

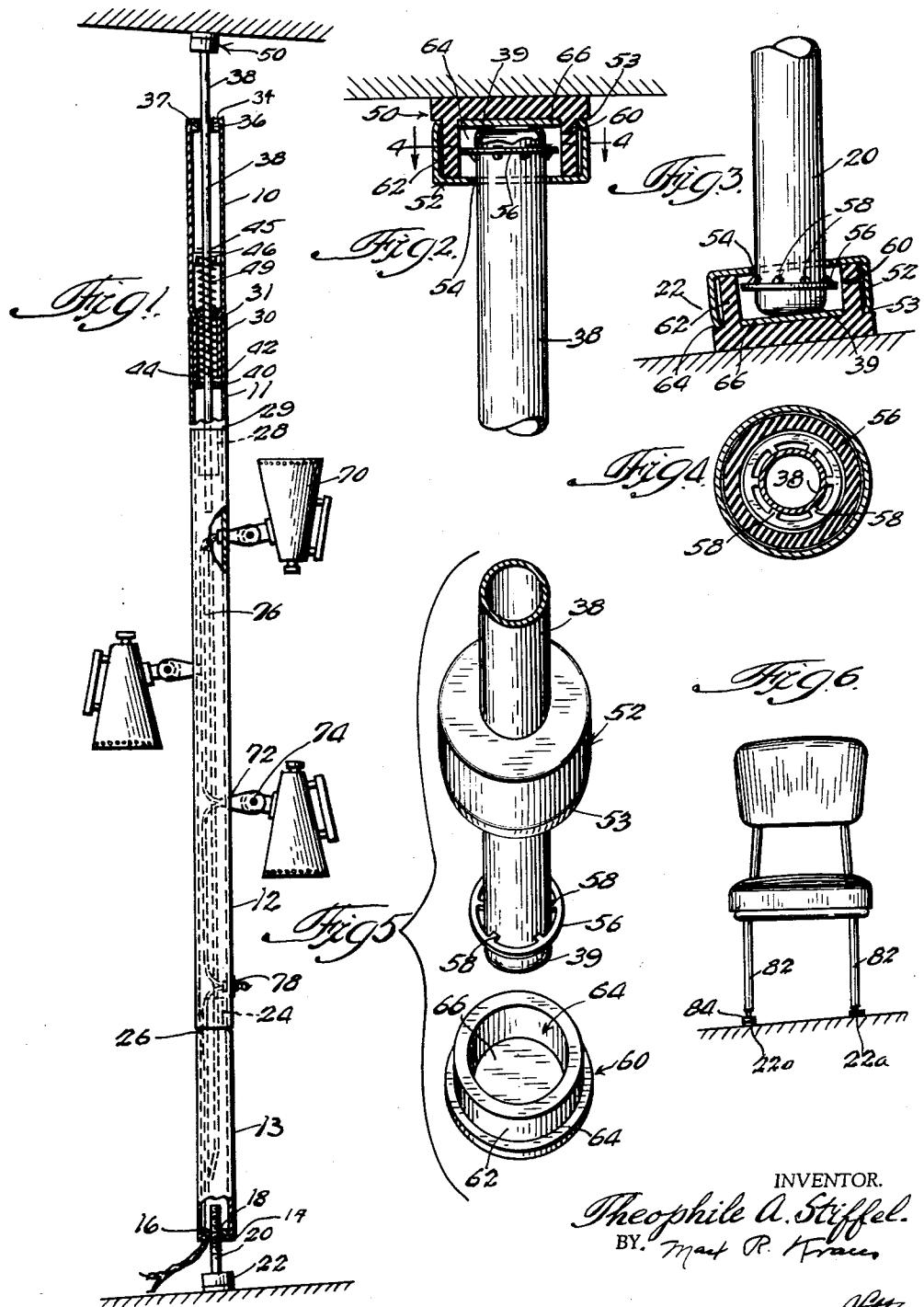
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SELF ADJUSTABLE LEVELING MEANS

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SELF ADJUSTABLE LEVELING MEANS

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2 Claims. (Cl. 248—193)

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. 2,855,037, 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.

