

Oct. 18, 1960

E. KLEIN

2,956,368

ADJUSTABLE FOOT FOR HOSPITAL AND RESTAURANT CABINETS, TABLES
AND LIKE ARTICLES OF FURNITURE

Filed Jan. 14, 1959

2 Sheets-Sheet 1

FIG. 1.

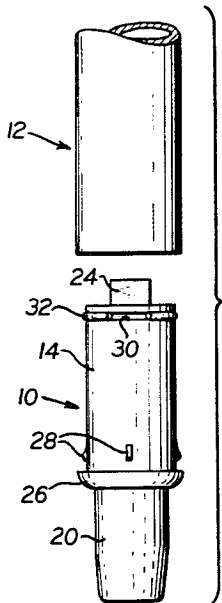


FIG. 2.

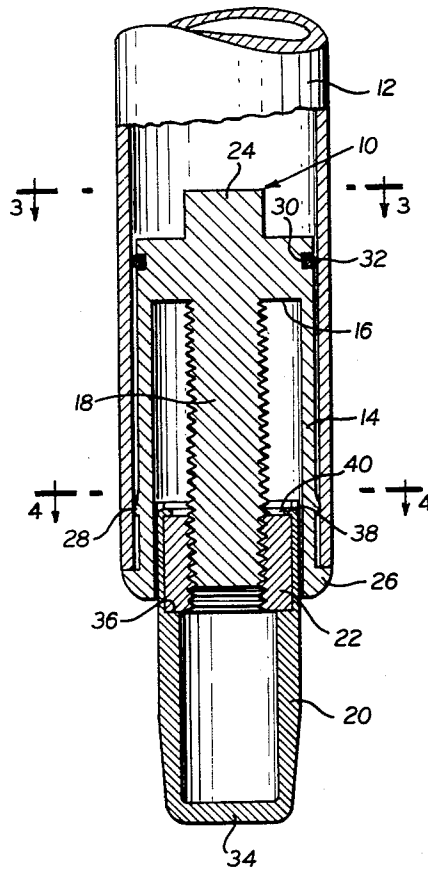


FIG. 3.

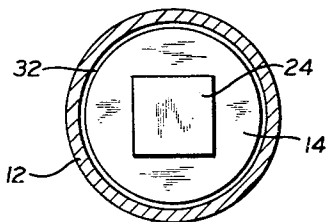
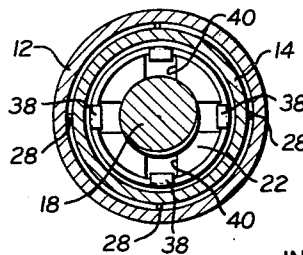


FIG. 4.



INVENTOR
ELI KLEIN

BY

Samuel J. Stoe

ATTORNEY.

Oct. 18, 1960

E. KLEIN

2,956,368

ADJUSTABLE FOOT FOR HOSPITAL AND RESTAURANT CABINETS, TABLES
AND LIKE ARTICLES OF FURNITURE

Filed Jan. 14, 1959

2 Sheets-Sheet 2

FIG. 5.

