

[54] **SELF-LEVELLING ACCESSORY FOR LADDERS**

147,367 7/1952 Australia..... 182/202

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[52] **U.S. Cl.** **182/201**

[51] **Int. Cl.²** **E06C 7/44**

[58] **Field of Search** 182/202, 203, 201, 200,
182/214

[56] **References Cited**

UNITED STATES PATENTS

2,366,829	1/1945	Biery.....	182/202
2,466,838	4/1949	Buell.....	182/108
2,835,427	5/1958	Balcar.....	182/202

FOREIGN PATENTS OR APPLICATIONS

269,463	10/1950	Switzerland.....	182/202
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[57] **ABSTRACT**

A self levelling accessory for extension ladders to accommodate to uneven terrain includes a pair of sockets secured to a cross member and adapted to be mounted on the lower end of a ladder. Two independently adjustable legs are slidably received, each in a respective socket. When the legs are relieved of the weight of the ladder the legs will self adjust to the terrain and when the weight of the ladder is again imposed on the legs, the legs lock by friction within their respective sockets, in adjusted positions.

6 Claims, 7 Drawing Figures

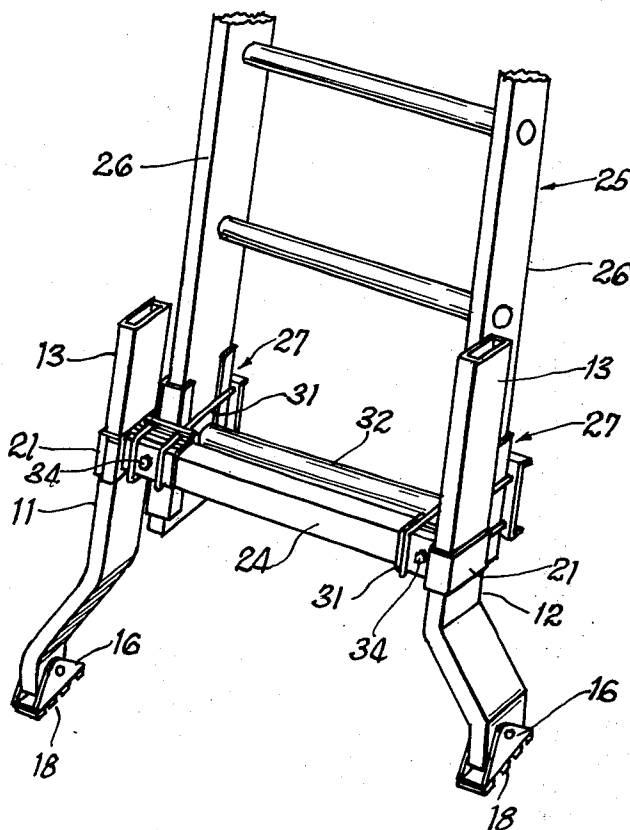


FIG. 1

