

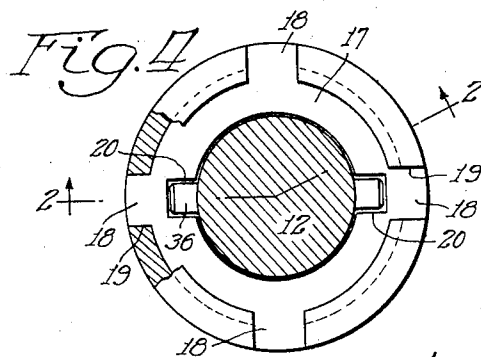
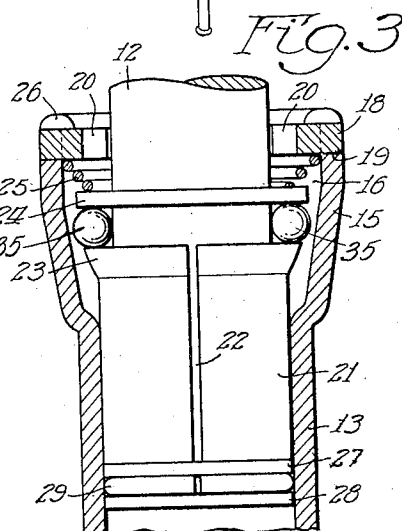
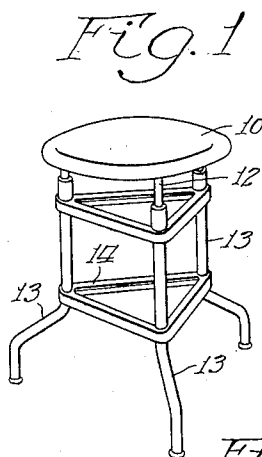
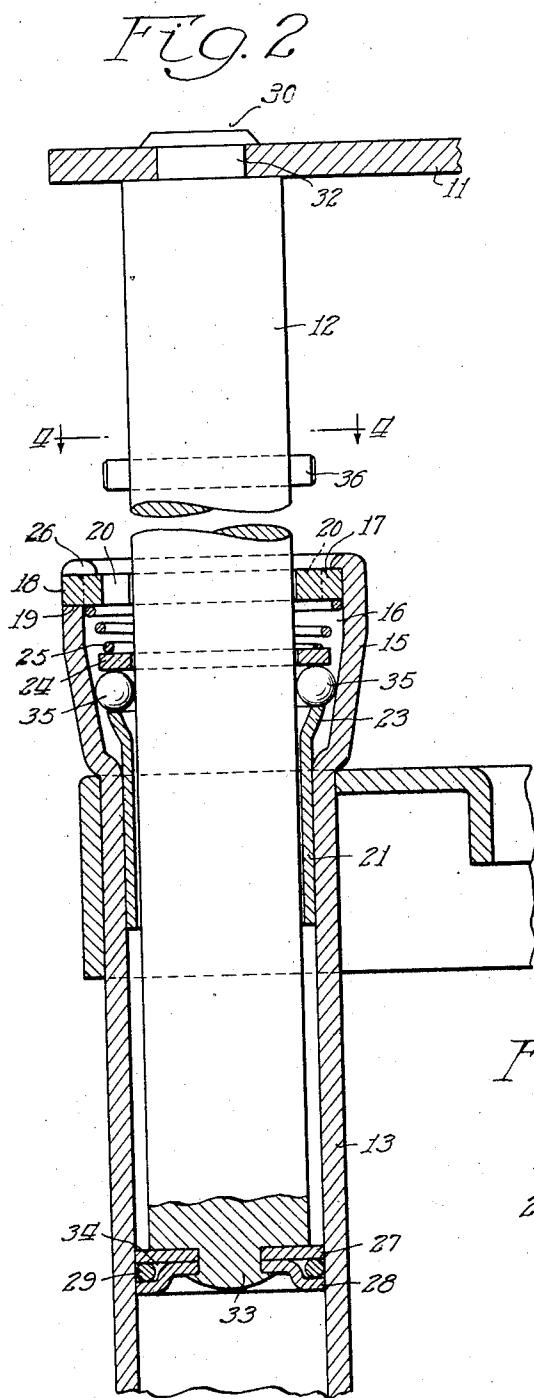
Aug. 6, 1935.

