No. 830,485.

L. M. NORTON. PATENTED SEPT. 4, 1906.

CONVERTIBLE EXTENSION STEP LADDER.

APPLICATION FILED SEPT. 28, 1905.

2 SHEETS—SHEET 1.

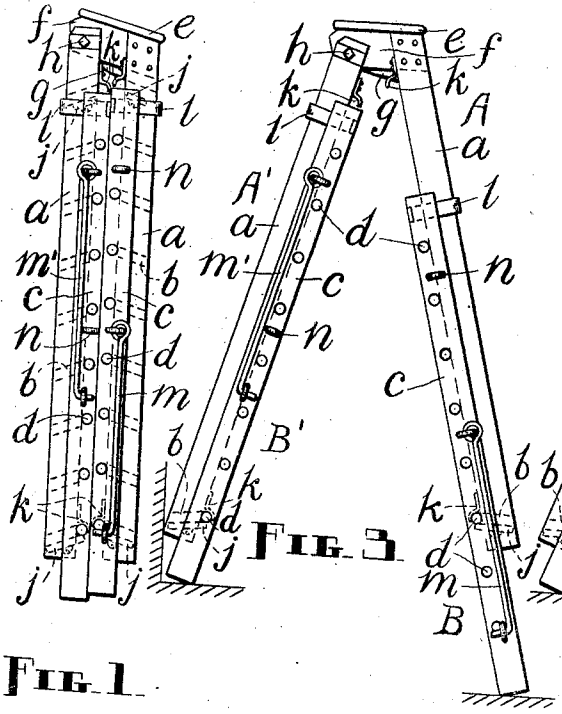


FIG. 1.

FIG. 3.

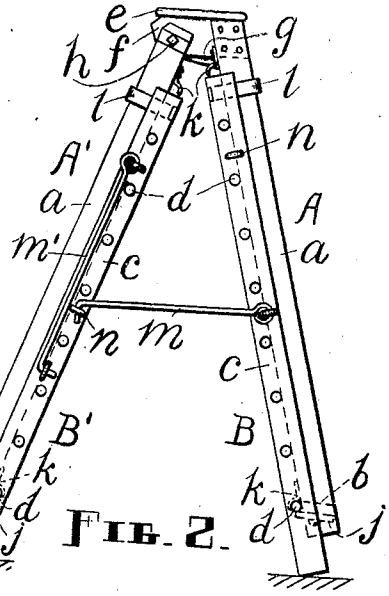


FIG. 2.

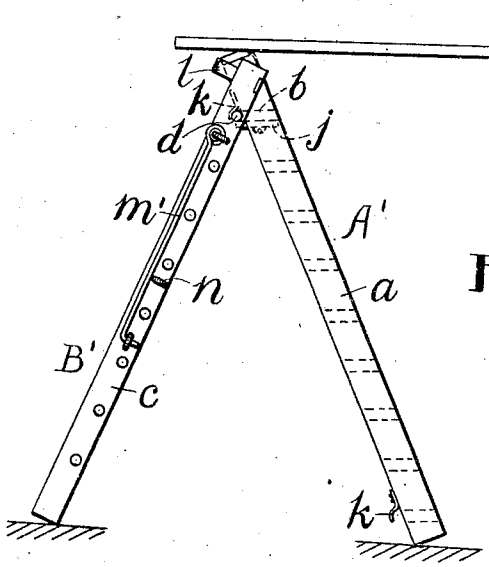
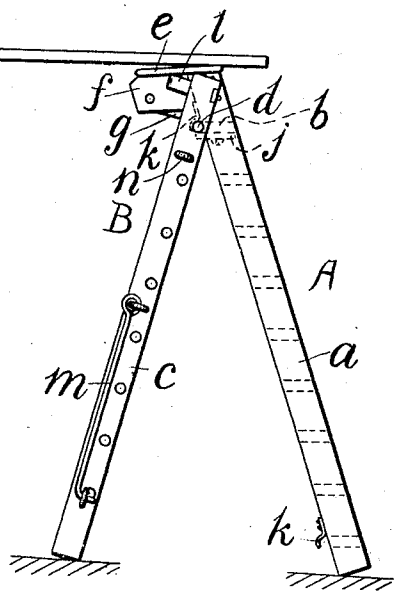


FIG. 4.



