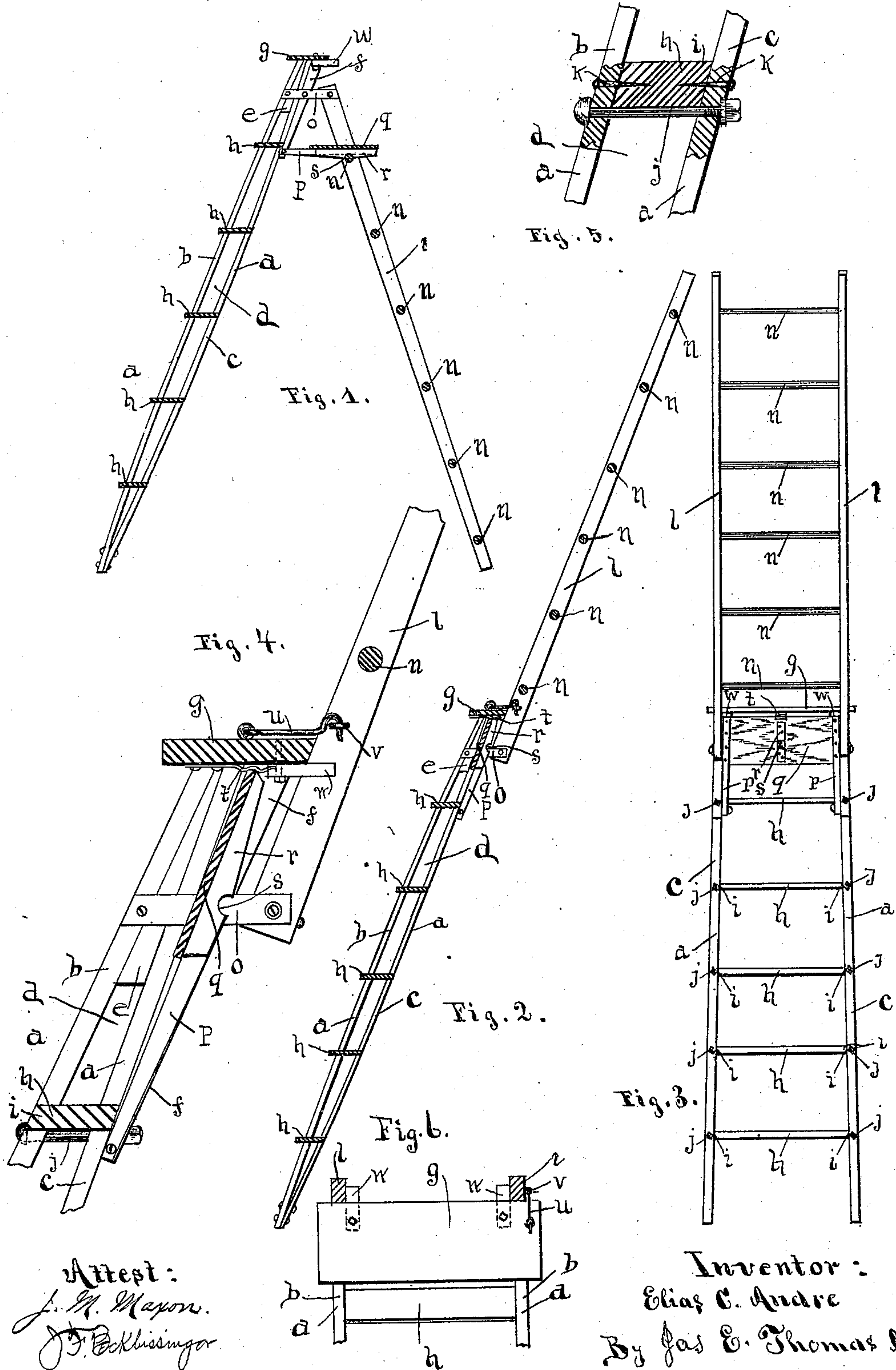


(No Model.)

E. C. ANDRE.
EXTENSION STEP LADDER.

No. 486,069.

Patented Nov. 15, 1892.



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UNITED STATES PATENT OFFICE.

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EXTENSION STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 486,069, dated November 15, 1892.

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To all whom it may concern:

Be it known that I, ELIAS C. ANDRE, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Extension Step - Ladders, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to extensible step-ladders; and the invention consists in the combination and arrangement of the parts, which will hereinafter be specifically explained in detail and which will also be specifically pointed out in the claim of this specification.

