

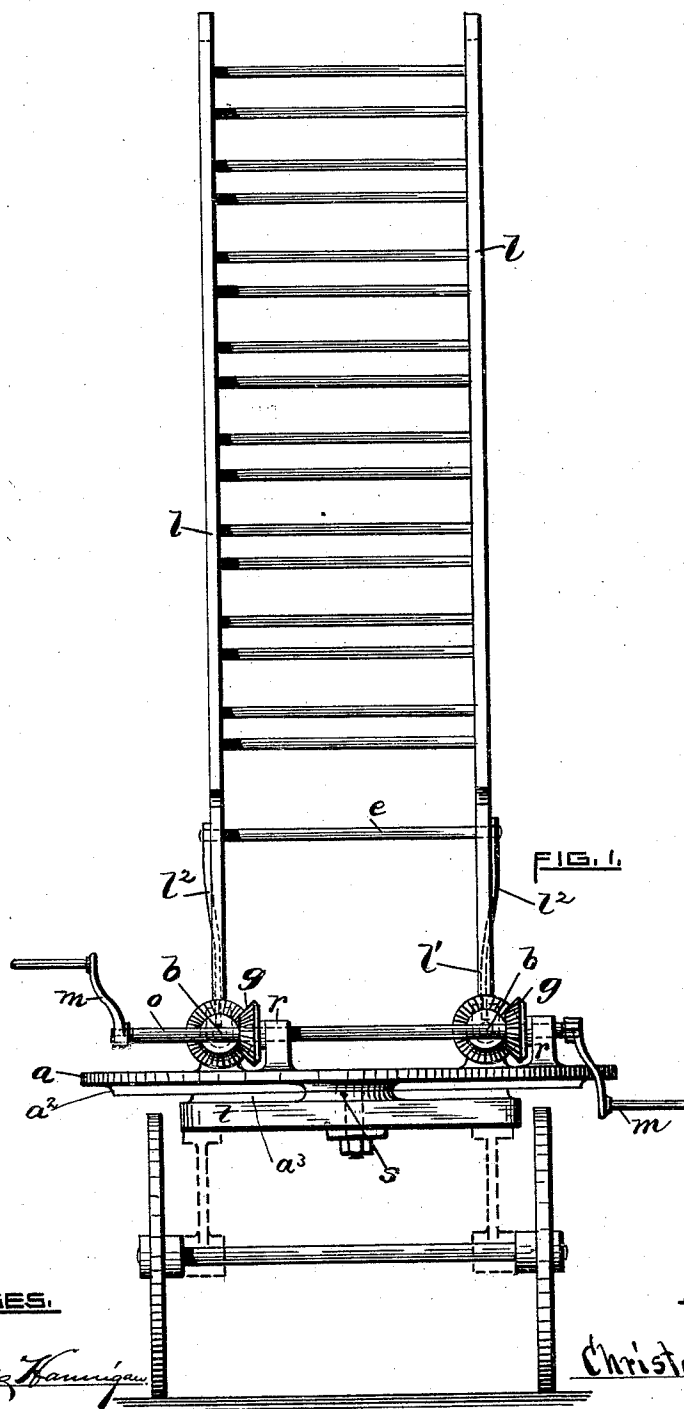
(No Model.)

2 Sheets—Sheet 1.

C. B. LITTLE.
FIRE LADDER.

No. 415,873.

Patented Nov. 26, 1889.



WITNESSES.

Charles Hannigan

Charles W. Broadman

INVENTOR.

Christopher B. Little

by Remington Henthorn
Atty.

