United States Patent

Drews et al.

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[54] CASTER JACK MECHANISM FOR PORTABLE APPLIANCES

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[52] U.S. Cl. **280/43.14**, 280/43.17

[51] Int. Cl. **B62d 21/18**

[58] Field of Search 280/43.14, 43.24, 43.17

[56] **References Cited**

UNITED STATES PATENTS

2,812,189	11/1957	Geldhof	280/43.14
3,179,438	4/1965	Field	280/43.14

Primary Examiner—Leo Friaglia

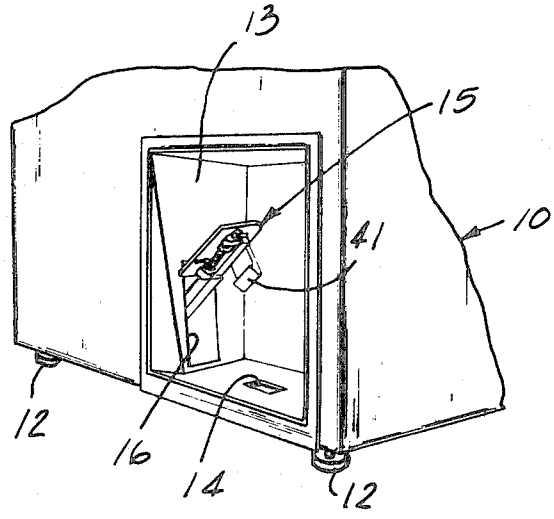
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[57] **ABSTRACT**

A caster jack mechanism for use with heavy appliances such as washing machines and the like employing a pair of shafts pivotally mounted to the cabinet of the appliance and provided with drive means for transmitting rotational motion from one shaft to the other. A plurality of casters are supported in spaced relation along the two shafts such that pivotal movement of the shafts in one direction causes the casters to be pivoted into cabinet-supporting relationship so that the entire weight of the cabinet is supported by the casters and the cabinet can be freely moved in this position. The actuating mechanism includes a pedal assembly mechanically coupled to one of the shafts and being provided with a spring-biased latch mechanism for holding the casters in their floor-engaging position.

