

(No Model.)

DON CARLOS SMART.  
STEP LADDER.

No. 314,267.

Patented Mar. 24, 1885.

Fig. 1.

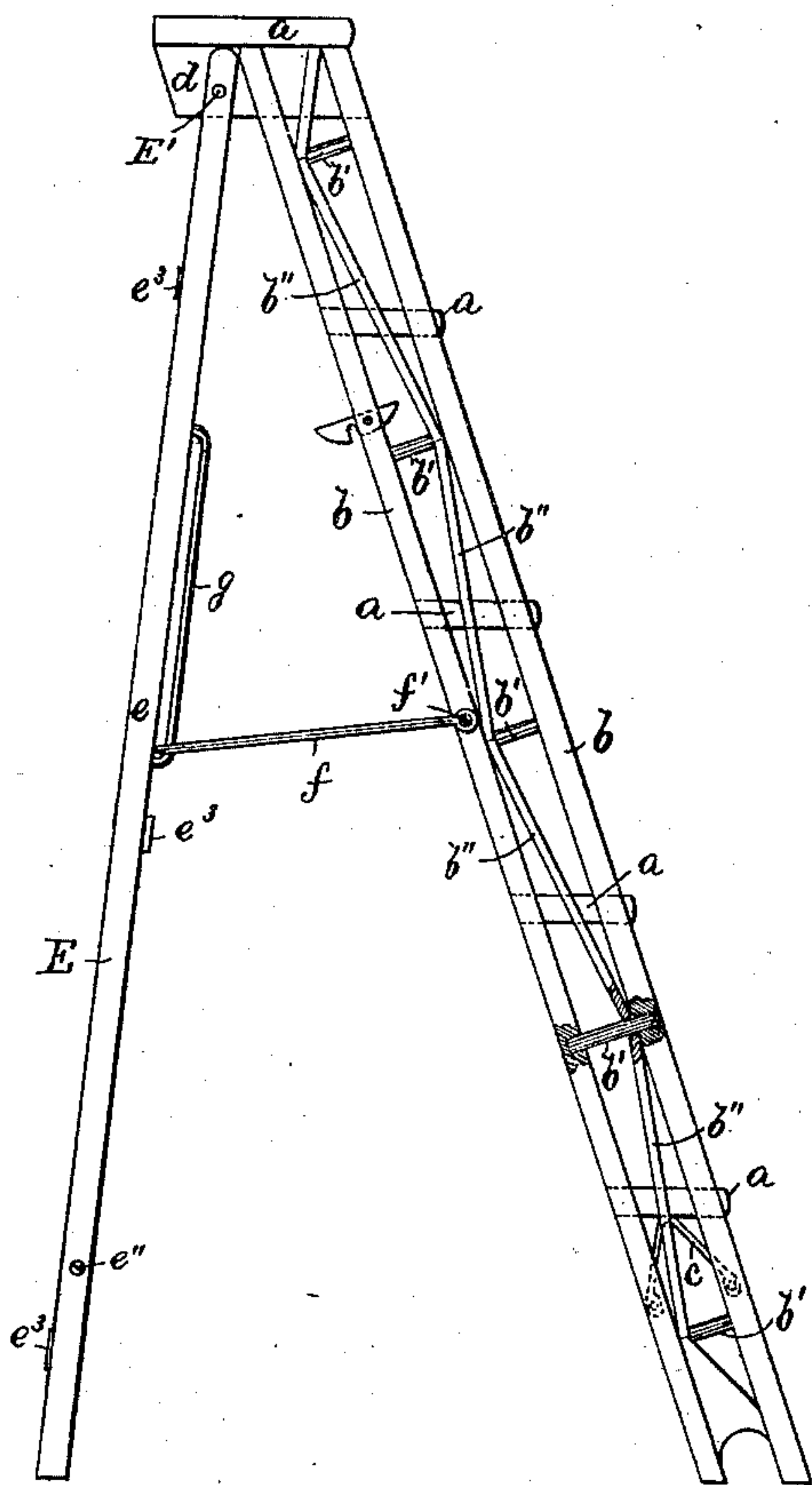


Fig. 2.

