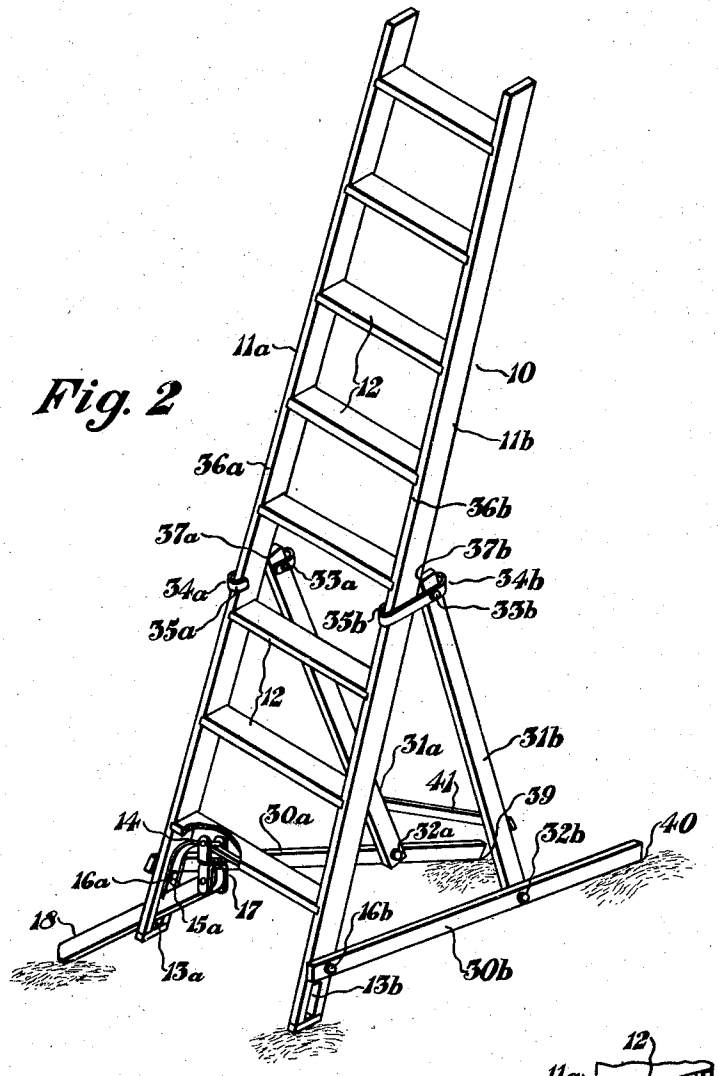
June 30, 1931. J. C. RUSE 1,812,119

UNIVERSAL LADDER

Filed May 31, 1929

Fig. 2



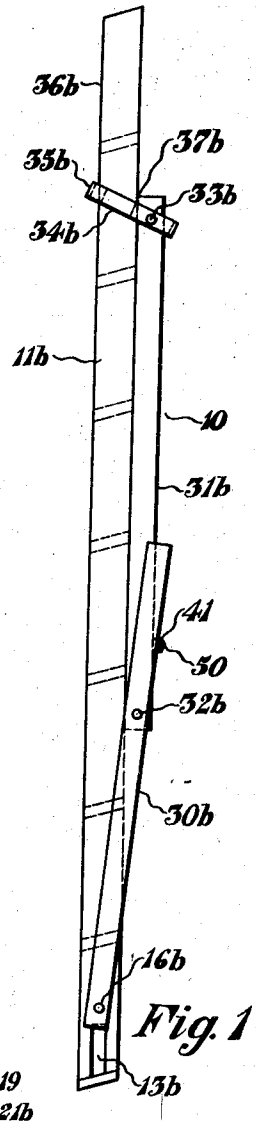
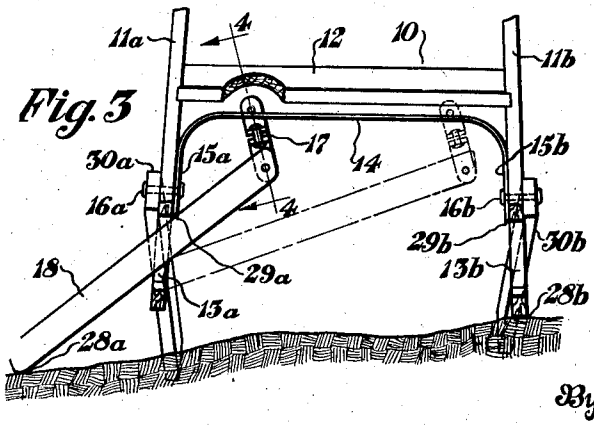


