Oct. 20, 1953 A. L. WHITE 2,656,088

STEPLADDER HAVING SAFETY SUPPORTING BAR

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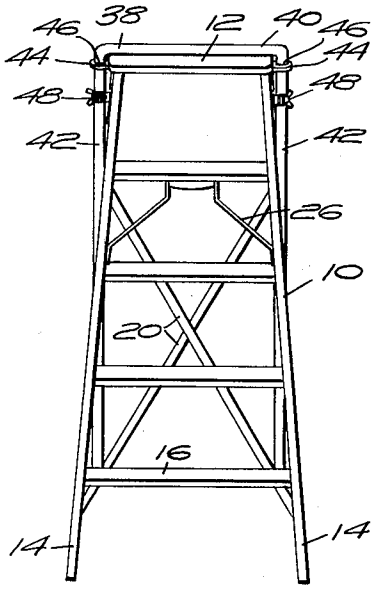


Fig. 1

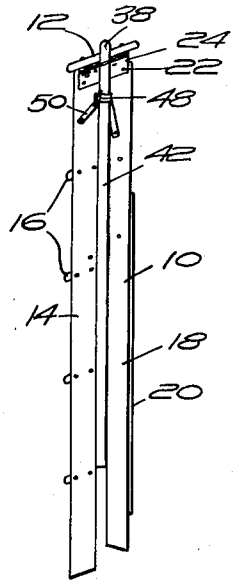


Fig. 2

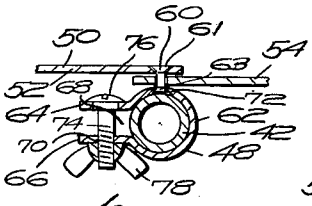


Fig. 6

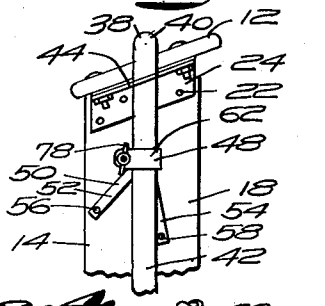


Fig. 4

Fig. 3

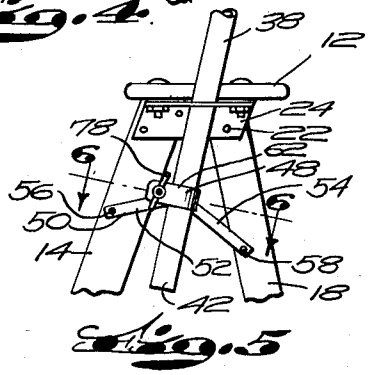


Fig. 5

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STEPLADDER HAVING SAFETY SUPPORTING BAR

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My invention relates to step-ladders, particularly those of the type having a safety supporting bar which may be either initially built into the step-ladder or sold as a separate attachment therefor.

Various types of safety attachments have been provided for knock-down step-ladders, but so far as I am aware these have been clumsy types of devices which permanently protrude from the step-ladder either in set-up or knocked down form.

In accordance with my invention, I provide a safety supporting bar for a step-ladder, comprising a U-shaped bar having a base of a width substantially that of the step-ladder platform and elongated U legs depending therefrom adapted to straddle the platform, movable, from a closed position with its U base immediately above the platform, to a raised position above and slightly in rear of said platform when the ladder is set up in used position, of any desired adjustable height from said platform in a position permitting the free climbing of the user to the top of the step-ladder, including the platform thereof and legs each of which is firmly anchored to a side of the step-ladder and which thereby provides a positive supporting means for the user of the step-ladder which is so stable in use that it may be leaned against by the user in use or may be used by the user to grasp in use and in which the depending U legs may be moved to a substantially concealed position between the front legs and rear legs of the step-ladder interior of the lower portions of the outwardly flaring walls thereof when the step-ladder is in a folded position, thus taking up no more room for storage than the step-ladder itself and solving the problem of how to use a U bar having legs extending downwardly at right angles from the base thereof in a step ladder.

An object of my invention, therefore, is to provide a step-ladder having a supporting bar which may be raised to any desired number of adjustable positions above the step-ladder platform and locked in a set position.

