

No. 849,224.

PATENTED APR. 2, 1907.

H. B. FORBES.
STEP LADDER.

APPLICATION FILED AUG. 14, 1906.

2 SHEETS—SHEET 1.

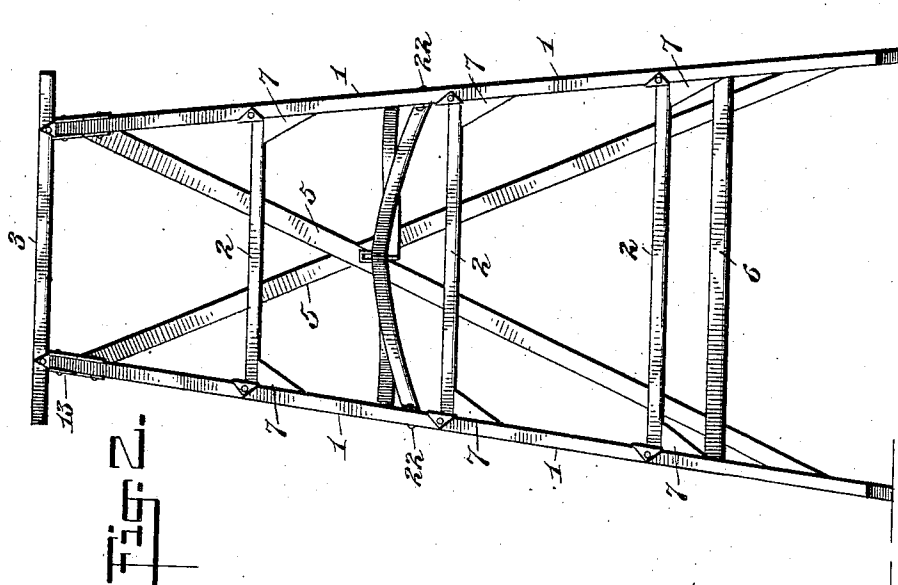


FIG. 2.

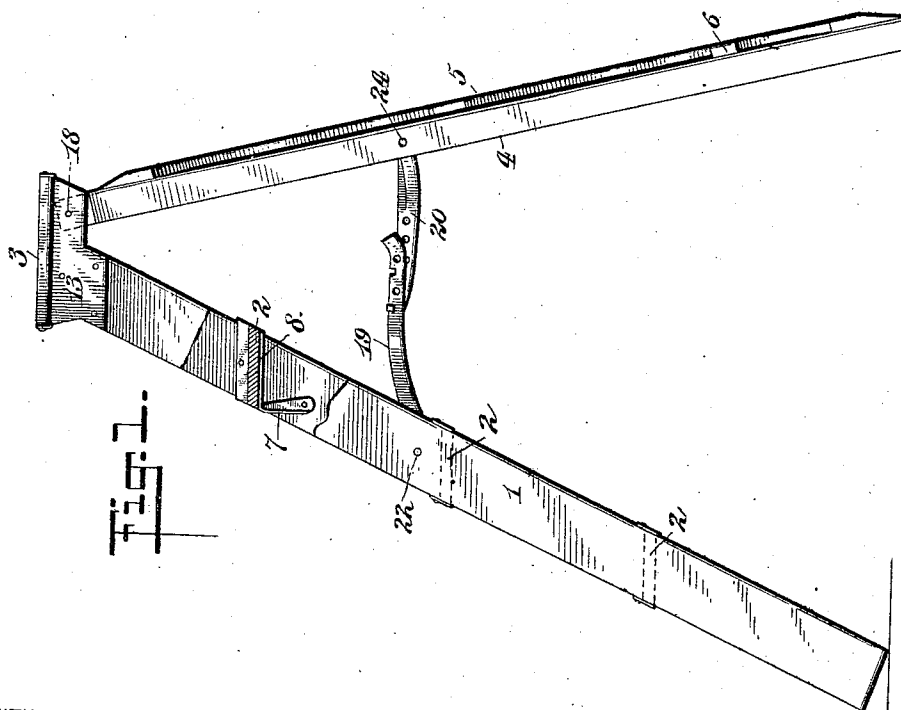


FIG. 1.