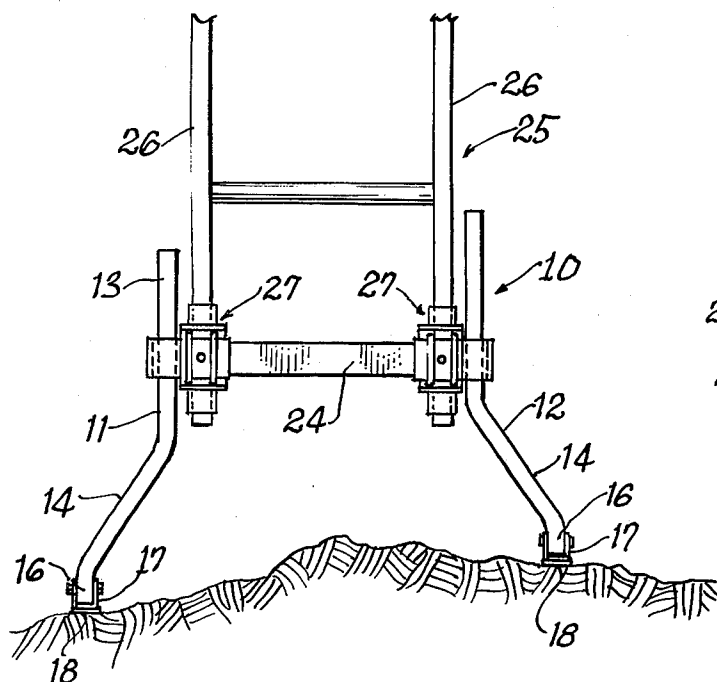


FIG. 2

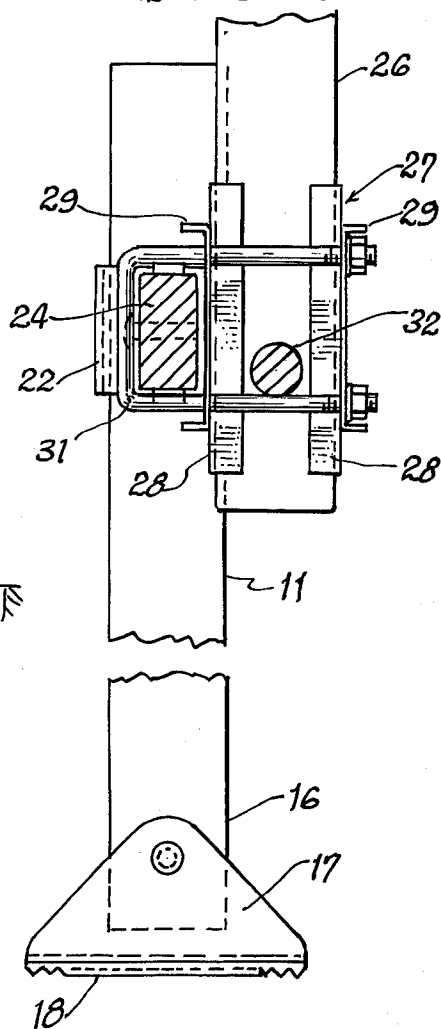


FIG. 3

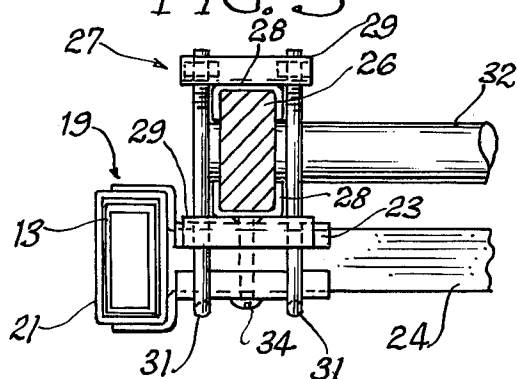


FIG. 4

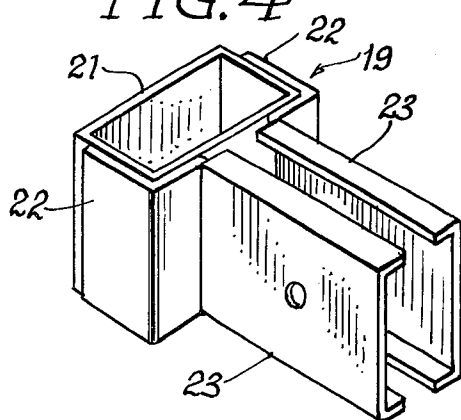


FIG. 5

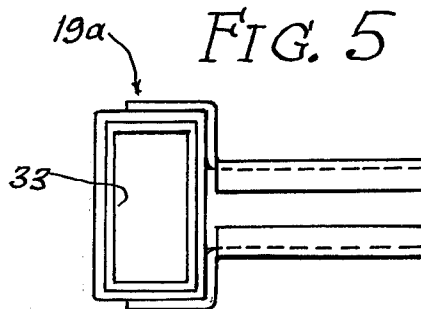


FIG. 6

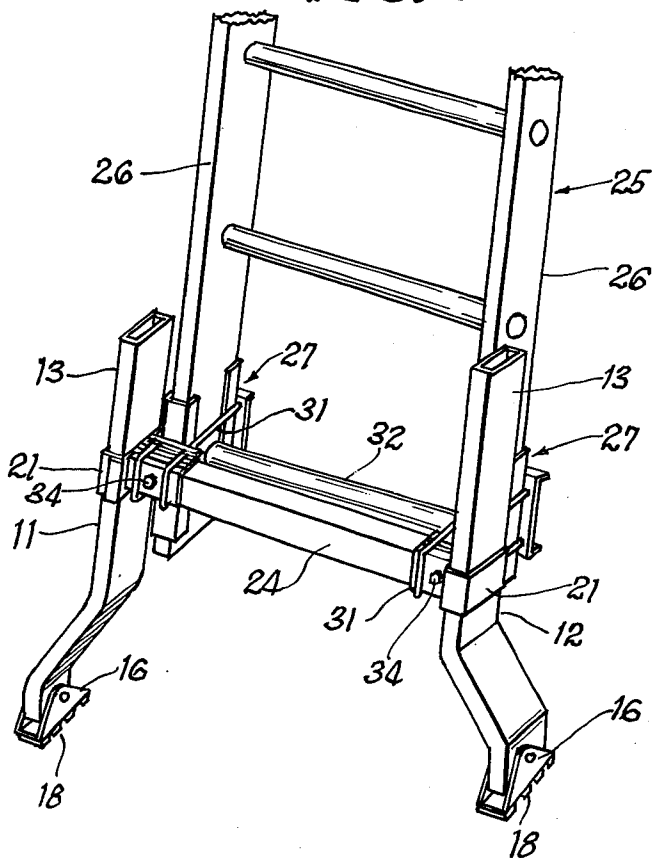
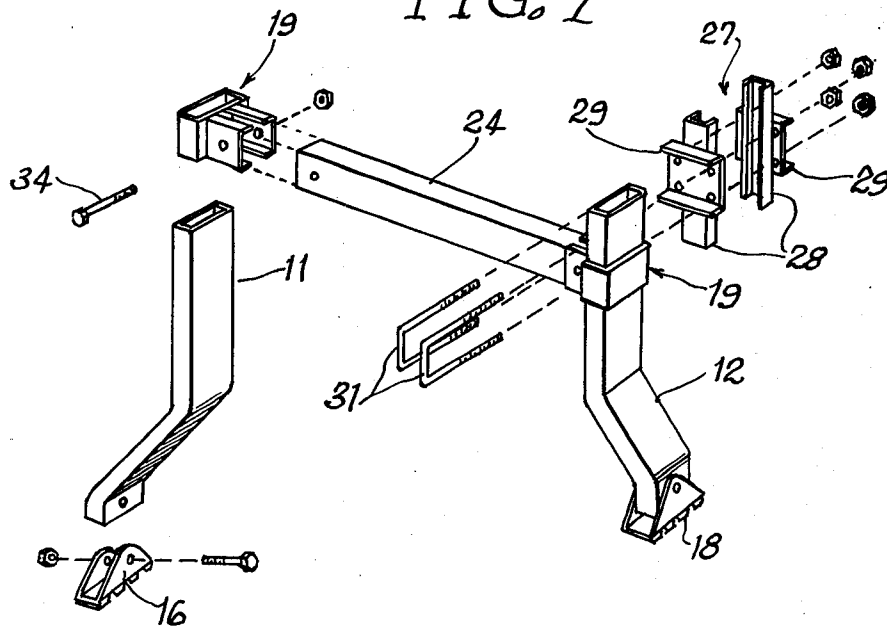


FIG. 7



SELF-LEVELLING ACCESSORY FOR LADDERS

BACKGROUND OF THE INVENTION

The present invention relates to a self-levelling accessory adapted for attachment to a ladder to permit the ladder to stand in a safe upstanding position on uneven terrain or supporting surfaces.

