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ELEVATOR CASTER

Filed Nov. 20, 1953

FIG. 1.

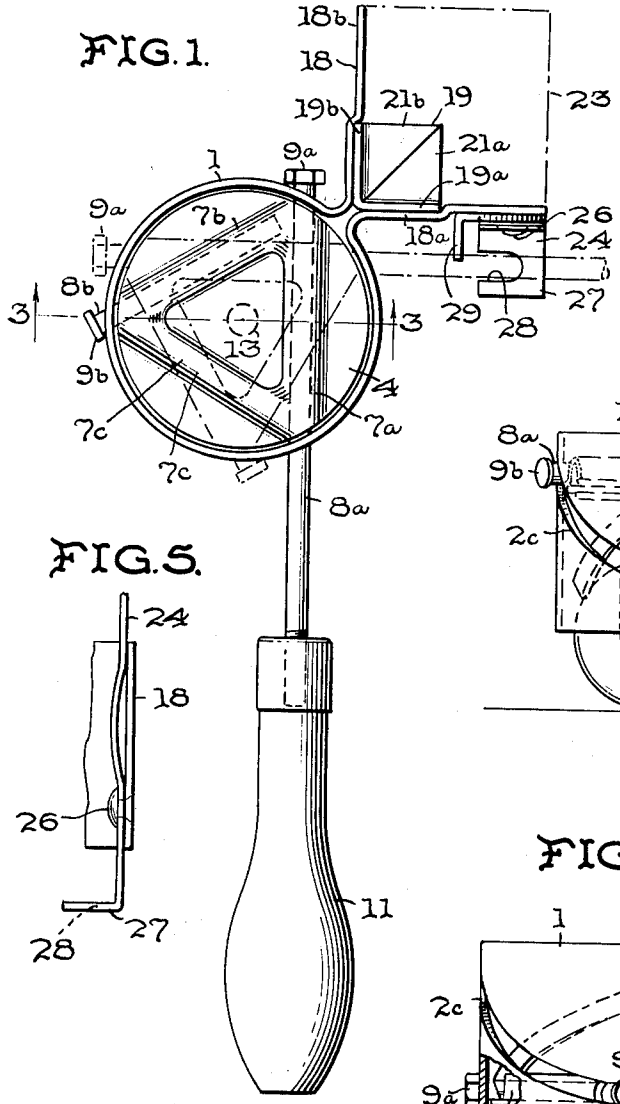


FIG. 2.

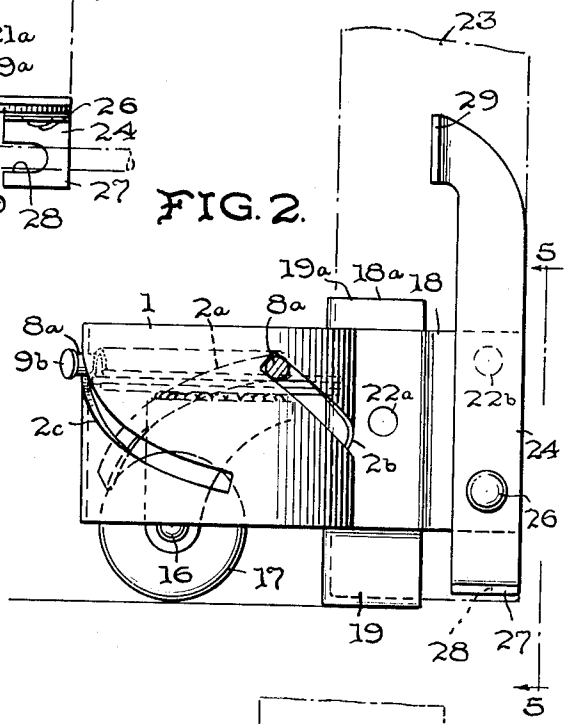


FIG. 5.

FIG. 4.

