(No Model.)

T. F. GROVES.

STEP LADDER.

No. 475,857. Patented May 31, 1892.

Fig. 1.

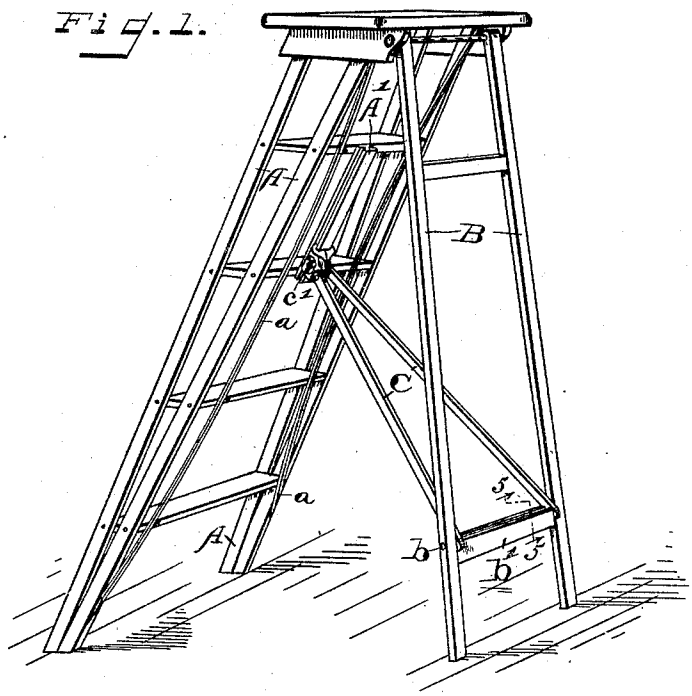


Fig. 2.

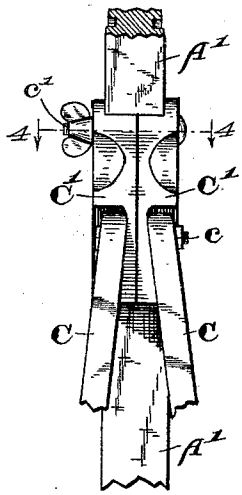


Fig. 3.

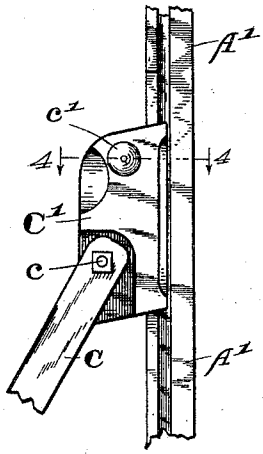


Fig. 4.

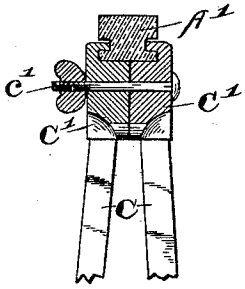
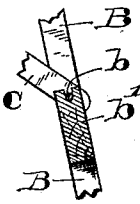


Fig. 5.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS FRED GROVES, OF KOKOMO, INDIANA, ASSIGNOR OF ONE-HALF TO SYLVANUS A. GARDNER, OF SAME PLACE.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 475,857, dated May 31, 1892.

Application filed January 9, 1892. Serial No. 417,571. (No model.)

To all whom it may concern:

Be it known that I, THOMAS FRED GROVES, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented certain new and useful Improvements in Step-Ladders, of which the following is a specification.

My said invention consists in various improvements in the details of construction of step-ladders, whereby such a ladder is provided of great strength and durability, and one which can be conveniently and securely adjusted to position for use, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view of a step-ladder embodying my said invention; Fig. 2, a detail rear view of a portion of the guide and clamp for attaching the brace thereto; Fig. 3, a side elevation of the same; Fig. 4, a horizontal section looking in the direction indicated by the arrows from the dotted line 4 4 in Fig 3, and Fig. 5 a detail view looking in the direction indicated by the arrows from the dotted line 5 5 in Fig. 1.

In said drawings the portions marked A represent the ladder proper, B the hinged legs or frame for supporting the same, and C the brace by which the legs are held in the desired position relative to the main portion of the ladder. The ladder A is in the main of substantially a well-known construction, consisting of steps supported by suitable side pieces properly secured and braced by curved braces *a* on the rear thereof. Secured to the steps at the proper point is a vertical guide A′, having grooved sides. The legs B are also in the main of a substantially common construction, being hinged at the top to the rear corner of the main portion of the ladder by a rod or other appropriate hinge, and thus adapted to support said ladder in position for use when desired or be folded up out of the way when not in use. The brace C consists of two rods or strips hinged at one end to each side of the frame formed by the legs B and connecting cross-pieces, the hinge consisting of a rod *b*, embedded in a longitudinal groove in the top edge of the lower cross-piece *b′* of said legs, notches being cut in said cross-piece to receive the ends of said brace-rods, and said rod *b* extending entirely through from the outside of one leg to the outside of the other, thus binding and securing the structure firmly together. On the opposite end of each rod composing said brace is formed or secured a metal clip C′, having inwardly-turned lips adapted to engage with the grooves formed in the sides of the guide A′, a single bolt *c* preferably sufficing for securing the several parts together, and a clamping-bolt *c′*, with a thumb-nut, being provided for tightening said clips upon said guide to hold the legs B in any position desired. This construction, while being simple, is at the same time of great strength, as well as convenient for operation. The ladder being in the position shown in Fig. 1, and it being desired to close the same, the thumb-nut upon the end of the bolt *c′* is loosened, which permits the clip C′ to slide freely in the grooves in the guide and allow the legs to be closed up, when by tightening said thumb-nut they are held in closed position, and the structure thus rendered more convenient and secure for carrying or shipping. In use the legs are adjusted to the desired position and can be secured, so that there will be no danger of slipping, thus rendering the ladder a safe and desirable one to use.

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

1. The combination of the main or ladder portion having the way or guide A′ secured thereto, the legs B, hinged thereto, and a brace C, having the clips C′ engaging with said guide A′, and a clamping bolt or screw for securing said clips at the desired position on said guide, substantially as set forth.

2. In a step-ladder, the combination of the main portion, the legs hinged thereto, and a brace adjustably secured to the ladder portion at one end and hinged to said legs at the other end by means of the rod *b*, passing through said leg structure and embedded in the upper edge of a cross-bar in which notches are cut to receive the ends of said brace, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 30th day of December, A. D. 1891.

T. FRED GROVES. [L. S.]

Witnesses:
E. W. BRADFORD,
J. A. WALSH.