A further object of my invention is to provide a supporting bar for a step-ladder which is firmly anchored to both sides of the step-ladder in use so as to provide a positive support for the user.

A further object of my invention is to provide a supporting bar for a step-ladder which when moved to its position for use does not interfere with the user in climbing the steps of the step-ladder or in working on the ladder.

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A further object of my invention is to provide a supporting bar for step-ladders which may be raised to a position such that the user may lean his whole weight against it for support, leaving his arms available for other work and which alternatively may be used, if desired, to hang buckets or other paraphernalia thereon.

A further object of my invention is to provide a supporting bar for step-ladders which may be moved to a lowered position so that the legs thereof slide in between the front and rear legs of the step-ladder to be concealed thereby and so that said supporting bar will positively take up no more volume than the volume taken up by the step-ladder in storage.

A further object of my invention is to provide a supporting bar having means to pivot it from a position slightly in rear of the platform when in a raised used position to a position between the front and rear legs when in a closed folded position.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of the accompanying drawings which illustrate an embodiment thereof.

In the drawings,

Fig. 1 is a front elevation of a step-ladder constructed in accordance with my invention in folded position with my improved supporting bar in a lowered position.

Fig. 2 is a side elevational view of the step-ladder with the supporting bar lowered and the step-ladder in folded closed position, as shown in Fig. 1.

Fig. 3 is a side elevational view showing the step-ladder in open position with the supporting bar pivoted and raised to its normal position in use, slightly in rear of the platform and showing the painter supported by the cross bar thereof.

Fig. 4 is a detailed side elevation of the top of the ladder, showing the means for moving and pivoting the supporting legs of the supporting bar and locking them, in closed position.

Fig. 5 is a detailed side elevation of the parts shown in Fig. 4, in locked open position.

Fig. 6 is a sectional view taken through the supporting bar and its pivot sleeve along the line 6—6 of Fig. 5.

In the drawings, wherein like characters of reference generally indicate like parts throughout, I have indicated a standard type of knock-down step-ladder 10. Said step-ladder has the usual top platform 12, the pair 14 of front legs projecting downwardly from said platform, and

as is customary in ladders of this description obliquely outwardly from the front end of said platform and forwardly therefrom when in the used position shown in Fig. 3. In most types of step-ladders, the front legs are rigidly attached to the front end of the platform. Said front legs 14 have the horizontal steps 16 mounted at vertically spaced intervals thereon. I also provide a set 18 of similar outwardly flaring rear legs joined together in any suitable manner such as by the diagonal cross bars 20 and mounted on the rear end of said platform, in the embodiment shown by means of the pivot pins 22 mounted on the rear end of each metallic extension 24 projecting downwardly from said platform 12. Said rear legs are thus pivotal from a closed knock-down position substantially abutting said front legs 14 as shown in Figs. 1, 2 and 4 to an open position as shown in Figs. 3 and 5 supporting said steps 16 and platform 12 in substantially horizontal planes. Ladders 10 of this description usually have a toggle 26 to limit their opening movement, comprising the front link 28 and the rear link 30 pivotally joined together by the pivot pin 32 and having their outer respective ends pivotally connected to a front leg 14 as at 34 and pivotally connected to a rear leg 18 as at 36.

I have described hitherto a standard type of step-ladder to which my invention is adapted to be attached.

In accordance with my invention I provide a supporting bar 38 preferably comprising the U-shaped bar 38 having the U base or cross-piece 40 and the extended legs 42 projecting downwardly therefrom. I provide guide members such as the flat eyes 44 projecting laterally from each side of said platform having the cylindrical rod holes 46 therein.

I also provide means 48 to positively clamp each respective leg 42 in an adjustable raised or lowered position and I provide suitable means 50 to move and support said clamping means 48.

