Oct. 10, 1950 J. D. McKEAN 2,524,819

RETRACTABLE CASTER

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FIG. 1

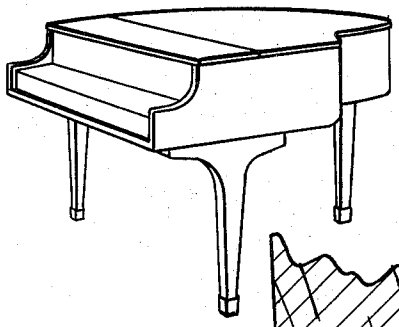


FIG. 2

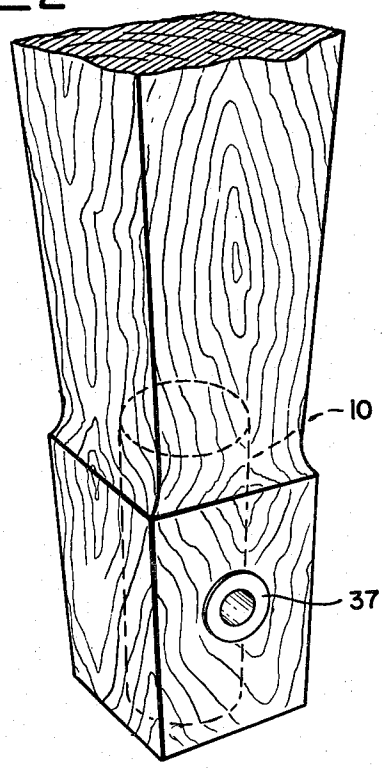


FIG. 3

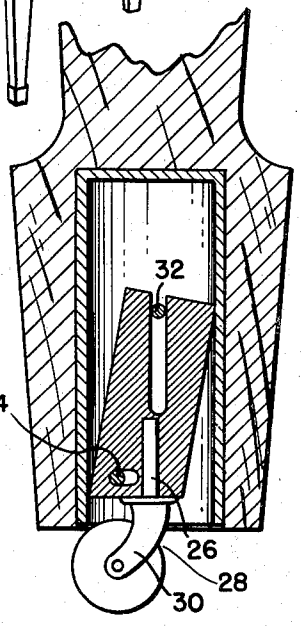
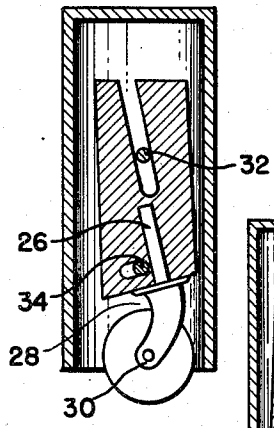


FIG. 5



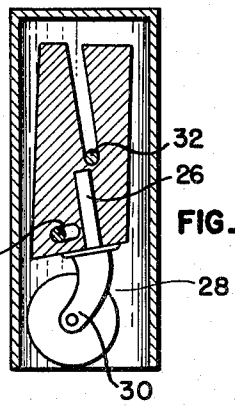
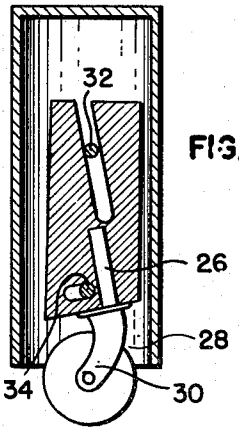


FIG. 6

FIG. 4



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RETRACTABLE CASTER

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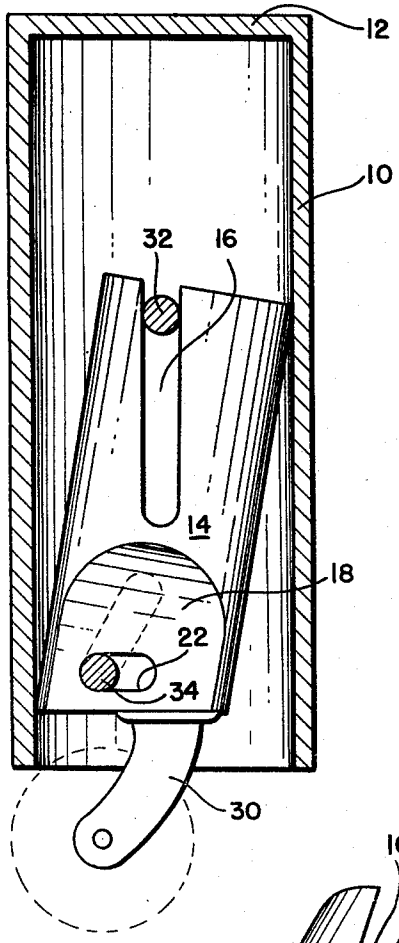