WITNESSES

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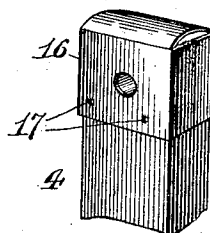
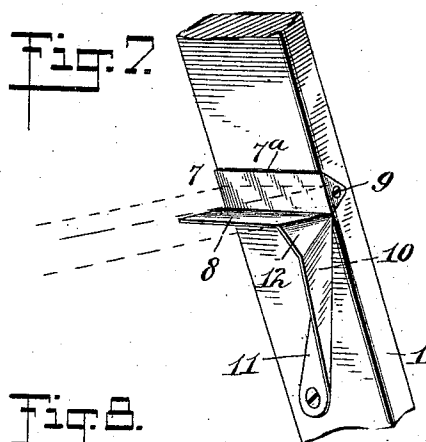
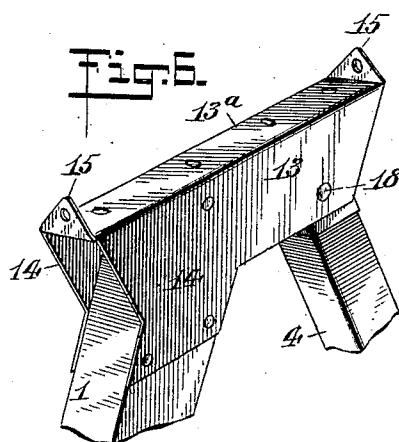
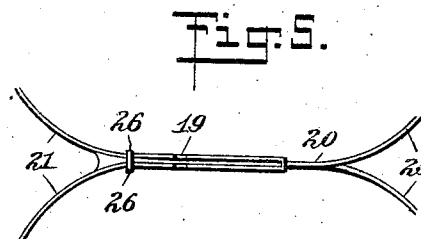
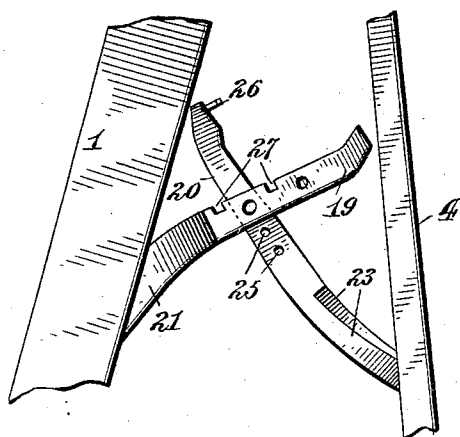
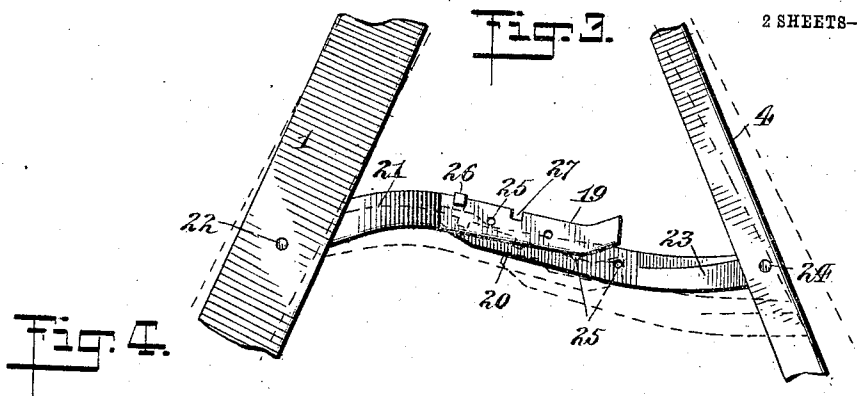
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HORACE B. FORBES, OF OGDEN, UTAH.

STEP-LADDER.

No. 849,224.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed August 14, 1906. Serial No. 330,548.

To all whom it may concern:

Be it known that I, HORACE B. FORBES, a citizen of the United States, and a resident of Ogden, in the county of Weber and State of Utah, have invented a new and Improved Step-Ladder, of which the following is a full, clear, and exact description.

This invention relates to improvements in step-ladders, more especially directed to means for assembling the parts in a strong and durable manner.

With this in view the invention consists of novel sheet-metal brackets forming the union between the ladder-steps and its front legs, combined with a sheet-metal bracket for connecting the upper ends of the legs with the top board, also affording means to which the rear legs of the latter are pivoted. The front and rear legs of the ladder are adjustably connected together by forked metal strips of peculiar formation, adapting the legs of the ladder to be folded together when not in use.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the ladder with one of the legs partly broken away to more clearly disclose the construction of a bracket employed at each end of the ladder-steps. Fig. 2 is a front elevation of the ladder. Fig. 3 is a fragmentary view of the central portion of the ladder, in side elevation, disclosing the means for adjustably connecting the rear and front legs. Fig. 4 is a view similar to Fig. 3, but with the legs of the ladder separated to a lesser extent. Fig. 5 is a plan view of the means for adjustably connecting the legs of the ladder together. Fig. 6 is a perspective view of a bracket employed in connecting the upper ends of the ladder-legs to the top board, the upper ends of said legs being shown in position in the bracket. Fig. 7 is a perspective view of a portion of one of the front ladder-legs with a bracket secured thereon as employed in connecting the front legs with the steps; and Fig. 8 is a perspective view of the upper end of one of the rear ladder-legs, showing a sheet-metal socket as employed to cover the same.

In carrying out the invention I employ struts or posts 1 1, forming the front legs of the ladder, which are braced by steps 2, transversely extending between the legs, and

a top board 3, connected to the legs at their upper ends. Struts 4 4, forming the rear legs of the ladder, are braced by diagonal strips 5 and transverse strips 6, connecting them together, the rear legs being in pivotal connection with the front legs of the ladder, as is usual in step-ladder construction.

