

April 26, 1960

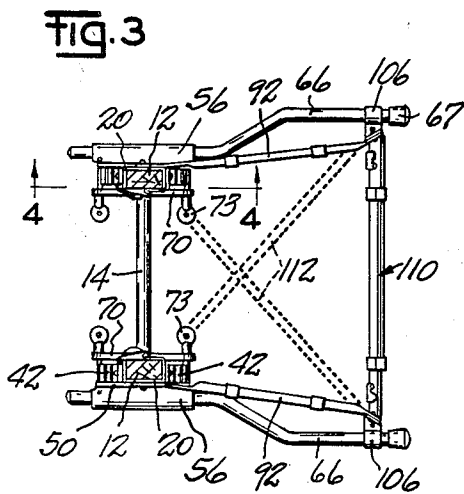
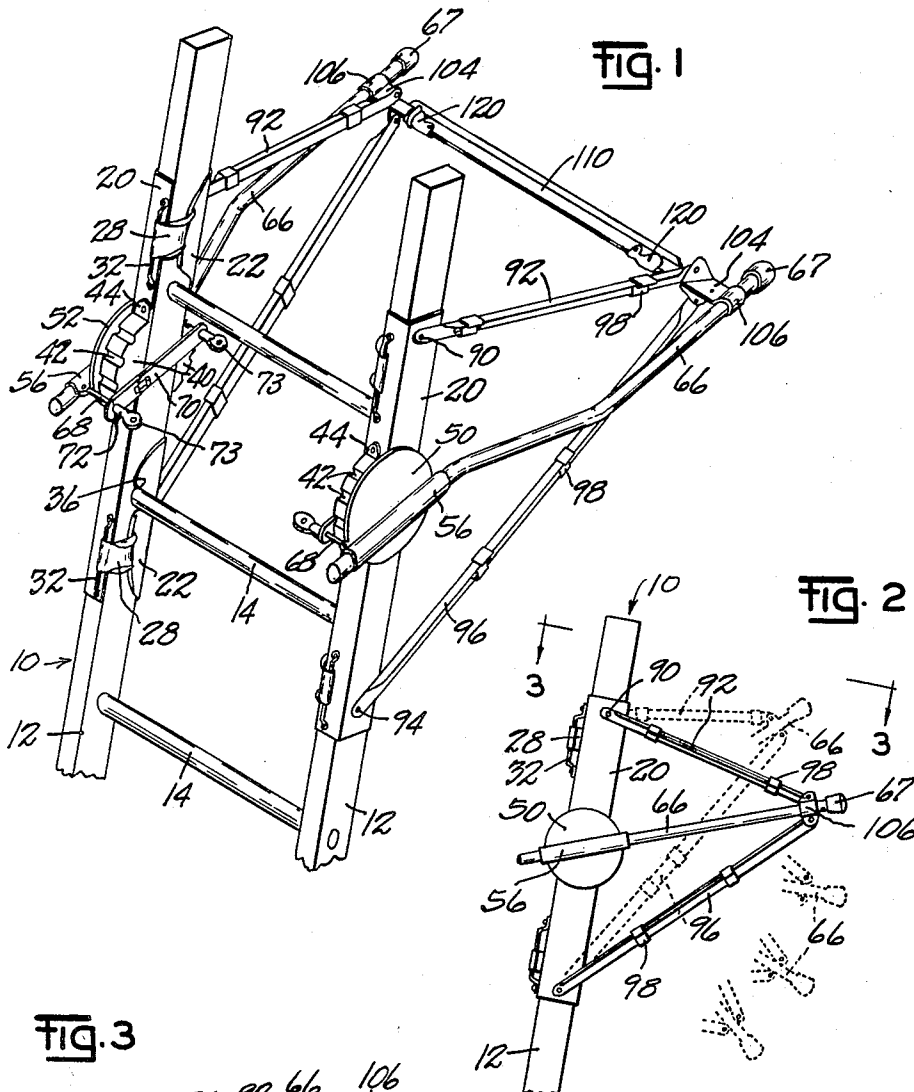
C. S. LADEWSKI

