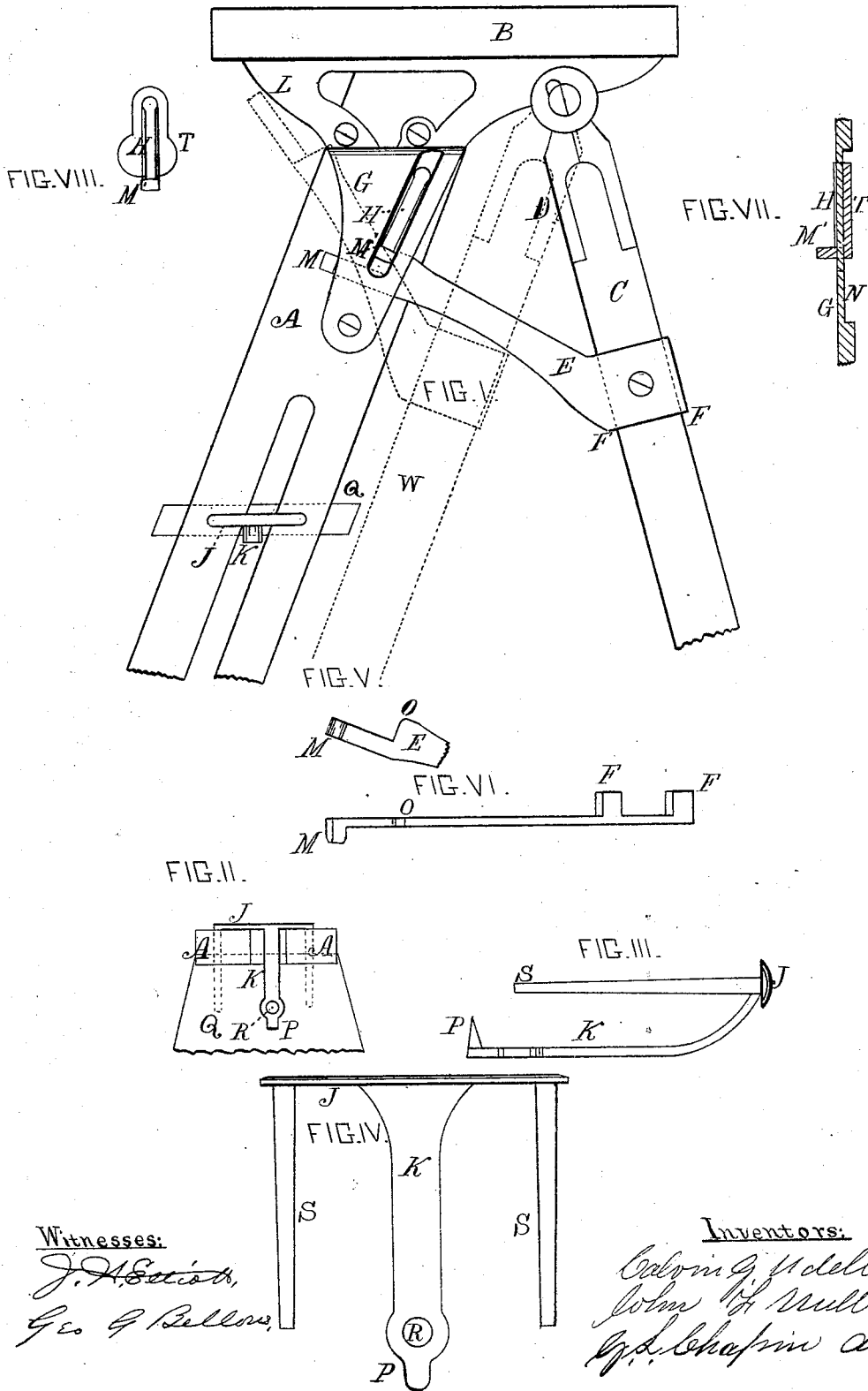


C. G. UDELL & J. F. NULL.  
Step-Ladders.

No. 152,023.

Patented June 16, 1874.



Witnesses:

J. A. Elliott,  
Geo. G. Bellows,

Inventors:

Calvin G. Udell and  
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# UNITED STATES PATENT OFFICE

CALVIN G. UDELL, OF CHICAGO, ILL., AND JOHN F. NULL, OF PHILADELPHIA, PA.; SAID NULL ASSIGNOR TO SAID UDELL.

## IMPROVEMENT IN STEP-LADDERS.

Specification forming part of Letters Patent No. **152,023**, dated June 16, 1874; application filed May 18, 1874.