5 Claims, 8 Drawing Figures



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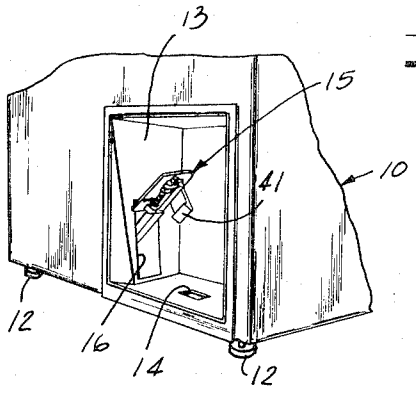
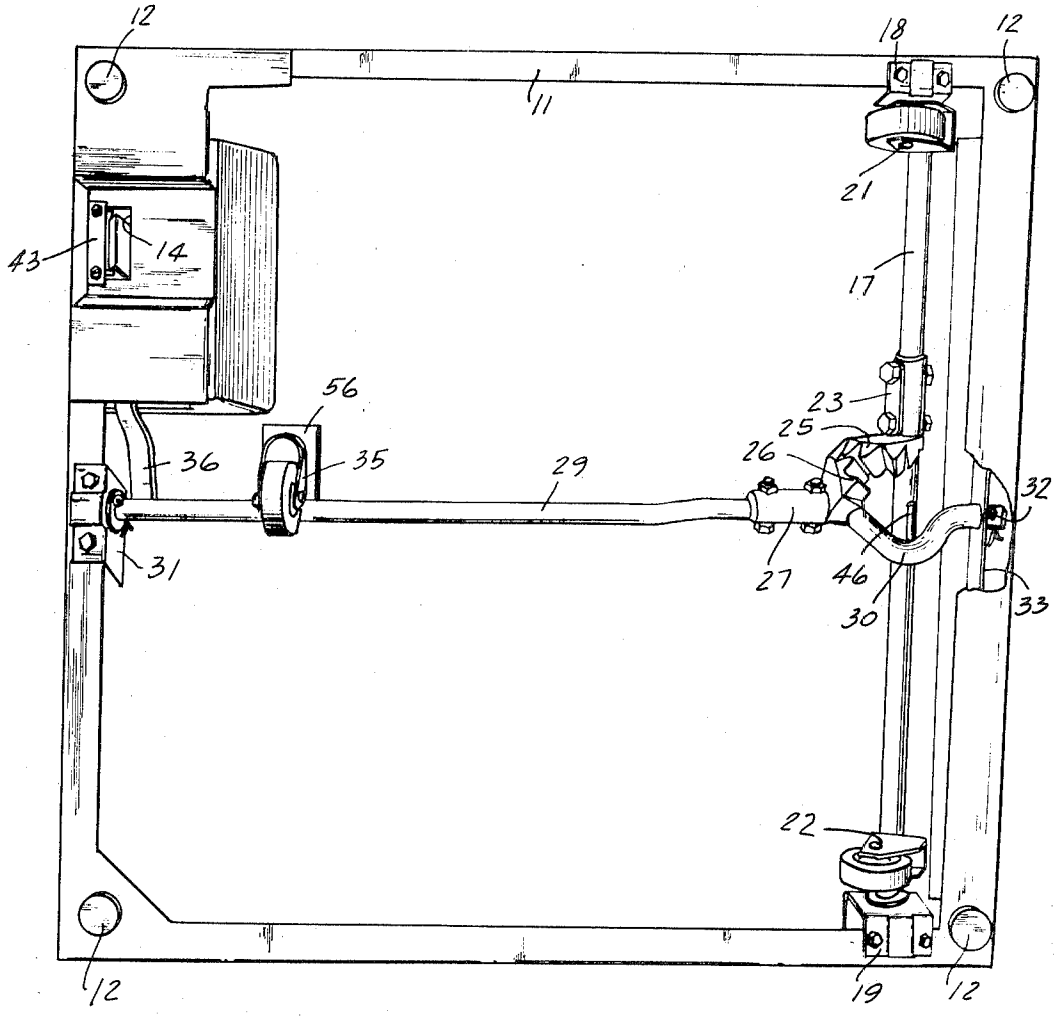


Fig. 1

Fig. 2



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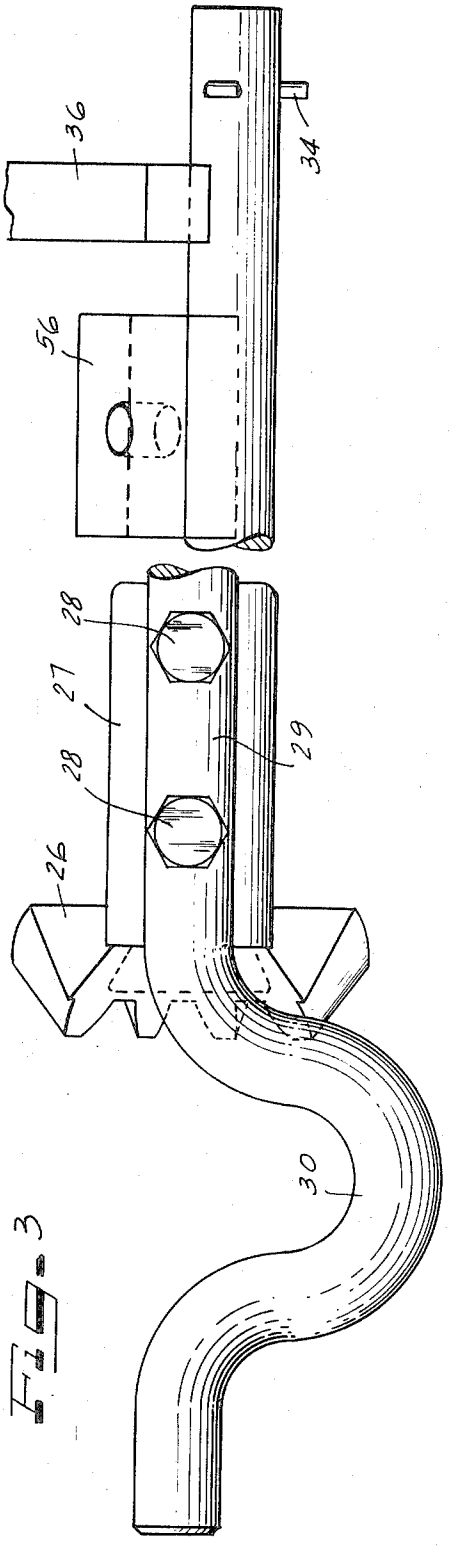


