

(No Model.)

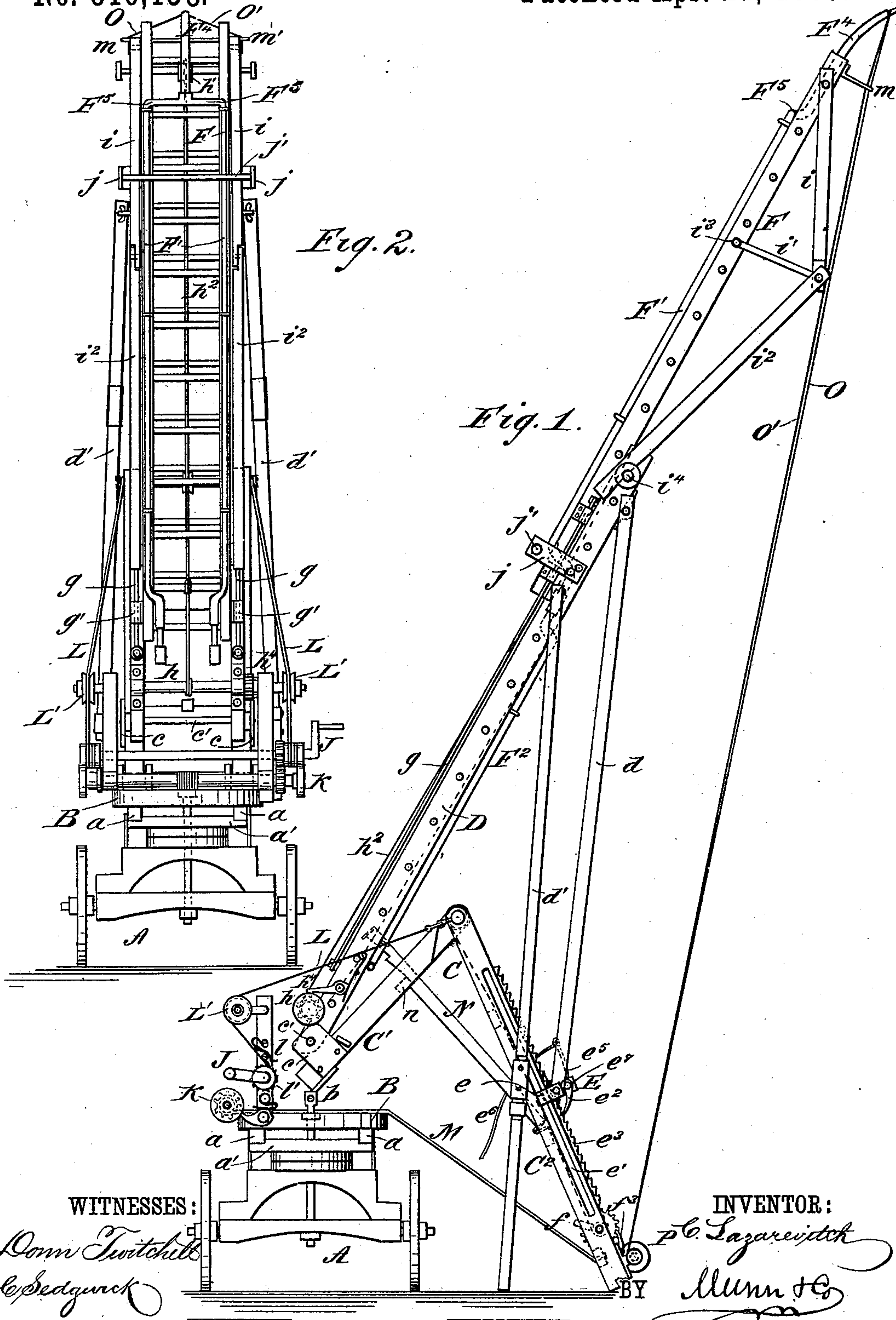
3 Sheets—Sheet 1.

C. LAZAREVITCH.

FIRE LADDER.

No. 316,155.

Patented Apr. 21, 1885.



