May 31, 1955 H. M. WOODBURN 2,709,626

LADDER STEP

Filed July 23, 1951

Fig. 1

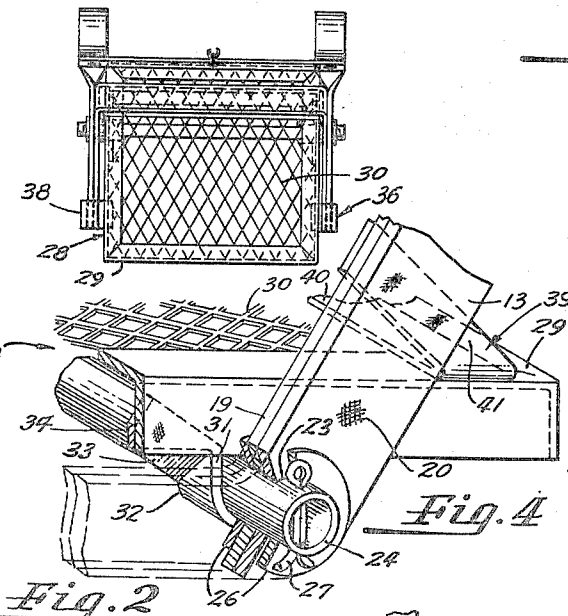


Fig. 4

Fig. 2

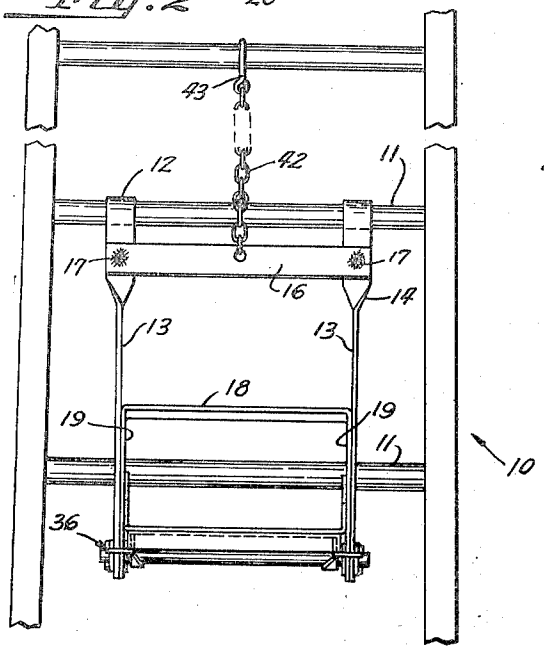


Fig. 3

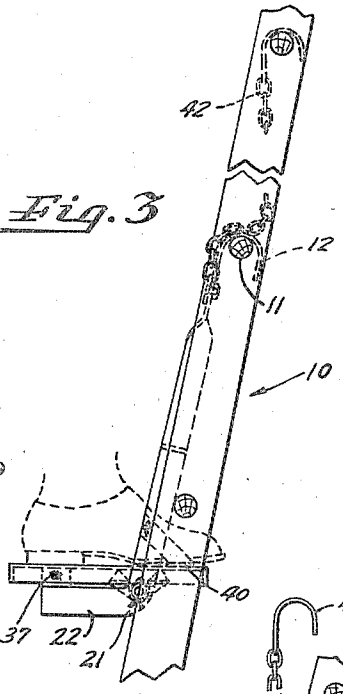
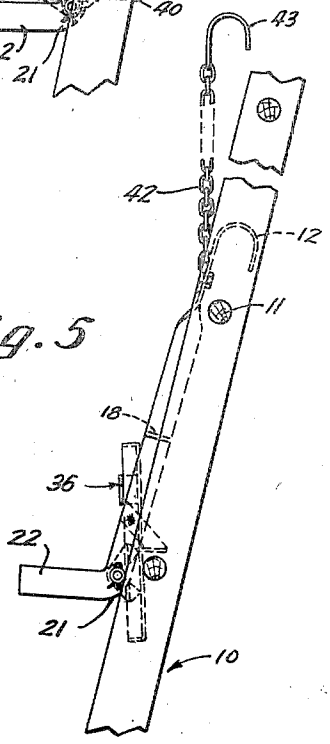


Fig. 5



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LADDER STEP

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3 Claims. (Cl. 304—31.5)

This invention relates to steps for ladders and more particularly to a collapsible and detachable step which may be attached to a rung ladder at any elevation and when attached at the desired location, the step may be swung to operative position so that a person using the ladder may stand at ease especially when he will operate from that position for a relatively long time.