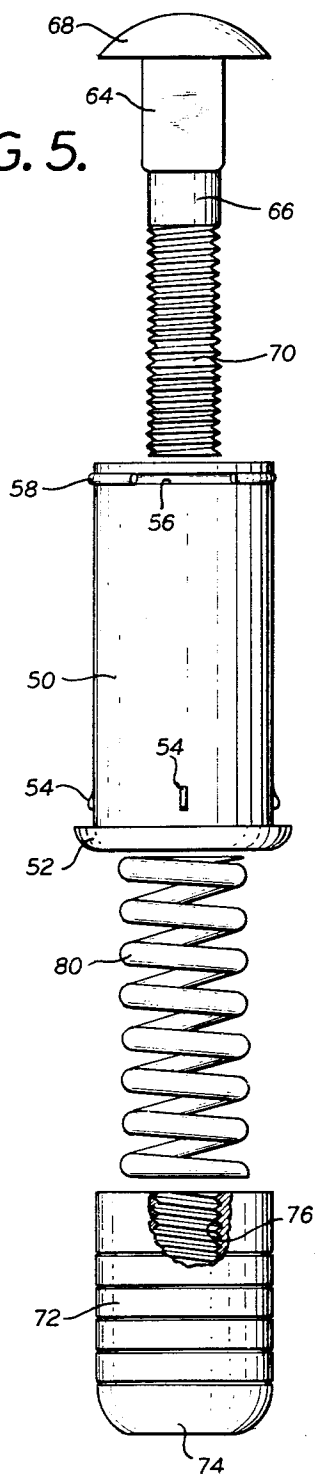
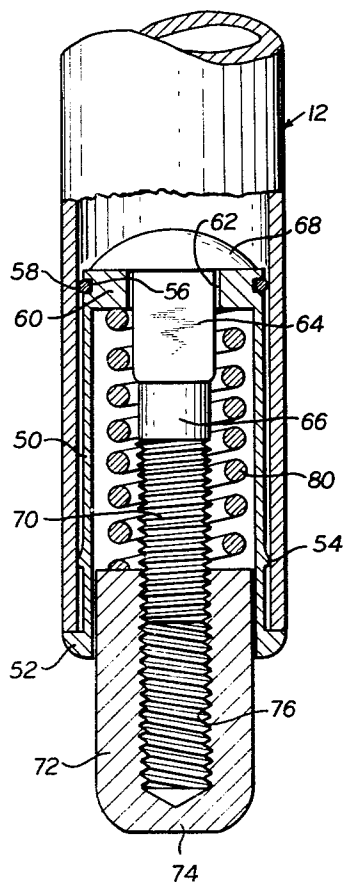


FIG. 6.



INVENTOR
ELI KLEIN
BY *Samuel J. Stoll*
ATTORNEY.

1

2,956,368

ADJUSTABLE FOOT FOR HOSPITAL AND RESTAURANT CABINETS, TABLES AND LIKE ARTICLES OF FURNITURE

Eli Klein, Franklin Square, N.Y., assignor to Klein Hardware Company, Inc., Brooklyn, N.Y., a corporation of New York

Filed Jan. 14, 1959, Ser. No. 786,728

1 Claim. (Cl. 45—137)

This invention relates to an adjustable foot for hospital and restaurant tables, cabinets and like articles of furniture.

Conventional adjustable feet of the character under discussion are complicated devices which are difficult to install. They require special leg constructions to receive them and they also require special fastening means, such as welding, to hold them in place. The range of adjustment of these conventional feet is relatively limited. They are difficult to align properly and they usually wobble when installed. Furthermore, these conventional devices frequently require grinding and polishing to render them commercially presentable. Moreover, they are usually provided with openings or recesses of one kind or another which tend to trap dirt and collect vermin.

It is an important object of this invention to provide an adjustable foot of the character described which requires no special table or cabinet leg construction, no special fittings or fastening members or means to hold them in place, and which may be installed by simply snapping them into conventional tubular table or cabinet legs.

Briefly stated, an adjustable foot made in accordance with this invention is provided with a cylindrical shank which is adapted to enter a tubular table or cabinet leg. An annular shoulder at the lower end of said cylindrical shank is adapted to abut the lower end of the leg and to serve as a stop member relative thereto. This not only limits the upward movement of the shank into the leg but also serves as a support for the leg. A split spring ring at the upper end of the shank serves as a bearing between the shank and the inner wall of the tubular leg and it also assists in locking said shank in place in said tubular foot. Adjacent the lower end of the shank are lugs which also serve as bearings between the shank and the inner wall of the tubular leg, but in addition, they serve as wedges which tend to frictionally lock the shank to the leg.

