United States Patent [19]

Phelan

[11] **3,903,991**

[45] **Sept. 9, 1975**

[54] **LADDER LOCKING ASSEMBLY**

[76] Inventor: **Richard D. Phelan,** 51 Fairmount Ave., Somerville, Mass. 02144

[22] Filed: **June 24, 1974**

[21] Appl. No.: **432,429**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 382,033, Oct. 29, 1973, abandoned.

[52] **U.S. Cl.** **182/93;** 182/229; 248/210

[51] **Int. Cl.**[2] **E06C 5/36;** E06C 1/34

[58] **Field of Search** 182/229, 93, 214; 248/210

[56] **References Cited**

UNITED STATES PATENTS

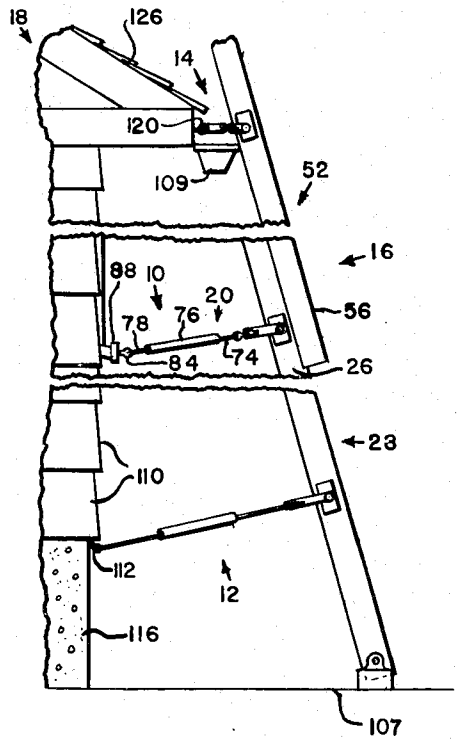
1,279,299	9/1918	DuBrau	182/229
1,890,029	12/1932	Delfs	182/214
2,854,291	9/1958	Riblet	182/229
3,318,415	5/1967	Christie	182/214

Primary Examiner—Reinaldo P. Machado
Attorney, Agent, or Firm—Walter J. Kreske

[57] **ABSTRACT**

An inexpensive rapidly attachable, detachable and rapidly adjustable locking assembly for combining with a ladder for locking the ladder in place at any desired position against a structure and thereby prevent injurious ladder slippage during use. The locking assembly is particularly suitable for a ladder of the type having two sides with each side having a pair of rails and web therebetween in substantially the cross sectional form of an I beam and hollow rungs with each of the rung ends fixed to the respective adjacent web. The locking assembly has a metal rod extending through one of the hollow rungs with the rod ends projecting beyond the sides of the ladder, a spacer on each of the ends of the metal rod rest against the outside of the web and project beyond each of the sides of the ladder to form a base for a bracket fixed to each of the metal rod ends, each bracket having an eye bolt, a pair of substantially equal length rods for each of the brackets, each of the equal length rods having a hook at one end and screw threads a substantial distance along the respective rod at the other end, the threads on one of the equal length rods being right hand and on the other being left hand and screwed into opposed ends of a turnbuckle having a length approximately equal to the combined length of the screw thread portions on the associated equal length rods, and an eye formation for each of the ladder sides adapted for attaching to the structure against which the ladder is to be locked in place and adapted for receiving the hook on the other of the turnbuckle rods.

