Jan. 16, 1962 E. F. HAMILTON 3,016,974

STEP STOOL

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Fig. 1.

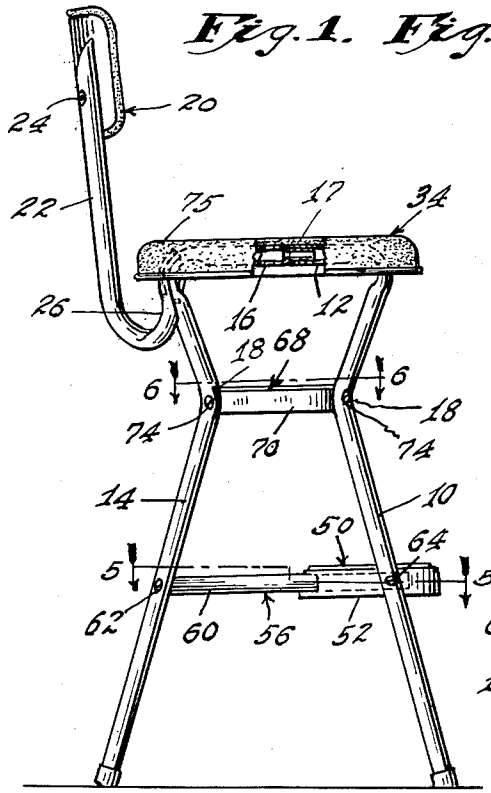


Fig. 2.

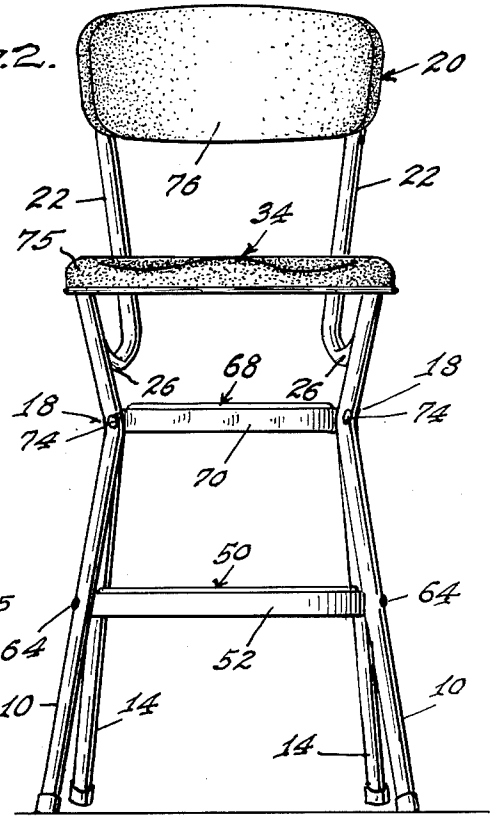


Fig. 5.

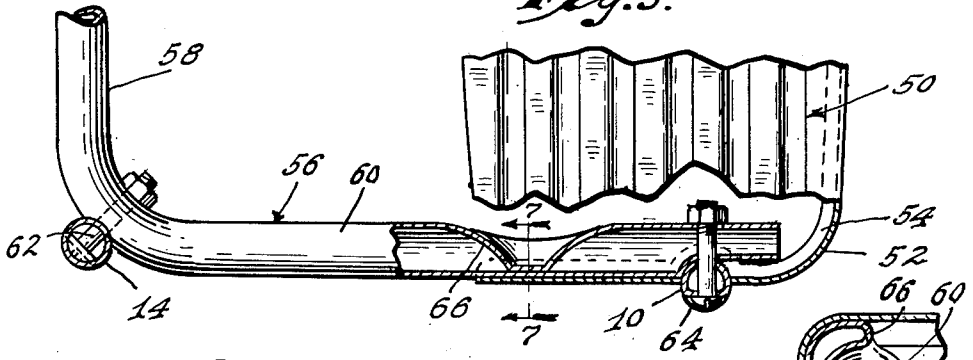


Fig. 6.