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STOOL SUPPORT

Filed May 24, 1933

2,010,292



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UNITED STATES PATENT OFFICE

2,010,292

STOOL SUPPORT

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Application May 24, 1933, Serial No. 672,589

6 Claims. (Cl. 155—94)

The invention relates to improvements in supports for stools, chairs, tables and similar articles and more particularly relates to improvements in such articles whereby the lengths of the pedestals or seat supporting members are extensible within predetermined limits and are automatically self locking against possible collapse under their own weight or the weight of an occupant.

The invention contemplates improvements in the structure shown and described in my copending application, Serial No. 650,687, filed January 7, 1933 and it is an object of the invention to provide an improved expansible support for articles of the kind described.

An object of the invention is the provision of an improved extensible support for stools, chairs, or the like, whereby the length of the support can be increased as desired from a predetermined minimum up to a predetermined maximum, the support being automatically locked against shortening or collapse for all extended positions less than the maximum.

Still another object of the invention is the provision of a stool, or the like, having a plurality of supporting members each extensible and self locking as desired and improved means adapted to connect the individual supporting members and hold the same in fixed spaced apart relation.

Among the further objects of the invention is the provision of a supporting member of the kind described which is simple in construction, readily and conveniently fabricated and assembled, economically manufactured and in its construction, assembly and use provides improvements and conveniences not heretofore employed in the art for the same general purposes.

In the drawing, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a perspective view of a stool embodying the principles of the invention;

Fig. 2 is a sectional view of a fragmentary elevation of a seat and one of the supports taken along vertical planes defined by the broken line 2—2 of Fig. 4;

Fig. 3 illustrates the locking mechanism in its inoperative position corresponding to the maximum expansion of the supporting member; and

Fig. 4 is a view along the line 4—4 of Fig. 2.

Referring now more particularly to the drawing, the numeral 10 designates a seat having a support comprising a plurality of casings and tubular members 13 each having a locking rod 12 telescoping therein. The seat is shown as

comprising a bottom plate 11 mounted on the locking rod 12 and fastened thereto by an upset stem 30 on the end of the rod.

The legs or casings 13 are held in fixed spaced apart relation by a plurality of triangular integrally formed brace members 14. The casings 13 closely fit in apertures provided for that purpose in the horizontal portion of the members 14. The lower ends of the casings 13 are projected outwardly to provide a firm support and the upper ends of each of the casings comprise an enlarged portion 15 providing a chamber 16 in which is located locking mechanism normally preventing collapse of the supporting members.

The locking rods 12 have a diameter slightly less than the interior of the casings 13 in which the rods are telescopically mounted. An upset stem 33 on the lower ends of the locking rods 12 each provides a mounting for plates 27 and 28 which have a close sliding fit with the casings. The outer annular edge of each plate 28 is projected downwardly to provide a space 34 in which a friction ring 29 is positioned. Frictional contact of the rings 29 with the members 13 prevents the rods 12 from moving downwardly by their own weight when the locking mechanisms are in inoperative position.

Annular caps or cover plates 17 closing the upper end of chamber 16, are each fastened in place by an intumed flange 26 swaged or otherwise formed on the member 13 and by a plurality of stems 18 projecting from the plates 17 into grooves 19 in the upper portion 15 of the casings 13.

The locking mechanisms each include a collar 21 frictionally supported in the casing 13 and each having an upper flanged end 23 positioned in the chamber 16. The collars 21 are normally cylindrical in shape and each is cut along the longitudinal line 22. The outside diameter of the collars 21 is slightly larger than the inner diameter of the casings 13 resulting in slight contraction of the collars when mounted in the casings. The tendency of the collars 21 to expand provides sufficient frictional contact with the casings 13 to require the exertion of substantial force to move the collars longitudinally of the casings.

The upper edge of the flanges 23 each provides a seat for a plurality of balls 35, on the top of which is positioned an annular ring 24. A compression spring 25, having its upper end abutting the cover plate 17 and its lower end abutting the ring 24, provides pressure tending constantly

to hold the balls 35 seated on the flange 23 both when the locking device is in the operative position shown in Fig. 2 and in the inoperative position shown in Fig. 3. The edge of the flange 23 is preferably slightly inclined downwardly towards the rod 12 and is spaced from the rod in a manner that the weight of the balls 35 tend to keep them in contact with the outer periphery of the rod. The tendency of the spring 25 to expand is insufficient to overcome the frictional contact between the collar 21 and the member 13.

