United States Patent [19]

Baumann

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[54] **RAIL EXTENSION DEVICE FOR LADDERS**

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[52] **U.S. Cl.** **182/201**
[51] **Int. Cl.** **E06c 7/44**
[58] **Field of Search** ... 182/201, 203, 204, 205, 108, 182/111; 248/188.4, 188.8

[56] **References Cited**

UNITED STATES PATENTS

2,318,017 5/1943 Schmidt 182/201
758,743 5/1904 Fader 292/348

Primary Examiner—Reinaldo P. Machado
Attorney, Agent, or Firm—Walter S. Murray

[57] **ABSTRACT**

An extension device attachable to the side rails of ladders that is adjustable to maintain the ladders in vertical positions upon uneven supporting surfaces, said device being readily manipulated to the desired rail extended condition and adapted to retain that condition when the ladder is set up or when the ladder is moved from one place to another.

5 Claims, 6 Drawing Figures

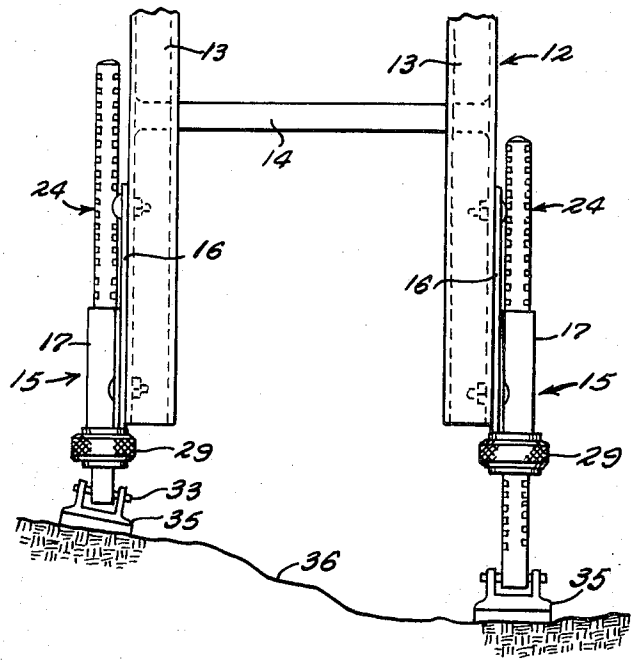
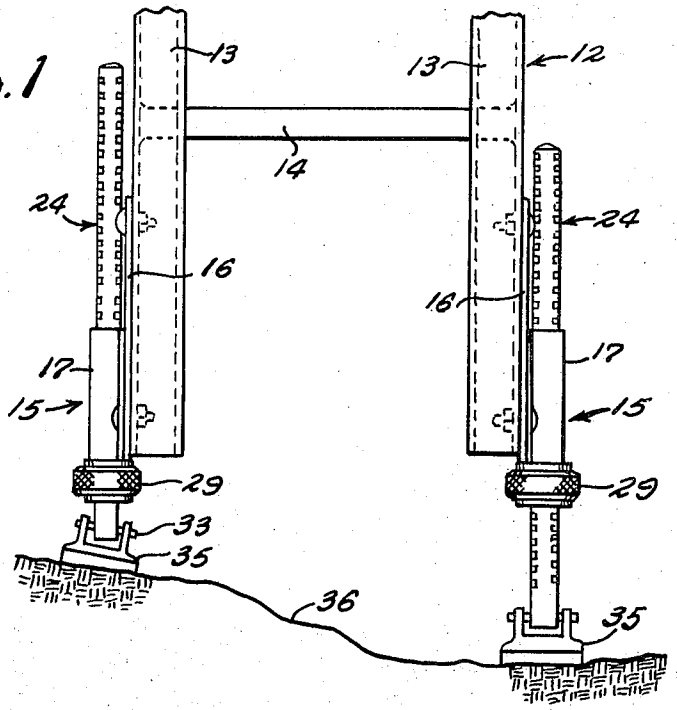


