(No Model.) 2 Sheets—Sheet 1.

J. N. VALLEY.

STEP LADDER.

No. 279,893. Patented June 19, 1883.

Fig 4.

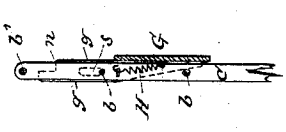


Fig 5.



Fig 2.

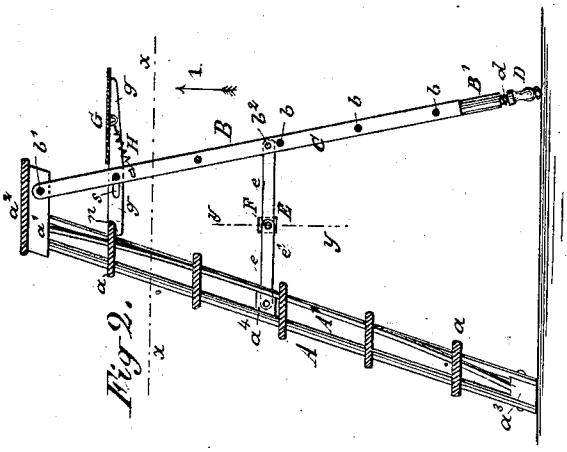


Fig 3.

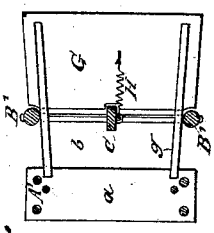
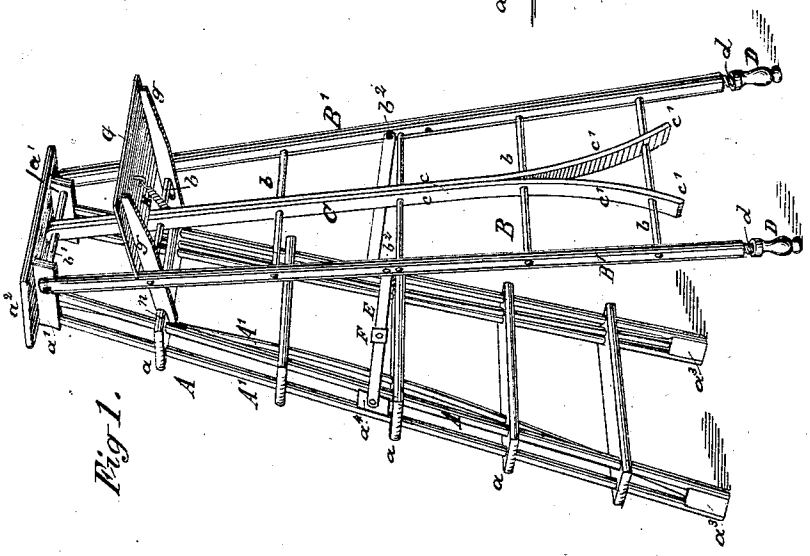


Fig 1.



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(No Model.) 2 Sheets—Sheet 2.

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STEP LADDER.

No. 279,893. Patented June 19, 1883.

Fig 6.

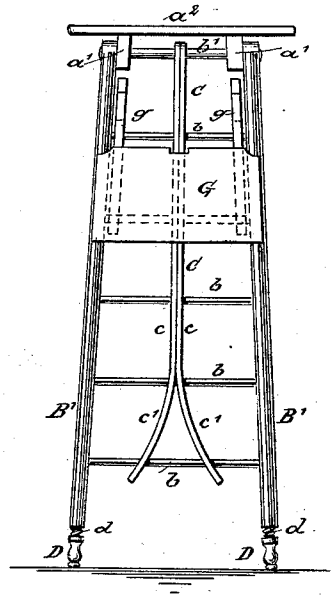


Fig 7.

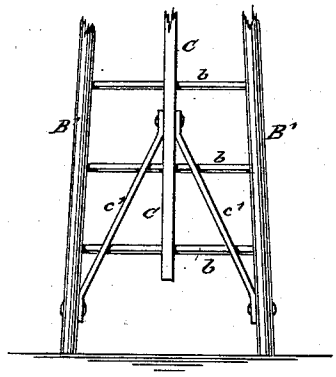


Fig 8.

