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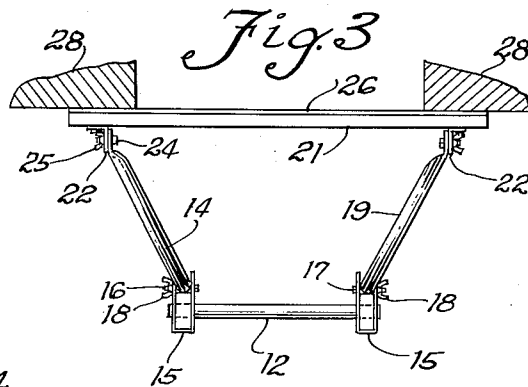
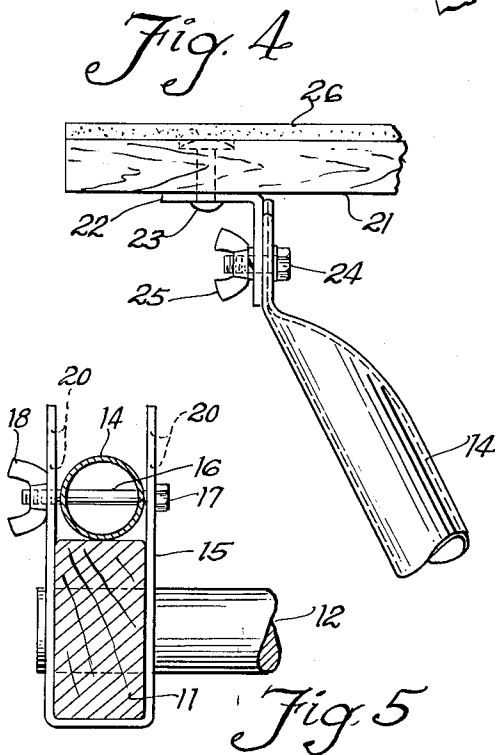
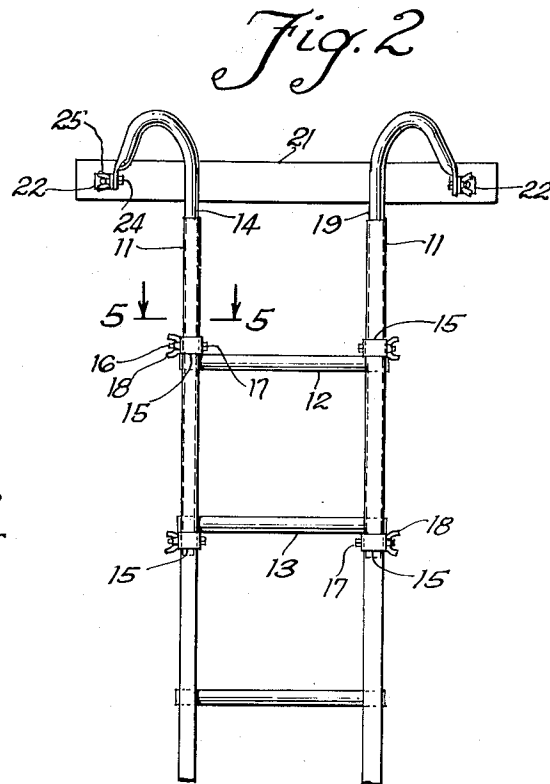
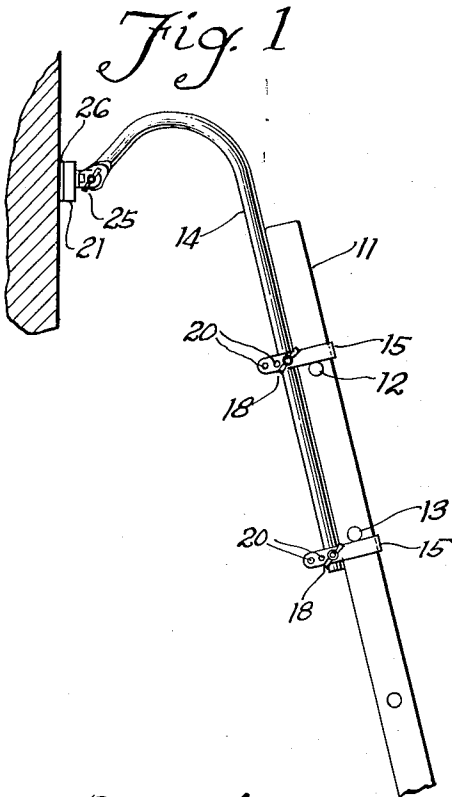
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2,722,360

