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KNOCKDOWN STEP LADDER.

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1,224,599. Patented May 1, 1917.

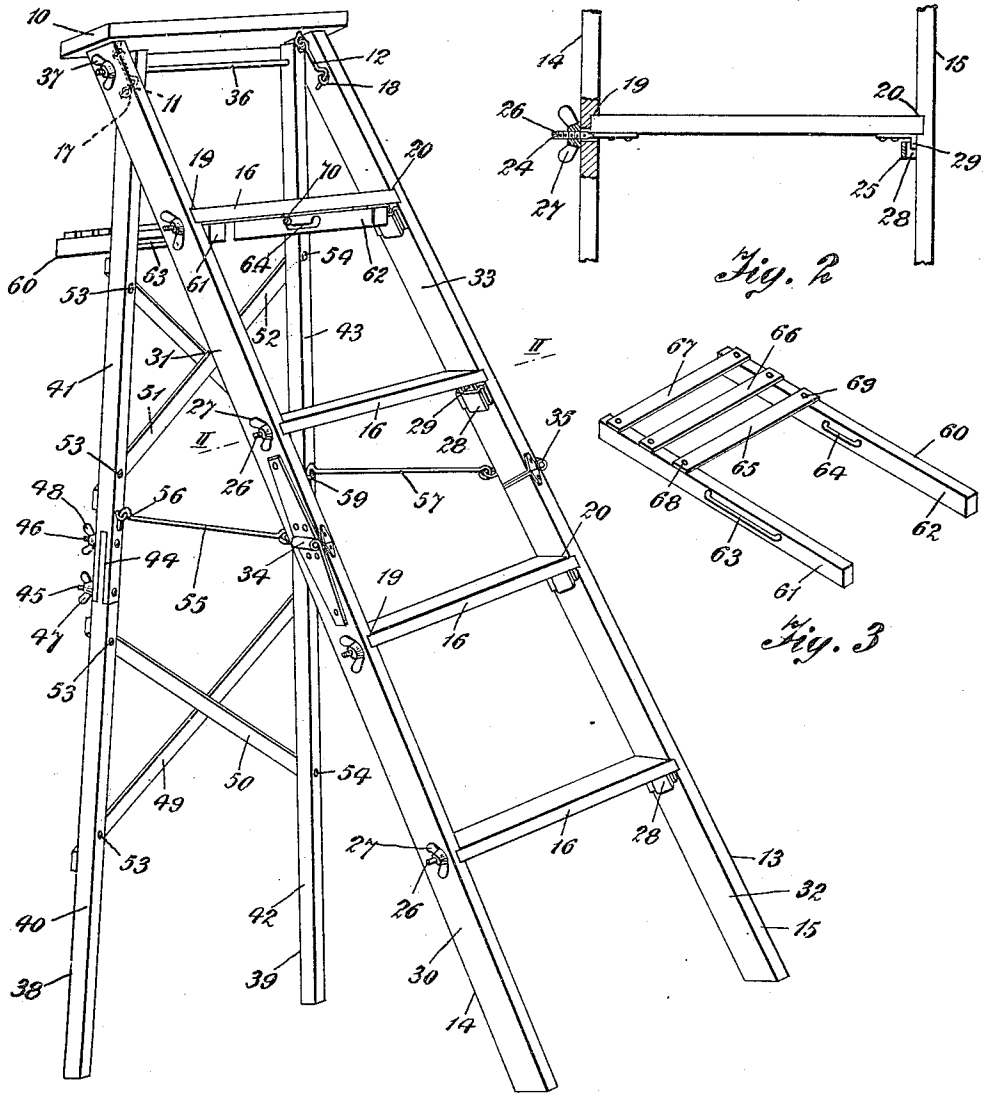


Fig. 1

Fig. 2

Fig. 3

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KNOCKDOWN STEP-LADDER.

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To all whom it may concern:

Be it known that I, CUTHBERT W. BUTCHER, a subject of the King of England, and a resident of Mamaroneck, county of Westchester, and State of New York, have invented a certain new and useful Improvement in Knockdown Step-Ladders, of which the following is a full, clear, and exact specification.

My invention has for its object primarily to provide a ladder of a form whereby the parts of the ladder may be separated for being packed into a comparatively limited space when not in use and for also being easily transported. The invention consists essentially of a top board, or plate to which is connected the upper ends of a stair member composed of two side bars with a number of steps, and to the upper ends of the side bars is pivoted the upper ends of two spaced rear legs, these parts being detachable from each other so as to be separated if desired when the ladder is not in use.

Other objects of the invention are to form each of the side bars of the stair member into two sections which are hinged together to allow the side bars to be folded after the steps have been removed therefrom; to form each of the rear legs also into two detachable sections to permit the legs to occupy a limited space when the ladder is disassembled; and to provide a detachable and collapsible bucket rest.