2,934,163

LADDER ATTACHMENT

Filed Oct. 23, 1957

3 Sheets-Sheet 1



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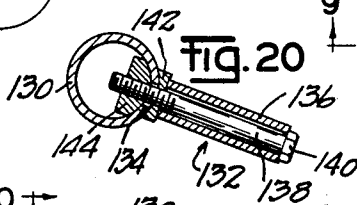
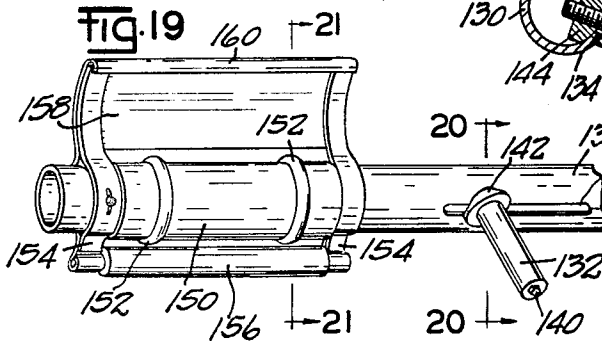
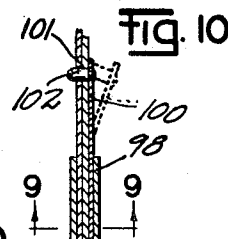
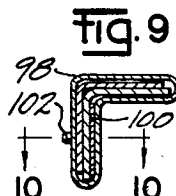
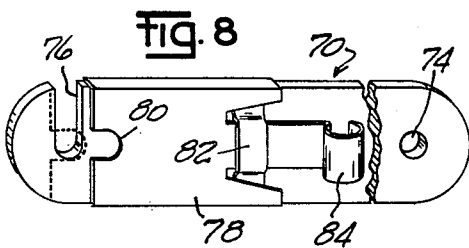
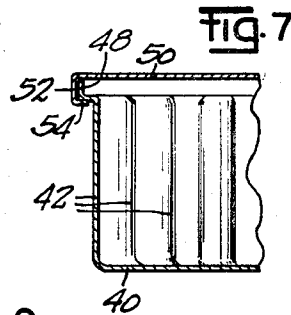
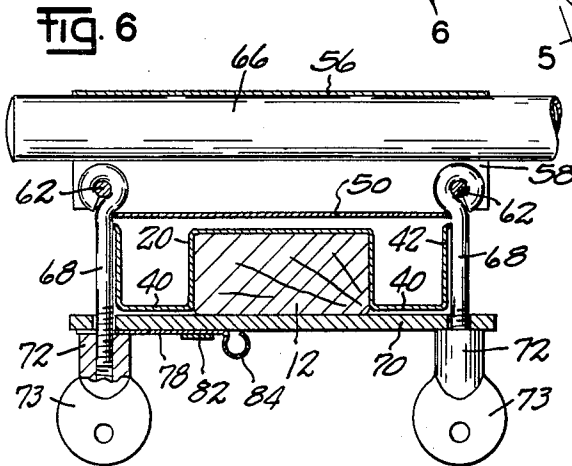
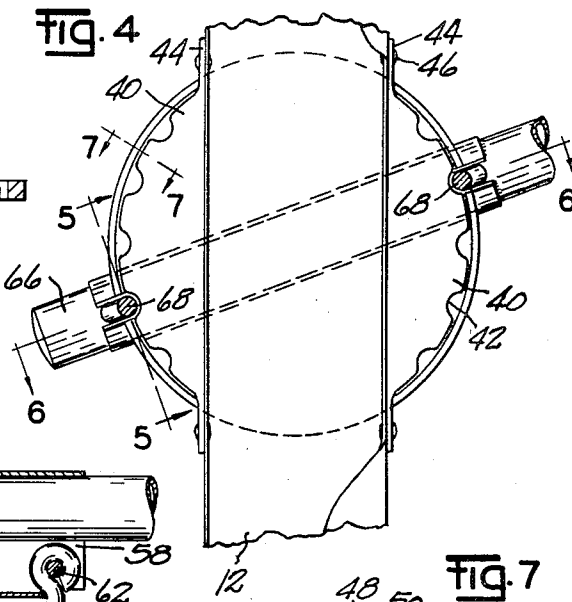
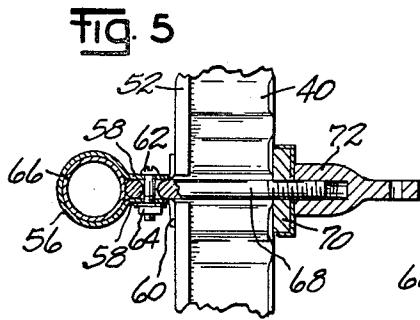
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3 Sheets-Sheet 2