It will be understood from the foregoing that the split ring and the lugs not only hold the shank in place but also accurately align the shank with the leg and prevent wobbling in conditions of normal use. Moreover, the annular shoulder at the bottom of the shank which engages the lower end of the tubular leg serves also as a barrier and seal, preventing vermin from entering the tubular leg. It is health requirement of equipment of this kind that strict sanitary conditions prevail at all times and that all possible steps be taken to preclude and prevent collecting of dirt and vermin.

Another important object of the invention is the provision of an adjustable foot of the character described which is provided with a very simple internal screw adjustment. Specifically, the cylindrical shank above mentioned has a downwardly extending screw formed therein, coaxial therewith. The screw and the shank are integral with each other at their upper ends and there is no opening at the top of the shank, between said shank and said screw, through which vermin may enter the tubular leg. The foot proper is itself a generally cylindrical member, save for its lower tapered end, and it is adapted to enter the

2

cylindrical shank with only such clearance between the outer wall of the foot and the inner wall of the shank as will enable said foot to move relative to the shank. Once again, vermin are excluded from the unit. The foot is provided with internal screw threads which are adapted to engage the screw in the shank and all that need be done to adjust the position of the foot relative to the shank, and consequently relative to the tubular leg in which the shank is mounted, is to rotate the foot in one direction or the other. The lower end of the screw does not project below the lower end of the shank. Hence, so long as the foot is in engagement with the screw, the screw will remain an internal component of the device. In short, no portion of the screw will be exposed to collect dirt or vermin.

Still another important object of the invention is the provision of an adjustable foot of the character described which is of relatively simple and inexpensive construction. Apart from the split ring which is easily mounted on the shank, this device is composed solely of two or at most three, component parts. One part is the cylindrical shank with its internal screw. The second is the foot proper with its internal screw threads adapted to receive the screw. If desired, said internal screw threads may be provided on a separate nut which is inserted into the foot proper. It is of course possible to make this device of more than two or three component parts assembled in the manner described but in the preferred form of this invention three component parts are the maximum number used.

A further object of this invention is the provision of an adjustable foot of the character described which is self-levelling. This device is adjustable in precisely the same manner as has above been described but there is the additional feature of automatic levelling to compensate for uneven floor surfaces, as when the furniture is shifted from one location to another. This type of device would provide a self-levelling effect to adjust the furniture to its new location.

In the latter form of the invention, the screw and the cylindrical shank are two separate members. The screw is fixed against angular movement relative to the shank but it is free to engage in vertical movement relative to said shank within a limited range. Between the top wall of the cylindrical shank and the upper end of the foot proper is a compression spring. To the extent that the spring will yield, the foot is movable in upward direction, integrally with the screw to adjust to the raised portion of the floor on which the article of furniture stands. The same spring will project the foot downwardly to adjust to a recessed portion of said floor. This is an automatic, self-levelling feature which functions independently of the screw adjacent of the device.

The invention is illustrated in the accompanying drawing in which:

Fig. 1 is an exploded view showing an adjustable foot, made in accordance with the first form of this invention, preparatory to being inserted into a tubular leg of an article of furniture such as a table or cabinet and in a restaurant or hospital or like institution.

Fig. 2 is an enlarged, fragmentary vertical section through said adjustable foot and the lower end of the tubular leg in which it is mounted.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2.

Fig. 5 is an exploded view of a self-levelling adjustable foot made in accordance with the second form of this invention.

Fig. 6 is an enlarged, fragmentary vertical section through a self-levelling adjustable foot made in accordance with said second form of the invention and of the

lower end of a tubular leg in which said adjustable foot is mounted.

Referring now to the first form of this invention and to Figs. 1 to 4 inclusive, it will be observed that an adjustable foot 10 made in accordance with said first form of the invention is adapted for engagement with a tubular leg 12 of a conventional table or cabinet or like article of furniture used in restaurants, hospitals and other institutions. The tubular leg 12 is generally cylindrical in shape and for the purposes of the present description it will be so deemed.

