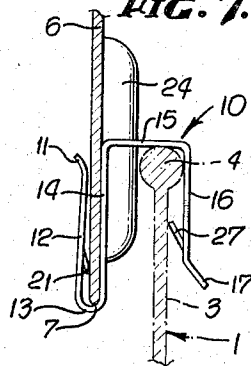
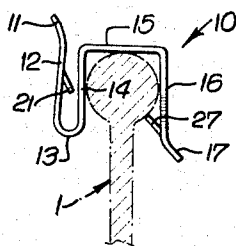


FIG. 6.



INVENTOR.
ARTHUR F. JACOBS
BY
Miketta, Glenn, Poma & Smith
ATTORNEYS.

1

3,371,900

UNITARY DOUBLE-DETENT CONNECTOR FOR LIGHTING FIXTURES

Arthur F. Jacobs, Los Angeles, Calif., assignor to Prudential Lighting Corporation, Los Angeles, Calif., a corporation of California

Filed Feb. 14, 1966, Ser. No. 527,264

6 Claims. (Cl. 248—343)

ABSTRACT OF THE DISCLOSURE

A unitary, double detent connector including an upright U whose outer leg includes a detent angularly inclined toward the base of the U to frictionally grasp an imperforate marginal edge of a lighting fixture at any desired portion of its length, and an inverted U having an inwardly extending detent for receiving and retaining the head of a T-bar of a grid-type ceiling, for removably positioning a lighting fixture on such ceiling.

Summary of the invention

Modern architectural treatments favor the provision of suspended-type ceilings (sometimes known as soffit-type ceilings) wherein a gridwork of T-bars or channels is employed, such T-bars and channels being connected to the permanent ceiling or upper floor of a structure. The soffit normally contains heating and ventilating ducts and the suspended ceiling itself includes light diffusing elements as well as air diffusion outlets. The lighting fixtures, or housings for lighting fixtures, are normally included in the ceiling and are either connected to the T-bars by various types of screws or latching elements or suspended from the gridwork by means of brackets. These various fastening elements used heretofore required the necessity of drilling holes for screw-type fasteners or required the use of brackets which embraced the lighting fixture housings and thereby cut down the amount of space available in a soffit for the various air ducts, etc. In the event a lighting fixture actually rests upon the flanges of the T-bars, some difficulty is experienced in placing the diffusion plates beneath the openings to the lighting fixture housings; it is to be remembered that these diffusion plates need be removed in order to change the fluorescent lighting tubes or other light sources contained in the fixture housings.

The present invention eliminates the necessity of drilling holes for screw-type fasteners and also eliminates the necessity of using swing latch-type fasteners; these various operations and fasteners were generally performed and placed on the fixtures at the factory. Often it has been found that such factory applied fasteners interfered with the suspension wires, brackets and positioning of the more permanent elements of a grid-type ceiling. The present connectors, on the other hand, are applied on the job, without the necessity of using specialized tools and the fasteners can be placed in any desired location and in any desired number, thereby greatly expediting installation. Moreover, the preferred construction described hereinafter provides connectors which maintain the lower marginal edges of a lighting fixture out of contact with the planar flanges of the T-bars (which lie in the plane of the ceiling) thereby permitting the ready and separate installation and removal of diffusion elements.

Moreover, the connecting elements of the present in-

2

vention may be very readily and inexpensively manufactured from planar, ribbon-like resilient strip metal. Although the connectors may be applied without the use of tools and firmly hold a lighting fixture housing in position upon the gridwork, the lighting fixture can be removed, adjusted, repaired, etc. and the connector means released by the use of a screwdriver or even the fingers, since they only need to be pried off.

An object of the present invention therefore is to disclose and provide a universal, unitary, simple and effective double-detent connector for attaching and positioning a lighting fixture upon grid bars of a suspended ceiling.

A further object of the invention is to disclose and provide a complete grid bar-type ceiling employing T-bars having enlarged heads on the longitudinal edge of the mid-leg of the T-bars, the lower edge of the lighting fixture being maintained out of contact with the flanges of the T-bars, thereby permitting the flanges to separately receive and support a light diffusing element.

