

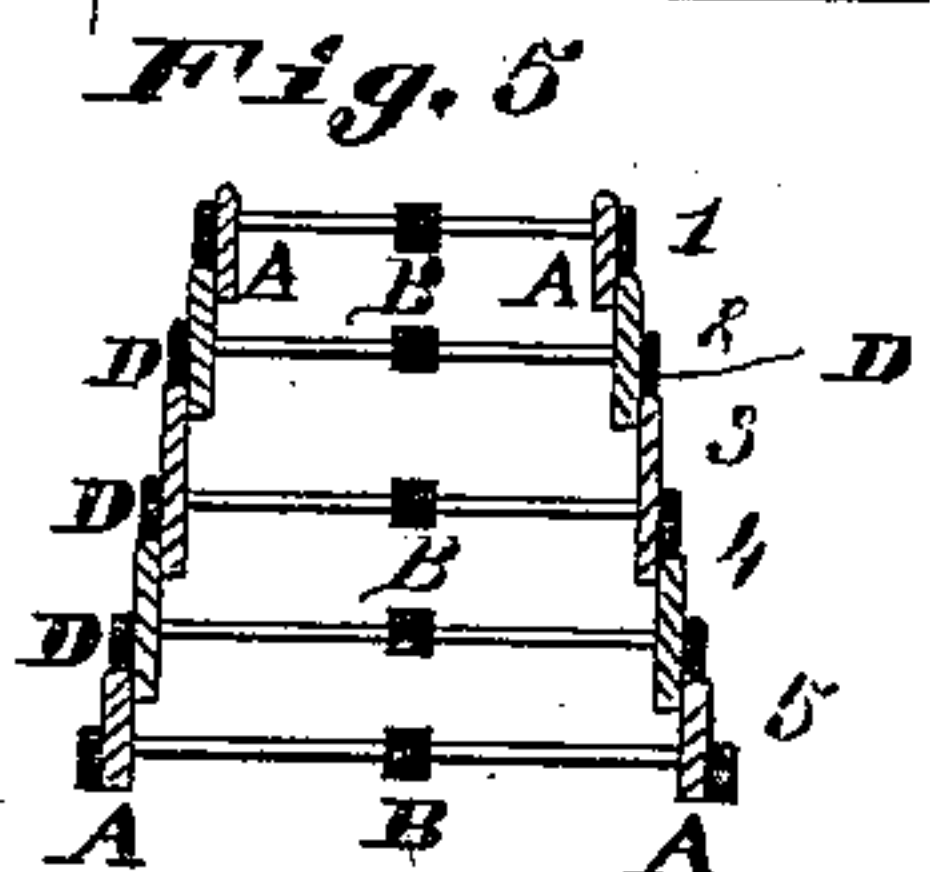
