SELF ADJUSTABLE LEVELING MEANS

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This invention relates to self adjustable leveling means for supporting an object.

One of the objects of this invention is to provide self adjustable leveling means which may be secured to the end or ends of an object to be supported which supports the object in a vertical position even though the supporting surface is inclined at an angle.

One of the objects of this invention is to provide self adjustable leveling means which may be used in connection with a pole supported by and between two surfaces which have means for adjusting itself to the angle or slant of the surface.

Another object is to provide a pole structure having means at its opposite ends for engagement with the floor and ceiling surfaces which means are adjustable by a mere positioning of same against the floor and ceiling surfaces to any slope or angular inclination of the floor and ceiling surfaces to maintain the pole in a vertical position.

Another object of this invention is to provide a lighting unit to be supported by and between floor and ceiling surfaces which has means for adjusting itself to the angle or slant of the two surfaces so that the lighting unit may be maintained in a vertical or substantially straight vertical position.

This invention has application to any object which rests on a floor surface and which has legs for example, tables, chairs and other like articles in which due to the slant or unevenness of the floor surfaces the table, chair or the like is caused to rock or tilt. By applying this invention thereto the chair, table or the like will be caused to be firmly supported against rocking or tilting.

This invention is an improvement of the supporting poles shown in Patent No. 2,793,286 and copending application 562,299, filed January 30, 1956, now Patent No. 2,855,057, and the improvement herein resides in the self adjustable means at the opposite ends of the pole which engage the floor and ceiling surfaces for maintaining the pole in a vertical position, irrespective of whether the floor and ceiling surfaces are parallel or angularly inclined with respect to each other.

Another object is to provide a self adjustable leveling means which is inexpensive to manufacture and easy to install.

Other objects will become apparent as this description progresses.

In the drawings:

Figure 1 is a view partially in cross section which shows the application of this invention to a pole-like lighting fixture supported by and between inclined floor and ceiling surfaces.

Figure 2 is an enlarged view partially in cross section showing particularly the self adjustable leveling means resting against a horizontal ceiling surface.

Figure 3 is a view similar to Figure 2 showing the leveling means resting against an inclined floor surface.

Figure 4 is a cross sectional view taken on lines 4—4 of Figure 2.
3. similar parts of both. The outer end of the tubular section 38 is preferably dome shaped as indicated at 39. Positioned on the upper end of the tubular member 38 is a cup shaped member 52 which has an enlarged annular opening 54 in the bottom thereof whereby the same is secured adjacent to the wall of the opening and the tubular member 38. This permits the cup shaped member 52 to be tilted, swiveled, or positioned at an angle with respect to the tubular member 38. This is best shown in Figures 2 and 3. The larger the opening 54, the greater tilt or angular movement permitted between the member 52 and the tubular member 38 or tubular member 20, Figure 3. For practical purposes I have found that an angular tilt of 50 degrees in all directions is satisfactory. Secured adjacent the upper end of tubular member 38 above the bottom of the cup shaped member is a ring-like member 56 having inwardly directed and radially spaced fingers 58 which engage the tubular member 38 to lock same thereto. The fingers 58 are slightly longer than the space between the inside of the ring and the outer surface of the tubular member and therefore when the ring 56 is positioned on the tubular member 38, the fingers will bite or dig into the tubular member and said fingers will be offset with respect to the horizontal plane of the ring as shown in Figure 2. As shown in said figure the fingers 58 extend downwardly from the horizontal plane of the ring, although it will be understood that they may be offset upwardly, depending on how the ring 56 is slipped on to the tubular member 38.

Secured inside the cup shaped member 52 is a resilient member or plug generally indicated at 60 made preferably of rubber or any composition having a degree of resilience. The body 62 of the resilient member fits within the cup shaped member 52 and has a frictional fit therewith. The inner rim of the cup shaped member 52 curves inwardly as at 53 to more securely hold the plug 60. The interior of the body 62 has an enlarged bore 64 which surrounds the tubular member 38 as well as the ring 56. A space is provided between the inner wall of the resilient body 62 and the ring 56 so as not to interfere with the angular or tilting movement of same. The outer end of the body of the resilient member 60 is enlarged and provides a shoulder which rests against the rim 53 of the cup shaped member 52. A metal disc 66 is secured inside the bore and adjacent the wall of the resilient member and prevents the donut shaped member 38 from cutting into the resilient plug.