FIG. 7

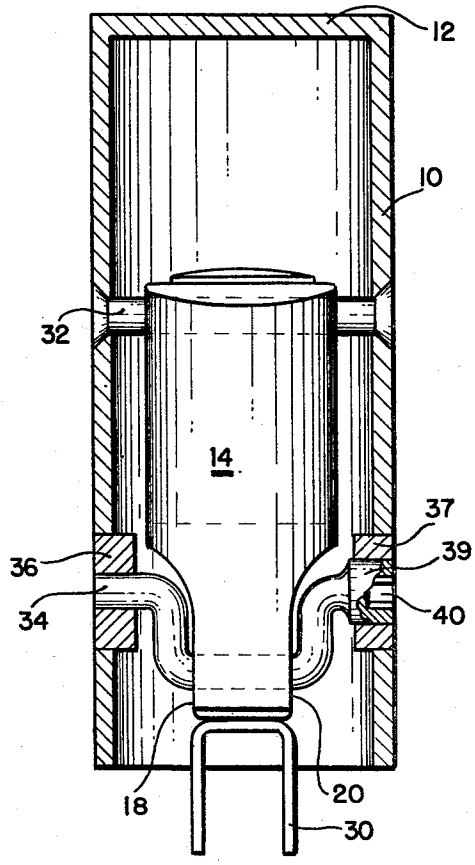


FIG. 8

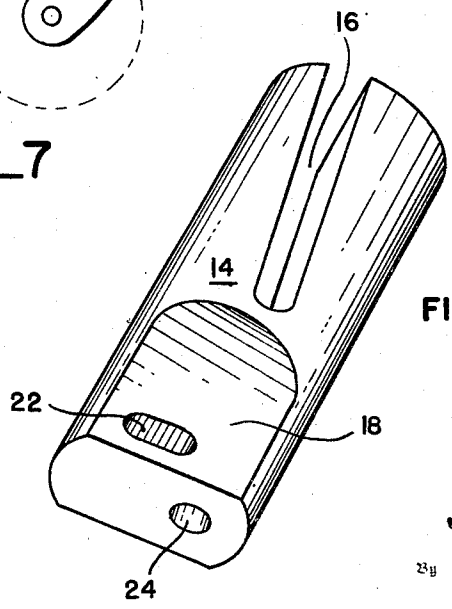


FIG. 9

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Patented Oct. 10, 1950

2,524,819

UNITED STATES PATENT OFFICE

2,524,819

RETRACTABLE CASTER

James D. McKean, Seattle, Wash.

Application February 23, 1949, Serial No. 77,771

4 Claims. (Cl. 16—32)

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My present invention relates to wheel casters, and more particularly to a retractable caster, and the means for actuating and maintaining the two extreme positions thereof. The principal use for my caster is on those types of equipment and furniture which normally are too heavy or bulky to be conveniently lifted and which from time to time may require a change in position, and when the new position is reached, it is then desirable to dispense with the function of the caster and have the object supported solidly on the floor.

There are many items of furniture, such as pianos, bookcases, beds and the like, which are too heavy or bulky to be handled by one person, excepting by sliding or preferably rolling. Then, too, there are such items as billiard tables and other game apparatus. Further, in industrial plants and particularly in the home shops of amateur mechanics, it is often necessary to move machine tools and such equipment about and when the new position is reached, it is very essential that the machine be carefully and fixedly deposited on the supporting floor. I am well aware that many attempts have been made in the past to achieve this general end result. However, those observed have taken advantage of the peculiarities of design of equipment to which they were attached and where bulk or appearance was immaterial. There are many cases, however, where it is most desirable to avoid any visual showing of such equipment. This is particularly true on the nicer pieces of equipment, such as pianos and the like that are used in the home. There are further considerations: namely, that casters of the type referred to are normally only employed with heavy equipment, and then it is desirable that tracks or marking from the rolling surface be prevented, in order that floors and carpets and the like will not be disfigured as the heavy weight is rolled across them. It is under such conditions that the majority of the devices observed fail, in that, in order to achieve a retractable mechanism, the diameter of the caster wheel itself has been reduced to such a small dimension that they either fail to roll, as over carpets and the like, or if they do, the small wheel area presented, does cause disfigurement on the floor covering. In my present invention, I believe I have overcome many of the deficiencies noted, in that I provide for a caster wheel of substantially the size the loading requires, and which the manufacturer would have used on his equipment were he supplying a conventional form of casters.

