May 10, 1949. H. M. SCHAEF 2,469,896

ADJUSTABLE PEDESTAL STOOL

Filed June 15, 1945

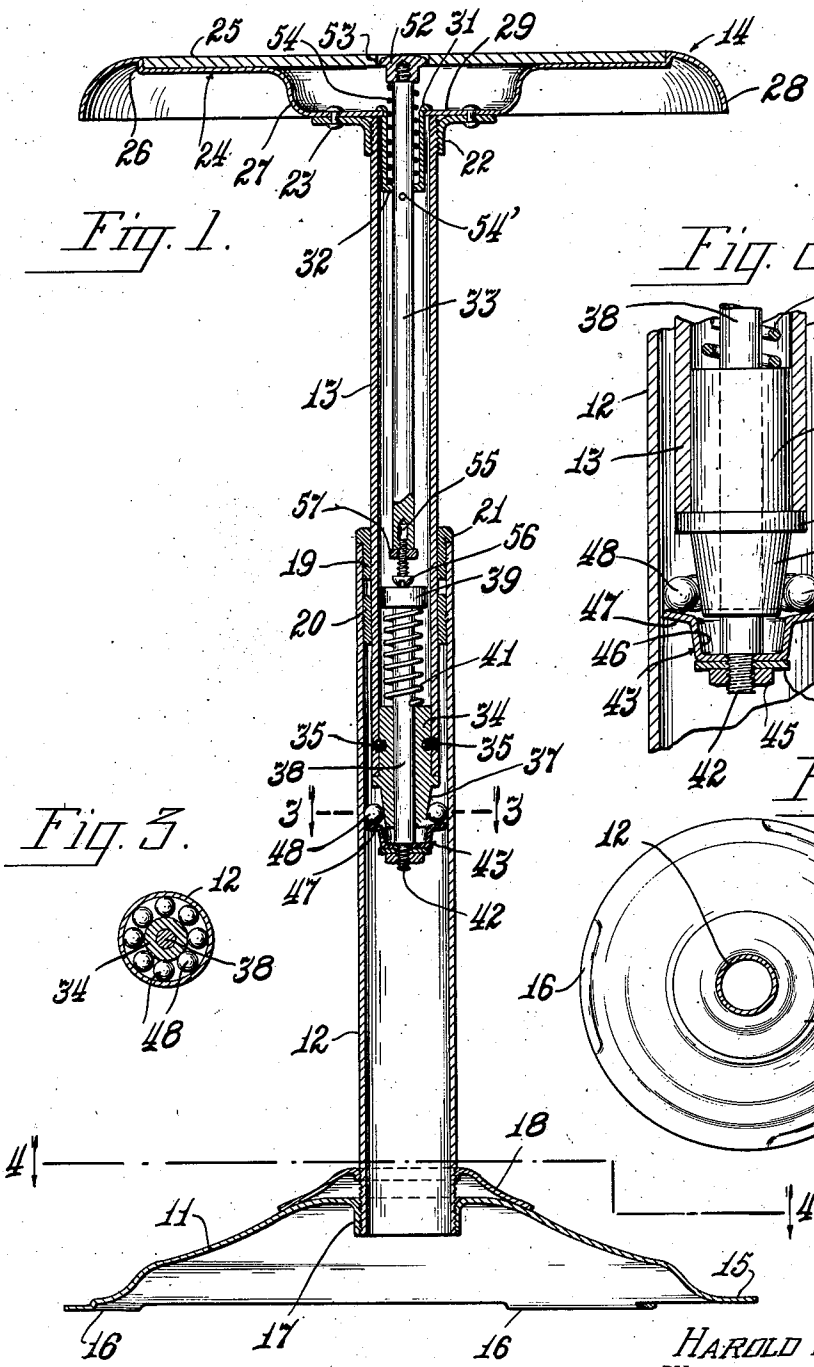


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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Patented May 10, 1949 2,469,896

UNITED STATES PATENT OFFICE

2,469,896

ADJUSTABLE PEDESTAL STOOL

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Application June 15, 1945, Serial No. 599,674

8 Claims. (Cl. 155—94)

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The invention relates to improvements in stools or the like, and more particularly to a novel supporting structure and the association of its component parts including novel means to co-act with relatively movable parts to automatically lock the same in selected relative positions to vary the height of the stool.

Stools of the general character of that embodying the present invention have been employed heretofore, but in most known instances positive means is provided to release a clutching mechanism for holding the parts adjusted, while in other known instances no means is provided to prevent sticking and inadvertent gripping of such clutch mechanism.