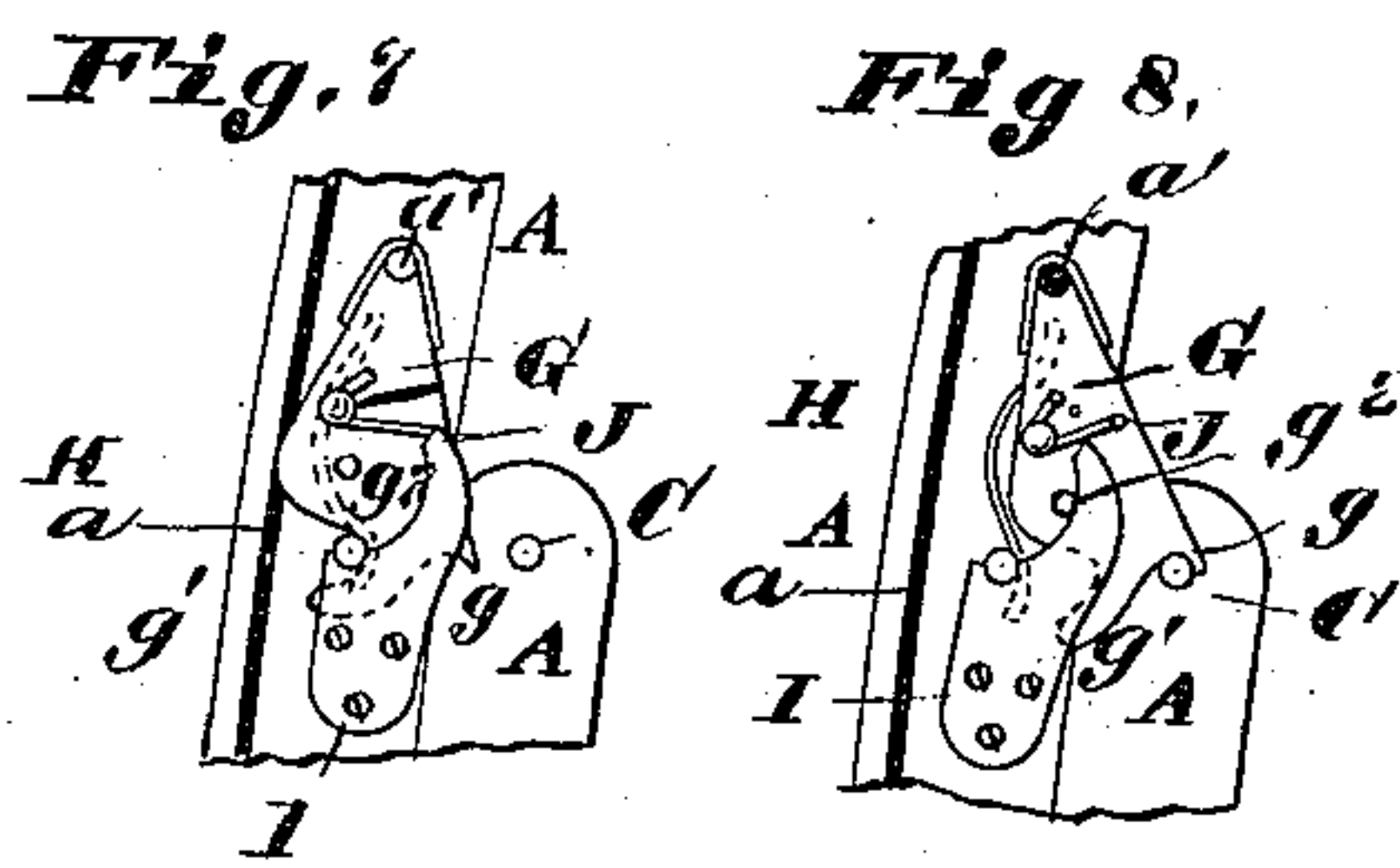
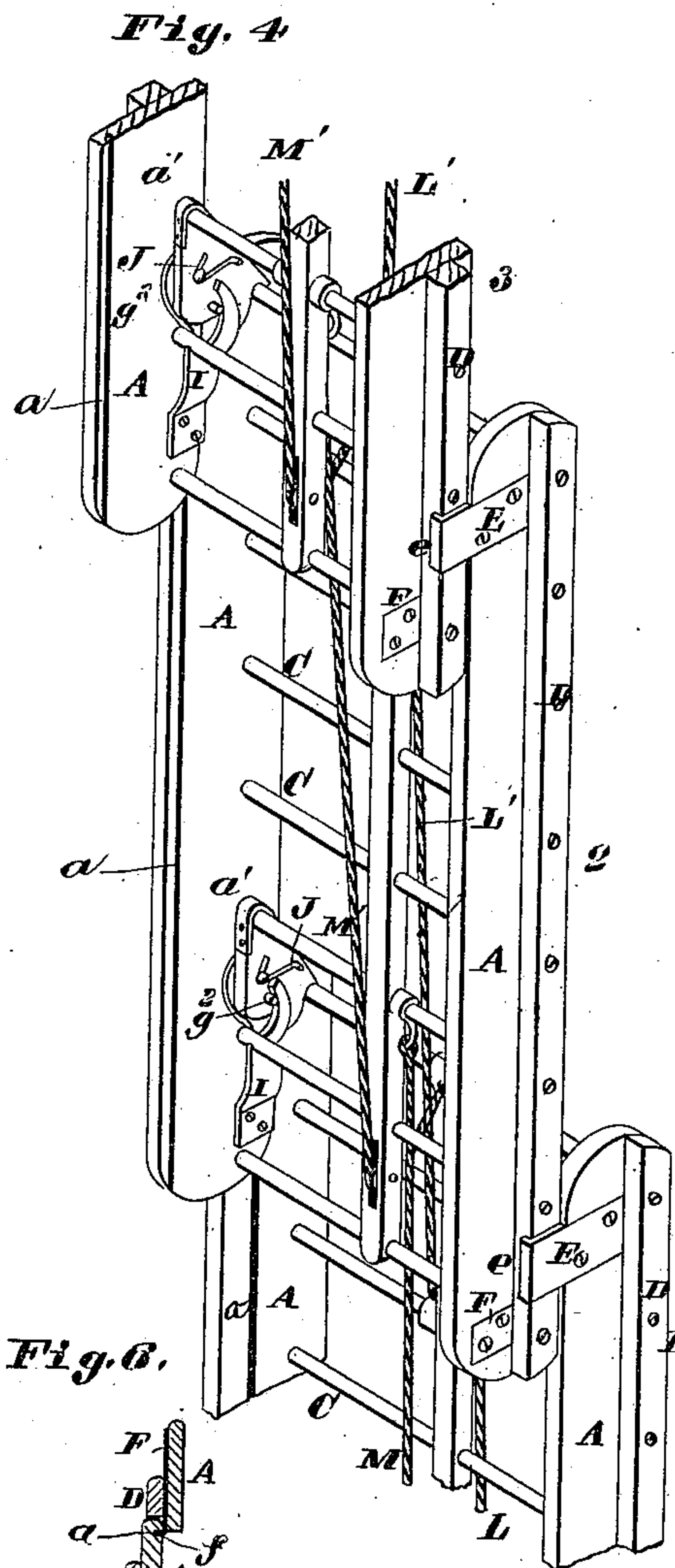