Adjustable foot 10 consists of a cylindrical shank 14 which is open at the bottom and closed at the top by means of a top wall 16, a screw 18 projecting downwardly from said top wall 16 in coaxial relation to cylindrical shank 14, and a foot proper 20 which is provided at its upper end with an internally threaded fitting 22. Cylindrical shank 14, top wall 16 and screw 18 may be cast integrally with each other in the same die or mold. Screw 18 is not cast integrally with its screw threads. Instead, it is cast simply as a solid rod of generally cylindrical shape, being tapered only to the extent necessary to draw it from the die. It will now be observed that a square block or head 24 is formed on top wall 16. This head is held in a chuck or similar device and the rod is then threaded by means of a suitable die. The result is that all three elements comprising the foot holder, namely, cylindrical shank 14, top wall 16 and screw 18, together with square head 24, are all formed integrally with each other. This makes for relatively inexpensive but nonetheless relatively strong construction.

It will also be seen that an annular bead or shoulder 26 is formed along the lower end of cylindrical shank 14, said annular bead or shoulder extending around the entire periphery of said cylindrical shank, radially outwardly therefrom. It will further be observed that tapered lugs 28 are formed on the outer wall of said cylindrical shank 14 a short distance above said annular bead or shoulder 26 and finally it will be noted that at the top end of said cylindrical shank 14, in its top wall 16, is an annular groove 30 in which is disposed a split spring ring 32.

From the foregoing it will be understood that the foot holder comprising shank 14, its top wall 16 and screw 18, may be attached to tubular leg 12 by simply inserting said foot holder into said tubular leg as far as annular bead or shoulder 26 will permit. This bead or shoulder abuts the lower end of the tubular leg and provides a stop member preventing insertion of said foot holder into said tubular leg beyond a predetermined limit. Furthermore, said annular bead or shoulder constitutes a support for said tubular leg as will shortly more clearly appear. Lugs 28 and split ring 32 serve as bearings between the cylindrical shank 14 and the inner wall of tubular leg 12. This feature centers the cylindrical shank and aligns it with the tubular leg. Moreover, said lugs 28 and split ring 32 provide frictional engagement with the tubular leg and securely hold cylindrical shank 14 in place. In short, all that need be done to secure said cylindrical shank (and the other elements with which it is combined) to the tubular leg is to snap it into said leg as far as the annular bead or shoulder 26 will permit.

Foot proper 20 is a hollow member of generally tubular shape, somewhat tapered in its lower end, closed at said lower end by means of a bottom wall 34 and open at its upper end. An annular seat or shoulder 36 is provided within foot 20 a spaced distance below its upper end. Seated thereon is internally threaded fitting 22. Lugs 38 are struck out at the upper end of foot 20 and bent laterally inwardly to lock internally threaded fitting 22 in place. Said fitting 22 is provided with recesses 40 to receive said lugs 38 and consequently said lugs not only hold said fitting in place within foot 20 but they also prevent relative angular movement between said fitting and said foot.

Internally threaded fitting 22 is adapted to engage screw

18 as Fig. 2 clearly shows. Foot 20 may be adjustably secured to screw 18 by simply threading fitting 22 to said screw. Said fitting and the foot in which it is mounted may be rotated in one direction or the other relative to said screw in order to raise or lower the foot relative to tubular leg 12.

Turning now to the second form of this invention and to Figs. 5 and 6 of the drawing, it will be noted that a cylindrical shank 50 is provided which corresponds to cylindrical shank 14 above described. Cylindrical shank 50 is provided at its lower end with an annular bead or shoulder 52, with lugs 54 above said annular bead or shoulder, with an annular groove 56 formed therein adjacent its upper end, and with a split spring ring 58 in said groove. Thus far said cylindrical shank resembles cylindrical shank 14 above described. However, top wall 60 of cylindrical shank 50 has a square hole 62 formed therein to receive the square shank 64 of a screw 66. The head 68 of said screw is adapted to abut top wall 60 of cylindrical shank 50. The threaded end 70 of said screw projects downwardly through said cylindrical shank 50 and terminates short of the lower end of said cylindrical shank. It will be seen from the foregoing that screw 66 is locked against angular movement relative to cylindrical shank 50 but is free to move longitudinally of said cylindrical shank.

