

Oct. 14, 1952

R. A. CRAMER

2,613,389

COMBINED FOOT AND SPRING SUPPORTED CASTER

Filed Sept. 15, 1949

Fig. 1.

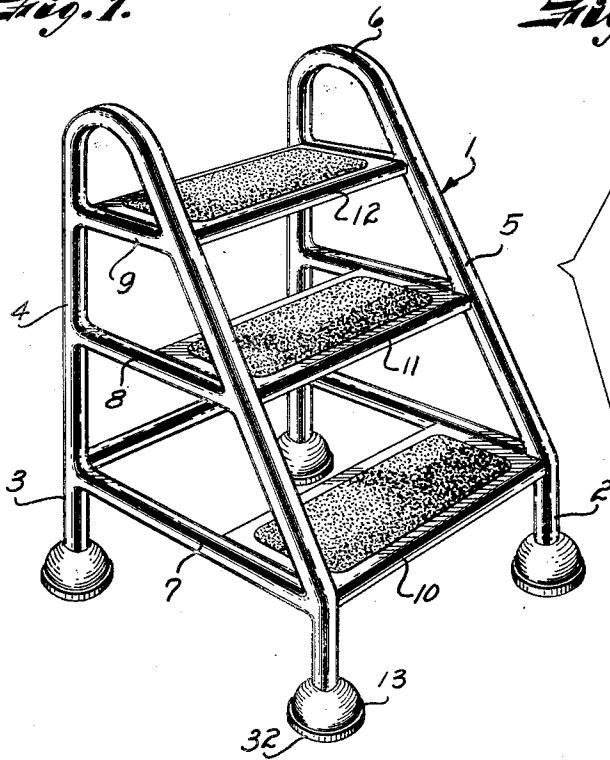


Fig. 2.

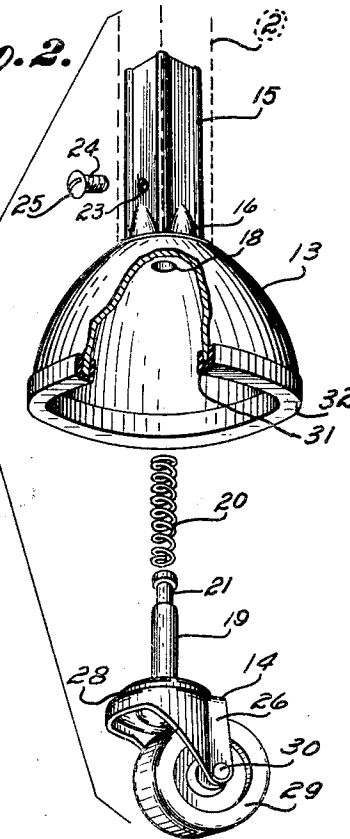


Fig. 3.

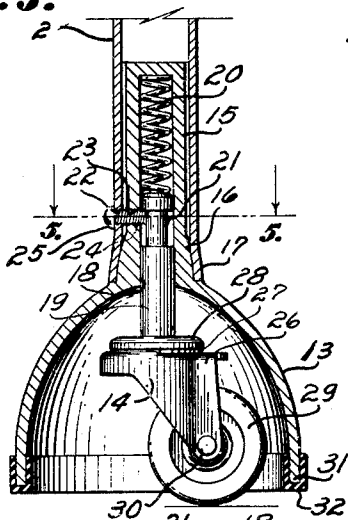


Fig. 4.

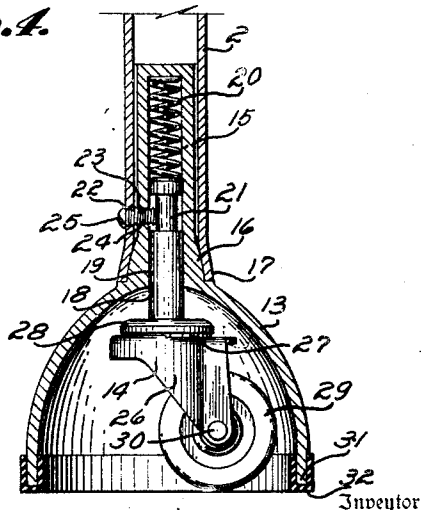
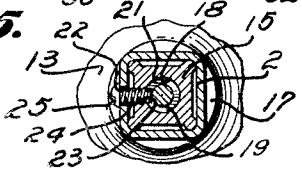


Fig. 5.



