

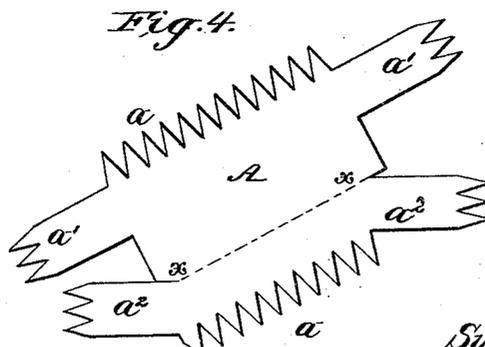
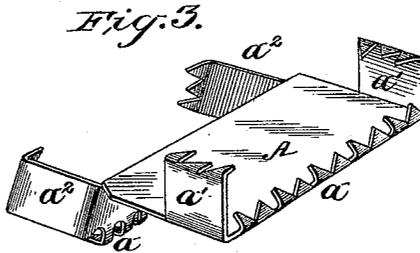
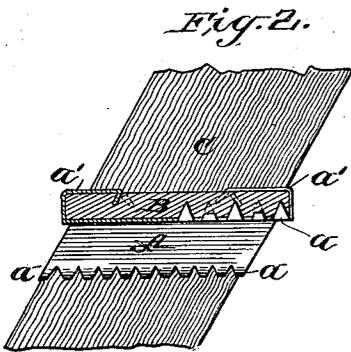
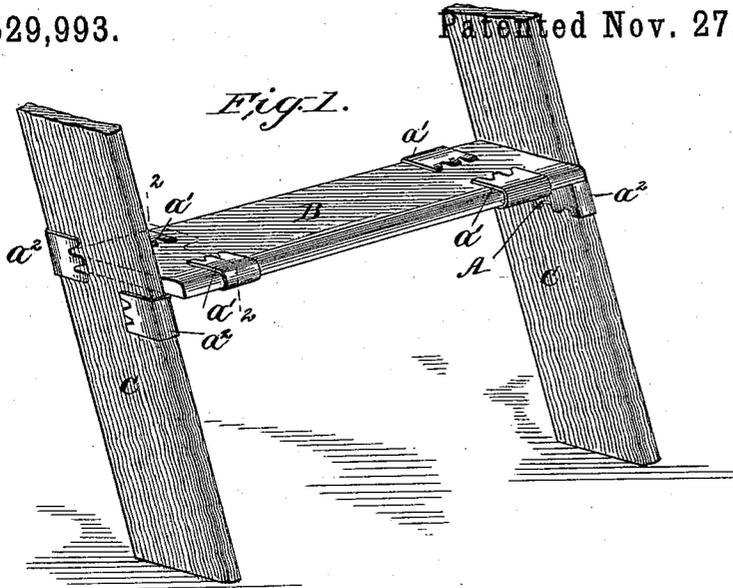
(No Model.)

S. E. ALLEN.

COMBINED BRACE, CLAMP, STEP FASTENING, AND SUPPORT FOR  
STEP LADDERS.

No. 529,993.

Patented Nov. 27, 1894.



WITNESSES:

*Harry J. Robinson*  
*Amos W. Hart*

INVENTOR

*Sydney E. Allen.*

BY

*Warr Co*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

SYDNEY E. ALLEN, OF WINSTON, NORTH CAROLINA.

COMBINED BRACE, CLAMP, STEP FASTENING, AND SUPPORT FOR STEP-LADDERS.

SPECIFICATION forming part of Letters Patent No. 529,993, dated November 27, 1894.

Application filed March 29, 1894. Serial No. 505,652. (No model.)

*To all whom it may concern:*

Be it known that I, SYDNEY E. ALLEN, of Winston, in the county of Forsyth and State of North Carolina, have invented an Improved Combined Brace, Clamp, Step Fastening and Support for Step-Ladders, &c., of which the following is a specification.