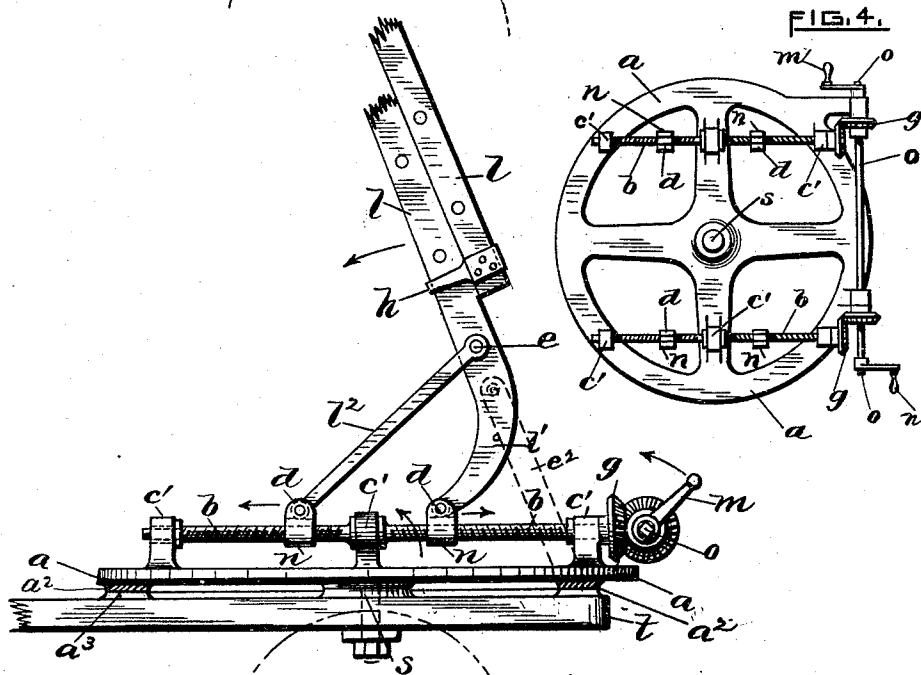
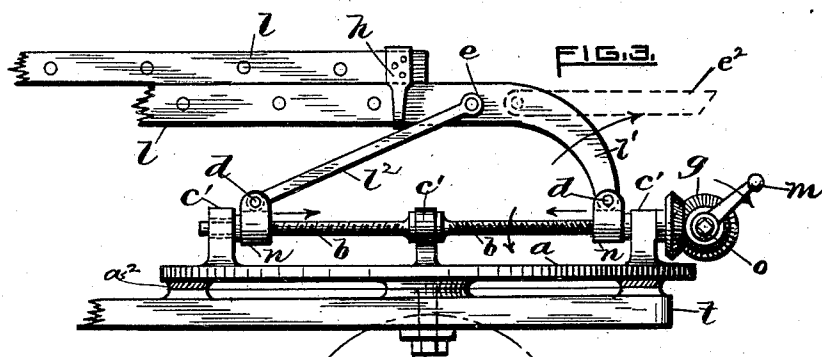
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WITNESSES.

Charles Hannigan,

Charles W. Boardman

INVENTOR.

Christopher B. Little.

By Remington & Ventron
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UNITED STATES PATENT OFFICE.

CHRISTOPHER B. LITTLE, OF PROVIDENCE, RHODE ISLAND.

FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 415,873, dated November 26, 1889.

Application filed August 24, 1889. Serial No. 321,846. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER B. LITTLE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Fire-Ladders; 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, and to letters of reference marked thereon, which form a part of this specification.

The improvement forming the subject of my present invention relates more particularly to extension fire-ladders; and it consists, essentially, of a swivel base-frame having two mounted suitably-operating and oppositely-screw-threaded shafts, combined with nuts fitted thereon, adapted to travel in opposite directions, and a ladder jointed to the nuts, as will be more fully set forth and claimed.

The object of my improvement is to furnish firemen with means for quickly raising and lowering ladders, the device being strong and safe and at the same time simple in the manner of its operation. It is well known that apparatus of this character or class should be so constructed that when an emergency arises requiring its use it can be operated with ease and facility.

In the accompanying two sheets of drawings, illustrating my improvements, Figure 1 represents a front elevation of a ladder raised to nearly a vertical position through the medium of my elevating apparatus. Fig. 2, Sheet 2, is a side view. Fig. 3 is also a side view, the ladder, however, being in its normal position preparatory to being elevated; and Fig. 4 is a plan view of the apparatus in reduced scale, the ladder being omitted.