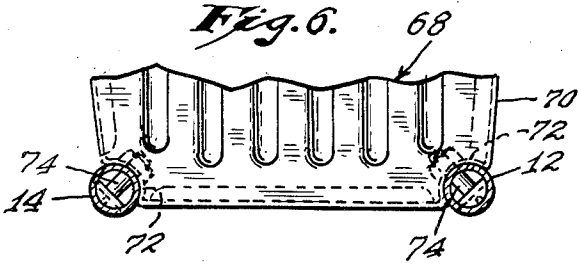
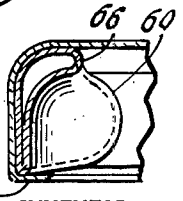


Fig. 7.



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Fig. 3.

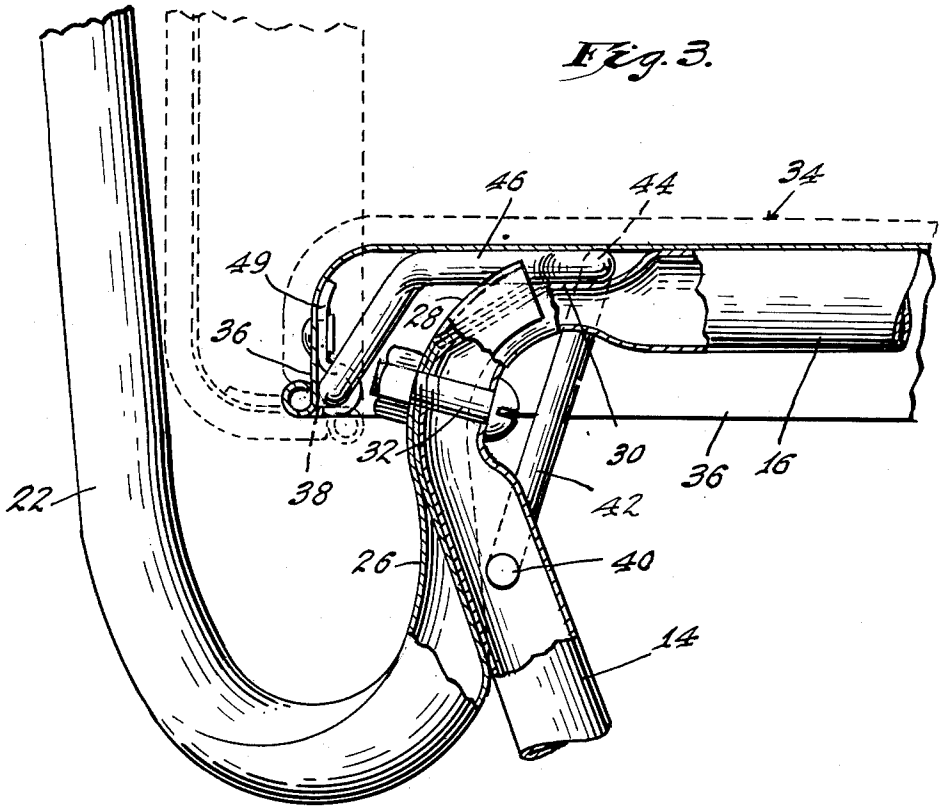


Fig. 4.

