

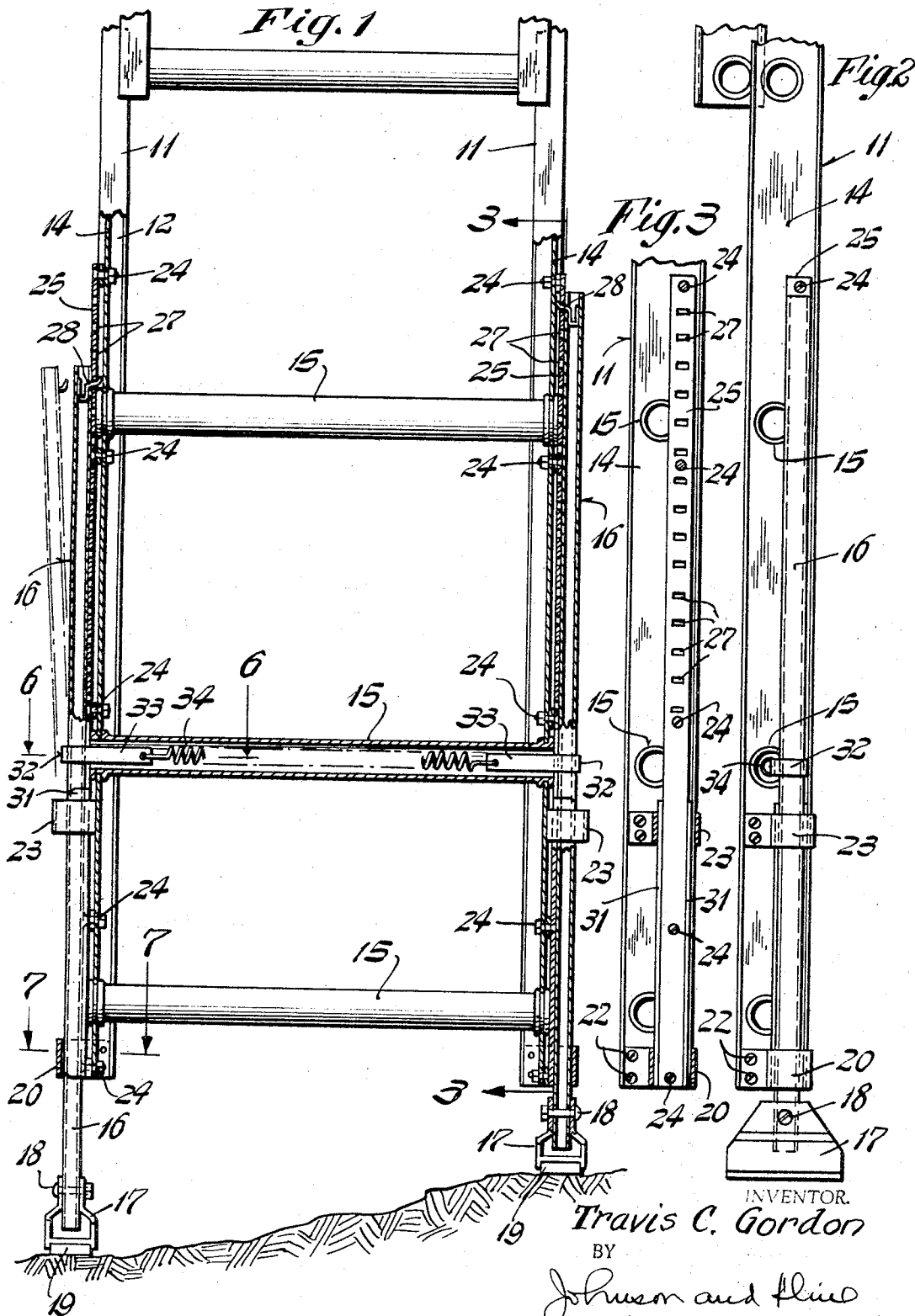
Feb. 18, 1969

T. C. GORDON
LADDER EXTENSIONS

3,428,147

Filed Nov. 13, 1967

Sheet 1 of 2



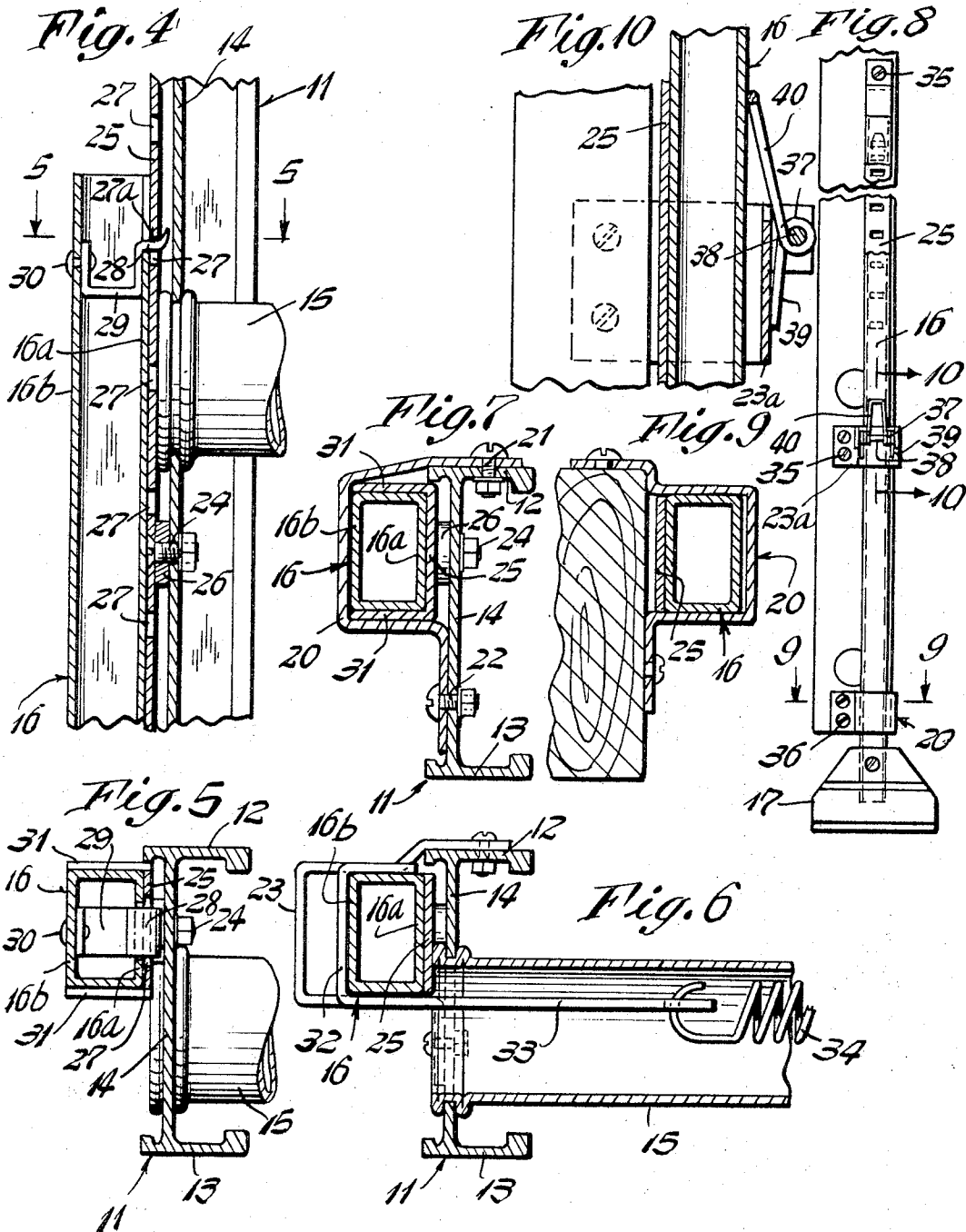
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LADDER EXTENSIONS

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5 Claims

ABSTRACT OF THE DISCLOSURE

Ladder rail extension which has a longitudinally adjustable rail slidably mounted on the ladder rail and carrying a dog engageable with one of a longitudinal series of apertures in a bar fastened to the latter rail, the foot carrying rail being bodily movable toward and away from the bar to cause the dog to engage a selected aperture in the ladder and hold the foot spaced from the bottom of the ladder rail the desired distance and to disengage the aperture when readjusting the position of the foot-carrying rail.

This invention relates to ladder extension means.

An object of this invention is to provide a ladder extension particularly suited for use with a ladder having metal side rails, and which may be attached to such rails with ease and facility.

A feature of this invention is the provision of means whereby the extension may comprise a sheet metal extension leg formed to resist twisting and bending in use, thus permitting a wide range of linear adjustment of the leg, in a reliable lightweight construction.

Another feature of this invention is the avoidance of small, delicate and difficultly operated means for controlling the linear adjustment of the extension leg relative to the ladder rails. This advantage is obtained in the forms of the invention herein disclosed by controlling the linear movement of the extension leg by bodily moving the extension leg laterally away from the ladder rail to release a rigid dog on the extension leg from engagement with apertured holding means attached to the ladder rail. The extension leg is bodily movable toward the apertured holding means preferably by resilient means to cause the dog to engage a selected one of the apertures in the holding means. The dog is inclined upwardly to prevent it from being disengaged accidentally from the web between the apertures of the holding means so long as the weight of the ladder is applied to the extension leg.

