July 25, 1939. K. O. MUEHLBERG 2,167,157

FOLDING STEPLADDER

Filed July 2, 1937

Fig. 1.

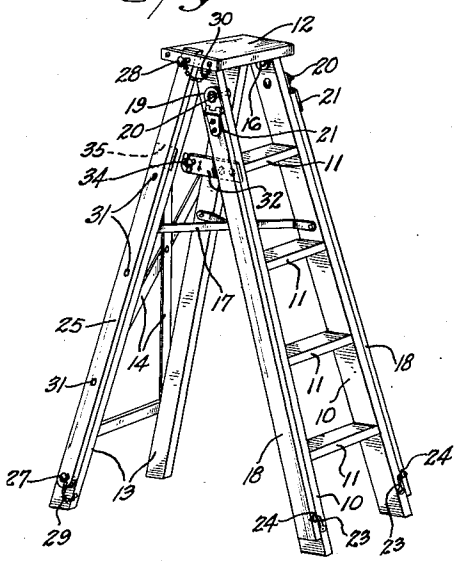


Fig. 2.

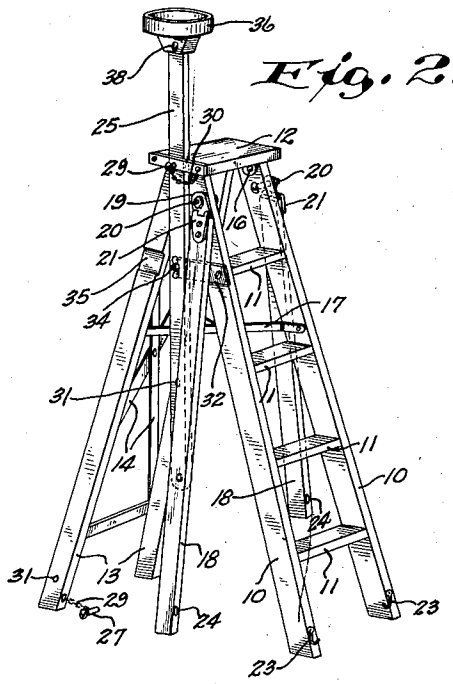


Fig. 5.

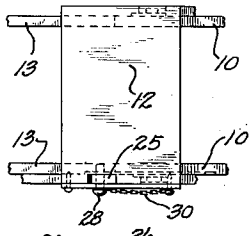


Fig. 3.

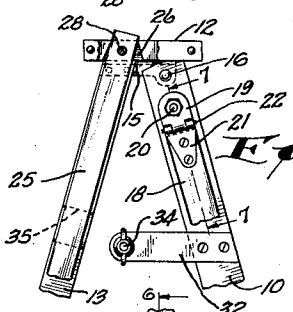


Fig. 4.

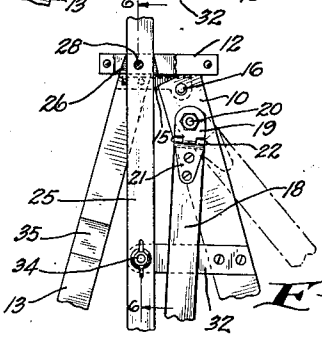


Fig. 6.

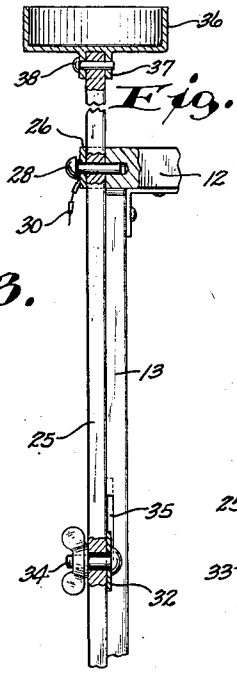


Fig. 7.

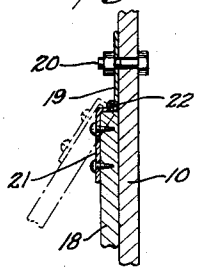
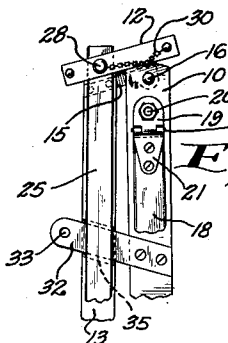


Fig. 8.



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FOLDING STEPLADDER

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Application July 2, 1937, Serial No. 151,635

1 Claim. (Cl. 228—60)

This invention relates to improvements in folding stepladders.