The object is to provide a strong and durable step-ladder, which is provided with means whereby the parts are retained in a proper position for use as a step-ladder in the ordinary way and which can also be extended to nearly double the length of the step-ladder proper and used as an ordinary ladder. The devices used for attaining these objects are illustrated in the accompanying drawings, which are to be used in connection with this specification, of which they form a part, the letters of reference used in the following description and explanation being found in the drawings designating the same parts or elements throughout the several illustrations.

Figure 1 is a side view in elevation of my improvement with the parts in position for use as a step-ladder. Fig. 2 is a longitudinal central section of the same extended for use as an ordinary ladder. Fig. 3 is a back view of the same. Fig. 4 is a central longitudinal section of the central portion of Fig. 2 enlarged. Fig. 5 is a sectional detail of the end portion of one of the steps and its supporting-pieces enlarged. Fig. 6 is a horizontal section of Fig. 4 taken above the upper step.

a are the sides of the step-ladder portion, and these sides are composed of the strips b and c , with their lower ends secured together, while the middle portions of the strips are bent away from each other, leaving a space d between, while the upper ends of the steps are secured firmly to a piece e between the ends, while on the outer side of the upper end of the back strips c are secured the rearwardly-projecting supports f , so that the upper ends of all of the parts form a bearing for

the wide upper step g , while h is a series of steps placed at suitable intervals, with their ends i reduced and passed between the pieces b and c and transversely across the space d and through the pieces b and c , and extending across the space d are passed the bolts j , the ends i of the steps resting directly upon the bolts and are held in position by the strips b and c , being clamped tightly thereon by the bolts j , which then form a firm and solid support for the steps and at the same time hold the parts firmly in place, while for an additional security nails or screws k are passed through the strips and into the step, as shown in Fig. 5.

l are the side bars of the ladder portion, and n are the rungs, with their ends passed through suitable openings in the side bars in the usual way, and the side bars are pivoted to the outer ends of the transverse pieces or brackets o , which are firmly secured to the sides of the step-ladder portion at a short distance below its upper end, and from the rear side of which the pivoted ends project slightly, so as to allow the bars l to turn on the pivots and fold against the rear side of the step-ladder portion, or to be extended to form a longer ladder, as shown in Figs. 2 and 3.

To the lower ends of the supports f are pivoted the inner ends of the arms p , and upon the outer ends of these supports is firmly secured the shelf q , while on the under side of the shelf is secured the transverse piece r , provided with the notch s , which fits over one of the rungs n for retaining the parts in the position shown in Fig. 1 for use as a step-ladder, and upon the under side of the upper step g is secured a spring t , having a bent end arranged for engaging with the edge of the shelf and retaining the same in a position beneath the step g when the ladder is closed for packing or when extended for use as a common ladder.

As shown in Figs. 2 and 3, the extension portion is raised until the sides l rest against the outer edge of the step g , and a hook u is arranged on the step to engage with an eye v in the side l for retaining the parts in this position, and w are pieces or supports which are secured to the step g , and extend rearwardly between and in contact with the inner sides of the side pieces l for providing a

brace against a lateral strain on the side pieces when the ladder portion is in an extended position.

It will be seen that by the use of the bolts 5 *j* a support for the ends of the steps is provided which has the full thickness of the step resting thereon, which provides the utmost strength and rigidity for the step, and the nails or screws passed through the front and 10 rear strips and into the steps provide against a lateral expansion of the sides and hold the ladder firmly and solidly together. It will also be seen that by the improved construction and arrangement of the parts a firm and 15 strong ladder is provided, which can be used as an ordinary step-ladder or can be quickly extended to form a ladder of the ordinary type, reaching nearly double the length of an ordinary ladder, and at the same time can be 20 folded compactly for shipping and storage.

Having described the construction and op-

eration of my improvement, what I claim as my invention is—

In a step-ladder, the combination of the sides *a*, carrying the steps *h*, the upper step 25 *g*, secured to the upper ends of the side pieces, the brackets *o*, secured to the side pieces and projecting rearwardly, the side bars *l*, pivoted to the rear ends of said brackets and carrying the rungs *n*, the arms *p*, pivoted by one 30 end to the side pieces *a* and with the shelf *q* secured to their outer ends, and the piece *r*, secured to the shelf and provided with a notch *s* for engaging with one of the rungs *n*, for the purpose set forth, substantially as de- 35 scribed.

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

ELIAS C. ANDRE.

Witnesses:

GEO. P. THOMAS,
JAS. E. THOMAS.