FIG. 3

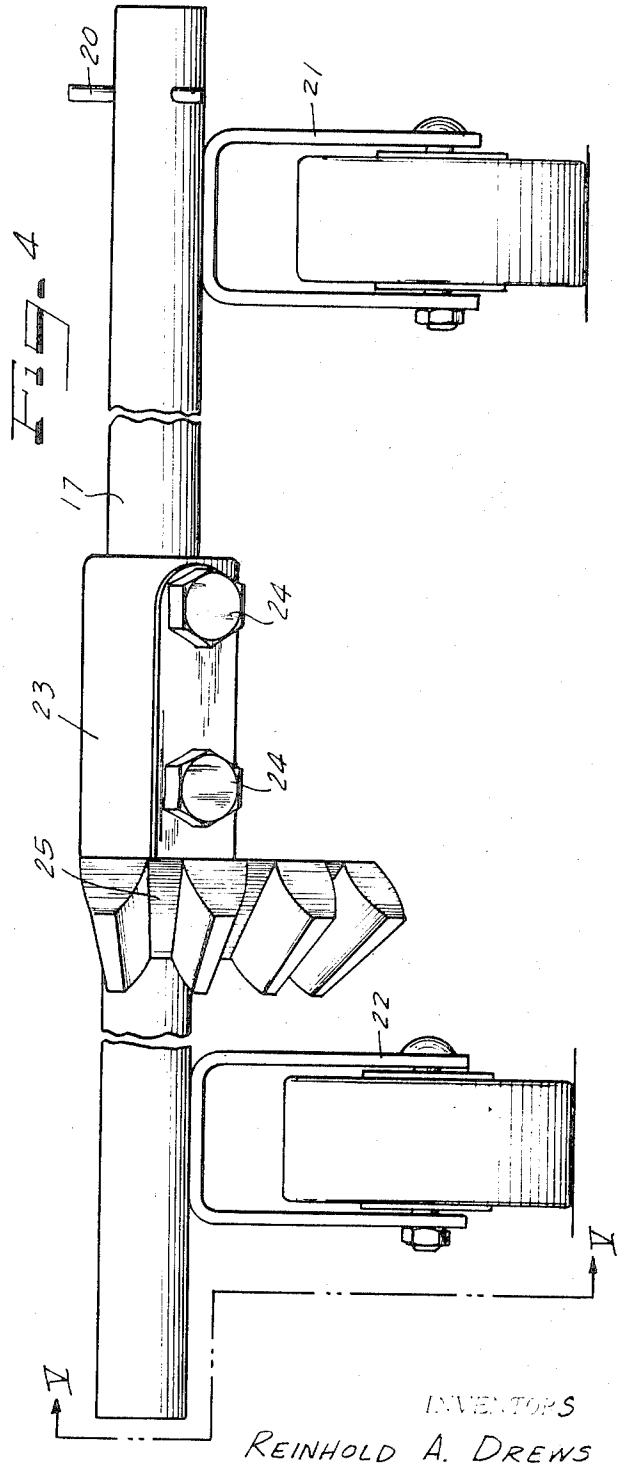


FIG. 4

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Fig. 5

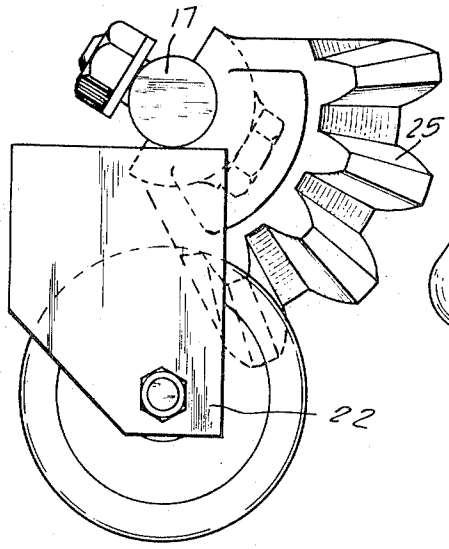
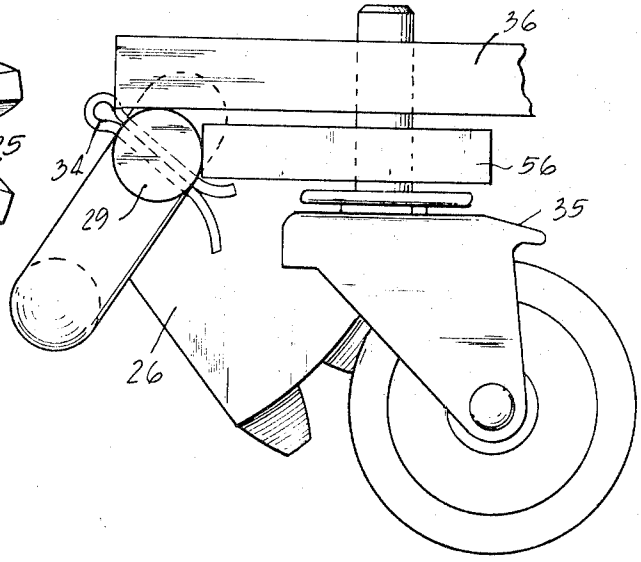