An object of this invention is to provide a detachable step for rung ladders, which is strong in construction so that a person standing on this step has ample freedom of movement without fear of tipping or bending the step.

A further object is the provision of a detachable step which is light in weight so that a person climbing the ladder may easily carry it with him until the desired elevation is reached when it can be easily mounted for use, or if more convenient, the step may be lifted by a chain a rung or two at a time until the desired elevation is reached.

A still further object is the provision of a detachable step for a rung ladder which is economical to make at a low cost and which provides the maximum of safety in use, especially in the protection against unintentional tipping of the tread member when in use.

Further objects will be apparent from the following specification, appended claims and drawings thereof in which—

Figure 1 is a plan view of the step;

Fig. 2 is a front elevation of the step applied to a rung ladder;

Fig. 3 is a side elevation of the step applied to a ladder;

Fig. 4 is a perspective of an enlarged detail showing the pivotal mounting for the step, and

Fig. 5 is a side elevation of the step applied to a ladder, but showing the step folded.

To stand on a rung of a ladder for any period of time is very tiring and whether the ball of the foot, or the arch of the foot rests upon the rung of the ladder, the leg muscles soon become cramped or quivery and necessitate the shifting of the weight from one position to another.

This causes a distraction from what is being done and often requires a longer time fighting the fatigue than would occur if the job could be performed in a relaxed state.

This invention allows a person performing an operation such as painting, electrical work or any of the many other operations which have to be performed from ladders, to be relaxed even though he may be relatively high above the floor or ground.

Referring more specifically to the drawings, there is shown a ladder **10** having the usual rungs **11** therein. In use this ladder is allowed to lean against a wall or other supporting object at the proper angle for stability and the person desiring to use the ladder climbs it to the desired elevation. He carries his paints or kit of tools as the case may be, and he can also carry the step disclosed herein. Being light in weight it may be

easily handled, or for freedom in the use of the hands, he may prefer to move the step up a few rungs at a time. When the desired height is reached, the hooked ends **12** of the side members **13** are hooked over one of the rungs **11**, and the depending sides of the members **13** are allowed to rest against the next lower rung **11** so that the step is securely supported.

The side members are formed of flat stock and are given a one quarter twist at **14** so that the flat face of the stock permits easy bending for the hooks **12**, and flat areas engage the rung **11**, while below the twisted areas, the flat faces are in a plane common to the greatest bending moments when the step is loaded. This allows one edge of each side member to engage the next lower rung.

A cross member **16** is spot welded to the side members **13** at **17** above the twisted areas to provide a more rigid structure and a brace **18** has its end extensions **19** spot welded to the inner faces of the side members **13** at **20**. This provides a double thickness of metal in each side member for greater rigidity in each side member from the brace **18** to the end of each of these side members. Each side member **13** is bent at **21** to present an outward extension **22**.

Each side member has a hole **23** drilled in it in the bend **21** to receive a cross tubing **24** which is held in place by washers **26** and cotter pins **27**. A step **28** is pivotally mounted upon this cross tubing **24**.

A length of light angle iron is notched and bent to form a rectangular frame **29** having its ends and notched edges welded to form a rigid structure. A piece of expanded metal **30** is spot welded inside the frame to form a tread area. Brackets **31**, formed of flat stock are spot welded inside the end members of the frame **29** and these brackets are bent and twisted to form straps **32** which hold the step **28** pivotally on the tube **24**, and ears **33** which are twisted from the straps **32** to the ears **34** which are welded in place in the frame **29**.

The end members of the frame **29** are also provided with brackets **36** which are bent at right angles to provide ears for spot welding to the inside faces of the angle iron ends at **37**, and the ears **38** which rest upon the extensions **22** of the side members **13** and **19**.

