Dec. 2, 1952 O. M. GULDJORD 2,620,115

LADDER FOOT

Filed Sept. 4, 1951 2 SHEETS—SHEET 1

FIG. 1.

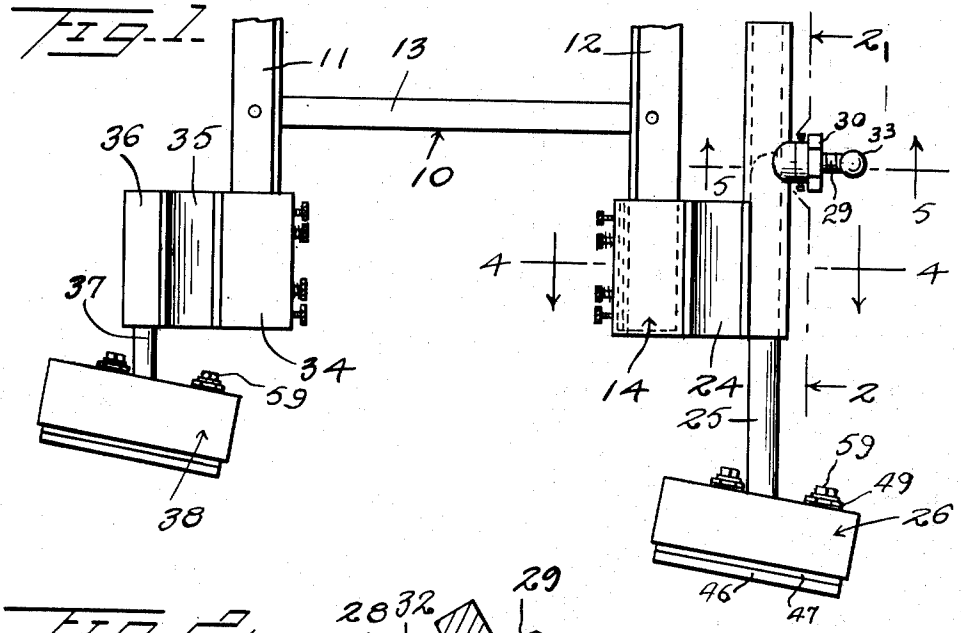

FIG. 2.

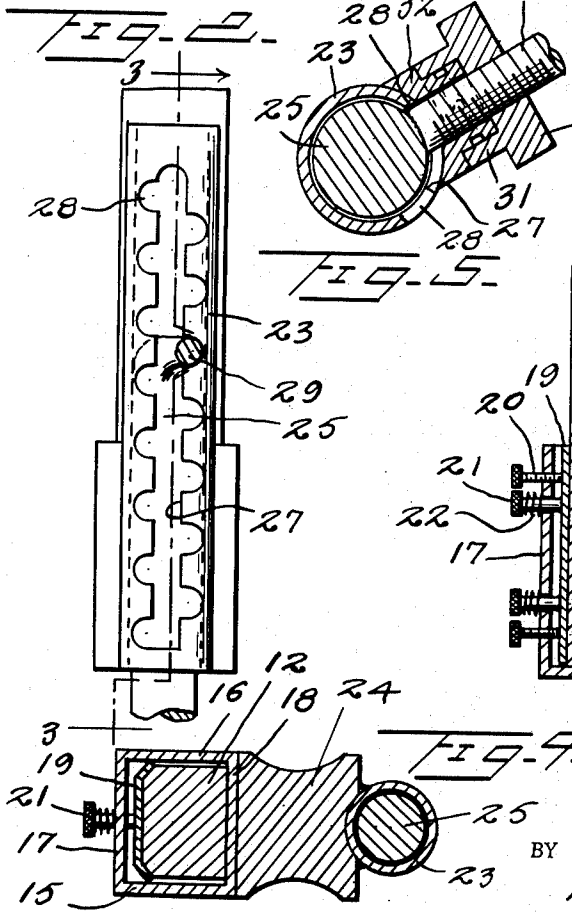

FIG. 5.

FIG. 3.

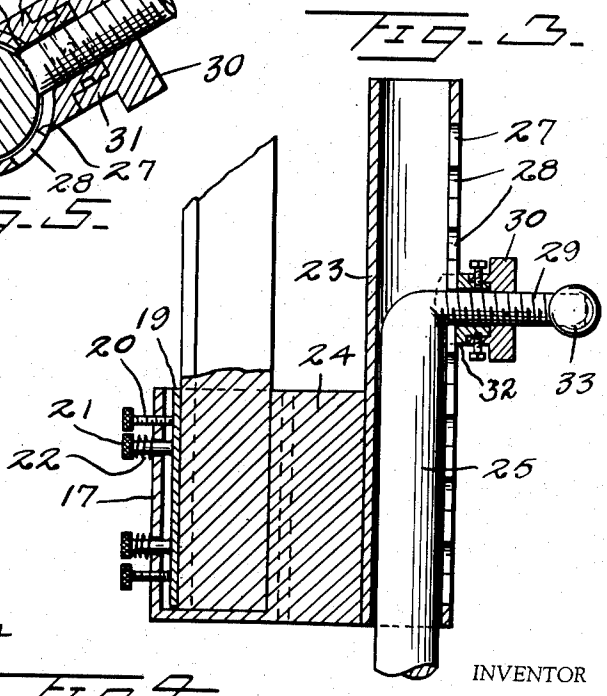

FIG. 4.

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LADDER FOOT

Filed Sept. 4, 1951

2 SHEETS—SHEET 2

Fig. 6.

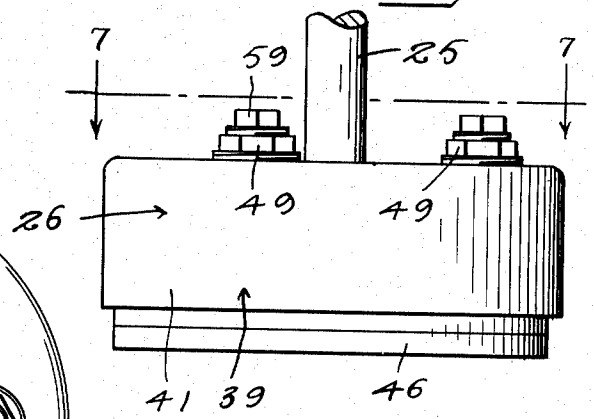


Fig. 7.

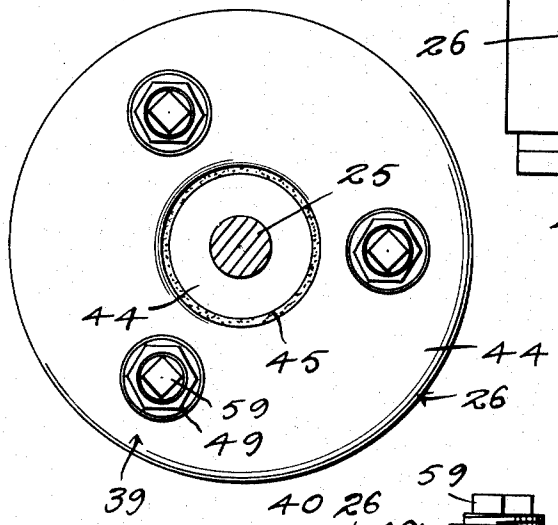
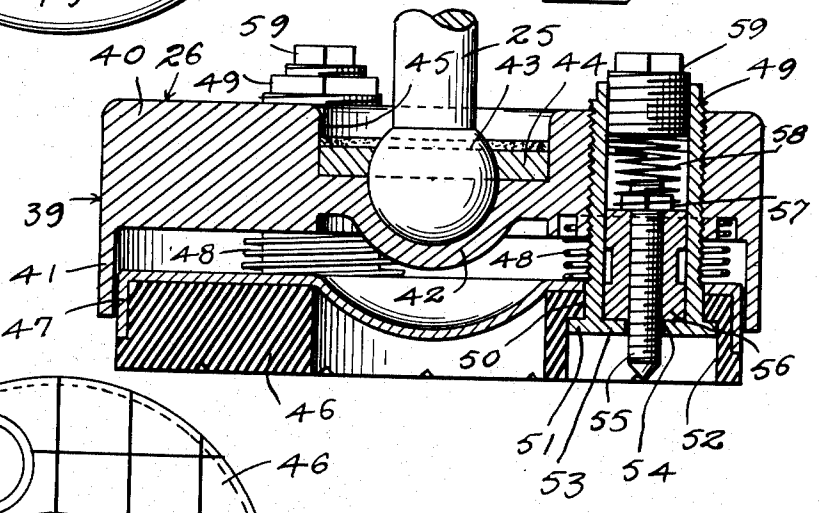