In my preferred embodiment for this purpose, I provide the cylindrical guide means 48 and the toggle means 50 to move and pivot said cylindrical guide means to a position for raising said legs 42 to a position when said ladder is open, such that said U bar 38 may move to an oblique raised position above and slightly in rear of the platform 12 so that its cross bar 40 may function as a support for the ladder user and to a closed position, so that said cylindrical guide means 48 may move to a position as shown in Figs. 1 and 2 to permit the U bar legs 42 thereof to extend vertically between the substantially abutting front and rear ladder legs 14 and 18 interior of the lower portions of the outwardly flaring walls thereof. In my preferred embodiment I have constructed said cylindrical guide means 48 and said moving means 50, as follows:

I provide the supplemental bar supporting toggles 50 each comprising a front link 52 and a rear link 54 having their outer respective ends pivotally connected to a front leg 14 and a rear leg 18 by pivot pins 56 and 58 respectively, and I provide a toggle pivot pin 60 loosely joining the center portions of said links together as shown more particularly in Fig. 6 to permit free pivotal movement thereof. The cylindrical guide means 48 preferably comprise the U-shaped clamps 48, each comprising a slotted cylindrical portion 62 having spaced arms 64 and 66 projecting horizontally at the ends of said slot 68, in the embodiment shown said slot 68 being at the front

of said cylindrical portion 62, with said arms 64 and 66 projecting forwardly, said arms 64 and 66 having aligned holes 68 and 70 therein.

I also provide a hole 72 on the inner portion of said cylindrical portion 62 to loosely receive the toggle pivot pin 60 therein for pivotal movement of said cylindrical portion 62 on said toggle pivot pin 60. In the embodiment shown, the pivot pin has a head 61 on the inner end thereof and the outer end 63 thereof is upset within said cylindrical portion 62 to provide a loose assembly permitting ready pivoting of the respective front and rear toggle links 52 and 54 and sleeve 62 thereon relative to each other.

To adjustably clamp the respective arms 64 and 66 together and hence said cylindrical portion 62 around a leg 42, I provide the bolt 74 having the preferably slotted head 76 on the inner end thereof between said front link 52 and inner arm 64 with said bolt shank projecting outwardly through said aligned holes 68 and 70 in said inner and outer arms 64 and 66 and having the thumb screw 78 on the outer end thereof to abut the outer arm 66 to squeeze said arms 66 and 64 together compressing the cylindrical portion 62 around said leg 42 to hold it in adjusted position.

As stated, the bar base 40 is of a width slightly greater than said platform 12 and the legs 42 extend downwardly through said guide eyes 46 and through the cylindrical portion 48 or 62 of the clamps, whereby said bar 38 may be movable on release of said clamps 62 to a lowered position shown in Figs. 1 and 2, with said cross bar 40 resting on top of said platform 12 and said bar 38 may be moved to a raised position with the U base 40 spaced upwards any desired adjustable distance substantially up to the length of said U legs from said platform 12. It is obvious that with this construction when said ladder is moved to an open position shown in Fig. 3, said toggle links 52 and 54 may move to a position moving the cylindrical portion 48 or 62 of said clamps towards the open front ladder legs 14, so that said U bar 38 may move to the oblique raised position shown in Fig. 2 slightly in rear of said platform to function as a support for the ladder user 80, it being obvious that when in this position the user may lean his entire weight against the U bar base 40 which is rigidly supported on the spaced ladder legs, may hang any desired object thereon or may grasp it with his hand, if desired, for support.

It is important that in moving the ladder to closed position, the clamps 62 be pivoted and moved just the right amount, for if moved too far forwardly and tilted too far rearwardly, even to less than a position parallel to the front legs, the bar 40 is moved too far in rear of the platform 12 to function as a support for the user, and if moved and pivoted too little, the bar 40 will be in the way of the user in climbing the steps and using the platform. It is also important that in moving the clamps rearwardly and in tilting them forwardly to the closed position, that they must also be moved and tilted the right amount to permit the U legs 42 to be moved to a position between the front and rear ladder legs 14 and 18. The amount of movement of said clamps 62 and the amount of tilting thereof may be varied by varying the length of the toggle links 52 and 54, the length of the legs 42 and the height that the toggle links are mounted on the ladder legs.

It is also obvious that on release and tightening of said clamps 48 that said U bar may be ad-

justed to any desired height above said platform 12.