It is my object to provide an improved means for connecting the steps with the legs or standards of a step-ladder, which shall not only form a rigid and secure fastening and brace, but serve as a rigid support for the steps, dispensing with mortise and tenon for this purpose, and which may also be easily and quickly applied or detached, and manufactured at small cost.

My invention is embodied in the construction and attachment of the device hereinafter described.

In the accompanying drawings—Figure 1 is a perspective view of the lower portion of a step-ladder having my improvement applied. Fig. 2 is an irregular cross section on line 2—2 of Fig. 1. Fig. 3 is a perspective view of my device in form for attachment to the frame of a step-ladder. Fig. 4 is a plan view of the blank from which said device is formed.

The device, A, is preferably cut out of a thin, soft-steel, or an iron plate, and, in the flat, presents an irregular contour, the body portion having two parallel toothed sides  $a, a$ , while two sets of claws, or toothed arms,  $a', a'$ , project from each end at different angles to each other; that is to say, the two opposite claws, or arms,  $a', a'$ , are in alignment, but those indicated by  $a^2, a^2$ , although likewise arranged at opposite sides of the plate, are not aligned, one being at an obtuse angle and the other at an acute angle to the adjacent claw or arm,  $a'$ .

To prepare the blank for application to a ladder, its body portion is folded or bent, longitudinally, at a right angle, on the line  $x-x$ , parallel to the toothed side edges,  $a$ , thus forming two flat portions which are respectively adapted for contact with, and attachment to, the step, B, and leg, C, of the ladder. The several claws, or arms,  $a', a^2$ , are then bent up at a right angle to the respective flat portions of the device, so that the latter presents the form shown in Fig. 3. The teeth of the body and claws stand approximately

at right angles to these respective parts, and alternate teeth are bent inward and outward, to render the attachment of the device more secure.

In practical application of the device to a step-ladder, it may be first attached to a step B, or to a leg, C. If applied first to the latter, the vertical, flat portion of the device, is laid in proper position against the inner side of the leg, C, and its teeth driven, or otherwise forced, into the wood. Then the claws, or arms,  $a^2, a^2$ , are bent around and clasped over the edges of the standard, and their teeth forced into the outer side of the same. One end of a step, B, is then laid on the horizontal flat portion of the device, A, and the teeth driven into the under side of said step. The arms,  $a^2$ , are next bent down upon and clasped upon the upper side of the step, and their teeth forced into it. The attachment of the device is thus complete, and the step, B, and leg, C, are firmly fastened together, and also held rigidly in the desired relation.

Although I have described my invention as applied to step-ladders alone, I do not restrict myself thereto, since it is capable of use in connection with other supports, for example scaffolds and staging. It is also obvious that with but slight modification of form it may be applied to parts which are oval or cylindrical in cross section.

What I claim is—

1. An improved device for the purposes specified, which consists of a metal body formed of two flat portions arranged at a right angle to each other, and having flexible claws or arms projecting from its ends, substantially as shown and described.

2. The improved device for the purposes specified, formed of sheet metal and consisting of a body having a right-angular shape, and provided on its side edges with teeth which are at an angle to the adjacent flat surfaces, and with two sets of flexible claws, or toothed arms, which project from the ends of the respective flat portions of said body, as shown and described.

3. A blank for a step-ladder brace and clamp, which consists of a sheet-metal plate having toothed side edges and toothed arms or claws projecting from its ends at the angles specified.

4. The combination with a leg, or standard, and a step or cross piece arranged at an angle to the former, of a connecting device composed of an angular body, provided with teeth at each side edge, and at the ends with claws or toothed arms, the same being applied with the flat portions of said body in contact with the inner side of a standard and the under side of the step, respectively, and said claws or arms being clasped around the leg and step, substantially as shown and described. 10

SYDNEY E. ALLEN.

Witnesses:

JOHN F. JEFFREYS,  
JAS. R. SHEPHERD.