Fig. 6



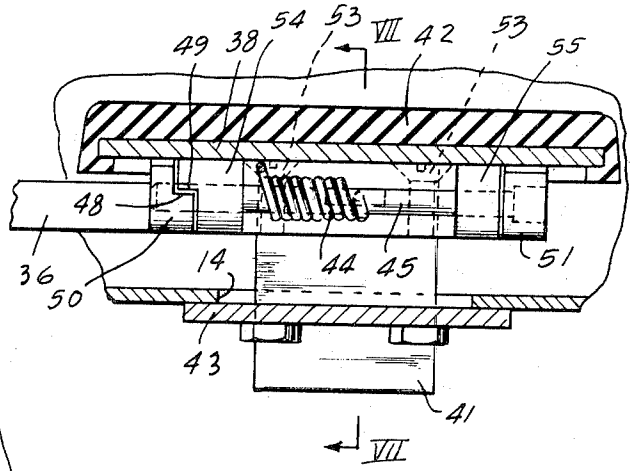


Fig. 8

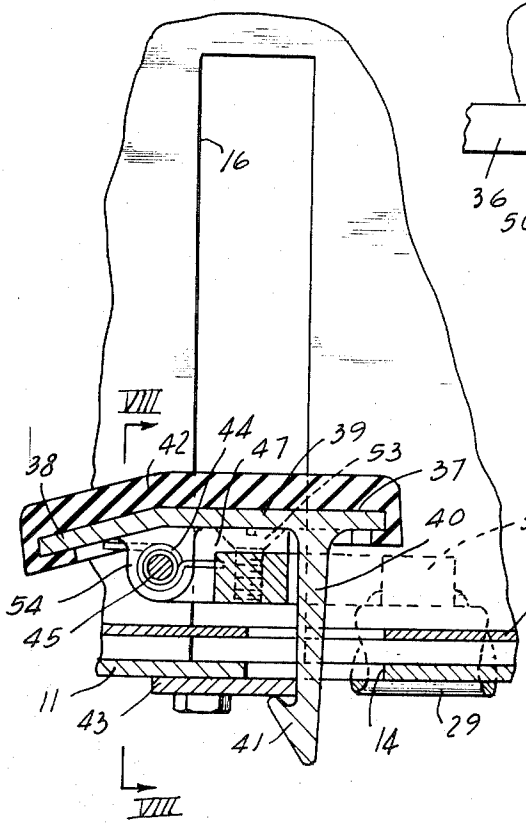


Fig. 7

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CASTER-JACK MECHANISM FOR PORTABLE APPLIANCES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is in the field of jack mechanisms for raising a heavy article or appliance off its normal support legs and placing it on self-contained casters to enable the user to move the article or appliance around much more conveniently.

2. Description of the Prior Art

There are several instances that we know of in the prior art showing the use of caster raising and lowering mechanisms for permitting easier movement of relatively heavy articles when, for example, it is desired to clean behind them. Williams U.S. Pat. No. 2,042,489 described one such device involving a pedal-operated mechanism which included toggle arrangements which maintain the casters either in a raised or lowered position.

Geldhof U.S. Pat. No. 2,812,189 owned by the assignee of the present application described a caster jack mechanism particularly suited for automatic washing machines including a pair of rotatable shafts coupled together by means of hand-operated lever mechanism which was located outside the perimeter of the cabinet and functioned to either raise or lower the casters as desired.

SUMMARY OF THE INVENTION

The present invention provides a caster jack mechanism which is operated by means of a pedal which itself is located in a recess provided for that purpose in the appliance cabinet. The pedal-operated caster mechanism is easier to use than prior art mechanisms as exemplified in the aforementioned U.S. Pat. No. 2,812,189 in that the operating mechanism is located in the front of the appliance cabinet. In addition, the mechanism of the present invention, being pedal operated, enables the user to shift the machine from a stationary to a movable condition by merely stepping on a pedal rather than manipulating a lever outside the cabinet. By being recesses in the cabinet structure itself, the foot pedal actuator of the present invention provides a clean appearance to the cabinet and eliminates any protruding handles or pedals which could provide a safety hazard and require additional storage and operating space. Furthermore, by recessing the pedal mechanism of the front portion of the cabinet, it is highly unlikely that the user would get his foot under the machine because of the required positioning of the body to actuate the pedal. There is also the advantage that providing such a pedal-operated mechanism makes it possible for the user to provide more leverage and there is no possibility of straining or hurting the back when raising and lowering the appliance.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

FIG. 1 is a fragmentary view in perspective of a corner of a washing machine employing the caster jack mechanism of the present invention;

FIG. 2 is a bottom plan view of the caster jack mechanism;

FIG. 3 is a view in elevation of a subassembly of the jack mechanism, consisting of one of the shafts and its associated bevel gear;

FIG. 4 is a view in elevation of another subassembly, as showing the second shaft which cooperates with the shaft shown in FIG. 3 to provide for raising and lowering of the caster wheels;

FIG. 5 is a view taken substantially along the line V—V of FIG. 4;

FIG. 6 is an end elevational view of the shaft assembly shown in FIG. 3;

FIG. 7 is a fragmentary view taken substantially along the line VII—VII of FIG. 8 showing the pedal mechanism; and

FIG. 8 is a fragmentary cross-sectional view taken substantially along the line 8—8 of FIG. 7, with the view being partially in elevation and partly in cross section.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The description of the preferred embodiments of the present invention will be made in conjunction with the application of the caster jack mechanism to a washing machine, but it will be understood that the invention is also applicable to various types of appliances and other bulky objects which have to be moved occasionally in order to permit cleaning of the surrounding area. The washing machine shown in FIG. 1 includes a cabinet generally illustrated at reference numeral 10, the cabinet including a frame 11 which is arranged to be positioned in a level condition on a floor by means of adjustable leveling pads 12 positioned on the four corners of the frame as illustrated in FIG. 2.