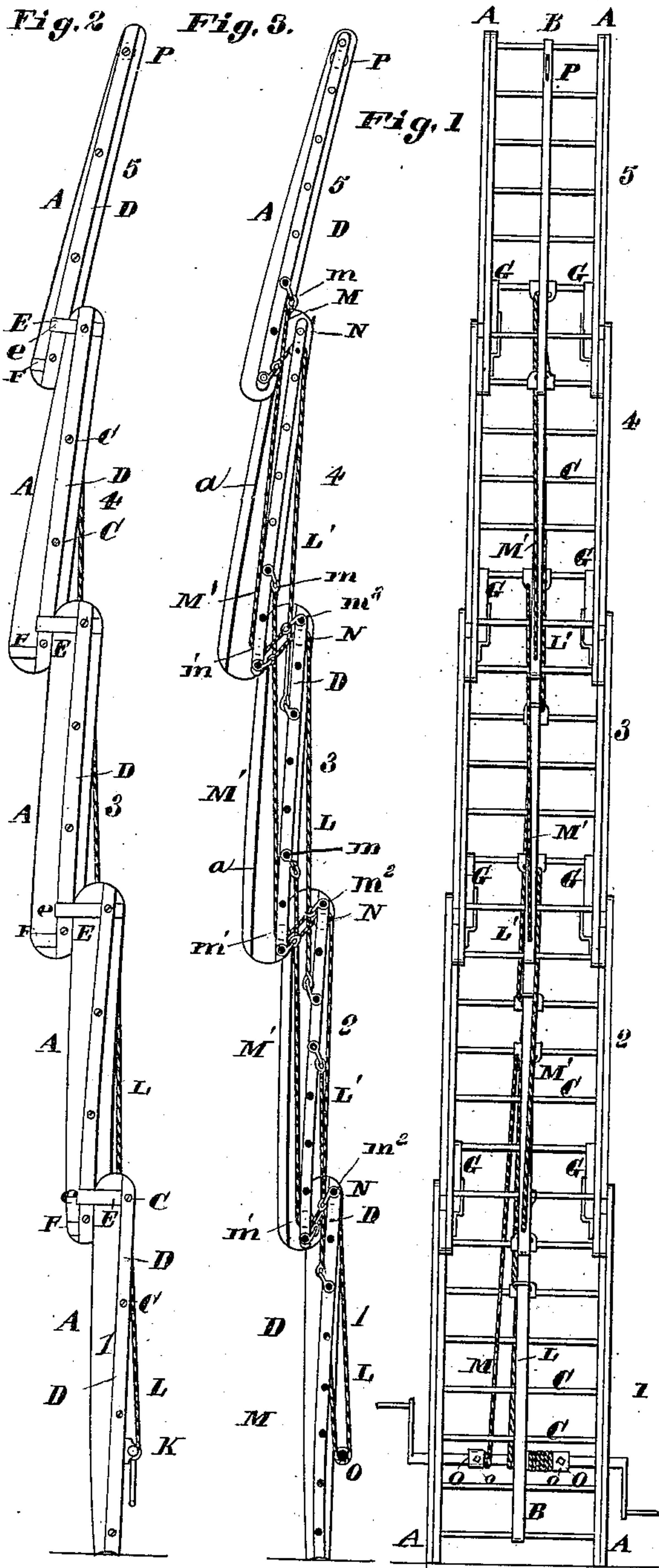
(No Model.)