Prior devices for providing ladders with adjustable feet to accommodate to uneven terrain have utilized movable legs with positive latching mechanisms such as racks and pawls, chains, cables and snubbers, nuts and bolts and the like. These accessories have met with little commercial success because they are both costly to produce and inconvenient to use. In most prior devices the adjustable legs must be manually deployed and adjusted to the terrain and they must be secured against further movement by manually latching a locking mechanism, tightening a nut or the like. Many of these prior devices are not compatible with modern metal ladders because they inherently subject the side rails of the ladder to unsafe torsional and bending stresses which these members are not designed to withstand.

SUMMARY OF THE INVENTION

The present invention provides a levelling mechanism for extension ladders and the like which is both self adjusting and self locking. In particular, the present invention provides the user with an expensive device which he may purchase as an accessory and attach easily to any common extension ladder without damaging or weakening the ladder. Accordingly, it is an object of the present invention to provide self adjustable leg means for accommodating a ladder to uneven terrain.

Another object of this invention is to provide for a ladder self-levelling means having movable legs which automatically lock in adjusted positions without having manually to actuate locking mechanisms, latches or the like.

A further object of this invention is to provide means for mounting the accessory to a ladder so that it will not weaken or place undue stresses on the ladder.

Still a further object of this invention is the provision of a self-levelling accessory for ladders which prevents undue stresses from being transmitted to the ladder when the accessory is in use.

Other and further objects and advantages of the present invention will become apparent from the following description when considered in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary front elevational view of a ladder with my self-levelling accessory attached to the side rails of the ladder.

FIG. 2 is an enlarged end elevational view of one side of the device shown in FIG. 1.

FIG. 3 is an enlarged top plan view of one side of the device shown in FIG. 1.

FIG. 4 is a perspective view of one of the components of my invention, and

FIG. 5 is a top plan view of a modified embodiment of the component illustrated in FIG. 4.

FIG. 6 is a fragmentary perspective view showing my invention applied to the lower portion of a ladder.

FIG. 7 is an exploded perspective view of my invention.

BRIEF DESCRIPTION OF A PREFERRED EMBODIMENT

Referring particularly to FIG. 1, the accessory of my invention, indicated generally by the numeral 10, comprises a pair of legs 11 and 12 formed preferably of rectangular tubing and each including an upper portion 13, an intermediate angular portion 14 and an offset lower portion 16. A foot member 17 is pivotally connected to the lower portion 16 and is provided with a corrugated rubber ground engaging slip-proof pad 18. A pair of sockets 19 constructed substantially as illustrated in FIG. 4 are arranged each to receive a respective leg 11 or 12. Each socket 19 includes a rectangular tubular section 21 having internal dimensions such as to freely receive for sliding movement the upper portion 13 of a respective leg 11 or 12. Thus, each leg portion 13 may slide longitudinally freely within the tubular portion 21 and by virtue of the rectangular cross section is prevented from twisting relative to the tubular portion 21. The tubular portion 21 is received in a pair of support members 22 and suitably welded thereto. Each support member 22 includes an integral channel ear 23, with the ears arranged in confronting relation to each other, as illustrated in FIG. 4, thereby providing a socket to snugly receive one end of a cross member 24 attached by suitable fastening means 34 to the support members 22. The cross member 24 preferably is formed of wood and is rectangular in cross section. The cross member 24 is sized to withstand the bending and torsional stresses which would otherwise be transmitted by the legs 11 and 12 to the side rails 26 of the ladder 25.

Referring to FIG. 1, two pairs of brackets, indicated generally by the numeral 27, are provided for mounting the sockets 19 and cross member 24 to the side rails 26 of a ladder. Each bracket 27 includes a vertical channel section 28 to which has been welded a horizontal channel section 29 substantially medially of the length thereof. The vertical channel sections 28 are intended to be arranged in confronting relation, as illustrated in FIG. 2, to snugly embrace opposite edge portions of a side rail 26 of a ladder. The horizontal channel sections 29 project beyond the longitudinal side edges of the channel sections 28 and are provided with holes in the projecting portions to receive a pair of U-bolts 31, as will be presently described.