APPARATUS FOR SUPPORTING AND BRACING LADDERS

Filed April 13, 1951

2 Sheets-Sheet 1



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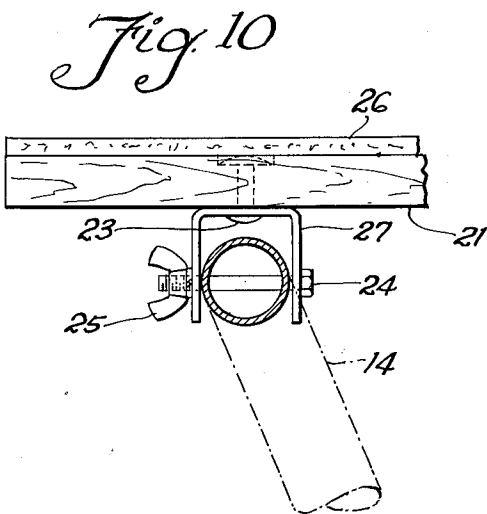
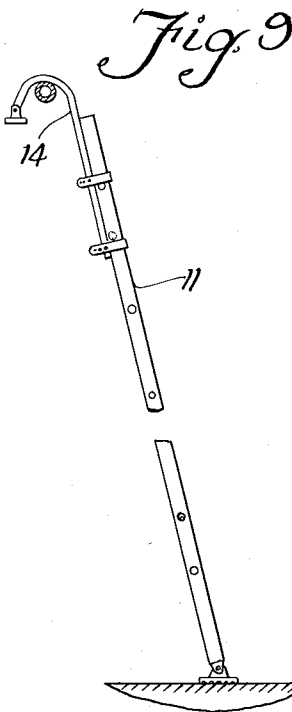
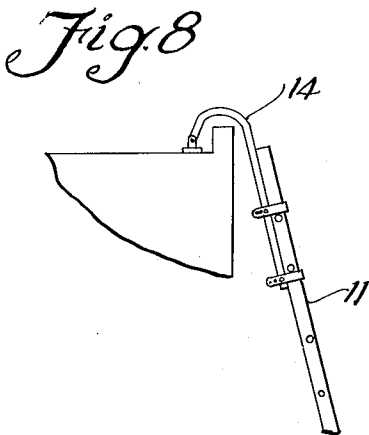
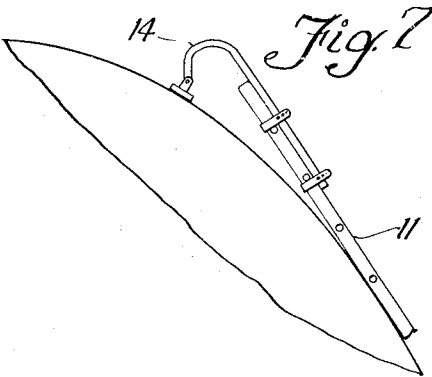
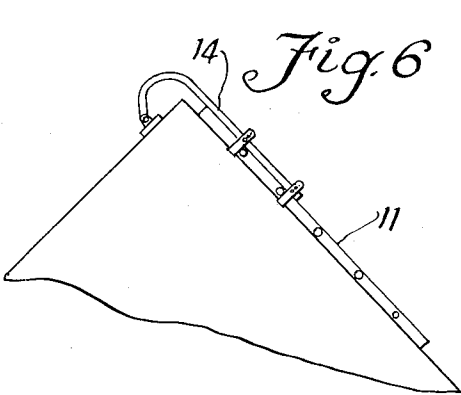
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APPARATUS FOR SUPPORTING AND BRACING LADDERS

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2 Sheets-Sheet 2



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2,722,360

APPARATUS FOR SUPPORTING AND BRACING LADDERS

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4 Claims. (Cl. 228—60)

This invention relates to straight ladders generally but specifically refers to means attachable to such ladders to increase their utility and safety by reason of the fact that a ladder equipped with the apparatus of this invention may be firmly supported against a variety of surfaces.

