

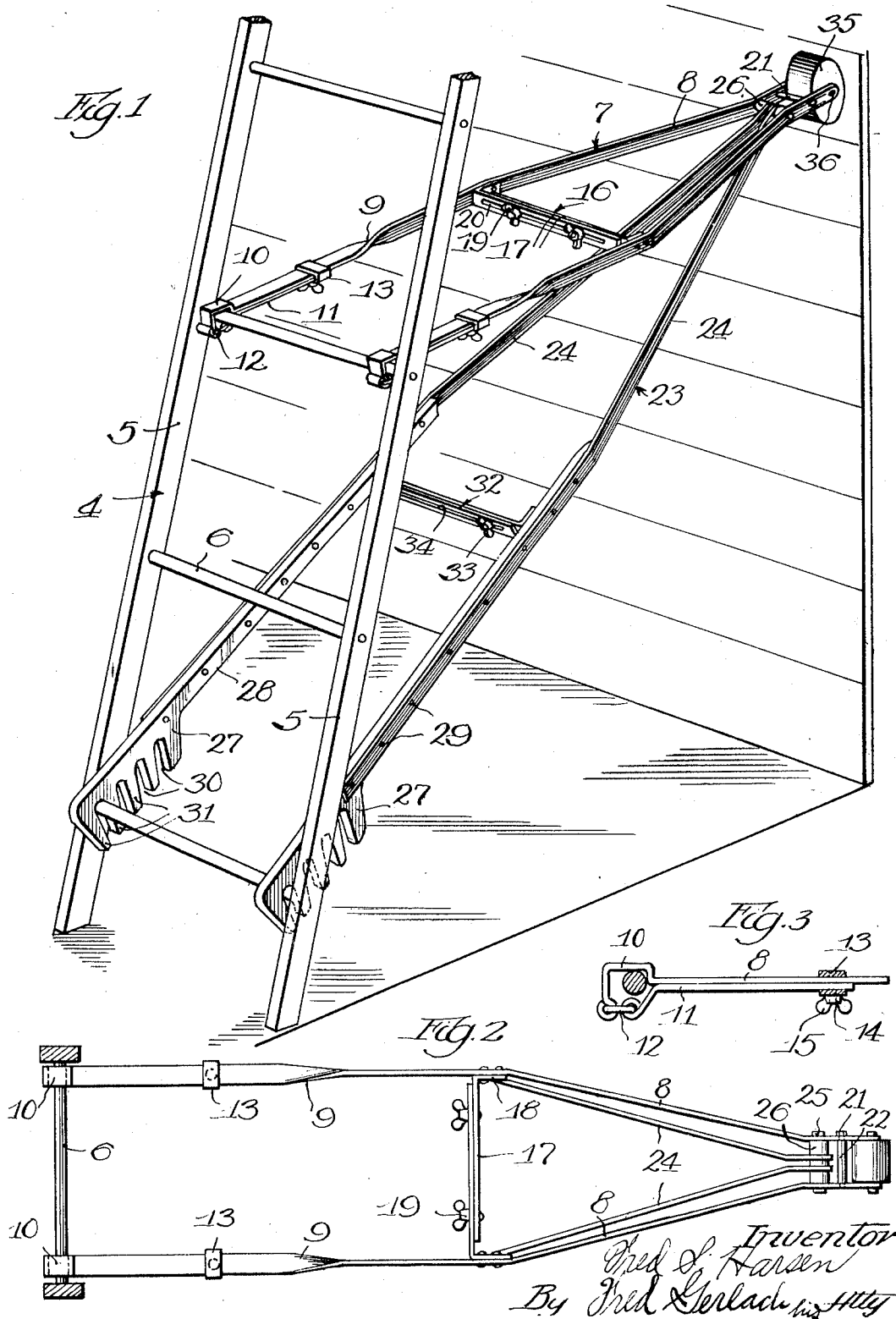
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LADDER SUPPORTING STRUCTURE

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LADDER SUPPORTING STRUCTURE

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The present invention relates generally to supporting structures for use in connection with ladders. More particularly the invention relates to that type of supporting structure which is attachable as a unit to a ladder and serves when in its operative position to space the upper ends of the side pieces of the ladder from the wall or surface against which the structure is placed so that a painter working on the ladder may, without difficulty, paint all portions of the wall especially those portions directly opposite the upper ends of the side pieces.