*To all whom it may concern:*

Be it known that we, CALVIN G. UDELL, of Chicago, Illinois, and JOHN F. NULL, of Philadelphia, State of Pennsylvania, have invented an Improvement in Step-Ladders, of which the following is a specification:

The first part of our invention consists in combining the braces which hold the bracing-frame in position with the bracket to which the bracing-frame is pivoted or attached, said braces being pivoted to the bracing-frame and sliding through the brackets when the adjustment is being made. By this means the bracket performs an additional function of supporting the brace, while at the same time the lock is very firm and simple, and can be made at small cost, and in operation will not project in front of the steps, so as to be in the way. The second part of our invention consists in the novel construction of combined nail-fastener and clamp for securing the stiles to the steps, as the whole is hereinafter fully described and shown.

In the drawing, Figure 1 is an elevation of the top part of a step-ladder patented by Calvin G. Udell, June 8, 1869; and Fig. 2, an inverted, broken, horizontal section through one of the stiles below the step, showing the position of the fastener; Fig. 3, an enlarged side elevation of the fastener; Fig. 4, an enlarged plan view of the fastener; Fig. 5, a broken elevation of the brace for holding the bracing-frame in a fixed position; Fig. 6, a top or plan view of the brace; Fig. 7, a broken section of the plate which holds the brace to the stile, and a section of the catch; Fig. 8, a front elevation of the catch removed from the face-plate.

A represents the stile; B, the step; C, the bracing-frame, and G the bracket, constructed substantially according to the within first-named patent, the joint or hinge D being constructed as shown in the patent issued to C. G. Udell, October 1, 1872. E represents a metal brace, which is rigidly attached to the bracing-frame C by a screw or other suitable means, and in this case flanges F project out from the brace, as shown in Fig. 6, to lock onto the front and back side of said frame.

The opposite end of the brace is provided with a notch, O, Figs. 1 and 5, to lock against a sliding catch, H, Figs. 1, 7, and 8, and on its extreme end is a nib or projection, M, by means of which the bracing-frame is prevented from swinging back too far. The bracket G is recessed out on its back side, as shown in Fig. 7, in order that the notched end O of the brace E may pass between it and the stile A; and said bracket is also provided with a slot, in which a latch, H, slides, the back part of the latch being provided with a wide flange, T, that it may be held in place and not turn by the pressure of the brace E. The bracing-frame C is shown set out from the stiles A, as when in use.

To close the frame, the sliding catch H is raised up by a projecting nib, M', the moving of which allows the brace E to slide through the bracket G, and the bracing-frame C to shut against the step Q of the ladder, as shown by dotted lines W. In the present construction, the brace E runs under the lower ends of the bracket G, but it may run under a separate plate attached to the stile, and operate just as well; but the cost of manufacture in such a case will be somewhat increased.

By a practical test, it is found that a bracing-frame thus held is much more convenient than when a rope or cord is used, inasmuch as the ladder as a whole can be moved from place to place, and at the same time retain a position for use. When a cord is used to hold the bracing-frame, the latter changes its position relative to the stiles every time the ladder is moved; consequently the frame has to be re-adjusted. Our invention is to obviate this objection. The steps Q are held to the stiles A by means as follows: A bar, J, has cast solid to it nails S S and a clamp or anchor, K. The nails are driven through the stiles A into the steps, and the anchor K passes under the steps, and the spur P on its end is driven into the step, and a nail or screw is put through the hole R into the step, thus uniting the steps firmly with the stiles. The parts J K S P are made of a single piece of casting, the metal used being generally malleable iron. The means now used to fasten the steps consist of

nails or screws; but as they have to be driven into the steps lengthwise of the grain, they do not hold so well nor make so strong a ladder as when the present fastening is used.

Only one side of a ladder is shown; but in practice each side of the ladder is to be provided with a brace, E, and both ends of the steps are to be fastened by the nails and anchors, right and left hand fastenings being made for that purpose.

We do not claim the supporting the bracing-frame by a rack or brace irrespective of the construction and arrangement of the bracket, as a rack has been before used.

We claim and desire to secure by Letters Patent—

1. The bar J, nails S, and anchor K, cast in one piece, and combined with the steps Q and stiles A of a ladder, substantially as and for the purpose set forth.

2. The braces E, attached to the bracing-frame C, and arranged to slide under the bracket-plate G, when combined with a step-ladder, and arranged to be locked by a sliding catch, H, substantially as and for the purpose set forth.

CALVIN G. UDELL.  
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Witnesses:

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