When a ladder is placed against a wall or similar perpendicular surface, it is almost impossible for any workman to stand on the top rung and perform work with any degree of safety. If the space between rungs is short and the ladder is only inclined slightly from the vertical surface, it will be unsafe in many such cases for the workman to stand on the top two or three rungs. Thereby the safe effective height of the ladder is substantially lowered.

The device of this invention when affixed to the upper end of the ladder will in effect increase its height substantially by enabling a workman to stand safely on the very top rung. It does so by firmly supporting the top end of the ladder away from the object the ladder would normally lean against.

Frequently, however, when placing a ladder up against a porch, stairway, building or similar structure, the upper end of the ladder cannot be supported because of a window or open space at that particular location. Therefore the ladder has to be moved aside for support of its upper end, or be supported lower down. In both such cases the safe effective use of the ladder is greatly decreased because the area of operations of any workman with safety is decreased substantially.

In order to overcome these disadvantages, the device of this invention also includes another means movably attached to the ends of the means for extending and bracing the rails of a ladder, which second means is much wider than the ladder so as to span a window, a door, or similar open space. The movably attached means enables the upper end of the ladder to be firmly supported by conforming to the supporting surface whether it be a perpendicular wall, a slanting roof or a curved surface.

Thus it is an object of this invention to provide a means movably attached to the free ends of means for lengthening and bracing the upper end of a ladder which enables the ladder to be supported across a window, a door, or similar opening, or against a vertical, slanting or curved surface.

In a preferred embodiment of this invention the means for lengthening and bracing the rails of a ladder might be a pair of members shaped approximately like the letter J and made of metal tubing, and the means movably attached to the ends thereof for spanning an opening might be made out of wood or light metal. All materials should be strong enough, however, to conform to accepted practice in the industry with respect to safety codes.

A feature of this invention is the shaping of the extension and bracing members for the rails of the ladder in the approximate form of an inverted letter J

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with a cross member movably attached to the curved ends of the extension and bracing members. This construction adds greatly to the utility and safety of a ladder so equipped. For example, such a ladder can be effectively hooked over the peak of a slant roof and by reason of the movably attached cross support member be firmly supported on the roof with the lower end of the ladder off the ground. Similarly the ladder may be laid at almost any angle against the roof of a quonset type of construction. Again the hook extension and support means is perfect for hooking over a parapet or fire wall on the roof of a building. Also the hook feature affords excellent support when used in boiler rooms or basements where it can hook around pipes near the ceiling, or over girders in open steel construction.

The aforesaid objects and features of the apparatus of this invention will be readily apparent from the following description and the annexed drawings in which like reference characters designate like parts in the several views illustrated.

Figure 1 is a side view of the upper end of a ladder equipped with the apparatus of this invention.

Figure 2 is a front view of the same.

Figure 3 is a plan view looking down to the top rung only of the same.

Figure 4 is an enlarged sectional view showing one method of joining one extension and bracing means to one end of the cross member.

Figure 5 is an enlarged sectional plan view along line 5—5 of Figure 2.

Figure 6 shows one application of this invention across the peak of a slanted roof.

Figure 7 shows another application on a roof of a quonset building.

Figure 8 shows another application over a parapet wall.

Figure 9 shows another application hooking over pipes or girders.

Figure 10 is an enlarged sectional view of an alternate construction to that shown in Figure 4.

Referring to the drawings, the upper ends of the ladder rails are numbered 11 and the top rung of the ladder is 12 and second rung down is 13, as shown in Figures 1 and 2. Tubular extension and bracing means 14 is shown attached to the left rail 11 of the ladder by means of clamp 15 which fits around the rail as shown in detail in Figure 5 preferably just above rung 12. The tube 14 is fastened to the rail 11 within the clamp 15 by a bolt 16 having a hexagonal nut head 17, and a wing screw 18 for tightening the threaded end of the bolt. The use of a bolt through the tube and clamp in this manner as a means of clamping the extension and bracing means to the rail of the ladder also prevents the tube from turning, as it would tend to do when a person climbed up the ladder equipped with the apparatus of this invention.

It is preferred that an identical clamping means be employed immediately below the second rung 13 of the ladder, and of course identical clamping means above rung 12 and below rung 13 to securely fasten tubular extension and bracing means 19 to the right rail 11 of the same ladder as shown in Figure 2. The placing of the clamps above rung 12 and below rung 13 of the ladder limits any movement of the extension and bracing means 11 and 19 along the rails 11 of the ladder. And so as to fit any thickness of rails to ladders the clamp 15 has a row of holes 20 bored through both sides to accommodate bolt 16 in the holes that will provide the tightest fit of the tube 14 to the rail 11, as shown in detail in Figure 5.

In Figure 4 we see in detail the manner in which the end of the curved section of tubular means 14 is connected to a supporting cross member 21 through a bracket 22

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which is securely fastened to member 21 by bolt 23 and relatively loosely attached to the flattened and bent end of tube 14 by hexagonal headed bolt 24. A wing tip screw 25 is used to tighten the bolt securely but loose enough to permit cross member 21 to swing in an approximate semi-circle. A layer of non-slipping material 26, such as plain rubber, corrugated rubber, sponge rubber or any other similar material is preferably bound across the face of the cross member 21 which comes in contact with the surface that supports the ladder so as to prevent the ladder from sliding. The end of the curved section of tubular means 19 is identically connected to the other end of cross member 21 as shown in Figure 3.

In the same Figure 3 we also see how the device of this invention allows the ladder to be erected to a window, door or other opening indicated by edges 28, by reason of the cross member 21 being wider than the ladder and designed to span any opening up to almost the width of the cross member. This feature together with the material across the face of the cross piece to prevent slipping greatly adds to the utility and safety of a ladder so equipped.

It is within the scope of this invention that the tubular means may be clamped to either side of the ladder rails as shown in the several drawings but of course for any particular use of this invention the two tubular extension and bracing means must be on the same side of the two rails of the ladder. This transposition of the tubular means to the other side of the ladder rail is very easily accomplished because the clamp and bolting means are easily reversed. In Figure 6 is shown a ladder equipped with the device of this invention but the tubular extension and bracing means are clamped to the side of the ladder rails away from the supporting surface. In this particular application of the device of this invention it is desirable that the tubes be on the upper side of the rails and the clamps turned up so that the ladder may rest flat on the slanting roof. The hooking of the tubular extension over the peak of the roof and the firm non-slipping support given the ladder by reason of the cross member setting flat against the opposite slope of the roof illustrates the greater utility and safety of a ladder equipped with the device of this invention.

In Figure 7 is illustrated another application of this invention wherein the ladder is set up on a curved surface such as a quonset building. Again we see the extension and bracing member on the side of the ladder rails away from the supporting surface. The features of a non-sliding cross member swingingly attached to the curved ends of the tubular extension and bracing members as illustrated are most advantageously utilized in this use of a ladder so equipped.

Likewise other advantageous uses of a ladder equipped with the device of this invention are shown in Figure 8 where the tubular extension and bracing member reaches over a fire wall or parapet and the cross support member sets flat on the roof beyond, and in Figure 9 where the inverted J-shaped members hook over pipes, girders or similar open construction work. In these two illustrations we again see the tubular inverted J-shaped members on the side of the ladder rails nearer the supporting element, although it is within the scope of this invention that like in Figures 6 and 7 they be fastened to the side of the ladder rails away from the supporting element.

