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C. E. BEARD

STEP ATTACHMENT FOR STOOLS

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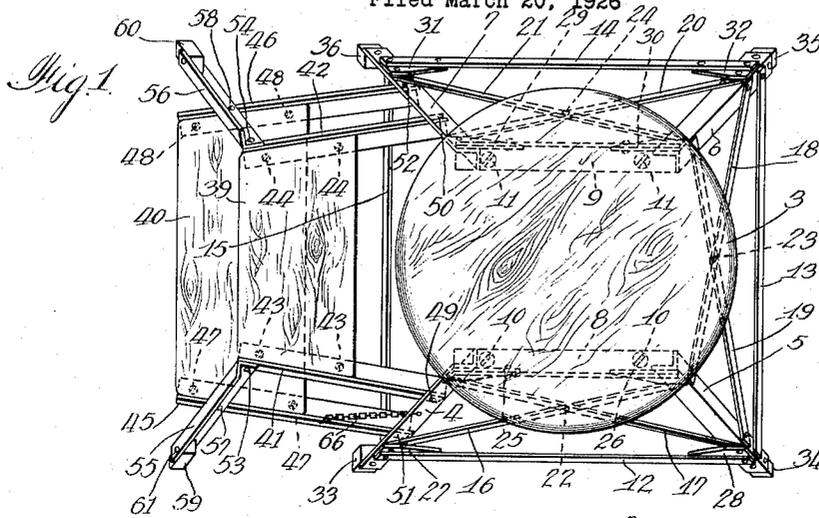


Fig. 2.

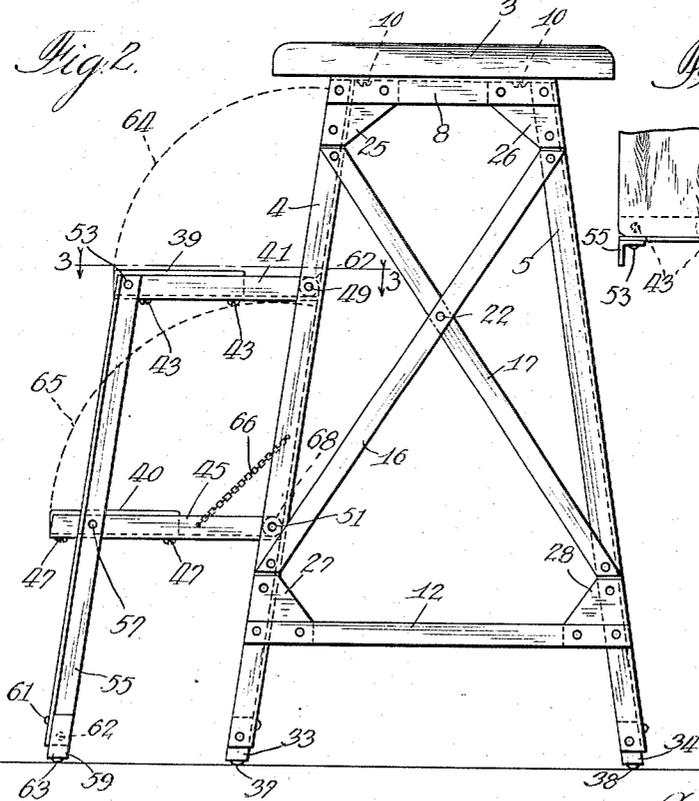
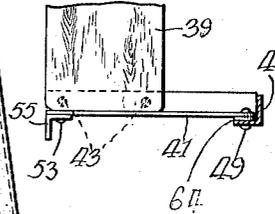


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## STEP ATTACHMENT FOR STOOLS.

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My invention relates to a step ladder attachment for stools, particularly high stools, and one of the objects of the invention is the provision of an improved attachment of such type.

A further object of the invention is the provision of a foldable step ladder attachment for stools.