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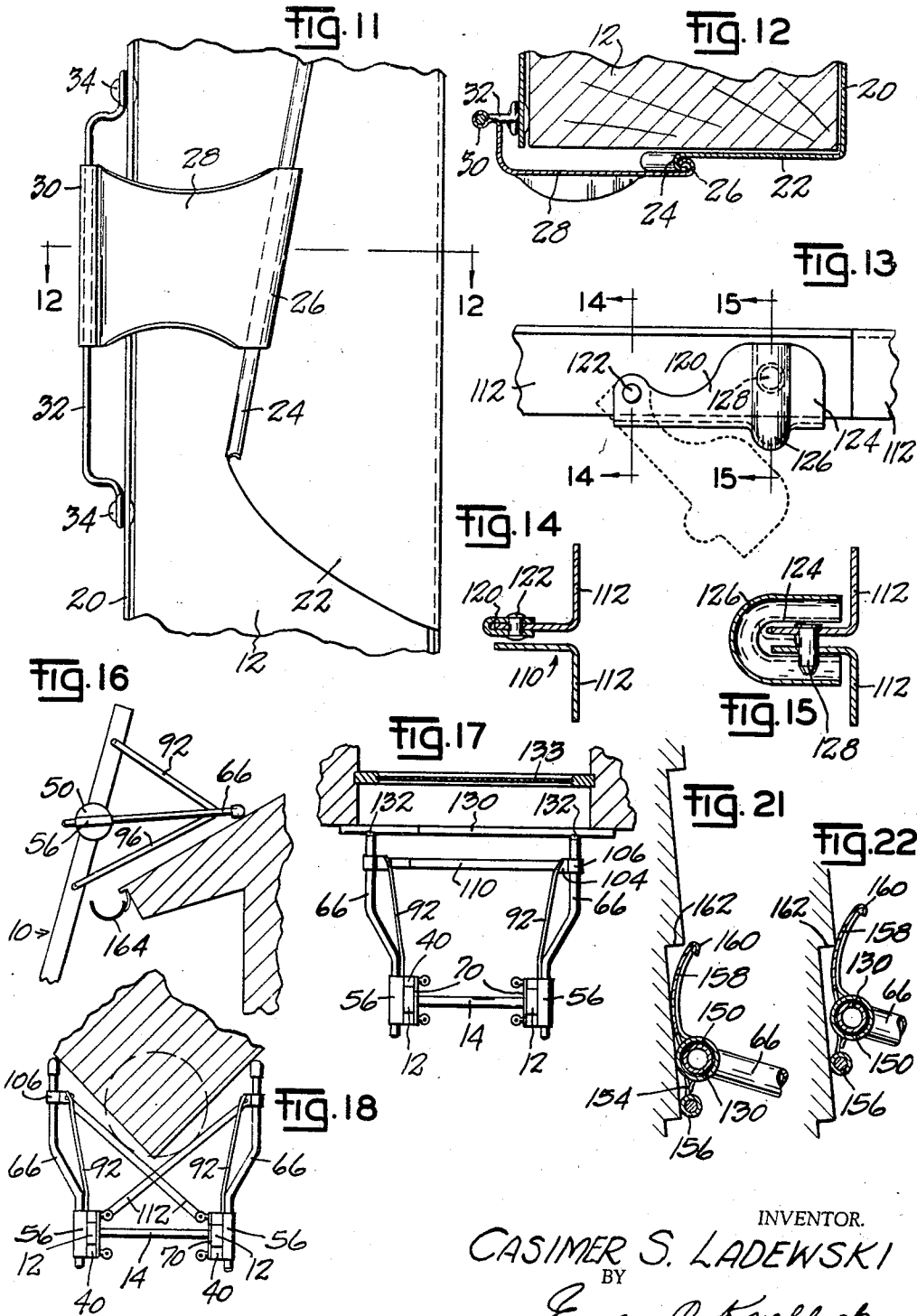
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3 Sheets-Sheet 3



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2,934,163

LADDER ATTACHMENT

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Application October 23, 1957, Serial No. 691,974

7 Claims. (Cl. 182—214)

This invention relates to improvements in ladder attachments.

