

A. P. BOYER.
EXTENSION LADDER.
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1,059,340.

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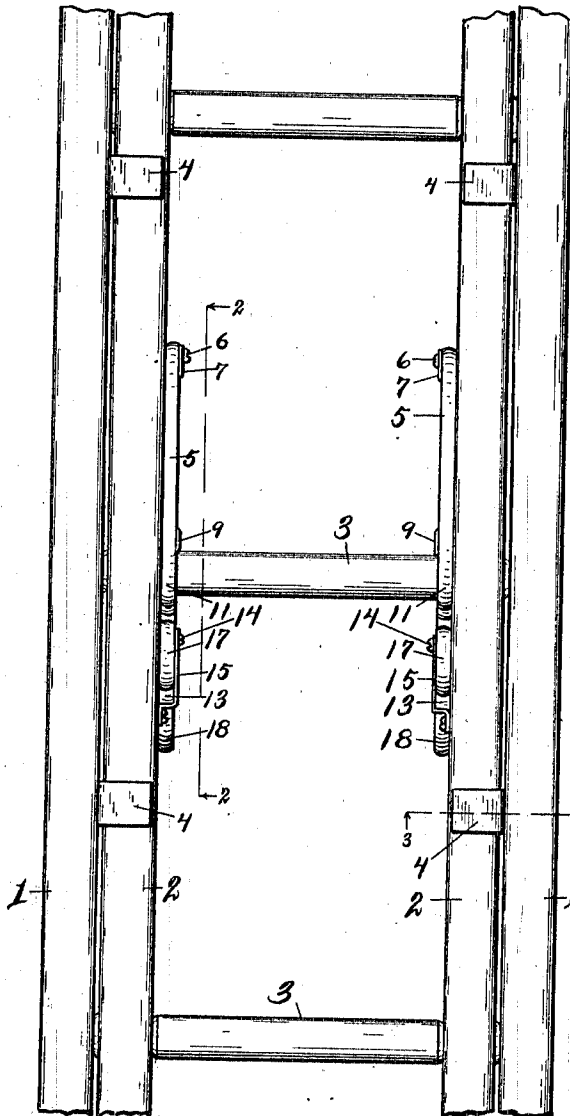


Fig. I.

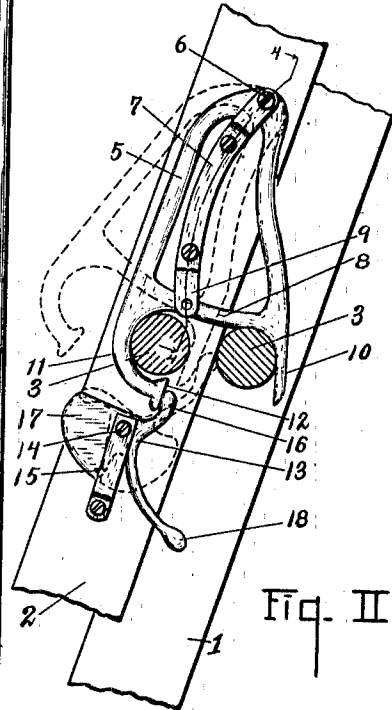


Fig. II.

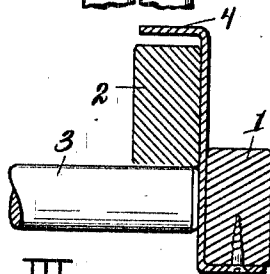


Fig. III.

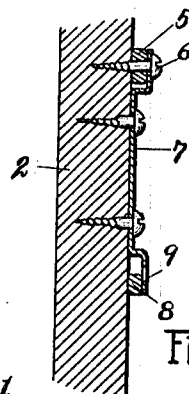


Fig. IV.

Witnesses

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UNITED STATES PATENT OFFICE.

ALLEN P. BOYER, OF GOSHEN, INDIANA.

EXTENSION-LADDER.

1,059,340.

Specification of Letters Patent.

Patented Apr. 22, 1913.

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To all whom it may concern:

Be it known that I, ALLEN P. BOYER, a citizen of the United States, residing at Goshen, Indiana, have invented certain new and useful Improvements in Extension-Ladders, of which the following is a specification.

This invention relates to improvements in extension ladders.

The objects of this invention are to provide an automatic locking device for extension ladders, which is simple in structure and of such a character as to insure complete and effective automatic operation.

Further objects relating to economies of construction, and details of operation, will definitely appear from the description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure showing a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a detail elevation view of the parts of an extension ladder necessary to understand my improvements. Fig. II is a detail sectional elevation on line 2—2 of Fig. I, showing the ladder in inclined position. Fig. III is an enlarged transverse sectional view, taken on a line corresponding to line 3—3 of Fig. I, showing a detail of the guide brackets. Fig. IV is a detail sectional view on the curved line 4—4 of Fig. II, showing the guiding means.

In the drawing, the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar numerals of reference refer to similar parts throughout the several views.

Referring to the numbered parts of the drawing, the lower section 1 of the ladder carries the upper or extension section 2, which rests upon the rungs 3 thereof, and is retained in place by guide brackets 4—4, which clearly appear in Figs. I and III, as many brackets 4 being provided as are necessary to efficiently guide the upper or extension section. On the upper or extension

section, I provide the automatic locking member 5, pivoting the same at 6 with a suitable curved retainer 7 to effectively keep the same in place, the lower end 9 of which serves as the guide for the lock. The hook is provided with a guiding cross bar 8 engaged by the guide 9 above mentioned. The lock is provided with a downwardly-engaging finger 10, which engages over the rung of the bottom section of the ladder to lock the extension in elevated position, and is provided with a downwardly-projecting hook finger 11, which embraces the rung of the upper or extension section 2, and has an enlarged head portion 12 at the end to be acted upon by the trip device.