4 Claims, 4 Drawing Figures



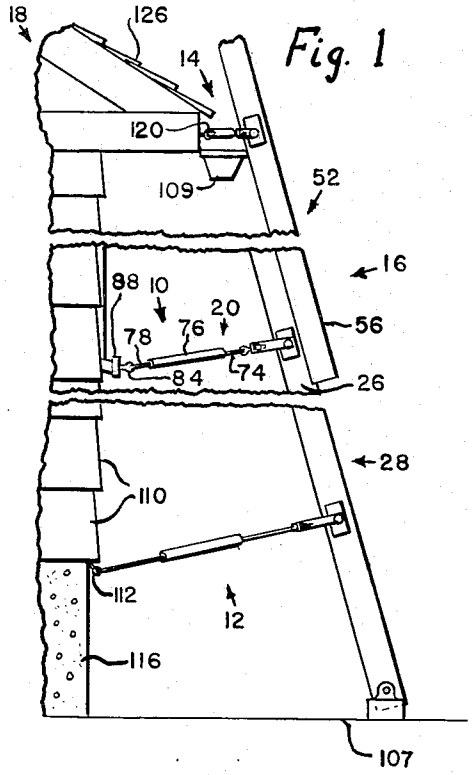


Fig. 1

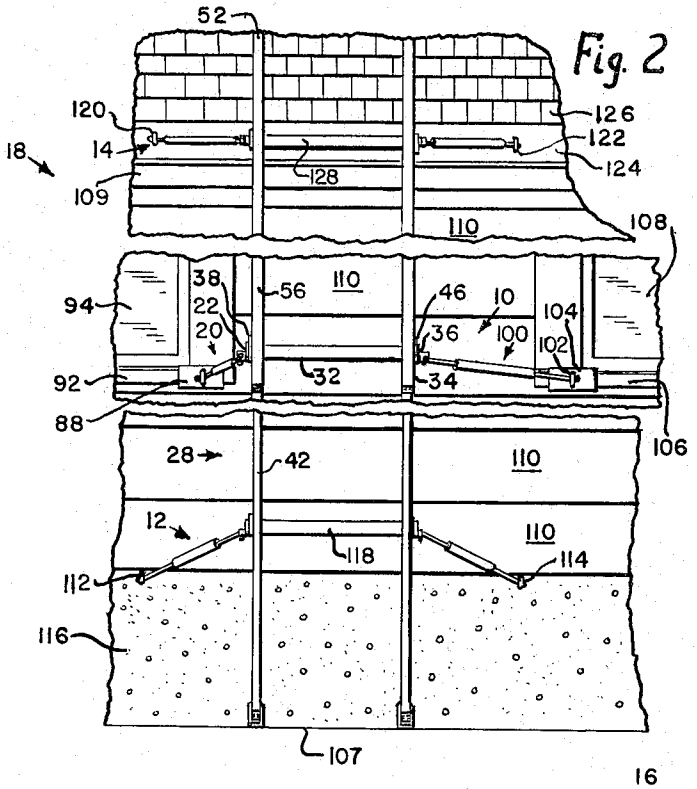


Fig. 2

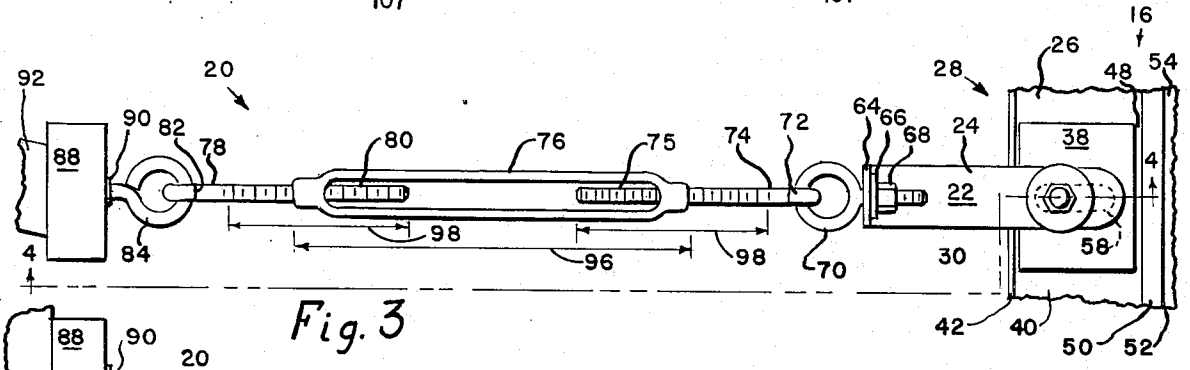


Fig. 3

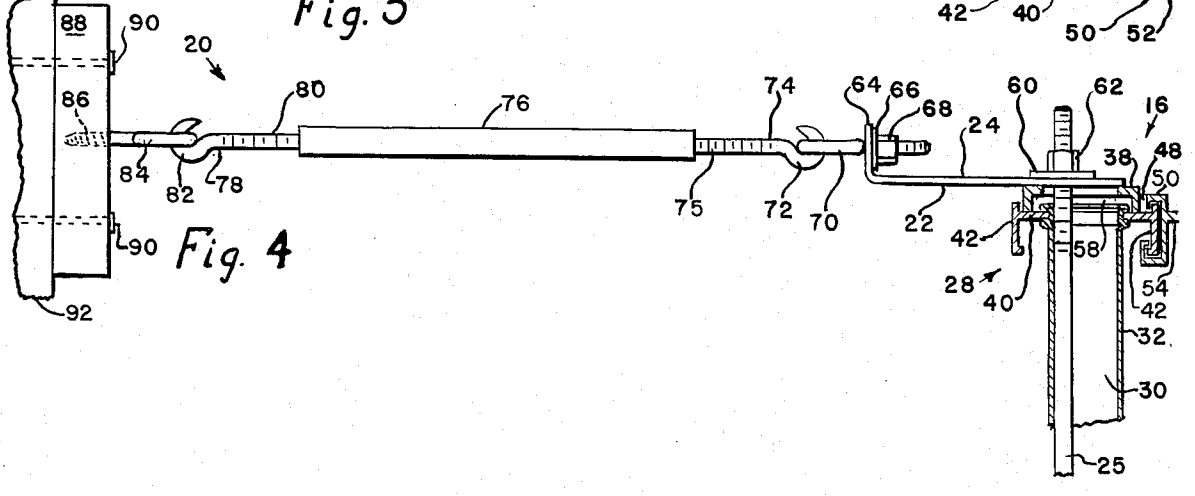


Fig. 4

LADDER LOCKING ASSEMBLY

This is a continuation-in-part application of application Ser. No. 382,033, filed Oct. 29, 1973, which has been abandoned in favor of this continuation-in-part application.

BACKGROUND OF THE INVENTION

This invention relates to device for holding ladders in place to prevent injurious slippage during use, and more particularly to an inexpensive, rapidly attachable, detachable and rapidly adjustable locking assembly for combining with a ladder for locking the ladder in place to a structure where the ladder is to be used and is characterized by a pair of brackets with one of the brackets being fixed in place at one side of the ladder and the other of the pair of brackets being fixed in place at the other side of the ladder, a turnbuckle for each of the brackets, each turnbuckle having opposed ends and carrying in each end an elongated turnbuckle rod, one of the rods of each turnbuckle being adapted for fastening to the bracket at the associated side of the ladder, and a configuration for rapid manual attachment and detachment of the other rod of each of the turnbuckles to the structure to which the ladder is to be locked.

The invention is particularly applicable to conventional aluminum or magnesium ladders of the type where each of the ladder sides is comprised of a pair of rails and connecting web therebetween in substantially the cross sectional form of an I beam and having hollow rungs with each of the rung ends fixed to the adjacent web, for which type the invention includes a bracket rod of sufficiently small cross sectional dimension for placement inside the hollow of one of the rungs and of a length that the ends of the bracket rod protrude from the respective sides of the ladder and are adapted for fastening the brackets in place at the respective sides of the ladder.

An eye bolt on each of the brackets and an associated hook on the end of one of the rods of each of the turnbuckles for hooking onto the associated eye formation are provided for achieving a rapid manual attaching and detaching arrangement.

A spacer is provided between each bracket and adjacent web to reduce the size of the brackets and increase the versatility of the invention.

Another hook on the end of the other rod of each of the turnbuckles, and an associated eye formation adapted for fixing to the structure to which the ladder is to be locked are provided for achieving a further simple and rapid manual attaching and detaching arrangement for locking the ladder in place.

Turnbuckles of about 20 inches in length and turnbuckle rods with screw threads extending over about a 10 inch portion of each turnbuckle rod are found to provide a wide versatility and convenience in application of the invention to locking ladders in place.