A foot 72 is provided on threaded portion 70 of screw 66. This foot is, like foot 20 above described, a hollow shell which is open at the top and closed at the bottom by means of bottom wall 74. Foot 72 is not provided with an inner threaded fitting corresponding to fitting 22 above mentioned but rather it is provided with its own internal screw threads 76. It is by means of these screw threads that foot 72 may be adjustably secured to the threaded end 70 of screw 66.

A compression spring 80 is mounted on screw 66, its upper end bearing against top wall 60 of the cylindrical shank and its lower end bearing against the upper end of foot 72. The function of this spring is to urge foot 72 and screw 66 downwardly as far as they are permitted to go. In Fig. 6 the head of the screw is shown to abut top wall 60 of the cylindrical shank and consequently said head serves as a limiting factor which prevents the spring from thrusting said screw and said foot downwardly below the positions which they are shown to occupy in said Fig. 6. Should the weight of the table or cabinet of which tubular leg 12 is a part, overcome the tension of spring 80, said foot 72 and said screw 66 will be caused to rise within said tubular leg 12 until the increased tension of the spring will balance the weight of said table or cabinet. Should the table or cabinet be placed in such position that foot 72 is aligned with a recess in the floor, spring 80 will thrust said foot and said screw 66 downwardly to compensate for said recess. Should the article of furniture be placed in such a position that foot 72 is aligned with a raised portion in the floor, the said spring 80 will yield to the extent needed and foot 72 and screw 66 will accordingly rise to compensate for said raised floor portion.

The foregoing is illustrative of two preferred forms of this invention and it will be understood that these forms may be modified and other forms provided within the broad principles of the invention and the broad scope of the claim.

I claim:

An adjustable foot for tubular legs of hospital and restaurant tables and cabinets and like articles of furniture, comprising a hollow cylindrical shank, said shank being open at the bottom and having a wall at the top, a screw within said cylindrical shank projecting downwardly from said top wall and being coaxial with the cylindrical shank, a hollow tubular foot, said foot being closed at the bottom and open at the top and being provided with internal screw threads adjacent the top, said foot being engageable with said screw by means of

5

said internal screw threads and being adapted to enter said cylindrical shank in the annular space between said screw and the inner wall of said cylindrical shank, said foot being adjustable relative to said screw and relative to said cylindrical shank by rotating it on said screw in either direction, said cylindrical shank being provided along its bottom peripheral edge with an outwardly extending annular bead which is adapted to abut the lower end of the tubular leg, said bead serving to limit the upward movement of said cylindrical shank into said tubular leg when said cylindrical shank is inserted therein and also serving as a support for said tubular leg on which the tubular leg rests when the adjustable foot is in operative position supporting the article of furniture, tapered lugs being provided on the outer wall of the cylindrical shank for engagement with the inner wall of the tubular leg to serve as bearings between said cylindrical shank and said tubular leg and to hold said cylindrical shank in place in said tubular leg, said lugs

5

being situated adjacent the annular bead at the lower end of said cylindrical shank, an annular groove being formed in the outer wall of said cylindrical shank at its top wall, a split spring ring being disposed within said annular groove and bearing against the inner wall of the tubular leg to assist in holding said cylindrical shank in place in said tubular leg, said lugs and said split ring being adapted to support said cylindrical shank in coaxial alignment with said tubular leg.

6

10

References Cited in the file of this patent

UNITED STATES PATENTS

1,638,561	Busch et al. -----	Aug. 9, 1927
2,099,450	Meyer -----	Nov. 16, 1937
2,852,883	Walsh -----	Sept. 23, 1958

15

FOREIGN PATENTS

38,935	France -----	Aug. 10, 1931
814,589	France -----	June 25, 1937