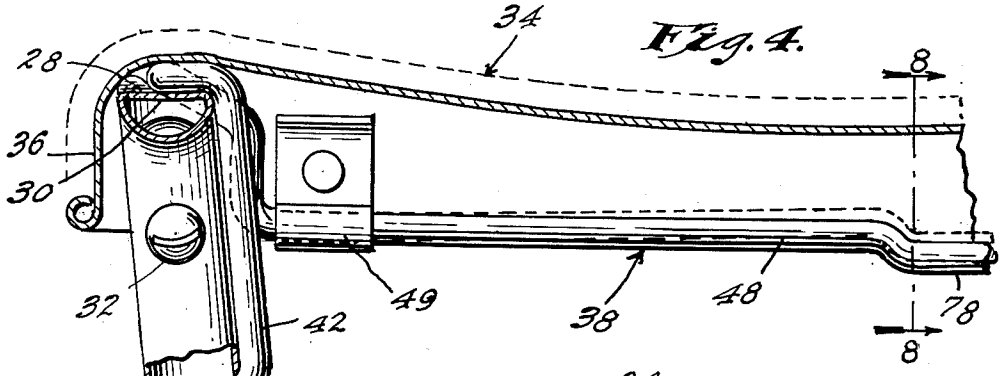
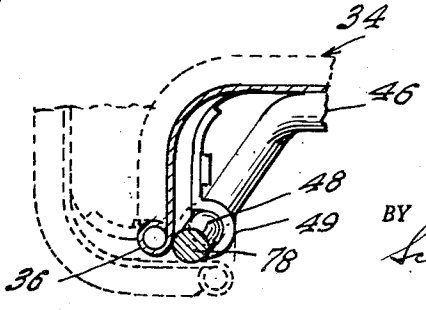


Fig. 8.



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STEP STOOL

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Filed Mar. 30, 1959, Ser. No. 802,936
11 Claims. (Cl. 182—33)

This invention relates to step stools, or stools having a group of steps mounted thereon.

It is an object of my invention to provide a step stool which will have a simplified construction, and which lends itself to manufacture from metal-tubing and sheet-metal. Still another object of my invention is to provide a step stool of attractive appearance, which is adapted for shipment in knocked-down condition, and which will prove sturdy and durable in use.

In carrying out my invention in its preferred form, I provide pairs of front and rear legs having their upper ends joined together. A seat is pivotally interconnected to the rear legs and is swingable between an extended position in which it is supported on the upper ends of the front and rear legs in a position substantially parallel with the floor or other supporting surface and a collapsed position in which it is disposed in a substantially vertical position. Conveniently, a back rest is mounted on the rear legs above said seat and at the rear thereof.

A plurality of steps are rigidly mounted at spaced intervals on the legs in a position such that the steps will be disposed in operative position upon movement of the seat to its collapsed position.

The accompanying drawings illustrate my invention. In such drawings:

FIG. 1 is a side elevation of a step stool embodying my invention;

FIG. 2 is a front elevation of the step stool shown in FIG. 1;

FIG. 3 is an enlarged fragmentary longitudinal section showing the pivotal seat mounting;

FIG. 4 is an enlarged fragmentary transverse section showing the pivotal seat mounting shown in FIG. 4;

FIG. 5 is a fragmentary horizontal section taken on the line 5—5 of FIG. 1;

FIG. 6 is a fragmentary horizontal section taken on the line 6—6 of FIG. 1;

FIG. 7 is a fragmentary vertical section taken on the line 7—7 of FIG. 5; and

FIG. 8 is a vertical section taken on the line 8—8 of FIG. 4.

As illustrated in the drawings, my step stool is supported on a plurality of floor-engaging legs conveniently formed from lengths of metal-tubing. Forward support for the step stool is provided by a pair of front legs 10 having their upper ends 12 bent rearwardly, and rearward support for the step stool is provided by a pair of rear legs 14 having their upper ends 16 bent forwardly. Conveniently, the upper ends 16 of the rear legs 14 are telescoped into the upper ends 12 of the front legs 10, as at 17, to rigidly connect the front and rear legs adjacent the lateral sides of the stool. For reasons that will become more apparent hereinafter, each of the legs 10 and 14 is bent inwardly at a point intermediate its length, as indicated at 18.