It is also apparent that as shown in Figs. 1 and 2 when said bar is lowered to a position bringing the U base 40 on top of said platform 12 that said toggle links 52 and 54 will pivot to move the cylindrical portion 48 or 62 thereof to positions relative to said platform 12 to permit the U base legs 42 to extend vertically between the substantially abutting front and rear ladder legs 14 and 16 interior of the lower portions of the outwardly flaring walls thereof as shown in Figs. 1 and 3.

It is apparent that in place of the bolt 74 and thumb screw 76 that any other suitable type of means may be provided to adjustably close and release said clamp portion 62 or 48. It is also obvious that any other suitable type of means may be provided to move and pivot the cylindrical portions or cylindrical guide means 48 from the open position shown in Fig. 3 to the closed position shown in Figs. 1 and 2, than the specific type of toggle links shown.

It is apparent that I have provided a novel type of step-ladder having a novel type of supporting bar incorporated therein with the advantages described above.

It is understood that my invention is not limited to the specific embodiments shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly, and obliquely outwardly from the front end of said platform, having horizontal steps mounted at vertically spaced intervals thereon, and a set of substantially similarly outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs to an open position supporting said steps and platform in substantially horizontal planes, a toggle comprising front and rear links pivotally joined together, having their outer respective ends pivotally connected to a front leg and a rear leg on each side of said ladder to limit the opening pivotal movement of said legs, guide members having rod holes therein projecting horizontally laterally from each side of said platform, supplemental bar supporting toggles each comprising front and rear links having their outer respective ends pivotally connected to a front leg and a rear leg on each side of said ladder and a toggle pivot rod loosely joining the center portions of said links together to permit pivotal movement thereof and a U-shaped clamp comprising a slotted cylindrical portion having spaced arms projecting therefrom at the respective ends of said slot, having holes therein and a hole on the inner surface of said cylindrical portion to receive the toggle pivot pin therein for pivotal movement of said cylindrical portion on said toggle pivot pin, a bolt having a head on the inner end thereof between said front link and inner arm projecting outwardly through said aligned holes in said arms and having a thumb screw on the outer end thereof, and a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide holes and through the cylindrical portions of the clamps, movable, on release of said clamps, to a lowered position on top of said platform and to a raised position with the U base thereof spaced upwards any desired adjustable distance substantially up to the length of said U legs from said platform, whereby when said ladder is moved to an open position said toggle links may move to a position moving the cylindrical portions of said clamps so that said U bar when raised moves to an oblique position with its base slightly in rear of said platform to function as a support for the ladder user and when said bar is lowered over said platform, said toggle links pivot to move said cylindrical portions to positions permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

2. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly, and obliquely outwardly from the front end of said platform, having horizontal steps mounted at vertically spaced intervals thereon, and a set of substantially similarly outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs to an open position supporting said steps and platform in substantially horizontal planes, guide members having rod holes therein projecting horizontally laterally from each side of said platform, bar supporting toggles each comprising front and rear links, having their outer respective ends pivotally connected to a front leg and a rear leg on each side of said ladder and a toggle pivot rod loosely joining the center portions of said links together to permit pivotal movement thereof and a U-shaped clamp comprising a slotted cylindrical portion having spaced arms projecting therefrom at the respective ends of said slot, having holes therein and a hole on the inner surface of said cylindrical portion to receive the toggle pivot pin therein for pivotal movement of said cylindrical portion on said toggle pivot pin, a bolt having a head on the inner end thereof between said front link and inner arm projecting outwardly through said aligned holes in said arms and having a thumb screw on the outer end thereof, and a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide holes and through the cylindrical portions of the clamps, movable, on release of said clamps, to a lowered position on top of said platform and to a raised position with the U base thereof spaced upwards any desired adjustable distance substantially up to the length of said U legs from said platform, whereby when said ladder is moved to an open position said toggle links may move to a position moving cylindrical portions of said clamps so that said U bar when raised moves to an oblique position with its base slightly in rear of said platform to function as a support for the ladder user and when said bar is lowered over said platform, said toggle links pivot to move said cylindrical portions to positions permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

3. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly and obliquely outwardly from the front end of said platform, having hori-

zontal steps mounted at vertically spaced intervals thereon, and a set of substantially similar outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs to an open position supporting said steps and platform in substantially horizontal planes, guide members having rod holes therein projecting horizontally laterally from each side of said platform, bar supporting toggles, each comprising front and rear links having their outer respective ends pivotally connected to a front leg and a rear leg on each side of said ladder and a toggle pivot rod loosely joining the center portions of said links together to permit pivotal movement thereof and a U-shaped clamp comprising a slotted cylindrical portion having spaced arms projecting therefrom at the respective ends of said slot and a hole on the inner surface of said cylindrical portion to receive the toggle pivot pin therein for pivotal movement of said cylindrical portion on said toggle pin, a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide holes and through the cylindrical portions of the clamps, movable on release of said clamps, to a lowered position on top of said platform and to a raised position with the U base thereof spaced upwards any desired adjustable distance up to substantially the length of said U legs from said platform and means to adjustably clamp said clamps around the U legs, whereby when said ladder is moved to an open position, said toggle links may move to a position moving cylindrical portions of said clamps so that said U bar when raised moves to an oblique position with its base slightly in rear of said platform to function as a support for the ladder user and when said bar is lowered over said platform, said toggle links may pivot to move said cylindrical portions to positions permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

4. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly and obliquely outwardly from the front end of said platform, having horizontal steps mounted at vertically spaced intervals thereon, and a set of substantially similar outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs to an open position supporting said steps and platform in substantially horizontal planes, guide means projecting horizontally laterally from each side of said platform, bar supporting toggles, each comprising front and rear links having their outer respective ends pivotally connected to a front leg and a rear leg on each side of said ladder and a toggle pivot rod loosely joining the center portions of said links together to permit pivotal movement thereof and a U-shaped clamp comprising a slotted cylindrical portion having spaced arms projecting from the respective ends of said slot, and a hole on the inner surface of said cylindrical portion to receive the toggle pivot pin therein for pivotal movement of said cylindrical portion on said toggle pivot pin, a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide means and through the cylindrical portions of the clamps, movable, on release of said clamps, to a lowered position on top of said platform and to a raised position with the U base thereof spaced upwards any desired adjustable distance up to substantially the length of said U legs from said platform and means to adjustably clamp said clamps around the U legs, whereby when said ladder is moved to an open position said toggle links may move to a position moving the cylindrical portions of said clamps so that said U bar when raised moves to an oblique position with its base slightly in rear of said platform to function as a support for the ladder user and when said bar is lowered over said platform, said toggle links may pivot to move said cylindrical portions to positions permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

5. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly and obliquely outwardly from the front end of said platform, having horizontal steps mounted at vertically spaced intervals thereon, and a set of substantially similar outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs, to an open position supporting said steps and platform in substantially horizontal planes, guide means projecting horizontally laterally from each side of said platform, a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide means, cylindrical guide means for containing a bar leg for each side of said ladder and link means to move and pivot said cylindrical guide means to a position such that when the ladder is open said U bar when raised may move to an oblique position with its base slightly in rear of said platform to function as a support for the ladder user and to a closed position such that said cylindrical guide means may move to a position permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

6. In a knock-down step-ladder having a top platform, a pair of outwardly flaring front legs projecting downwardly and obliquely outwardly from the front end of said platform, having horizontal steps mounted at vertically spaced intervals thereon, and a set of substantially similar outwardly flaring rear legs joined together and mounted on the rear end of said platform, one of said sets of legs being pivotal from a closed position substantially abutting said other set of legs to an open position supporting said steps and platform in substantially horizontal planes, guide means projecting horizontally laterally from each side of said platform, a U-shaped supporting bar of a width slightly greater than said platform, having extended downwardly projecting U legs extending downwardly through said respective guide means, cylindrical guide means for containing a bar leg for each side of said ladder and means to move and pivot said cylindrical guide means to a position such that when the ladder is open said U bar when raised may move to an

oblique position with its base slightly in rear of said platform to function as a support for the ladder user and to a closed position such that said cylindrical guide means may move to a position permitting the U bar legs thereof to extend vertically between the substantially abutting front and rear ladder legs interior of the lower portions of the outwardly flaring walls thereof.

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