Ladder fastening arrangements such as disclosed in Pat. No. 1,066,892 inherently requires the user to risk climbing an unfastened ladder for making the fastening installation. Also the fastening arrangement is cumbersome on the time involved for its installation and thus not suitable for most ladder applications which are transitory and of short duration.

Also, the turnbuckles and adjustable arm arrangements disclosed in Pat. Nos. 14,156 and 1,279,299 are for scaffoldings which by inherent configuration are installations of relatively long duration and do not teach

applicability to transient and short duration uses, a characteristic of most ladder use. Nor even if combined with the ladder of Pat. No. 1,066,892 do they teach the locking of a ladder in place without the need for first risking the climbing of an unfastened ladder.

The present invention constitutes a significant advance in the art in that Applicant's ladder locking assembly not only achieves an arrangement for locking a ladder in place without the need for first climbing the ladder while it is still unfastened, but also achieves a structure which may be rapidly attached and detached so as to make it convenient and desirable for even transitory and short term uses of a ladder to avoid injurious slipping of the ladder.

Accordingly, it is a primary object of the present invention to provide a ladder locking assembly which may be used to lock a ladder in place without the need for climbing the ladder while still unfastened.

Another object is the provision of a ladder locking assembly which inherently lends itself to rapid attachment and detachment from the structure at which the ladder is being used to thereby provide convenience and safety for even transitory and short term uses of the ladder.

And a further object is the provision of a ladder locking assembly which is particularly applicable to conventional aluminum and magnesium ladders.

Further objects include the provision of a ladder locking assembly which is relatively inexpensive to manufacture, lends itself to mass production, and is relatively simple in construction and operation.

SUMMARY OF THE INVENTION

A ladder locking assembly in accordance with the present invention includes in combination a pair of brackets, a structure for fixing one of the brackets in place at one side of the ladder and the other bracket in place at the other side of the ladder, a turnbuckle for each of the brackets and having opposed ends carrying in each respective turnbuckle end an elongated turnbuckle rod, one of the rods for each turnbuckle being adapted for fastening to the bracket at a respective one of the ladder sides, and a fastener for rapid manual attachment and detachment of the other rod of each of the turnbuckles to the structure to which the ladder is to be locked.

For conventional aluminum and magnesium ladders where each of the sides have a pair of rails and connecting web therebetween in the cross sectional form of substantially an I beam and hollow rungs with ends fixed to the adjacent web, the structure for fixing the brackets in place includes a bracket rod having two ends and of a cross sectional dimension for placing in the hollow of one of the rungs and being of a length such that the ends protrude from the respective sides of the ladder and are adapted for fastening the brackets in place at the respective sides of the ladder.

To reduce the size of each of the brackets and increase the versatility of the ladder locking assembly, a spacer is provided between each bracket and adjacent web to form a base against which the respective bracket is fixed.

Rapid manual attachment and detachment is achieved by making the fastener arrangement in the form of an eye formation attachable to the structure on which the ladder is to be used, and providing a hook on the other rod of each of the turnbuckles for hooking

onto such an eye formation for each of said other turnbuckle rods.

A similar eye formation on each of the brackets and a hook formation on the one rod of each of the turnbuckles provides a rapid attachment and detachment configuration at the respective bracket.

DESCRIPTION OF THE DRAWINGS

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with the features, objects and advantages thereof will be better understood from the following description in conjunction with the accompanying drawings in which like reference numbers identify like components and in which

FIG. 1 is a side elevational view of fragmentary portions of a conventional extension ladder and building illustrating representative levels at which the ladder may be fixed in place to the building by a preferred embodiment of the present ladder locking asembly invention;

FIG. 2 is a front elevational view of fragmentary portions of the FIG. 1 illustration;

FIGS. 3 is a side view to enlarged scale of a portion of a preferred embodiment of the ladder locking assembly invention shown fastened at one end to a portion of the sill appearing in FIGS. 1 and 2 and the other end fastened to a portion of the ladder appearing in FIGS. 1 and 2;

FIG. 4 is a bottom view of the FIG. 3 illustration taken on line 4—4 of FIG. 3 with only a portion of the ladder rung shown in cross section.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Three ladder locking assemblies in accordance with the present invention are designated generally by the numerals **10, 12** and **14** respectively in FIGS. **1** and **2** to illustrate different representative levels at which a conventional extension ladder **16** may be effectively locked to a building **18** such as a house to prevent injurious ladder slippage during use. Any one of the ladder locking assemblies **10, 12** or **14** is sufficient for securely holding the ladder **16** in place of normal use. The illustrated levels at which the locking assemblies **10** and **12** appear have the desirable characteristic of being attachable and detachable without the need for first climbing the ladder **16** as will be hereinafter further described.

