

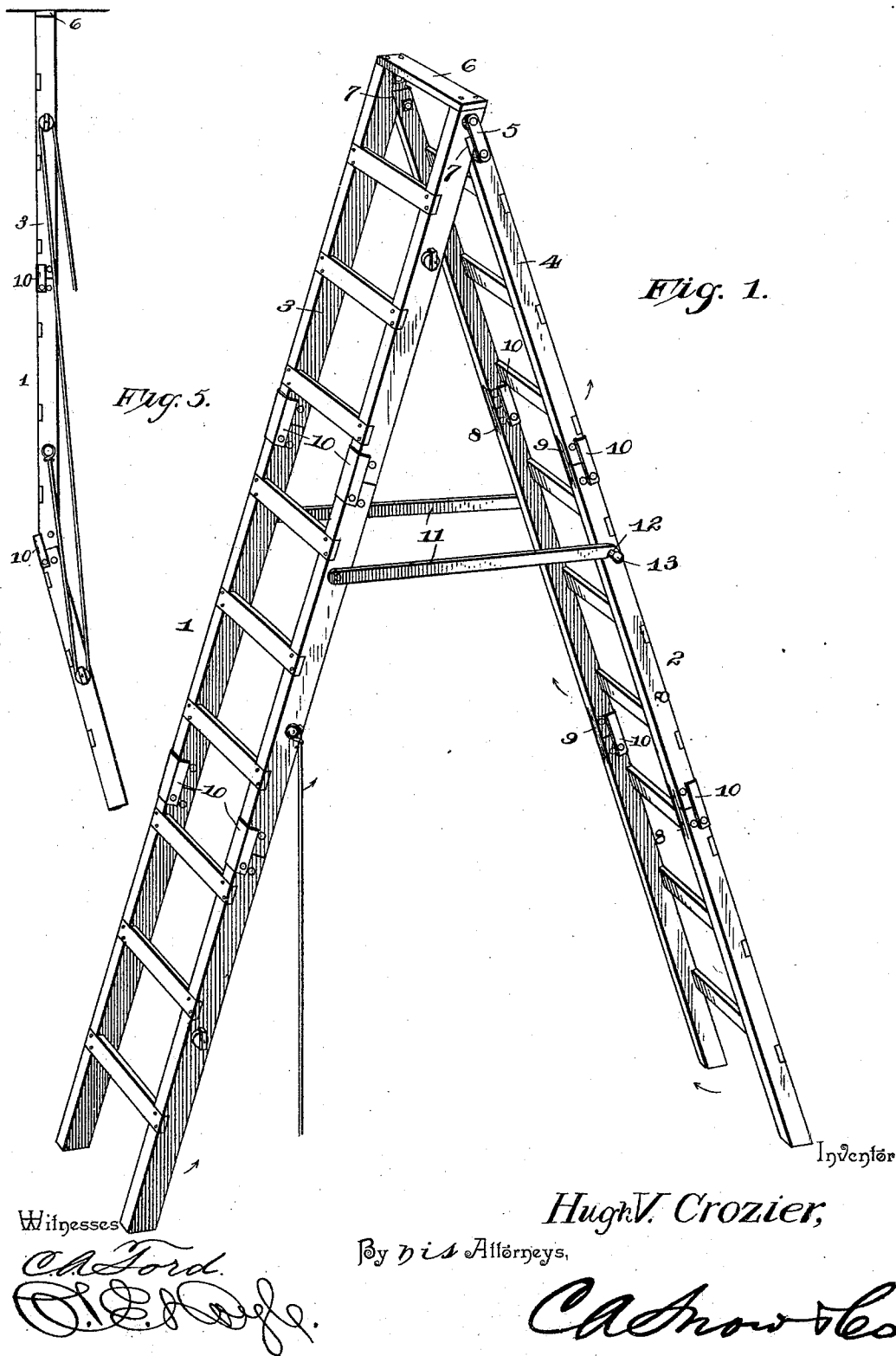
(No Model.)

