Dec. 26, 1939. W. CHEW 2,184,486

STEPLADDER, TRESTLE, AND THE LIKE

Filed March 19, 1937

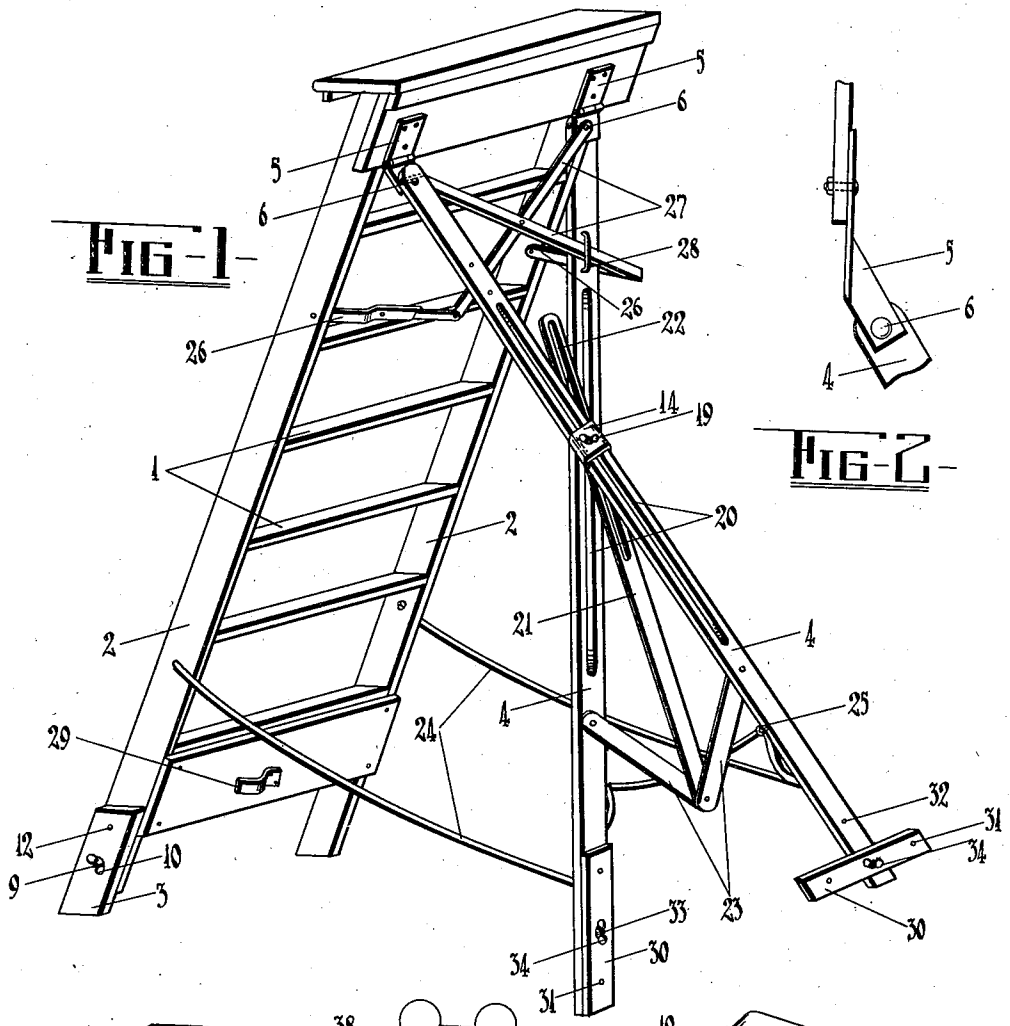


FIG-1-

FIG-2-

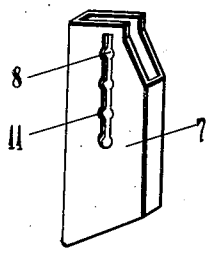


FIG-5-

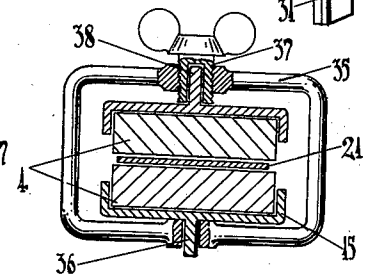


FIG-3-

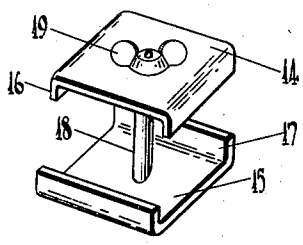


FIG-4-

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Patented Dec. 26, 1939 2,184,486

UNITED STATES PATENT OFFICE

2,184,486

STEPLADDER, TRESTLE, AND THE LIKE

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Application March 19, 1937, Serial No. 131,957
In New Zealand March 31, 1936

3 Claims. (Cl. 228—31)

The invention relates to stepladders, trestles and the like of the type wherein when not in use, a back support is foldable upon or hinged to lie along the back of a front portion which is, in the case of a step ladder, that portion containing the steps, or is extendable out backwards away from the front portion to support the latter when in use.

The object of the invention is to provide a stepladder, trestle and the like of the kind indicated, which is easily and quickly adjustable to allow for unevenness in the ground at the same time allowing the ladder, trestle and the like, to stand firmly on the front portion and the back support or supports even when both the latter are resting on slippery or like surfaces.

Further also, the back support is extendable so that it spreads sideways as well as backwards to provide a wide base ensuring stability in the stepladder while in use.

A further object of the invention is to provide a back support which folds or lies upon the front portion and is retained in that position so that the stepladder, trestle and the like, is easily carried and/or stored when not in use.

According to this invention the improved stepladder, trestle and the like comprises a front portion which may accommodate rungs or steps between styles or legs and a back support formed by legs slidably retained and adjustable upon each other, having their upper ends hinged backwards and sideways to the upper end of the front portion and flexible connection between the front portion and the back support whereby the latter can be adjusted to uneven ground and awkward positions as required by the user.