Roy A. Cramer

By *Fisburn & Mullandore*
Attorneys

UNITED STATES PATENT OFFICE

2,613,389

COMBINED FOOT AND SPRING SUPPORTED CASTER

Roy A. Cramer, Kansas City, Mo.

Application September 15, 1949, Serial No. 115,800

2 Claims. (Cl. 16—44)

1

This invention relates to a caster-mounted step ladder, and more particularly to a ladder which may be moved freely over a surface and be fixed in a certain location when weight is placed on the steps of the ladder as by a person mounting the same.

The device is particularly adaptable for use in stockrooms, libraries, bank vaults and other places having objects inaccessible to a person from the floor.

The principal object of the present invention is to provide cup members on the bottoms of the legs of the ladder adapted to receive spring tensioned casters and movably retain the same therein so that when no weight is on the ladder, the caster will engage the floor or other surface where the ladder is used.

Other objects of the present invention are to provide a stepladder so that when the weight of the user is placed thereon, the cup members will engage the floor to prevent slipping of the ladder when in use, and when the weight is removed from the ladder, the spring tensioned casters engaging the floor will lift the cup members so that the ladder is readily movable thereover; to provide shanks on the cup members engageable within the hollow legs of the ladder; to provide said shanks with recesses adapted to accommodate springs for providing tension on the shanks of the casters and provide a bearing surface for the shanks of the casters; to provide means for retaining the casters in the shanks of the cup members, and to provide a device of this character, light in weight, simple, economical to manufacture and efficient in operation.

In accomplishing these and other objects of the present invention, I have provided improved details of the structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of my invention.

Fig. 2 is an elevational view of a cup member and caster shown in disassembled relation with parts of the cup broken away to better illustrate the invention.

Fig. 3 is a vertical sectional view through a cup member and leg showing the caster in distended position.

Fig. 4 is a vertical sectional view of the cup members showing the caster in retracted position.

Fig. 5 is a cross transverse sectional view taken on the line 5—5, Fig. 3.

Referring more in detail to the drawing:

1 designates a ladder embodying the features

2

of my invention, comprising a frame structure having front legs 2 and rear legs 3. The legs are extended upwardly to form side members 4 and 5 of the ladder. The side members are substantially triangular shaped with the vertex of the triangle rounded as indicated at 6, and the front portion of the triangle being at a slightly greater angle than the rear portions thereof. Located between the side members 4 and 5 are frames 7, 8 and 9, which are welded to the side members of the framework structure, or which may otherwise be suitably secured thereto. I preferably form the framework structure of tubular material, substantially square in shape, although I do not wish to be limited to any form of structure. The bottom frame 7 is substantially square with its respective corners secured to the frame and a step 10 is provided at the front portion thereof. The frame 8 is substantially U-shaped and a step 11 also provided at the front portion thereof slightly to the rear of the lower step 10. The top frame 9 is also provided with a step portion 12 also slightly to the rear of the second step, and all of the steps are provided with a non-skid material.

Cups or bell-shaped members 13 are provided for housing casters 14. The cups are provided with shanks 15 adapted to engage in the lower ends of the hollow legs 2 and 3 and are pressed therein to form a substantially tight fit. The lower end of the shanks are enlarged slightly as indicated at 16 (Fig. 4) so that when the shanks are pressed into the legs the lower end of the legs will be belled slightly as indicated at 17. The shanks 15 of the cup members are centrally bored to provide a recess 18 to receive the shanks or pins 19 of the casters 14. The recess 18 is substantially deeper than the length of the caster pin 19 to accommodate a coil spring 20 having one end bearing against the top of the caster pin and the other against the top of the recess in the shank 15 of the cup member.