One object of the invention is to provide a supporting structure of the aforementioned type which comprises a horizontally extending strut for holding the ladder in spaced relation with respect to the adjacent wall or surface, and an oblique or inclined brace which extends upwardly and rearwardly from one of the lower rungs of the ladder and is connected to the rear or distal end of the strut.

Another object of the invention is to provide a ladder supporting structure of the character here under consideration in which the front end of the horizontally extending strut is pivotally connected to the ladder and the oblique brace is pivoted to the rear or distal end of the strut and is removably secured to its rung so that it may be disconnected when desired and together with the brace shifted into a folded position against the ladder in order that the ladder may be readily transported from place to place without undue bulkiness.

A further object of the invention is to provide a ladder supporting structure of the character to which reference was last made in which the oblique brace is adjustably connected to its rung so that it may be adjusted lengthwise in order to bring the strut into a horizontal position.

A still further object of the invention is the provision of a shoe which is movably connected to the rear or distal end of the horizontally extending strut and operates to engage directly the wall against which the supporting structure and ladder are placed.

In addition, it is contemplated as one of the objects of the invention to provide a ladder supporting structure which may be manufactured at a low cost and is generally of new and improved construction, and in which facility of adjustment is combined with durability and compactness of construction.

Other objects of the invention and the various advantages and characteristics of the present

structure will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views: Figure 1 is a perspective, exhibiting a ladder equipped with a supporting structure embodying the invention;

Figure 2 is a plan view of the supporting structure, showing in detail the construction of the horizontally extending strut which serves to hold the ladder in spaced relation with respect to the wall or surface against which the structure is placed; and

Figure 3 is a detailed view of one of the connections for connecting pivotally the front end of the strut to the ladder.

The supporting structure which forms the subject matter of this invention is adapted for association with a ladder 4 and serves, when in its operative position, to space the upper end of the ladder from the adjacent wall or surface so that a painter working on the ladder has access to all portions of the wall and may paint readily under the upper end of the ladder. The ladder 4 is of the conventional type and comprises a pair of elongated side pieces 5 which are arranged in side by side relation and are spaced apart and connected at intervals by a series of rungs 6. The latter extend through the side pieces 5 and form steps whereby the user of the ladder may ascend or descend. The supporting structure is associated with lower end of the ladder and comprises a strut 7 which is adapted to extend horizontally and serves as the medium or instrumentality whereby the ladder is held in spaced relation with respect to the wall or surface against which the supporting structure is placed. This strut consists of a pair of elongated members 8 which are arranged in side by side relation and are formed of strap iron or any other suitable material. The front ends of the strut-members 8 are twisted, as at 9, so as to extend horizontally, and have the extremities thereof bent upwardly, then forwardly and then downwardly to form a pair of retaining elements 10. These elements are adapted to be placed upon one of the central or intermediate rungs of the ladder and are adapted to connect pivotally the front end of the strut 7 to the ladder. The members 8 of the strut

