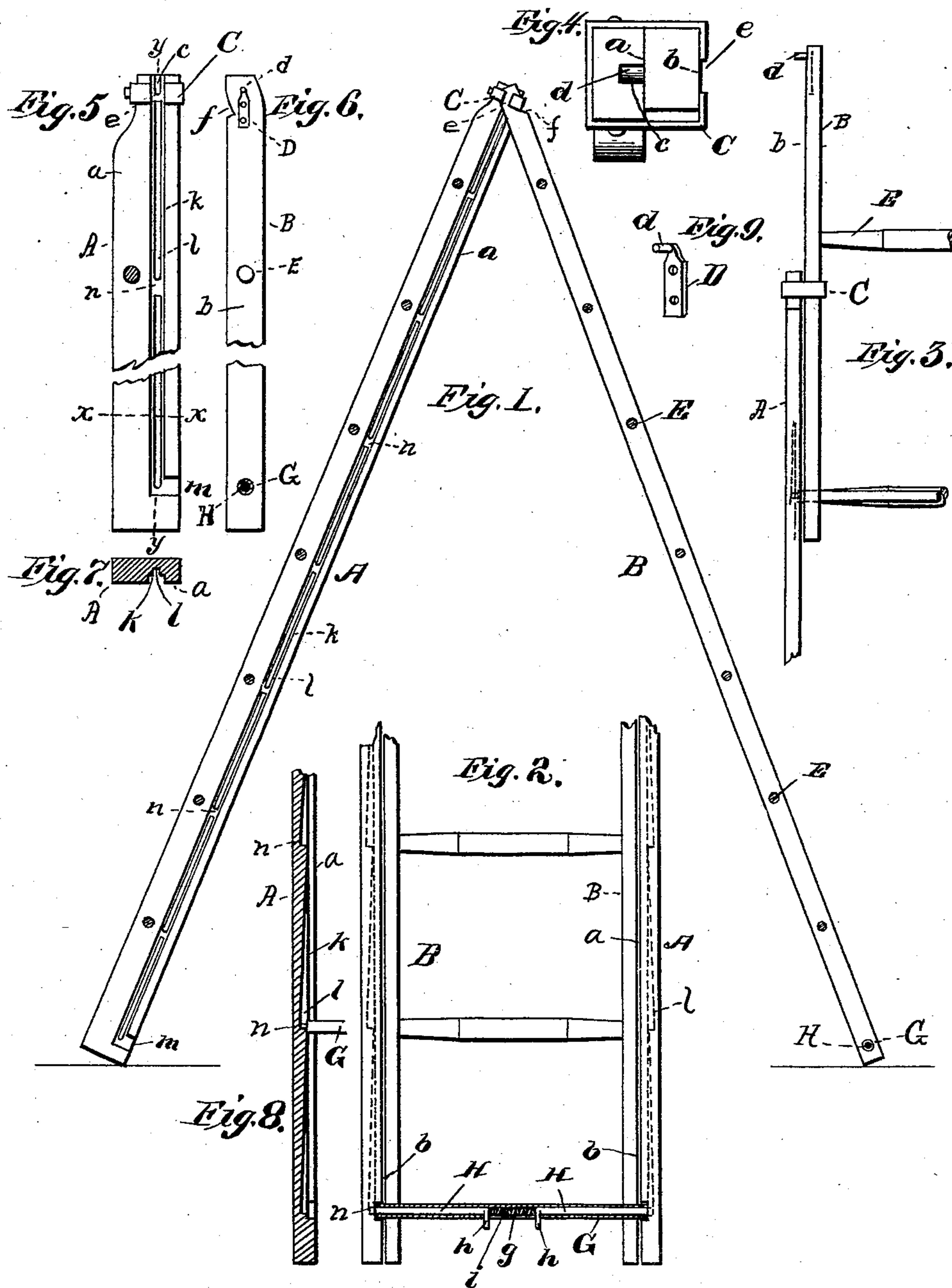


(No Model.)

J. B. McSHERER.
COMBINED STEP AND EXTENSION LADDER.

No. 542,308.

Patented July 9, 1895.



WITNESSES.
Howard W. Orr.
J. H. Griffin.

INVENTOR.
Jerome B. McSherrer
BY
M. D. Peck
HIS ATTY.

UNITED STATES PATENT OFFICE.

JEROME B. MCSHERER, OF LANSING, MICHIGAN.

COMBINED STEP AND EXTENSION LADDER.

SPECIFICATION forming part of Letters Patent No. 542,308, dated July 9, 1895.

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To all whom it may concern:

Be it known that I, JEROME B. MCSHERER, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in a Combined Step and Extension Ladder; and I do hereby 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, which form part of this specification.