Located substantially near the upper end of the shank 19 of the caster is an annular groove 21. The lower portion of the hollow leg members are provided with openings 22 and the shanks 15 of the cup members are also provided with threaded openings 23 adapted to receive a threaded shank 24 of a set screw 25, the inner end of the set screw being adapted to engage in the annular groove 21 in the pin of the caster. The set screw provides a stop limiting movement of the caster pin vertically in the recess of the shank of the cup member and retains the casters in the shanks of the cup members.

3

The caster 14 includes the frame 26 in which the shank 19 is rotatably mounted including ball bearings as indicated at 27 (Fig. 3) retained by the housing 28. A roller 29 is secured in the frame by a pin 30. The open lower edges 31 of the cups are provided with a non-skid covering 32. While I have here shown a U-shaped rubber member for this purpose, other material may be utilized without departing from the spirit of my invention.

With the structure illustrated and described, the coil springs 20 exert pressure on the top of the recesses in the shanks of the cup members and on the shanks of the casters effecting relative movement therebetween moving the cup members upwardly to the limit of the annular groove 21, thus causing cup members to be spaced from the floor and the roller of the caster to engage the floor so that the ladder may be freely moved thereover. This position of the caster is illustrated in Fig. 3. When weight is placed upon the ladder as by a person stepping on the step members, the cup members will be pressed downwardly into engagement with the floor to prevent slippage thereon. The rubber covering for the bottom of the cups will aid in preventing such slippage.

It would be obvious from the foregoing that I have provided an improved caster mounting for step ladders or the like in which the cup members will engage the floor and prevent rolling of the caster wheels thereon when weight is placed on the ladder, and will automatically be raised from the floor for rolling movement of the ladder on the casters upon weight being removed from the ladder.

I claim:

1. A caster mounting for an article of furniture having a leg with an opening extending axially thereof, a shank, the lower end of said shank having a thickened portion adapted to engage in said opening whereby forcing of the shank in said opening will center the same therein and prevent rotation thereof, said shank being axially bored and having its upper end closed forming a socket therein, a substantially bell-shaped member secured to the lower end of said shank and having a non-skid member on its lower edge, a caster having a stem rotatably mounted in said socket, the upper end of said stem being spaced from the closed end of the shank, a coil spring having one end engaging against the closed end

4

of said shank and its other end against the upper end of the stem on the caster and normally urging the caster downwardly, and means in said shank and stem cooperating to retain the stem in the socket to limit movement of said caster by said spring and adapted to cooperate with a tubular leg to retain the shank in the opening thereof.

2. A caster mounting for an article of furniture having a leg with an opening extending axially thereof, a shank, the lower end of said shank having a thickened portion adapted to engage in said opening whereby forcing of the shank in said opening will center the same therein and prevent rotation thereof, said shank being axially bored and having its upper end closed forming a socket therein, a substantially bell-shaped member secured to the lower end of said shank and having a non-skid member on its lower edge, a caster having a stem rotatably mounted in said socket, the upper end of said stem being spaced from the closed end of the shank, a coil spring having one end engaging against the closed end of said shank and its other end against the upper end of the stem on the caster and normally urging the caster downwardly, said shank having a threaded opening near its lower end which is adapted to align with a similar threaded opening in a tubular leg, the upper end of said stem having a reduced portion forming an annular groove, and a threaded pin adapted to engage in the threaded opening in such leg and engaging in the threaded opening of the shank and having its inner end engaging in said annular groove to retain said stem in the socket and to limit movement of same therein in response to pressure of the spring.

ROY A CRAMER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
282,099	McDonald	July 31, 1883
615,155	George	Nov. 29, 1898
1,064,244	Neugebauer	June 10, 1913
1,152,687	Acton	Sept. 7, 1915
1,409,150	Blood	Mar. 14, 1922
1,749,751	Bergsten	Mar. 11, 1930