In the instant device a construction is provided wherein two relatively movable members are telescopically associated one within the other and are secured in adjusted relative positions by a novelly constructed, easily engaged and actuated clutch mechanism of a type adapted to respond instantly to any actuating force applied thereto.

It is, therefore, an object of the present invention to provide a locking mechanism for locking two relatively movable parts in selectively adjusted positions, of a kind which embodies novel means to insure quick response to actuation of mechanism operable to enable the locking elements to move to unlocked position.

Another object of the invention is to provide an article of the character referred to including a tubular standard and a base embodying novel structural features useful primarily in providing a firm support for the standard nothwithstanding the presence of some unevenness in the surface upon which said base is rested.

Another object is to provide a stool of the character described wherein means is provided in the seat thereof operable to release mechanism normally retaining the stool in a selectively adjusted position, which means is effective to prevent inadvertent locking of said mechanism during adjustment.

Other and further objects of the present invention will be apparent in the following description and claims, and are illustrated in the accompanying drawing which illustrates a preferred embodiment and the principle thereof and which is considered to be the best mode contemplated for applying that principle. Other embodiments

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of the invention, embodying the same or equivalent principle, may be used and structural changes may be made, as desired, by those skilled in the art, without departing from the spirit of the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a vertical central sectional view through a stool embodying the features of the present invention.

Fig. 2 is an enlarged detail sectional view of the locking mechanism illustrating it in unlocked position.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a horizontal sectional view taken on line 4—4 of Fig. 1.

Referring to the disclosure of the stool illustrated in the accompanying drawing, said stool is comprised generally of a base 11 having a tubular standard or support 12 extending upwardly therefrom and receiving telescoped into its upper end a tubular post 13 depending downwardly from a seat 14. Suitable locking mechanism, to be described in detail hereinafter, is provided within the telescoped portions of the tubular standard 12 and tubular post 13 to retain said parts in adjusted relative positions.

The base 11 preferably is formed from a circular piece of sheet material, such as sheet metal, suitably dished to provide a lower circumferential margin 15 having a plurality of downwardly struck offsets constituting foot portions 16 on its peripheral margin adapted to provide, as in the present instance, a three-point support for said base, whereby any irregularities in the surface upon which said base rests are compensated for. The base 11 is provided with a central aperture surrounded by a downwardly extending flange 17 internally threaded to receive the threaded lower end of the tubular standard 12. A cap ring 18 is threaded onto the lower end of the standard 12 prior to its being mounted on the base plate 11 and said cap is then rotated about the standard so as to carry it downwardly into tight bearing engagement with the top surface of the base 11. The cap ring 18 serves to reinforce the mounting of the standard 12 in the base 11 and also provides an ornamental collar at the mounting of the standard on the base 11.

The upper end of the tubular standard 12 is suitably provided with a pair of sleeve bushings 19 and 20 which preferably are welded or otherwise firmly secured in place, and the bushing 19 has an external annular flange 21 adapted to fit tightly against the upper end of the standard 12 so as to provide a smooth exterior surface at the meeting of the tubular standard and the flange 21. The tubular post 13, depending from the seat 14, is of such external diameter as to have a snug sliding fit within the sleeve bushings 19 and 20 so as to be freely movable into various positions of adjustment relative to the standard 12.

As shown, the upper end of the tubular post 13 is threaded externally and is mounted within a flanged collar 22 firmly secured, as by rivets 23, to and depending from the bottom face of the seat 14. The seat 14 preferably includes a sheet metal circular member 24 and a cover portion 25, the latter being of substantially smaller diameter than the portion 24 and being adapted to be seated in an annular depressed portion 26 in the top face of the member 24. In the present disclosure, the circular member 24 is suitably depressed centrally, as at 27, so as to dispose the flanged collar 22 below the plane of the downwardly turned circumferential flange 28 on the member 24. The central depressed portion 27 includes a wall portion 29 which has an aperture in axial alignment with the tubular post 13 in which is secured a cylindrical cup-like member 31. The cup-like member 31 extends downwardly into the tubular post 13 and its bottom wall 32 also is apertured to receive freely therethrough a rod 33 provided for a purpose to be described in detail hereinafter.