The following is a detailed description of my improved ladder-elevating apparatus, including the manner of its operation.

t indicates a portion, say, of the frame of the common form of truck of a fire-ladder.

a designates a base mounted to swivel upon the frame *t* by means of a central pin *s*. The under side of the base is provided with a cir-

cular flange or projection *a*² adapted to engage a like flange or lugs *a*³, secured to the upper side of the frame *t*. The upper face of the base is provided with two series or 55 bearings *c*¹, arranged parallel with each other, and having the two screw-threaded shafts *b* mounted therein, (see Fig. 4,) each shaft having both right and left screw-threads and being separated from each other horizontally by 60 a distance substantially equal to the width of the ladder. A nut *n* is fitted to each threaded portion, and is provided with ears at its upper side, through which a pin *d* passes to engage the ladder. The ladder *l* may be of 65 usual construction, except that the lower end or heel portions *l'* of the ladder-frame is preferably bent, the bottom end being jointed to the forward nuts *n*, which are fitted to travel back and forth, say, on the right-hand 70 threads of the shafts *b*. The other nuts in like manner travel on the left-hand threaded or rear portion of the shafts, and are jointed to strong links *l*², which in turn are jointed to the lower portion of the ladder at *e*. A 75 gear *g* is secured to the forward end of each shaft *b*, which mesh into similar gears secured to a transversely-mounted shaft *o*, the latter being provided with cranks *m* for revolving it. 80

From the foregoing it is obvious that upon turning the cranks in the arrow direction, Fig. 3, the two oppositely-threaded shafts *b* will be caused to simultaneously revolve, 85 thereby forcing the nuts *n* toward each other, the forward nuts acting to draw the lower end of the ladder in a horizontal direction toward the center bearings, the other nuts acting at the same time through the medium 90 of the links *l*² to elevate the ladder. A continued movement of the cranks elevates the ladder to the position shown in Figs. 1 and 2. A reversal of the crank's movement (see arrows, Fig. 2) will return the ladder from the elevated position shown to that represented 95 in Fig. 3—*i. e.*, its normal position.

I make no claim to mechanism for extending the ladder, nor to a ladder made in sections adapted to be operated successively, as obviously any sectional ladder of well-known 100 construction may be employed, the only change being in adapting its lower end to

properly connect with the forward nuts, and providing links l^2 , which are also jointed to the ladder-frame and rear nuts.

By means of the swivel or center pin s the ladder when elevated can be readily swung around to any desired position.

By means of braces attached to the lower portion of the ladder it may be steadied in position when in use. In the drawings I have shown by dotted lines braces or struts e^2 for such purpose, the same being represented as attached to the ladder by pivots.

I claim as my invention—

1. A ladder-elevating apparatus having two mounted shafts b , each provided with right and left screw-threads, nuts fitted to the threaded portions, a ladder having its lower end jointed to two of said nuts, links jointed both to the ladder and to the other nuts, and mechanism for simultaneously revolving the screw-threaded shafts, substantially as hereinbefore set forth.

2. A ladder jointed at its lower end to two nuts fitted to the forward portion of two simultaneously-operated mounted screw-threaded shafts b , and further provided with links jointed to the ladder above the lower end, and also jointed to two nuts fitted to the rear or oppositely-threaded portion of said shafts, substantially as hereinbefore described, and for the purpose set forth.

3. The combination of the ladder l , having its lower portion bent, as at l' , and jointed to two forward nuts n , adapted to simultaneous movement, side links l^2 , jointed both to the ladder-frame and to two rear nuts n , two mounted oppositely-screw-threaded parallel shafts b , having said nuts mounted

thereon, mechanism for operating the shafts b , and struts or braces, as e^2 , attached to the lower portion of the ladder, substantially as hereinbefore described.

4. The combination, with a wheeled truck, of a base plate or frame swiveling thereon, having two mounted oppositely-screw-threaded simultaneously-operating shafts b , provided with two series of nuts arranged to travel on the shafts, a ladder jointed to one series of said nuts, and links connecting the ladder with the other series of nuts, all constructed, arranged, and adapted for operation, whereby the revolution of said shafts in one direction causes the nuts to travel simultaneously toward each other to elevate the ladder, and a reverse movement depresses the ladder to its normal position, substantially as shown and hereinbefore described.

5. The ladder-elevating apparatus hereinbefore described, consisting of the mounted base-frame, the two oppositely-screw-threaded shafts b , mounted to revolve in end and center bearings, a mounted transverse shaft o , and gearing for simultaneously revolving the shafts b , forward and rear nuts fitted to the screw-threads, a ladder having its frame bent at the lower end and jointed to the forward nuts, and links jointed both to the ladder and the rear nuts, all arranged and operating substantially as shown and set forth.

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

CHRISTOPHER B. LITTLE.

Witnesses:

CHARLES HANNIGAN,
GEO. H. REMINGTON.