L. C. BOYINGTON.

EXTENSION-LADDERS.

No. 195,440. Patented Sept. 25, 1877.

Fig. 1

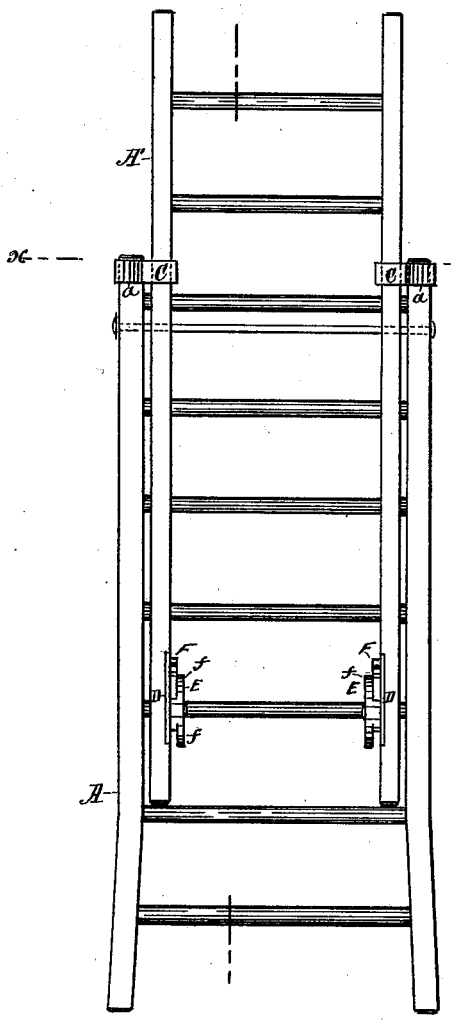


Fig. 2

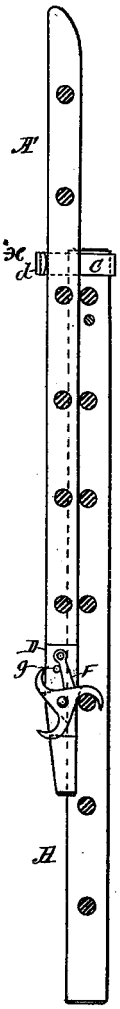
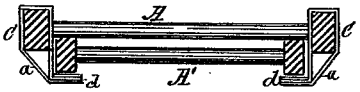


Fig. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEVI C. BOYINGTON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN EXTENSION-LADDERS.

Specification forming part of Letters Patent No. **195,440**, dated September 25, 1877; application filed June 20, 1877.

To all whom it may concern:

Be it known that I, LEVI C. BOYINGTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Extension-Ladders; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 represents a front elevation of an extension-ladder embodying my said invention. Fig. 2 represents a transverse sectional elevation of the same, and Fig. 3 represents a sectional plan of the same taken on the line *x x* drawn across Fig. 1.

Like letters of reference indicate like parts.

My invention relates to that class of ladders formed of two or more sections coupled together, and so arranged as to admit of being adjusted to lengthen or shorten the same at will; and my invention consists in the means employed for holding the movable section at any requisite adjusted point when extended, and in the novel construction of the stirrup employed to connect the upper section to the lower section, as will be more fully set forth in the following description and claims.

In the drawing, A represents the lower section of the ladder, and A′ the upper section, both of which are constructed in the usual manner, and so that the width of the section A shall exceed the width of the section A′ sufficient to allow the side rails of the section A′ to rest against the rounds and between the side rails of the section A, as shown in Fig. 1.

C C are metal stirrups, which are permanently attached to the upper end of the side rails of the lower section A, as shown in Fig. 3. These stirrups are each made of a single piece of flat iron bent in a quadrilateral shape, so as to fit against the sides and back of the side rails of the section A and extend forward from the said side rails, as shown in Fig. 3, and the ends of the side bar are welded together so as to produce a bracket, *d*, extending inward toward the center of the section, and in a plane parallel with the plane of the front edge of the side rails. These brackets are each rounded off on the back, and are located at a proper distance forward of the upper round of the lower section A, to allow the side rails of the section A′ to pass loosely between them and the said round, as shown in Fig. 3.

The object of making the stirrups in quadrilateral form is to cause the part *a* to form a brace to the bracket, and thereby greatly increase the strength of the same; and the object of rounding off the back of the bracket is to reduce the frictional surface bearing against the side rails of the section A′, and thereby rendering the same more easily raised or lowered.

D D represent metal plates, which are permanently attached to the inner sides of the side rails of section A′, near the lower end of the same. E E are ratchet-wheels, which are journaled to the plates D D, respectively, and are so arranged as to freely revolve. These ratchet-wheels are each provided with a series of hooks, *f*, which are so arranged as to engage with and partly encircle the respective rounds of the section A, by which means the section A′ is firmly held at any adjusted height when the ratchet-wheels are held in a fixed position.

F F are pawl-levers, which are pivoted to the upper end of the plates D D, respectively, and so arranged as to engage with the ratchets on the outer side of the wheels E E, by which means the said wheels are prevented from being turned backward. A stop-pin, *g*, is secured to each plate, above the ratchet-wheels, and at the proper point to prevent the pawl from moving forward so as to be disengaged from the ratchet-wheels when the pawl is back of the pin, and to hold the pawl from contact with the ratchet-wheel when the pawl is thrown forward and upon the pin, as shown by dotted lines in Fig. 2.

In elevating the upper section, the wheels E E are turned forward by their friction against the rounds of the section, and are locked by the pawl as they pass the respective rounds, so that the hooks will engage or take over the round last passed and hold the section A′ from descending; and when necessary to lower the upper section, the pawls are thrown forward upon their respective stop-pins, when

the wheels can readily turn back so as to allow the said section to descend.

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

1. The combination, with the sections A and A′ of an extension-ladder, of the quadrilateral-shaped stirrups C C, each so constructed that one of the sides thereof will rest against the outer side of the movable section and inner side of the stationary section, and provided with the bracket *d*, having the rounded surface arranged to bear against the front edge of the side rails of the movable section, substantially as and for the purpose specified.

2. The combination, with the side rails of the movable section A′, of the pawl F F and the revolving ratchet-wheels E E, provided with the hooks *f*, to engage the rounds of the lower section A, substantially as and for the purpose described.

3. The combination, with the side rails of the section A′ and the rounds of the lower section A, of the plates D D, ratchet-wheels E E, pawl F F, and stop-pins *g g*, substantially as and for the purposes described.

The above specification of my invention signed by me this 14th day of June, 1877.

LEVI C. BOYINGTON.

Witnesses:

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