It will be seen that the cup shaped member 52 and resilient plug 60 are secured together as a unit and same is movable vertically on the tubular section 38 to the extent that the cup shaped member 52 and resilient plug 60 with respect to the tubular 38. The self adjustable leveling means identified by the numeral 22 is identical to that described and is mounted on the bottom of tubular section or abutment member 20 at the bottom of the pole. In this instance, the tubular section 20 is substituted for the tubular section 38 and the self adjustable leveling means 22 operates with respect to the section 20 as does the self adjustable leveling means 50 with respect to tubular member 38. This is shown in Figure 2. The parts in Figure 3 are numbered to correspond to the parts in Figure 2. The only difference being in sections 38 and 20 which are the equivalents. The outer end of the section 20 is dome shaped as at 39. Thus the opposite ends of the pole have the self adjustable leveling means whereby the pole rotates, swings, or tilts from the floor and ceiling surfaces to maintain the pole in an upright or vertical position under compression even though the floor or ceiling surfaces are uneven or incline or tilt as shown in Figure 1.

Secured preferably to section 12 are a plurality of lighting fixtures designated by the numeral 70, each supporting a light bulb. The lighting fixtures are rotatably mounted as at 72 to be rotatable with respect to tubular section 12 and swivelly mounted as at 74 to direct the light in any direction. When in an upright position the pole are electrically insulated conducting wires 76 which are connected to the lighting fixtures 70 and to switch 78 mounted on section 12. The conducting wires 76 extend upwardly through section 12 and outwardly thereof and are electrically connected by means of the usual plug to a source of current supply.

The lighting unit is shipped with the sections 10, 11, 12 and 13 disassembled from each other and the user merely slips the sections together to form the pole and positions it between the floor and ceiling surfaces. The pole is maintained under compression while in use and when in non-use position, that is just prior to being inserted between floor and ceiling surfaces, the pole extends to a height greater than the distance between floor and ceiling surfaces. The self adjusting ends 22 and 50 permit the pole to accommodate itself to floor and ceiling surfaces whether they are parallel with respect to each other or are inclined at an angle with respect to each other.

While I have described the self adjustable leveling means shown in said pole for use as a lighting fixture as shown in my Patent No. 2,793,286, it is also used in connection with the pole for supporting panels as shown in my co-pending patent application S.N. 562,299, now Patent No. 2,855,037.

The invention also has application to a pole which may be horizontally positioned between two vertical walls. The invention may be used with equal facility on legs for tables, chairs and other objects. In such instances, the self adjustable leveling means is secured to the leg and the legs could be comparable to the tubular sections 20 and 38 or inserts equivalent thereto could be inserted in such legs. As shown in Figure 6 the leg of the chair or table is represented by the numeral 82. A short insert 84 like the outer end of section 20 is fixedly secured inside the leg 82. The self adjustable leveling means generally indicated at 22 comprises the elements previously described in connection with the leveling means 22 or 50. It is applied to one or more of the legs and operates to adjust itself to the floor surface where the floor surface is slanted or uneven.

It will be understood that the invention and modifications may be made from the foregoing without departing from the spirit and scope of the appended claims.

1. In a self-adjustable means comprising a conventional supporting member, a socket member having a closed end and an outwardly facing open end, a socket member having a closed end and an outwardly facing open end, said closed end having an opening larger than the diameter of the supporting member whereby said socket member is positioned on said supporting member and is slidable thereon, a resilient plug secured in the open end of said socket member to close said socket member and enclose the end of said supporting member, said resilient plug having a flat bearing surface for the end of the supporting member, a ring having inwardly directed radially spaced fingers secured to said supporting member and positioned inside said resilient plug to permit free relative movement of said plug with respect to said ring so that said ring is not under compression, said ring adapted to engage the closed end of said socket member to retain said resilient plug and said socket member on said supporting member, said socket member and said forming a unit which is self-adjustable longitudinally and angularly with respect to said supporting member.

2. In self-adjustable means for a pole adapted to be supported by and between floor and ceiling surfaces with said pole having a rod extending from at least one end thereof; said self-adjustable means comprising a socket member having a closed end and an outwardly facing open end, said closed end having an opening larger than
the diameter of said rod whereby said socket member is positioned on said rod and is slidable thereon, a resilient plug secured in the open end of said socket member to close said socket member and enclose the end of said rod, said resilient plug having a flat bearing surface for the end of said rod, a ring having inwardly directed radially spaced fingers secured to said rod and positioned inside said resilient plug to permit free relative movement of said plug with respect to said ring so that said ring is not under compression, said ring adapted to engage the closed end of the socket member to retain said resilient plug and said socket member on said rod, said socket member and resilient plug forming a unit which is self-adjustable longitudinally and angularly with respect to said rod.