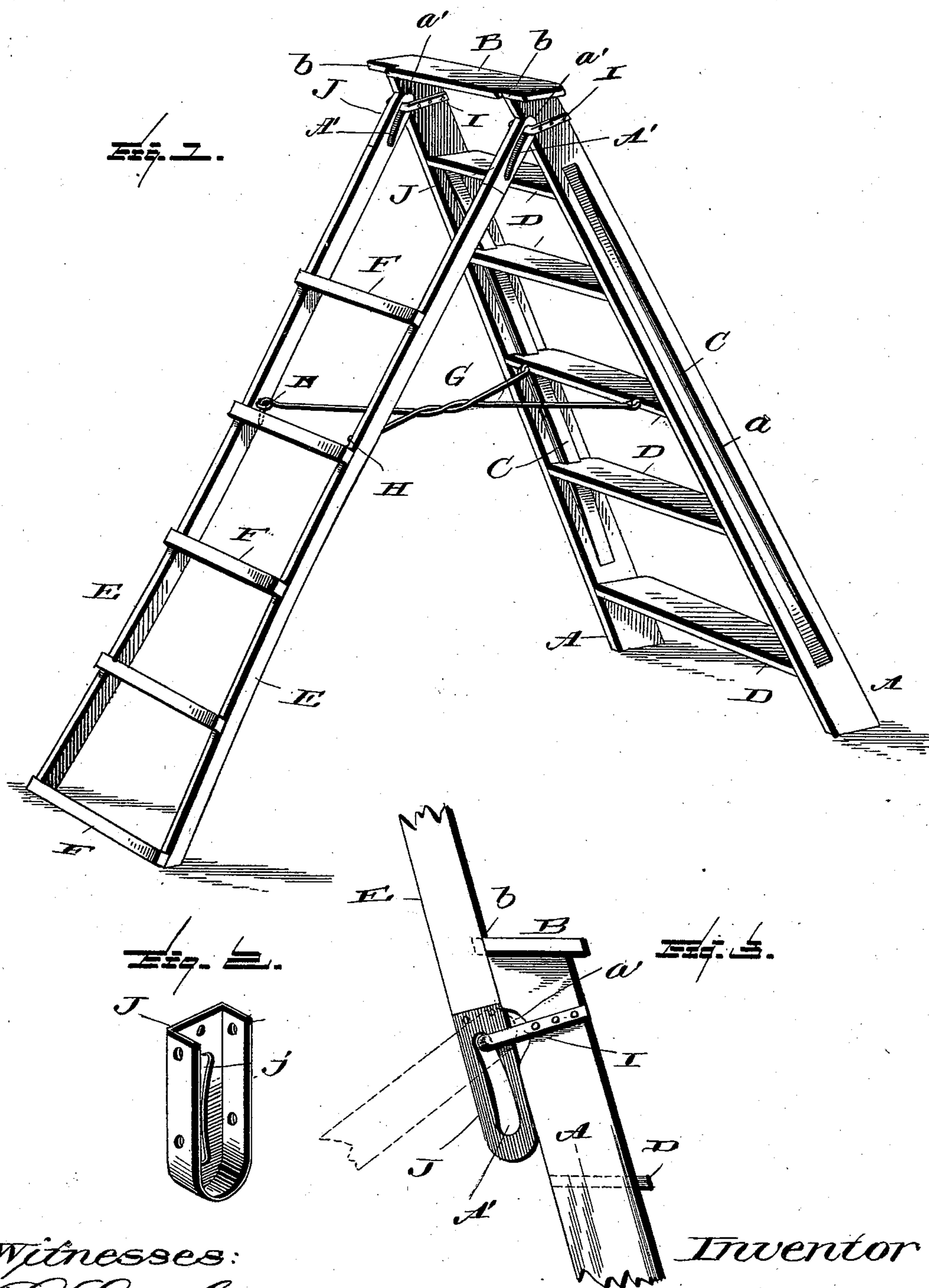


(No Model.)

E. J. BRUCH.
LADDER.

No. 540,948.

Patented June 11, 1895.



Witnesses:
L. C. Hills.
E. A. Bond

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UNITED STATES PATENT OFFICE.

ERWIN J. BRUCH, OF EMAUS, ASSIGNOR OF ONE-HALF TO SILAS A. LENTZ,
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LADDER.

SPECIFICATION forming part of Letters Patent No. 540,948, dated June 11, 1895.

Application filed November 14, 1894. Serial No. 528,738. (No model.)

To all whom it may concern:

Be it known that I, ERWIN J. BRUCH, a citizen of the United States, residing at Emaus, in the county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Ladders, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in ladders, and it has for its object among others to provide a simple, cheap and strong ladder adapted for use either as a step ladder or as an extension ladder, and foldable into small compass for the purpose of storage or shipment.