S. S. THOMPSON.  
EXTENSION LADDER.

2 Sheets—Sheet 1.

No. 309,997.

Patented Dec. 30, 1884.



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Wm. J. Jagers.

Inventor,  
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(No Model.)

2 Sheets—Sheet 2.

S. S. THOMPSON.

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Fig. 10 Fig. 11. Fig. 9.

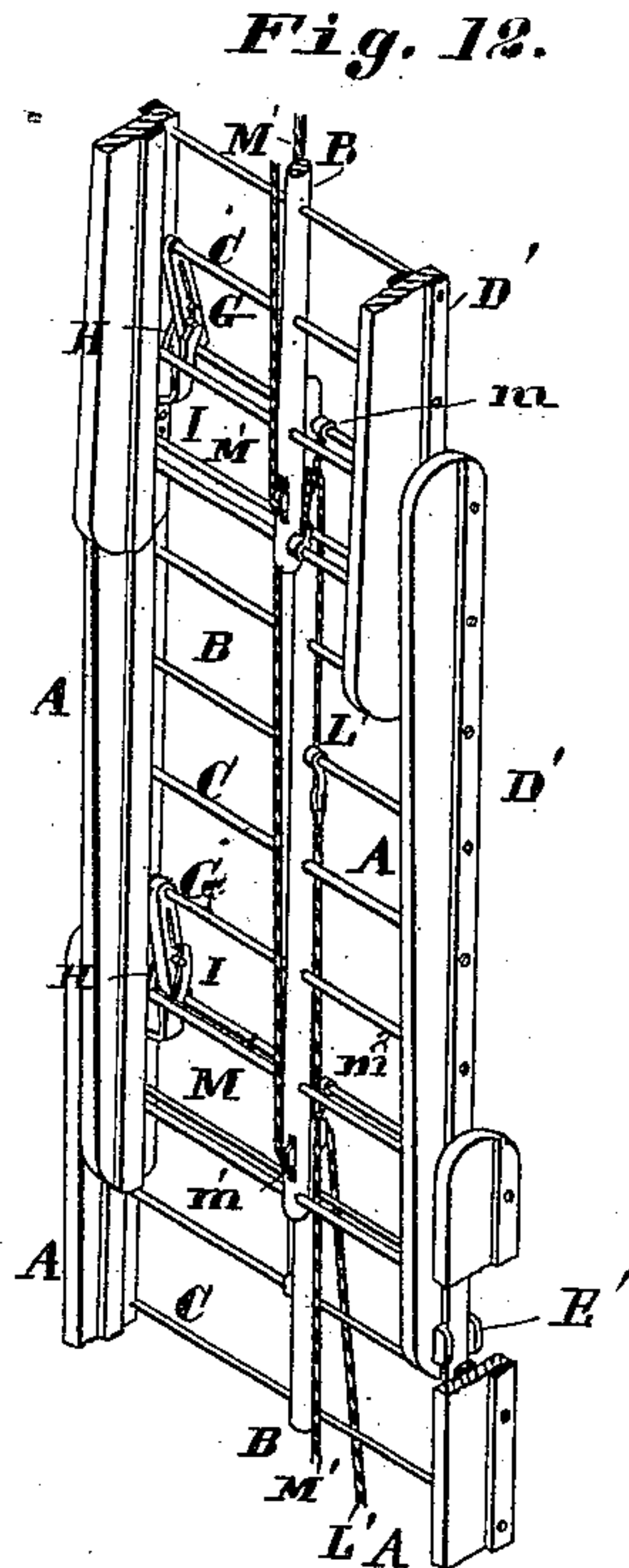
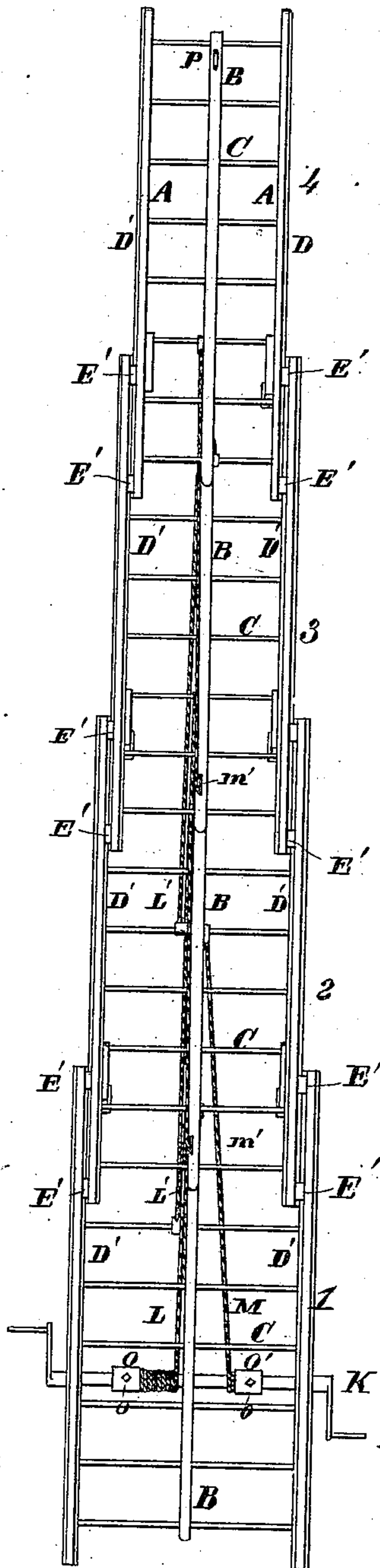
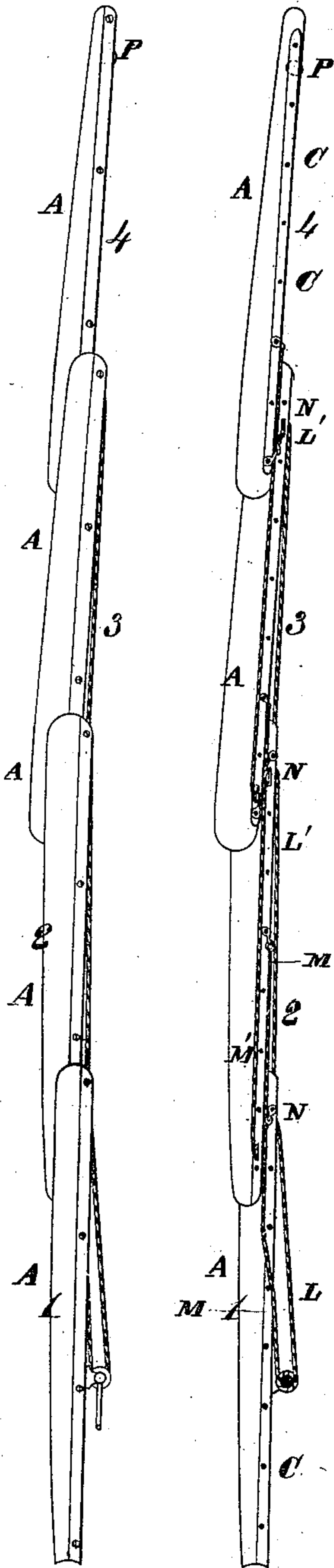


Fig. 14.