A back rest 20 is mounted on the rear legs 14 by a pair of back supports 22 having their upper ends connected to said back rest by screws 24. Conveniently, each of the supports 22 is formed from a length of metal-tubing having its lower end bent into a generally U-shape with the forwardly disposed stretch 26 of the U-shaped portion being flattened and bent into an arcuate cross-section to mate with and bear against the rear face of one of the rear legs 14. The upper end of each of the back-support stretches 26 is further bent to overlie

the horizontally disposed upper end 16 of one of the rear legs, and to provide a rib 28 extending the length of that portion of the stretch 26 overlying the upper end 16 of the rear leg. The rearward ends of the horizontally disposed ends 16 of the legs 14 are also flattened, as at 30, and are connected to the back-support stretches 26 by bolts 32.

A stool seat 34 in the form of a sheet-metal stamping having a downwardly extending peripheral flange 36 is pivotally connected to the rear legs 14. To this end, I provide a seat-supporting rod 38 having outturned ends 40 received in aligned openings in the inner faces of the rear legs 14 adjacent the upper ends thereof. Conveniently, the rod 38 has a symmetrical configuration for fixedly mounting said rod on the legs 14 and permitting the seat 34 to be swung about said rod between its fully collapsed and extended positions. As is best illustrated in FIGS. 3 and 4, the rod 38 is bent upwardly, as at 42, from its ends 40 and then laterally outwardly, as at 44, to rest upon the flattened portion 30 of the legs 14. From the laterally extending stretches 44, the rod 38 is bent rearwardly, as at 46, with said rearwardly extending stretches 46 abutting the inner faces of the back support ribs 28 and resting on the back support stretches 26 overlying the upper ends 16 of the rear legs. At the rearward ends of the stretches 46, the rod 38 is bent downwardly and then inwardly to form a tranversely extending stretch 48 pivotally connected to the rear stretch of the peripheral seat flange 36 by clips 49 mounted on the inner face of said flange. Thus, by forming the rod 38 in the manner described, the seat 34 is swingable about the axis of the transverse rod stretches 48 disposed below and to the rear of the upper ends of the rear legs. This permits the seat to be swingable between a collapsed position shown in dotted lines in FIG. 3 in which it is disposed substantially parallel with the back rest 20 and an extended position in which it is supported on the upper ends 12 and 16 of the front and rear legs. By flattening the rear legs, as at 30, and the ends 26 of the back supports overlying the flattened leg stretches, the upper faces of the rod stretches 44 and 46 and the upper ends 12 and 16 of the legs are substantially coplanar, thereby permitting the seat 34 to rest upon and be supported by the upper ends of the legs along substantially their entire length.

As illustrated in FIG. 1, I provide a plurality of steps rigidly mounted at spaced intervals on the inner faces of the front and rear legs to cross-brace said legs and to provide a ladder-type construction. As shown, the lower step 50 is formed from a sheet-metal stamping having a downwardly extending marginal flange 52 formed along its forward and lateral edges, the lower edge of said flange being bent inwardly to form a stiffening lip 54. The step 50 is strengthened by a brace 56 formed from a length of metal-tubing bent into a U-shape comprising a transverse stretch 58 interconnecting a pair of substantially parallel arms 60. The step 50 is secured to the rear legs 14 by bolts 62 interconnecting the brace 56 to each of the rear legs 14, and to the front legs 10 by bolts 64 extending through aligned openings formed in the forward ends of the brace arms 60 and the lateral stretches of the step flange 52. Conveniently, to form a more rigid connection between the step 52 and the brace 56, the arms 60 are deformed, as at 66, to bind against the lower face of the step and the flange lip 54, as is shown in FIG. 7.

The upper step 68 is rigidly mounted on the front and rear legs adjacent their inwardly bent portions 18 to dispose the step 68 rearwardly of the step 50, thereby facilitating use of the stool as a ladder. As shown in FIG. 6, the step 68 is in the form of a sheet-metal stamping having a depending peripheral flange 70. At each corner,

the step 68 and the flange 70 are recessed, as at 72, to mate with the inner faces of the legs 10 and 14, and are secured thereto as by bolts 74.