Fig. 8.



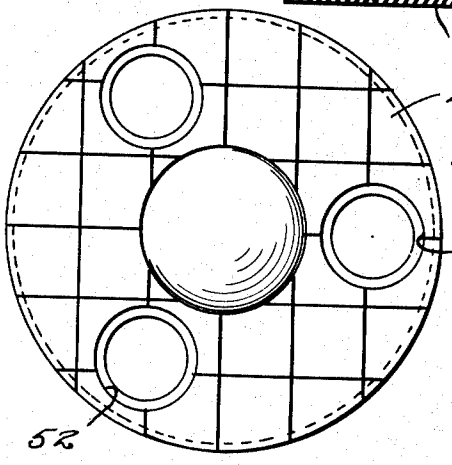


Fig. 9.

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LADDER FOOT

Oscar M. Guldjord, Seattle, Wash.

Application September 4, 1951, Serial No. 244,869

2 Claims. (Cl. 228—63)

1

This invention relates to an equalizer attachment for ladders.

An object of this invention is to provide an attachment for mounting on the lower ends of the side rails of a ladder whereby the ladder may be levelled or made vertical where the ground is uneven.

Another object of this invention is to provide an attachment of this kind which may be used on either side of a ladder so as to level the ladder.

A further object of this invention is to provide an improved foot for a ladder which will firmly grip the surface on which the ladder is resting so as to prevent slipping of the ladder.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a detailed side elevation of a ladder equalizer constructed according to an embodiment of this invention.

Figure 2 is a fragmentary sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a sectional view taken on the line 5—5 of Figure 1.

Figure 6 is a detailed side elevation of one of the foot members.

Figure 7 is a sectional view taken on the line 7—7 of Figure 6.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Figure 9 is a bottom plan view of the rubber cushion member.

Referring to the drawings, the numeral 10 designates generally a conventional ladder having a pair of side rails 11 and 12 which are connected together by means of rungs 13.

In order to provide a means whereby the rails 11 and 12 may be disposed in substantially a vertical position irrespective of the contour or inclination of the ground or surface on which the ladder rests, I have provided an equalizer means as will be hereinafter described. A socket member 14 is adapted to telescope over the lower end of the rail 12 and is formed of front and rear walls 15 and 16, respectively, and inner wall 17 and an outer wall 18.

The lower end of the rail 12 is adapted to seat in the socket 14, and the socket 14 is firmly clamped to the rail 12 by means of a clamping

2

plate 19 which is loosely disposed within the socket 14 and is adjusted inwardly to a clamping position by means of a pair of threaded pressure bolts 20 which are threaded through the inner wall 17.

The clamping plate 19 is constantly urged outwardly to released position by means of a pair of headed pins 21 which are slidable through the inner wall 17 and are secured at their inner ends to the clamping plate 19. A spring 22 is disposed about each pin 21 and constantly urges plate 19 to the left or toward the inner wall 19 and to a released position.

A vertically disposed tubular guide 23 is fixed relative to the socket 14 and is disposed in outwardly offset position relative to socket 14 by means of a connecting bracket 24.

A shank or shaft 25 is slidable within the guide 23, and the lower end of the shaft or shank 25 has adjustably secured thereto a foot member generally designated as 26. The guide 23 is formed with a vertically disposed slot 27 and a plurality of staggered and vertically spaced apart keepers or notches 28 are formed in the guide 23 on opposite edges of the slot 27.