The primary object of this invention is to provide a ladder attachment adapted to be readily applied to and removed from a ladder and which accommodates support of the upper end of the ladder in spaced relation to a supporting surface so as to facilitate the performance of work by a person standing upon the ladder.

A further object is to provide a ladder attachment for positioning the upper end of the ladder with respect to a support, which attachment is adjustable to accommodate application of the ladder in different locations and support of the ladder effectively against surfaces which do not normally provide solid support for a ladder.

A further object is to provide a ladder attachment adapted to be mounted on the upper end of a ladder to hold the upper end of the ladder spaced from a building and provided with novel means for accommodating vertical extension and retraction of the ladder with minimum resistance due to surface irregularities of a building, such as the stepped contour of a building sheathed by lapped wood siding.

Other objects will be apparent from the following specification.

In the drawings:

Fig. 1 is a perspective view of the attachment applied to a ladder;

Fig. 2 is a side view of the attachment as applied to a ladder, illustrating in dotted lines different adjustments of the attachment;

Fig. 3 is a view taken on line 3—3 of Fig. 2, and illustrating the attachment in top plan view with an alternate adjustment thereof shown in dotted lines;

Fig. 4 is an enlarged detail sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is an enlarged detail sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken on line 6—6 of Fig. 4;

Fig. 7 is a fragmentary detail sectional view taken on line 7—7 of Fig. 4;

Fig. 8 is a fragmentary perspective view of a part of the device;

Fig. 9 is a transverse sectional view of a brace member of the device, taken on line 9—9 of Fig. 10;

Fig. 10 is a longitudinal sectional view of a brace member taken on line 10—10 of Fig. 9;

Fig. 11 is an enlarged fragmentary side view of a locking member of the device;

Fig. 12 is a fragmentary sectional detail view taken on line 12—12 of Fig. 11;

Fig. 13 is a fragmentary side view of a retainer employed in the device;

Fig. 14 is a sectional detail view taken on line 14—14 of Fig. 13;

Fig. 15 is a detail sectional view taken on line 15—15 of Fig. 13;

Fig. 16 is a side view of the device illustrating one manner in which it may engage a support;

Fig. 17 is an end view of the device illustrating a modified embodiment thereof applied against a supporting surface to hold the ladder in desired relation;

Fig. 18 is an end view of the device showing the same applied against a support of a different type with the device shown in a different adjustment than in Fig. 1;

Fig. 19 is an enlarged detail fragmentary perspective view of a modified embodiment of the invention;

Fig. 20 is a sectional view taken on line 20—20 of Fig. 19;

Fig. 21 is a sectional view taken on line 21—21 of Fig. 19 and illustrating an application of the device to a supporting surface of irregular contour; and

Fig. 22 is a view similar to Fig. 21 but illustrating the attachment in a different position with respect to a supporting surface.

Referring to the drawings which illustrate the preferred embodiment of the invention, and particularly to Figs. 1 to 15, inclusive, the numeral 10 designates a ladder having elongated side rails 12 interconnected by spaced parallel rungs 14. The ladder may be of any suitable character, such as a simple ladder or a two-part extensible ladder, and also may be formed of any material, such as wood or aluminum alloy or any other light weight material.

A pair of elongated members 20 of substantially channel shape in cross-section constitute means for snugly embracing the elongated rails 12 of the ladder. The channel members 20 form a part of the means for anchoring the attachment to the ladder, and are preferably of a length substantially greater than the spacing of adjacent rungs 14 of the ladder. Any suitable means may be provided for detachably anchoring the channel members to the ladder rails 12. In the form shown, each channel 20 has a pair of flanges 22 projecting from one longitudinal edge thereof at opposite ends thereof and each provided with a diagonally extending flanged or beaded edge 24 terminating spaced from the opposite marginal edge of the channel 20. In the form shown in Fig. 12 the flange 24 is of hook shape in cross-section and is adapted for engagement with the hook-shaped end 26 of a metal plate 28 having a looped or tubular end 30 rotatable and slidable upon an elongated run 32 of a substantially U-shaped member anchored at its ends at 34 to the margin of the channel 20 opposite the margin from which the flange 22 projects. It will be apparent that downward sliding of the plate 28 from the position shown in Fig. 11 will cause the hook parts 24, 26 to become disengaged so that the plates 28 may be pivoted about their ends 30, and the channels may be disengaged from the ladder rails 12. Conversely upward movement of the plate 28 after interengagement of the hook parts 24, 26 will result in a combination tightening and locking action producing a firm frictional anchor of the channel 20 upon the ladder rails. If desired, one more of the flanges 22 of each channel may have a notched portion thereof at 36 engageable with a rung 14 of the ladder to assist the clamp plates 28 in holding the attachment at selected position along the length of the ladder rails.

