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2,398,812

LADDER ASSEMBLY

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FIG 1

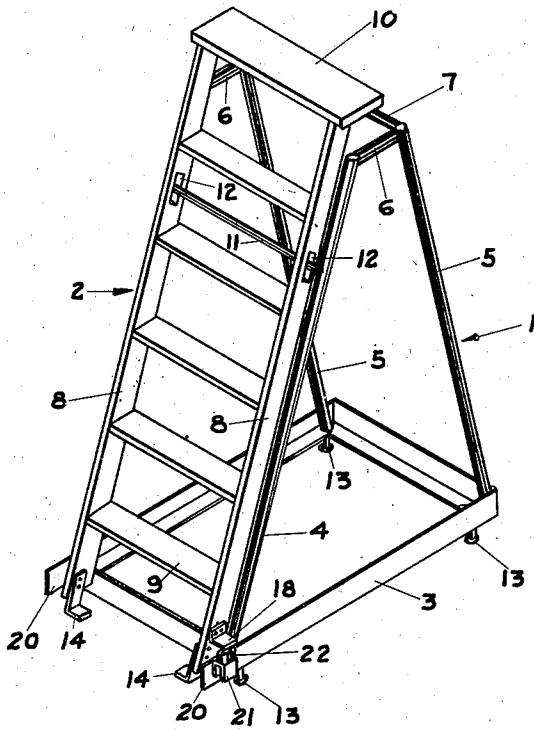


FIG 2

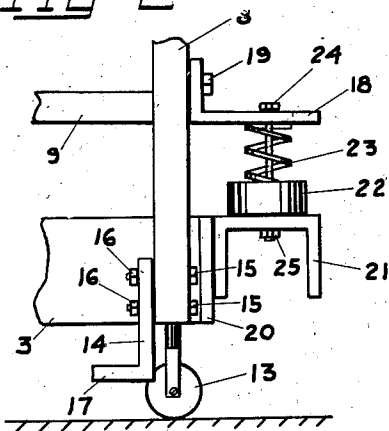
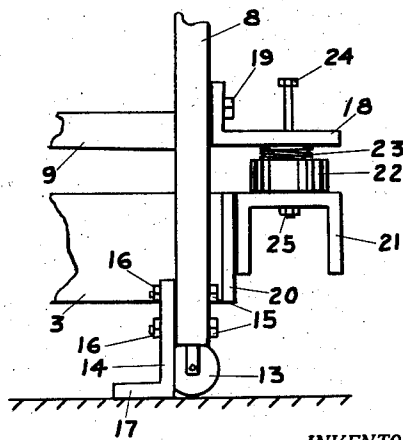


FIG 3



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LADDER ASSEMBLY

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2 Claims. (Cl. 228-15)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to a ladder assembly and more particularly to a portable ladder assembly of the type adapted to be used in stockrooms and which may be moved about freely and yet secured in a fixed location when an individual stands on the ladder.

It stockroom work, it is desirable to employ a ladder of the step-ladder type which may be moved about as desired to furnish access to regions normally out of reach of an individual. Heretofore, such ladders have been mounted on castors or wheels to enable them to be moved easily, but the castors or wheels have had a tendency to move or slip when an individual stands on the ladder, with the result that the individual may sustain a serious injury from a fall.

It is the principal object of the present invention to provide a ladder assembly suitable for stockroom work and which may be moved about freely on castors or wheels when unoccupied, but which is automatically secured in a fixed location when an individual stands thereon.

It is a further object of the invention to provide for carrying out the foregoing object in a facile, economical, and efficient manner.

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

Fig. 1 is a perspective view of a ladder assembly embodying my invention.

Fig. 2 is an enlarged detail elevational view of a portion of the ladder assembly showing the position of certain of the parts when the ladder is unoccupied.

Fig. 3 is a view similar to Fig. 2, but showing the position of the parts when the ladder is occupied.

Referring more in detail to the drawing:

The ladder assembly embodying my invention comprises a frame structure, designated generally as 1, on which is supported the ladder, designated generally as 2.

The frame structure 1 preferably comprises an angle iron base 3 substantially rectangular in outline and formed by welding together suitable lengths of angle iron. Suitably secured to the base 3, as by welding, are a pair of rearwardly sloping front frame members 4 and a pair of forwardly sloping rear frame members 5. The respective frame members 4 and 5 are secured together by a pair of substantially horizontal connecting members 6 and the members 5 are further secured together by the substantially horizontal

transverse cross member 7. Preferably, the members 4, 5, 6, and 7 are formed from metal pipes or rods and are secured together by welding. It is thus seen that the frame structure 1 is firmly constructed to enable it to support the weight of the ladder 2 and an individual standing thereon.

