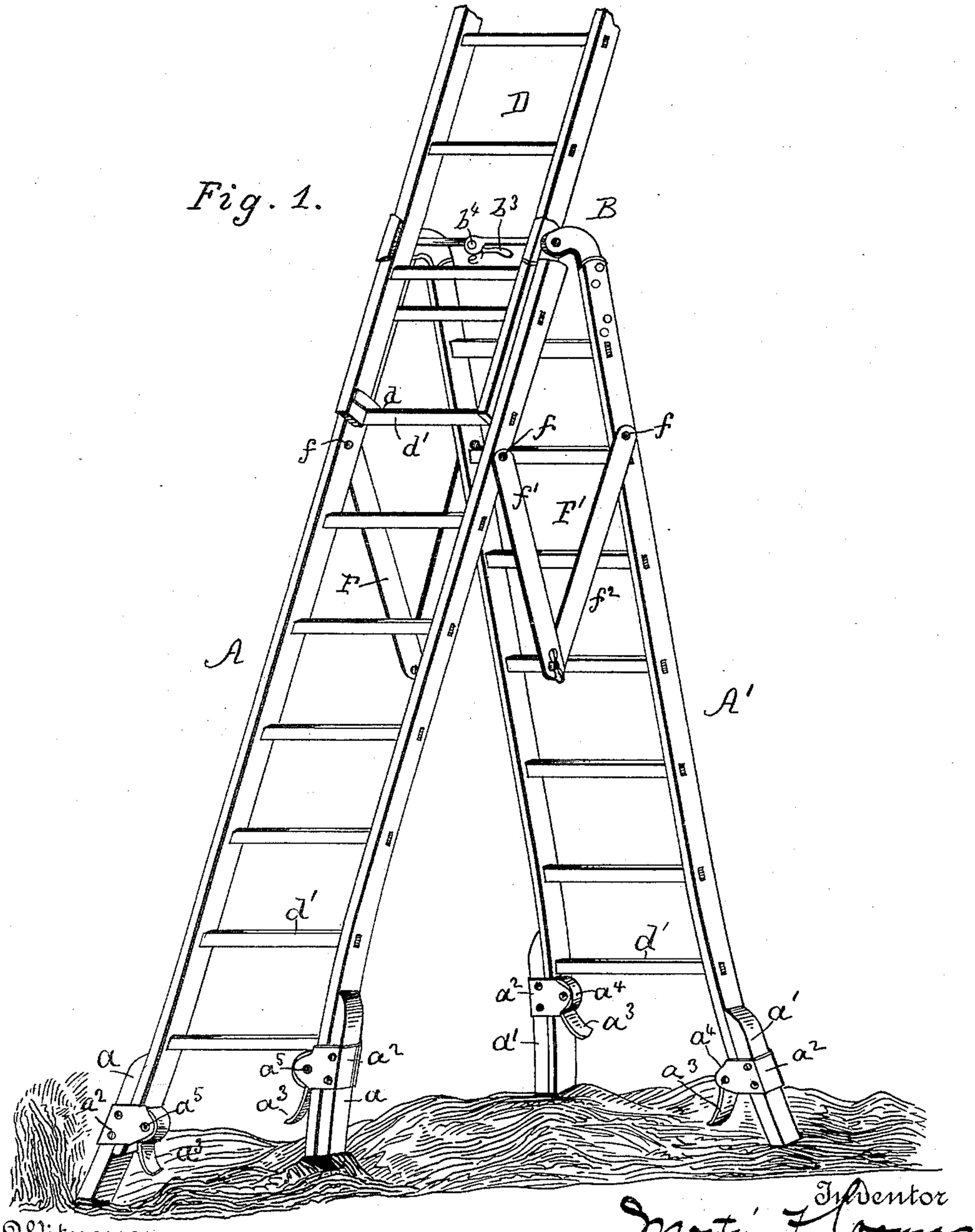
(No Model.) 2 Sheets—Sheet 1.

M. F. COOMES.

STEP LADDER.

No. 442,360. Patented Dec. 9, 1890.