The construction of components of each of the three ladder locking assemblies **10, 12** and **14** are similar and thus for convenience in illustration will be described in more detail with respect to the ladder locking assembly **10**, one leg **20** of which is shown in enlarged scale in FIGS. **3** and **4**. The ladder locking assembly leg **20** has an L shaped bracket **22**, one leg **24** of which is at one end of a bracket rod **25** on one side **26** of the bottom section **28** of the ladder **16**. The bracket rod **25** extends through a hole (not shown) in the bracket leg **24** and through the hollow **30** of a hollow rung **32** and projects beyond the other side **34** (FIG. **2**) of the ladder **16** where it extends through another bracket **36** (FIG. **2**) similar to the bracket **22**. A spacer **38** is placed between the bracket leg **24** and a web **40** which connects a pair of rails **42** and **44** in substantially the cross sectional form of an I beam to form the side **26** of the ladder **16** as conventional construction in aluminum and magnesium type ladders. A similar spacer **46** (FIG. **2**) is similarly placed with respect to the bracket **36** on the other side **34** of the ladder **16**. Each of the spacers **38** and **46** have a depth such that the respective brackets **22** and **36** clear the sides **26** and **34** of the ladder **16** and are of a width allowing clearance **48** (FIGS. **3** & **4**) for guide channel **50** of upper section **52** of the ladder **16**. The upper section **52** of ladder **16** also has a web **54** connecting the guide channel **50** to a rail **56** (FIGS. **1** & **2**) in substantially the form of an I beam which permits the ladder locking assembly **14** to be of similar construction to the ladder locking assembly **10**. A slot opening **58** is provided in spacer **38** and similarly in spacer **46** for permitting the spacers to move toward the bottom rail such as rail **42** and thereby insuring ample clearance **48** for travel of the upper ladder section **52** with respect to the bottom ladder section **28**.

The brackets **22** and **36** are fixed in place against the respective spacers **38** and **46** by a conventional washer and nut such as the washer **60** and nut **62** screwed onto the threaded ends of the bracket rod **25** at respective sides **26** and **34** of the ladder **16**. Leg **64** of the bracket **22** has fixed thereto by a washer **66** and nut **68** an eye bolt **70** to which is detachably engaged a hook **72** at one end of a turnbuckle rod **74**, the other end of which has screw threads **75** and is carried in one end of a turnbuckle **76** of a common axis with another turnbuckle rod **78** having screw threads **80** and carried in the other end of the turnbuckle **76**. The other turnbuckle rod **78** terminates in a hook **82** similar to the hook **72** and engaging an eye screw **84** which has a screw portion **86** fixing it to a wooden fastening member **88** fastened by conventional nails **90** to a sill **92** below a window **94** of the building **18**. The screw threads on one of the turnbuckle rods **74** and **78** are right hand and left hand on the other so that rotation of the turnbuckle **76** in a selected direction adjusts the distance between the hooks **72** znd **82**. Also, a turnbuckle **76** having a length **96** of about 20 inches and the turnbuckle rods **74** and **78** having length of threaded portions **98** of about 10 inches each has been found to provide a single ladder locking assembly with a convenient and desirable wide useful range of ladder locking applications.

A similar arrangement of components with brackets **36** combine to form at the other side **34** of the ladder **16** another ladder locking leg **100** similar to the ladder locking leg **20** and similarly engaging a screw eye **102** fixed in a similar fastening block **104** nailed to a sill **106** below another window of the building **18**. The ladder **16** need not be centered between the windows **108** and **94** because the turnbuckle in each of the ladder locking legs **20** and **100** may be adjusted to compensate for varying distances between the respective brackets **22** and **36** at the sides of ladder **16** and the screw eyes **88** and **102**.