Another object of the invention is the provision of an improved and efficient means for limiting the positions of the steps of a foldable step ladder attachment for stools.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

In the accompanying drawings:—

Figure 1 is a plan view of my improved step ladder attached to a stool;

Figure 2 is an elevation of a step ladder attached to a stool in position for use; and

Figure 3 is a detail view.

In the accompanying drawings, 3 designates the seat which is preferably made of wood and mounted on a metal supporting structure consisting of four legs 4, 5, 6, and 7, each preferably of angle-iron and braced to occupy inclined upright positions. The upper ends of the angle-iron legs are riveted to the horizontal angle-irons 8 and 9 which in turn are secured by means of screws 10, 10 and 11, 11 to the bottom of the wooden seat 3. Cross pieces 12, 13, 14 and 15 are arranged between the lower portions of the legs. Diagonal bracing strips 16, 17 may be arranged in X-formation between the legs 4 and 5. In a similar manner, diagonal bracing strips 18, 19 may be arranged in X-formation between the legs 5 and 6. Diagonal bracing strips 20, 21 may also be arranged in X-formation between the legs 6 and 7. The extreme ends of the diagonal bracing strips may be riveted to the legs and also riveted to each other where they cross, as indicated at 22, 23 and 24. In addition to the diagonal bracing strips which are riveted at their ends to their legs, gusset plates may be mounted at the angular connections between the cross pieces extending between the legs and the legs. Such gusset plates are shown at 25, 26 riveted respectively to the leg 4 and cross-piece 8 and to the leg 5 and the cross piece 8. The gusset plate 27 is riveted to the lower portion of the leg 4 and the cross piece 12. In a similar manner, the gusset plate 28 is riveted to the lower portion of the leg 5 and the cross piece 12. Gusset

plates 29 and 30 are also riveted to the cross piece 9 and the upper ends of the legs 6 and 7. Gusset plates 31 and 32 are riveted to the ends of the cross piece 14 and the lower portion of the legs 6 and 7.

In some instances, the gusset plates may be entirely omitted and the diagonal bracing strips alone relied upon to reinforce the cross strips 12, 13 and 14 in holding the legs in proper positions. Also, in some instances, the gusset plates alone may be relied on and the diagonal bracing strips omitted so as to reduce the amount of material in construction of the stool and to lighten the weight thereof.

The feet 33, 34, 35, and 36 are preferably made of wood attached to the lower ends of the angle-iron legs by means of screws located at different elevations and at right angles to each other. Such wooden feet are desirable to prevent the metal from marring the surface on which it rests and also because rubber tips or sliding castors, such as those indicated at 37 and 38 in Figure 2, may be desired.

The steps for facilitating ascent to the top of the stool for the purpose of standing on the seat 3 are indicated at 39 and 40 and are preferably made of wood but may be constructed of other material, if desired. The horizontal step 39 is located between the inner angular faces of the angle-irons 41 and 42 and may be secured thereto by means of wood screws 43, 43 and 44, 44. In a similar manner, the lower step 40 may be secured between the angular faces of the angle-irons 45, 46 by means of wood screws 47, 47 and 48, 48.

The outer vertical flanges of the angle-irons 41 and 42 are pivoted respectively at 49 and 50 to the inner angular faces of the upright legs 4 and 7 respectively. In a similar manner, the upright flanges of the angle-irons 45 and 46 are pivoted respectively at 51 and 52 to the inner faces of the legs 4 and 7, respectively. The angle-irons secured to the steps 39 and 40 may be arranged in converging relation, as indicated in Figure 1, so as to facilitate movement of the angle-irons 41, 42 and 45, 46 into the angular recesses of the upright angle-iron legs 4 and 7.

Pivoted at 53 and 54 to the outer ends of the angle irons 41 and 42 are upright legs 55 and 56. These legs are also pivoted at 57 and 58 to the angle irons 45 and 46 in such a position that the step 40 projects outwardly from the legs 55, 56 as shown in the drawing.

The lower ends of the legs 55 and 56 may

be provided with wooden feet 59 and 60 which may be secured in place by means of wood screws 61 and 62 inserted at different elevations and at right angles to each other.