The trip device 13 is pivoted at 14, and has a retainer 15 to protect the same and retain it in place, and to serve as a stop to limit its movement and insure its remaining in operative position. A finger or arm of the trip, 16, projects in proximity to the head end 12 of the hook finger 11, to act upon the same, and a weight 17 is opposite the same which normally depends downward and brings the tip into operative position.

A finger 18 from the trip device extends, owing to the action of the weight 17, normally beyond the back edge of the side rail of the upper or extension section, so that it will be contacted and acted upon by the rungs 3 of the bottom section when the extension section is moved up and down in passage. It will be seen that in manipulation, the upper or extension section can be readily raised to any height desired, and by stopping the same when the lock finger 10 has dropped past one of the rungs 3 of the bottom section, the lock will readily engage the same. Whereas, if the extension section is raised so that the finger 18 passes and extends above any rung 3 of the bottom section, when the extension section is lowered, this finger acts as a lever and guard and when it comes in contact with the rung of the lower section as it descends, throws the lever 16, acts on the hook at 12 and raises up until the lever 18 comes in contact with the hook finger at 10 and thus prevents the locking process by means of the double action, owing to the fact that the finger 18 swings upwardly against the hook

10, the extension section can be readily lowered to any point desired. When the finger guard 18 is acted on by the lowering of the upper section so that the rungs of the lower section raise the same, the finger 16 first acts and partially throws the lock so that when the finger 18 strikes the lock finger 10 it is already partially depressed and very easily engaged and operated, by a comparatively short finger. I am able to use a short lever or guard that is entirely protected by the rails of the ladder. The device is thus very compact without any objectionable long fingers to bend and break. The upper or extension section is manipulated by hand, or by any suitable means not necessary to illustrate.

I have shown my improved structure with a weight 17 for holding the trip member normally in the required position, and this is the preferred construction, but it will be readily understood that a similar trip can be provided with other means for retaining it normally in the operative position. I have shown the preferred form.

My improved lock can also be manipulated by other devices and it will be found to be very effective because it completely and effectively locks the upper or extension section to the main section by embracing the rungs of the ladder and is of such form that it is readily manipulated, and is a very effective and strong lock.

I show the operating trip device provided with two operating fingers for engaging the lock successively. This makes a compact structure possible and avoids long fragile parts.

I have shown the parts made as light as possible, and consequently have provided extra retainers for the parts so that they will remain effectively in position. These features, however, can be modified at the pleasure of the user.

By forming the parts as indicated, illustrated and described, the parts are interchangeable, rights and lefts, for either side. A pair of locks is provided on each extension.

From these statements, it will be observed that my improved structure is capable of considerable modification without departing from my invention, which is clearly defined and pointed out in the claims.

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

1. An extension ladder comprising a lower section and an upper or extension section, consisting each of suitable side rails and rungs, suitable guides for retaining the extension section in place, a pivoted lock on the side rail of the upper or extension section, having a suitable guide cross bar

thereon, and downwardly-depending hook portions to engage and couple the sections together by embracing the adjacent rungs thereon, an enlarged head on the hook that embraces the rung of the upper or extension section, a weighted trip lever for acting upon the said head of the hook members, with one finger adapted to act upon the lock to swing the same partially out of engagement with the main section, and a second finger extending normally beyond the side rail of the upper or extension section to contact with the rungs of the lower section for throwing the lock into the disengaged position, disposed to swing and cover the engaging hook to permit the extension section to descend after being raised past any particular rung, coacting for the purpose specified.

2. An extension ladder comprising a lower section and an upper or extension section, consisting each of suitable side rails and rungs, suitable guides for retaining the extension section in place, a pivoted lock on the side rail of the upper or extension section, having a suitable guide cross bar thereon, and downwardly-depending hook portions to engage and couple the sections together by embracing adjacent rungs thereof, an enlarged head on the hook that embraces the rung of the upper or extension section, a trip to act on said head to throw said lock to the inoperative position, and a guard finger to close over the said lock, as specified.

3. In an extension ladder comprising upper and lower sections, the combination of a hook lock on the upper or extension section, having a plurality of downwardly-projecting arms that act automatically and successively on the rungs of the lower section, the upper arm of which has an enlarged end; and a double acting trip and guard pivoted on said upper section and having a plurality of arms corresponding to the arms of the hook lock that act on said hook lock arms successively, the lower of which arms extends into and is disposed in the path of travel of the rungs of the lower ladder section and is disposed to engage the lower arm of the hook lock after it has been moved by the action of said trip to guard the same and permit adjustment, as specified.

4. In an extension ladder comprising upper and lower sections, the combination of a hook lock on the upper or extension section, having a plurality of downwardly-projecting arms that act automatically and successively on the rungs of the lower section; and a double acting trip and guard pivoted on said upper section and having a plurality of arms corresponding to the arms of the hook lock that act on said hook lock arms successively, the lower of which arms extends

into and is disposed in the path of travel of the rungs of the lower ladder section and is disposed to engage the lower arm of the hook lock after it has been moved by the action of said trip to guard the same and permit adjustment, as specified.

In witness whereof, I have hereunto set

my hand and seal in the presence of two witnesses.

ALLEN P. BOYER. [L. S.]

Witnesses:

L. G. GREENFIELD,

M. L. GLASGOW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