At an intermediate point along the length thereof, each of the channels 20 mounts at opposite sides thereof of segment or arcuate members 40 having notched peripheral portions 42 and end flanges 44 providing means for attachment of securing members 46 for anchoring the members 40 to opposite legs of the channel 20. The members 40 are so shaped and proportioned, as illustrated in Fig. 4, that their parts 42 define concentric arcs at opposite sides of each ladder rail. Members 40 preferably include an outwardly projecting marginal curved rim or flange 48 at one side thereof projecting beyond one side surface of the channel 20. If desired, the members 40 may be formed integrally with the channel 20, as seen in Fig. 6.

A disk 50 bears against the offset flanges 48 and has an annular rim part 52 fitting around the flange 48 and an intumed flange 54 hooking behind the offset between the flange 48 and the peripheral portion 42 of the member 40. A clamp comprising a substantially tubular part 56 and a pair of spaced flanges 58 has out-turned foot portions 60 bearing against the disk 50. Suitable securing means of releasable character, such as bolts 62 having nuts 64 threaded thereon, serve to draw the clamp flanges 58 together to clampingly embrace a tubular leg 66. The disk 50 and the leg clamp are locked in selected angular adjustment with respect to the ladder rail 12 by eye-bolts 68 in the construction shown, the eye-bolts 68 passing through apertures in a cross-bar 70 in the construction best illustrated in Fig. 8, and mounting thumb nuts 72, as illustrated in Figs. 4, 5 and 6.

The member 70, as shown in Fig. 8, preferably constitutes a bar having an aperture 74 at one end thereof to receive one of the eye-bolts 68. The opposite end of the bar 70 has a transverse groove or slot 76 formed therein and adapted to receive the shank of the other eye-bolt 68. It will be observed in Fig. 4 that the bolt shanks 68 are so spaced that they seat in notches in the parts 42 of the members 40 and thereby provide positive means for controlling the angular adjustment of the legs 66 relative to the ladder rails 12. A retainer 78 is preferably slidable on the bar 70 and has a longitudinal notch 80 in one end thereof. A strap or guide 82 is preferably carried by the bar intermediate the length thereof and a hand pull 84 carried by the retainer 78 passes through the guide 82 so that retainer 78 may be moved through a limited extent, as between the full line position shown in Fig. 8 and the dotted line position shown in Fig. 8, in which latter position the bolt shank 68 is effectively locked in place. It will be apparent that as the thumb nuts 72 are tightened, the legs are held in a firmly clamped position upon the ladder rails 12. Likewise, it will be understood that upon release of the thumb nuts 72 at the lefthand end of the construction shown in Fig. 6, the retainer 78 may be slid to the full line position shown in Fig. 8, whereupon the plate 70 may swing about the other eye-bolt to a releasing position, disengaging the ladder rail 12.

Each of the channels 20 has pivotally connected at 90 at one end thereof an extensible brace 92 and has pivotally connected at 94 at the opposite end thereof an extensible brace 96. The extensible brace members 92 and 96 are preferably formed of a pair of metal angle members, as illustrated in Fig. 9, which are slidably embraced at spaced points thereof by retainers 98, as illustrated in Fig. 9. Each of the extensible braces is preferably provided with a pair of retainers 98, one thereof preferably being secured to the free end of each of the two constituent angle members of said brace. At least one retainer member 98 preferably mounts means for adjusting the brace. Thus an elongated longitudinally projecting leaf spring 100 may be carried by a retainer and mounts a pin 102 at its free end. The constituent angle members forming the two braces 92 and 96 may be provided with a series of longitudinally spaced apertures 101, and the spring 100 normally urges the pin 102 into registering apertures. Spring 100 accommodates disengagement of the pin 102 from said apertures 101 by flexing thereof to the dotted line position shown in Fig. 10 to permit changing the adjustment or the overall length of the extensible brace.

