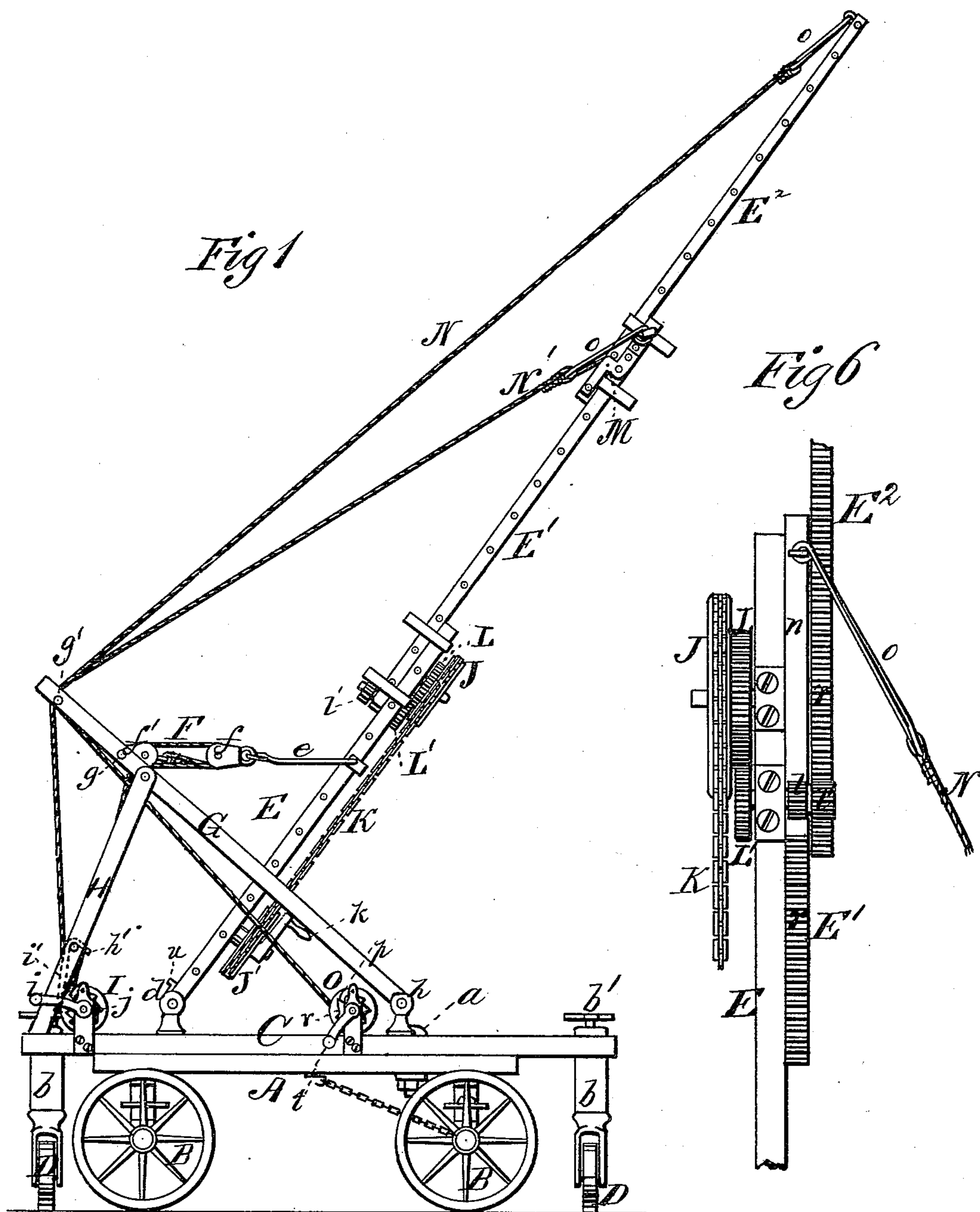


**A. AMES.**

## Firemen's Extension-Ladder.

No. 165,525.

Patented July 13, 1875.



WITNESSES

Robert Emmett  
A. J. Masie

~~INVENTOR~~

INVENTOR  
Adelbert Ames,  
Chipman Hosmer & Co,

ATTORNEYS

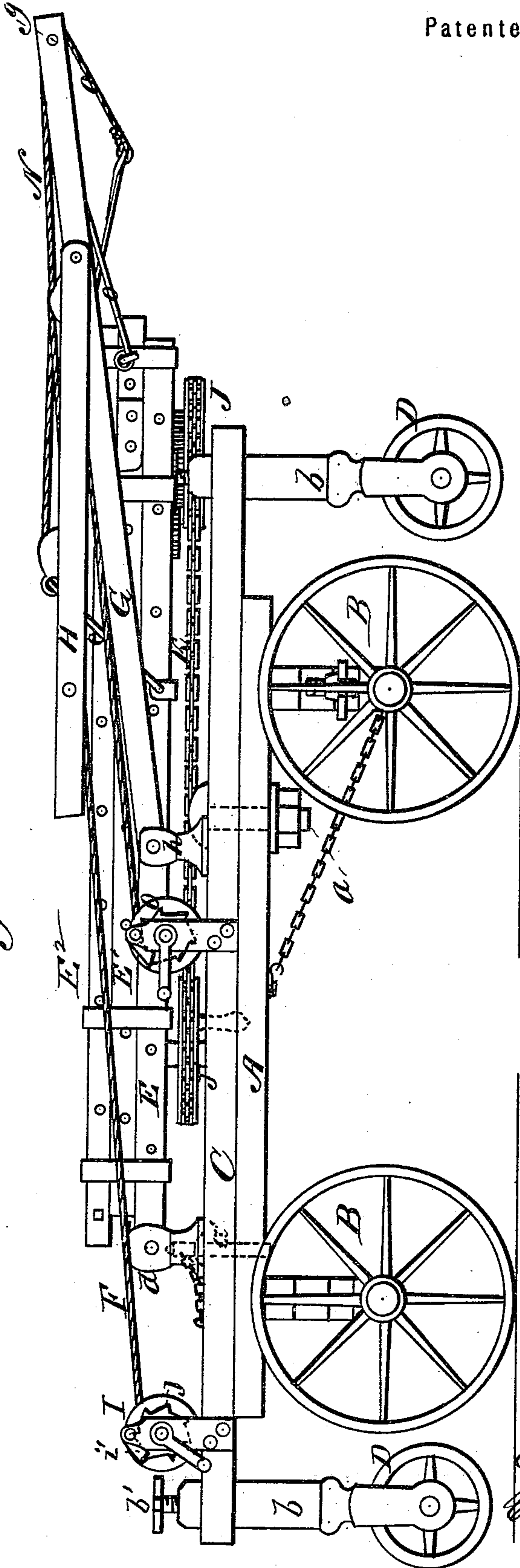
A. AMES.

Firemen's Extension-Ladder.

No. 165,525.

Patented July 13, 1875.

*Fig 2*



WITNESSES

*Robert Everett,  
F. J. Chase*

INVENTOR

*Adelbert Ames*  
*Chipman & Associates*  
ATTORNEYS

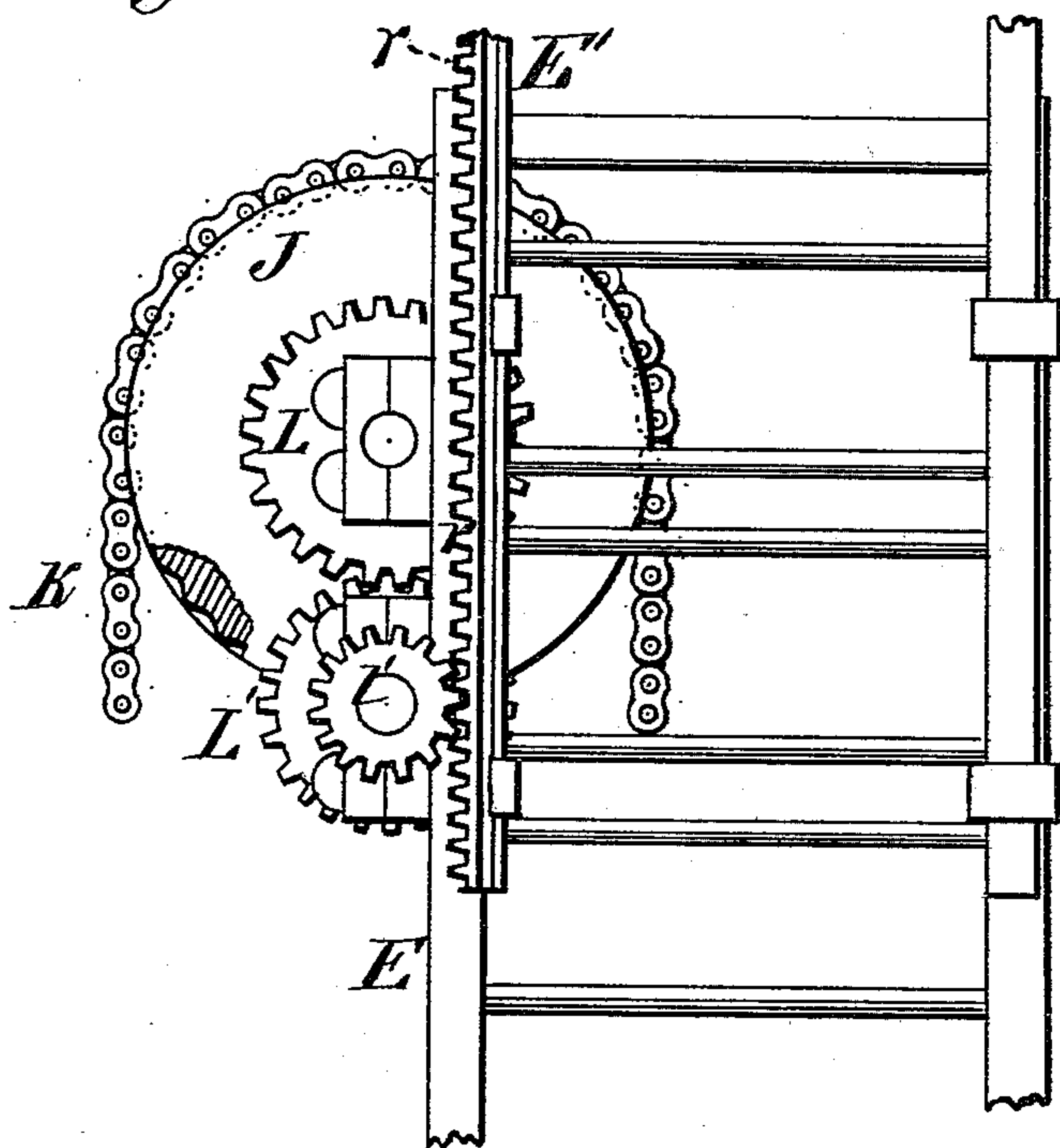
A. AMES.

Firemen's Extension-Ladder.

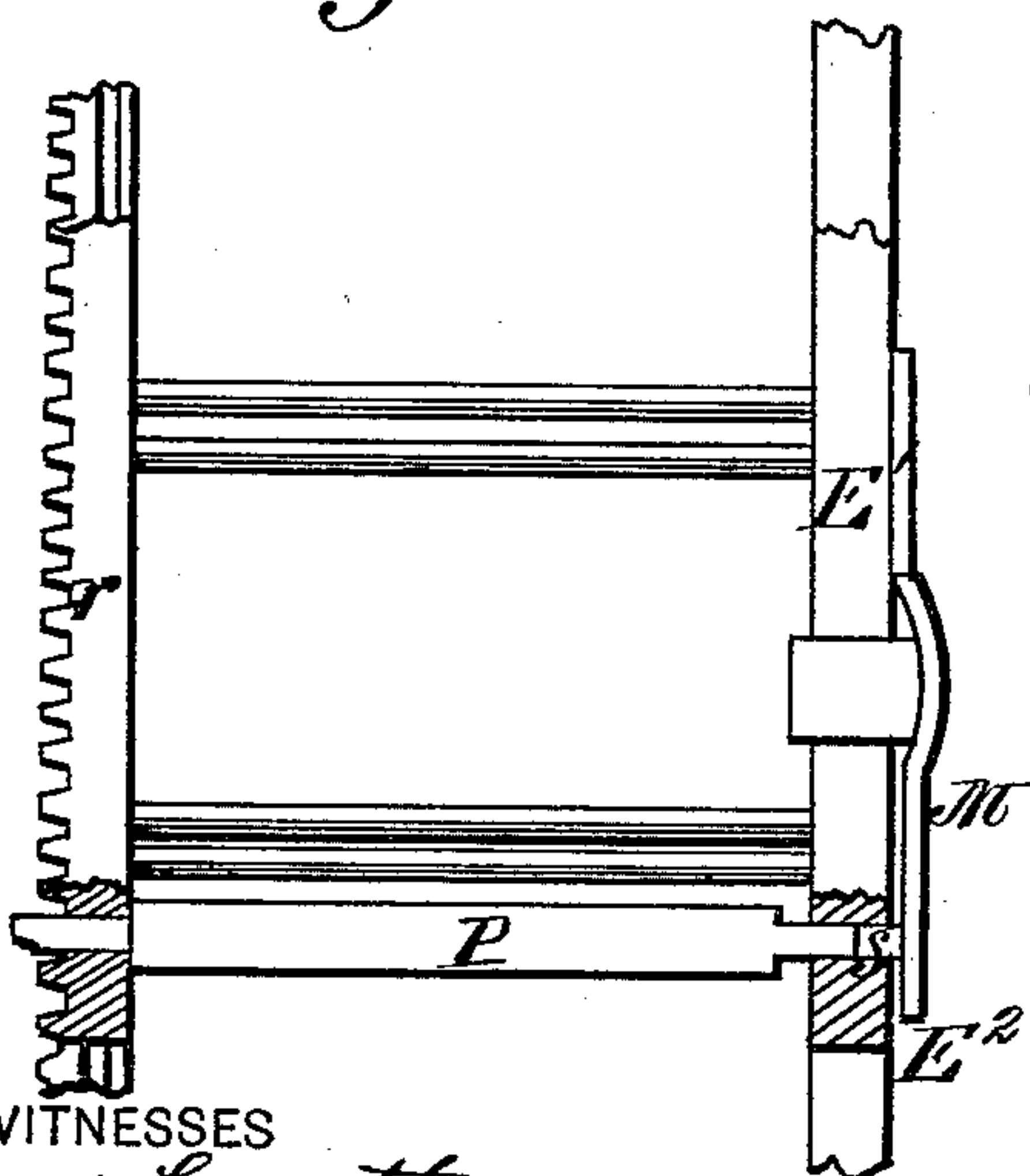
No. 165,525

Patented July 13, 1875.