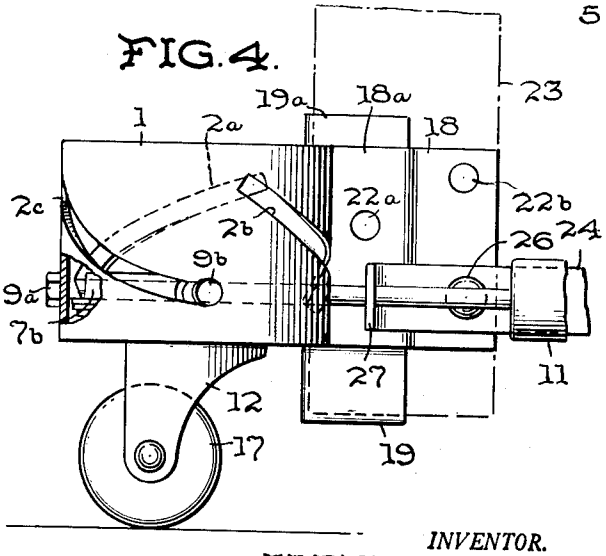
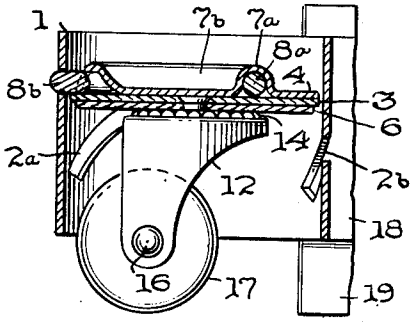


FIG. 3.



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ELEVATOR CASTER

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4 Claims. (Cl. 16—32)

This invention relates to casters and more particularly to that type of caster which may be raised and lowered relative to the base or leg or an article of furniture, equipment, or the like so that the article may rest either upon its own legs or base or upon its supporting casters.

Furniture or equipment is either provided with supporting casters, or it is supported on a floor or the like by legs or a base portion which rests directly on the floor. When the furniture or equipment rests upon its base or legs, stability is achieved, but, at the sacrifice of mobility. Thus, furniture or equipment, such as a television set or radio, is normally supported from its legs or base to achieve rigidity of mounting and to lessen damage to the radio or television set should the delicate parts thereof be subjected to a bumping or jarring motion. However, should it be desired to move the furniture or equipment to another location or merely to move it temporarily for purposes of cleaning, etc., it becomes a difficult task when the furniture is supported directly by its base or legs.

The present invention contemplates casters which may be secured to the legs or base of an article in such manner that they normally are not effective for supporting the article, but which may, when desired, be moved to a position in which they support the full weight of the article. Thus, the article normally may be firmly and stably supported on the floor or other support by its legs or base, but when it is desired to move the article for any purpose whatever, the casters may be shifted to a position where they support the full weight of the article so that the article readily may be moved to a new place, or shifted for cleaning, repairing or any other purpose. When the article has been moved to a desired new location, or moved back to its original location, if only moved temporarily, the casters may be shifted to their inoperative position so that the article again will be firmly and stably supported from the floor by its legs or base. Hence, the present invention extends the use of casters in that it provides a caster suitable for supporting articles which heretofore normally were not adapted to be so supported.

More particularly this invention relates to a caster unit comprised of several principal parts constructed and arranged to permit the caster to be raised or lowered relative to the legs or base of an article of furniture, equipment or the like. The principal parts of the unit are a cylindrical supporting collar, a caster member, bracket means and locking means. The supporting collar is provided with three evenly-spaced helical cam slots which have the same degree of pitch. The caster is supported by the cylindrical collar by means of rods which lie in a horizontal plane and ride within the helical cam slots to provide a stable three-point suspension for the caster. An operating handle is rigidly secured to the rods so that the assembly may be shifted as a unit to cause the rods to move upwardly and downwardly in the cam slots, thereby shifting the position of the caster between its lower, or article-supporting position, and its upper, or inoperative position, where the furniture or

other article is firmly and stably supported by its own legs or base. Suitable locking means are provided for securely maintaining the caster in its lower, article-supporting position. A bracket is attached to the cylindrical collar to facilitate mounting of the caster unit upon the side of the legs or base of the article of furniture.

The invention will be described in greater detail in connection with the drawings which illustrate one embodiment of this invention. However, it will be understood that the invention is not limited to this one embodiment and other forms are possible which would lie within the scope of the invention. The scope of this invention is defined and set forth in the attached claims.

In the drawings:

Fig. 1 is a top plan view of a caster unit embodying the invention, showing the caster in its raised or non-supporting position and also showing in dotted lines the caster in its lowered or supporting position.

Fig. 2 is an elevational view of the caster unit, showing the caster in its elevated or non-supporting position.

Fig. 3 is a sectional view on line 3—3 of Fig. 1, showing the supporting means for the caster.

Fig. 4 is an elevational view of the caster unit, showing the caster in its lowered or supporting position.

Fig. 5 is an elevational view on line 5—5 of Fig. 2 showing means for locking the caster in its lowered or supporting position.

This caster unit comprises supporting means for the caster, a caster supported by such means, a bracket for attaching the unit to the legs or base of an article of furniture and locking means for securing the caster in its lowered or article-supporting position.

