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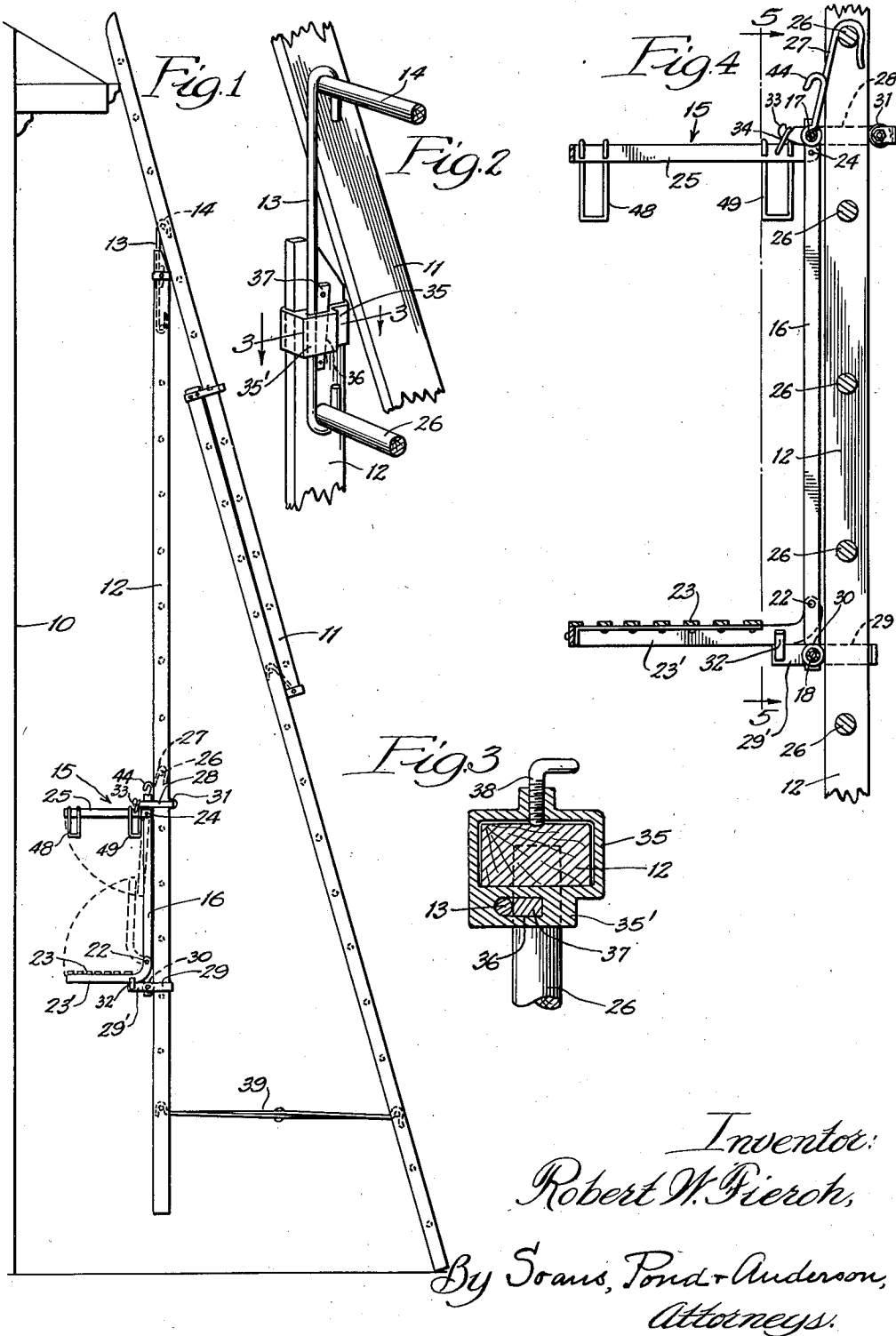
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SAFETY SCAFFOLD ATTACHMENT FOR LADDERS

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2 Sheets-Sheet 1



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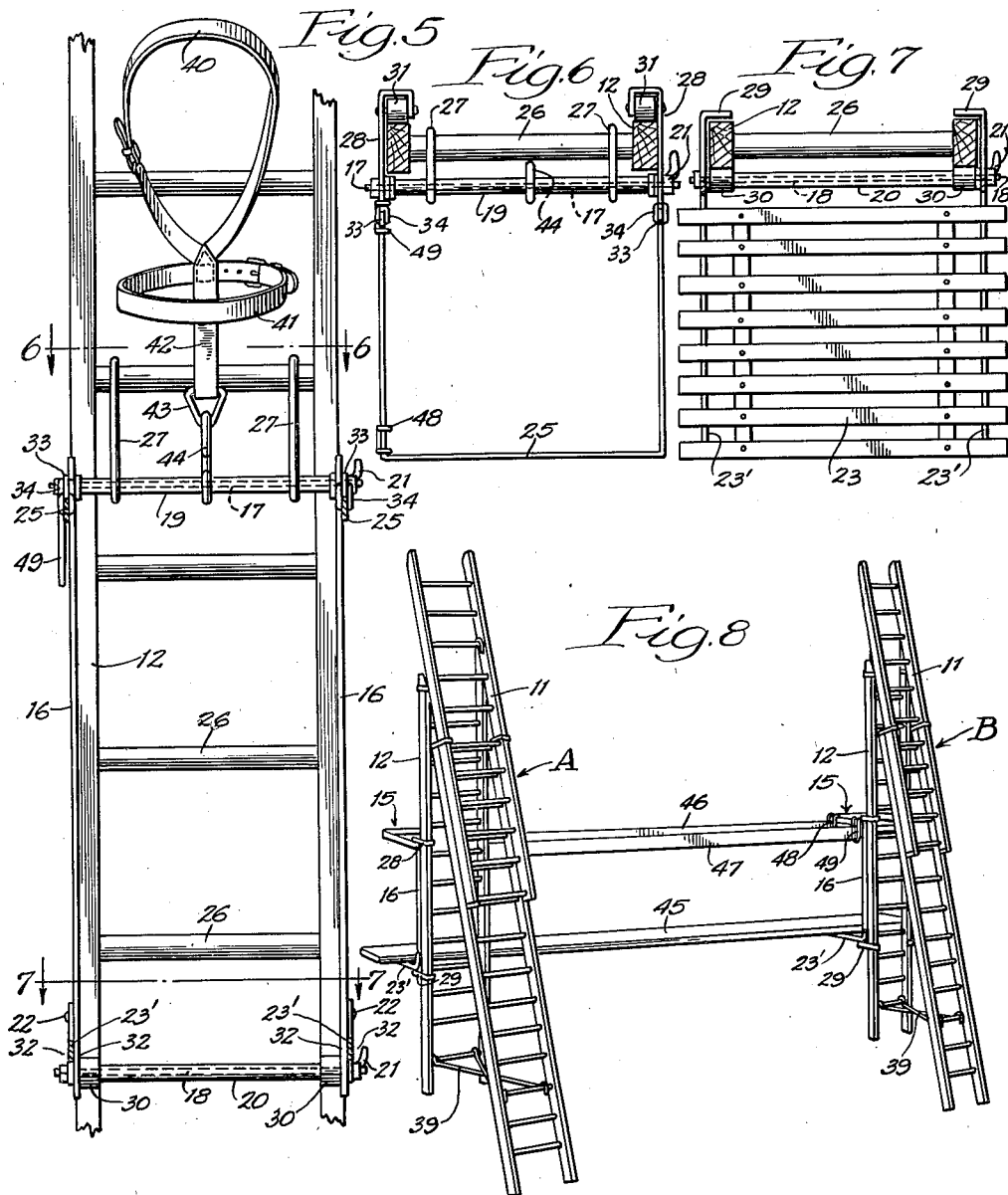
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SAFETY SCAFFOLD ATTACHMENT FOR
LADDERS

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10 Claims. (Cl. 304—10)

This invention relates to a class of devices used by workmen when working upon a vertical wall. Known devices of this character comprise the three elements of an inclined ladder stepped at its lower end on the ground and at its upper end supported against an eave or cornice of the building, a suspension ladder hung vertically from the upper portion of the inclined ladder, and a platform on which the workman stands that is vertically shiftable by the workman from time to time up and down on the suspension ladder.

The general object of the invention has been to provide a thoroughly practical, safe and convenient device of this character for enabling a workman to work upon a vertical surface, such as the external wall of a building. More specific objects have been to provide an improved scaffold for the workman and improved means for slidably engaging the scaffold with the side rails of the suspension ladder so that it can be easily shifted by the workman up and down the ladder; to provide an improved means for raising and lowering the scaffold; to provide as part of the scaffold a safety device in the general nature of a guard frame which will prevent the workman from accidentally pitching headlong or sidewise from the platform of the scaffold due to leaning so far as to lose his balance; and to provide an improved and simple means for hanging the suspension ladder from the inclined ladder at any desired height on the ladder. In devices of this type with which I am familiar, the means for raising and lowering the scaffold to a point opposite a new area of work has commonly consisted of a block and tackle by which the workman, while standing on the scaffold, raises and lowers the latter to a new position. A block and tackle lifting and lowering device is clumsy and very much in the workman's way; and a further important object of this invention has been to do away with the usual block and tackle, and substitute therefor a simple and out-of-the-way means by which the workman may take a new position by climbing up or down on the ladder and simultaneously raise and lower the scaffold by suspending it from his own shoulders.

A practical and approved embodiment of the invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation showing the device in working position opposite a vertical wall of a building.

Fig. 2 is an enlarged fragmentary perspective view illustrating the means for suspending the

hanging ladder from a rung of the inclined ladder.

Fig. 3 is a sectional detail taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged front-to-rear vertical section of the scaffold and a cooperating portion of the suspension ladder with which it is engaged.

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4, and showing also in rear elevation a harness donned by the workman when changing the position of the scaffold.

Figs. 6 and 7 are plan sections taken on the lines 6—6 and 7—7, respectively, of Fig. 5.

Fig. 8 is a perspective view of a structure designed to afford a longer scaffold, such as might accommodate several workmen, with the same degree of safety as that afforded by the shorter scaffold structure illustrated in the other views.

Referring to the drawings, 10 designates a vertical wall of a building that is to be painted, pointed up, or otherwise treated, and 11 designates an ordinary extension ladder that is footed on the ground and supported in an inclined or leaning position by contact with an eave or cornice of the building. 12 designates the suspension ladder that is hung by means of hooks 13 from any selected rung 14 of the inclined ladder 11. Slidably engaged with the side rails of the suspension ladder 12 is the scaffold, designated as an entirety by 15.

Describing the scaffold 15 in detail, 16 designates each of a pair of vertical side bars that are connected and spaced near their upper and lower ends by horizontal rods 17 and 18, and sleeves 19 and 20 through which said rods extend. These rods 17 and 18 extend through the vertical side bars 16, and one end at least of each rod is threaded and equipped with a handle nut 21.

Pivoted at 22 to the lower portions of the side bars 16 is a workman's platform 23, and similarly pivoted at 24 to the upper portions of the side bars 16 is a three-sided guard frame 25, that is located approximately waist high to a workman standing on the platform 23. When the workman is working on the wall 10, the scaffold 15 is suspended from one of the rungs 26 of the suspension ladder 12 by a pair of hooks 27, the lower ends of which are former with eyes encircling the spacing sleeve 19 of the upper connecting rod 17 as is best shown in Figs. 5 and 6. Both the ladder suspending hooks 13 and the scaffold suspending hooks 27 engage the rungs of their respective ladders closely adjacent to the inner sides of the side rails, where the breaking strains

on the rungs are least—a structural feature which contributes to the safety of the device.

Describing next the means by which the scaffold is slidably engaged with the ladder 12, 28 and 29 designate upper and lower rectangular keepers that are mounted on the upper and lower spacing and connecting rods 17 and 18, respectively, and extend across the outer and rear sides of the side rails of ladder 12. On the lower rod 18 are journaled rollers 30, best shown in Fig. 7, that bear against the front walls of the side rails of ladder 12; and on the rear ends of the upper keepers 28 are journaled similar rollers 31, best shown in Fig. 6, that bear against the rear sides of the side rails of ladder 12. Since the strain of the weight of the scaffold creates a thrust of rollers 30 and 31 against the front and rear sides of the ladder rails, the scaffold is very easily moved up and down on the ladder 12.

As shown by dotted lines in Fig. 1, the pivoted platform 23 and the pivoted guard frame 25 can be readily folded inwardly to positions substantially parallel with the ladder 12, when the device is not in use. When the device is in use, the platform 23 is supported in horizontal position by resting upon forward extensions 29' of the keepers 29; and to check any side shake of the platform, the transverse supporting arms 23' of the platform overlap a pair of vertical keepers 32 attached to the extensions 29', as most clearly shown in Figs. 4 and 5.

To maintain the guard frame 25 in horizontal working position, I preferably form on the front ends of the upper keepers 28 hooks 33 that are detachably engaged by loops 34 pivotally mounted in the side limbs of the guard frame 25. Manifestly, by simply lifting the loops 34 off the hooks 33, the guard frame may drop by gravity to the folded position indicated by dotted lines in Fig. 1.

In Figs. 2 and 3 I have illustrated a simple device for maintaining the elongated C-shaped hooks 13 in fixed engagement with the side rails of the suspension ladder 12. This comprises a collar 35 that embraces a side rail of the ladder 12 just below its upper end and is formed with a laterally offset portion 35', in which offset portion is formed a vertical wedge-shaped slot 36, through which the body of the hook 13 extends; and a wedge 37 driven into said slot locks the hook 13 rigidly to the collar 35. A handle set screw 38 (Fig. 3) threaded into the opposite side of the collar 35 is turned into biting engagement with the outer side of the ladder side rail so that, by the described structure, the hook 13 is rigidly maintained against either endwise or lateral movement relatively to the ladder 12. This is a substantial convenience when the workman on the ground is shifting the suspension ladder from one rung to another of the main inclined ladder.

It remains to describe the means by which the workman raises and lowers the scaffold 15. Fig. 5 illustrates a simple harness which the workman wears for this operation, this harness consisting of a shoulder strap 40, a belt strap 41, a tab strap 42 depending from the junction of the straps 40 and 41, and a ring 43 in the lower end of the tab strap 42. Referring to Figs. 4, 5 and 6, pivoted on and centrally of the upper connecting and spacing rod of the scaffold frame is a hook 44 adapted to be engaged with and disengaged from the ring 43 of the workman's harness.

To steady the suspension ladder 12 and maintain it in true vertical position, crossed brace

rods 39 are inserted between opposed lower rungs of the two ladders 11 and 12.

The manner in which the above described safety scaffold attachment is used has already been to a considerable extent indicated in the description of its structural features, but may be briefly outlined as follows.

With the parts in operative position, such as is shown by full lines in Fig. 1, the ladder 12 is suspended by the hooks 13 from a rung of the ladder 11 and the scaffold 15 is suspended by the hooks 27 from a rung of the ladder 12. The workman standing on the platform 23 and safeguarded against accidentally pitching forward or sidewise by the guard frame 25, and against falling rearwardly by the ladder 12, operates upon the area of the wall within his reach. When he wishes to raise or lower the scaffold to a position opposite a fresh area of work, wearing the harness, he engages the ring 43 of the harness with the hook 44, then grasps the ladder and steps upon the higher rung and disengages the suspension hooks 27. He is then carrying the entire scaffold suspended from his shoulders. He climbs up or down on the ladder 12 to the new position, re-engages the hooks 27 with the ladder 12, disengages the ring 43 from the hook 44, steps back onto the platform 23, turns half-way around, and goes to work, entirely unimpeded by any block and tackle hoisting apparatus encumbering foot and arm space on the scaffold.

In Fig. 8 I have illustrated an extension of the described structure to provide a longer scaffold and guard on which two or more workmen may be simultaneously engaged. This enlarged structure comprises two complete ladder and scaffold units designated as entireties by A and B. Each of these units is structurally identical with the single unit already described, and they are spaced laterally to a suitable extent to serve a scaffold of the desired length. When the two units have been suitably placed, a relatively long plank 45 is extended between and at its ends supported on the two platforms 23. The guard feature may also be retained by providing front and rear guard rails 46 and 47 that at their ends enter and are supported by front and rear hangers 48 and 49 (Fig. 4) that are suspended from the inner side limbs of the two guard frames 15. Thus, two or more workmen may operate on the platform 45 independently or simultaneously with workmen operating inside of the guard frames 15. By simultaneous action on the part of the workmen operating in the guard frames 15, the elongated scaffold may be raised and lowered in a manner previously described.

Variations and modifications in the details of structure and arrangement may be resorted to within the purview and coverage of the appended claims.

I claim:

1. A safety scaffold attachment for ladders, comprising a suspension ladder provided with hooks on its upper end whereby it may be hung from a rung of an inclined ladder, and a scaffold slidably mounted on said suspension ladder and provided with hooks whereby it may be hung from a rung of said suspension ladder, another hook on said scaffold, and a harness adapted to be worn by a workman equipped with a ring engageable with said last-named hook.