In assembling the accessory to a ladder 25, the brackets 27 are applied to embrace each of the side rails 26 and positioned so that the horizontal channel sections 29 are in registration with the lowermost rung 32 of the ladder. The cross member 24 and sockets 21 are secured to the ladder 25 by a pair of U-bolts 31 both of which embrace the channel sections 23 and one of which also embraces the rung 32. Both U-bolts 31 are passed through the registering holes in the horizontal channel sections 29. The brackets 27 are designed to spread the stresses generated by the U-bolts 31 over a sufficient area of each side rail 26 so as to prevent the side rail from being over-stressed or injured by the installation of the accessory. It will be understood that the brackets 27 are applied and secured to each side rail 26 and that when installed the accessory may become a permanent part of the ladder 25.

In the modified embodiment illustrated in FIG. 5, socket 19a is similar to socket 19, except that it includes a liner 33 formed of some suitable material, such

as NEOPRENE, or asbestos filled phenolic brake lining material which in contact with the leg portions 13 which preferably are formed of an aluminum alloy, affords a higher coefficient of friction than when the socket is used without such a liner.

In use, the accessory of my invention is affixed to the rails 26 in the manner hereinabove described and illustrated. The ladder 25 then is carried by a user to a point of use location and held vertically with one or both of the foot members 17 engaging the ground. The operator supports the ladder to remove most of the weight of the ladder from the foot members 17 and shakes the ladder gently, thus allowing the legs 11 and 12 to move up or down, as required, to accommodate to the terrain on which the ladder is to stand.

When the full weight of the ladder 25 is again allowed to rest on the foot members 17, the legs 11 and 12 are automatically locked in adjusted positions within their respective sockets 19. It will be noted that the lower leg portion 16 is offset from the upper portion 13 of each leg 11 and 12 thus, generating moments of force on each leg tending to spread the legs 11 and 12 apart, in effect, canting the legs 11 and 12, each in relation to its respective socket 19 so that there is frictional engagement between each leg portion 13 and its respective socket 19 adequate to lock the legs 11 and 12 in fixed relationship to their respective sockets.

Various changes coming within the spirit of my invention may suggest themselves to those skilled in the art; hence, I do not wish to be limited to the specific embodiments shown and described or uses mentioned, but intend the same to be merely exemplary, the scope of my invention being limited only by the appended claims.

I claim:

1. A self levelling and self locking accessory for supporting an extension ladder having a pair of side rails and rungs extending between said side rails, said accessory comprising a pair of open ended sockets, each

adapted to be secured outwardly of and in close proximity to a respective side rail, a pair of ground engaging legs, each leg having a lower portion outwardly offset from an upper portion with the upper portion of each leg being received in a respective socket and freely independently slidable therein, said sockets and legs being substantially quadrilateral in cross-section, said legs when the weight of the ladder is removed from the legs being independently freely movable in said sockets to accommodate to the terrain on which the ladder is rested, said legs being automatically self binding and locked in adjusted positions when the weight of the ladder thereafter is imposed on said legs.

2. The invention as defined in claim 1 including a cross member connecting said sockets.

3. The invention as defined in claim 1 including a cross member and means associated with said sockets for securing said sockets to opposite ends of said cross member.

4. The invention as defined in claim 3 including clamping engaging said side rails and a pair of U-bolts associated with said clamping means and embracing said cross member and the lowermost rung of said ladder and in which the clamping means comprises vertically extending channel members engaging opposite end edges of said side rails and laterally extending members secured to said channel members and having apertures to receive said U-bolts.

5. The invention as defined in claim 1 including means for securing said accessory to the side rails of said ladder whereby the stresses imparted by said accessory to said ladder are distributed over an area sufficient to prevent injury to said side rails.

6. The invention as defined in claim 1 including a liner in each of said sockets providing a higher coefficient of friction with said legs and the material of said socket liners.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,908,796
DATED : September 30, 1975
INVENTOR(S) : Mathew Hurwitz

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE CLAIMS:

Column 4, line 21, after "clamping" insert --means--.

Signed and Sealed this
thirtieth Day of December 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks