

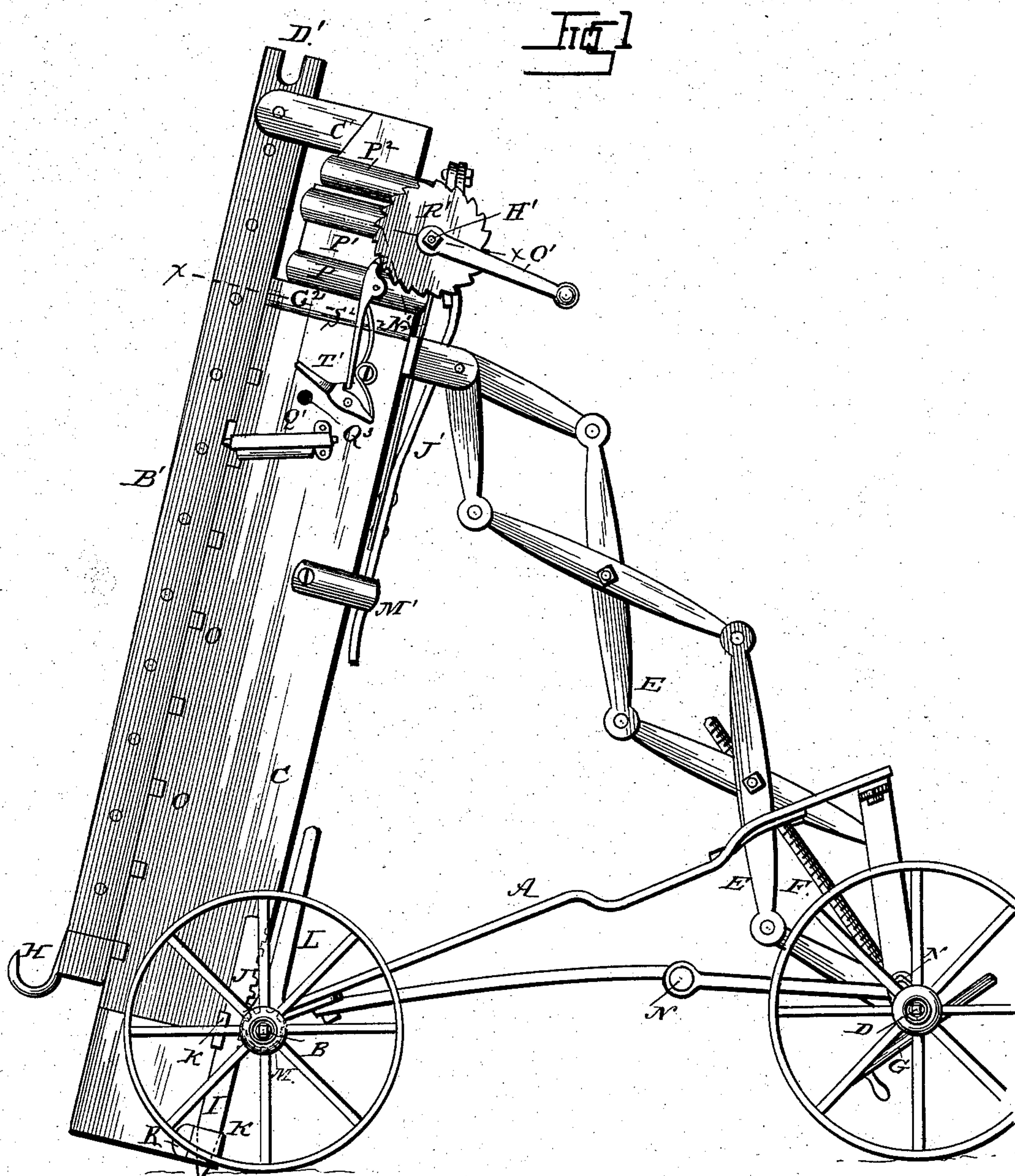
(No Model.)

3 Sheets—Sheet 1.

W. BRANNAN.  
FIRE ESCAPE LADDER.

No. 296,920.

Patented Apr. 15, 1884.



WITNESSES:  
*Fred. G. Dieterich*  
*A. G. Lyne.*

INVENTOR:  
*Wm Brannan*  
BY *Munn & Co*  
ATTORNEYS.

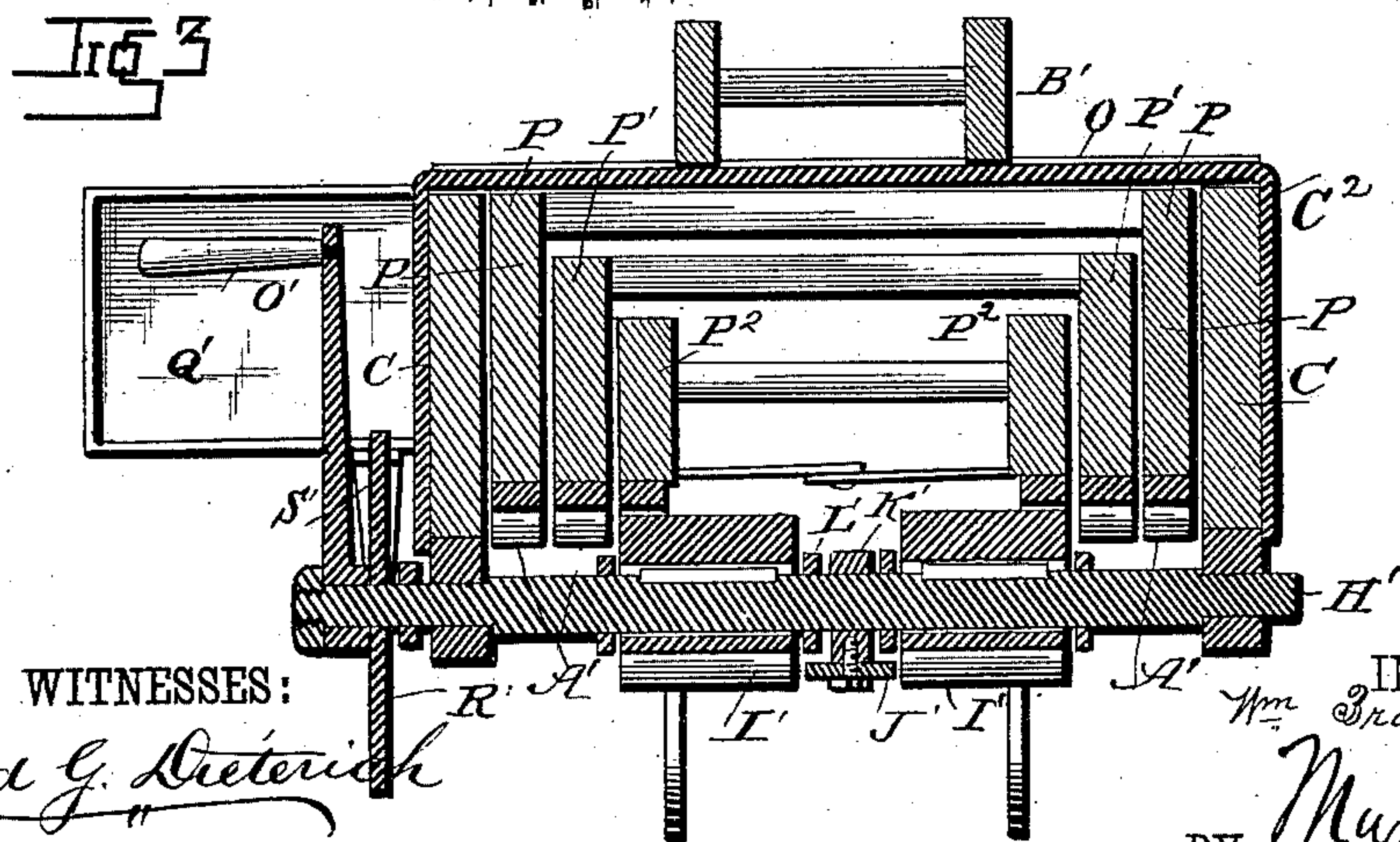
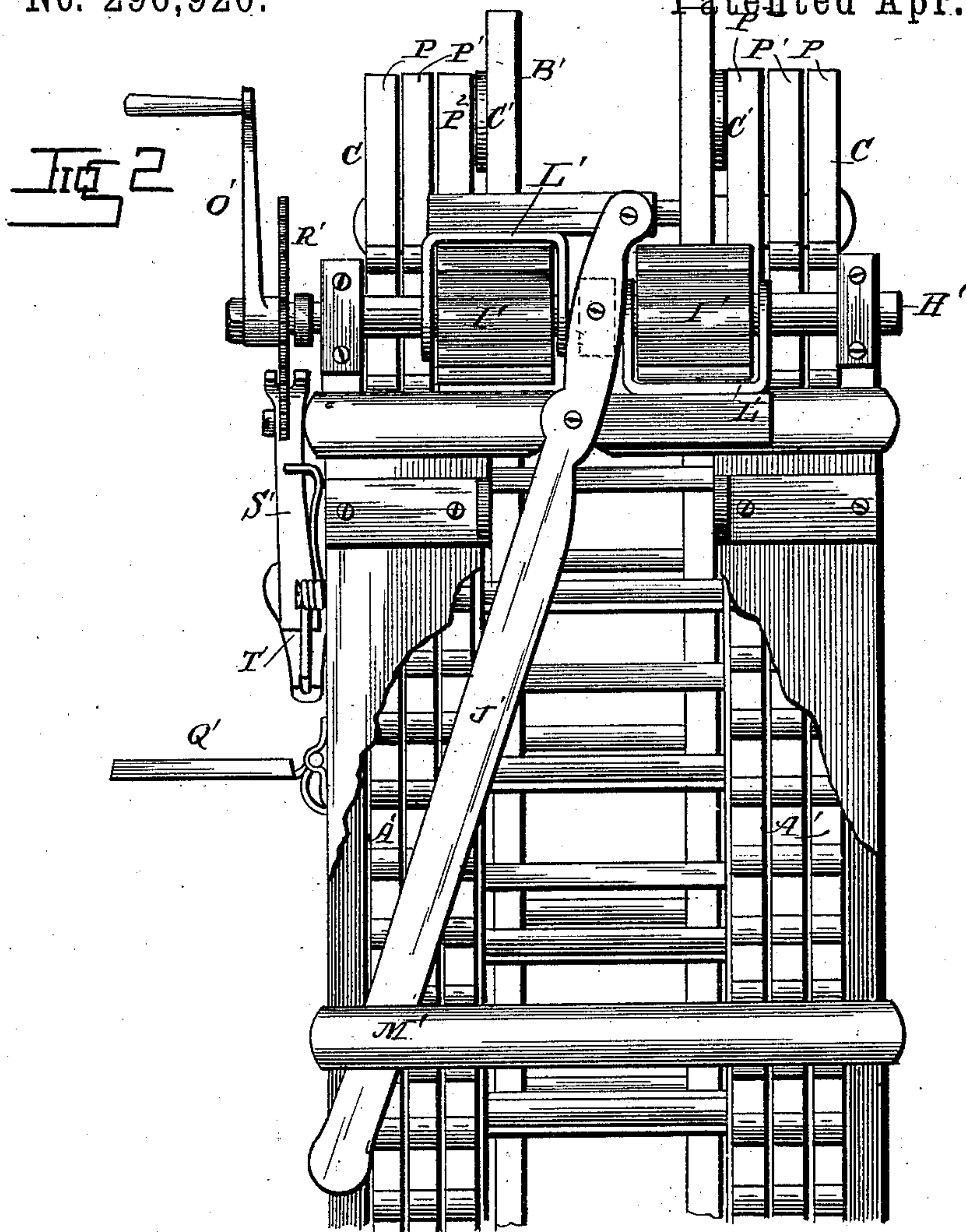
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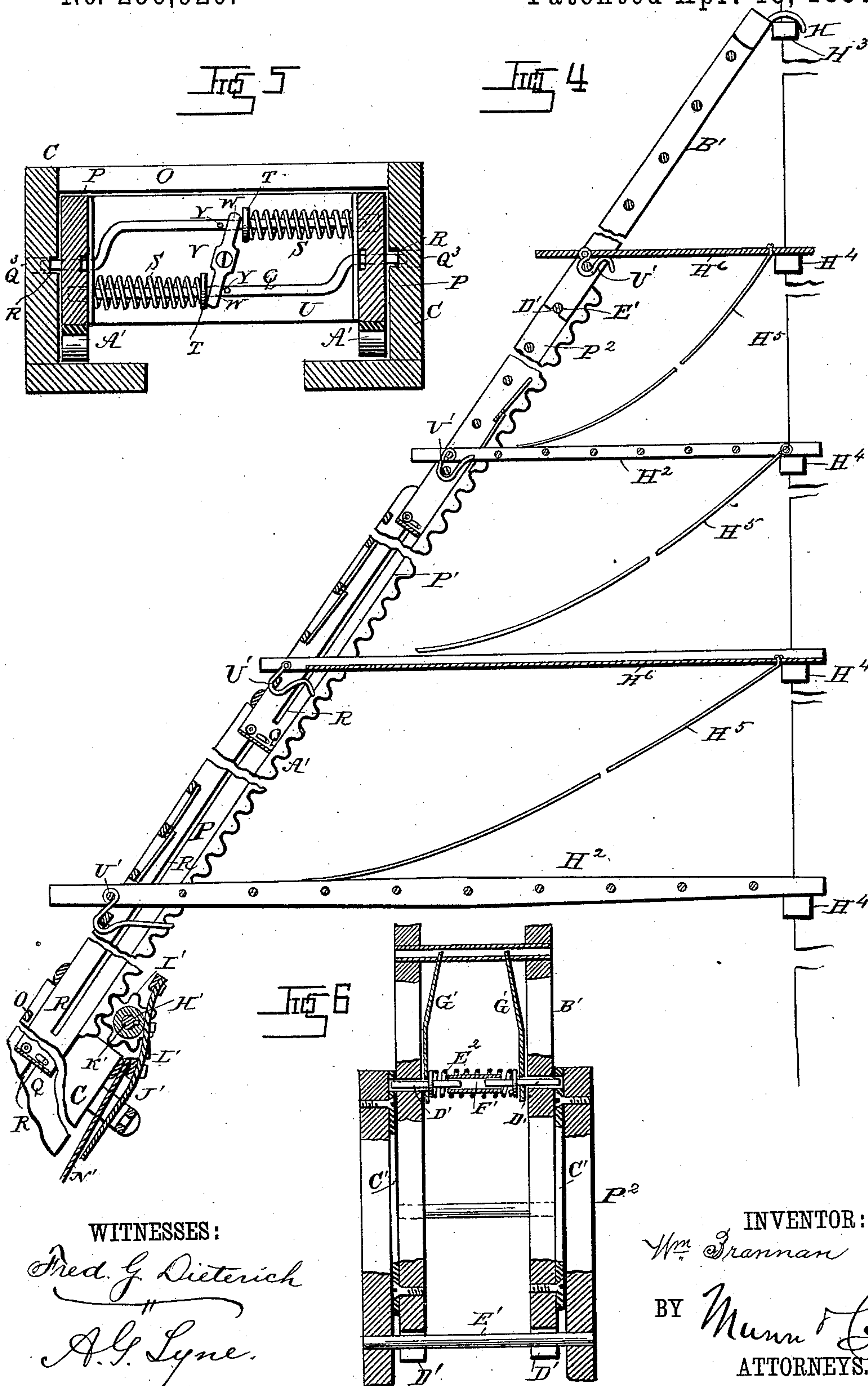
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# UNITED STATES PATENT OFFICE.

WILLIAM BRANNAN, OF FREDERICKSBURG, VIRGINIA.

## FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 296,920, dated April 15, 1884.

Application filed July 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BRANNAN, of Fredericksburg, in the county of Spottsylvania and State of Virginia, have invented a new and useful Improvement in Fire-Escape Ladders, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

10 This invention relates to extensible ladders for reaching the windows or roofs of houses from the ground in case of fire; and the invention consists of the novel construction hereinafter described and claimed.

15 In the drawings, Figure 1 is a side elevation, partly broken away, showing my improved ladder. Fig. 2 is a detail view, showing the means for extending the ladder-sections. Fig. 3 is a sectional view on line *xx* of Fig. 1. Fig. 4 shows the ladder in position for use, and Figs. 5 and 6 are detail views.

20 A indicates a four-wheeled frame, which is made higher at the forward than at the rear end. To the rear axle, B, is pivoted the lower end of the ladder-sheath and supporting-frame C, which is connected to the forward axle, D, by the series of the lazy-tongs E in such manner that the sheath may be elevated at the upper or forward end as far as to a vertical position. The axle D carries a screw, F, which is connected to a nut on one of the pivots of the lazy-tongs, so that by rotating the screw by means of a crank or hand-wheel, G, or by other suitable mechanism, the lazy-tongs may be extended or collapsed, and held at any desired position. In practice it is designed that the tongue of the wheeled frame shall be removed when a burning building is reached, and that the front wheels shall be run up on the sidewalk, with the rear wheels against the curbstone, or on the street, and then that the sheath C shall be elevated to a sufficiently upright position to allow the ladder to be extended without being obstructed by the building. When extended to the desired height, the ladder is to be inclined toward the wall of the house by again operating the screw and lazy-tongs in a suitable manner, which will be readily understood. The upper end of the ladder is provided with hooks H, which are to catch over and be hooked to the window-

sill or roof, as hereinafter explained. The sheath C is provided with an anchor, I, at each side, consisting of a pointed rack-bar, J, supported in guides K, and adapted to be operated to set the pointed end in the ground by means of a lever, L, connected to a pinion, M, loosely mounted on the rear axle, B. To accommodate the forward axle to the different positions assumed by the lazy-tongs, the frame A is provided with flexible joints at N.

The sheath C consists of a box-like frame reinforced by one or more iron straps, C<sup>2</sup>, one side of which frame is provided with cross-bars O, to form the lower end of the ladder. Inside this sheath is arranged a section, P, of the ladder, which is provided at its lower end with laterally-extending catches Q, (see Figs. 4 and 5,) which protrude through openings in its sides, and are adapted to slide in longitudinal grooves R in the inner surfaces of the sides of the sheath C, until they reach the upper end of the sheath, where they are forced through openings Q<sup>3</sup> in the sides of the sheath by means of springs S. The catches consist of two rods having their ends supported in the sides of the section P, and provided with collars T, between which and the sides of the section the springs S are arranged. At the center of a cross-plate, U, is pivoted a lever, V, having slots in its ends W, which receive the rods or catches Q, and are adapted to engage with shoulders or lugs Y, formed on said rods in such manner that when the lever is turned in the proper direction by means of a wrench of suitable construction, or by hand, the catches will be drawn inward against the action of the springs, to allow the section P to be returned to the sheath.

The section P is provided with rack-bars A', which are to be made of metal, while the sides of the said section may be made of wood. These rack-bars are secured to corresponding edges of the said sides, and are to be operated to extend the said section by means of a device yet to be explained. Inside the section P is another section, P', of the ladder, made in all respects like the section P, and connected to said section in the same manner the latter is connected to the sheath. Likewise another section, P<sup>2</sup>, of the ladder is arranged inside the section P', and is adapted to operate like



the preceding sections. The ladder, of course, is to be made of any desirable number of sections, each higher section being adapted to slide within the next lower one, and all within the sheath C, except the topmost section, B', which, for convenience, is not made to slide within the next lower section, P<sup>2</sup>. The section B' is connected to the section P<sup>2</sup> by means of pivoted link-bars C', which are secured to said sections near their adjacent ends, in such manner that when the section B' is turned up, and the slotted ends D' of its sides are placed in engagement with the topmost round, E', of the section P<sup>2</sup>, the link-bars C' will assume a position in alignment with and between the corresponding inner and outer surfaces of the sides of the two said sections. The section B' is provided with two catches, D', projecting through its sides, and provided with a single retaining-spring, E<sup>2</sup>, bearing against shoulders or collars on said catches, and arranged around a sleeve, F', which receives and guides the inner ends of the catches. Two levers, G', are arranged in engagement with the collars on the catches, and are bent inward at their free ends, so that when the levers are pressed outwardly the spring will be compressed at both ends and the catches will be withdrawn. When the ladder is folded or sheathed, the section B' is to be turned back on top of the sheath.