My invention relates to combined step and extension ladders, and has for its object to provide a ladder that can be opened so that one section will brace the other when it is desired for a step-ladder, and when used as an extension-ladder the sections are to be folded together and extended one upon the other to any desired ordinary height required, there being an inclined groove in the stationary section and a spring-stop in the extensible section to automatically hold it at any desired point; and to this end my invention consists in the construction and combination of parts hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 represents an elevation showing the inner face of one side of the ladder when used as a step-ladder, the rounds being in section. Fig. 2 is a front view, partly in section, of a portion of the ladder, showing the two sections folded together. Fig. 3 is a similar view as Fig. 2 of a portion of the ladder when extended. Fig. 4 is a top view of one side of the ladder when used as a step-ladder, showing the hinge and strap that hold the parts together. Fig. 5 is a view of an elevation of one side of the outer section of the ladder. Fig. 6 is an elevation of one side of the inner section of the ladder. Fig. 7 is a sectional view on the line *xx* of Fig. 5. Fig. 8 is a view of a longitudinal section of Fig. 5 on the line *yy*, and Fig. 9 is a detached detail view showing that part of the hinge secured to the upper end of the extension-section.

Similar letters of reference indicate corresponding parts in each figure of the drawings.

A represents the outer section of the combined ladder, and B the inner section, which

is adapted to be extended upon the outer one. The tops of the outer section A on the sides *a* are provided with recesses *c*, to receive pins *d*, projecting from the sides *d* of the inner section. These pins *d* are made integral with small plates D, the pins projecting from one end thereof, and the plates let into the sides of the section flush with its surface, as shown in Fig. 3. A strap C is securely bolted to the top of the outer section A, which extends around the upper end of the section and partially around the inner section B, leaving an open space in the strap on the side *b* of the inner section. This strap C holds the inner section in engagement with the side *a* of the outer section and forms a guide through which the inner section B slides when the ladder is being extended. The ends of the strap C are separated or left apart to form a space *e* for the passage of the rounds E of the inner section when it is being extended on the outer section of the ladder. The rear edges of the section B are notched at their upper end, as indicated at *f*, to form seats in which the straps C rest when the two sections are spread apart at their lower ends to form a step-ladder, as clearly shown in Fig. 1. It is thus clearly seen that the two sections of the ladder are detachably hinged together at their upper ends, and that the strap C holds the hinged parts in proper relation to each other and also limits the distance to which the lower ends of the sections may be spread apart.

The lower round G of the inner section B is tubular in form, being preferably composed of a section of iron pipe, and extends a short distance beyond the outer faces of the sides *b* of the section B, as shown in Fig. 2. This tubular round G is provided with an elongated slot *g*, usually in its lower side, through which project finger-pieces *h*, which form a part of the sliding rods H inserted in the tubular round. Between the inner and opposing ends of these rods there is placed a spring *i*, the normal tendency of which is to force the rods outwardly from each other.

On the inner faces *a* of the outer section A there are formed longitudinal grooves *k*, of sufficient width to receive the projecting ends of the tubular round G and in which they can slide up and down, and in the rear walls of these grooves *k* there is formed a series of

narrower grooves *l*, which are adapted to receive the projecting ends of the sliding rods H and in which they can slide up and down. These grooves *l* gradually decrease in depth from their lower to their upper ends and preferably correspond in length to the distance between the rounds, as shown in Figs. 1, 2, and 8. The grooves *k* at their lower ends are continued at a right angle to the rear edges of the sides *a*, as indicated at *m*, and these grooves *m* are of the same depth as the grooves *k*. The object of the grooves *m* is to permit the withdrawal of the ends of the tubular round G from the outer section A when it is desired to spread the lower ends of the sections, the ends of the rods H being withdrawn from the grooves *l* by means of the finger-pieces *h*. When the ladder is folded together or closed, as shown in Fig. 2, the ends of the rods H will rest in the grooves *l* and hold the sections together at their lower ends.

When it is desired to extend the ladder, the inner section B can be easily pushed upward, as the ends of the rods H will slide up the inclined faces of the grooves *l*, forcing the rods inwardly against the spring *i* until the ends of the rods reach the shoulders *n* at the lower end of the inclined grooves, when the spring will again force them outwardly into the succeeding grooves *l*, and thus continue in the same manner until the ladder is extended to the desired height. To lower the section B, the end of the rods H must be withdrawn from the grooves *l* by means of the finger-pieces *h*, when the section will slide downwardly until the rods H are released, when the spring *g* will throw them outwardly and their ends will be caught upon the next

shoulder *n* below, formed in the inclined grooves *l*. The strap C forms guides through which the rear section B slides, and together with the tubular round G within the grooves *k* securely hold the two sections together in their extended position.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a ladder, of an outer section having recesses formed and open in the upper ends of its sides, an inner section having pins projecting from its sides into said recesses, and straps secured to the sides of the outer section and embracing the sides of the inner section, the sides of the inner section having notches forming seats for the straps, and the straps having their ends separated to form a passage for the rounds of the inner section when the latter is extended, substantially as and for the purpose set forth.

2. The combination in a ladder of an outer section having longitudinal grooves in its sides, and a series of inclined grooves in the rear walls of the longitudinal grooves, an inner extensible section having a tubular round projecting at each end into the said longitudinal groove, spring actuated rods in the tubular round projecting into the inclined grooves, and straps secured to the outer section and forming guides for the inner extensible section, as and for the purpose set forth.

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

JEROME B. MCSHERER.

Witnesses:

R. MOTT,

FRANK M. HEWINGS.