June 3, 1969 R. A. SMITH 3,447,631

LADDER LEVEL

Filed Nov. 17, 1967

Fig. 1

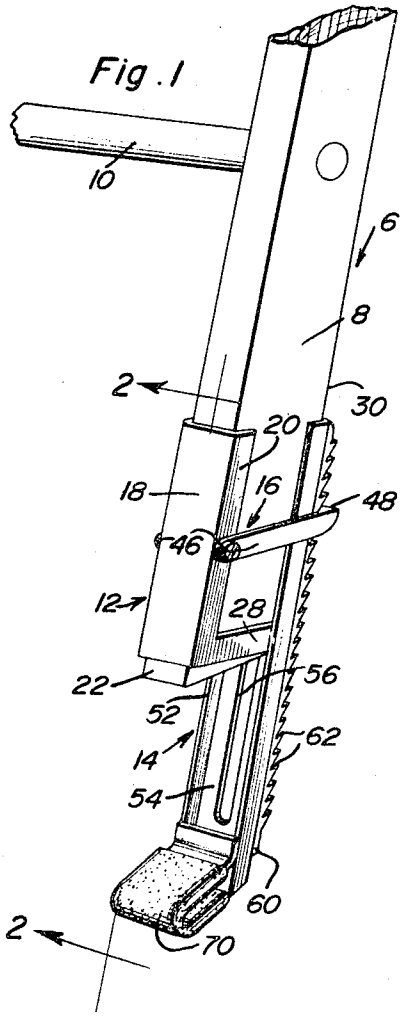


Fig. 2

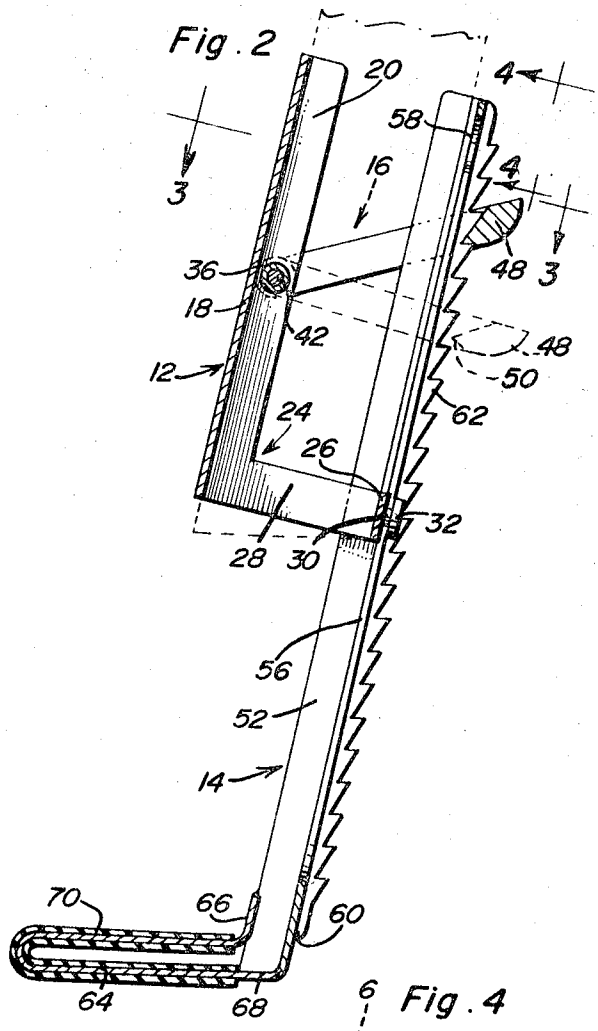


Fig. 3

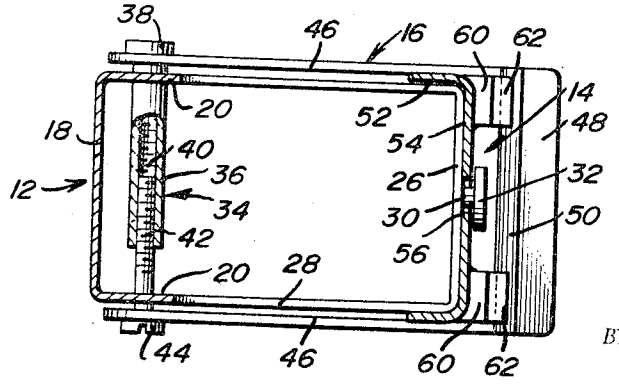
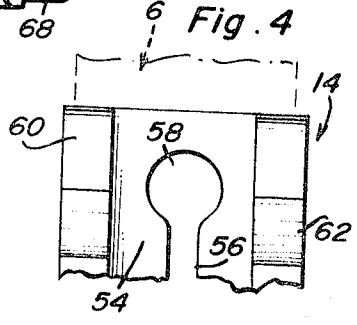


Fig. 4



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LADDER LEVEL

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ABSTRACT OF THE DISCLOSURE

A rung-equipped ladder wherein one or both stiles are provided with surface engaging, levelling and compensating extensions. The adaptation shown is characterized by three component parts, namely, a vertically shiftable stile-length adjusting unit, a companion adapter unit, and a complemental latch-dog unit pivotally connected to the adapter unit. The adapter unit embodies a channel, a rigidifying stile surrounding yoke or bridle and a headed stud keyed slidingly in the slotted web of the vertically shiftable channel member of the length adjusting unit. This latter unit has an anti-slipping foot, and rack teeth with which the latch-dog is incrementally and releasably engageable.

This invention relates, generally speaking to rung- and step-equipped ladders wherein the lower end portion of at least one stile or side rail is provided with an extensible and retractable length-varying, ladder levelling and surface engaging and compensating attachment, commonly referred to in the art as a stile extension and which, in keeping with the herein disclosed concept, features significant improvements.

One improvement has to do with an adapter bracket or unit which embodies a channel which is capped over a front lower end portion of the stile and is saddled over the stile and is secured in place by bolt means and firmly held against displacement by a U-shaped yoke which is bridled over the stile.

Another improvement features a vertically adjustable relatively long channel member which is slidingly keyed to the yoke and embraces and rides up or down in a manner to locate and properly position a rubber-covered anti-slipping foot beneath the bottom of said stile.

An equally important improvement relies for uniqueness on a feasible and easy-to-use latch-dog which is pivotally hinged on the aforementioned bolt means, has arms straddling both channels and a heavy duty tooth-like detent or dog which is incrementally releasably engageable with rack teeth provided exteriorly on the web of the adjustable channel member.

Briefly, this invention, construed from the standpoint of a novel combination, comprehends a ladder embodying a rung-equipped stile having front and rear lengthwise surfaces, and relatively stationary support surface engaging, compensating, and levelling means carried by a lower end portion of said stile, said means comprising, a vertically slidable stile-length adjusting unit and a complemental adapter unit, said adapter unit being securely fastened on said lower end portion, said adjusting unit embodying a vertically elongated attaching member slidingly connected with (1) cooperating portions of said rear lengthwise surfaces and (2) a coacting component part of said adapter unit, said member having a lower end terminating in a support surface engaging foot.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein

like numerals refer to like parts throughout, and in which:

FIG. 1 is a fragmentary perspective view showing a single rung, a lower end portion of one of the side rails or stiles of a conventional ladder and also showing the attachment and how it is constructed, operatively attached and used.

FIG. 2 is a vertical sectional view taken on the plane of the section line 2—2 of FIG. 1 and on a slightly enlarged scale.

FIG. 3 is a horizontal section on a further enlarged scale taken on the horizontal section line 3—3 of FIG. 2.

FIG. 4 is a detail view of the upper end portion of the rearward channel member taken on a suitably enlarged scale on the plane of the line 4—4 of FIG. 2.

By way of introduction it is to be pointed out that the attachment is herein referred to as a ladder level, is shown in use on a rung-type ladder but, manifestly, lends itself to use on a stepladder (not shown) if desired. It is also evident that a single one of the attachments is shown and that in practice there may be an attachment for the lower end of each of the ladder stiles.

With reference to FIG. 1 the ladder is denoted by the numeral **6**. The single ladder stile or side rail is denoted at **8** and the single rung at **10**.

The attachment comprises three component parts or units, namely, an adapter unit **12**, a stile-length adjusting unit **14** and a third unit referred to generally as a latch-dog **16**.

The adapter unit **12** is of one-piece construction and embodies a vertically elongate channel embodying a web portion **18** and channel walls or flanges **20**. This channel is capped or saddled over the forward edge portion **22** (FIG. 1) and the flanges **20** accordingly embrace the co-operating side surfaces of the stile. The lower end portion of this unit is provided with a substantially U-shaped stile encircling yoke **24** (FIG. 2) which embodies a bight portion **26** connecting corresponding ends of the arms **28**. These arms straddle the stile and the bight portion **26** bridges a rearward vertical edge portion **30** of the stile as is evident in the dotted line showing in FIG. 2. The median portion of the bight portion has an integral outstanding stud **30** with a circular assembling and keying head **32**. The median portions of the flanges **20** are provided with bolt holes for the bolting and retaining means denoted generally at **34** in FIG. 3. The hollow component **36** has a head **38** and an internal axial screw-threaded socket **40** to accommodate the shank **42** of the companion headed bolt section **44**. This headed shank passes through the bolt hole and the two heads and adjacent portions of the bolt means serve not only to anchor the adapter in place but provide hinging and retaining means for the aforementioned U-shaped latch-dog **16**. This arrangement is clear from FIG. 3 wherein it will be noted that the limbs **46** are hinged on the headed ends of the bolt means. The median connecting portion **48** is provided with a beveled knife-like edge which constitutes a detent **50** and is used in the manner illustrated in FIGS. 1 and 2.

