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Baggott

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[54] **PULL-DOWN LAMP**

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[52] **U.S. Cl.** **240/69,** 240/88, 248/331

[51] **Int. Cl.** **F21v 21/20**

[58] **Field of Search** 240/69, 88; 248/331

[56] **References Cited**

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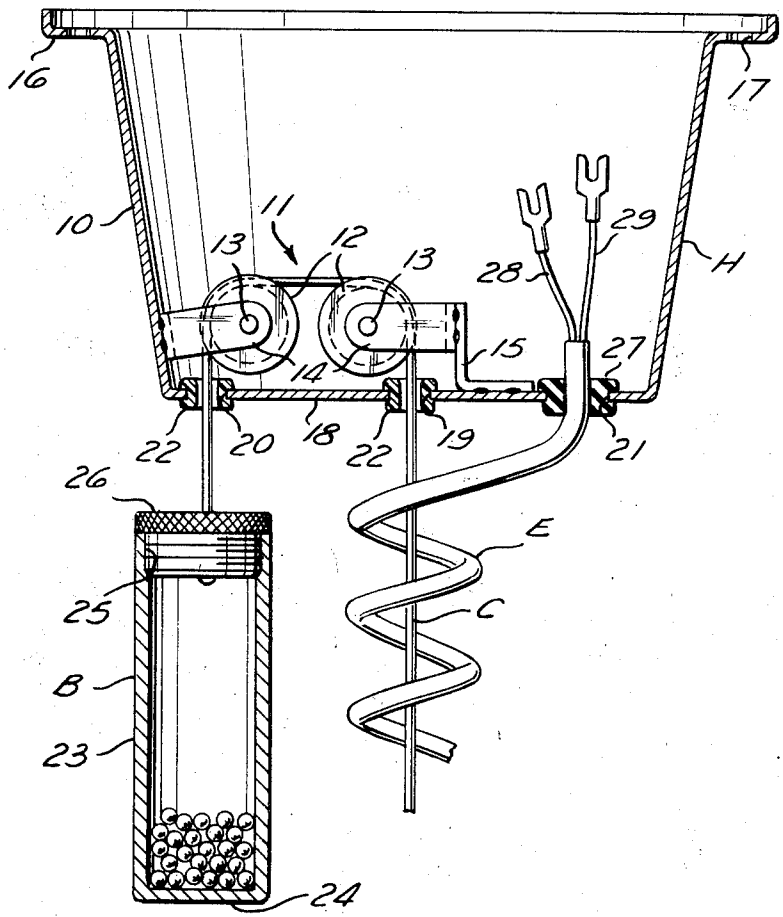
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[57] **ABSTRACT**

An electrical fixture supported from the ceiling or other overhead structure having a fixed central hollow housing mounted on the overhead structure and a light unit vertically adjustable with respect thereto by means of a suspending cable passing through the housing and a counterweight attached to the cable.

2 Claims, 3 Drawing Figures



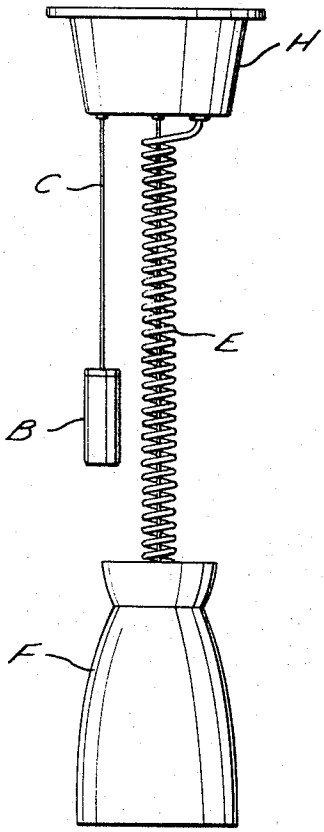
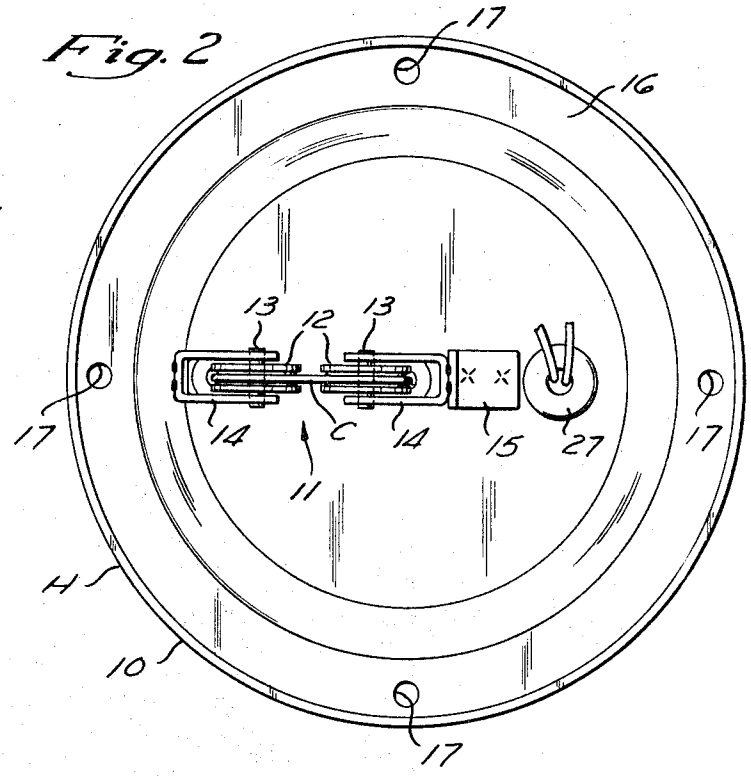