*Fig 3*



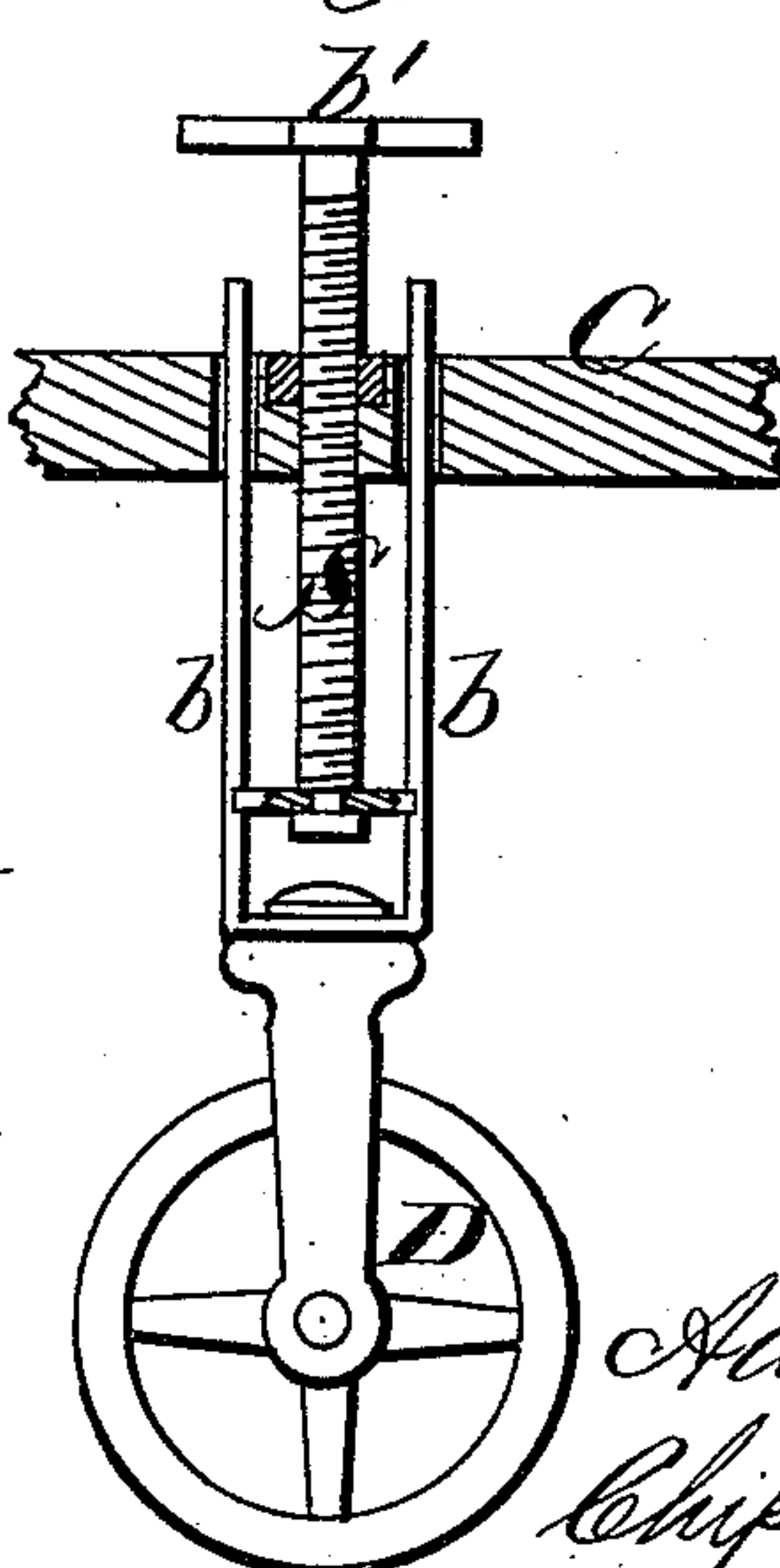
*Fig 4*



WITNESSES

*Robert Everett*  
*C. J. Chasi*

*Fig 5*



INVENTOR

*Adelbert Ames*  
*Chipman & Co.*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

ADELBERT AMES, OF NATCHEZ, MISSISSIPPI.

## IMPROVEMENT IN FIREMEN'S EXTENSION-LADDERS.

Specification forming part of Letters Patent No. 165,525, dated July 13, 1875; application filed May 8, 1875.

*To all whom it may concern:*

Be it known that I, ADELBERT AMES, of Natchez, in the county of Adams and State of Mississippi, have invented a new and valuable Improvement in Extension-Ladders; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1 and 2 of the drawings are representations of side views of my ladder, and Figs. 3, 4, 5, and 6 are detail views of the same.