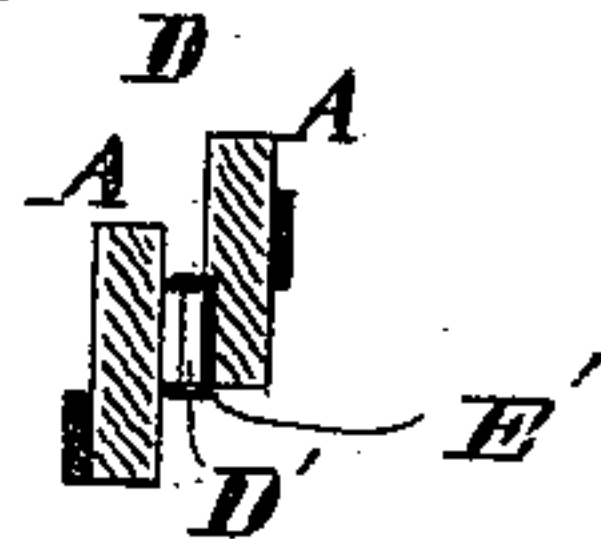


Fig. 15.

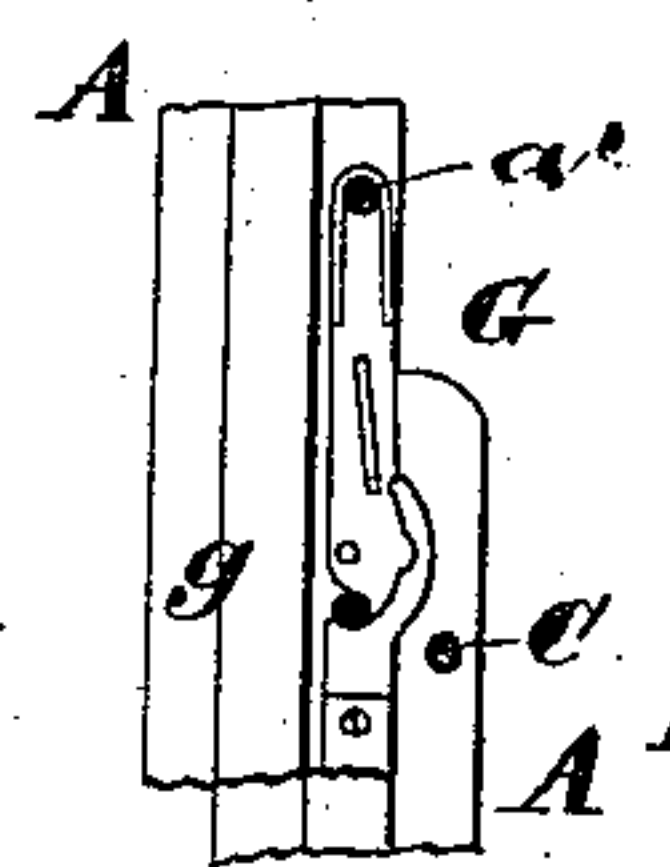


Fig. 16.

