J. J. STEPHAN.

Step-Ladder.

No. 167,037. Patented Aug. 24, 1875.

Fig. 1.

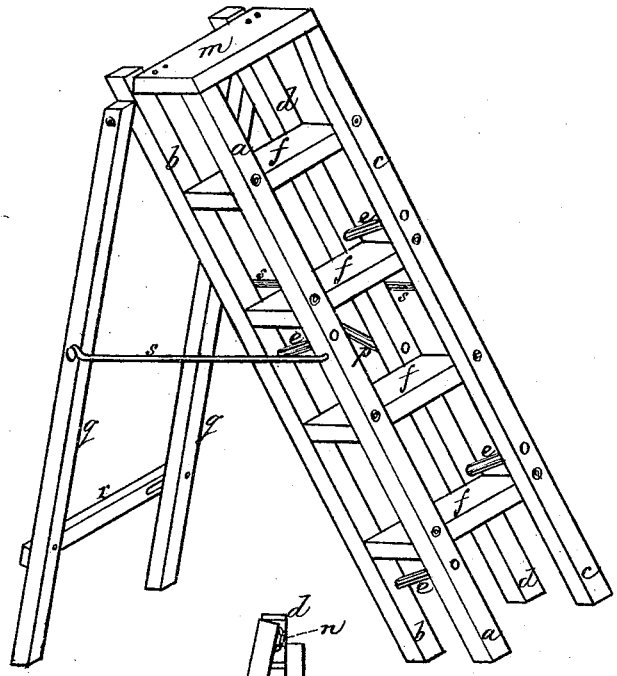
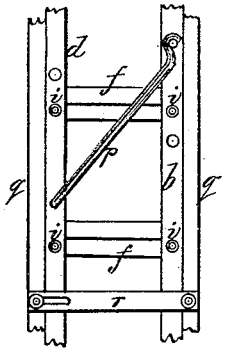


Fig. 4.



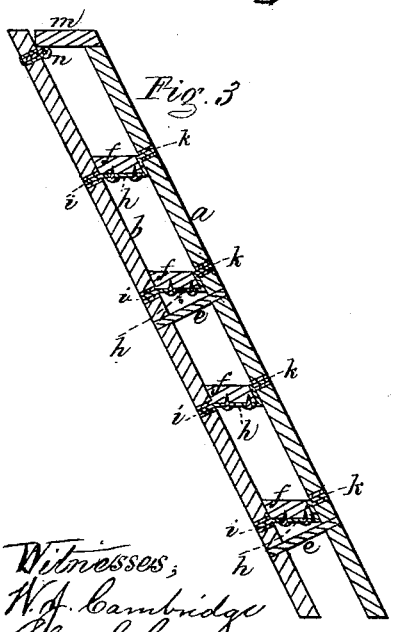


Fig. 3

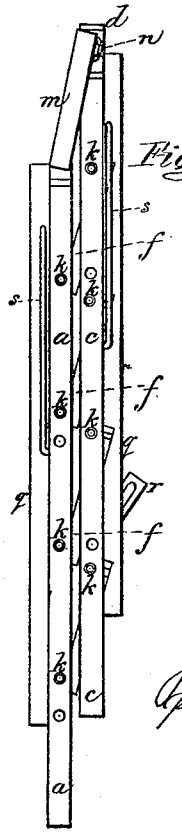


Fig. 2.

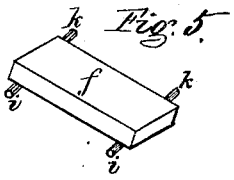


Fig. 5.

Witnesses,
W. J. Cambridge
Chas. E. Griffin

Inventor,
John J. Stephan
per Deschemacker & Stearns
Attys

UNITED STATES PATENT OFFICE.

JOHN J. STEPHAN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN STEP-LADDERS.

Specification forming part of Letters Patent No. **167,037**, dated August 24, 1875; application filed July 29, 1875.

To all whom it may concern:

Be it known that I, JOHN J. STEPHAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Step-Ladders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of a step-ladder constructed in accordance with my invention. Fig. 2 is a front elevation of the same folded up. Fig. 3 is a vertical section through a portion of the same. Fig. 4 is a rear elevation of a portion of the same. Fig. 5 is a perspective view of one of the steps detached.

My invention consists in a step-ladder in which the steps are so pivoted and arranged between parallel strips as to admit of the ladder being compactly folded up when not required for use, in order to facilitate its transportation from place to place.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, *a b c d* represent four wooden strips, which form the sides of the step-ladder, each pair of strips being firmly secured together at the desired distance apart by short bars or braces *e*. *f* are the steps, which are arranged between the side strips and pivoted thereto, as seen in Fig. 3, so as to admit of the ladder being folded compactly together, as seen in Fig. 2. These steps have secured at each end, on the under side, a bar, *h*, one end of which extends out, forming a pivot, *i*, while the other end is bent up around the front side of the step and extends out, forming a pivot, *k*, the position of these pivots being such that a straight line passing longitudinally through both will be at right angles to the direction of the length of the adjacent side strips, which construction insures the two opposite sides of the ladder being folded squarely and flatly together, which would not be the case if the steps were pivoted on a line parallel with the tread or upper surface. The upper or broad step *m* is secured to the rear strips *b d* only, by means of hinges *n*, the front of the step resting on the top of the strips *a c*, and one portion of each of the hinges *n* is elongated and passes through a bushing in the wooden strip to which it is secured, turning freely therein to allow of the upper step being canted when the sides of the ladder are brought together. Each of the step-pivots *i k* fits into a metal bushing, which prevents the wearing away of the surrounding wood.

Instead of the braces *e*, suitable wooden blocks may be used for holding the side strips together, and these braces should be arranged alternately on opposite sides above and below each step.

When the ladder is unfolded, as seen in Fig. 1, the two sides are held rigidly apart and stiffened and strengthened by a brace, *p*, pivoted at one end to the strip *d*, and provided at its opposite end with a hook, which fits over a pin projecting from the strip *b*; but any other suitable device may be employed for this purpose.

The support for the step-ladder, when in use, consists, as usual, of two strips of wood, *q*, pivoted at their upper ends to the sides of the ladder, these strips being secured together near their lower ends by a cross-brace, *r*, which is pivoted and provided with a slot at one end to allow of the movement of the strips *q* when the latter are brought up against the sides of the strips *b d*, and the steps are folded, as seen in Fig. 2.

Instead of pivoting the strips *q* to the outer sides of the strips *b d*, they may be hinged to their rear sides, which will reduce the width of the step-ladder when folded up.

The support *q q* is held firmly in the desired position, when the ladder is in use, by ordinary hook-braces *s*; any other description of brace may, however, be used.

A step-ladder constructed as above described is extremely convenient, as it can be compactly folded, so as to facilitate its transportation from place to place, and, when folded, can be conveniently stowed away, on account of the small space which it occupies.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A folding step-ladder in which the ends of the steps are pivoted between parallel strips *a b c d*, forming the sides of the ladder, substantially as and for the purpose described.

2. The steps *f*, pivoted at each end on a line

at right angles to the direction of the length of the sides of the ladder, substantially as and for the purpose set forth.

3. In combination with the strips *a b c d*, the upper stem *m*, secured to the strips *b d* by pivoted hinges, substantially as and for the purpose described.

Witness my hand this 24th day of July, A. D. 1875.

JOHN J. STEPHAN.

In presence of—
P. E. TESCHEMACHER,
W. J. CAMBRIDGE.