The ladder 2 preferably comprises a pair of side rails 8 and a plurality of steps 9 suitably secured thereto. The uppermost step may be extended over the side rails to form a shelf or platform, as indicated at 10.

A cross bar 11 is suitably secured between the front frame members 4. The side rails 8 of the ladder 2 are provided with elongated slots 12 through which the cross bar 11 passes to attach the ladder 2 to the frame 1. The ladder is thus secured to the frame in such a manner that it cannot readily be removed therefrom, but may be moved vertically with respect thereto to the limits permitted by engagement of the cross bar 11 with the upper and lower bounding edges of the slots 12.

The frame assembly is preferably supported on a plurality of castors or wheels 13 suitably secured to the base 3. This manner of support enables the assembly to be moved easily about as desired over the surface on which it rests.

In order to prevent unintended movement of the assembly when an individual stands on the ladder, I provide a novel mechanism for holding the assembly in a fixed location at all times during which the ladder is occupied. The mechanism preferably comprises a pair of feet 14, one of which is preferably secured to each side rail adjacent the lower end thereof, as by means of the bolts 15 and nuts 16. The feet 14 each preferably have flange portions 17 adapted to engage the surface on which the assembly rests whenever the ladder is occupied. The frictional force between the feet and the surface substantially prevents movement of the assembly about the surface on the castors or wheels 13.

It is desirable that the feet 14 should automatically be forced into engagement with the supporting surface whenever an individual steps on the ladder and that these feet should automatically be removed from such engagement when the individual steps off the ladder, and I have provided a further novel mechanism for accomplishing this latter purpose.

A pair of brackets 18 are suitably secured to the side rails 8 of the ladder above the feet 14, as by means of the screws 19, one bracket 18 preferably being secured to each side rail 8. The side members of the base 3 preferably are pro-

vided with forwardly extending portions 20, to which are suitably secured, as by welding, a second pair of brackets 21, one bracket 21 preferably being secured to each extending portion 20. The brackets 21 preferably are of channel shape, the webs of which support cups 22. Fitted within each cup 22 is a compression spring 23 on which rests the adjacent bracket 18. A bolt 24 extends through each bracket 18, spring 23, cup 22, and bracket 24 and is held in position by a nut 25. The bolts 24 and nuts 25 retain the springs and flanges in the proper relationship and also act to limit relative upward movement of the ladder on the frame.

Operation

When the ladder is unoccupied, the assembly may be freely rolled about on the castors or wheels 13 to any desired location. The springs 23, acting between the brackets 18 and 21, support the weight of the unoccupied ladder on the frame and maintain the feet 14 out of contact with the supporting surface, Fig. 2.

When an individual steps on the ladder, his weight is transmitted to the springs 23 and the force thereof compresses these springs. The ladder is thus moved downwardly relative to the frame 1 against the action of the springs 23 until the feet 14 engage the surface on which the assembly rests, Fig. 3. Friction between the flanges 17 of the feet 14 and the surface is sufficient to prevent undesired movement of the assembly as long as the ladder is occupied. When the individual steps off the ladder, the springs 23, acting between the brackets, automatically raise the ladder to the position shown in Fig. 2 in which condition the assembly may again be moved about freely.

While I have shown but one embodiment of my invention, it is apparent that the structure is susceptible to modification without departing from the spirit of the invention. I do not wish, therefore, to be limited by the disclosure set forth, but only by the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A ladder assembly comprising a frame having a substantially rectangular base, upwardly extending front and rear frame members secured to said base, connecting members securing said front and rear members together respectively, a cross member securing said rear members to each other, and a cross bar connected between said front members, said base being mounted on castors, a ladder having a pair of side rails and a plurality of steps secured between said side rails, said side rails having elongated slots through which said front cross bar passes to join the ladder to the frame and permit relative vertical movement therebetween, feet on said side rails adapted to engage a surface on which the assembly rests in the lowered position of the ladder on the frame to prevent unintended movement of the assembly on said surface, at least one bracket secured to a side rail of the ladder, at least one bracket secured to said base in cooperative relation to said first named bracket, and means between said brackets tending to raise said ladder with respect to said frame and maintain said feet out of contact with the surface on which the assembly rests.

2. A ladder assembly comprising a frame having a substantially rectangular base, front and rear frame members secured to said base, connecting members securing said front and rear members together respectively, a cross member securing said rear members to each other, and a cross bar connected between said front members, said frame being mounted on castors, a ladder having a pair of side rails and a plurality of steps secured between said side rails, said side rails having elongated slots through which said cross bar passes to join the ladder to the frame and permit relative vertical movement therebetween, means on said side rails adapted to engage a surface on which the assembly rests in the lowered position of the ladder on the frame to prevent unintended movement of the assembly on such surface, and means arranged between portions of said ladder and said base tending to raise said ladder with respect to said frame.

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