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Figure 5 is an enlarged exploded perspective view of the parts forming the self adjusting leveling means, and Figure 6 shows the application of this invention to a chair.

As shown in Figure 1, the pole which is supported by and between floor and ceiling surfaces is formed of four tubular sections designated by the numerals 10, 11, 12 and 13 which are joined together, as will be described, for the purpose of providing a singular tubular pole.

10 Due to the difference in ceiling heights it may be necessary to reduce the height of the pole, consequently one of the tubular sections, for example, section 11, may be eliminated and section 10 may be secured to section 12, or if a longer pole is desired, additional sections similar to that of section 11 may be added between sections 10 and 11.

The lower tubular section 13 has a flange 14 and supports a washer 16 which is rigidly secured thereto. The washer 16 has a threaded opening 18 which receives a tubular member 20 which may be externally threaded for longitudinal adjustment. Secured to the outer end of tubular member 20 is the self adjusting leveling means generally indicated at 22 and since said leveling means is identical to the leveling means positioned at the upper end of the pole, they will be subsequently described in detail.

The upper end of section 13 is open and is provided with a reduced circumferential portion 24 which nests into section 12 and is held in friction-tight fit therewith. A shoulder 26 on section 13 limits the nesting fit between section 13 and section 12.

The upper open end of section 12 is adapted to receive the reduced circumferential portion 28 of section 11 which is likewise provided with a shoulder 29. The upper open end of section 11 which is shown in cross section in Figure 1, is adapted to receive the reduced circumferential portion 30 of section 10 in frictional-tight engagement. A shoulder 31 is provided on section 10 to limit the telescopic engagement. The upper end of section 10 has a flange 34. A washer 36 is secured in the upper end of section 10 and seats against the flange and said washer has a central opening 37 through which a tubular member or abutment member 38 passes to extend into tubular section 10. The opposite or lower end of section 10 has a flange 40 which supports a washer 42 which has an opening 44 in alignment with opening 37 and through which the tubular member 38 passes downwardly of section 10.

The tubular or abutment member 38 is formed to provide an annular shoulder 45 against which rests an inverted cup shaped washer 46 positioned on said tubular member. A coiled spring 49 is positioned inside said tubular section 10 surrounding said tubular member 38 and between the cup shaped washer 46 and the washer 42 and normally urges the tubular member 38 upwardly or outwardly of tubular section 10 as shown in Figure 1. The tubular member 38 is prevented from being withdrawn outwardly of tubular section 10 by the shoulder 45. It will be seen that section 10 is a self-contained unit and may be readily secured to section 11 by any of the other sections by merely slipping same into the other sections as described.

Since the self adjustable leveling means is secured on the outer ends of tubular members 38 and 20, the said tubular members may be considered to be the same in construction. Said members may be also considered as abutment members or supporting members.

Secured to the outer end of tubular member 38 is the self adjustable leveling means generally indicated at 50 which is identical to the self adjustable leveling means 22 on the tubular member 20 on the leg of the pole and therefore similar numerals will be used to indicate the

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 to provide a space between 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 or abutment 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 30 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 best shown in Figure 2. As shown in said figure, the fingers 58 extend downwardly of 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 resiliency. The body 62 of the resilient member fits within the cup shaped member 52 and has a frictional fit therewith. The outer 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 dome shaped end 39 of 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 of the position of the ring 56 and is also capable of tilting or swiveling in an angular position in somewhat the manner of a universal joint. It is self adjusting to accommodate itself to the surface against which it rests, yet will maintain the pole under compression. The dome shaped end 39 facilitates the swiveling movement of the member 52 and 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 3. 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 which adjust themselves against 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 desired direction. Extending interiorly of the pole are electrical 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 downwardly through section 13 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 in combination with a 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. 2,853,037.

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 legs 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 22a 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 various changes and modifications may be made from the foregoing without departing from the spirit and scope of the appended claims.

I claim:

1. In a self-adjustable means comprising a conventional supporting member, 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 plug 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.

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