The locking mechanism provided for holding the tubular post 13 in an adjusted position relative to the tubular standard 12 is best shown in Figs. 1 and 2 and is carried entirely by the tubular post 13. As shown, a cylindrical fitting 34 is fitted into the lower end of the tubular post 13 and is secured therein preferably by lock screws 35. Said fitting includes an abutment collar 36 of a diameter corresponding to the outside diameter of the tubular post 13 and a downwardly extending conical portion 37. An axial opening is provided in the fitting 34 to receive, for free sliding movement therethrough, a stem 38 which extends upwardly into the tubular post and is provided on its upper end with a head 39. A spring 41 surrounds the stem 38 and is disposed between the inner end of the fiitting 34 and the head 39 so as to normally urge the stem upwardly into the tubular post 13. The stem 38 extends downwardly beyond the lower end of the conical portion 37 of fitting 34 and its lower end is suitably reduced in diameter and threaded as at 42.

A washer 43, best shown in Fig. 2, is fitted over the threaded end 42 of the stem 38 and is secured firmly on said stem as by a lock washer and nut 44 and 45 respectively. The washer 43 is substantially dish-shaped to provide a recess 46 having an internal diameter of such size as to fit freely over the lower end of the conical portion 37 of the fitting 34 in the event said washer is positioned so as to telescope thereover. The washer 43 also includes a circumferential flange 47 disposed at the upper end of the walls defining the recess 46 which is inclined upwardly and outwardly so as to provide an annular inwardly downwardly inclined surface or dished raceway adapted to support a plurality of rolling elements 48 which in the present instance are ball bearings. The rolling elements 48 are, as shown, disposed around the conical portion 37 of the fitting 34 and are of such size as to be wedgingly bound between the conical surface and the inside surface of the tubular standard 12 only when said rolling elements are moved upwardly part of the length of said conical portion 37.

When the rolling elements 48 are in the position illustrated in Fig. 2 they rest upon the dished raceway 47 against the conical portion 37 and are spaced inwardly from the inside surface of the standard 12 so as to permit the inner tubular post 13 to be moved freely into various positions with respect to said standard. Such positioning of the rolling elements 48 is attained only when the stem 38 has been depressed so as to lower the dished raceway 47 relative to the fitting 34. However, in the absence of such pressure, the spring 41 will urge the raceway 47 upwardly relative to the fitting 34 so as to carry the rolling elements into such position that they are tightly wedged between the conical portion 37 and the inside surface of the standard 12. Such a position of the rolling elements is illustrated in Fig. 1 and when said elements are thus positioned, the tubular post is locked against downward movement into the standard 12. Any increase in the load carried by the post 13 will increase the binding-wedging action.

Means is provided whereby the stem 38 may be manually actuated to effect unlocking of the locking mechanism in the manner described hereinbefore. Such means is best illustrated in Fig. 1 and it includes the rod 33 carried in the cup-like member 31 and wholly inclosed within the tubular post 13. The upper end of the rod 33 projects into the depressed central portion 27 of the seat 14 and is provided on its end with a button 52 disposed in and accessible through an opening 53 in the cover 25. A spring 54, located between the bottom wall 32 of the cup-like member 31 and the button 52 normally retains the rod 33 in an elevated position with a stop pin 54' thereon in abutment with the wall 32.

The lower end of the rod 33 is adapted to cooperate with the head 39 on the stem 38. However, due to variances in the over-all length of assembled units, the rod 33 carries an adjustable element on its lower end to compensate for such variations. As shown, the lower end of the rod 33 may be tapped, as at 55, to receive a screw 56 having a lock nut 57 thereon, which screw is adjustable to vary the effective over-all length of the rod 33 so as to insure contact between said rod and the stem head 39.

It should be evident at this time that upon the application of manual pressure downwardly on the button 52, the rod 33 is moved downwardly to similarly carry the stem 38 in a downward direction to thereby move the dished raceway 47 away from the rolling elements 48. The rolling elements 48 being then in a wedged position, and being incapable of following the raceway 47 downwardly, it is then necessary to grasp the seat 14 and elevate it slightly while holding the rod 33 depressed. Such upward movement of the seat, and likewise of the tubular post 13, releases the rolling elements 48 from their wedging position, whereupon they drop onto the raceway 47 and, because of the inclination of the said raceway, they roll inwardly away from the wall of the tubular standard 12. The post 13 may then be repositioned. It is evident that the rolling elements 48 are thereby so located as to be sufficiently spaced from the wall of the standard 12

that they are not liable to be frictionally engaged thereby, during adjustment of the stool, with sufficient force to cause them to be drawn upwardly into a wedging locking engagement.