In operation of the ladder locking assembly **10**, the sills **92** and **106** selected may be for first floor windows **94** and **108** so that they may be reached for nailing the fastening blocks **88** and **104** without climbing the ladder **16**. The brackets **22** and **36** are fastened as described above to a rung **34** which when the ladder **16** is in place against the building **18** is at a height above the screw eyes **84** and **102** a sufficient distance such that the ladder locking legs **20** and **100** will preferably be in a plane substantially perpendicular to the ladder **16**. The distance between the hooks such as **72** and **82** of the turnbuckle rods is adjusted by rotating the re-

spective turnbuckles for mounting to the associated eyes fixed to the brackets **22** and **36** and sills **92** and **106** so that a firm seating of the ladder against the building **18**, which in the FIGS. **1** & **2** illustration is against gutter **109** of buiding **18**, and the terrain **107** is obtained, whereupon the ladder is locked in place for normal use.

To move the ladder **16** to a new location, the turnbuckles in the legs **20** and **100** are rotated to loosen and quickly remove the hooks from screw eyes **84** and **102** thereby permitting the ladder **16** to be moved to the new location where the fastener blocks **88** and **104** may again be similarly nailed to adjacent sills or even to siding **110** of the house **18** if desired. The fastener blocks **88** and **104** may in each instance be removed when desired by prying away in conventional manner with a claw hammer.

Alternatively, in place of fastening blocks **88** and **104**, screw eyes **112** and **114** similar to the screw eye **84** may be screwed directly to the sill resting on the concrete foundation **116** of the building **18**. In such event it is convenient to provide screw eyes such as **112** and **118** at suitable intervals around the entire building and left there permanently, in which case the brackets of the leg locking assembly **12** my be retained permanently in an appropriate rung **118** for use at any desired location about the building **18**.

Also alternatively, similar screw eyes **102** and **122** may be screwed directly into the board **124** below the roof **126** of the building **18**. In such event the rung **128** at which the ladder locking assembly **14** is mounted is preferably at about the same height as the screw eyes **120** and **122** so that the respective ladder locking legs are about parallel with the terrain **107**.

This invention is not limited to the specific details of construction and operation as equivalents will suggest themselves to those skilled in the art.

What is claimed is:

1. In a locking assembly for a ladder of the type having two sides and hollow rungs between the sides with each of the two ladder sides having a pair of rails and connecting web therebetween in the cross sectional form of substantially an I beam and the hollow rungs having two ends with each rung end fixed to the web adjacent the respective rung end, the combination of a pair of brackets with each of said brackets having a screw eye; means for fixing one of said pair of brackets in place at one of said sides and the other of said pair of brackets in place at the other of said sides, said means including a bracket rod having two ends and a cross sectional dimension for placing in the hollow of one of said rungs and being of a length such that said rod ends protrude from the respective sides of the ladder and are adapted for fastening the brackets at the respective sides of the ladder and including a spacer at each end of the bracket rod, each spacer having a surface for engaging said web and an opposed surface for clearing the associated ladder side to form a base for the associated bracket; a turnbuckle for each of said sides, each of said turnbuckles having opposed ends and carrying in each respective turnbuckle end an elongated turnbuckle rod, one of the rods for each turnbuckle includes a hook formation for fastening to said respective bracket; and means for rapid manual attachment and detachment of the other rod of each of said turnbuckles to a structure to which said ladder is to be locked.

2. The combination as in claim **1** wherein said means for rapid attachment and detachment includes a hook formation on the other rod of each of said turnbuckles and a pair of eye formations with each eye formation being for receiving a respective one of said last mentioned hook formations and adapted for fastening to said structure to which the ladder is to be locked.

3. The combination as in claim **2** wherein said adaptation for fastening to said structure is a wood screw formation on said eye formation.

4. The combination as in claim **2** wherein said adaptation for fastening includes a rigid member fixed to said eye formation and adapted for nailing to said structure.

* * * * *