2 Sheets—Sheet 1.

H. V. CROZIER.
FOLDING STEP LADDER.

No. 513,485.

Patented Jan. 30, 1894.



(No Model.)

2 Sheets—Sheet 2.

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FOLDING STEP LADDER.

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Fig. 2.

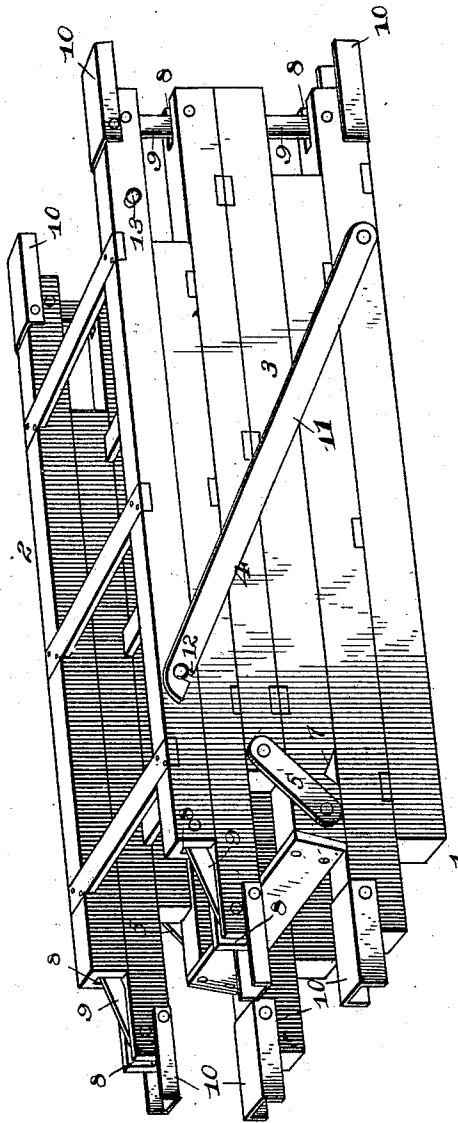


Fig. 4.

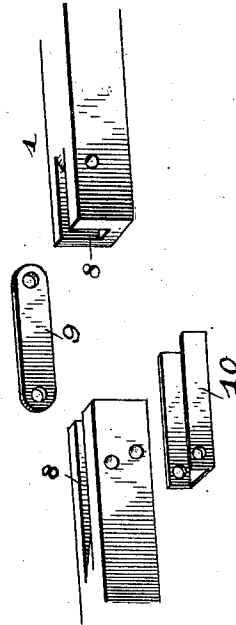
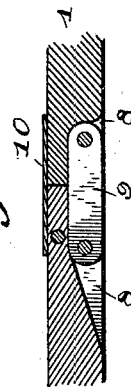


Fig. 3.



Witnesses

C. A. Ford.
E. J. Poff.

By his Attorneys,

C. A. Snow & Co.

Inventor
Hugh V. Crozier.

UNITED STATES PATENT OFFICE.

HUGH V. CROZIER, OF MORRILLTON, ARKANSAS.

FOLDING STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 513,435, dated January 30, 1894.

Application filed August 14, 1893. Serial No. 483,131. (No model.)

To all whom it may concern:

Be it known that I, HUGH V. CROZIER, a citizen of the United States, residing at Morrillton, in the county of Conway and State of Arkansas, have invented a new and useful Folding Step-Ladder, of which the following is a specification.