A further object of the invention is to provide a step ladder adapted to be made so as to combine great strength and durability, and which is susceptible of being made in various sizes as occasion may require.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawing forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views, and will then be pointed out in the claim at the end of the description.

In the drawing, Figure 1 is a perspective view of one form of knockdown step ladder embodying my invention.

Fig. 2 is a front view, partly in section, taken on the line II—II of Fig. 1, and

Fig. 3 is a perspective view of the bucket rest used in conjunction with the ladder.

The ladder has a top board, or plate 10 which may be substantially rectangular, or of any other suitable shape, and depending from the underside of this board in proximity to its ends are two hooks, as 11 and 12.

The top board 10 is removably supported on the upper ends of a stair member 13 composed of two spaced side bars 14, 15, and a number of removable steps, as 16, therebetween. Contiguous to the upper ends of the side bars 14 and 15 are two eyes, or rings 17 and 18 each of which is releasably engaged by one of the hooks 11 and 12 of the top board 10 for permitting the stair member to be detachably held to the top board. At spaced intervals in the inner surface of the side bar 14 of the stair member 13 are a number of transverse grooves 19, and at corresponding spaced intervals in the opposed surface of the side bar 15 of the stair member are similar transverse grooves 20. Through the side bars 14 and 15 of the stair member and adjacent to the lower edges of the grooves 19 are holes, and removably disposed in each pair of the transverse grooves 19 and 20 of the side bars of the stair member is one of the steps 16.

Adapted to detachably hold the steps 16 against accidental displacement in the grooves of the side bars 14 and 15 of the stair member, I provide two retaining elements, as 24 and 25 Fig. 2, in conjunction with each step. The retaining elements 24 are similarly formed, and the retaining elements 25 are also preferably alike in construction. Each of the retaining elements 24 is composed of a threaded bolt 26, and one of these bolts is removably disposed through each of the holes of the side bar 14 of the stair member. The bolts 26 are of sufficient lengths to extend some distance beyond this side bar, and on the threaded free end of each bolt is screwed a thumb nut 27. Each of the retaining elements 25 consists of a strap 28, all of which extend outwardly from the inner surface of the side bar 15 of the stair member, one adjacent to the lower edge of each of the grooves 20. Depending from the underside of each of the steps 16 at its end opposite to the bolt 26 is a tongue, or finger 29, and each of these tongues is removably disposed in one of the straps 28 of the side bar 15 of the stair member. To secure the steps 16 against movement, or displacement between the side bars of the stair member the thumb nuts 27 are screwed on the bolts 26 tightly in abutment against the side bar 14 of the stair member. The steps 16 will then be directed

toward the side bar of the stair member, and in turn the tongues 29 will tightly engage the straps 28 on the side bar 15 of the stair member. The steps will thereby be snugly held in the grooves of the side bars of the stair member, and to remove the steps from the side bars, the thumb nuts 27 are unscrewed from the bolts 26. By guiding the side bar 14 outwardly from the steps the bolts 26 and the adjacent ends of the steps will be removed from the holes of this side bar and also from the grooves 19 of the side bar, and the opposite ends of the steps as well as the tongues 29 of the retaining elements 25 may then be separated from the grooves 20 and from the straps 28 by guiding the steps outwardly of the grooves and upwardly of the straps. By then disengaging the hooks 11 and 12 of the top board 10 from the eyes 17 and 18 of the side bars of the stair member the side bars may be separated from the top board. To permit the side bars of the stair member to be folded after the top board is detached from the stair member, and after the parts of the stair member are disassembled, the side bar 14 is divided into two sections 30 and 31 while the side bar 15 is likewise divided into two sections 32 and 33. The sections 30 and 31 of the side bar 14 of the stair member are hinged together, at 34, and the sections 32 and 33 of the side bar 15 of the stair member are hinged together, at 35, so that when these parts of the ladder are separated the sections of the side bars 14 and 15 of the stair member 13 may be swung upon each other for being packed into a limited space.