In the ordinary stepladder construction the support of the same in unfolded condition for use is dependent upon the angular disposition of the hinged legs with the ladder unit. At best, stepladders, especially when used on an uneven base or support, are shaky and wobbly, and there is always the hazard of the same collapsing or tipping while in use and when a worker has mounted the same.

A general object of the present invention is to overcome the above objections inherent to the ordinary type of stepladders by providing a folding stepladder construction having auxiliary movably mounted leg or bracing elements which can be positioned so as to additionally brace and steady the ladder when it is unfolded and open for use.

A further object of the invention is to provide a folding stepladder of the character described having auxiliary leg or bracing elements which are mounted for movement in several planes relative to the ladder and which, when not in use, may be folded compactly against the side rails of the ladder.

Ordinary stepladders are inadequate as to providing supporting means for a worker positioned on any of the upper steps of the ladder. Furthermore as the worker is positioned near the upper portion of the ladder, the ordinary stepladder fails to provide any suitable, conveniently positioned supporting means for any of the worker's materials or tools.

With the above in mind, the invention has as a further object the provision of an adjustable supporting element which may be projected vertically above the upper end of an opened-out stepladder for the purpose of aiding in the support of the worker and the worker's tools and materials.

A further object of the invention is to provide a folding stepladder of the character described which may be collapsed as compactly as the standard forms of stepladders.

A further object of the invention is to provide a folding stepladder which is of very simple construction, which is easy to manipulate and adjust, which is strong and durable and secure, which is inexpensive to manufacture, and which is well adapted for the purposes set forth.

With the above and other objects in view the invention consists of the improved folding stepladder, and its parts and combinations as set forth in the claim, and all equivalents thereof.

In the accompanying drawing in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a perspective view of the improved stepladder in open or unfolded position with the auxiliary supporting and bracing instrumentalities in inoperative position;

Fig. 2 is a similar view only showing the supporting and bracing elements moved into operative positions;

Fig. 3 is a fragmentary side view of the upper portion of the stepladder, with the bracing and supporting elements in inoperative position and portions broken away to show structural details;

Fig. 4 is a similar fragmentary side view only showing the operative positions of the supporting and bracing instrumentalities;

Fig. 5 is a plan view of the stepladder as arranged in Fig. 3;

Fig. 6 is a vertical sectional view, on a larger scale, indicated on line 6—6 of Fig. 4 and showing a utensil mounted at the upper end of the vertically adjustable supporting element;

Fig. 7 is a vertical sectional detail view taken on line 7—7 of Fig. 3; and

Fig. 8 is a fragmentary side view of the upper end of the stepladder in collapsed condition.

Referring now more particularly to the drawing, it will appear that the improved stepladder includes a pair of transversely spaced-apart side rails 10 to which are secured the ends of vertically spaced-apart, and horizontally disposed steps 11. An enlarged top platform 12 is pivotally mounted relative to the bevelled upper ends of the side rails 10 and projects laterally of said rails.

The stepladder is provided with the usual supporting legs 13 which are held together as a unit by suitable braces and struts 14, in a manner so that said legs 13 are slightly downwardly, outwardly divergent. The upper ends of said legs 14 are fastened to a bracket 15 which is carried by the top platform 12 and which is pivotally associated with the step rails 10, as at 16.

From the construction thus far described it will be evident that the connected legs 13 may be diverged relative to the step rails 10, and when the ladder is in open position it is arranged as shown in Figs. 1 and 2, and it may be held in this position by the usual foldable struts 17 extended between the rails 10 and supporting legs 13. From the open position of Fig. 1 the ladder may be moved to collapsed position as shown in Fig. 8 wherein the legs 13 are moved adjacent

the inner faces of the rails 10, by virtue of the pivotal mounting 16.

One feature of the invention resides in the provision of auxiliary supporting legs or bracing instrumentalities indicated generally by the numerals 18. An auxiliary leg 18 is positioned adjacent an outer face of each of the rails 10 and consists of an elongated member, substantially co-extensive with the rail. At the upper end of each auxiliary support 18 there is a pivot plate 19 pivotally held to the upper portion of the respective rail 10 by a pivot bolt 20. The upper end of each element 18 carries a hinge plate 21 which is connected to an adjacent portion of the plate 19 by a pintle 22. It will thus be seen that each auxiliary leg 18 is free to swing on its pivotal mounting 19 angularly in the plane of its rail 10, and it is also free to swing in a plane at right angles thereto on the pintle 22. When not in use the auxiliary legs 18 are held in the position shown in Fig. 1 by hooks 23 engaging eyes 24.