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2 SHEETS—SHEET 2.

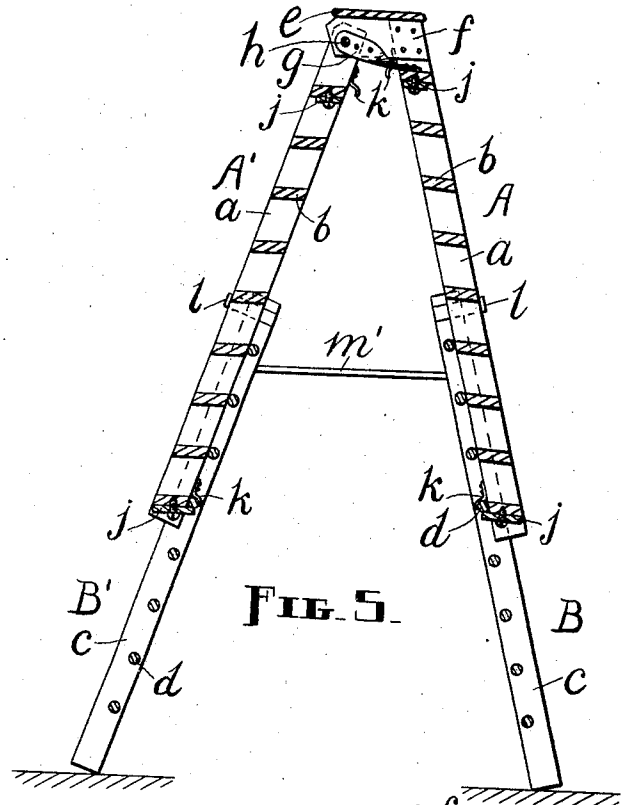

FIG. 5.

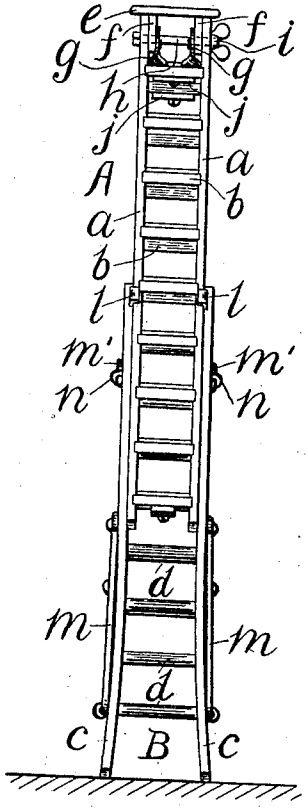

FIG. 6.

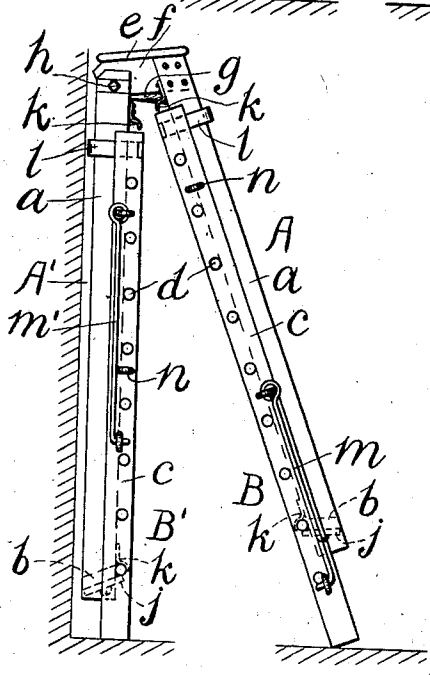

FIG. 7.

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CONVERTIBLE EXTENSION STEP-LADDER.

No. 830,485. Specification of Letters Patent. Patented Sept. 4, 1906.