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In order, however, to supply a large caster wheel and still have it retractable, a general form of construction, not observed in any of the prior equipment, must be employed.

The principal object of my present invention, therefore, is to provide a retractable caster which can be applied to any legged piece of furniture or equipment and which will be substantially unobservable when the caster is not being used.

A further object of my invention is to provide a retractable caster which can be housed as in a piano leg, for instance, and still employ a caster wheel of adequate diameter and face to carry the loading placed upon it.

A further object of my invention is to provide a simple, sturdy, retracting mechanism, which will be self-locking in either its retracted or using position and to achieve this with mechanism that is simple, to the end that the cost of same may be kept within the range required on an item that must be used in considerable quantities.

A further object of my invention is to provide a caster and its actuating mechanism, all disposed within a tubular housing, so that the same can be sold and installed as a complete unit and can be easily installed by the simple procedure of forming a cylindrical recess into which the cylindrical housing will seat.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

It is to be expressly understood, however, that the drawings are for purposes of illustration only and are not intended as a definition of the limits of the invention, reference for this purpose being had to the appended claims.

Figure 1 is a perspective view of a grand piano which provides a good use for my equipment and the view shows the same with my caster retracted and the piano resting solidly on the supporting floor.

Figure 2 is a perspective view, showing an enlarged portion of the lower piano leg.

Figure 3 is a cross-sectional view thru a piano leg with one of my casters in place and in its rolling or supporting position.

Figures 4, 5 and 6 are views taken the same sense as Figure 3 and showing different features in the operation of my retractable caster.

Figure 7 is a view taken the same general sense as Figure 3, but showing the same in enlarged detail.

Figure 8 is a view similar to Figure 7, with the cutting plane revolved ninety degrees.

Figure 9 is a perspective view showing the mounting block used with my retractable caster.

Referring more particularly to the diclosure in the drawings, throughout which I have shown one form of my invention, the numeral 10 designates the housing for my retractable caster. This I prefer to form of metal tubing and to provide the same with a closed upper end 12. When so arranged, the end 12 provides an adequate bearing surface for any reasonable load that may be placed upon the caster. Disposed for longitudinal movement within the bore of housing 10, is the mounting block 14. This block is shown by Figure 9 and is characterized by having an angularly disposed open slot 16, disposed at a small angle to the axis of the block. At its lower end, the two sides of the preferably round block, is relieved as at 18 and 20, thus forming two parallel sides, so as to better accommodate the operating crank for the same, as illustrated in Figure 8.

At what is normally the lower end of block 14, I provide a transversely disposed closed slot 22, and at 24 I provide a preferably drilled hole, which is substantially parallel to slot 16, and, as will be observed in Figures 3, 4, 5 and 6, is angularly disposed with the longitudinal axis of block 14. Hole 24 is adapted to accept the shank 26 of caster assembly 28. This may be suitably arranged to fixedly secure a deformed caster shank in which the head or yolk portion 30 is revolvably mounted independent of shank 26; or if the simple caster is used, it may form the bearing for the same, in which case, the hole must be round.

Block 14 has a dual purpose. It must securely support the caster assembly and it is one convenient means for providing that the caster spindle 26 will be vertically disposed when the caster wheel is down in its rolling position, and will be angularly disposed when the caster assembly is in its retracted position. This is a prerequisite if the maximum diameter of caster wheel is going to be used with a minimum diameter housing bore.

Block 14 is held in position within the bore of housing 10 by the co-action of a pin or rivet 32, which slidably engages slot 16, and by crank 34, which slidably engages slot 22. Crank 34 may operate in bearings formed in the wall of the housing 10, although I have found it desirable in certain instances to provide additional bearing surface as the bearing members 36 and 37 which are normally fixedly secured within the housing. Bearing 37 I prefer to form with an enlarged bore, so that crank 34 may have an enlarged end 39, which is provided with a socket as 40, either square or hectagon or otherwise formed, so as to provide a suitable seat for a key, or preferably a crank having a reasonable leverage, as when used with heavy equipment considerable leverage is required if the lifting of the equipment to be moved is to be achieved, as by a housewife, for instance.