Although a specific embodiment of the present invention has been described in detail hereinabove, and specifically disclosed in the accompanying drawing, it should be evident that the invention may embody a wide variety of modifications in detail structure without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A stool comprising, in combination, an upright tubular member, a second tubular post telescoped into the upper end of said tubular member, a cone carried on the lower end of said tubular post, a stem carried in the tubular post and extending through the cone, a washer on said stem including a ring having a hollow hub portion, at least the top surface of said ring being inclined upwardly outwardly radially, a plurality of rolling elements seated on said top surface of the ring surrounding the cone, and a spring to normally urge said washer into telescoped relation with said cone to move the rolling elements outwardly radially into wedging engagement between the cone and tubular member.

2. A stool comprising, in combination, an upright tubular member, a second tubular post telescoped into the upper end of said tubular member, a cone carried on the lower end of said tubular post, a stem carried in the tubular post and extending through the cone, a washer on said stem including a ring having a hollow hub portion, a plurality of rolling elements seated on said ring surrounding the cone, said ring having a roller supporting surface having its inner peripheral edge located on a plane below its outer peripheral edge whereby the rolling elements tend to rest against the cone, a spring to urge said washer into telescoped relation with said cone to move the rolling elements upwardly into wedging engagement between the cone and tubular member, and a rod associated with said stem operable to overcome the action of said spring and shift the washer downwardly to permit said rolling elements to roll inwardly away from said tubular member.

3. A stool comprising, in combination, an upright tubular member, a second tubular post telescoped into the upper end of said tubular member, a cone carried on the lower end of said tubular post, a stem carried in the tubular post and extending through the cone, a washer on said stem including a ring having a hollow hub portion, said ring having a roller supporting surface having its outer peripheral edge elevated above the plane of its inner peripheral edge, a plurality of rolling elements seated on said ring surrounding the cone, a spring to normally urge said washer into telescoped relation with said cone to move the rolling elements outwardly into wedging engagement between the cone and tubular member, and manually operable means engageable with the stem actuable to shift the washer downwardly against the action of said spring whereby said rolling elements move inwardly radially by gravity out of their wedging engagement.

4. In an adjustable stool or the like, the combination of a vertically movable seat supporting tubular post, a stationary tubular member telescoped over the post, a conical fitting carried on the lower end of said post, rolling elements surrounding said fitting for locking engagement between the fitting and the surface of the tubular member, shiftable means including a stem extending through said fitting into the tubular post normally retaining the rolling elements in such locking engagement, a control rod effective to move said shiftable means to enable the rolling elements to move into an ineffective position, said rod being enclosed within said tubular post and being accessible for manipulation through an opening in the seat, and means on said rod adjustable to vary its effective length to insure contact between the rod and stem.

5. In an adjustable stool or the like, the combination of a vertically movable seat supporting tubular post, a stationary tubular member telescoped over the post, a conical fitting carried on the lower end of said post, rolling elements surrounding said fitting for locking engagement between the fitting and the surface of the tubular member, shiftable means including a stem extending through said fitting into the tubular post normally retaining the rolling elements in such locking engagement, a control rod effective to move said shiftable means to enable the rolling elements to move into an ineffective position, and means on said rod adjustable to vary its effective length to insure contact between the rod and stem.

6. In an adjustable stool or the like, the combination of a vertically movable seat supporting tubular post, a stationary tubular member telescoped over the post, a conical fitting carried on the lower end of said post, rolling elements surrounding said fitting for locking engagement between the fitting and the surface of the tubular member, shiftable means including a stem extending through said fitting into the tubular post normally retaining the rolling elements in such locking engagement, and a control rod operatively associated with said stem and depending through an opening in said seat and through the tubular post, said control rod being engageable through the seat opening for actuation to move the shiftable means and permit the rolling elements to move into an ineffective position.

7. In a stool having a tubular support, a seat mounted on said support, said seat comprising a circular member having a downwardly turned annular flange and a depressed central portion, a circumferential shoulder in the peripheral margin of said member, a collar secured to and extending downwardly from the depressed central portion, said collar providing a fitting to mount the seat on the tubular support, and a cylindrical member secured to said depressed portion within the collar, said cylindrical member and depressed portion having aligned openings through which a rod extends, and a cover seated on the circular member and of a size to fit snugly within the circumferential shoulder having an opening registering with the rod openings so that access may be had to said rod.

8. In a stool having a tubular support, a seat mounted on said support, said seat comprising a circular member having a downwardly turned annular flange and a depressed central portion, a collar secured to and extending downwardly from the depressed central portion, said collar providing a fitting to mount the seat on the tubular support, and a cylindrical member secured to said depressed portion within the collar, said cylindrical member and depressed portion having aligned openings through which a rod extends, and a cover seated on the circular mem-

ber having an opening registering with the rod openings so that access may be had to said rod.

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