The invention will now be further described with reference to the accompanying drawing in which—

Figure 1 is a back perspective view of the invention as applied to a stepladder unfolded ready for use,

Figure 2 illustrates an alternative form of hinge for the back support,

Figure 3 is a cross section of a shackle form of clamp, while

Figure 4 is a perspective view of a clamp having a bolt and nut, and

Figure 5 is a perspective elevation of an adjustable shoe for use with the feet of the front portion.

Referring to the drawing of the invention as applied to a stepladder, the latter comprises a front portion having cross pieces such as rungs or steps 1, arranged in stiles or legs 2, which may be lengthened by the latter accommodating adjustable extensions 3, and a back support formed by crossed legs 4, slidably retained upon each other within limits, and movable in relation to the front portion by their upper ends having hinges 5, and pivots 6, so that the back support can be extended and adjusted to uneven ground and awkward positions. The stiles or legs 2 of the front portion may be extended also by adjustable shoes 7, which fit snugly upon the ends of the stiles or legs 2, said shoes 7 having slots 8 through which bolts 9 attached to the stiles or legs 2, can pass and by which the shoes 7 can be held in place so that they are clamped in desired positions along said ends, by nuts 10 on the bolts 9 passing into enlargements 11 made at intervals in the slots 8. In the form of the invention illustrated in Figure 1, one stile or leg of the front portion is made shorter than the other to allow for unevenness of the ground, but the short leg extension 3 may be secured to such a short stile or leg by said bolt 9 and wing nut 10 and by a stud (not shown) on the stile or leg passing into a corresponding hole 12 in the short leg piece.

Preferably the short leg extension 3 comprises a short portion and a long portion, one on each side of the bolt 9, so that the short stile or leg can be made the same length as the other stile or leg or longer than the latter by turning the said extension 3 about its bolt 9.