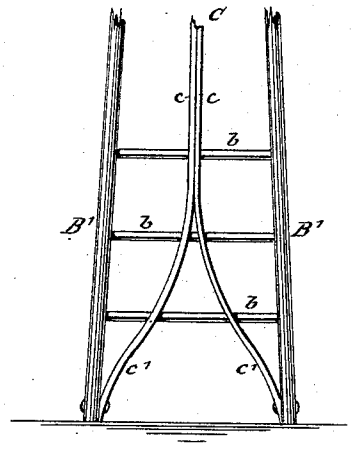
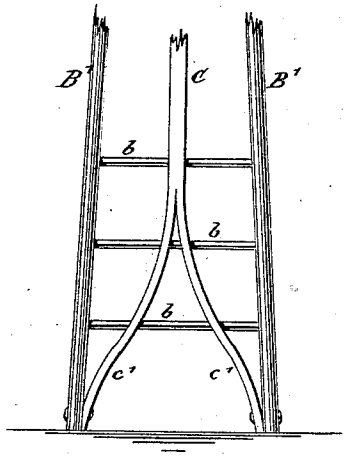


Fig 9.



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UNITED STATES PATENT OFFICE.

JOHN N. VALLEY, OF JERSEY CITY, NEW JERSEY.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 279,893, dated June 19, 1883.

Application filed April 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. VALLEY, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Step-Ladders, of which the following is a specification.

My invention relates to step-ladders generally, but more especially to folding ladders and such as are provided with an extra shelf whereon to place water-pails or paint-cans, &c., so as to keep them readily within reach without impeding the free use of the steps and top shelf of the ladder to stand on when washing or painting walls or windows, &c.

The invention comprises the construction and combination of improved devices for giving steadiness to the pail-shelf in either position of folded or of being adjusted for use; strength and rigidity to the back of the ladder; increased facility and security of folding the ladder and of bracing it when unfolded; and for supporting a step-ladder evenly upon its four feet notwithstanding inequalities in the surface on which it may stand, as will be hereinafter described and claimed.

In the accompanying two sheets of drawings, Figure 1 represents a perspective view of my improved step-ladder. Fig. 2 is a vertical section of the same. Fig. 3 is an under side view of the pail-shelf in position for use, the view being seen in the direction of the arrow 1 from about the horizontal section-line *x x* of Fig. 2. Fig. 4 is a sectional detail view, seen as in Fig. 2, of the pail-shelf when folded. Fig. 5 is a detail section, on *y y* of Fig. 2, of the side-brace knuckle. Fig. 6 is a rear view of the ladder when folded. Figs. 7, 8, and 9 are detail rear views, showing modifications of the back brace.

A designates the front or step ladder proper, composed of the steps *a*, the round bars A′, connecting the steps by passing through and being fastened in holes through the ends of the steps, the cleats *a′*, bored to receive and secured upon the upper ends of the rods A′, the top shelf, step, or board, a^3, securing together the lower ends of the rods A′ at either side, and a block, a^4, secured higher up at either side of the ladder, between the two parallel rods A′, to which blocks the forward ends of the folding braces are pivoted, all in a manner hitherto known.

The back ladder, B, which is hinged at its upper end upon a round, *b′*, passing through and between the rear ends of the cleats *a′*, consists of round legs B′, connected by cross-rounds *b* (so that it also may be used to climb and stand, on like a ladder) and a central strengthening-brace, C, which latter is one of the points of the present improvements, and is pivoted with its upper end upon the round *b′* midway between the cleats *a′* on the legs B′, and thence extends down to or nearly to the foot of the back B, all the rounds passing through holes in the said brace C. The lower ends of the legs B′ are provided with threaded axial sockets, into which are screwed the threaded shanks *d* of knobs or other conveniently turnable pieces D, by which and the said threaded sockets the legs B′ may be lengthened or shortened, as the case may require, to evenly support the folding ladder upon its four feet, in a manner similar to leveling billiard-tables.