3 Sheets—Sheet 2.

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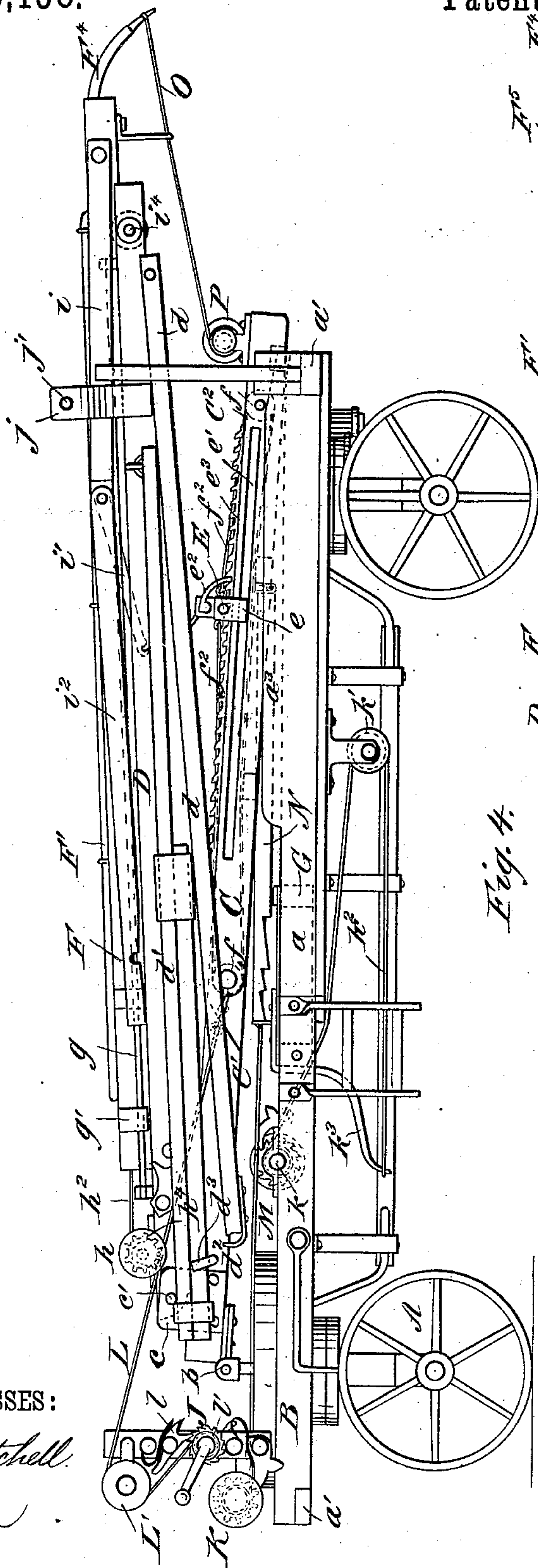


Fig. 3.

WITNESSES:

Donn Twitcheell.  
C. Sedgwick

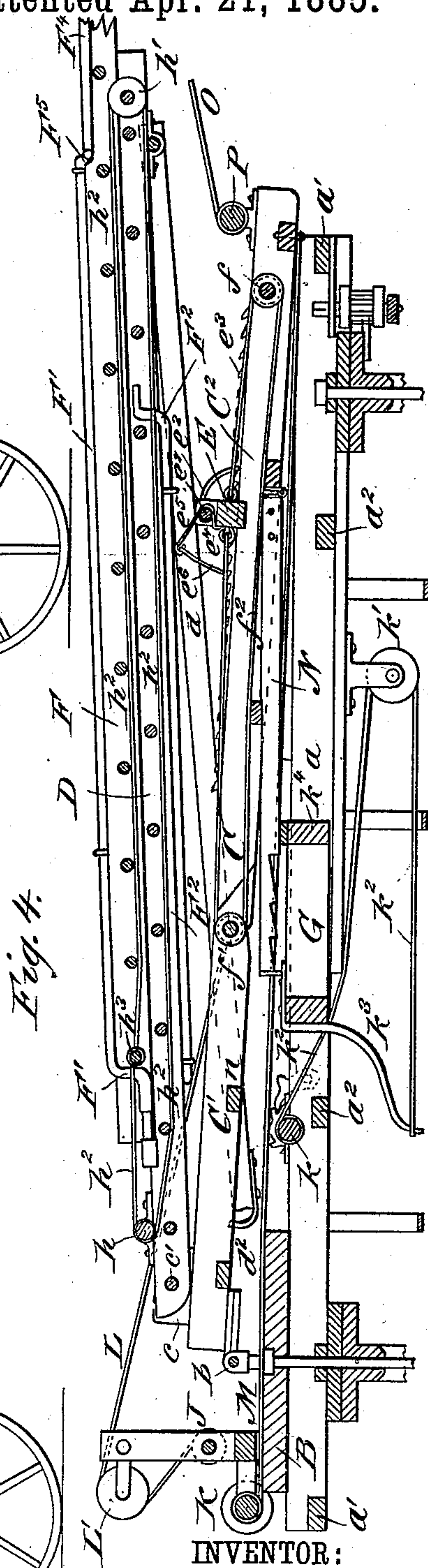


Fig. 4.