The supporting means for the caster consists of a cylindrical sheet metal collar 1, having evenly spaced helical cam slots 2*a*, 2*b* and 2*c*. The three helical cam slots each have the same degree of pitch. Within the sheet metal collar is a sheet metal disc 3, preferably circular in shape. Lying above the sheet metal disc is a reinforcing and retaining plate 4, secured to the disc by any suitable means, such as by soldering, welding, or the like. Lying below the sheet metal disc is a mounting plate 6 of the caster. The mounting plate is also attached to the sheet metal disc by any suitable means such as by welding, soldering or the like.

The reinforcing and retaining plate 4 is provided with corrugations 7*a*, 7*b* and 7*c*. These three corrugations form a triangle which is approximately an equilateral triangle. A rod 8*a* lies within the space formed by corrugation 7*a*, and a rod 8*b* is positioned within the space formed by the corrugation 7*b*. Rod 8*a* extends beyond the periphery of the collar at both ends and rides within helical cam slots 2*a* and 2*b*. Rod 8*b* extends beyond the periphery of the collar at one end and rides within helical cam slot 2*c*. The extremities of rods 8*a* and 8*b* are provided with heads 9*a* and 9*b* respectively. The extremity of rod 8*a* remote from the head 9*a* has a handle 11 attached thereto. This handle serves as a means for moving the rods 8*a* and 8*b* along the helical cam slots 2*a*, 2*b* and 2*c* and thus raising and lowering the caster supporting means.

The mounting plate 6, which, as already described, is attached to the circular disc 3, carries the caster. This comprises bifurcated frame 12 suspended from the mounting plate 6 by a pin 13 which forms the vertical axis of rotation for the caster. Placed between the bifurcated frame 12 and the mounting plate 6 are roller bearings 14 which serve to reduce friction and increase the ease of rotation of the caster about pin 13. Suspended between the bifurcated frame 12 by means of an axle 16, which extends through the free end portions of the legs of the bifurcated frame, is a caster roller 17. The axle 16 serves as the horizontal axis of rotation for the caster.

The caster unit is secured to the legs or base of an article of furniture, or the like, by a bracket **18**. This bracket includes vertically extending sheet metal members **18***a* and **18***b* positioned at right angles to one another. These members may be formed either from extensions of the cylindrical collar **1**, as shown in Fig. 1, or they may be formed from a separate piece of angled sheet metal and attached to the cylindrical collar in any suitable manner. A reinforcing bracket **19** comprising angled portions **19***a* and **19***b* preferably is attached to the bracket **18**. The angled portions **19***a* and **19***b* are provided at their lower ends with extensions **21***a* and **21***b*, respectively, which are bent inwardly and at right angles to members **19***a* and **19***b*. The portions **19***a* and **19***b* are adapted to be placed beneath the leg or a corner of the base of the article of furniture. The brackets may be secured to the legs or base of an article of furniture by fastening means, such as nails, screws or bolts passed through perforations **22***a* and **22***b* in the sides of the brackets **18** and **19** and secured to the leg or base **23** of the article of furniture, or the like.

The means for maintaining the caster in its lowered or article-supporting position consists of a locking lever **24** pivoted to bracket **18** by means of a rivet **26**. The inner end of the locking lever **24** is bent at right angles to form a locking portion **27**. The portion **27** has a slot or notch **28** extending downwardly from its upper edge. The slot or notch **28** is adapted to be passed about the rod **8***a* when it is at the bottom of helical cam slots **2***a* and **2***b* and to securely hold the rod at the lower end of those cam slots and thereby lock the caster unit in its lowered position. To facilitate manual operation of the locking lever about its pivotal point, the outer end thereof is bent at right angles to provide a generally horizontally extending portion **29** against which pressure can be exerted to swing the locking lever about its pivotal axis.

Assuming that the caster unit is in its elevated position shown in Fig. 2 with the article of furniture stably supported on the floor by its own legs and it is desired to lower the caster unit to impart mobility to the supported article, the locking lever is swung to a position approaching the vertical position shown in Fig. 2 so that the portion **27** will not interfere with movement of the rod **8***a* in the helical cam slots **2***a* and **2***b*. The handle **11** is then grasped and moved to the right, as viewed in Fig. 2, through an angle of approximately 90°. This causes the rods **8***a* and **8***b* to move downwardly in the helical cam slots until they reach the lower end of those slots. As the supporting means for the caster unit is connected to the rods, it also is lowered and is brought to its article-supporting position as shown in Fig. 4.