My invention relates to a folding step-ladder, and has for its object to provide a device of the class named in which the main body or rung-bearing portion and the brace are constructed of a series of connected sections hinged together to enable them to be folded into a compact form for transportation.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a perspective view of a ladder embodying my invention arranged in the operative position. Fig. 2 is a similar view of the ladder folded. Fig. 3 is a detail sectional view of one of the joints between adjoining sections. Fig. 4 is a perspective view of one of the joints with the members thereof disassembled. Fig. 5 is a side view of the ladder as seen when suspended from a ceiling or overhead support and used without the rear brace, indicating the manner of folding by means of a cord.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The main or rung portion 1 of the ladder comprises upper, lower, and intermediate sections, and the brace 2 consists of a corresponding number of sections, the upper section 3 of the main portion being connected at its upper end to the corresponding end of the upper section 4 of the brace by means of a pair of links 5, which are pivotally connected at opposite ends to the side-bars of said sections. The rear side of the upper main section is notched to receive the upper ends of the side-bars of the upper brace-section, as shown clearly in Fig. 1, said connecting links serving to retain the upper ends of the side-bars of the brace-section in said position. The side-bars of the upper main section may be connected, as shown in the drawings, by a horizontal platform or rest 6, the notches 7

for the upper ends of the sides of the brace-section being located below said platform. The joints between the sections of the main portion and those of the brace are constructed in the same manner, and therefore the description of one will suffice. The adjoining ends of the side-bars of two connected sections are provided with registering longitudinal slots 8, thus bifurcating said ends of the sections, and in these registering slots are arranged links 9, which are pivoted at their terminals respectively to the sections. This link connection allows the sections to be deflected to permit of their being folded in parallel planes, the links lying perpendicular to the planes of the sections.

Fixed securely to the terminals of the end-bars of one section are the three-sided sheaths or braces 10, which are adapted at their free ends to bear against the outer sides of the terminals of the bars of the adjoining section. These sheaths or guards stiffen the joints and maintain the terminals of the side-bars in their proper relative positions when the sections are extended, as shown in Fig. 1.

11 represents stay-bars, which are pivotally connected to the main portion of the ladder and are notched as at 12 to engage headed studs 13 upon the sides of the brace.

By the above described arrangement of the parts, the lower or terminal sections of the main portion and brace may be folded to allow the ladder to rest upon the lower ends of intermediate sections, when a ladder of less height is required. To fold the sections they are swung in the direction indicated by the darts in Fig. 1, namely: the lower or terminal sections are folded inwardly at their lower ends to lie parallel with and contiguous to the inner surfaces of the intermediate sections. Said terminal and intermediate sections are then folded inwardly against the inner surfaces of the upper sections, whereby the lower sections are disposed parallel with and between the intermediate and upper sections; and finally, the upper sections are folded to bring their outer surfaces together, thus throwing the intermediate and lower sections outside of the upper sections. In this position the parts of the ladder may be secured together for transportation.

The link connection between the sections

of the ladder enables them to be deflected and brought into alignment without rounding or chamfering the ends of the side-bars, and hence when the parts are arranged in their operative positions the side-bars present square bearing ends for contact with adjoining sections, thus increasing the stability of the structure.

In practice various changes in the form, portion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. A step ladder having main and brace portions hinged together at their upper extremities, each portion being composed of a series of foldable sections connected together by interposed loose link-hinges and provided with means for holding the sections in alignment when extended, whereby the sections are capable of folding in one direction only, substantially as specified.

2. A step-ladder composed of foldable sections connected by loose link-hinges and provided at the joints with sheaths or guards which are fixed rigidly to one of the adjoining ends and engages the other when the parts are in their operative positions, substantially as specified.

3. In a foldable ladder, the combination with adjoining sections connected by a link-hinge, of three-sided sheaths or guards fixed to and carried by the side-bars of one section and adapted to engage the adjoining ends of the side-bars of the other section when said sections are in their operative positions, substantially as specified.

4. In a step-ladder, the combination of sectional jointed main and brace portions, of stay-bars pivotally connected to one portion to engage studs upon the other portion, and links pivotally connecting the upper ends of the top sections of said portions, the side-bars of the top section of the main portion being notched to receive the upper ends of the side-bars of the top section of the brace portion and said links being connected to the top main section near the upper extremities of its side-bars whereby the top section of the base portion may be folded over the top section of the main portion to bring the outer side of said sections together when folded, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HUGH V. CROZIER.

Witnesses:

CHAS. C. REID,

H. CLOUD RAINWATER.