**INVENTOR:**

C. Lazarewitch

BY

Munn & Co  
ATTORNEYS.



(No Model.)

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Fig. 6.

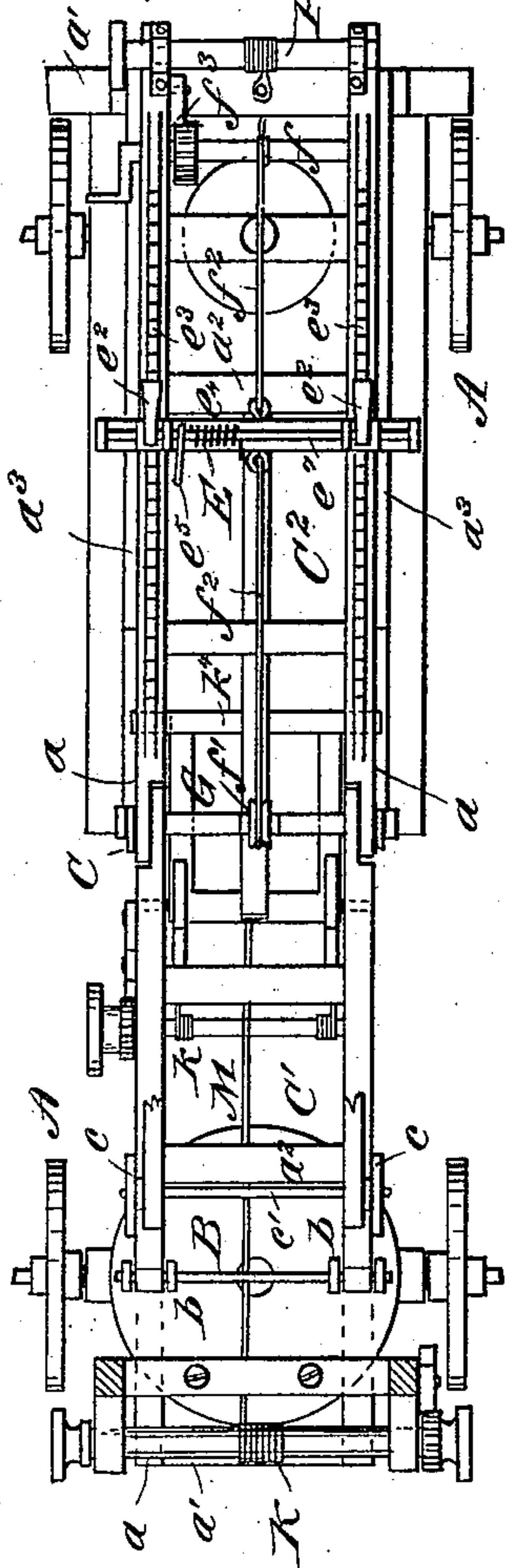


Fig. 5.