Fig. 1

Fig. 3



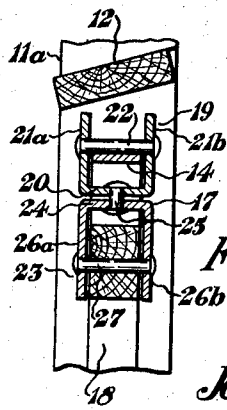


Fig 4

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Patented June 30, 1931 1,812,119

UNITED STATES PATENT OFFICE

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UNIVERSAL LADDER

Application filed May 31, 1929. Serial No. 367,326.

My invention relates to ladders including adjustable base supporting members, whereby the ladder may rest directly upon the ground, regardless of the slope thereof, and be supported for use, without leaning the upper end of the ladder against any external support, such as a wall or tree. Such a ladder is particularly useful for picking fruit and the like.

Ladders have been made including one or two adjustable base supporting members, but such ladders are not effective when used on ground, no point of which is in the same plane.

Most ladders include two longitudinally extending side members or legs, and transversely extending longitudinally spaced rungs connected at their ends with the side members.

For properly supporting a two legged ladder on irregular ground, it is essential to provide three adjustable supporting members in addition to a selected one of the ladder legs.

Accordingly the objects of the present invention include the provision of a universal ladder including two longitudinally extending legs, transversely extending longitudinally spaced rungs connected at their ends with the legs, and three independently adjustable base supporting members, whereby the ladder may be supported for use on irregular ground upon one of the legs and the three independently adjustable supporting members.

Further objects of the invention include the provision of improved rapidly releasing clamping means for maintaining the adjustable members in any desired position of adjustment.

These and ancillary objects are attained in the present invention, as will hereinafter be set forth in detail, and claimed.

A preferred embodiment of the invention is illustrated in the accompanying drawings forming part hereof, in which

Figure 1 is a side elevation illustrating the improved universal ladder of the present invention folded up when not in use;

Fig. 2, a perspective view thereof illustrating the ladder in use;

Fig. 3, a fragmentary front elevation and sectional view, illustrating details of the construction and arrangement of the adjustable base supporting members; and

Fig. 4, an enlarged fragmentary sectional view thereof, as on line 4—4, Fig. 3.

Similar numerals refer to similar parts throughout the several views.

The improved universal ladder indicated generally at 10 includes transversely spaced longitudinally extending side members or legs 11*a* and 11*b*, and longitudinally spaced transversely extending rungs or steps 12, each step being connected at its opposite ends with the side legs 11*a* and 11*b*, respectively.

The lower end of the leg 11*a* has formed therein a side opening longitudinally extending slot 13*a*, and similarly the lower end of the leg 11*b* has formed therein a side opening longitudinally extending slot 13*b*.

A transversely extending rail 14 is located below the lowermost step 12 and preferably includes ends 15*a* and 15*b* both angularly bent downwardly from the body of the rail.

A rivet or the like 16*a* extends transversely through suitable registering apertures in the rail end 15*a* and the lower end of the leg 11*a*, and similarly a rivet or the like 16*b* extends transversely through suitable registering apertures in the rail end 15*b* and the lower end of the leg 11*b*.

A swivel member 17 is mounted for transversely sliding at one end on the rail 14, and is pivotally connected at its other end with one end of a laterally extending adjustable base supporting member 18.

The swivel member 17 preferably includes an upper U member 19 comprising a base 20 below the rail 14 and legs 21*a* and 21*b* extending upwardly from the ends of the base 20, about the sides of the rail 14; and a rod 22 above the rail 14 connects at its ends with the upper ends of the legs 21*a* and 21*b*, respectively.