5 The lower ends of the wooden feet 59 and 60 may be provided with rubber tips or sliding castors, as indicated at 63 in Figure 2.

The steps may be moved to folded position, as indicated by the dotted arcuate lines 10 64 and 65. While the lower step 40 projects outwardly beyond the legs 55 and 56, its outward end moves along the arc 65 so as to occupy a folded position beneath the inner pivoted ends of the angle-irons 41 and 42 15 and between the legs 4 and 7. That is to say, since the outer upright flanges of the angle-irons 41, 42 and 45, 46 are pivoted at their inner ends to the outer upright flanges of the legs 4 and 7, the folding relation is such that 20 the steps 39 and 40, when in their upright positions, are located between the legs 4 and 7 and may be held in such folded position by friction of the pivots 53 and 54 with the inner surfaces of the outer flanges of the upright 25 legs 4 and 7.

It should be noted that although the step ladder attachment may be adapted to be mounted on a previously constructed stool or an ordinary stool of various types, it is 30 preferred to especially construct the stool so as to have sufficient strength and rigidity consistent with the lightness thereof. Furthermore, in order to secure a more compact folded relation, I prefer to mount the angle-iron legs 5 and 6 as shown in Figure 1, with 35 the angular recess faces directed inwardly, whereas the legs 4 and 7 are preferably so arranged as to have the angular recess portions facing toward the steps 39 and 40 so that these angular recess portions will serve 40 to receive the angle-irons 41, 42 and 45, 46 together with the steps 39 and 40 when the latter are in their folded positions. For this purpose also, the legs 55 and 56 are pivoted 45 to the angle-irons 41, 42, 45, 46 so that the adjacent upright flanges of the legs 55 and 56 will tend to move inside of the outer flanges of the legs 4 and 7. Preferably, the legs 55 and 56 are so mounted as to be in approximate parallelism with the legs 4 and 7 50 when the steps 39 and 40 are in their lower or horizontal positions. While one of the steps may be omitted, it is preferred to retain both pairs of angle irons 41, 42 and 45, 55 46 so as to provide parallel motion mechanism for folding purposes and to hold the legs 55 and 56 in the positions shown in the drawings.

60 Furthermore, in order to facilitate the folding of the steps into compact relation with the stool, no diagonal brace rods or strips are desired on that side of the stool facing the steps 39 and 40. The lower cross strip 15 is sufficient for requisite strength and 65 rigidity of the stool in view of the bracing

structure at other portions thereof. It is preferable to mount the seat 3 with the grain of the wood thereof at an angle of 45° with the supporting angle-irons 8 and 9 beneath the same. Such arrangement will prevent 70 the wood seat 3 from splitting even at the very edges thereof at any point when a person steps thereon after using the steps 40 and 39. The wooden steps 39 and 40 are supported 75 throughout their widths and therefore breaking or splitting thereof is reduced to a minimum, when the step ladder is used to mount the top of the stool. The steps 39 and 40 are of sufficient width to distribute 80 the weight of the person standing on them so that a portion of such weight is supported by the legs 4 and 7 of the stool and the remainder by the legs 55 and 56.

Inasmuch as it may be desired to lift the stool together with the step ladder arrange- 85 ment to various places from time to time while the steps 39 and 40 are in their lower and horizontal positions, I have provided a flexible connection shown as a chain 66 connected between the angle-iron 45 and the leg 90 4. This chain will serve to limit the downward movement of the steps 39 and 40 when the stool is lifted off the floor to another position. In addition to the chain 66, the inner 95 ends of the angle-irons 41, 42 and 45, 46 may be rounded as indicated at 67 and 68 in Figure 2 and provided with a close fit to their lower inner ends with the upright faces of the angle iron legs 4 and 7 so that the downward movement of the steps 39 and 40 may be 100 definitely limited, even independently of the chain 66, in which event, the latter may be omitted, if desired. It is preferred to use the chain 66, because if the bearings at the inner ends of the angle-irons 41, 42 and 45, 105 46 are relied upon entirely, the construction will require a more exact location of the rivet holes both in the hinged angle-irons and in the legs 4 and 7 of the stool.