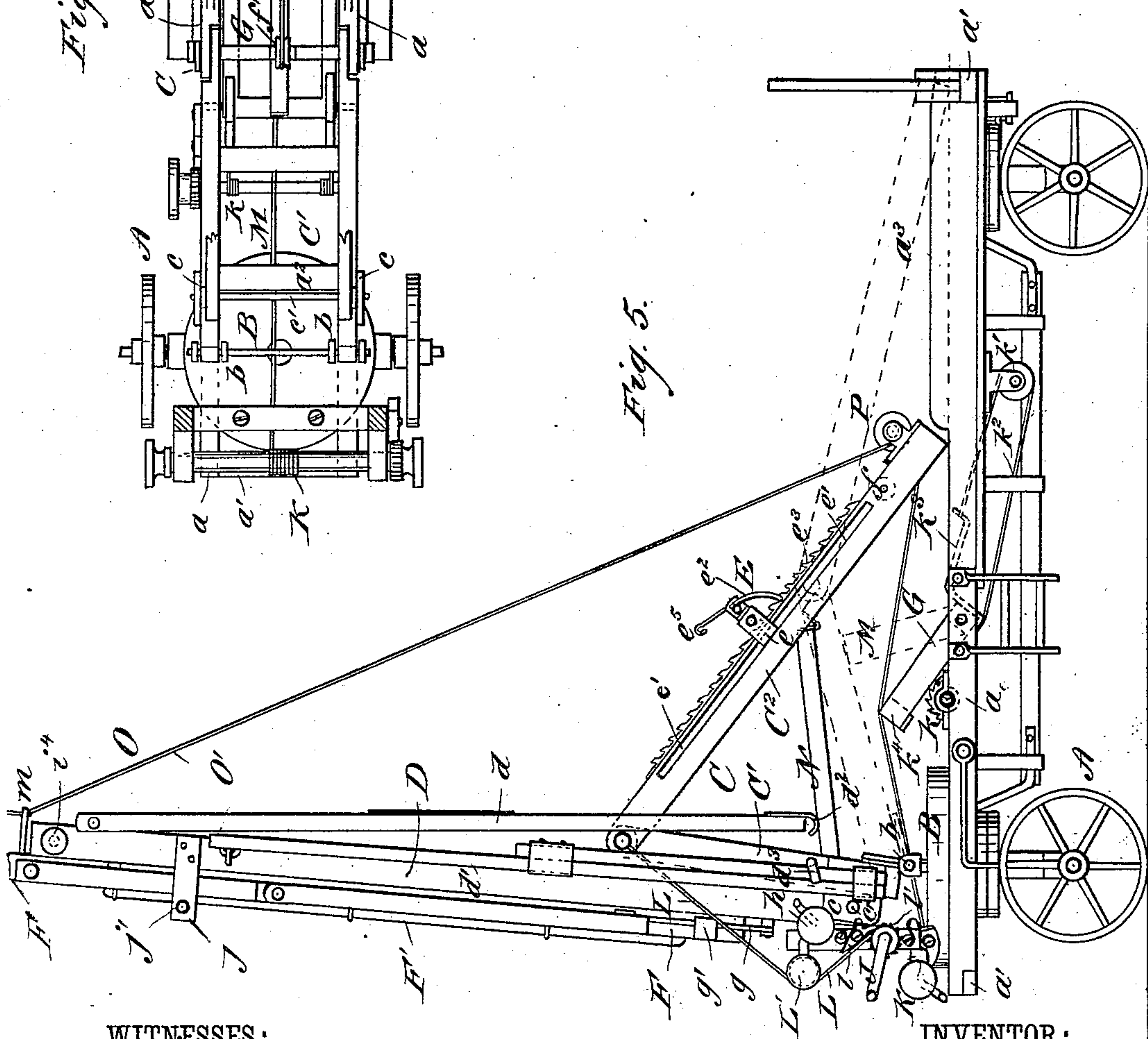
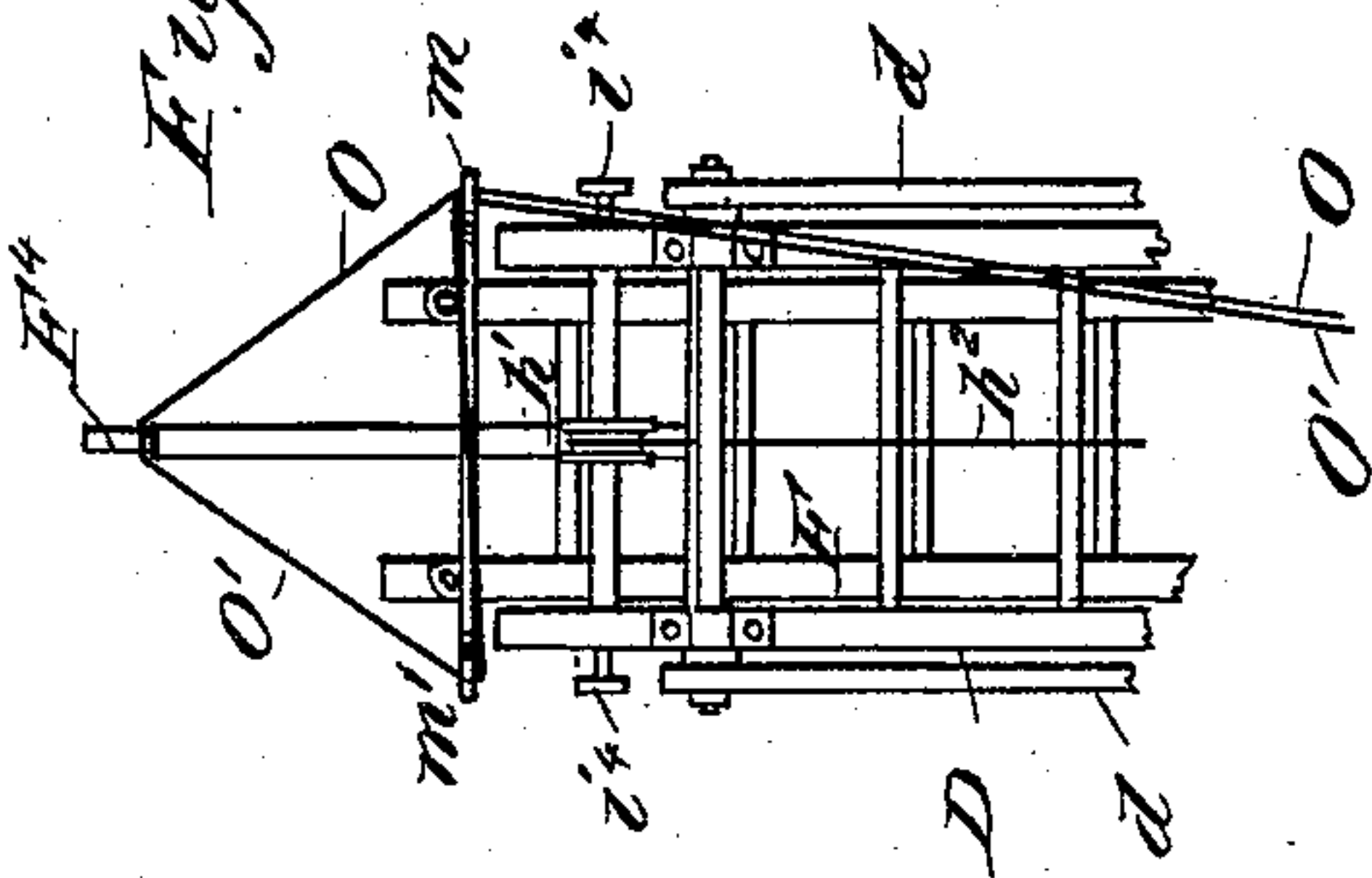