This invention has relation to improvements in extension-ladders, which are more especially designed for the use of firemen; and the nature of the invention consists in combining, with a wagon-truck and a turn-table supporting the ladders, an adjustable support, arranged at one or both ends of the turn-table, whereby it is prevented from tilting, and is held in a horizontal position when turned, with its length at right angles to that of the truck. It consists, in addition, in the arrangement and novel construction, in connection with a supporting-frame, of an extension-ladder, made up of sections, which are adapted to be successively extended by one and the same mechanism, as will be hereinafter more fully explained.

In the annexed drawings, A designates a platform, which is supported, after the manner of a wagon-body, upon four transporting-wheels, B, upon which is pivoted to vibrate horizontally a platform or turn-table, C. This turn-table is supported at either end by supplemental wheels D, and its length, in relation to that of the truck, is such that it is allowed to vibrate in the arc of a circle of three hundred and sixty degrees about its pivot *a*; consequently it is capable of being directed to any point, turning a ladder supported thereon in a corresponding direction without changing the position of the truck.

The advantage of this construction is that in narrow streets and alleys the ladder may be directed to either side, where there would be insufficient room to turn the truck without great loss of time.

Wheels D are socketed into a strong U-shaped metallic plate, *b*, the legs of which are passed upward through slots in the turn-table C, and are allowed a free endwise movement therein, so that the wheels are capable of being raised or lowered, as the necessities of the case may require, by means of a screw, S, operated by a hand-wheel, *b'*.

By this means the table may be supported from either end by extending wheels D, where a depression in the surface of the ground occurs, and by raising them therefrom when there is a rise. By this means also the wagon or truck is effectually prevented from tilting when it is subjected to the leverage of the extended ladders.

In exemplifying the construction and working of my ladder, I propose to use one made up of three sections, E E<sup>1</sup> E<sup>2</sup>, that number being deemed sufficient; but I may use any number of ladders or sections that may be necessary.

The lower section of the ladder E is pivoted in the upper furcated ends of uprights *d*, rigidly secured to the turn-table, and it has free vertical vibration in relation thereto, so that it may be raised to any angle in relation to the truck, or allowed to lie flat thereon, as may be desired, and it is raised from a recumbent position by means of a suitable rope, F, which is rove through double sheaf-blocks *f* *f'*, the former of which is attached to a bail, *e*, hooked into the ladder E, and the latter to a brace, *g*, of a vertically-vibrating crane, G.

This crane is pivoted to two uprights, *h*, in the upper bifurcated ends of which its side rails are fulcrumed, and it is supported by means of a suitably-braced prop, H, which is held in proper position for sustaining the crane by means of a suitable hook or hooks, *h'*. Rope F passes downward from block *f'*, and is passed over a windlass, I, operated by a crank-arm, *i*, and held against backward rotation by means of a pawl, *i'*, and a rack-wheel, *j*. Ladder E passes between the side rails of the supporting-crane, and is provided with chain-wheels J J', the former being at its top, and the latter at its bottom, over which an endless chain-belt, K, is passed, which wheels rotate in suitable bearings. When motion is communicated to wheel J'