Application filed September 28, 1905. Serial No. 280,410.

To all whom it may concern:

Be it known that I, LEONARD M. NORTON, a citizen of the United States of America, residing at Northampton, in the county of Hampshire and Commonwealth of Massachusetts, have invented a new and useful Convertible Extension Step-Ladder, of which the following is a specification.

My invention relates to improvements in step-ladders of the extension variety, and comprises four separable or independent ladders or ladder-sections, together with attaching or connecting means, two of such sections being by preference provided with steps and the other two with rungs and one of the step-sections having a platform at the top, all as hereinafter set forth.

The object of my invention is to provide a light, serviceable, and convenient, yet strong and durable step-ladder which can be employed as an ordinary step-ladder or extended to different heights, is capable of use under various conditions where it would not be possible or practicable to use the old form of step-ladder, is convertible into two step-ladders each separate and distinct from the other, and may be disunited to furnish two entirely-separate extension-ladders or four segregated ladder-sections.

A further object of my invention is to afford simple and convenient means for permitting the various changes which such a step-ladder is capable of to be made with comparative ease and celerity.

I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the step-ladder complete, showing it closed or folded and occupying the least possible space; Fig. 2, a similar view showing the same open, or, in other words, with the legs separated and in position for use like an ordinary step-ladder; Fig. 3, a side view of the step-ladder, one leg being partly extended, an arrangement adapting it for use where one leg is to rest on a stair-tread or other elevation while the other leg rests upon the floor below; Fig. 4, side elevations of two step-ladders made out of the one shown in the other views, with a platform supported thereby; Fig. 5, a sectional view of the step-ladder with the legs separated and both partly extended; Fig. 6, a front elevation of the step-ladder when arranged as it appears in Fig. 5, and Fig. 7 a side elevation illustrating how the step-ladder can be placed against a perpendicular wall or the like.

Similar letters refer to similar parts throughout the several views.

This step-ladder consists, preferably, of four sections A, A′, B, and B′, each of the two former being made up of side rails *a a*, connected by steps *b*, and each of the two latter of side rails *c c* and rungs *d*. The sections A and B constitute what may be termed the "front" leg and the sections A′ and B′ the "back" leg. Permanently affixed to the top of the section A is a short platform *e*, mounted on joists *f f*, rigidly attached at their front ends to the side rails *a* of said section. Braces *g g* extend from the rear terminals of the joists *f* to the uppermost step *b* of the section A to assist in supporting said joists and the platform *e*. The back leg is pivotally attached to the joists *f* by means of a pivot pin or bolt *h*, passing through holes in the upper ends of the side rails *a* of the section A′ and through holes in said joists and in the braces *g*. One terminal of the bolt *h* is screw-threaded to receive a thumb-nut *i* outside of the adjacent rail *a*. The bolt *h* permits the legs to be swung toward and away from each other. Upon the removal of the thumb-nut *i* from the bolt *h* the latter can be withdrawn from the joists *f* and section A′, so as to allow the back leg to be removed and the step-ladder to be converted into two extension-ladders or two independent step-ladders, as desired.

On the under side of each top and bottom step *b* is a button *j*, arranged and adapted when turned crosswise of the step to project inward beyond the same. Two stirrups *k* are secured on the inner edge of each side rail *a* near the top and bottom, the inwardly-projecting curved portions thereof being adjacent the rear edges of the uppermost and lowermost steps *b*. These stirrups are designed to fit onto the rungs *d* and the buttons *j* to engage the under sides of said rungs, as will be clearly seen upon referring to the drawings. Angular plates or clasps *l* are fastened to the side rails *c* of the sections A′ and B′ near their upper terminals and extend outwardly to receive the sections A and B. It

will now be seen that when either of the lower buttons *j* is turned out of the way of the rungs *d* of the adjacent section B or B′ said section can be easily separated from the upper section in the same leg sufficiently for said rungs to clear the associated stirrups *k*, moved up or down, accordingly as it is desired to shorten or lengthen the leg the requisite distance, and then again secured by clasping the proper rung between said stirrups and button. There is sufficient looseness between the clasps *l* and the upper sections to permit of the required amount of separation between such upper sections and the lower sections so that the latter can be moved without their rungs catching upon the lower stirrups except at the proper time. The fastening means for the two sections of each leg just described is very safe and secure, although simple and inexpensive. With the bolt *h* removed and the leg-sections unlocked said sections can be separated into four independent ladders.