I mount upon the rear and upper end of the base portion the portion which serves both as the brace for the ladder when used as a step ladder and for the upper part when used as an extension ladder. I provide a novel form of connection between these parts whereby the upper portion will be firmly held in place when extended.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a perspective view of my improvement set up as a step-ladder. Fig. 2 is a perspective view of the cap for the end of the upper portion. Fig. 3 is a detail in side elevation with the upper part extended vertically.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the side bars of the base portion, which is preferably tapered in the usual manner, and these sides are joined at their upper end by the piece B which at its rear edge is notched as shown at b for a purpose which will hereinafter appear.

The side bars A are formed longitudinally with openings a in which are fitted the inwardly-curved strips C as shown in Fig. 1, which serve as a sort of truss, and the steps D are secured to the inner faces of the side

bars and notched to receive the curved strips as shown in Fig. 1. This provides a very strong and light construction.

The other portion of the ladder is formed of the side bars E and the cross-bars F which are secured thereto in any suitable manner. It is made narrow at the center and wider at each end for the purpose of having more surface support when the ladder is used as a regular step ladder and by its being narrow in the center I require less material, it being one of the main objects of the invention to make the device as light as possible consistent with strength. It also forms a sort of truss, adding strength.

To the rear edge of one of the steps D I hinge the rods G the other ends of which are hooked as shown to engage eyes or analogous devices H on the side bars of the extension portion as shown in Fig. 1 to hold the parts against collapsing when used as a step ladder as will be readily understood from Fig. 1.

The extension part is hinged to the main part as follows: The side bars of the extension part are provided with slots A' at the upper ends thereof as shown and these slots are cam-shaped as seen in Figs. 1 and 3 and in these slots engage means on the upper end of the main part. In this instance this means is shown as being the cross portion of a strap or U-shaped metal piece I secured to the side bar as shown. The ends of the side bars of the extension may be protected by metal plates or caps such for instance as is shown in Fig. 2 and designated by the letter J. This plate or cap has a slot j corresponding to the slot A' in the side bar of the extension. This plate or cap may be secured to the side bar in any suitable manner and will prevent splitting out of the end of the side bar. The rear edges of the side bars of the main portion are preferably cut out as shown at a' to receive the ends of the side bars of the extension when used as a step ladder, as shown in Fig. 1, the upper ends of the said side bars being rounded as shown.

In practice, the extension is placed in position with its rounded ends entering the recesses in the rear edges of the side bars of the main portion and the hooks of the brace rod G engaged in the hooks or eyes on the extension.

sion as shown in Fig. 1, when the device constitutes a step ladder. When a long ladder is desired the brace rod is disengaged and the extension is turned up in line with the main part, the slots in the ends of the side bars of the extension allowing of the necessary movement. When in line with the main portion the extension is forced downward when the cam shape of the slots will bind in position to firmly hold the extension, the side bars of the extension fitting in the notches of the upper step B and engaging the shoulders thereof and thus preventing side movement of the extension. To return the extension to its former position, press upward upon the lower end thereof until the cross bars of the plates I ride down the walls of the slot or vice versa when the extension may be turned down as indicated by dotted lines in Fig. 3.

I deem it important that the main portion of the ladder and its extension be pivotally connected by means of the strips or plates I or other equivalent which embrace the upper ends of the said bars of the main portion and whose horizontal portions pass through and work in the slots of the said bars of the extensions. These plates thus strengthen the upper end of the portion and enable me to bring the side bars of the main portion and extension in the same plane from front to rear whereby I am enabled to seat the rounded ends of the side bars of the extension in the notches or recesses α' of the side bars of the main portion as indicated in Figs. 1 and 3.

What is claimed as new is—

1. The combination of the main part, the extension having cam slots and the plates embracing the upper ends of the side bars of the main part and having transverse portions

passed through and working in said slots of the extension, substantially as specified.

2. The combination of the main part, the extension having cam slots, the plates embracing the upper ends of the side bars of the main part and having transverse portions passed through and working in said slots of the extension and strengthening plates on the extension provided with slots coincident in its side bars, substantially as specified.

3. The combination with the main portion of the extension having curved slots at its upper ends and pivotally mounted upon the upper end of the main part with its side bars in the same plane and adapted to bear against the rear edge of the side bars of the main part, substantially as specified.

4. The combination with the main part having its top step notched at the ends upon its rear ends and the rear edges of its side bars formed with recesses, of the extension having curved slots in its side bars and rounded ends to engage said recesses, and plates embracing the upper ends of the side bars of the main portion and having curved portions passed through and working in said slots, substantially as specified.

5. The combination of the main part with U-shaped plates, the extension having cam-slots in which the cross portions of said plates work, and caps on the side bars of the extension having slots corresponding to the slots of the side bars of the extension, as set forth.

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

ERWIN J. BRUCH.

Witnesses:

BENJAMIN JARRETT,
M. S. WEIDNER.