An alternate means for connecting the end of the tubular extension and bracing member 14 to the cross piece 21 is shown in Figure 10. Instead of an L-shaped bracket 22, a U-shaped bracket 27 is securely bolted by means 23 to cross piece 21. A hexagonal head bolt 24 is passed through the two arms of bracket 27 and through a pair of holes in tubular member 14. Wing screw 25 is tightened up on the bolt sufficiently to secure the connection but not stop the freedom of the cross member and U-shaped bracket to swing on said bolt 24. When this means is used, it is not necessary to flatten and bend the end of the tubular member in order to bolt the same to the L-shaped

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bracket. Obviously also in this manner of joining the elements bolt 24 would have to be longer than in joining same as shown in Figure 4.

What I claim as my invention:

1. A ladder attachment for supporting and extending the upper end of a ladder comprising a pair of tubular members having a relatively long straight section and shorter arcuate section, said straight sections being securely fastened to the upper ends of the rails of the ladder by two clamping means to each rail, each of said clamping means comprising a pair of arms, one clamping means gripping the rail above the top rung of said ladder and the second gripping said same rail below the next lower rung of said ladder, said clamping means securing each of said tubular members to a rail of said ladder by a bolt through the arms of each said clamping means and the center of each said tubular member and secured by nuts, said arcuate sections of said tubular members spreading away from each other as they arc to a supporting surface, and a horizontal cross member hingedly attached to the ends of said arcuate sections of said two tubular members and having a non-slipping material across the entire face of said cross member that contacts the supporting surface.

2. An attachment for supporting the top of a ladder comprising a pair of tubular elements, each having a lower straight section and an upper arcuate section, said lower straight section of each tubular element being immovably fastened to the upper section of one rail of said ladder by suitable clamping means, said clamping means consisting of a U-shaped bracket with fastening bolt that passes through the arms of said bracket and through each said tubular element to prevent said tubular element turning within said bracket, one of said clamping means being fastened around said tubular element and said rail of said ladder contiguous to and above the top rung of said ladder, the second of said clamping means being fastened around said same tubular element and said same rail of said ladder contiguous to but below the second rung down from the top of said ladder to prevent movement of said tubular element along said rail of said ladder, said upper arcuate sections of said tubular elements extending divergently outward from the upper rails of said ladder to join a cross piece that is wider in a horizontal direction than the distance between the distal ends of said arcuate tubular sections, said cross piece being swingingly connected to said distal ends of said arcuate sections and having a non-slipping material across the face of said cross piece that contacts the surface which supports the upper end of said ladder.

3. In combination with a ladder having side rails and adapted to have its upper end braced away from any supporting element, an attachment for supporting and bracing the top of such ladder comprising a pair of tubular elements, each having a lower straight section and an upper arcuate section, said lower straight section of each tubular element being immovably fastened to the upper section of one rail of said ladder by suitable clamping means, said clamping means consisting of a U-shaped bracket with fastening bolt that passes through the arms of said bracket and through said tubular element, one of said clamping means being fastened around said tubular element and said rail of said ladder contiguous to and above the top rung of said ladder, the second of said clamping means being fastened around said same tubular element and said same rail of said ladder contiguous to but below the second rung down from the top of said ladder, said upper arcuate sections of said tubular elements extending divergently outward from the upper rails of said ladder and having their distal ends joined to a horizontal cross piece, said cross piece being swingingly connected to said distal ends of said arcuate sections of said tubular elements.

4. In combination with a ladder having side rails and adapted to have its upper end braced away from any supporting element, a supporting device comprising a pair

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of tubular elements connected to a horizontal cross piece, each of said tubular elements having a lower straight section and an upper curved section, said straight sections being longer than said curved sections so as to lie adjacent said side rails of said ladder for suitable fastening thereto, the straight section of each of said tubular elements being fastened to one of said side rails by two clamping means one located just above the top step of said ladder and the other located just below the next lower step, said clamping means encircling one rail of said ladder and the straight section of one of said tubular elements and having a closing element that fastens said clamping means in place, said closing element also extending diagonally through said tubular element and when fastened in said clamping means preventing all movement of said tubular element along the rail of said ladder or around in said clamping means, said upper curved sections of said tubu-

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lar elements extending divergently outward from the rails of said ladder, and said horizontal cross piece being swingingly connected to the distal ends of said curved sections of said tubular elements.

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