Fig. 1

Fig. 2



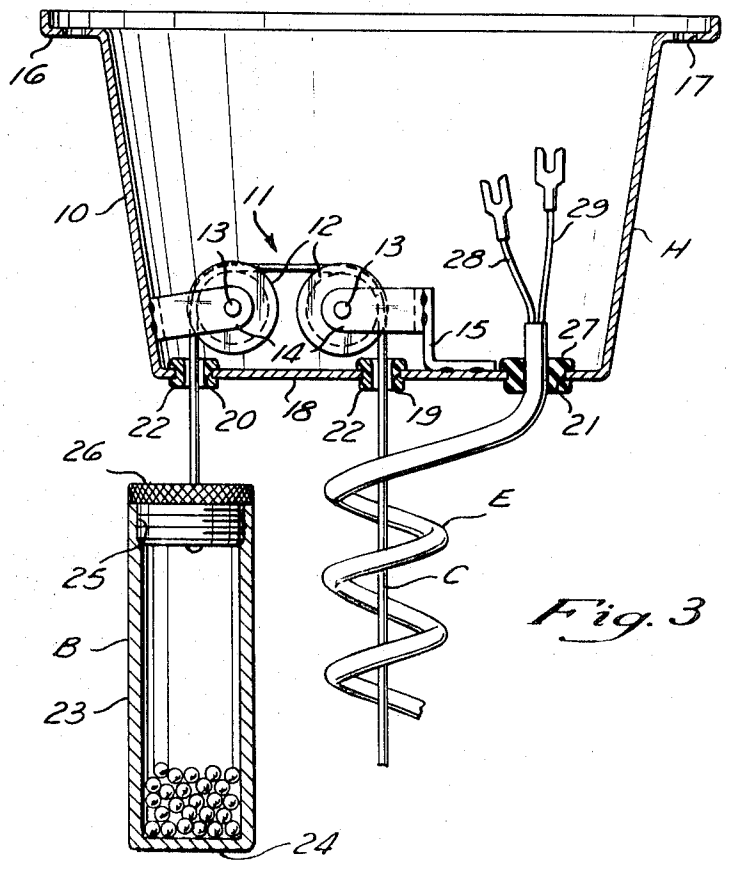


Fig. 3

PULL-DOWN LAMP

BRIEF SUMMARY OF THE INVENTION

This invention relates to a pull-down electrical fixture, for example, a lamp. Such a fixture is commonly supported from the ceiling or other overhead structure at a vertically adjustable height for illuminating and/or warming a table, counter and/or floor.

Widely used means for providing vertical height adjustment employ reels for winding and storing variable amounts of supporting wire or cable extending between the supporting structure and the fixture. The reels are normally designed with a pawl-type locking mechanism for holding them in a given position. An operating spring may bias the reel in a direction to shorten the supporting cable and in opposition to gravity. The reels generally are located in housings at the ceiling or in egg-shaped cases interposed in the length of the supporting cable between the ceiling and the fixture. Such housings or casings must be large enough to contain reels of substantial diameter and thus they tend to be unattractive and to detract from the appearance of the installation. The pawl-type reel positioning mechanism is jerky in operation and permits positioning of the fixture only at intervals provided by the particular mechanism.

As will be seen from the particular embodiment of this invention shown in the drawings and described below, this invention provides a vertically adjustable hanging electrical fixture that is stepless and completely smooth in its vertical movement, which has no particular interval of adjustment and which may be positioned at any location between the limits of its travel.