The swivel member 17 also includes a lower U member 23 comprising a base 24, whose upper face is located adjacent the lower face of the base member 20 of the U member 19,

and is pivotally connected therewith as by means of a rivet pin 25 extending in the direction of the legs of the U members through suitable apertures in the bases of the U members 19 and 23; and the U member 23 further includes legs 26*a* and 26*b* extending downwardly from the ends of the base 24, about the sides of the adjustable base supporting member 18, and a headed rod 27 extends through registering apertures in the leg 26*a*, adjustable supporting member 18, and leg 26*b*, for pivotally connecting the swivel member with the adjustable supporting member as aforesaid.

The length of the transversely extending adjustable base supporting member 18 is such as to permit the swivel member 17 to ride on the rail 14 to either side of the ladder, for permitting the outer end of the base supporting member 18 to be inserted through the side opening slot 13*a* or 13*b*, as the case may be, in the opposite ladder leg, after which the transversely extending supporting member 18 is moved endwise through the slot, which may be as illustrated the slot 13*a*, and angled with respect to the leg as required.

As illustrated in Fig. 3, the lower end of the leg 11*b* is resting upon a point 28*b* of an irregular ground surface, and the adjustable base supporting member 18 extends transversely through the slot 13*a* in the opposite leg, and the outer end of the member 18 rests upon a point 28*a* of the ground below the point 27.

Each of the slots 13*a* and 13*b* is substantially longer than the width of the member 18, thus permitting angulation of the member 18 in either slot.

The member 18 may be made of wood, and for securing the member in any desired position of adjustment in either slot, engaging members 29*a* and 29*b* are provided, which may be pointed extremities of the rail ends 15*a* and 15*b*, respectively, for gouging into the abutting surface of the member 18.

Accordingly the weight of the ladder itself, and any additional load imposed thereon from above, causes the upper end of the particular slot through which the member 18 is extending, and the adjacent engaging means, to press downwardly on the upper surface of the supporting member 18, about the outer end thereof as an axis, thus causing the rod 22 of the swivel member 17 to be pulled downwardly against the upper surface of the rail 14 as best illustrated in Fig. 3, thereby clamping the member 18 in position; and the intensity of the clamping forces is increased with increasing load on the ladder.

The outer end of the shank of the rivet 16*a*, preferably passes through a suitable aperture in one end of a rearwardly extending adjustable base supporting member 30*a*, for pivotally connecting the adjustable base supporting member 30*a* with the ladder leg 11*a*; and similarly the outer end of the shank of the rivet 16*b*, preferably passes through a suitable aperture in one end of a rearwardly extending adjustable base supporting member 30*b*, for pivotally connecting the adjustable base supporting member 30*b* with the ladder leg 11*b*.

Intermediate its ends, the base supporting member 30*a* is pivotally connected with the lower end of an adjusting strut 31*a* as by means of a rivet 32*a*; and the upper end of the adjusting strut 31*a* is pivotally connected as by means of a rivet 33*a* with the rear end of a clamping member 34*a*, the forward end of which is in the form of a hook 35*a* which hooks about the forward end face 36*a* of the ladder side leg 11*a*, and the upper inner end corner 37*a* of the adjusting strut 31*a*, extends above the clamping member 34*a*, whereby the clamping member 34*a* may be swung upwardly about the rivet 33*a* as an axis permitting raising or lowering of the adjusting strut, with a consequent raising or lowering of the rear end of the adjustable base supporting member 30*a*.

When the rear end of the adjustable base supporting member 30*a* rests upon the point of ground support 39 in such position as to maintain the ladder upright, the strut 31*a* is clamped in position by pushing the clamping member 34*a* downwardly, thus wedging the end corner 37*a* and the clamping hook 35*a* against the opposite end faces of the ladder side member 11*a*.

Similarly, intermediate its ends, the base supporting member 30*b* is pivotally connected with the lower end of an adjusting strut 31*b* as by means of a rivet 32*b*; and the upper end of the adjusting strut 31*b* is pivotally connected as by means of a rivet 33*b* with the rear end of a clamping member 34*b*, the forward end of which is in the form of a hook 35*b* which hooks about the forward end face 36*b* of the ladder side leg 11*b*, and the upper inner end corner 37*b* of the adjusting strut 31*b*, extends above the clamping member 34*b*, whereby the clamping member 34*b* may be swung upwardly about the rivet 33*b* as an axis permitting raising or lowering of the adjusting strut, with a consequent raising or lowering of the rear end of the adjustable base supporting member 30*b*.