As already stated, the several sections of the ladder, except the topmost section, are provided with rack-bars by which they are to be operated. These rack-bars, it will be understood, are arranged in pairs, and when the ladder is sheathed the several pairs of rack-bars will be arranged one within another. Now, to extend the sections one by one in regular order, I provide a shaft, H', supported in suitable bearings at the upper end of the sheath, and provided with two pinions, I', which are feathered thereon in any suitable manner, in order that they may be adjusted toward or from each other to bring them into position for engaging the pairs of rack-bars in turn. To this end a lever, J', is pivoted to a collar, K', on the center of shaft, H', and is connected at equal distances from its pivot to two yokes, L', which embrace the pinions, respectively, and are adapted to slide on the shaft to and from each other when the lever is oscillated.

M' is a guard for holding the lever in any one of its adjustments, and N' is a spring for holding the lever in proper contact with the guard. The shaft H' is provided with a crank, O', by which it to be turned, the operator standing on the folding platform Q', and the shaft is also provided with a ratchet, R', and spring-pawl S'.

T' is a spring-catch for holding the pawl S' out of engagement with the ratchet R' when the shaft is being reversed to sheathe the sections.

When the ladder has been extended, and is inclined toward the wall of a house, the hooks

on the upper end of the section B' are to be placed over the eaves of the roof or the window-sill H<sup>3</sup> of the highest story, and made to engage therewith by slightly lowering the ladder to cause them to grip the sill. To reach the windows H<sup>4</sup> of the lower stories, short supplemental ladders H<sup>2</sup> or boards H<sup>6</sup> are to be employed. These ladders or boards are provided with pivoted hooks U', which are adapted to be placed in engagement with rounds of the main ladder after one end has been placed on a window-sill. The hooks U' are adapted to be sprung into engagement with the rounds, so that there will be no danger of accidental displacement of the ladders when once arranged. Each ladder reaching across to the lower windows is to be provided with a pendent rope, H<sup>5</sup>, which shall serve as a guide and stay for persons walking across on the next lower ladder, the rope being held in the hands of the person thus escaping.

What I claim is—

1. The combination of the wheeled frame, the sheath and ladder pivoted to the rear axle of said frame, the lazy-tongs and operating-screw connecting the sheath to the forward axle of said frame, and the anchors adapted to be set in the ground when the ladder is elevated, substantially as shown and described.

2. The combination of the sheath, the sections of ladder arranged one within another, and having rack-bars secured to their sides, the spring-catches adapted to connect said sections rigidly together, and the adjustable pinions adapted to engage with each pair of rack-bars in turn, substantially as shown and described.

3. The combination, with the sections of ladder having rack-bars thereon and arranged one within another, of a shaft supported in suitable bearings, a pair of pinions feathered thereon, a lever pivoted to the shaft between the pinions, and connected to the latter by sliding yokes, and means for holding the lever in desired positions, substantially as shown and described.

4. The combination, with the connected sections of ladder, of a top section connected to one of the other sections by pivoted link-bars, and having one end recessed to engage with a round of said other section, and spring-catches for forming a rigid connection between the top section and said link-bars, substantially as shown and described.

5. The combination, with the ladder, and means for elevating and supporting the same, of supplemental ladders having hooks at one end adapted to engage with rounds of the main ladder, while their other ends rest on window-sills, and having pendent cords reaching, severally, to each next lower supplemental ladder, substantially as shown and described.

WILLIAM BRANNAN.

Witnesses:

JNO. A. ENGLISH,  
ST. GEO. R. FITZHUGH.