In addition, the apparatus of this invention requires no mid-cable cases or large and unsightly housings at the ceiling to house reels and ratcheting mechanisms. Only a shallow ceiling housing is required which contributes to the attractive appearance of the fixture and installation.

The invention provides a fixture having a wide range of smooth adjustability in a given installation as well as being adaptable for use in applications having widely varying supporting structure or ceiling heights and fixture weights. The invention achieves these objects in a fixture that is economical to manufacture, easy to install and reliable in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overall side elevation view of a complete electrical fixture embodying this invention;

FIG. 2 is a top elevation view of and looking into the housing to be mounted against a ceiling or supporting structure; and

FIG. 3 is a partially sectioned side elevation view taken in the plane of 3—3 in FIG. 2 and in a scale corresponding to FIG. 2 and larger than that of FIG. 1 and showing the operative elements of the fixture.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

As seen in FIG. 1, the major elements of a preferred embodiment consist of a housing H intended to be mounted on an overhead supporting structure, a supporting cable C passing through housing H, a counterweight B fastened to one end of cable C, a lighting fixture F attached to the other end of cable C, and an

electrical cord E for conveying power from housing H to fixture F.

Housing H, as seen in FIGS. 2 and 3, comprises a shell 10 which conceals and supports a sheave means indicated generally at 11. As shown, sheave means 11 comprises a pair of grooved wheels 12 supported for rotation in the same vertical plane on laterally spaced apart axles 13. U-shaped supports 14, mounted and secured by spot welding, for example, directly or by means of an angle bracket 15 to housing shell 10 carry axles 13.

Housing H preferably has a flange 16 at its upper face for permitting easy mounting of the housing to a ceiling or supporting structure by means of fasteners fitted through mounting holes 17 in flange 16. Housing H may be mounted by other means in a suitable manner. Side 18 of housing H facing generally away from a supporting structure is provided with a generally central aperture 19 and two apertures 20 and 21 spaced laterally therefrom. All three apertures are preferably provided with appropriate bushings as shown and as will be explained more fully below.

Grooved wheels 12 are positioned in the same vertical plane and are aligned between vertical axes extending through central aperture 19 and one of the laterally spaced apertures. One wheel 12 stands tangent to a vertical axis through central aperture 19 and the other wheel 12 is tangent to a vertical axis extending through aperture 20.

Cable C, a flexible cord or cable having sufficient strength to support the loads involved with a suitable safety factor, extends from and into housing H through apertures 19 and 20 in shell 10. Within the housing, cable C passes over and has running and supporting engagement with wheels 12 of sheave means 11. Lighting fixture F is attached to one end portion of cable C, preferably the end extending through central aperture 19. Counterweight B is attached to the other end portion of cable C extending through laterally spaced aperture 20. Apertures 19 and 20 are provided with suitable bushings 22 of nylon, for example, to insure the smooth and easy passage of cable C through the apertures in the wall of housing H.

As shown in the drawings, lighting fixture F is intended for an infrared heat lamp used to keep prepared food warm at a serving station or counter, for example. The deeply drawn shade covers and shields the lamp and socket and directs the energy from the lamp onto a limited area. Obviously, this invention comprehends other electrical fixtures than the one shown including lamps for decoration or illumination as well as other devices such as small cooling fans or multiple outlet electrical sockets.

Counterweight B comprises a cylindrical case 23 having a closed end 24 and an internally threaded open end 25 adapted to receive a cap 26 turned into it to close it. Cap 26 preferably is attached directly to cable C and thus the counterweight to the cable. This arrangement permits the easy and convenient interchange of cylindrical cases of different size, color, or weight for example, and/or the changing of the weight held by a particular case.

As shown, case 23 contains some shot to add weight to counterweight B. The counterbalancing weight can be adjusted over a substantial range by loading case 23 with a varying amount of material. Adjustment is easily accomplished by removing and replacing cap 26.

It will be apparent that this invention comprehends other forms and types of structures used as counterbalances. The small diameter cylinder is advantageous because it permits close lateral spacing without interference of the two ends of cable C. Also, it has desirable stability when supported from its upper end; it is unobtrusive; and it fits well in appearance with the other elements with which it functions.

Electrical cord E preferably is a conventional coiled two-conductor insulated cable having its pair of conductors and a helical spring built together under a single sheath. Because of the elasticity of the including spring, the cord as a whole tends to maintain its long, helical coil form.