In its lowest supporting position, the caster wheel, of course, must assume its full proportion of the load of the equipment it is used with, and in order to provide a simple lock, so that no exterior ratchets or latches will be required, I provide that crank 34 swing past the vertical, so that loading coming on the caster will force the lower corner of block 14 against the wall of housing 10. This condition is illustrated in Figures 3 and 7. In Figure 6 it will be noted that the crank is in a relatively similar position but in the upward limit of its swing. Consequently, the caster is held in its upper position again without any special locking equipment.

To overcome certain disadvantages of previously observed retractable casters, it is very desirable that the maximum diameter and width of caster wheels be used, and this I have illustrated throughout my drawings. It is this requirement that makes it necessary to have shank 26 angularly disposed with the longitudinal axis of block 14, and it is believed that its functioning will be relatively clear from a study of Figures 3, 4, 5 and 6. It is desired to point out, however, that the caster wheel in its down position must be capable of swinging entirely around about its now vertical axis. Otherwise, it would not serve as a caster. If the proportions shown in my drawings are followed, however, this will be achieved without any interference.

In using my equipment, if it is assumed that the piano, for instance, in Figure 1 is resting firmly upon the supporting floor, the casters will be in the retracted position as shown in Figure 6. Then to operate as intended, a lever having a formed end which will fit socket 40, is inserted in the socket and the crank 34 revolved substantially 180°. This will appear to force the caster wheel down. Actually what will occur is that the caster wheel which is, in Figure 6, already resting substantially upon the floor, engages the floor and the action of crank 34 is to actually raise the entire leg and in the case of the piano, it would have to raise one-third of the weight of the piano. The user would then follow the same procedure with the other two legs. Then all three would appear after the showing of Figure 3, and the piano could be moved in any direction, due to the fact that the caster's axes 26, as viewed in Figure 3 or Figure 7, are vertically disposed and the casters free to swing in any direction. When the new position is reached, a reversal of the crank operation will lower the legs again to the floor and retract the caster assemblies up into their respective housings 10.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of a retractable caster.

Having thus disclosed the invention, I claim:

1. A retractable caster, consisting of: a cylindrical housing adapted to be secured to a supported object; a mounting block disposed for longitudinal movement within said housing; guide means for said block positioned in said housing adapted to vary the axial alignment of said block with respect to said housing; means positioned in said housing and connected to said block for longitudinal positioning of said block; a caster secured to said block with its axis of revolution disposed at a small angle with the axis of said block.

2. A retractable caster, consisting of: a housing adapted to be secured to a supported object; a mounting block disposed for longitudinal movement within said housing; guide means for said block positioned in said housing adapted to vary the axial alignment of said block with respect to said housing; crank means positioned in said housing and connected to said block for longitudinal positioning of said block within said hous-

ing; a caster secured to said block with its axis of revolution off the axis of said block and said caster adapted to extend out beyond the circle of said housing when in its load supporting position.

3. A retractable caster, consisting of: a housing having a cylindrical bore adapted to be secured to a supported object; a mounting block disposed for longitudinal movement within said housing; guide means for said block positioned in said housing adapted to vary the axial alignment of said block with respect to said housing; crank means positioned in said housing and connected to said block for longitudinal positioning of said block; a caster secured to said block with its axis of revolution off the axis of said block and said block adapted to engage said housing when the caster is in a load supporting position and limit the rotation of said crank.

4. A retractable caster, consisting of: a cylindrical housing having a cylindrical bore, adapted to be secured to a supported object; a mounting block disposed for longitudinal movement within

said housing; a guide pin fixedly positioned in said housing; said block having a guide slot through which said guide pin runs to vary the axial alignment of said block with respect to said housing; crank means secured to said housing and said block for longitudinal positioning of said block; a caster pivotably secured to said block with its axis of revolution disposed approximately parallel to said guide slot; and the lower edge of said block adapted to engage said housing when the caster is in a supporting position and limit the rotation of said crank.

JAMES D. McKEAN.

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The following references are of record in the file of this patent:

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