Other objects, advantages and modifications of the invention will be apparent from the following description. For purposes of illustration, reference will be had to the appended drawings in which:

FIG. 1 is an enlarged perspective view of an end portion of a lighting fixture equipped with the connectors of the present invention in position for installation upon a grid bar ceiling;

FIG. 2 is a side elevation of a partly formed strip of resilient metal from which the connector is made;

FIG. 3 is an enlarged side elevation of an exemplary form of connector, the marginal lower portion of a fixture and the position of a T-bar being indicated in dash lines;

FIG. 4 is a side elevation of the left side of the connector shown in FIG. 3;

FIG. 5 is a transverse section taken along the plane V—V of FIG. 4;

FIG. 6 is a side elevation of a modified form of connector;

FIG. 7 is a transverse section of a further modification as applied to a marginal edge of a lighting fixture provided with spacing dimples;

FIG. 8 is a fragmentary side elevation of the connector and lighting fixture illustrated in FIG. 7.

FIG. 1 is an isometric, somewhat diagrammatic representation of a small portion of a suspended ceiling composed of interlocked T-bars 1, 1', etc., with their lower flanges 2 in the plane of a ceiling. The form of T-bar illustrated has a mid-leg 3 provided with an enlarged head 4 (which may be either rectangular in section or circular). Grid-type ceilings of this character are normally supported by means of suspension wires 5.

A typical lighting fixture housing 6 is shown in position above an opening in the ceilings. The lower marginal portions of the housing 6 are preferably planar and imperforated as shown in FIG. 1, the lower edge being indicated at 7. Such a housing contains any desired number of actual light sources, such as the fluorescent tubes 8. The lower marginal edge of the fixture 6 is shown provided with the connector means of the present invention at 10. Any desired number of such connector means may be used at any desired point along the longitudinal or transverse edges of a housing fixture and these connector elements are normally applied by hand on the job, so as not to interfere with suspension wires or other elements that have been installed in a ceiling prior to the installation of the lighting fixtures.

The attachment of a lighting fixture 6 to the grid-type ceiling is extremely simple since it is only necessary to press the fixture downwardly, the heads 4 of the grids or T-bars extending into the downwardly open, or inverted U, of the connector means 10. By referring to FIG. 3, the relative position of the parts is evident.

The connectors 10 may be made from a ribbon of resilient metal and, at the initial stage of manufacture, such ribbon may be caused to assume the formation shown in FIG. 2. As there shown, the ends of the ribbon are bent out of the plane of the ribbon in opposite direction; the end 11 may be bent downwardly whereas the upper end is bent in the opposite direction. A detent is then lanced out of the strip adjacent each end, each detent extending angularly out of the plane of the strip in the direction opposed to the direction of inclination of the adjacent end. For example, the detent 21 is shown extending out of the plane of the ribbon in a direction opposed to the end 11 whereas the detent 27 extends in the direction opposed to the inclination of the end 17. This pre-cut and lanced band is now bent with two reverse curves so that as best shown in FIG. 3, three substantially parallel legs are formed, namely, the legs 12, 14 and 16, the legs 12 and 14 being bent to form an upward U around a sharp bend 13, whereas, the common leg 14 and the outer leg 16 are bent to form a downwardly directed U having a base 15 which is preferably substantially in a plane at right angles to the plane of the legs 14 and 16 so that when it is applied to a headed T 4, the base 15 of this downwardly directed U will seat itself firmly on the head. The detents 21 and 27 lanced out of the body of the strip are oppositely directed, as indicated in FIGS. 2 and 3. By examining FIGS. 4 and 5, it will be seen that these detents may either be rectangular or semi-circular in form, FIG. 4 indicating that the detent 21 is semi-circular, whereas, the detent 27 is rectangular in form. As indicated in FIG. 5, the U formed by the legs 12 and 14 is preferably pre-stressed so as to present a very narrow opening between the outwardly flaring end 11 and the body of the clip or connector. When the edge portion of a lighting fixture housing 6 is inserted therebetween, the detent 21 frictionally grasps the planar marginal edge portion of the fixture firmly, the outwardly flaring end 11 guiding the marginal edge of the fixture into the narrow U. Similarly, the outwardly flaring end portion 17 permits the entire connector to be readily applied to the headed end of a T 1, the detent 27 extending beneath the head 4 of the T thereby firmly connecting the lighting housing to the T.

Although in FIGS. 1 and 3 the T is shown provided with a rectangular head 4, it will be noticed that in FIG. 6 the head of the T has a circular cross-section. Moreover, as indicated in FIG. 6, the end 11 may extend above the plane of the intermediate portion 15 of the connector; the small diameter closed end 13 of the clip need not extend below the level of the free end 17 but, as shown in FIG. 6, the outwardly flaring free end 17 of the inverted U may assume a position below the level of the reverse bend 13. At all events, the inwardly extending detent 27 extends beneath the head 4 of the T.