For connecting the end of each step of the ladder to the front legs 1 I employ a sheet-metal bracket 7, (best shown in perspective in Fig. 7,) comprising members 7^a and 8, bent at right angles to each other, the member 7^a being provided with extended ears 9, bent in the same direction to embrace and be secured to the edges of the leg. The projecting portion 8 of this bracket is formed with an extended portion at one end which is bent downwardly at substantially right angles to the member 8, forming a brace 10, and is provided with a portion 11, bent inwardly to lie flat against the inner face of the leg. For fastening this bracket on the inner face of the leg screw-nails or other devices are employed, which are passed through the ears 9 and at the end of the inwardly-turned portion 11 of the brace 10, as illustrated in Fig. 7. After a suitable number of these brackets have been fastened to the inner face of each leg, corresponding in number to the number of steps desired, the steps 2 are nailed or otherwise secured to the projecting portions 8. It should be noted that the angle formed between the projecting portion 8 and the brace 10 is slightly flattened, as at 12, in order to throw the braces inwardly toward the inner face of the ladder-leg, and thus adapting the portion 11 to lie flat against said inner face.

For securing the top board 3 to the upper ends of the legs 1 and also providing means to which the rear legs 4 are pivotally connected I employ a bracket 13, best shown in perspective in Fig. 6 and comprising a top or central portion 13^a and downwardly-turned sides 14, to embrace the legs 1 at opposite sides and be secured thereto by nails or other devices, as illustrated in said figure. The top of the bracket is extended at each end to provide upwardly-turned ears 15, which when the bracket is connected to the top board 3, embraces the board at opposite edges and is secured thereto by nails or other devices passing through the apertures shown.

Each of the rear legs 4 of the ladder are inclosed at their upper ends by a metal cap or socket 16, (shown in Fig. 8,) said cap being made of sheet metal and bent to inclose

these ends of the legs, as illustrated. Each side of the cap 16 is indented with protuberances 17, which prevent the cap from working loose when they are inserted between the sides 14 of the bracket 13 and drawn together by a bolt 18, pivotally connecting the bracket and cap with the leg 4 contained therein. These caps 16 prevent undue wearing of the upper ends of the legs 4, as also the holes through which the bolts 18 are passed.

For adjustably connecting the front and rear legs of the ladder together I employ a sheet-metal member 19, which is bent upon itself at its center to form an intermediate slot, through which a sheet-metal member 20 is adapted to pass. The sheet-metal member 19 is constructed with divergent ends 21, forming a fork, the outer ends of which are pivotally connected to the front legs by pins 22 or rivets 22. The sheet-metal member 20 is split longitudinally to form a fork comprising members 23, which are divergently bent and pivotally connected by rivets or pins 24 to the legs 4, the members 23 being sprung in order that the pivot-pins may be in alignment.

Each of the members 19 and 20 are provided with a series of holes 25, which are adapted to be brought into alignment and a bolt or pin pass therethrough, thereby holding the front or rear legs of the ladder from folding together, which is desirable for use by paper-hangers or for other special purposes.

The member 20 carries at its end prongs 26, extending over the member 19 and cooperating with slots or notches 27 therein for holding the legs of the ladder in adjusted position. As shown, the outer end of the member 19 is slightly upturned in order that the member 20 can freely pass under it and into the slot adjacent thereto.

Although I have particularly described the invention in detail, it is to be understood that the precise embodiment is not material, provided it is within the scope of the annexed claims.

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

1. A step-ladder comprising two sets of legs pivotally connected together, means for adjustably bracing the legs, consisting of a sheet-metal member bent to form a slot with

the ends thereof divergently bent and pivotally connected to one pair of the legs, a second sheet-metal member passing through the slot in the first and longitudinally split forming members divergently bent and pivotally connected to the second set of legs, and locking means carried by the adjacent ends of each member.

2. In a step-ladder, legs, steps, sheet-metal brackets secured to the legs and connecting them with the steps, each bracket comprising a portion to lie flat against the inner face of a leg, and a second portion bent at substantially right angles to the first to lie flat against the under face of a step, said second portion having an extended end bent downwardly, forming a brace, the latter lying in a plane substantially at right angles to both of said first and second portions, part of said extended end being bent to lie in a plane with said first portion.

3. In a step-ladder, legs, steps, sheet-metal brackets secured to the legs and connecting them with the steps, each bracket comprising a portion to lie flat against the inner face of a leg with ears bent to embrace the edges thereof, and a second portion bent at substantially right angles to the first to lie flat against the under face of a step, said second portion having an extended end bent downwardly, forming a brace, the latter lying in a plane substantially at right angles to both of said first and second portions, part of said extended end being bent to lie in a plane with said first portion, for the purpose described.

4. In a step-ladder, legs, steps secured to the legs rigidly connecting them together, sheet-metal brackets bent in inverted-U shape to embrace the upper ends of the legs at both sides, upwardly-extending ears formed integral with the top of said brackets at each end thereof, a top board secured between said ears, and rear legs having their upper ends pivoted to and inclosed by said brackets.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE B. FORBES.

Witnesses:

ABBOT MAGINNIS,
JAMES N. KIRKBALL.