In accordance with the present invention, one of the panels making up the cabinet 10 is provided with a recess into which there is fitted an insert identified as reference numeral 13. Disposed at the base of the insert 13 is a slot 14 which receives a pedal-and-latch mechanism generally indicated at reference numeral 15 of the drawings, the pedal-and-latch mechanism 15 being mounted for up-and-down movement within a slot 16 also formed in the insert 13.

Turning now to FIG. 2, it will be seen that a shaft 17 extends across the width of the cabinet and is journaled for rotation at its opposite ends by means of a pair of brackets 18 and 19 secured to the frame 11. A cotter pin 20 (FIG. 4) is provided at one end of the shaft to limit the amount of sliding movement which the shaft 17 can undergo.

Secured to the shaft 17 in spaced relation are a pair of caster wheel assemblies 21 and 22 as illustrated in both FIGS. 2 and 4. Intermediate the two caster wheel assemblies 21 and 22 there is a sleeve 23 which is rigidly secured to the shaft 17 by means of bolts 24. The sleeve 23 carries a bevel gear 25 which is arranged to mesh with a bevel gear 26, the latter being formed as part of a collar 27 secured by means of bolts 28 to a shaft 29. As best seen in FIG. 2, the shaft 29 is generally perpendicular to the axis of the shaft 17 and is provided with a gooseneck portion 30 to permit the bevel gears 25 and 26 to mesh completely.

One end of the shaft 29 is received within a bearing generally indicated at reference numeral 31 while the opposite end is provided with a cotter pin 32 and positioned behind a plate 33, and a similar cotter pin 34 can be positioned at the end of the shaft 29 which is received in the bearing 31. Roll pins may advantageously be used rather than cotter pins 32 and 34. Conventionally flat washers will be used between the cotter pins and the adjacent bearings.

Intermediate the ends of the shaft 29 there is another caster wheel assembly 35 mounted on plate 56 which is rigidly secured to the shaft 29 and which, in combination with the caster assemblies 21 and 22, provides a three-point suspension for supporting the entire weight of the cabinet when the shafts 17 and 29 are jointly rotated such that the caster wheels engage the floor surface and lift the cabinet off the floor.

In the preferred embodiment, caster wheel assembly 35 is pivotal about a vertical axis, while assemblies 21 and 22 are nonpivotal. It is to be realized that other combinations of pivotal and nonpivotal caster wheel assemblies could be used. Joint rotation of the shafts 29 and 17 is accomplished by means of the pedal-actuated mechanism previously designated at reference numeral 15. An arm 36 of generally rectangular cross section is welded or otherwise suitably secured at one end to the shaft 29, as shown in FIG. 2. Secured to the opposite end of the arm 36 is a pedal 37 having an inclined flange portion 38, a generally horizontal flange portion 39, and a depending portion 40 which, at its end, is formed with a hook portion 41, as shown in FIG. 7. The flange portions 38 and 39 of the pedal assembly are covered by means of a resilient cover 42 composed of synthetic rubber or the like.

Pedal 37 is secured to arm 36 via pedal stop 47 and pin 45. Pedal stop 47 is fastened to arm 36 by screws 53. Pedal stop 47 is provided with a pair of protruding tabs 50 and 51 having a central aperture to receive pin 45. Pedal 37 is also provided with a pair of protruding tabs 54 and 55 having a central aperture to receive pin 45. Thus, pedal 37 is pivotally mounted to arm 36 through pin 45 and pedal stop 47.

Tab 50 of the pedal stop and tab 54 of the pedal have corresponding surfaces 48 and 49, respectively, which engage to limit the rotation of pedal 37 about pin 45 in the counterclockwise direction as viewed in FIG. 7. This limitation of rotation is to prevent excessive travel by hook portion 41 which could damage insert 13 or prevent hook portion 41 from entering slot 14.