Conveniently, in order to enhance the attractive appearance of the step stool and to provide greater safety therefor, the seat 34 and/or the back rest 20 may be provided with padded coverings 75 and 76, and upper faces of the steps 50 and 68 may be corrugated as illustrated in the drawings.

As shown in FIGS. 1 and 2, my step stool is adapted to be used as a conventional stool, the seat 34 being disposed in a substantially horizontal position parallel with and overlying the steps 50 and 68. To adapt the step stool for use as a ladder, it is merely necessary to raise the seat 34 into a substantially vertical position as shown in dotted lines in FIG. 3. This is accomplished by applying a lifting force to the front edge of the seat to cause said seat to pivot about the seat-supporting rod 38 until the upper face of said seat abuts the forward face of the back rest 20. To releasably lock the seat 34 in this retracted or collapsed position, I provide a downwardly directed offset 78 on the transverse stretches 48 of the seat-supporting rod engageable with the rear stretch of the seat flange 36. As the seat 36 is raised toward its collapsed position, the rear stretch of the seat flange 36 bears against the offset 78, thereby stressing the seat-supporting rod upwardly, as shown in dotted lines in FIG. 4. The inherent resiliency of the rod 38 produces a corresponding downwardly directed biasing force against the rear stretch of the seat flange 36 to releasably hold the seat 34 in its collapsed substantially vertical position. With the seat 34 fully collapsed, it no longer overlies the steps 50 and 68, thereby disposing said steps in operative position.

To move the seat into its operative position in which the step stool is adapted to be used as a conventional stool, the above-described sequence is reversed. That is, the seat 34 is swung downwardly until the lower face of said seat rests upon and is supported by the upper horizontally disposed ends 12 and 16 of the legs 10 and 14.

I claim as my invention:

1. A step stool, comprising pairs of front legs and rear legs, means extending along the lateral edges of said stool interconnecting the upper ends of the front and rear legs at each side of the stool, a plurality of vertically spaced steps fixedly mounted at spaced intervals on said front and rear legs, said front legs being angled rearwardly from their lower ends to a point coplanar with the uppermost of said steps and then angled forwardly to dispose their upper ends forwardly of said uppermost step, a back rest mounted on said rear legs, and a seat pivotally interconnected to the rear legs and swingable between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on said means.

2. A step stool, comprising a pair of front legs connected to a pair of rear legs, said legs being formed of metal-tubing with their upper ends being bent into a substantially horizontal plane and fixedly joined together along the lateral sides of the stool, a back rest, a pair of back supports rigidly connected to said back rest and rear legs, the lower ends of said back supports bearing against the rear faces of said rear legs and the upwardly presented faces of their horizontally disposed upper ends, a plurality of vertically spaced steps fixedly mounted on said front and rear legs, and a seat pivotally interconnected to the rear legs and swingable between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on the substanially horizontally disposed upper ends of the front and rear legs.

3. A step stool, comprising pairs of tubular front legs and rear legs, said rear legs having forwardly extending stretches at their upper ends fixedly connected to the upper ends of said front legs, a plurality of steps fixedly mounted

at spaced intervals on said front and rear legs, a back rest mounted on said rear legs by a pair of tubular back supports having lower ends abutting the rear faces and forwardly extending stretches of said rear legs, a seat-supporting rod mounted on said rear legs and having a pair of rearwardly extending stretches carried on said rear leg stretches and the lower ends of said back supports and interconnected by a transverse rod stretch defining a pivotal axis rearward of the upper ends of said rear legs, said rear leg stretches and the lower ends of said back supports underlying said rod stretches and being deformed to dispose the upper faces of said pair of rod stretches coplanar with the upper ends of said front and rear legs, a seat pivotally mounted on said pivotal axis and swingable between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on the upper ends of the front and rear legs and said pair of rod stretches.