After the step **28** has been placed upon the tube **24** and the washers **26** and cotter pins **27** have been assembled, the side members **13** are tied together in spaced relation for greater strength to resist lateral bending of these side members.

The step **28** is swung to horizontal position as shown in Figs. 2 and 3 so that the extensions will engage and support the ears **38** on the step. As the step extends beyond the fulcrum in both directions, a brace **39** has a flat section **40** overlying the tread area of the step adjacent its forward edge and has the ends **41** bent perpendicularly and at a rearward angle to the flat surface **40**, and has these ends **41** spot welded in place to the inside faces of the side members **19** of the brace **18**. This flat area **40** comprises a portion of the tread area so that a person standing on the step distributes part of his weight upon the area **40**, and cannot apply his weight to the forward edge of the step to cause the step **28** to tilt forwardly.

To facilitate raising or lowering the step as one ascends or descends the ladder, a chain **42** is attached to the cross member **16** and a hook **43** is attached to its free end. This allows a person to ascend the ladder with his necessary equipment and maintain a degree of freedom to hold onto the rungs of the ladder with one hand as he advances the step upwardly a rung or two at a time.

While I have described one embodiment of the structure in which the parts are mostly formed from sheet

metal it will be obvious that the parts may be formed by other means, as by casting or other conventional fabricating methods, depending upon the cast and the availability of materials.

In use, the step may be raised to a desired elevation with the step folded as shown in Fig. 5, using the hook **43** and chain **42** as a medium for dragging the step up the ladder, or by suspending the step beside the ladder. The hook may be raised a rung or so and hooked to the rung as a person ascends the ladder so that he may not have his hands too occupied for safety. At the desired elevation the hooks **12** are engaged with one of the rungs of the ladder and the edges of the sides **13** are allowed to rest against the next lower rung **11**. The step is swung to horizontal position and the user steps upon the tread area from the rung below or from the rung above as the case may be. The imposed weight on the step causes it to grip the supporting rung **11** firmly and the step and its frame provides a sturdy, comfortable standing area. The rung **11** upon which the frame is hung is free for use and may be stepped on if it is desired to change the location of the step with respect to the ladder, or to lower it.

I claim:

1. A detachable step for rung ladders comprising spaced side members having hooks on one end thereof for engaging the rung of a ladder, lateral extensions on the other ends of said side members extending transversely from one side thereof, a step pivotally mounted between said side members and having portions thereof extending on opposite sides of the pivot axis thereof, brackets on one of said portions of said step engageable with the top of said lateral extensions when said step is in its extended position, and a cross piece secured to said side members and having a flat portion overlying the other of said portions of the step closely adjacent the upper surface thereof in the extended position of the step with its major plane extending parallel with the upper surface of the step.

2. A detachable step construction for rung ladders comprising a support framework having means at its upper end for engaging a rung of a ladder to suspend the support framework therefrom, said support framework having a downwardly extending portion depending from said rung engaging means adapted to have one side thereof engage a lower rung on the ladder, said support framework including a rigid portion on the lower end of said depending portion extending transversely from the other side of said depending portion, a flat step pivotally mounted on the lower end of said depending portion for movement about an axis intermediate the side edges of the step, means on said step laterally offset from one side of the pivot axis thereof for engaging the top of said rigid portion, and means secured to said downwardly extending portion for engaging the top of said step on the other side of the pivot axis thereof.

3. A detachable step for rung ladders comprising a support framework including spaced side members of light flat stock having hooks formed on the upper ends thereof, said side members having the major portions thereof disposed with the flat sides in spaced parallel relation, a first cross member having the ends thereof bent in parallelism with said side members and having said ends secured to said side members to reinforce the latter, a second cross member extending through said side members and said ends of said first cross member, a step pivotally mounted on said second cross member between said side members, said side members at their lower ends being bent transversely to provide extensions constructed and arranged to extend outwardly from one side of said support framework, and ears on said step spaced from the pivotal mounting thereof engaging the tops of said extensions to support the step in an extended position.

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