The ladder extension of the present invention may be applied to either or both rails of the ladder; and while particularly adapted for use with a metal ladder, it may be applied to the wooden rails of the wooden ladder.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

FIGURE 1 is a front view of the lower part of a ladder showing the ladder extensions partly in section with the left foot extended and the right foot in fully retracted position.

FIG. 2 is a side view of the ladder and extension shown in FIG. 1.

FIG. 3 is a vertical section taken on the line 3—3 of FIG. 1.

FIG. 4 is a fragmentary vertical section of the ladder rail and foot extension showing the locking dog in operative position.

FIG. 5 is a horizontal sectional view taken on the line 5—5 of FIG. 4.

FIG. 6 is a horizontal sectional view taken on the line 6—6 of FIG. 1.

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FIG. 7 is a horizontal sectional view taken on the line 7—7 of FIG. 1.

FIG. 8 is a side view of a modified form of the invention showing the leg extension applied to a wooden ladder.

FIG. 9 is a horizontal section taken on the line 9—9 of FIG. 8.

FIG. 10 is a vertical section taken on the line 10—10 of FIG. 8.

As shown in FIGS. 1 to 7, the leg extension of the present invention is applied to a metal ladder having rails 11 of modified I-beam form, each rail having flanges 12 and 13 and a web portion 14. Tubular rungs 15 are fastened to the web portion 14 to connect the rails 11 together.

The extension leg of this invention comprises a bar 16 having at its lower end a yoke 17 pivoted at 18 and carrying a foot 19 which may swing on the pivot 18 to adjust itself to the level of the ground which it engages. The bar 16 is preferably an extrusion of an aluminum alloy for instance, and tubular in cross section to be light and still rigid against bending or twisting.

The bar 16 normally lies adjacent to and parallel with the ladder rail 11 and is held to the latter for vertical sliding movement by a yoke 20 secured by bolts 21 and 22 to the flange 12 and web 14 respectively at the lower end of the ladder rail, as shown in FIG. 7. Another yoke 23, vertically spaced from the yoke 20, is similarly mounted on the ladder rail.

Between the bar 16 and the web 14 of the ladder rail there is secured to the web 14 by bolts 24 and spacers 26 an elongate bar 25 having a vertical series of closely spaced slots 27 which determine the extended or retracted positions of the extension leg bar 16. For the purpose of locking the bar 16 in desired position, the bar is provided, at its upper end, with a dog 28 which is shaped to enter any one of the slots 27, as shown in FIG. 4, and engage the web 27a defining the upper margin of the slot which the dog 28 enters.

The dog 28 has a U-shape portion 29 (see FIG. 4) fitting snugly between the inner wall 16a and the outer wall 16b of the bar 16 and is secured to the wall 16 by a rivet 30. The dog 28 is slightly narrower than the width of the slots 27, thereby resisting lateral movement of the upper end of the bar 16. The inner end of the dog 28 extends upwardly so as to engage the inner surface of the web portion 27a, and thus prevent the bar 16 from accidentally moving outwardly away from the elongate aperture holding bar 25 so long as there is any upward thrust on the bar 16.

Flanges 31 on the holding bar 25 between which the bar 16 extends (see FIG. 5) resist lateral movement of the bar 16. Flanges 31 terminate, however, in the vicinity of the stop yoke 23 so that the upper portion of the bar will be accessible for manual engagement. Normally, the bar 16 is held against the fixed bar 25 by resilient means which, in the forms of the invention shown in FIGS. 1, 2 and 6, comprises a hook 32 (see FIGS. 1 and 6) which extends around the bar 16 and has an arm 33, which, as shown, extends into one of the hollow rungs 15 where it is attached to a coil spring 34, the other end of which may be secured in any suitable manner. As shown in FIG. 1, the other end of the spring 34 is attached to the arm 33 of the hook 32 located at the other side of the ladder.

When it is desired to extend the length of one of the rails of the ladder, it is merely necessary, with the device of the present invention, to take the weight of the ladder off the foot 19, grasp the extension leg or bar 16, and pull it downwardly until the foot 19 engages the surface intended to support the rail of the ladder. During this extending movement of the bar 16, the dog 28 will click

over the webs between the holes 27 due to the inclination of the end of the dog. When this movement ceases, the dog 28 will enter the nearest hole above it—the spring 34 yielding to cause this movement of the bar 16.