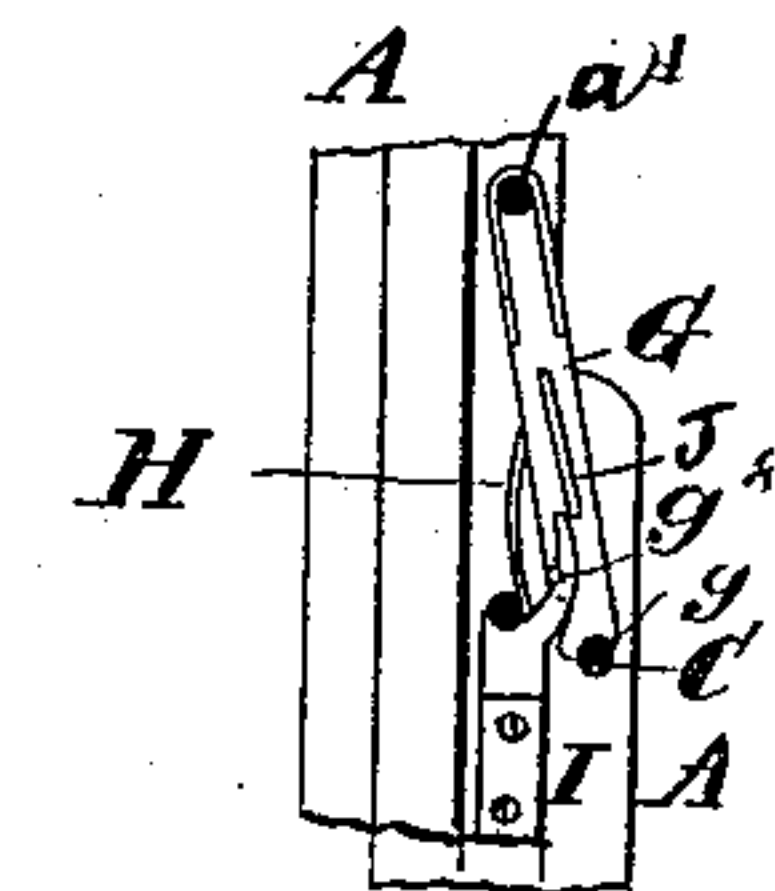


Fig. 13.



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# UNITED STATES PATENT OFFICE.

SALATHIEL S. THOMPSON, OF SAN FRANCISCO, CALIFORNIA.

## EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 309,997, dated December 30, 1884.

Application filed October 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, SALATHIEL S. THOMPSON, of the city of San Francisco, in the county of San Francisco and State of California, have invented a certain new and useful Improvement in Extension-Ladders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvement relates to that class of ladders in which the sections of which the ladder consists slide together, and are elevated by a windlass upon the lower or ground section.

My improvement is set forth in the claims.

Figure 1 is a front view of the ladder in its extended condition, and Figs. 2 and 3 are respectively a side view and a central vertical section of the same. Fig. 4 is an enlarged detail perspective view. Fig. 5 is a transverse section of the ladder in its contracted condition. Fig. 6 is a detail section showing the inside cleat-connection between the sections. Figs. 7 and 8 are detail side views showing the supporting-catch by which each section is sustained when raised, the catch engaging on a round of the section beneath. In Fig. 7 the supporting-catch is shown held back by a spring-catch, and in Fig. 8 it is shown engaged.

The following figures relate to modifications in the construction of the ladder. Fig. 9 is a front view in its extended condition. Fig. 10 is a side view thereof. Fig. 11 is a central vertical section of the same. Fig. 12 is a detail perspective view. Fig. 13 is a transverse section of the ladder in its contracted condition. Fig. 14 is an enlarged transverse section showing the slide-connection between the side bars or stiles of two sections. Figs. 15 and 16 are detail side views showing a supporting-catch disengaged in Fig. 15 and engaged in Fig. 16.

Each section consists of two side bars or stiles, A, and a central strengthening-stile, B, extending the length of the section, giving bearing to the pulleys and staples or eyes for the ropes by which the sections are raised. The stiles are connected by horizontal rounds, as usual, and shown at C.

In order to give to the middle of the ladder a

greater amount of rigidity than is required at the end portions, each section is made broader at the end nearer to the middle, the middle section being made of equal breadth from end to end, or larger at middle. The stiles A of each section are made to slide within the stiles of the section beneath, and have upon their outer sides strips D, that slide upon the outer edge of the stiles beneath. The strips D are connected to the sides over the ends of the rungs by means of screws inserted in the ends of the rungs. The sections are held together by sliding clamps upon the inside and outside. The outside clamps, E, are attached to the lower section, and have a lip, e, engaging over the edge of the strip D, while the inside clamps, F, are attached to the upper section, and have a lip, f, engaging in a groove, a, in the inner side of the stile of the lower section.

The supporting-catches are constructed as follows:

G is a plate pivoted at a' to the inner side of a stile, A, and having at the lower part a recess, g, suited to engage a round of the section beneath. From one side of the recess extends a guide-finger, g', serving to guide the recess to the round. The catch is thrown out to the position of engagement by a spring, H.

I is a guide-plate beneath which the supporting-catch plays, and which acts to limit the rearward movement of the catch by the impingement against it of a pin, g<sup>2</sup>, upon the face of the catch G.