The brace C, I make preferably of two separate slats, *c*, put together as shown in Figs. 1, 6, and 8, the lower end of the brace being forked by diverging the lower ends, *c′*, of the slats *c;* but the brace C may be made in one piece and its lower end split to form the fork *c′ c′*, as in Fig. 9; or the brace may be made to extend straight and solid to and below the lowest cross-round *b*, and the fork *c′ c′* may be made of separate pieces bored and fitted upon the lower rounds *b*, said pieces being secured with their lower ends to the inner sides of the legs B′, as shown in Fig. 7. This last modification makes a very strong construction, equally applicable whether or not the extension-pieces D are used. Otherwise, when the legs are made extensible, the fork ends *c′* are cut off beneath the lowest round *b*, as in Figs. 1 and 6; and, when the screw-pieces D are dispensed with, the lowest end of the fork *c′ c′* is secured to the inside of the lower ends of the legs B′, as in Figs. 8 and 9. Each of the folding side braces, E, (by which the front and back A and B are held at a proper angle to each other for supporting the ladder when unfolded in position for use,) is made of two flat bars or links, *e*, pivoted together at one end, at *e′*, to and between the two vertical sides *f* of

an angular knuckle or bail-shaped plate, F, whose top or horizontal side, f', by contact with the upper edges of the links c at their pivot e', locks the folding brace E in its horizontal position until again raised for the purpose of folding the ladder. The brace E is pivoted with one of its ends to the block a^4 of the front A, and with the other end, at b^2, to the legs B', as shown in Figs. 1 and 2.

G is the pail-shelf, being secured upon two bracket-arms, g, which are pivoted, by means of slots s, upon the uppermost round b of the back B, and are notched or rabbeted upon their free ends at n, so as to engage at the rear edge the under side of the opposite uppermost step a of the ladder A when the shelf is placed horizontal and in position for use, as shown in Figs. 1, 2, and 3. The slots s are sufficiently longer than the lower projection of the arms g, formed by the rabbets or notches n, to allow of drawing back the arms clear of the rear edge of the step a, and (by swinging them on their pivoting-round b) fold the shelf G, when not in use, down upon the back B, as shown in Figs. 4 and 6. In order to keep the shelf steady in either position, so that it may not be accidentally raised or slipped backward from contact between the arms g and the step a when in position for use, nor hang loosely and rattling with the carrying and moving of the ladder when folded, I have provided a spiral spring, H, fastened with one end to the side of the central brace, C, a little distance below the horizontal position of the shelf, thereby giving the spring H a tendency to pull the shelf toward the pivoting-round b and downward toward its folding position upon the back B at the same time. The spring H may be attached to the pivoting-round b, instead of to the brace C. In either case it will serve its aforesaid objects.

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

1. The spring H, in combination with the folding shelf G and back B of a step-ladder, substantially as and for the purpose set forth.

2. In a step-ladder, the back B, formed of the combination of the legs B', the central brace, C, pivoted with its upper end in line with the leg-pivots, and the horizontal rounds b, passing through the said brace and into the said legs simultaneously, substantially as and for the purpose set forth.

3. In combination with the legs B' and rounds b of a step-ladder back, B, the central brace, C, made of one or more slats, and having diverging side braces, c', at its lower end, as set forth, the said legs connecting rounds b, passing also through the said braces C c', substantially as specified.

4. In combination with the front A and back B of a step-ladder, the folding brace E, consisting of the knuckle F, having a horizontal stop-flange, f', and vertical flanges f, and the links e, pivoted with one end to the said flanges f, substantially as and for the purpose set forth.

5. In combination with the front A of a step-ladder, the back B, having threaded sockets in one or both of its legs B', and extension-pieces D d, screwed into the said sockets, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of March, 1883.

JOHN N. VALLEY.

Witnesses:
ROBT. W. MATTHEWS,
EDUARD ARFELT.