4. A step stool, comprising pairs of front legs and rear legs fixedly connected at their upper ends, a plurality of vertically spaced steps fixedly mounted on said front and rear legs, a back rest mounted on said rear legs, a seat-supporting rod interconnecting said rear legs, a seat having a depending peripheral flange, means on the rear stretch of said peripheral seat flange for pivotally mounting the seat on the seat-supporting rod and permitting said seat to be moved between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on the upper ends of the front and rear legs, said seat-supporting rod having means engageable with the seat during movement of the seat to collapsed position to releasably lock said seat in its collapsed position.

5. A step stool, comprising pairs of front and rear legs fixedly connected at their upper ends along the lateral edges of the stool, said front legs having intermediate stretches offset inwardly from their upper and lower ends, a pair of steps fixedly mounted at vertically spaced intervals on said front and rear legs, the upper of said pair of steps being mounted on the front and rear stool legs in the plane of said intermediate stretches of said front legs to dispose the upper step rearwardly of the lower step and the upper ends of said front legs, a back rest mounted on said rear legs, and a seat pivotally interconnected to the rear legs and swingable between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on the upper ends of the front and rear legs.

6. A step stool, comprising pairs of front legs and rear legs fixedly connected at their upper ends, a plurality of steps fixedly mounted at spaced intervals on said front and rear legs, a back rest mounted on said rear legs, a seat-supporting rod interconnecting said rear legs adjacent their upper ends, and a seat pivotally mounted on said seat-supporting rod, said seat-supporting rod providing a pivotal axis for said seat to the rear of and below the upper ends of the rear legs for swinging movement of said seat between a collapsed position substantially parallel with the back rest and an extended position substantially parallel with the steps in which it is supported on the upper ends of the front and rear legs.

7. A step stool, comprising pairs of front and rear legs fixedly connected at their upper ends, a seat swingably interconnected to said rear legs and swingable to and from an extended position overlying the upper ends of said legs in which it is supported thereon, a plurality of steps fixedly mounted at vertically spaced intervals on said front and rear legs, at least one of said steps comprising a horizontally disposed upper face having a downwardly extending marginal flange, and a U-shaped brace fixedly connected to the rear legs and having a pair of arms extending below said horizontally disposed upper face, said brace arms and downwardly extending flange being fixedly connected to the front legs.

8. A step stool as set forth in claim 7 with the addition that said downwardly extending flange is provided with an inwardly directed lip and said brace arms are bindingly received between said inwardly directed lip and said horizontally disposed upper face.

9. A step stool, comprising pairs of front and rear legs, means extending along the lateral edges of said stool interconnecting the upper ends of the front and rear leg at each side of the stool, a plurality of steps fixedly mounted at vertically spaced intervals on said front and rear legs and interconnecting the same, said front legs being angled rearwardly from their lower ends to a point coplanar with the uppermost of said steps and then angled forwardly to dispose their upper ends forwardly of said uppermost step, a seat-supporting rod connected to said rear legs and providing a transverse pivotal axis, and a seat swingably connected to said rod and swingable about said pivot axis between an extended position overlying the steps in which it is supported on the upper ends of the front and rear legs and a collapsed position in which said seat is disposed in a substantially vertical position rearwardly of said steps and the upper ends of said rear legs..

10. A chair as set forth in claim 3 in which the lower ends of said back supports are provided with upstanding ribs engageable with said pair of rod stretches for retaining said rod in a fixed lateral position on the stool.

11. A step stool, comprising pairs of interconnected front and rear legs, a plurality of steps mounted at vertically spaced intervals on said front and rear legs, said front legs being angled rearwardly from their lower ends to a point coplanar with the uppermost of said steps and then angled forwardly to dispose their upper ends forwardly of said uppermost step, and a seat swingably interconnected to said rear legs for movement between a collapsed position in which it is disposed rearwardly of said steps and an extended position overlying said steps in which it is supported on said front and rear legs.

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