When the rear end of the adjustable base supporting member 30*b* rests upon the point of ground support 40 in such position as to maintain the ladder upright, the strut 31*b* is clamped in position by pushing the clamping member 34*b* downwardly, thus wedging the end corner 37*b* and the clamping hook 35*b* against the opposite end faces of the ladder side member 11*b*.

Any load which may be imposed upon the ladder further increases the clamping action of the clamping members 34*b*.

When folding and unfolding the ladder to

the position illustrated in Fig. 1, it is desirable that both rearwardly extending adjustable base supporting members 30*a* and 30*b* be operated more or less simultaneously, and for this purpose a transverse connecting member 41 is pivotally secured at its ends as by means of screws 50 to the opposite strut 31*a* and 31*b*.

I claim:

1. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each base supporting member with the frame, and self-clamping means for individually maintaining each base supporting member in selective angular positions with respect to the frame.

2. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each base supporting member with the frame, and adjustable means for maintaining each base supporting member in selective angular positions with respect to the frame, one of the adjustable means including a strut pivotally connected at one end with one of the base supporting members and a releasable self-wedging clamp connecting the other end of the strut and one of the ladder frame side members.

3. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each base supporting member with the frame, and adjustable means for maintaining each base supporting member in selective angular positions with respect to the frame, and said adjustable means each including a strut pivotally connected at one end with one of the base supporting members and a releasable self-wedging clamp connecting the other end of the strut and one of the ladder frame side members.

4. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each of some of the base supporting members with the frame, adjustable means for maintaining each pivotally connected base supporting member in selective angular positions with respect to the frame, said adjustable means each including a strut pivotally connected at one end with one of the base supporting members and a releasable self-wedging clamp connecting the other end of the strut and one of the ladder frame side members, and means operatively connecting another of the base supporting members on the frame for endwise movement with respect to the frame.

5. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each of some of the base supporting members with the frame, self-clamping means for maintaining each pivotally connected base supporting member in selective angular positions with respect to the frame, and means operatively connecting another of the base supporting members on the frame for endwise movement with respect to the frame.

6. A ladder including longitudinally extending transversely spaced side members, and transversely extending, longitudinally spaced step members connected at their ends with the side members, the side members and step members comprising a frame, a plurality of base supporting members extending laterally of the frame, means pivotally connecting one end of each base supporting member with the frame, adjustable means for maintaining each base supporting member in selective angular positions with respect to the frame, and said adjustable means each including a strut connected at its ends to a base supporting member and a side frame member, and having a pivotal connection with one of the members and a self-wedging clamp connection with the other.

7. A ladder including a frame comprising longitudinal side members and transversely extending step members therebetween, a plurality of adjustable base supporting members extending laterally of the frame, a transverse guide member on the frame, and self-clamping means slidably connecting one of the base supporting members with the guide member.

8. A ladder including a frame comprising longitudinal side members and transversely extending step members therebetween, a plurality of adjustable base supporting members extending laterally of the frame, a transverse guide member on the frame, self-clamp-

ing means slidably and pivotally connecting one of the base supporting members with the guide member, and means on each side frame member for selectively engaging said slidably and pivotally connected base supporting member.

9. In a ladder including a frame comprising longitudinal side members and transversely extending step members therebetween, a plurality of laterally extending base supporting members for the frame, a transverse guide member extending between the longitudinal side members of the ladder, means slidably mounted on the said guide member and pivotally connected to one end of one of the base supporting members, each side member having an aperture formed therein and adapted to selectively receive the other end of said pivotally connected base supporting member, and means for coacting with each of said apertures to engage said base supporting member and maintain it in selective angular positions relative to the ladder frame.

10. In a ladder including a frame comprising longitudinal side members and transversely extending step members therebetween, a plurality of adjustable base supporting members for the frame, adjustable means for maintaining each base supporting member in selective angular positions with respect to the frame, a plurality of the adjustable means each including a clamp slidable on one of the side members and a strut pivotally connected at one end with the outer portion of one of the base supporting members and pivotally connected intermediate its ends and adjacent the other end to the clamp, whereby the weight of the ladder will effect a wedging action between the side member and the end of the strut beyond the clamp.

In testimony that I claim the above, I have hereunto subscribed my name.

JOHN C. RUSE.