are held in connected relation with respect to the ladder by a pair of latches 11. These latches are formed of strap iron and are pivotally connected by links 12 to the downwardly extending parts of the rung-retaining elements 10. The free or distal end parts of the latches are adapted to underlie the front ends of the strut-members 8, as illustrated in Figure 3, and are secured in place by loops or rings 13. The latter are mounted slidably on the front ends of the members 8 and are adapted to be shifted around the latches 11. Screws 14 having wings 15 extend through the loops 13 and are adapted to engage the latches so as to hold the latter in place. In connecting the strut 7 to the ladder, the retaining elements 10 are first placed upon the desired rung and are then locked in place by swinging the latches 11 against the underface of the strut-members 8. After swinging the latches into their locked position, the loops 13 are slid forwardly on the strut-members until they encircle the free or distal end parts of the latches. Thereafter, the screws 13 are manipulated to clamp the loops in place and hold the latches against the contiguous end parts of the strut-members 8. The central portions of the strut members are held in spaced relation by means of an extensible transversely extending arm 16. This arm comprises a pair of elongated parts 17 which are arranged in lapped relation and are provided with laterally extending lugs 18 whereby they are attached to the strut-members 8. The arm parts 17 are movable longitudinally relatively to one another to lengthen or shorten the arm 16 and are held in their various adjusted positions by bolts 19 which are mounted in one of the parts and extend through an elongated slot 20 in the other part. When the bolts 19 are loosened the parts 17 are free so that they may be shifted inwardly or outwardly to adjust the free ends of the strut-members into the desired position. By utilizing the arm 16 between the strut-members, the strut is efficiently reinforced. Furthermore, it is possible to adjust the members 8 so as to bring the rung-retaining elements 10 into close proximity to the side pieces 5 of the ladder. The rear ends of the strut-members 8 extend inwardly and are joined together at their extremities by a bolt 21. The latter is provided with a sleeve 22 which extends between and serves to space apart the extreme rear ends of the strut-members.

In addition to the strut 7, the supporting structure for the ladder 4 comprises a brace 23. This brace extends upwardly and rearwardly from the lowermost rung of the ladder and is adapted to hold the strut 7 in a horizontal position so that it is exceedingly effective in holding the ladder at the desired distance from the wall or surface against which the supporting structure is placed. Said brace consists of a pair of side members 24 which, like the members 8 of the strut, are preferably formed of strap iron and are arranged in spaced relation. The upper or rear ends of the brace-members 24 are pivotally connected by a bolt 25 to the rear end of the strut 7. The bolt 25 is positioned slightly in front of the bolt 21, extends through the rear extremities of the members 8 and is provided with sleeves 26 for preventing lateral displacement of the members 24 relatively to the strut-members 8. The lower or front ends of the brace-members are provided with a pair of arms 27. These arms are formed of wood or any other suitable material and embody rearwardly and upwardly extending elongated extensions 28.

The latter lap the inner faces of the brace-members 24 and are secured to said members by rivets or screws 29. The lower portions of each arm 27 have open-ended slots 30 formed therein to form a longitudinal series of fingers 31. These fingers are adapted, as illustrated in Figure 1 of the drawing, to grip the lowermost rung of the ladder and connect the lower or front end of the brace in place. A characteristic and an advantage of utilizing a series of fingers 31 on each arm 27 is that the brace 23 may be adjusted longitudinally with respect to the ladder rung with which it is associated in order to hold or retain the strut 7 in a horizontal position. A further advantage of utilizing the fingers on the arms 27 is that the brace may be readily disconnected from its rung whenever it is desired to collapse or detach the supporting structure. The lower or rear ends of the brace-members 24 are held in spaced relation by an extensible transversely extending arm 32. This arm is similar to the arm 16 in that it comprises a pair of parts which are arranged in lapped relation and are shiftable inwardly or outwardly to effect lateral adjustment of the members 24. The parts of the arm 32 are retained in adjusted relation by screws 33 which are mounted in one of the parts and extend through a longitudinal slot 34 in the other part.

A shoe 35 is mounted on the rear end of the strut 7 and is adapted to engage the wall or surface against which the supporting structure is placed. This shoe is preferably of oval conformation and is pivotally supported on a bolt or pin 36. This pin is positioned in the rear of the bolt 21 and retains the shoe between the rear extremities of the strut-members 8. By utilizing the pin 36, the shoe is so supported that it is movable automatically into gripping relation with the contiguous portion of the wall when the supporting structure is arranged in its operative position.