After the caster unit has been lowered, as above-described, and while the handle is still grasped to hold the caster unit in its lowered posittion, the locking lever is swung to its horizontal position shown in Fig. 4 to cause the slot or notch **28** to pass about the rod **8***a* and thereby prevent the rods **8***a* and **8***b* from being forced back up the helical cam slots by the upward reactionary force exerted on them by the caster unit. The caster unit is now securely locked in its lower or article-supporting position and will remain in that position until it again is desired to have the article of furniture stably supported on its own legs or base. When that is desired, the horizontally extending portion **29** of locking lever **24** is grasped by the hand and forced upwardly, thereby disengaging slot or notch **28** of the locking lever from about rod **8***a*. The weight of the supported article acting downwardly upon brackets **18** and **19** will cause the rods **8***a* and **8***b* to ride upwardly in the helical cam slots until the rods have reached the upper ends of the helical cam slots and the caster supported from the rods has been raised to its elevated or non-supporting position as shown in Fig. 2.

The caster unit is preferably mounted upon the legs or base of an article of furniture so that the cylindrical collar **1** lies beneath and within the outer dimensions of the article of furniture. By so mounting the caster unit, the operating handle **11** and locking means are so positioned that they do not form a hazard to someone walking past the article of furniture. When so mounted, the handle **11** will lie parallel to the vertical face of the furniture when the furniture is supported by its legs or base; and the locking lever may be swung about its pivotal axis so that it extends vertically and parallel to the face of the article of furniture.

It will be understood that, if desired, either the sheet metal disc 3, or the reinforcing and retaining plate **4**, or both could be dispensed with and the rods **8***a* and **8***b* attached directly to the caster mounting plate **6**. Also a different number of helical cam slots may be used, with a corresponding change in the number of actuating rods which lie within the helical cam slots. Likewise, any other form of locking means may be employed which will effectively cause the caster unit to be retained in its lowered, article-supporting position.

From the foregoing, it will be seen that the invention provides a caster which normally may be moved to a non-supporting position, so that the article to which it is attached may rest firmly and stably upon the floor on its own legs or base, but which may readily be moved to a position in which it acts as a support for the article so that article may easily be moved from place to place. The invention also provides a caster unit which does not require special bearing surfaces, or lubrication to prevent binding of the parts during the raising and lowering operations.

I claim:

1. A caster unit comprising a cylindrical collar having a plurality of inclined slots positioned around the collar, a disc lying within said collar, a caster supported by said disc, a corrugated reinforcing and retaining plate attached to said disc, a plurality of rods lying within spaces formed by the corrugations of said plate and between said disc and said retaining plate, said rods extending through and adapted to move along said slots, a handle attached to one of said rods for moving said rods relative to said collar in a direction to cause the rods to move along the inclined slots, whereby the caster selectively may be raised and lowered relative to the collar, a vertically-extending bracket attached to the collar, said bracket having extensions bent substantially at right angle thereto adapted to be beneath and support a portion of an article, and a locking lever pivoted to said bracket for engagement with one of said rods for maintaining said caster in a lowered position.

2. A caster unit for attachment to an article adapted to rest on a floor, said unit comprising a cylindrical collar, said collar having a plurality of inclined slots positioned therearound, caster supporting means carried by said collar, a caster supported by said supporting means, elevating means secured to said supporting means and extending through and adapted to move along said inclined slots, means for moving said elevating means relative to said collar in a direction to cause the elevating means to move along said inclined slots, whereby said caster selectively may be raised relative to said collar to permit said article to rest on a floor, and lowered relative to said collar to an article-supporting position whereupon the article is raised off a floor and may be rolled along a floor while supported on the caster, and means for maintaining said caster supporting means in a lowered article-supporting position.

3. A caster unit as set forth in claim 2 wherein said elevating means is a plurality of rods, said caster supporting means is a disc lying within said collar, and including a corrugated reinforcing and retaining plate securing said rods to the disc, said rods lying within spaces formed by the corrugations of said plate and between said disc and said retaining plate.

4. A caster unit for attachment to an article adapted to rest on a floor, said unit comprising a member having

at least one inclined slot, caster supporting means carried by said member, a caster supported by said supporting means, an elevating rod secured to said supporting means and extending through the slot in said member and beyond said member on both sides thereof, said elevating rod being adapted to move along said inclined slot, said elevating rod terminating beyond said member in a handle-section, movement of said handle-section being adapted to cause said elevating rod to move along said inclined slot, whereby said caster selectively may be raised relative to said member to permit said article to rest on a floor, and lowered relative to said member to an article-supporting position whereupon the article is raised off a floor and may be rolled along a floor while supported on the caster, and means for maintaining said caster supporting means in a lowered article-supporting position.

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