Fig. 1.



Witnesses
Thos. Houghton.
M. S. W. Gay.

Inventor
Martin F. Coomes
By D. A. McKnight,
his Attorney

(No Model.) 2 Sheets—Sheet 2.

M. F. COOMES.

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Fig. 2.

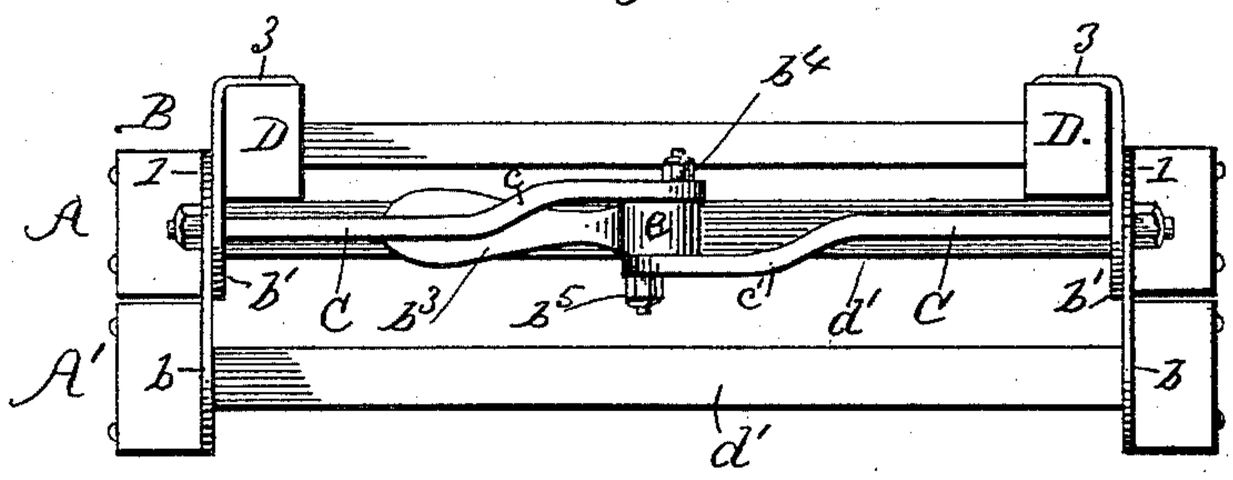


Fig. 3.

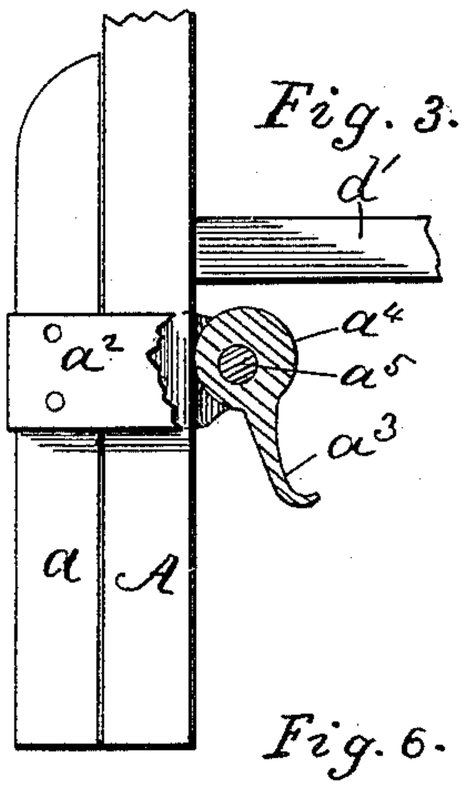


Fig. 4.