Fig. 7.



WITNESSES:

Donn Twitchell.

C. Sedgwick

INVENTOR:

C. Lazarevitch

BY

Munn & Co

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

CONSTANTIN LAZAREVITCH, OF BROOKLYN, NEW YORK, ASSIGNOR TO  
HIMSELF AND JOHN C. LAZAREVITCH, OF SAME PLACE.

## FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 316,155, dated April 21, 1885.

Application filed March 16, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, CONSTANTIN LAZAREVITCH, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Fire-Ladder, of which the following is a full, clear, and exact description.

This invention relates to an extension fire-ladder attached to a truck, the sections of and parts connected to the ladder being adapted to be folded together to lie flat upon the truck; and the invention consists, principally, of a folding brace or support attached to the ladder and truck arranged for bracing the ladder directly from the ground when the sections of the ladder are elevated for use.

The invention also consists in providing the sections of the ladder with permanent water-pipes for adapting the ladder when elevated to be used also as a water-tower.

The invention also consists of the means employed for elevating the ladder, and of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my new fire-ladder as it appears when elevated and wholly extended, and the water-pipes of the upper and lower sections coupled together. Fig. 2 is a front elevation of the same, the upper section of the ladder not being elevated. Fig. 3 is a side elevation of the truck and ladder folded to lie flat upon the truck. Fig. 4 is a sectional elevation of the same, the wheels and axles of the truck being omitted. Fig. 5 is a side elevation of the truck and ladder partially raised, ready to be turned to the position shown in Fig. 1, for lowering the folding sectional brace C to the ground. Fig. 6 is a plan view of the truck and brace C, placed flat upon the truck, the other portions of the ladder being removed; and Fig. 7 is a detailed rear elevation of the upper portion of the ladder, showing the arrangement of cords for operating the water-nozzle from the ground.

A represents a four-wheeled truck, with a frame composed of the side pieces,  $a$   $a$ , end pieces,  $a'$   $a'$ , and intermediate cross-pieces,  $a^2$

$a^2$ . The side pieces,  $a$ , have the upwardly-projecting flanges  $a^3$  formed upon or secured to them for the purposes hereinafter described.