In some instances, it is desirable to permit the interior of the lighting houses to be ventilated or vented into the soffit. As shown in FIGS. 7 and 8, the exterior marginal surface portion of the lower edge of the lighting fixture 6 may be provided with a series of outwardly embossed elongated dimples 24. The lateral extent of these dimples 24 may be such that as indicated in FIG. 4, they contact the head 4 of the T and hold such head between the dimple and the base of the inverted U as well as the outer leg 16 of the inverted U of the connector means, the inwardly extending detent 27 preventing ready removal or displacement of the clip and its associated fixture from the T of the ceiling grid. In other words, the width of the inverted U portion of the clip need not be

exactly the same as the width of the head of a T, provided other means, such as the dimples 24, snugly contain the head within the connector.

Moreover, as indicated in FIG. 6, the outwardly flaring end 11 of the connector may extend above the plane of the bottom of the large U 15 and the base 13 of the narrow U need not extend below the level of the outwardly flaring end 17 of the connector but, instead, may be at a higher level than the flaring end 17. In other words, the connector may assume a variety of different forms and each of the individual modifications shown in the figures may be combined with other forms herein illustrated in order to provide a universal, unitary double-acting clip or connector for the ready installation of lighting fixtures into suspended ceilings composed of various types of T bars.

It is to be noted, however, that all of these connector means may be readily attached to the lighting fixture and to the T bar without the use of tools. No holes need be drilled and no screws are employed. Any desired number of connectors may be used, and their placement may be varied in accordance with the circumstances found in each instance. In the event it is subsequently desired to remove or change the position of a lighting fixture, this can be done very readily. All changes and modifications coming within the scope of the appended claims are embraced thereby.

I claim:

1. A connector means for connecting a lighting fixture body to a T-bar of a grid-type suspended ceiling comprising:

a planar strip of resilient metal bent with two reverse bends to form a narrow upright U adapted to receive the edge of a lighting fixture and a wider, inverted U adapted to receive and rest upon and engage the head of a T-bar; said connector having three virtually parallel legs, one leg being common to said U's;

the outer leg of the upright U being provided with a detent extending in the direction of the base of said U to frictionally grasp the imperforate wall of a lighting fixture, and the outer leg of the wider inverted U having a detent extending inwardly into said U for retaining the head of a T-bar therein.

2. A connector means as stated in claim 1 wherein the base of the narrow upright U is below the level of the downwardly extending free end of the inverted U.

3. A connector as stated in claim 1 wherein the base of the inverted wider U lies in a plane virtually perpendicular to the planes of the legs of said U, to firmly rest upon the head of a T-bar.

4. A connector means as stated in claim 1 wherein said connector comprises a planar strip of resilient metal having its ends bent in opposite directions, a detent lanced out of said strip adjacent each end, each detent extending angularly out of the plane of the strip in a direction opposed to the direction of inclination of the adjacent end.

5. A connector as stated in claim 2 wherein the free end of the leg of the narrow U extends beyond a transverse plane passing through the base of the inverted U.

6. A suspended ceiling including a grid system composed of inverted T-bars, the mid-leg of the T-bars terminating in an enlarged head and the flanges thereof lying in the plane of the ceiling;

a light fixture housing having vertical, planar, and imperforate lower margin portions; connector means of planar resilient metal bent with two reverse bends to form a narrow upright U adapted to receive the lower margin portions of a lighting fixture and a wider inverted U adapted to receive, rest upon and engage the head of a T-bar; the outer leg of the upright U being provided with a detent extending in the direction of the base of said U to grasp the lower margin portion of a lighting fixture, said connector means positioning the lower edges of the fixture housing above the level of the flanges of said T-bars,

3,371,900

5

whereby said flanges may separately receive and support a light diffusing element.

References Cited

UNITED STATES PATENTS

2,369,480	2/1945	Mills.	
2,665,103	1/1954	Flora et al.	248—229 X
3,081,398	3/1963	Karth	248—343 X

6

FOREIGN PATENTS

885,372	12/1961	Great Britain.
101,700	5/1962	Netherlands.

5

ROY D. FRAZIER, *Primary Examiner.*

J. F. FOSS, *Assistant Examiner.*