Through holes in the side bars of the stair member 13 in proximity to the upper ends thereof, is removably disposed a rod 36 having a head, not shown, on one of its ends. The rod 36 is of a length to extend some distance beyond the opposite side of the stair member, and this end of the rod is threaded to allow a thumb nut 37 to be screwed thereon to removably hold the rod to the stair member. On the rod 36 between the side bars of the stair member 13 is swung the upper ends of two spaced rear legs 38 and 39 adapted to be guided toward and rearwardly of the stair member as is usual with the adjustment of this class of step ladders. To allow the rear legs to be also packed into a limited space when the ladder is disassembled, the rear leg 38 is divided into two sections 40 and 41, and the rear leg 39 is similarly divided into two sections 42 and 43. The opposed ends of the sections of each of the rear legs are detachably connected by a groove and tongue union, as 44, through registered holes in spaced parts of which are threaded bolts 45 and 46 on which are screwed thumb nuts 47 and 48, respectively. To hold the parts of these unions of the rear legs against movement the thumb nuts 47 and 48 are tightened in the usual manner on the bolts 45 and 46, and when it is desired to separate the sections of the rear legs these thumb nuts are unscrewed from their bolts. The bolts 45 and 46 are then removed from the rear legs, and the sections of the legs may then be separated by withdrawing the tongue of one section of each leg from the groove of the second section of each leg. In order to hold the sections of the rear legs against lateral movement when the ladder is assembled and in use, the sections 40 and 42 of these legs are connected by two cross-braces, or bars, as 49 and 50, disposed in the shape of an X, and the sections 41 and 43 of the legs are likewise connected by two cross-braces, or bars, as 51 and 52, which are also disposed in the shape of an X. Each of the braces 49, 50, 51, 52 is connected to its respective section of the legs by bolts, or pins, as 53 and 54, being removably passed through registered holes provided in each brace and in the sections of the legs to which the brace is attached. To hold the rear legs 38 and 39 in proper spaced relation to the stair member 13 when the ladder is in use, to the side bar 14 of the stair member is pivotally held one end of a rod 55 having on its other end a hook which releasably engages an eye, or ring 56 projecting from the rear leg 38, and to the side bar 15 of the stair member is pivotally held one end of a rod 57 also having on its other end a hook in releasable engagement with an eye, or ring 59 extending from the rear leg 39. When it is desired to separate the rear legs 38 and 39 from the ladder the thumb nut 37 is removed from the rod 36, and the rod is then withdrawn from its holes in the stair member and in the rear legs. The rear legs may then be disassembled by removing the bolts 53 and 54 from the legs and from the braces 49, 50, 51, 52 to separate the braces from these legs. The sections of the rear legs are then disconnected, and the parts of the stair member 13 as well as the top board 10 may afterward be separated, as hereinbefore explained.

Serving to permit articles to be supported at the top of the ladder so as to be convenient to reach when the ladder is in use, I provide a detachable and pivoted collapsible bucket rest, as 60. The detachably pivoted collapsible rest 60 has two side bars 61 and 62. Transversely through the central part of the bar 61 is an elongated slot, as 63, having upwardly disposed ends, as shown, and transversely through the central part of the bar 62 of the rest is a slot, as 64, of less length than the slot 63, and this slot also has upwardly turned ends one of which is in register with one of the upwardly turned ends of the slot 63 of the bar 61. These side bars of the rest 60 may be of any suitable lengths, and the forward end portions

of these side bars are connected by spaced slats, as 65, 66, 67, the ends of each of which are pivoted, at 68 and 69, to the tops of the side bars. The detachably pivoted collapsible rest 60 is detachably applied to the ladder by providing a projecting pin, as 70, on the inner surface of each of the rear legs 38 and 39, and these pins are substantially on alinement with the underside of the upper step of the stair member 13 of the ladder. The side bars 61 and 62 are spaced apart to allow the end parts thereof opposite to the slats 65, 66, 67 to be disposed between the rear legs 38 and 39 and to permit the slots 63 and 64 of the side bars to receive the pins 70 of the rear legs. By then slidably moving the rest toward the front of the ladder, the side bars 61 and 62 will be disposed so as to contact with the underside of the top step of the ladder and the pins 70 will be received in forward upwardly turned ends of the slots 63 and 64. The rest 60 will thereby be supported to the ladder so that its slatted end will extend rearwardly of the ladder for receiving any articles which may be placed thereon for the convenience of the person using the ladder. To separate the rest from the ladder the side bars 61 and 62 are directed rearwardly from between the legs 38 and 39 until the side bars are free of the top step of the ladder. The pin 70 of the rear leg 39 will then be seated in the opposite upturned end of the slot 64 of the side bar 62 of the rest, and by guiding the side bar 61 of the rest a further distance so that the pin 70 of the rear leg 33 will be seated in the opposite upturned end of the slot 63 of the side bar 61 the rest may be easily removed from the ladder. By then moving the side bars 61 and 62 in opposite directions the slats 65, 66, 67 of the rest will cause these side bars to be moved to collapsible positions against each other. In this manner the ladder may be knocked down so as to occupy a comparatively limited space when not in use.

In the foregoing description, I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle, or sacrificing any of the advantages of this invention, therefore I reserve to myself the right to make such changes as fairly fall within the scope thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

In a collapsible ladder with two stair-members, two rear legs, means connecting the stair-members and the rear legs together, a top-board, and a plurality of steps, the combination of a detachably pivoted collapsible rest, comprising two parallel side-bars, a plurality of transverse bars pivotally secured thereto, said side bars having in each an elongated slot with their ends curved at an angle therewith, one slot being longer than the other, and pins provided in the inner surface of the rear legs for engaging the said slots whereby the rest may be supported for use, substantially as shown and described.

This specification signed and witnessed this twenty-ninth day of July, A. D. 1915.

CUTHBERT W. BUTCHER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."