The crossed legs 4 forming the back support, are crossed and retained upon each other along their central portions, and have their upper ends attached to the upper end of the front portion by said hinge 5 affixed to the front portion and said pivots 6 connecting the upper ends of the legs 4 to the hinge 5; the outer one of the crossed legs 4, being pivoted to the outside of its hinge 5 and the inner one of the crossed legs 4 being pivoted to the inside of its hinge 5. Thus both legs can be swung backwards and forwards from the top of the front portion, and at the same time pivoted sideways so that the lower parts of the legs 4 can be moved out or spread sideways from or upon each other while remaining crossed and retained together by means of a sliding clamp fitting upon the crossed portions of the legs 4, and clamping the legs 4 together in desired positions.

In a preferred form of clamp, as illustrated in Figure 3, it comprises flanged front and back plates 14, 15, slidable upon legs 4, and held upon the latter by a shackle 35 which engages with a pin 36 of the back plate 15 and takes a screw-

threaded bolt 37 which passes upon and engages with a pin 38 of the front plate 14, and which bears upon the outer surface of the front plate 14 to bring the said plates together to clamp upon the legs 4.

In another preferred form of clamp as illustrated in Figure 4, it comprises back and front plates 14, 15 having flanges 16, 17 respectively, and shaped to fit upon the legs 4 so that said plates 14, 15 form a slideway. A bolt 18 may be passed centrally through both plates 14, 15 and a screw threaded outer end of the bolt 18, takes a winged nut 19, so that the plates 18 can be brought together upon the back legs 4. To allow for the use of this form of clamp the back legs have slots 20 lengthwise along their central portions so that the bolt 18 which holds the plates 14, 15 together, passes through and is movable in and along said slots 20; otherwise the slots 20 are not necessary and are not used with the first mentioned form of clamp.

In order to add strength to the back legs 4 and to reduce the spring or whip in them or the spread thereof, a leg stay may be added between the back legs 4. The leg stay comprises an upper part 21 passed between and separating the crossed back-legs 4, said upper part 21 having a slot 22 through which the bolt 18 of the clamp plates 14, 15 passes as in the case of the legs when a clamp as described and illustrated, is used, but it will be understood that a slot in the upper part 21, is not necessary when a shackle clamp (see Figure 3) is employed. Pivotally attached to the lower end of the upper part 21 of the leg stay are arms 23 which extend sideways and are pivotally secured to respective back legs 4. Thus the clamping of the upper part of the back stay between the crossed legs 4, adds stability through the pivoted arms 23 to the lower parts of the crossed legs 4, while at the same time the back stay folds and extends with the crossed legs.

Further, the backward and sideward movement of the back legs is given an extreme limit by flexible connections such as a cord or cords 24 affixed between the legs 4 and the front portion of the ladder and between the legs 4 themselves, and the cord 24 as between the legs 4 can be shortened by passing the cord through hooks 25 attached to the legs 4. It will be appreciated that when the said leg stay is used, the cord 24 between the legs 4 can be dispensed with and vise versa.

Further also, the limit of the backward and sideward movement of the legs 4 may be governed by collapsible and extending stays. Said stays may comprise side arms 26, each in two pieces and pivoted together, and having one piece pivoted to the style of the front portion of the ladder, and the other piece pivoted to ends of crossed pieces 27 centrally attached and held together; the said latter pieces 27 having their other ends pivotally attached to the back leg pivots 6. Where the crossed pieces 27 pass by or cross over the back legs 4, they are retained upon the legs by keepers 28 which latter also limit the movement of the back legs.

The supporting back legs 4 are preferably attached to their hinges 5, so that the inner one of the legs 4, is pivoted to the front of its hinge and the outer one of the legs 4, is pivoted to the back of its hinge. In this latter connection the collapsible and extending stays are pivoted on pivots 6 respectively to the back of the inner leg of the back support and to the front of the outer leg of the back support so that the legs and stays fold snugly upon the front portion aforesaid. In folding the legs 4 as stated, either one or both of the latter are passed into a stepped and open-ended keeper 29 affixed to and near the bottom and the back of the front portion of the stepladder. The folding into the keeper 29 and the clamping of the legs 4 together, holds the latter in said keeper 29 for transport or storage purposes.