When it is desired to retract the extension leg 16, the user grasps the upper portion of the bar 16 at a point where it is convenient for him to do so, pressure having been taken off the foot 19, and move the bar downwardly and outwardly to remove the inclined dog 28 out of the slot in the bar 25, and then move the bar 16 upwardly until the foot 19 arrives at the desired position, whereupon the operator's grip on the bar 16 is relaxed, allowing the spring 34 to pull the bar 16 toward the fixed bar 25, thereby causing the dog 28 to enter the next higher slot 27.

As stated above, the bar 16 fulcrums about the retaining yoke 20 when being pulled away from the ladder rail. This movement is limited, however, by the stop yoke 23.

The extension leg means may be applied to one rail only of the ladder or to both rails. It may also be applied to a wooden ladder as shown in FIGS. 8, 9 and 10, wherein the fixed bar 25 may be secured to the rail by wood screws 35, and the yokes 20 and 23 may likewise be secured to the wooden rail by wood screws 35 and 36 or bolts if desired.

Instead of the coil spring 34 which holds the bar 16 against the bar 25, a torsion spring 37, as shown in FIG. 10, may advantageously be employed, especially in connection with wooden ladders which usually do not have hollow rungs. As shown, a doubled length spring wire coils around a stud 38 on the yoke 23a with its ends 39 engaging the yoke 23a and its looped end 40 engaging the bar 16 and urging it against the bar 25.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. Ladder rail extension means comprising an elongate bar adapted to be fixed to the lower end portion of a ladder rail parallel thereto and having a vertical row of closely spaced apertures; an extension leg having a foot portion and adapted to lie against said bar and be longitudinally movable relative thereto to extend the foot portion more or less beyond the bottom of the ladder rail, said extension leg having adjacent its upper end an upwardly inclined tooth to extend into an aperture in said bar and hold the extension leg in longitudinally adjusted position; guiding and retaining means adjacent the bottom of the ladder rail for holding the extension leg close to the bar; and spring-operated means spaced upwardly from said guide means for holding the extension leg against the bar, said spring-operated means yielding to permit the extension leg to bodily fulcrum on said guide means, whereby said inclined tooth on the extension leg may be cammed out of an aperture in the bar with which it may be engaged and all the apertures which it engages when the extension leg is moved downwardly relative to the bar until the desired position is reached, whereupon the tooth engages an adjacent aperture, said spring-operated means also yielding to permit the extension leg to be moved and held manually away from the bar with

the tooth out of range of the apertures when the extension leg is to be retracted from extended position.

2. The ladder rail extension means as defined in claim 1, in which the portion of the bar located between the guide means and the spring-operated means has side flanges positioned to engage the side of the extension leg to prevent appreciable lateral movement of the extension leg on the bar.

3. The ladder rail extension means as defined in claim 1, in which the apertures in the bar are rectangular and the tooth on the extension leg substantially fits the aperture widthwise to prevent appreciable lateral movement of the upper end of the extension leg relative to the bar.

4. The ladder rail extension means as defined in claim 1, in which the rungs of the ladder are hollow and said spring-operated means includes a yoke extending around the bar and the extension leg and has an arm extending into the open end of a hollow rung, and a spring located in the hollow rung biased to draw the yoke and extension leg toward the bar.

5. A ladder having side rails and tubular rungs open at their ends secured to the side rails, each side rail having an elongate bar adapted to be fixed to the lower end portion of a ladder rail parallel thereto and having a vertical row of closely spaced apertures; an extension leg having a foot portion adapted to lie against said bar and be longitudinally movable relative thereto to extend the foot portion more or less beyond the bottom of the ladder rail, said extension leg having adjacent its upper end an upwardly inclined tooth to extend into an aperture in said bar and hold the extension leg in longitudinally adjusted position; guiding and retaining means adjacent the bottom of the ladder rail for holding the extension leg close to the bar; and spring-operated means spaced upwardly from said guide means for holding the extension leg against the bar, said spring-operated means yielding to permit the extension leg to bodily fulcrum on said guide means, whereby said inclined tooth on the extension leg may be cammed out of an aperture in the bar with which it may be engaged and all the apertures which it engages when the extension leg is moved downwardly relative to the bar until the desired position is reached, whereupon the tooth engages an adjacent aperture, said spring-operated means also yielding to permit the extension leg to be moved and held manually away from the bar with the tooth out of range of the apertures when the extension leg is to be retracted from extended position, said spring-operated means including a yoke extending around the bar and the extension leg and has an arm extending into the open end of a tubular rung, and a spring located in the tubular rung biased to draw the yoke and extension leg toward the bar.

References Cited

UNITED STATES PATENTS

1,179,391	4/1916	Bachman	182—204
2,599,117	6/1952	Maxson	182—204

FOREIGN PATENTS

901,224	7/1962	Great Britain.
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