J is a spring catch or detent, made to engage against the plate I when the supporting-catch is in the position of disengagement, so that the ladder-sections can be lowered.

K is the windlass, having two ropes, L and M, coiled upon it in opposite directions, so that when one rope is being wound up on the windlass-barrel the other rope is being uncoiled therefrom. The rope L extends up over a pulley, N, upon the upper part of the lower section, 1, and down to the lower end of the next section, 2, so that as the cord L is wound up on the windlass-barrel the upper one of the sections is drawn upward. The rope M extends upward and is attached directly to the upper one of the sections, (marked 2,) so that when the rope M is wound on the barrel the



section 2 is drawn down. The pulleys N are mounted obliquely to the rungs, as shown more clearly in Figs. 9 and 11, so as to cause the ropes to hug the sides of the rungs.

5 L' is a rope having its lower end attached to the section 1 and passing over a pulley in the upper part of section 2, and its other end carried down and attached to the lower part of section 3, so that as section 2 is raised section 3 is also drawn up an equal distance. In  
10 this manner all the upper sections (from 3 upward) are raised by the ropes L', which are attached to their lower parts, from thence pass over a pulley at the upper part of the section  
15 next below, and then downward to the section next below the latter. The ropes M' act to forcibly draw down all the sections above section 2 when the latter descends. For this purpose one end of the rope M' is attached to the section  
20 to be drawn down by it. From such place of attachment the rope passes beneath a pulley in the lower part of the section next below it, and from such pulley upward to the section next below the latter to which the end is made  
25 fast. For instance, the lower one of the set of ropes M' has one end attached to the section 3 at *m*, from whence it passes beneath a pulley, *m'*, at the lower part of section 2, and from thence to section 1, to which it is attached at *m*<sup>2</sup>.  
30 It will be seen that the upward and downward movements of the sections are all positive by means of the ropes L L' and M M', (operated by the windlass K.) The cords L and M are not in their preferred form attached directly to the barrel, but are attached to sleeves  
35 O and O', surrounding the barrel, and held fast upon it by set-screws *o*. The arrangement is such that the ropes can be tightened by turning one or both of the sleeves on the barrel.

40 P is a pulley that may be used in hoisting a hose or other object to the top of the ladder.

In the modification shown on Sheet 2 the connection between the sections differs somewhat from that described.

45 The slide-connection is the only essential difference between the ladder as before described and the modification. In the latter there are strips D' upon the contiguous sides of the stiles, said strips being on the outer  
50 sides of the stiles of the inner (and upper) sec-

tion, and upon the inner sides of the stiles of the outer section. The faces of the strips are laid together from end to end, so as to slide the one upon the other, and they are held in position by metal cleats E' one cleat on each stile  
55 at each point of connection. The cleat that is attached to each stile has two lugs embracing the edges of the strip D' upon the other stile. Thus it will be seen that the cleats will hold all the sections in line, and will also prevent  
60 their separation, as the impingement of one cleat against another would limit the extension of the ladder.

In raising the ladder any one or more of the supporting dogs or catches G may be put in  
65 position to engage the rounds and hold the ladder extended.

I claim herein as new and of my invention—

1. In an extension-ladder composed of sections having adjusting ropes and pulleys, the  
70 combination of a rope, pulley, and section-rungs, the pulley being mounted obliquely to the rungs to cause the rope to hug the sides of the rungs, as shown.

2. The combination, with a ladder-section,  
75 of the strengthening-strips connected to the sides over the ends of the rungs by means of screws inserted in the ends of the rungs, as shown.

3. An extension-ladder consisting of sections sliding the upper on and within the  
80 lower, each section having its side bars increasing in width toward the center of the ladder, and the widest ends of the bars lapping with the side bars of the next section.  
85

4. An extension-ladder having the guide-bars of its sections inclined to the side bars, A, causing the ladder to take an arched form when extended.

5. In an extension-ladder composed of sliding sections, the combination of supporting-catches, the plate G, having notch *g*, guide-finger *g'*, and pin *g*<sup>2</sup>, detent-spring H, guide-plate I, and spring-catch J, substantially as  
90 and for the purpose set forth.

SALATHIEL S. THOMPSON.

Witnesses:

JOHN E. HAMILL,  
JOHN SLAGLE.