A bracket 104 is pivotally connected to the free ends of the extensible braces 92 and 96 associated with each channel 20, thereby serving to interconnect said braces. The bracket 104 includes a tubular guide portion 106 slidably receiving an end portion of the adjacent leg 66 opposite the end portion embraced in the tubular clamp 56. The legs 66 are bent so that the opposite end portions of the legs 66 are preferably substantially

parallel to one another but offset from each other to accommodate outward lateral projection of the bracket 104 from the extensible braces 92 and 96 to which it is pivotally connected. If desired, an end portion of each leg 66 may mount a rubber cup or cap 67.

It will be apparent that by virtue of the provision of the extensible brace members 92 and 96 and the means for adjustably locking each of the legs 66 to the ladder rails 12, the angular position of the legs 66 with respect to the ladder rails 12 may be changed within a wide range, as indicated by the dotted line showings in Fig. 2. Thus, assuming that the anchor bolts 68 and their thumb nuts 72 are released so that the disk 50 and the clamp 56 are free to rotate, the braces 92 and 96 may be manipulated to the desired lengths, whereupon the clamp means 68, 72 for the disk 50 may be retightened. It will be apparent that the spacing of the apertures 101 in the extensible braces which receive the locking pins 102 must be so correlated with respect to the angular disposition of the bolt-shaped receiving grooves 42 in the members 40 that each bolt shank 68 will seat in a groove 42 for each adjustment or setting of the pins 102 of the extensible braces 92, 96.

A two-part cross-brace 110 may interconnect the brackets 104. The two parts 112 of the brace 110 are preferably angle members, and each is pivoted at one end thereof to one of the brackets 104 in a direction to swing toward and away from the members 40. Suitable means are provided for releasably holding the parts 112 of the brace together. Thus, as illustrated in Fig. 13, a clip 120 of U-shape in cross-section may be pivoted at 122 to one member 112. The member 120 has an enlarged U-shaped head portion 124 adapted to extend around both of the members 112 and is preferably provided with a transverse offset 126 adjacent the point at which a locking pin 128 is anchored by the flange of a member 112 confronting an apertured flange of the opposite member 112 to pass through an aperture of the latter, as seen in Fig. 15. Apertures may be formed in parts 112 at the free ends of the cross-brace members 110 and these apertures accommodate parts 112 for attachment near the ladder rails. The apertures of parts 112 may register with eyelet-heads 73 on the innermost nuts 72 at the opposite side of the attachment for connection of the parts 112 with said eyelets 73 by suitable securing members (not shown) to provide the cross-brace arrangement illustrated in Fig. 18.

A modified form of the invention is illustrated in Fig. 17, wherein an extensible bar 130 is provided with a pair of perpendicular projections 132 adapted to seat in the ends of the tubular legs 66 when the end caps 67 thereof have been removed. The bar 130 will accommodate positioning of the ladder against a building in the manner illustrated in Fig. 17 adjacent to a window 134, so that the bar 130 spans the window frame while locating a ladder adjacent said window to accommodate painting of the window or other work thereon. The member 130 will preferably be formed of two telescoping parts to accommodate extension thereof. For this purpose a construction as illustrated in Figs. 19 and 20 may be provided. Thus each tubular telescopic section of bar 130 will be provided with an elongated slot 134 extending longitudinally thereof. Each pin 132 may constitute a hollow tube 136 receiving the shank 138 of a bolt having a head 140 at its outer end bearing against the end of tube 136. A washer 142 bears against the inner end of the tube 136. A nut 144 having a part-spherical surface fits within the tube 130 and is threaded upon the shank of the bolt 138 which extends through slot 134. It will be apparent that the setting of the pin 132 may be varied along the length of the slot 134, thus accommodating extension and retraction of the bar 130 while maintaining desired spacing of pins 132.