Fig. 2 shows the locking mechanism in its operative position with the balls 35 wedged between the rod 12 and the side walls of the chamber 16, in which position retraction of the rod 12 in the member 13 is prevented and its extension is permitted by exerting a pull on the rod sufficient to overcome the frictional contact of the ring 29 with the member 13. Fig. 3 illustrates the locking mechanism in inoperative position with the balls 35 elevated to a point where they clear the side walls of the chamber 16.

A pin 36, mounted on the rod 12 above the locking mechanism, provides means for moving the mechanism from its inoperative to its operative position. A pair of oppositely positioned recesses 20 in the cover plate 17 permits the pin 35 to enter the chamber 16 when the rod 12 is retracted for that purpose. The resulting contact of the pin with the ring 24 results in moving the locking mechanism from its inoperative to its operative position. Similarly, movement of the locking mechanism from operative to inoperative position is accomplished by extending the rod 12 sufficiently to bring the projecting edge of the plate 27 into contact with the collar 21.

The adjustment of the height of the stool and the locking of same against collapse in any desired position is accomplished by manipulating the locking mechanism as follows: Assuming the stool to be in the position shown in Fig. 2 which may be any extended position of the rod 12 less than its maximum, further elevation of the stool is accomplished by exerting a pull sufficient to overcome the frictional contact of the collars 21 with the members 13 and to overcome the resistance of the springs 25. When it is desired to lower the height of the stool, the rods 12 are first fully extended by exerting a pull thereon until the plates 27 contact with and thereby lift the collars 21 sufficiently that the locking mechanisms take the inoperative positions shown in Fig. 3, in which positions the springs 25 are compressed and the balls 35 clear the tapering side walls of the chambers 16. The frictional contact of the collars 21 with the members 13 being greater than the resilience of the springs 25, the collars will remain in their elevated positions corresponding to the inoperative positions of the locking members until they are pushed downwardly by retracting the rods 12 their maximum amount which brings the pins 36 into contact with the rings 24 and moves the locking devices downwardly to a point where the balls 35 are wedged between the rods and the side walls of the chambers 16 as already described.

The stool may then be set at the desired height by exerting a pull on the rods 12 sufficient to overcome the frictional contact of the rings 29 with the casings 13, the locking mechanisms being inoperative in all positions to prevent outward movement of the rods and operative to prevent inward movement of the rods only when in the position shown in Fig. 2.

The frictional contact of the rings 29 with the

members 13 prevents outward movement of the rods 12 when lifting or carrying the stool by grasping the seat. The described manipulation of the locking mechanism to adjust the height of the stool can be accomplished with the stool in vertical or in any other position.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the kind described, a vertical casing having its upper end providing a chamber with downwardly converging side walls, a rod projecting through the chamber and into the casing, said rod being reciprocally movable in the casing within predetermined limits, a collar arranged about the rod and frictionally engaging the casing, one end of the collar projecting into the chamber and providing a flange inclined upwardly away from the rod, a plurality of balls mounted on the upper edge of the flange, said edge being so spaced from the rod that gravity maintains the balls in contact with the rod, a pair of lateral projections respectively mounted on the rod above and below said collar, said upper projection being adapted to lower the collar to a position wherein said balls engage the side walls of the chamber upon maximum retraction of the rod, said lower projection being adapted to lift the collar to operatively disengage said balls from said side walls upon maximum extension of the rod.

2. In an extensible stool support, a vertical casing having its upper end providing a chamber with downwardly converging side walls, a rod projecting through the chamber and into the casing, said rod being reciprocally movable in the casing within predetermined limits, a collar arranged about the rod in frictional engagement with the casing, one end of the collar projecting into the chamber and providing a flange inclined outwardly away from the rod, a plurality of balls mounted on the upper edge of the flange, the edge of said flange being so spaced from the rod that gravity maintains the balls in contact with the rod, a ring mounted on the top of said balls, a plate mounted on the casing to provide a closure for the outer end of the chamber, a compressive coil spring having its ends respectively abutting said plate and ring, the resilience of the spring being insufficient to overcome the frictional contact of the collar with the casing, a lateral projection on the rod above said collar, said plate provided with an aperture through which the rod extends, and having a notch connected with said aperture through which said lateral projection is adapted to be moved into and out of the chamber by reciprocation of the rod, a lateral projection on the rod below said collar, said upper lateral projection being adapted to engage said ring and lower the collar to a position wherein said balls engage the side walls of said chamber upon maximum retraction of the rod, said lower projection being adapted upon maximum extension of the rod to lift the collar and disengage said balls from said side walls.