Upon the forward end of the frame of the truck is placed the turn-table B. To this is secured, by the hinge  $b$ , the folding sectional support or brace C, which is composed of the upper section,  $C'$ , and lower section,  $C^2$ , which latter is adapted to rest upon the ground at its lower end to support and brace the ladder when elevated, as illustrated in Fig. 1. The section  $C'$  of the hinged and folding brace or support C is provided, near the hinge  $b$ , with the heavy plates  $c$   $c$ , to which the lower end of the lower section, D, of the ladder is attached by the heavy rod  $c'$ .

Attached to the lower section, D, of the ladder, near its upper end, are the brace-rods  $d$ , provided at their lower ends with the hooks  $d^2$  or other attachments, adapting the rods  $d$  to be fastened to the ends of the adjustable cross-piece E, placed upon the section  $C^2$  of the folding brace C. The cross-piece E is held to the section  $C^2$  by plates or flanges  $e$ , running in grooves  $e'$ , and the cross-piece E is provided with pawls  $e^2$ , adapted to engage with the ratchet-plates  $e^3$  of the section  $C^2$ , so that the cross-piece E may be held at any desired position upon the section  $C^2$ . The objects of the rods  $d$  and adjustable cross-piece E are, first, to brace the ladder from the section  $C^2$  of the folding brace C, which section rests directly upon the ground, and secondly, to enable the pitch of the ladder to be varied when elevated as circumstances require.

The pawls  $e^2$  are held in contact with the ratchet-plates  $e^3$  by the action of a spring,  $e^4$ , Figs. 4 and 6, placed on a rod,  $e^7$ , to which the pawls are attached, and said rod is provided with arm  $e^5$ , to which the cord  $e^6$  is attached, so that by pulling downward upon the cord the pawls may be disengaged from the ratchet-plates  $e^3$ , to permit the cross-piece E to slide downward to the bottom of the slots  $e'$ .

To facilitate the lowering and also the elevating of the cross-piece E, I provide the section  $C^2$  of the folding brace C at its lower end with the windlass  $f$ , and at its upper end with the pulley  $f'$ , and attach to the cross-piece E the endless cord or chain  $f^2$ , that passes over the windlass  $f$  and pulley  $f'$ , as shown in Fig.



4, so that by turning the windlass  $f$  the cross-piece  $E$  will be raised or lowered, as desired; and I provide the windlass  $f$  with a pawl and ratchet,  $f^3$ , for locking the windlass to hold or assist in holding the cross-piece  $E$  at any desired position.

To the front of the section  $D$  of the ladder are attached the rods  $g g$ , to which is attached, by the loops or eye-plates  $g' g'$ , the upper section,  $F$ , of the ladder, so that the section  $F$  may be elevated, as shown in Fig. 1, or lowered to stand in front of or rest upon the section  $D$  of the ladder, as shown in the other figures of the drawings.

For raising and lowering the section  $F$ , I provide the section  $D$  at its lower end with the windlass  $h$ , and at its upper end with the pulley  $h'$ , and attach to the lower rung,  $h^3$ , Fig. 4, of the section  $F$  the endless rope or chain  $h^2$ , that passes over pulley  $h'$  and windlass  $h$ , so that when the windlass is revolved the chain or rope  $h^2$  will raise or lower the section  $F$ ; and I provide the windlass  $h$  with pawl and ratchet  $h^4$ , Figs. 1, 2, 3, for holding the section  $F$  at any desired position. The section  $F$ , when elevated, will be braced from the upper end of section  $D$ , as shown in Fig. 1, by the brace-pieces  $i i^2$ , and said section  $F$  is provided with the permanent pipes  $F' F'$ , that are adapted, when the section  $F$  is elevated, to be coupled to the permanent pipes  $F^2 F^2$ , attached to the lower section,  $D$ , so that by coupling the hose of a fire-engine to the lower ends of the lower pipes  $F^2$  water may be forced to the top of the ladder and discharged from the nozzle  $F^4$ , with which the pipes  $F'$  are connected by the branch pipes  $F^5 F^5$ , as shown clearly in Fig. 2. The brace-rods  $i$  are pivoted to the section  $F$  of the ladder near its upper end; the rods  $i'$  are pivoted to the lower ends of the rods  $i$ , and are adapted to be attached to pins  $i^3$  at the sides of the section  $F$ , and the rods  $i^2$  are also pivoted to the lower ends of the rods  $i$ , and are adapted to be attached to the pins  $i^4$  at the upper ends of the ladder-section  $D$ , so that the rods together form truss-braces, which may be easily connected to and disconnected from the sections of the ladder and folded alongside of the section  $F$  of the ladder, so as not to interfere with the raising and lowering of the ladder. In raising and lowering the section  $F$ , the side plates,  $j j$ , and cross-rod  $j'$  act as keepers and guides to the section  $F$ , and prevent lateral displacement of the section  $F$ .