Anti-friction means may be provided upon each end of the bar 130 to accommodate sliding thereof on irregu-

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lar building surfaces, as on lap siding, as illustrated in Figs. 21 and 22. As here shown, a tube 150 rotatably encircles each end part of the tube 130 and may be provided with circumferential ribs 152. Brackets 154 include parts which encircle the tube 130 adjacent each end of the tube 150. Each bracket journals at one end thereof an end of a comparatively small roll 156 extending parallel to the large roll 150 and spaced therefrom. The opposite ends of the brackets 154 project in diametrically opposed relation to the rollers 156 and are curved and interconnected by a transversely curved plate 158 having a rounded outer edge 160. This anti-friction means permits the ladder attachment to be shifted against the side of a building, as illustrated in Figs. 21 and 22. Thus the rollers 150 and 156 will normally engage the building and accommodate rolling movement of the attachment against the building wall when the length of the ladder is being extended and retracted. If any projection in the building wall is encountered, as at 162 in Fig. 21, the curved plate 158 and the curved ends of the brackets 154 cam the unit as it is moved toward that projection, thereby causing the brackets 154 and the curved plate 158 to slide against the projection 162 while the small roller 156 engages the portion of the wall below the projection 162 until such time as both rollers 150 and 156 can bear on the surface of the building again.

The ladder attachment provides great versatility. Thus, as shown in Fig. 16, the attachment legs 66 are shown resting upon the roof of a building spaced above the eaves with the ladder 10 spaced outwardly from the eaves 164. This affords a workman an opportunity to work at and around the eaves and behind and beneath the eaves with safety and convenience. Another adjustment of the device, as illustrated in Fig. 18, permits the ladder to be supported either at a corner of a building or against the trunk of a tree or against a pole. The adjustment shown in Fig. 17 permits the ladder to be positioned at a window. Consequently, the attachment provides for safe accomplishment of work by a user standing on a ladder, and provides safe ladder support at a large number of locations and in a large number of positions at which ladders cannot now be safely used. The device is light in weight so that it does not render a ladder unwieldy; and it affords a large number of adjustments so that it is highly versatile. The attachment is preferably made of sheet metal, angle members and metal tubing, and hence can be made of light weight without sacrifice of strength.

While the preferred embodiments of the invention have been illustrated and described, it will be understood that changes in the construction may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, said securing leg means including a leg-engaging clamp rotatably adjustable on said mounting member, and means for anchoring said clamp to said mounting member in selected rotative adjustment.

2. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the

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mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, said leg-securing means including a pair of arcuate sector members carried by each mounting member in concentric relation, a member rotatably supported on said sector members and including a leg clamp, and means for locking said rotatable member on said sector members in selected rotative adjustment.

3. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, said leg-securing means including a pair of arcuate peripherally notched concentric members carried by each mounting member, a leg-supporting member including a disk bearing against the margins of said arcuate members, and means for clamping said leg-supporting members in selected rotative relation to said mounting member and arcuate members and including drawbolts seating in selected notches of said arcuate members.

4. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, said legs being bent laterally outwardly intermediate their length, and means connected to each mounting member for detachable connection with the cross-brace of the other unit.

5. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, said legs constituting tubes, an extensible crossbar, spaced pins projecting from said crossbar and releasably fitting in the ends of said legs, and means for securing said pins in selected positions on said crossbar.

6. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said legs, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, a crossbar carried by said legs spaced from said ladder, a roller journaled on each end of said crossbar, a bracket pivoted on each end of said crossbar, and a second

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roller journaled on each bracket in spaced parallel relation to said first roller.

7. An attachment for a ladder having side rails and rungs, comprising a pair of attachment units, each unit including a mounting member adapted to be secured to a ladder rail, a leg, means on each mounting member securing said leg in selected angular relation to the mounting member, a pair of extensible braces each secured at one end to the mounting member, means pivotally interconnecting the opposite ends of said braces and supporting said leg, a pair of cross-brace members each pivoted to one unit spaced from the mounting member thereof and detachably secured to the other unit, and a crossbar spanning and secured to the ends of said legs spaced from said ladder, a roller journaled on each end of said crossbar, a bracket pivoted on each end of said crossbar, a second roller journaled on each bracket in spaced parallel relation to said first roller, said

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bracket including a curved skid portion projecting from said crossbar in diametrically opposed relation to said second roller.

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