through the medium of a crank-arm,  $k$ , it will transmit the same through belt  $K$  and wheel  $J$ , and through a gear-wheel,  $L$ , upon the shaft of wheel  $J$ , and an interlocking-gear,  $L'$ , having its bearings on the side rail of the crane or derrick to ladders  $E^1 E^2$ . The shaft of gear  $L'$  has upon its upper end two separate and distinct pinions,  $l l'$ , which engage, respectively, with a rack,  $r$ , upon the lateral edges of the ladders  $E^1 E^2$ ; that of the former terminating at a point just below its pinion  $l$ , so that when motion is imparted to gear  $L'$  such motion will be transmitted only to the upper ladder  $E^2$  through pinion  $l'$ , the lower ladder  $E^1$  remaining quiescent until the upper ladder is fully extended, when the two will become automatically locked together, and the lower ladder will become extended in the following manner, to wit: A strong spring-locking arm,  $M$ , rigidly secured to ladder  $E^1$ , extends upward on a level with ladder  $E^2$ , the said spring having upon its free end a spur,  $s$ , extending inward, which spur is adapted to be received into a corresponding perforation in the lower end of ladder  $E^2$ , when the latter has been fully extended, as above described, thus connecting the two ladders, and allowing the lower one to be in its turn extended by pinion  $l$ , which will then become engaged with rack  $r$  of ladder  $E^1$ , owing to the fact that rack  $r$  of ladder  $E^2$  extends down below the smooth portion  $n$  of ladder  $E^1$ . Ladders  $E^1 E^2$  have free endwise movement in relation to each other and to ladder  $E$ , but they are rigidly held against all lateral or other displacement. They are also, respectively, braced against swaying by means of guys  $N N'$ , which are, respectively, secured to vibrating bails  $o$  on the upper ends of ladders  $E^1 E^2$ ; passing thence over the top rails  $g'$  of derrick downward to windlasses  $O O'$ , which are operated by means of crank-arms  $t$ , and are held against backward rotation by means of pawls  $p$ , adapted to be engaged with and disengaged from a rack-wheel,  $v$ . The intermediate ladder is prevented from undue endwise downward displacement, with relation to ladder  $E$ , by means of a stop,  $u$ , rigidly secured to the latter, against which the said ladder abuts.

When it becomes necessary to cause the ladders to be retracted the lower chain-wheel  $J'$  is reversed, thereby retracting ladder  $E^1$  until it abuts against stop  $u$  on the base-ladder  $E$ , when pinion  $l'$  will become engaged with rack  $r$  of ladder  $E^2$ , at the same time actuating an endwise movable unlocking-rod,  $P$ , arranged at the lower end of and transverse to the ladder  $E^2$ , to thrust spur  $s$  of spring-arm  $M$  out of the perforation above described, in the

lower end of ladder  $E^2$ , thus allowing it to be retracted or lowered. Rod  $P$  at its end next the pinion  $l'$  extends through and projects beyond the side rail of the upper ladder, and it is thus made automatic in its operation. The ladders having been retracted the pawls of windlasses  $O O'$  are disengaged from their respective racks, and the pawl of windlass  $I$  being then likewise disengaged from its rack, the whole extension-ladder may be lowered, and its supporting derrick folded over thereon, presenting the appearance shown in Fig. 2.

By this means the whole superstructure is capable of being folded into a small compass, and may be stowed away in an ordinary engine house, and yet be at all times ready for use at a moment's notice.

Turn-table  $C$  is held against vibration when not in use by means of a detachable bolt,  $a'$ , secured to the said platform by a chain, and passing through registering perforations therein, and in platform  $A$ , as shown in dotted lines, Fig. 2.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the adjustable supporting-wheels  $D$  with a turn-table and a wagon-truck, substantially as specified, and for the purpose set forth.

2. The extension-ladder sections  $E^1 E^2$ , arranged face to face, each having a rack,  $r$ , upon the lateral edges of their uprights, and the former having the blank  $n$  above its rack, in combination with the pinion  $l l'$ , supporting-ladder  $E$ , and catch  $M$ , substantially as specified.

3. The combination, with an extension-ladder,  $E E^1 E^2$ , of the guys  $N N'$ , and the adjusting-rope  $F$  and their respective windlasses, substantially as specified.

4. The extension-ladder sections  $E^1 E^2$ , having racks  $r$  upon the lateral edges of their uprights, in combination with the ladder section  $E$ , having pinions  $l l'$ , gear-wheels  $L L'$ , chain-wheels  $J J'$ , and endless belt  $K$ , substantially as specified.

5. The endwise-movable unlocking-arm  $P$ , extending completely across ladder  $E^2$ , and adapted to be automatically actuated by pinion  $l'$  to thrust spur  $s$  of spring-arm  $M$  out of engagement with the said ladder, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ADELBERT AMES.

Witnesses:

I. N. OSBORN,  
R. B. AVERY.