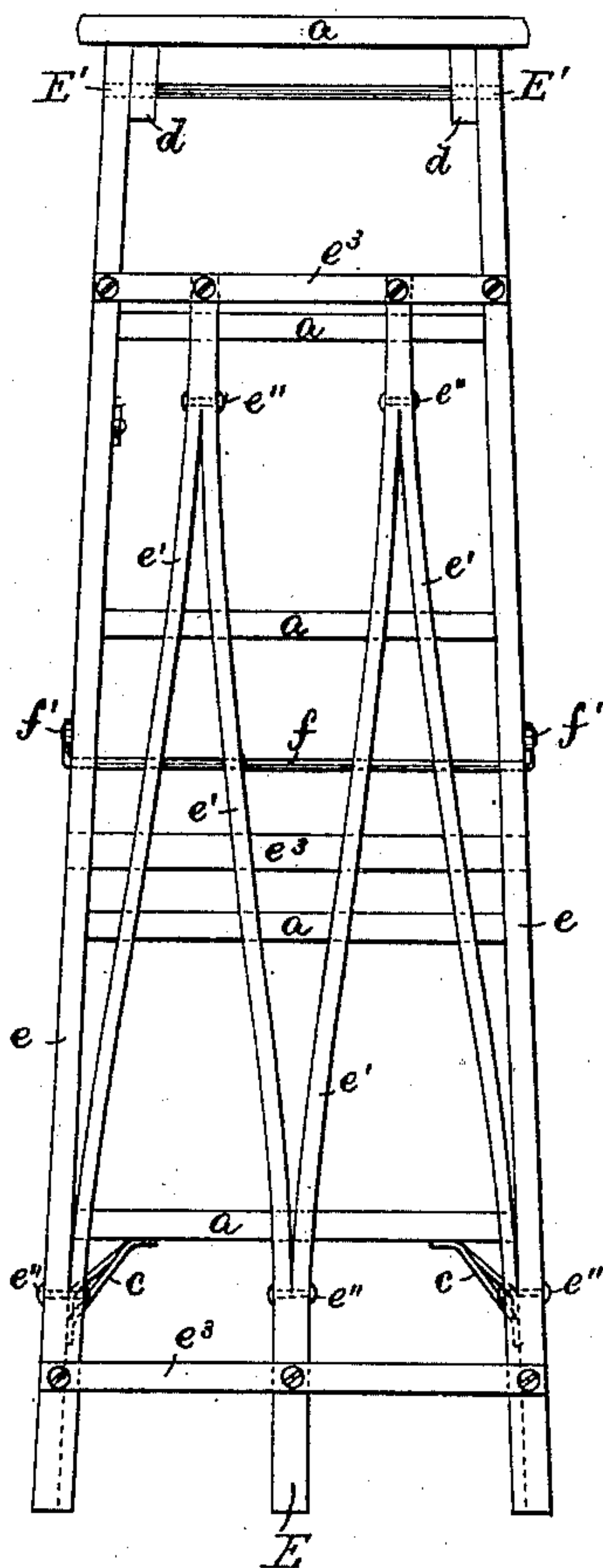
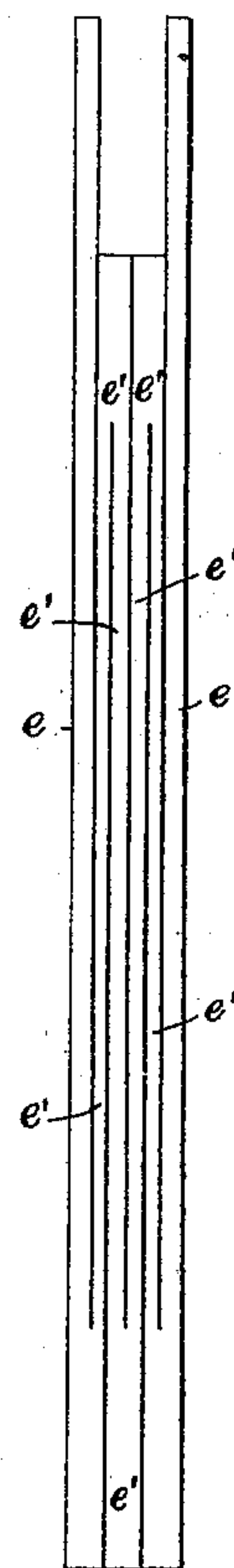


Fig. 3.



Witnesses.

Henry Chadbourne.  
Sarah M. Goddick

Inventor.

Don Carlos Smart.

# UNITED STATES PATENT OFFICE.

DON CARLOS SMART, OF CAMBRIDGEPORT, MASSACHUSETTS.

## STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 314,267, dated March 24, 1885.

Application filed August 19, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, DON CARLOS SMART, a citizen of the United States, residing at Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Step-Ladders; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements in step-ladders; and it consists in making the sides of the ladder of two strips of wood, that are joined together by stays and diagonal braces, which form a truss and make the ladder very light and strong.

My invention also consists of the peculiar construction of the standard, which is formed from a piece of wood split from one end and then from the other alternately and sufficiently to allow the outside pieces that are nearly split from the rest to be spread so as to form the sides of the standard, and the inner pieces to be spread so as to form the braces. These pieces are riveted to keep them from splitting entirely off, and are secured in their spread position by means of horizontal braces, as will be more fully shown by reference to the accompanying drawings, on which—

Figure 1 represents a side elevation of the step-ladder in an open position and ready for use. Fig. 2 represents a rear view of the same, and Fig. 3 represents a detail view of the piece of wood from which the standard of the ladder is made, showing it split ready to be spread.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

*a a a* represent the steps of the ladder, which are doweled or otherwise attached to the sides of the ladder in any of the usual manners. The sides of the ladder are each made of two strips, *b b*, joined together by means of the stays *b' b'*, which are glued or otherwise secured in suitable mortises in the strips *b b*, said stays being at right angles to the strips *b b*, and forming rectangular openings in the sides of the ladder.

*b'' b''* are braces placed diagonally through the rectangular spaces formed by the strips *b b* and stays *b' b'*, and butting against the diagonal corners formed by said strips and stays, as shown. These diagonal braces are arranged

alternately—that is, the first brace *b''* extends from the lower rear corner of the lower rectangular space to the upper forward corner of the same, and the next brace *b''* extends from the lower forward corner to the upper rear corner of the next rectangular space, and so on to the top of the ladder, forming a truss. Thus it will be seen that the sides of the ladder are made skeleton and are very light and strong.

*c c* represent braces extending from the under side of the lower step, *a*, to the inside of the sides, as shown, to steady the ladder, and to prevent it from moving sidewise.

To the rear ends of the blocks *d d*, which are firmly secured to the upper ends of the sides, and to the under part of the top step, *a*, is pivoted at *E'* the standard *E*, which is formed of one piece split alternately from one end and then from the other (shown in Fig. 3) sufficiently to allow it to be spread, as shown in Fig. 2, to form the sides *e e* of the standard, and also the *M*-shaped brace *e'* of the same. The middle section of the brace *e'* may be left long enough to reach to a level with the sides *e e*, if so desired; but this is not essential.

*e'' e'' e''* represent rivets inserted through the ends of the *M*-shaped brace *e'*, to prevent it from splitting entirely apart when the standard *E* is spread.

*e<sup>3</sup> e<sup>3</sup> e<sup>3</sup>* represent horizontal braces to retain the standard in a spread position. Said braces are secured to the sides *e e* and *M*-shaped brace *e'* of the standard.

It will be seen that by forming the standard in the manner described I make it very stiff, strong, and light with very little labor, as I dispense with the usual mortises and tenons that are generally employed in making the standards to step-ladders, and make the same from one piece split, spread, and secured by the horizontal braces, as described.

I have shown the ladder as being provided with my improved bail and locking device patented to me April 27, 1880, No. 226,935; but this is not essential, as I may use any of the old and well-known devices for holding the ladder in an open position without departing from the spirit of my invention.

My improved bail and locking device consists of the bail *f*, hinged at *f' f'* to the sides of the ladder, and playing up and down in the guides *g g* on the sides *e e* of the standard *E*.



the lower ends of the guides being a little below the level of the pivot  $f'$ , on which the bail  $f$  hinges. This prevents the bail from rising while the weight is on the ladder.

5 Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a step-ladder, the standard  $E$ , formed of one piece split alternately from one end and  
10 then from the other, and being spread to the required width, in combination with one or more horizontal braces,  $e^3$ , for retaining said piece in its spread position, as set forth.

2. In a step-ladder, the steps  $a$ , joined to the

sides of the ladder, said sides being formed by 15 the strips  $bb$ , stays  $b'b'$ , and diagonal braces  $b''b''$ , as described, in combination with the standard  $E$ , formed from one piece split and spread as described, and having one or more horizontal braces,  $e^3$ , for the purpose described, 20 said standard being held in relative positions to the ladder by a suitable bail, as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

DON CARLOS SMART.

Witnesses:

HENRY CHADBURN,

SARAH M. GOODRICH.