Some suitable means, as the ordinary hooks *m* and *m′* and staples *n*, may be provided for holding the legs of the step-ladder in place after being properly positioned and preventing them from further spreading apart.

In Figs. 1 and 2 the lowermost rungs *d* of the two sections B and B′ support the sections A and A′ through the medium of the bottom stirrups *k*, the clasps *l* assisting, the bottom button *j* in this, as in all cases, merely serving to prevent the engaging rungs and stirrups from becoming accidentally disconnected either while the device as a whole is being moved or at other times. In Fig. 3 the third rung from the bottom of the section B forms the support in front and the lowermost rung of the section B′ forms the support behind, thus producing a step-ladder with legs of unequal length adapted to stand upon different levels. The arrangement in Fig. 7, where the supporting-rungs front and back are the second from the bottom of the section B and the lowermost of the section B′, respectively, also produces a step-ladder with legs of unequal length, but which are adapted to stand on the same level, the back leg being vertical. Both legs are equally extended in Figs. 5 and 6, or substantially so, but not as much as they might be, into at least one rung front and back.

After disconnecting the legs each can be converted into a step-ladder by engaging the uppermost rung of the section B with the top stirrups *k* on the section A and the uppermost rung of the section B′ with the top stirrups *k* on the section A′, the top buttons *j* being now brought into service to prevent accidental displacement of the parts. By preference the section B is turned about, and so also is the section A′, in order to bring the clasps *l* into play as stops, as shown in Fig. 4, thus doing away with any need of hooks, since one pair of said clasps contacts with the platform *e* and the other pair with the upper terminals of the rails *a* of said section A′. It will be seen that one leg of each of these step-ladders is provided with steps and the other with rungs. A board or platform *o* is laid on the aforesaid independent step-ladders to form a staging.

No hooks or other equivalent fastening devices are required when the step-ladder is employed either as shown in Fig. 3 or Fig. 7.

It is a great advantage to have steps on both sections of the step-ladder upon which a person can stand to work—that is, the two upper sections—since two persons are thus enabled to stand comfortably thereon or one can work conveniently from either the front or back side thereof.

It is clear that the step-ladder can be arranged in various other forms and made the subject of various other changes in addition to those illustrated, and it will be understood that much of its value resides in the many and different uses to which it is applicable.

I am aware that extension step-ladders have been produced before and do not seek to claim such a step-ladder, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. A convertible extension step-ladder comprising four sections adapted to be separated one from another, two of such sections being provided with stirrups and the other two sections with clasps, whereby two independent step-ladders may be formed out of the four sections, in the manner substantially as shown.

2. The combination, in a step-ladder, of two upper sections having steps, a platform rigidly attached to one of such sections, removable pivotal means for securely connecting the free end of said platform to the upper end of the other section and for releasing the same, two lower sections having rungs, stirrups on said upper sections adapted to bear upon the lower section-rungs, and clasps on said lower sections adapted to receive the upper sections.

3. The combination, in a step-ladder, of two upper sections having steps, a platform rigidly attached to one of such sections, removable pivotal means for securely connecting the free end of said platform to the upper end of the other section and for releasing the same, two lower sections having rungs, stirrups at or near both terminals of said upper sections adapted to bear upon the lower-section rungs, and clasps at or near the upper terminals of said lower sections adapted to receive the upper sections.

4. The combination, in a step-ladder, with

two ladder-sections arranged for pivotal attachment and provided with stirrups adapted to fit over rungs and with buttons adapted to engage such rungs from below, of two other ladder-sections provided with clasps adapted to receive said two first-mentioned sections.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEONARD M. NORTON.

Witnesses:
J. M. STERNS,
F. A. CUTTER.