3. In an extensible stool support, a vertical casing having its upper end providing a chamber with downwardly converging side walls, a rod projecting through the chamber and into the casing, said rod being reciprocally movable in the casing within predetermined limits, a collar arranged about the rod in frictional engagement with the casing, one end of the collar projecting into the chamber and providing a flange inclined outwardly away from the rod, a plurality of balls mounted on the upper edge of the flange, said flange being so spaced from the rod that gravity

maintains the balls in contact with the rod, a ring mounted on top of said balls, a plate mounted on the casing to provide a closure for the outer end of the chamber, a compressive coil spring having its ends respectively abutting said plate and ring, the resilience of the spring being insufficient to overcome the frictional contact of the collar with the casing, a pin mounted on the rod above said collar with its ends providing lateral projections, said plate provided with an aperture through which the rod extends, and providing notches connected with said aperture in the path of the projecting ends of the pins permitting the pin to be moved into and out of said chamber upon reciprocation of the rod and a member forming an annular projection on the rod below said collar, said pin being adapted to engage said ring and lower the collar to a position wherein said balls engage the side walls of said chamber upon maximum retraction of the rod, said annular projection being adapted to engage said collar and move the collar and balls upwardly to operatively disengage said balls and side walls upon maximum extension of the rod.

4. In an extensible stool support, a vertical casing having its upper end providing a chamber with downwardly converging side walls, a rod projecting through the chamber and into the casing, said rod being reciprocally movable in the casing within predetermined limits, a collar arranged about the rod and frictionally supported by the casing, one end of the collar projecting into the chamber and providing a flange inclined outwardly away from the rod, a plurality of balls mounted on the upper edge of the flange, said flange being so spaced from the rod that gravity maintains the balls in contact with the rod, a ring mounted on top of said balls, a plate mounted on the casing to provide a closure for the outer end of the chamber, a compressive coil spring surrounding and spaced away from said rod with one end abutting said plate and the other end abutting said ring, the resilience of the spring being insufficient to overcome the frictional contact of the collar with the casing, a pin mounted on the rod above said collar with its ends provided with diametrically opposite lateral projections, said plate providing an aperture through which the rod extends in close sliding fit with the plate, said plate provided with notches connected with said aperture in the path of the projecting ends of the pins permitting the pin to be moved into and out of said chamber upon reciprocation of the rod, a member forming an annular projection on the rod below said collar, said member comprising a pair of circular plates mounted on the rod with their peripheral edges forming spaced

apart lateral projections, and a ring positioned between said peripheral edges in frictional contact with said casing, said pin being adapted to engage said ring and lower the collar to a position wherein said balls engage the side walls of said chamber upon maximum retraction of the rod, said annular projection being adapted to engage said collar and move the collar and balls upwardly to operatively disengage said balls and side walls upon maximum extension of the rod.

5. An extensible member of the kind described comprising a unitary vertical casing having its upper end expanded to provide a downwardly converging chamber, an inner member longitudinally movable within and having its upper end projecting from the casing, a collar supported by frictional engagement with the unexpanded portion of the casing, the upper end of the collar projecting into the chamber and providing a flange extending upwardly away from said inner member, a plurality of balls mounted on the upper edge of said flange, said edge being so spaced from the inner member that gravity maintains the balls in contact with the inner member, a pair of lateral projections respectively mounted on the inner member above and below said collar, said upper projection being adapted to lower the collar to a position wherein said balls engage the side walls of the chamber upon maximum retraction of the inner member, said lower projection being adapted to lift the collar to operatively disengage the balls from said side walls upon maximum extension of the inner member.

6. In an extensible construction, the combination of a supporting shaft movable axially for adjustment, a retainer fixed in position and embracing said shaft and having an inner surface angularly arranged with respect to said shaft, a free rolling member arranged between the angularly disposed face of the retainer and the presented face of the shaft and normally maintained in contact with said faces so that movement of the shaft in one direction moves said free rolling member into wedged locking position to restrain movement of the shaft in said direction while permitting movement in the other, a reciprocating member arranged in said retainer and movable to obstruct the wedging action of said free rolling member, said shaft having a part adapted to engage said reciprocating member to move said free rolling member to inoperative position, and means associated with the shaft for pressing upon the said free rolling member to return said reciprocating member to inoperative position at the end of the shaft movement in the opposite direction.

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