Another feature of the invention referred to is a supporting element 25 susceptible of vertical projection relative to the ladder. Said member 25 is an elongated member disposed, in inoperative position, against an outer face of one of the legs 13, and substantially co-extensive therewith, as in Fig. 1. Said vertical supporting element 25 extends through a slot 26 provided therefor in one side of the top platform 12. As best shown in Figs. 3 and 4, said slot 26 is outwardly downwardly enlarged and tapered so as to permit movement of the member 25 from the angular position of Figs. 1 and 3 to the vertical position of Figs. 2 and 4.

When said vertical supporting element 25 is in inoperative position, as in Figs. 1 and 3, it is lowered against the outer face of the adjacent leg 13 with its upper end projecting only slightly above the top platform 12. It is secured in position by the lower pin 27 and an upper pin 28 passed through registering openings therefor in the ends of the member 25 and in the leg 13 and side edge of the platform 12. Said pins 27 and 28 are carried on secured chains 29 and 30 so that the same will not become lost and will always be available.

The auxiliary vertical supporting element 25 is only adapted for use when the ladder is in unfolded operative position. It is then used when the worker desires a supporting medium, either for himself or for materials, which is projected vertically substantially above the upper platform 12. This adjustment is accomplished by removing the pins 27 and 28 and swinging the member 25 to a vertical position and then projecting it vertically upwardly the desired extent. The member 25 is formed with a series of spaced apertures 31, and a selected aperture is brought into registration with the aperture in the side edge of the platform 12. Then the upper bolt 29 is inserted through these registering apertures. The auxiliary member 25 is further held in adjusted projected position by a brace 32 which projects horizontally rearwardly from one of the rails 10. The outer free end of this brace 32 has an aperture 33 therein which is adapted to coincide with one of the apertures 31 in the member 25, and then a bolt 34, carrying a winged nut, is inserted through said last mentioned registering aperture to additionally secure the member 25 in its position of vertical adjustment. This arrangement is clearly disclosed in Figs. 2 and 4. Due to the inner or rearward projection of the brace 32, the adjacent rear leg 13 is provided with a recess 35, which recess accommodates the extending portion of the brace when the ladder is completely collapsed as in Fig. 8.

A material receptacle 36 is adapted for removable mounting on the upper end of the support 25 when it is in vertically projected position, according to the requirements of the worker. This receptacle has a bifurcated lower end 37 into which the upper end of the member 25 extends, and releasable connection of the element 26 to the element 25 is effected by a pin 38 inserted into registering apertures as in Fig. 6.

It will be obvious from the description that the improved stepladder is susceptible of normal and ordinary usage as in Fig. 1. When so used the auxiliary legs and supporting members are held compactly against the stepladder elements and do not in any manner interfere with the use and operation of the ladder, and said elements are also maintained in the latter position when the ladder is collapsed, and they do not in any way interfere with the folding or unfolding of the ladder. If it becomes desirable to additionally brace the ladder, either or both of the auxiliary legs 18 may be swung so as to engage the ground or base and are especially effective if the ground or base is uneven, as said legs may be swung in several planes so as to most effectively engage the support and prevent the wobbling or unsteadiness of the ladder. The member 25 may be easily projected into a supporting position whenever desired and provides means for the worker to hold onto and also provides a convenient receptacle for working materials when the member 36 is positioned as shown in Figs. 2 and 6.

From the foregoing it will be evident that the improved folding stepladder is of simple and novel construction and is well adapted for the purposes set forth.

What is claimed as the invention is:

A stepladder, comprising a ladder member having side rails and a top platform, there being a tapered slot in the latter, supporting legs foldably connected with said platform, an elongated arm slidably mounted through the tapered slot in said top platform and normally disposed at an angle to vertical against a side of a supporting leg and in coincidence therewith, said arm being movable in the slot of the platform to a selected position of projection extending vertically above said platform, means on the upper end of said arm permitting the mounting of a receptacle when the arm is in a projected position, and means for releasably retaining said arm in either its lowered angular position against a leg or in a selected projected vertical position, the means for retaining the arm in a selected projected position and for mounting a receptacle on the arm being accessible and operable only when said supporting legs are extended for ladder supporting purposes.

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