As illustrated in FIG. 7, when the pedal assembly is depressed, the hook portion 41 latches under a striker plate 43 which is secured to the cabinet 11 in the vicinity of the slot 14. The hook portion 41 is biased into its latching engagement with the striker plate 43 by the action of a torsion spring 44, the spring 44 being mounted on pin 45, and having one end bottomed under the inclined flange portion 38 and its opposite end received within a suitable aperture provided in pedal stop 47 secured to the arm 36.

Thus, when the user exerts a downward force on the flange portion 39 of the pedal assembly, the hook portion 41 of the pedal assembly is pushed through the slot 14 causing the hook portion 41 to be engaged under the striker plate 43. This causes the arm 36 to rotate the shaft 29 and, through the meshing of the gears 25 and 26, to rotate the shaft 17. The caster wheel assemblies 21, 22 and 35 are thus lowered by their pivotal movement into engagement with the floor surface, raising the cabinet so that it is no longer supported on the pads 12 but rests on the suspension provided by the caster wheel assemblies. To disengage the latch mechanism and restore the cabinet to its original position, it is merely necessary to apply a downward force on the inclined flange portion 38 of the pedal assembly, thereby causing the hook portion 41 to become disengaged from the striker plate 43.

A roll pin 46 is located on gooseneck portion 30 of shaft 29. This pin is to prevent rotation of shaft 29 further than required to retract the caster wheel assemblies, by interfering with shaft 17. By so limiting rotation of shaft 29, the pedal-and-latch mechanism 15 is prevented from rising high enough to damage insert 13.

The caster jack mechanism of the present invention provides a simple means for providing portability to bulky appliances and has the advantage that the operating mechanism is located in the front of the cabinet, in an out-of-the-way position. The recessed position of the actuating mechanism eliminates any protruding handles or pedals which might present a potential hazard. In addition, the location of the actuating mechanism is such that the user's other foot must be positioned outside the frame of the cabinet in order to effectively actuate the pedal mechanism, so that there is little or no danger of the cabinet dropping accidentally on the operator's foot.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A laundry appliance comprising:
a cabinet,
one of the walls of said cabinet having a recessed portion therein, a foot-operable pedal confined within said recessed portion and being accessible for operation therein,
a first shaft supported for rotative movement by said cabinet,
a second shaft at substantially a right angle to said first shaft supported for rotative movement by said cabinet and mechanically coupled to said pedal,
drive means connecting said first shaft to said second shaft for rotating said first shaft in response to rotation of said second shaft,
a plurality of casters distributed in spaced relation along said first and second shafts, said casters being pivotable into cabinet-supporting relation upon rotation of said first and second shafts in one direction,
and latch means coupled to said pedal and engageable with a portion of said cabinet within said recessed portion for holding said first and second shafts in a predetermined angular relationship when said cabinet is supported on said casters.

2. The appliance of claim 1 in which said drive means consists of a pair of bevel gears.

3. The appliance of claim 1 in which said pedal carries a latch means including a hook portion, and also carries a spring which is arranged to urge said hook portion into latched engagement with a portion of said cabinet.

4. The appliance of claim 1 which includes a rigid arm connecting said pedal with said second shaft.

5. A caster jack for use in combination with a washing machine affording a means for lifting the machine for movement from place to place and lowering the machine for direct engagement with the floor for washing, said caster jack mechanism comprising:
first and second shafts at substantially right angles rotatably mounted adjacent the bottom of said machine,
means coupling said first shaft to said second shaft whereby said first shaft rotates in response to rotation of said second shaft,
at least one caster mounted on each of said first and second shafts,
a transverse lever connected to said second shaft,
a pedal mechanism mounted on said lever spaced from said second shaft for rotating said second shaft,
said pedal mechanism including latch means biased to a latching position, and
retainer means connected to said machine and positioned to engage with said latch means when said caster jack mechanism is positioned for lifting the machine for movement.

* * * * *