It should also be noted that in order to 110 facilitate the movement of the inner upright flanges of the legs 55 and 56 into the angular recesses of the legs 4 and 7 back of the outer upright flanges thereof, separators such as a loose collar or bushing 64 (Fig. 3) may be 115 located between the upright flanges of the hinged angle-irons and the inner surfaces of the upright outer flanges of the legs 4 and 7. Such separators 64 for the pivots 49, 50, 51 and 52 should be approximately of a length 120 equal to the thickness of the front flanges of the legs 55 and 56.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from 125 the spirit and scope of the invention as defined by the claims hereto appended, and I wish therefore not to be restricted to the precise construction herein disclosed.

Having thus fully described and shown an 130

embodiment of my invention, what I desire to secure by Letters Patent of the United States is:—

5 1. A stool adapted to have mounted thereon a foldable step ladder attachment, and comprising spaced-apart angle-iron legs with their inner recess portions facing outwardly for nesting the legs of the step ladder attachment when the same is folded against the  
10 stool.

2. The combination with a stool comprising spaced-apart and substantially perpendicular angle-iron legs, of two pairs of spaced-apart angle-iron supports pivoted at  
15 their inner ends to said spaced-apart legs, steps mounted on said angle-iron supports, and upright spaced-apart legs pivoted to said angle-iron supports and adapted when extended to rest parallel with the angle iron  
20 legs of the stool.

3. In a combined stool and folding step-ladder, legs for the stool having angular faces providing recesses, and legs on the step-ladder having angular faces adapted to engage in said recesses when the ladder is folded  
25 against the stool and friction means for retaining said engagement comprising projections on the sides of the angular faces of the ladder legs having a wiping contact with the  
30 sides of the angular faces of the stool legs.

4. In a combined stool and folding ladder, legs for the stool having angular faces providing recesses, legs for the ladder, step-supports on said ladder legs, steps attached thereto, angular faces on said step supports,  
35 one face on each step support providing a supporting ledge for the steps and the other face on each support embracing the sides of the steps, said ladder legs having angular  
40 faces one face of which on each leg together with the step supports and the steps being adapted to enter the recesses in the stool legs when the ladder is folded against the  
45 stool.

5. A self-supporting stool having legs constructed of angle irons, and a collapsible step

ladder combined with said stool, said step ladder comprising angle iron links pivoted at one end to one pair of the stool legs, steps  
50 secured upon said links, and angle iron legs for the ladder pivotally connected at the opposite ends of said links, one of the angular faces of said ladder legs including said links and said steps adapted to nest within the  
55 angular faces of the stool legs when the ladder is folded against the stool.

6. A self-supporting stool having legs constructed of angle irons, and a collapsible step ladder combined with said stool, said step ladder comprising angle iron links pivoted at  
60 one end to one pair of the stool legs, steps secured upon said links, and angle iron legs for the ladder pivotally connected at the opposite ends of said links, one of the angular faces of said ladder legs including said links  
65 and said steps adapted to nest within the angular faces of the stool legs when the ladder is folded against the stool, and friction means for holding the ladder folded against the  
70 stool.

7. A self-supporting stool having legs constructed of angle irons, and a collapsible step ladder combined with said stool, said step ladder comprising angle iron links pivoted  
75 at one end to one pair of the stool legs, steps secured upon said links, and angle iron legs for the ladder pivotally connected at the opposite ends of said links, one of the angular faces of said ladder legs including said links and said steps adapted to nest within the  
80 angular faces of the stool legs when the ladder is folded against the stool, and friction means for holding the ladder folded against the stool comprising projections on the sides of the  
85 angular faces of the ladder legs having a wiping contact with the sides of the angular faces of the stool legs.

In testimony whereof I have signed my name to this specification on this 13th day of March, A. D. 1926.

CLEMENT E. BEARD.