Fig. 1



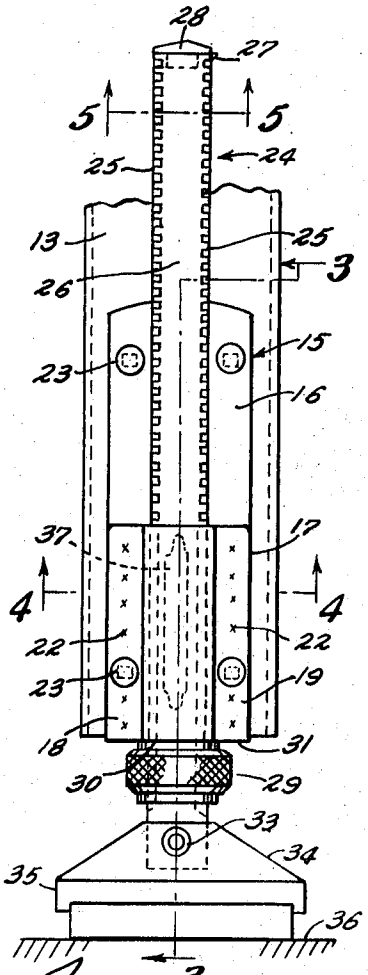
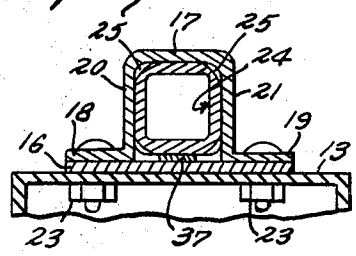


Fig. 2

Fig. 4



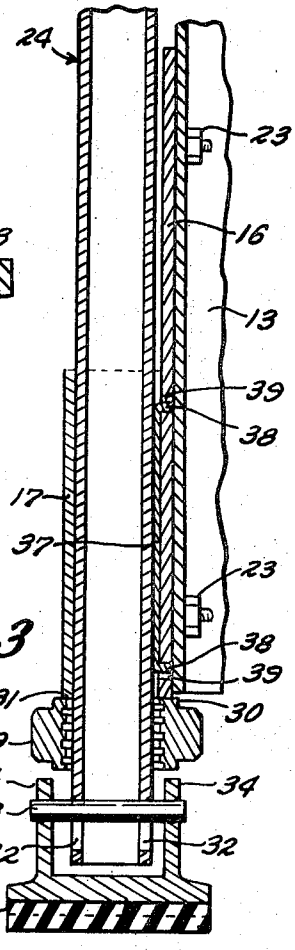


Fig. 3

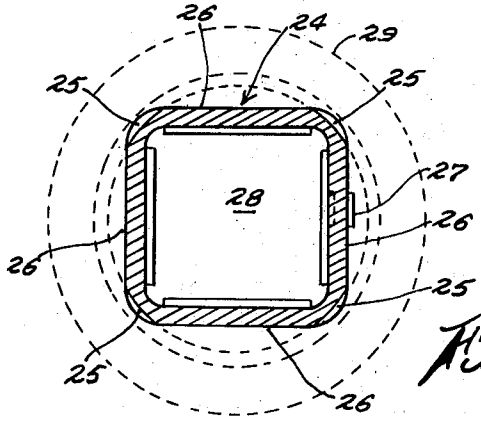


Fig. 5

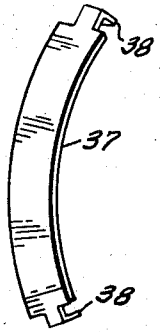


Fig. 6

RAIL EXTENSION DEVICE FOR LADDERS

The present invention relates to ladders and is particularly directed to improvements in adjustable extension devices for attachment to either or both of the side rails of ladders to permit said ladders to stand in safe, upstanding positions on slanted or offset supporting surfaces.

The primary object of the invention is to provide an extension device capable of fine adjustments within infinite tolerances to horizontally position the rungs of even the longest extension ladders that are to be stood upon supporting surfaces which are as much as 24 inches out of level.

Another object of the invention is to provide a device having the foregoing characteristics that may be readily adjusted and which will positively maintain its adjusted positions in either its ladder set up or its ladder portable conditions.

A further object of the invention is to provide an inexpensive, yet practical extension device for the side rails of ladders that may be readily attached to any type of straight ladder, either wood or metal, and which is durable and easily manipulated to place a ladder in a stable perpendicular position upon uneven supporting surfaces.

With these and other objects in view the preferred embodiment of my invention is depicted in the accompanying drawings and described in the following specification.

In the drawings:

FIG. 1 is a fragmental, front elevational view of a ladder with my extension device attached to each of the side rails of the ladder.

FIG. 2 is an enlarged, side elevational view of one extension device shown in FIG. 1, the associated ladder rail being broken away.

FIG. 3 is a fragmental section taken on line 3—3 of FIG. 2.

FIG. 4 is a fragmental section taken on line 4—4 of FIG. 2. FIG. 5 is a section taken on line 5—5 of FIG. 2, the adjustment nut being in phantom indicated by dotted lines therein.

FIG. 6 is a perspective view of the leaf spring for the device shown in FIGS. 1–5 of the drawings.