2. The combination with a suspended ladder, of a vertically adjustable scaffold comprising vertical side bars, top and bottom horizontal rods connecting and spacing said side bars, a plat-

form mounted on the lower ends of said side bars, a guard frame mounted on the upper ends of said side bars, and means for maintaining said scaffold in sliding engagement with the side rails of said ladder comprising upper and lower pairs of rectangular keepers mounted on said horizontal connecting and spacing rods and embracing the outer and rear sides of the ladder side rails, rollers mounted on the rear ends of the upper pair of keepers and bearing on the rear sides of the ladder side rails, and rollers mounted on said bottom connecting and spacing rod and bearing on the front sides of the ladder side rails.

3. An embodiment of the subject-matter defined in claim 2, wherein both the platform and guard frame are pivoted on the vertical side bars and are capable of swinging into substantial parallelism with the latter, and means are provided for supporting them in horizontal position.

4. The combination with a suspended ladder, of a vertically adjustable scaffold comprising vertical side bars, top and bottom horizontal rods connecting and spacing said side bars, a platform mounted on the lower ends of said side bars, a foldable guard frame pivoted on the upper ends of said side bars, means for maintaining said scaffold in sliding engagement with the side rails of said ladder comprising upper and lower pairs of rectangular keepers mounted on said horizontal connecting and spacing rods and embracing the outer and rear sides of the ladder side rails, and releasable means for supporting said guard frame in horizontal position, comprising hooks on the inner ends of said upper pair of keepers, and links carried by said guard frame adapted to be engaged with and disengaged from said hooks.

5. The combination with a suspended ladder, of a vertically adjustable scaffold comprising vertical side bars, top and bottom horizontal rods connecting and spacing said side bars, a guard frame mounted on the upper ends of said side bars, a foldable platform pivoted on the lower end portions of said side bars above the bottom connecting and spacing rod, means for maintaining said scaffold in sliding engagement with the side rails of said ladder comprising upper and lower pairs of rectangular keepers mounted on said horizontal connecting and spacing rods and embracing the outer and rear sides of the ladder side rails, and means for supporting said platform in horizontal position comprising inward extensions of the lower pair of keepers underlying the platform when the latter is in horizontal position.

6. In a device of the class described, the combination with an inclined ladder, a suspension ladder, and a vertically adjustable scaffold slidably engaged with said suspension ladder, of a

pair of elongated C-hooks for hanging said suspension ladder from a rung of said inclined ladder, the lower ends of said hooks engaging beneath a rung of the suspension ladder and their upper ends over a rung of the inclined ladder, and means for clamping the bodies of said hooks to the side rails of said suspension ladder.

7. An embodiment of the subject-matter defined in claim 6, wherein the clamping means for each hook comprises a collar embracing a side rail of the ladder, a wedge clamping the body of the hook to said collar, and a set-screw for securing said collar in fixed position on said side rail.

8. An embodiment of the subject-matter defined in claim 6, wherein the clamping means for each hook comprises a collar embracing a side rail of the ladder and formed with a laterally offset portion containing a vertical wedge-shaped slot through which the body of the hook extends, a wedge driven into said slot, and a set screw mounted in the opposite side of the collar and engaged with the outer side of the ladder side rail.

9. A relatively long workman's scaffold of the class described, comprising duplicate units disposed in laterally spaced relation, each of said units comprising a suspended ladder, a vertically adjustable scaffold having vertical side bars, top and bottom horizontal rods connecting and spacing said side bars, a platform mounted on the lower ends of said side bars, a guard frame mounted on the upper ends of said side bars, and means for maintaining said scaffold in sliding engagement with the side rails of said ladder; a plank extending between and at its ends resting on the platforms of the two units, and front and rear guard rails extending between and at their ends supported on the guard frames of the two units.

10. A relatively long workman's scaffold of the class described, comprising duplicate units disposed in laterally spaced relation, each of said units comprising a suspended ladder, a vertically adjustable scaffold having vertical side bars, top and bottom horizontal rods connecting and spacing said side bars, a platform mounted on the lower ends of said side bars, a guard frame mounted on the upper ends of said side bars, and means for maintaining said scaffold in sliding engagement with the side rails of said ladder; a plank extending between and at its ends resting on the platforms of the two units, front and rear hangers suspended from each of the adjacent limbs of the guard frames of the two units, and front and rear guard rails extending between and at their ends supported by said hangers.

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