When it is desired to use the supporting structure, the ladder is inclined at the desired angle and is positioned so as to bring the shoe 35 at the rear end of the strut into engagement with the wall or surface adjacent which the ladder is disposed. The brace 23 is then adjusted with respect to the lowermost rung so as to bring the strut into a horizontal position. Upon completion of this adjustment the ladder 4 is supported so that the upper ends of the side pieces 5 are held in spaced relation with respect to the adjacent portions of the wall and consequently it is possible for a painter to paint all portions of the wall without interference from the aforesaid side pieces. When it is desired to transport the ladder the brace 23 is shifted out of engagement with the rung with which it is associated and together with the strut 7 is folded against the ladder. In applying the supporting structure to the ladder, the retaining elements 10 at the front ends of the strut-members 8 are placed upon the desired rung of the ladder and are locked in place by means of the latches 11. In order to bring the elements 10 into abutting relation with the side pieces 5 of the ladder, the arm 16 is extended or adjusted so as to space the rear ends of the strut-members the proper distance apart. After the strut is connected to the ladder the brace 23 is shifted into a position wherein the lowermost rung of the ladder is engaged by and connected to the arms 27. Lateral adjustment of the side members 24 of the brace is effected by manipulating the extensible arm 32. When the supporting structure is in use the brace 23 retains the strut

8 in a horizontal position and prevents displacement of the lower end of the ladder when the user ascends towards the uppermost rung.

5 The ladder supporting structure herein disclosed may be manufactured at a comparatively low cost by virtue of the fact that it consists of but a small number of parts. Inasmuch as the side members of the strut and brace are adjustably held in spaced relation, the structure may be applied to ladders that vary in width. By connecting the rear ends of the strut and brace removably to the ladder, the supporting structure is in the nature of an attachment.

15 The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

20 Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a structure for supporting a ladder in spaced relation with respect to a wall, the combination of a substantially horizontally extending strut consisting of a pair of laterally spaced side bars, the inner ends of which are provided with hook-members for engaging one of the ladder rungs and connecting the strut pivotally to the ladder and the outer ends of which are bent inwardly so that they converge, and are provided at the outer extremities thereof with a pin whereby they are cross-connected and held a slight distance apart, a shoe for engaging the wall positioned between said outer extremities of the outer ends of the side bars and mounted on the pin, an extensible arm extending between and connected to the central portions of the side bars at substantially the points where the outer ends of the side bars are bent into converging relation and serving to hold the bars apart, and an

obliquely extending brace disposed beneath the strut and having the upper end thereof connected pivotally to the outer ends of the strut-forming side bars directly inwardly of the shoe and its lower end connected adjustably to the ladder so that it may be adjusted angularly with respect to the ladder. 80

2. In a strut for supporting a ladder in spaced relation with respect to a wall, the combination of a substantially horizontally extending strut consisting of a pair of laterally spaced side bars, the inner ends of which are connected pivotally to the ladder and the outer ends of which converge and are connected together by a pair of transversely extending pins, a shoe for engaging the wall mounted rotatably on one of the pins and positioned between the rear ends of the side bars of the strut, and an obliquely extending brace disposed beneath the strut, and having the upper end thereof connected pivotally to the other pin and its other end connected adjustably to the ladder so that it may be adjusted angularly with respect to the ladder. 85 90 95

3. In a strut for supporting a ladder in spaced relation with respect to a wall, the combination of a substantially horizontally extending strut consisting of a pair of laterally spaced side bars, the inner ends of which are connected pivotally to the ladder and the other ends of which converge and are connected together by a pair of transverse pins, an oval-shaped shoe for engaging the wall mounted rotatably on one of the pins and positioned between the rear ends of the side bars of the strut, and an oblique brace for preventing displacement of the strut relatively to the ladder, disposed beneath the strut and having the upper end thereof connected pivotally to the other pin and its lower end connected removably to the ladder. 100 105 110

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