One end of cord E is anchored on lighting fixture F and electrically connected to the electrical unit therein. The other end is anchored to housing H. Cord E enters housing H through aperture **21** and is grasped and held by a tight fitting elastic grommet **27.** As shown, the sheath is removed from a portion of the cord extending inside housing H and the two electrical conductors **28** and **29** are provided with conventional terminal devices for connection to a source of electrical power in the supporting structure to which housing H is attached. Aperture **21** advantageously is laterally spaced from central aperture **19** in the opposite direction from aperture **20** in order to minimize any interference between cord E and cable C.

In operation fixture F is supported by cable C from housing H at various positions of vertical adjustment. Fixture F is held at any particular spacing from housing H by the weight of counterweight B and by friction in the sheave means **11** and any forces applied by resiliently extensible and contractible cord E. Adjustment of vertical position is accomplished, for example, by manually pushing or pulling fixture F up or down. Alternatively, counterweight B may be manually moved in a direction opposite that which fixture F is to be moved.

The means and manner of this invention for providing vertical adjustment for a hanging electrical fixture are distinctively advantageous over prior reel type devices having positive locking means. First, the apparatus of this invention permits the free and easy adjustment of fixture height to any position, not just the discrete positions determined by a pawl-type locking mechanism.

Also, a minimum of applied force is required to accomplish an adjustment because the weight of counterweight B can be adjusted easily and closely to the minimum value necessary to counterbalance the weight of fixture F while taking into account the friction of the particular moving parts involved and the forces introduced by resiliently extensible and retractible cord E. The forces stored in spring loaded pawls and strong reel operating springs to not have to be over come and the sudden jerks produced by them, avoided. The apparatus is therefore easier to use and safer and more gentle in its handling of a supported fixture.

Further, the range of vertical adjustment is easily changed by changing the point of attachment of counterweight B on fixture F at one end of cable C. The possible range of adjustment and/or absolute distance between housing and fixture is not limited by reel or operating spring capacity, either in size or power to retract. Adjustment throughout the range of adjustment requires substantially a constant force rather than increasing and decreasing forces as more or less energy is stored in an operating spring of a reel type device with vertical displacement of the fixture.

The distance at which the fixture can be supported below the housing is not dependent upon the reel size and capacity that can be accommodated in a particular housing. This invention permits a single size shallow housing designed primarily for its aesthetic compatibility rather than the size of the mechanism it must hide. The sheave means of this invention can be of very small diameter, or if desired, a single wheel having a diameter about equal to the lateral spacing of one of the spaced apertures from the central aperture. The invention comprehends such modifications that are not possible with prior reel and ratchet mechanisms.

Those skilled in the art will appreciate that various changes and modifications may be made in the apparatus and method described herein without departing from the spirit and scope of the invention.

I claim;

1. An electrical fixture movably suspended from a fixed overhead supporting structure such as a ceiling, said fixture comprising

a central hollow, dish-like housing adapted to be mounted on and supported solely by an overhead supporting structure and having a side facing generally downwardly away from the supporting structure, said housing having in said side a centrally located first aperture and second and third apertures spaced laterally from said first aperture,

sheave means inside said housing supported for rotation in a vertical plane between and aligned with said central aperture and one of said laterally spaced apertures, and tangent to vertical axes through said central aperture and said one of said laterally spaced apertures,

a flexible cable extending from and into said housing through said central aperture and through said one of said laterally spaced apertures, said cable within said housing passing onto and off of said sheave means at the points of tangency with said vertical axes of said apertures and having running and supporting engagement with said sheave means,

an electrical unit attached to that portion of said cable extending through said central aperture,

a counterweight attached to that portion of said cable extending through said one of said laterally spaced apertures, said counterweight comprising a hollow vessel having an open end and a cap for closing said open end whereby material may be added and removed from said vessel to adjust the weight of said counterweight,

a helically coiled, resiliently extensible and contractible electrically conducting cord adapted to supply power to said electrical fixture from a source available on the supporting structure, said cord having one end electrically and mechanically connected to said electrical unit and having its other end extending into and mechanically connected to said housing through the other of said laterally spaced apertures, said cord helically coiling about the length of said flexible cable extending between said housing and said electrical unit and resiliently extending and contracting as said length of said cable changes.

2. The apparatus according to claim **1** in which said sheave means comprises a pair of sheaves supported

inside said housing for rotation in a common vertical plane between and aligned with said central aperture and one of said laterally spaced apertures with one of said pair of sheaves tangent to a vertical axis through said central aperture and the other of said pair of sheaves tangent to a vertical axis through said one of said laterally spaced apertures.

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