The extensible and retractable stile-length adjusting unit **14** is of one-piece construction and comprises a vertically elongated channel member embodying spaced parallel side flanges **52** joined by an elongate web **54** having a central slot **56**. This channel member is shiftably and slidingly engageable with the rear edge portion **30** of the stile and when in proper position the headed stud means **30** and **32** is operatively connected with the slot **56** to slidingly connect the two units **12** and **14**. The upper end of the slot is provided with an enlarged opening which is denoted at **58** in FIG. 4. This construction and arrangement allows the slotted web and headed shank to be as-

sembled and permits the unit **14** to slide relative to the stationary unit **12**. Fixed on the exterior side of the web **54** are elongated toothed rack bars **60**. These rack bars provide keeper teeth **62** which are shaped and arranged to accommodate the incrementally engageable and releasable detent **50** in the manner shown. The desired lateral surface engaging and compensating foot is denoted at **64** and has its end portions **66** and **68** welded or otherwise secured to component parts of the channel. This foot is of the elongate shape shown and is protectively enclosed in a rubber or an equivalent cushioning and anti-slipping jacket **70**.

FIG. 1 shows the complete attachment installed and readied for use. FIG. 2 shows the component parts considerably enlarged and also serves to bring out the function of the U-shaped latch-dog **16**. The specific details are brought out advantageously in FIG. 3. It is believed that a careful consideration of the specification in conjunction with the views of the drawing and the invention as claimed will enable the reader to understand the invention, the manner of use and the inherent features and advantages which have been attained. A more detailed description is thought to be unnecessary.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In combination, a ladder embodying a rung-equipped stile having front and rear lengthwise surfaces, and support surface engaging, compensating, and levelling means carried by a lower end portion of said stile, said means comprising, a vertically slidable stile-length adjusting unit and a separate but complemental adapter unit for said adjusting unit, said adapter unit being retentively bolted on said lower end portion, said adjusting unit embodying a vertically elongated attaching member slidingly connected with (1) cooperating portions of said rear lengthwise surface and (2) a coacting component part of said adapter unit, said attaching member having a lower end terminating in a support surface engaging foot, said foot being disposed at an angle lateral to the vertical long axis of said attaching member and underlying the lower terminal end of said stile, said foot being integral with the lower end of said attaching member.

2. The combination defined in and according to claim **1**, and wherein said attaching member is channel-shaped in cross-section, the rear lengthwise portion of said stile being fitted conformingly but shiftably in the channel portion, and, in combination, a latch-dog carried by said adapter unit and having a detent releasably engaging keeper means provided therefor on said attaching member.

3. The combination defined in and according to claim **1**, and wherein said adapter unit embodies a vertically elongated channel having a rail encompassing, stabilizing and anchoring yoke at a lower end, said channel being secured to said rail.

4. The combination defined in and according to claim **1**, and wherein said adapter unit comprises a vertically elongated channel which is cooperatively saddled in place over the cooperating lower end portion of said stile, said channel being provided at a lower end with a right angularly directed rail surrounding, stabilizing and holddown U-shaped yoke, and a U-shaped latch-dog having a pair of arms saddled over a cooperating portion of said stile and pivotally mounted on a median portion of said channel and also having a bight portion provided with a tooth-like detent adapted to bridge said attaching member and releasably engageable with rack teeth provided for that purpose on said member.

5. For use on the lower end portion of a rung-equipped ladder stile, a surface engaging, levelling and compensating device comprising, in combination, three principal components, namely, a vertically shiftable stile-length adjusting and levelling unit, a companion adapter unit, and a complemental latch-dog, said adapter unit comprising a vertically elongated channel member having side flanges and of a cross-section capable of being capped over and saddled in place on a predetermined portion of said stile, said channel member having an integral U-shaped rail embracing yoke at a lower end adapted to be bridled over said stile, said yoke having a central portion provided with a headed stud, said latch-dog being U-shaped in plan and embodying rail straddling arms pivotally joined at like ends to median portions of said side flanges, and a bight portion connecting the other ends of said arms and provided with a rigid tooth-like detent.

6. The device defined in and according to claim **5**, and wherein said stile-length adjusting unit comprises an attaching member which is channel-shaped in cross-section, is provided at a lower end with a lateral rubber-covered anti-slipping foot, has a web provided with a centralized longitudinal slot in which the headed end of said stud is slidingly keyed, said web being provided with fixed spaced parallel toothed racks, the teeth thereof providing keepers, and said detent bridging and being selectively and releasably connectible to said keepers.

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