Means may be provided to stop the bottoms of the legs 4 from sinking into soft ground, or on the other hand, to allow the legs 4 to be extended when more length is desired for same. Such means may comprise lengths 30 of leg material with holes 31 made therein and spaced apart to correspond with holes 32 made in the bottom portions of the legs 4, said holes taking bolts 33 with winged nuts 34. Thus when not in use, the lengths 30 wholly lap on the legs 4 and are held in place by the bolts 33 and winged nuts 34; when the lengths 30 are in use as extensions of the legs 4, said lengths 30 partially overlap the legs 4 so that portions of the lengths 30 extend beyond the legs 4 to extend the latter; while for use in soft ground the lengths 30 are affixed by the bolts 33 and winged nuts 34 in the bottom hole in the legs 4 and extend out at right angles to the latter.

It will be clearly understood that the back support described herein, is adaptable to and is intended for the conversion of ladders, trestles and the like made heretofore as well as for the construction of new stepladders and the like embodying the invention herein.

What I do claim and desire to obtain by Letters Patent of the United States of America is:

1. A stepladder, trestle and the like comprising a front portion having rungs arranged in and extending between stile-forming front legs, a back support formed by crossed back legs slidably retained and adjustable on each other, a sliding clamp retaining the said back legs together by clamping the latter in infinitely variable positions within the compass of said crossed legs, articulating hinges joining the upper part of the front portion to the upper parts of the back legs for backward and sideward movement of the latter relative to said front portion, and a regulable flexible connection between the front portion and the back support, whereby the latter is adjustable to uneven ground and awkward positions, the said crossed legs forming a back support being provided with slots, and said sliding clamp, for retaining the legs together and clamping them in desired positions, being provided with back and front plates flanged and shaped to fit upon and form slideways for the legs, said plates being held together by a bolt and nut, said bolt passing through and being slidable in said slots of said legs, said back legs having a stay movable and adjustable with the back legs to curtail whip or spread of the latter when in use, said back leg stay comprising an upper part passed between and separating the crossed legs and retained by the clamp of the latter, and arms pivoted to a lower part of the leg stay and pivoted to respective back legs.

2. A stepladder, trestle and the like comprising a front portion having rungs arranged in and extending between stile-forming front legs, a back support formed by crossed back legs slidably retained and adjustable on each other, a sliding clamp retaining the said back legs together by clamping the latter in infinitely variable posi-

tions within the compass of said crossed legs, articulating hinges joining the upper part of the front portion to the upper parts of the back legs for backward and sideward movement of the latter relative to said front portion, and a regulable flexible connection between the front portion and the back support, whereby the latter is adjustable to uneven ground and awkward positions, the said back support being provided with a collapsible and extending stay which comprises side arms each in two pieces pivoted together and having one piece pivoted to the front portion and the other piece pivoted to crossed pieces, the latter being centrally attached and held together, and being also pivotally attached to respective back legs.

3. A stepladder, trestle and the like comprising a front portion having rungs arranged in and extending between stile-forming front legs, a back support formed by crossed back legs slidably retained and adjustable on each other, a sliding clamp retaining the said back legs together by clamping the latter in infinitely variable positions within the compass of the said crossed legs, articulating hinges joining the upper part of the front portion to the upper parts of the back legs for backward and sideward movement of the latter relative to said front portion, and a regulable flexible connection between the front portion and the back support, whereby the latter is adjustable to uneven ground and awkward positions, the said back support being provided with a collapsible and extending stay which comprises side arms each in two pieces pivoted together and having one piece pivoted to the front portion and the other piece pivoted to crossed pieces, the latter being centrally attached and held together and being also pivotally attached to respective back legs, the said crossed pieces passing through keepers attached to the back legs.

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