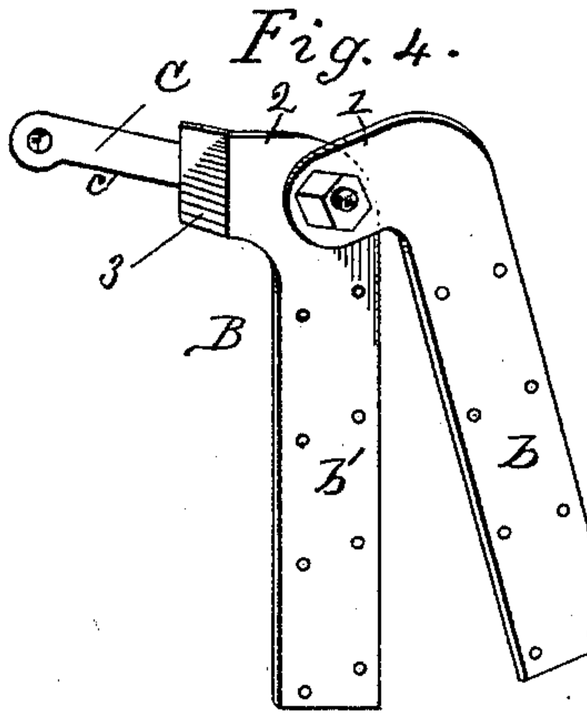


Fig. 10.

Fig. 6.

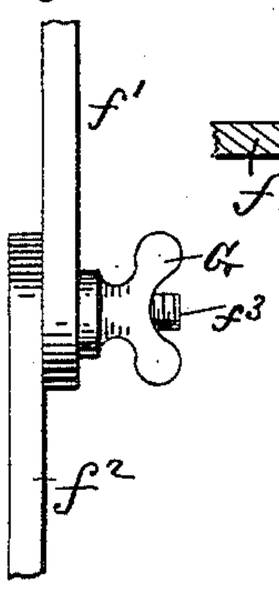


Fig. 5.

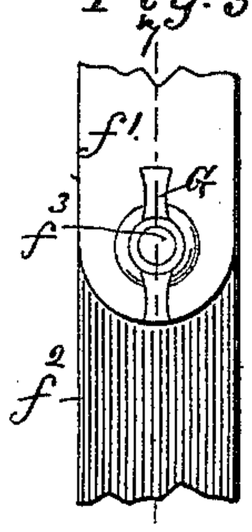


Fig. 7

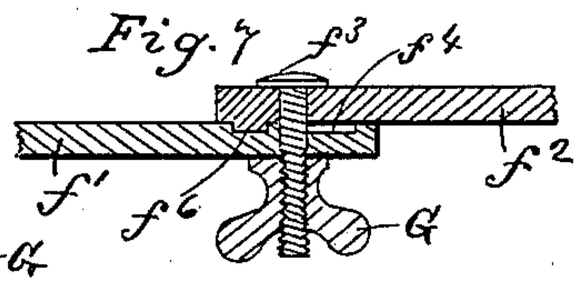


Fig. 8.

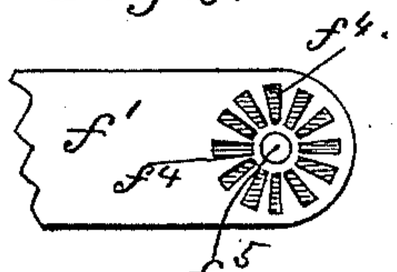
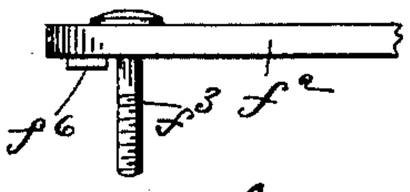


Fig. 9.



Witnesses
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M. S. W. Day.

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UNITED STATES PATENT OFFICE.

MARTIN F. COOMES, OF LOUISVILLE, KENTUCKY.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 442,360, dated December 9, 1890.

Application filed August 19, 1890. Serial No. 362,375. (No model.)

To all whom it may concern:

Be it known that I, MARTIN F. COOMES, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Step-Ladders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of a ladder embodying my invention, a part of the extension being broken off. Fig. 2 is a top end view of the ladder closed. Fig. 3 is an enlarged detail view of the locking-cam and bottom extension. Fig. 4 is a perspective view of one hinge-connection and one-half of the pintle of same. Fig. 5 is a face view of the locking portion of one lateral brace. Fig. 6 is a side view of same. Fig. 7 is a central section on line 7 7 of Fig. 5. Figs. 8 and 9 are detail views of the locking ends of one of the lateral braces. Fig. 10 is a detail inside view of the lower end of one of the side pieces of the extension-ladder.