With reference to the accompanying drawings, wherein like numerals designate similar parts throughout the several views, the numeral 12 (FIG. 1) generally indicates a conventional straight ladder having a pair of side rails 13—13 connected together by a spaced series of rungs 14. The lower end portion of each rail 13—13 has an extension device 15—15 attached to its outer face. As both rail extension devices are identical in structure and functions only one device will be specifically described hereinafter, it being understood that a particular ladder may have a pair of said devices attached thereto or a ladder may have a single device attached to one rail only and with relatively good results.

The rail extension device 15 consists of a base plate 16 having a U-shaped bracket 17 mounted on its lower portion as by means of outturned flanges 18 and 19 integrally joined to legs 20 and 21, respectively, of the bracket; said flanges being spot welded at 22 to the outer face of the base plate 16. Fasteners such as carriage bolts 23 are adapted to mount the base plate 16 and the attached bracket 17 to the ladder rail 13.

A tubular rail extension member 24 that is substantially square in cross-section (FIGS. 4 and 5) is mounted for axial sliding movement in the hollow space provided between the bracket 17 and the base plate 16 and, as best shown in FIG. 5, said member 24 has thread segments 25 formed in each of its four corners. Preferrably a standard fine screw thread is chased in the extension member, the diameter of the basic thread depth being slightly larger than the interior diagonal dimension of the member 24 whereby the screw thread is interrupted between adjacent threaded corners of the member to provide a flat exterior face 26 on the member between adjacent thread segments 25. The upper end of the member 24 has a projecting detent 27 formed therein to provide a stop for the member that will engage the bracket 17, said upper end also being closed by a friction shoe 28. The lower end portion of the member that depends from the bracket 17 cooperates with a manually operated, knurled nut 29 which has a shoulder 30 that bears against the lower edge 31 of the bracket 17.

The terminal portion of the extension member is free of screw threads and has a pair of longitudinally disposed slots 32—32 (FIG. 3) formed in opposed sides to freely receive a pin 33 fixed in spaced apart ears 34—34 of a foot member 35. As indicated in FIG. 1 the foot member therefore has a universal movement on the extension member to automatically adjust to the particular contour of the support surface 36 on which the ladder foot is to be placed.

A leaf spring 37 having an integral lug 38—38 projecting at right angles from each end thereof is preset in the bowed condition depicted in FIG. 6 of the drawings. This spring is positioned within the bracket 17 in the narrow space between the extension member 24 and the base plate 16 and bears against a flat side wall 26 of the member (FIG. 4) between adjacent threaded corners 25 thereof. Holes 39—39 are formed in the base plate to receive the lugs 38—38 to position the leaf spring in its operative position. The tension created in the leaf spring by its pre-formed bowed condition provides a friction between the spring and the extension member which prevents undesirable sliding movement of the member 24 in the bracket 17 but will readily permit such movement when the knurled nut 29 is manipulated to extend the member or when the member is to be retracted by hand or by the weight of the ladder.

The rail extension device has been depicted as applicable to one or both rails of single section straight ladders but manifestly said extension device could be connected to extension ladders and with a few attachment changes could be used on step ladders and the like.

Having described the invention, what is claimed is:

1. An extension device for attachment to a ladder rail consisting of a U-shaped rail mounted bracket, an upstanding tubular extension member mounted for axial, sliding movement in the bracket, said member having a square configuration in lateral section, a screw thread segment formed in each of the longitudinally extending corners of the extension member, said thread being interrupted by the flat exterior sides of the member between said adjacent corners, a nut bearing against the bottom edge of the bracket and cooperable with the thread segments in the extension member, a foot on the lower end portion of the extension member, and a spring means interposed between the bracket and the

extension member in frictional engagement with a flat exterior side of the member between the adjacent threaded corners thereof, and biased to preclude undesirable axial movements of the member in the bracket.

2. An extension device for attachment to a ladder rail as set forth in claim **1** wherein the spring means is a leaf spring having a preformed, bowed configuration.

3. An extension device for attachment to a ladder rail as set forth in claim **2** wherein the spring has integral lugs formed at the ends thereof, and the bracket has longitudinally spaced holes therein for receiving said lugs.

4. An extension device for attachment to a ladder rail as set forth in claim **1** wherein a standard fine screw thread is chased in the longitudinally extending corners of the extension member.

5. An extension device for attachment to a ladder rail as set forth in claim **1** wherein the lower portion of the tubular extension member has a pair of opposed longitudinally extending slots formed therein, and the foot member has a pair of spaced ears, and a pin is fixed in the ears and freely extends through the slots.

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