The shaft or shank 25 has projecting from the upper end thereof a right angularly disposed locking arm 29 which is movable vertically within the slot 27 and is adapted to be swung laterally into a selected one of the keeper notches 28.

The arm 29 is threaded and a locking nut 30 is threaded on the arm 29. The nut 30 has swivelly secured to an annular flange 31 carried by the nut 30 a clamping sleeve 32 which is adapted to bear against the outer side of the guide 23. The outer end of the arm 29 has mounted thereon a knob or enlargement 33 so as to prevent removal of the nut 30 when the latter is rotated to a released position.

A second socket 34 similar to socket 14 is mounted on the lower end of rail 11 and includes an outwardly projecting bracket 35 having a vertically disposed sleeve 36 fixed thereto. A shank 37 is fixedly disposed in the sleeve 36, and a cushioned foot member 38 similar to foot member 26 is rockably or adjustably carried by the shank 37.

Referring now to Figures 6 to 9 inclusive, there are disclosed the details of construction of the foot members 26 and 38. The details of construction of one of these foot members will apply equally as well to the other foot member. The foot member 26 includes an inverted cup-shaped housing 39 which is formed of a top plate 40 having annular side wall 41.

The top plate 40 is formed centrally thereof

with a downwardly depressed ball socket 42 within which a ball 43 carried by the shank 25 rockably engages. A cap 44 is welded or otherwise fixed within a central recess 45 formed in the top wall 40 so as to retain the ball 43 in socket 42.

A ring-shaped rubber cushion member 46 is carried by an inverted cup-shaped washer 47 which is slidable in the housing 39, and springs 48 within the housing 39 constantly urge the washer 47 and the cushion member 46 downwardly to operative position.

The springs 48 engage about threaded sleeves 49 which extend through the top wall 40 and also are slidable in openings 50 formed in the cushion member 46. The lower end of the sleeve 49 is provided with an annular flange 51 loosely engaging in an opening 52 formed in the ring 46, and the lower end of the sleeve 49 also includes a bottom wall 53 having a central opening 54.

An anti-friction pointed pin 55 loosely engages through the opening 54 and has a nut 56 threaded thereon, which is slidable within the sleeve 49. The pin 55 is locked in adjusted position relative to the slide nut 56 by means of a lock nut 57. The pin 55 with the slide 56 is constantly urged downwardly by means of a spring 58 bearing against the upper end of slide nut 56 and also bearing against a spring tensioning plug 59 which is threaded into the upper end of sleeve 49.

In the use and operation of this device where the surface to be engaged by the ladder 10 slopes to the right, as viewed in Figure 1, the adjustable shank 25 is disposed on the right side of the ladder with socket 14 clamped to rail 12. Socket 34 is clamped to rail 11. When the rails 11 and 12 are substantially vertically disposed, the shank 25 may be vertically adjusted so that the foot member 26 will be in contact with the sloping surface.

The vertical adjustment of shank 25 is accomplished by loosening lock nut 30, and the shifting arm 29 to the desired keeper notch 28. When

arm 29 is in the desired keeper notch 28, lock nut 30 is threaded inwardly so that clamping sleeve 32 will bear tightly against the guide 23 and thereby hold arm 29 against release from the keeper notch 28.

The brackets 24 and 35 which offset the guide 23 and the guide or sleeve 36 laterally from the rails 12 and 11, respectively, provide for increasing the width of the bottom of the ladder so that the ladder will have a firm footing on the supporting surface.

What is claimed is:

1. An anti-slipping ladder foot comprising an inverted cup-shaped housing, a resilient cushion member, an inverted cup-shaped retainer for said member loosely disposed in said housing, a spring constantly urging said retainer downwardly, a plurality of sleeves adjustably carried in said member, a plurality of pointed pins loosely projecting through said sleeves, threaded means for adjusting said sleeves to provide for varying the projection of said pins below said housing and means for varying the tension of said spring.

2. The structure of claim 1 wherein said last-mentioned means includes exterior threads on said sleeves, and wherein said pins are carried by spring biased slidable members movably mounted interiorly of said sleeves.

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