The object of my invention is to provide an easily-constructed and safe combined step and extension ladder, adapted for store use or out of doors by shopmen, painters, general jobbers, or other artisans.

A A′ designate the main ladder, constructed of two equal and similar ladders, hinged together at their upper ends by a novel combined hinge and gripper.

B is the combined hinge and gripper, consisting of two leaves b b' and a pintle made in two parts, pivotally connected together midway between the sides of the ladder by a lever b^3, provided with two pivots b^5 b^6, projecting eccentrically from its hub, as seen in Fig. 2. Said hinges B are made rights and lefts, one of each being used on one ladder. It is evident that the eccentricity of the two pivots b^4 b^5 of lever b^3 enables me to shorten or lengthen the pintle C. To lengthen the pintle, I throw lever b^3, Fig. 1, to the left. This releases the grip on extension D. It may then be moved up or down as required. To tighten the grip, the lever is thrown to the right, as herein shown. The upper end of leaf b has an offset 1, projecting at right angles to the body of said leaf and extending over to a little beyond midway the width of its adjacent leaf b', and is perforated near its offset end for the reception of the pintle C. Leaf b' has a similar projection 2 to offset 1 of leaf b, and an offset 3 at right angles to projection 2. Said offset 3 constitutes a gripper to hold the extension-ladder D at any desired height. The gripping part of the device consists of the leaf b', as above described, a pintle made in two separate and equal parts c c', each screw-threaded, and provided with a nut at their outer ends and perforated at their inner ends, and a lever E, provided with a hub e, and two eccentric-pins b^4 and b^5, projecting from opposite sides of said hub. Pins b^5 and b^4 are screw-threaded to receive nuts to secure the inner ends of the pintle together.

The bottom end of extension-ladder D is provided with fixed hooks d, adapted to engage with the rungs d' of main ladder, as shown in Figs. 1 and 2.

The feet of the main ladder are provided with downward extensions a a'. A band a^2 is secured to each extension-foot, and is provided with a cam-lever a^3 on the inside of the ladder, by which the extension-foot may be held firmly when placed in the desired position. a^4 is the hub, and a^5 the pivot of cam a^3. By means of these extension-feet any ordinary inequalities of surface of the ground are provided for.

F F′ are lateral braces pivotally secured near the top end of the main ladder, as shown at f f in Fig. 1. Said braces are made in two parts f' and f^2 and united by a pivot f^3 and a locking device, as shown in Figs. 7, 8, and 9. The part f' of brace F has a series of radial depressions f^4 surrounding the pivot-hole f^5. (Shown in Figs. 7 and 8.) f^2 is provided with a projection or catch f^6, arranged so as to engage with any of the radial depressions f^4 of part f'. It is evident that when thumb-nut G is loosened, braces F F may be closed or opened to any angle desired, and the two parts of the main ladder may be, if desired, opened straight out to form one long ladder. Then by tightening nuts G G both braces will be securely locked,

and the ladder will thus be safely held in any required position.

It will be seen that these several metal trimmings may be manufactured and sold to the trade without being mounted, as locks, hinges, and other articles of hardware are now sold.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a combination step and extension ladder, the combined hinge and gripper herein shown, whereby the two ladders are held securely together, as herein set forth.

2. In combination with a step and extension ladder, the combined hinge and gripper and the extension locking-feet, as herein set forth.

3. In combination with a step-ladder, the lateral braces provided with a locking device consisting of two plates, one with projections on its inner surface and the other with corresponding depressions, through which passes a pivot operated by a thumb-nut, substantially as described.

4. In a combined step and extension ladder, the combination therewith of a combined hinge and gripper and lateral locking-braces, as herein set forth.

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

MARTIN F. COOMES.

Witnesses:

ROBT. V. HUGHES,

D. A. MCKNIGHT.