When the ladder is folded down upon the truck  $A$ , the sectional folding brace or support  $C$  and sections  $D F$  of the ladder will occupy nearly a horizontal position upon the frame of the truck, the brace or support  $C$  being at the bottom, where it will be held from lateral displacement by the above-mentioned flanges  $a^3$  of the side pieces,  $a$ , which flanges also act as guides to the lower end of the brace or support  $C$  in elevating and lowering the ladder.

In elevating the ladder the first act is to break the general alignment of the brace or

support  $C$  and the sections of the ladder. This I accomplish by the lifter  $G$ , pivoted between the side pieces,  $a a$ , of the frame of the truck, and adapted to be turned from the position shown in Fig. 4 (the position it will occupy when the ladder is folded upon the truck) to that shown in Fig. 5. The lifter  $G$  may be operated by hand or by the windlass  $k$ , Fig. 4, pulley  $k'$ , and rope  $k^2$ , attached to the windlass, passed over the pulley  $k'$ , and carried back and attached to the arms or levers  $k^3$  of the lifter, so that by turning the windlass  $k$  to wind up the rope  $k^2$  the lever  $k^3$  will be drawn backward and the lifter turned upward upon its pivots, which will cause the cross-pieces  $k^4$  of the lifter to impinge upon the lower edges of the brace or support  $C$  and lift it so that it will occupy the position shown in dotted lines in Fig. 5. When in this position, to lift the ladder to the position shown in full lines in Fig. 5 the windlasses  $J K$  should be simultaneously revolved; which will act, respectively, to wind up the ropes  $L L$  and  $M$ , the former of which pass over pulleys  $L' L'$  and are attached to the upper end of the section  $C'$  of the brace or support  $C$ , while the latter is attached directly to the rear or lower end of the section  $C^2$  of said brace or support. The winding up of the ropes  $L M$  will draw the brace or support  $C$  forward and turn it on the hinge  $b$  and lift the ladder. Shortly before the sections of the ladder and sectional brace  $C$  reach the position shown in full lines in Fig. 5 the notched end of the brace  $N$ , Fig. 4, should be placed upon the cross-piece  $n$  of the section  $C'$  of the brace  $C$ , to prevent the ladder from being pitched forward and to prevent the sections  $C' C^2$  from being folded too far. The brace  $N$  being put in place, by turning the windlass  $J$  still farther the whole ladder and folding brace  $C$  may be turned on hinge  $b$ , so as to lift the lower end of the section  $C^2$  up from the side pieces,  $a$ , of the frame of the truck, in which position the turn-table  $B$  will be given a one-quarter revolution, which will turn the ladder and swing the support  $C$  to one side of the frame of the truck. The pawl  $l$  of windlass  $J$  will now be lifted from ratchet  $l'$  and the windlass let back, which will permit the ladder and support  $C$  to lower until the lower end of section  $C'$  of the support  $C$  rests upon the ground, as shown in Fig. 1. The braces  $d$  will now be attached to the adjustable cross-piece  $E$ , and this cross-piece will then be elevated, as above described, for increasing the pitch of the ladder. This done, the side braces,  $d'$ , will be adjusted, which brace the ladder sidewise from the ground. The ladder being thus elevated and braced, the section  $F$  of the ladder will be elevated by turning windlass  $h$ , and the brace  $i i^2$  adjusted, and the water-pipes  $F' F'$  coupled together, when the ladder is ready for use both as a fire-ladder and water-tower.

To fold the ladder, the reverse of the operations above detailed will be followed.

The nozzle  $F^4$  is flexible, and its outer end



may be raised, lowered, or turned to the right or left for directing the jet of water either by hand by a person on the ladder, or it may be operated from the ground by the ropes O O', both attached to the nozzle and both passed through the eye *m*, the rope O' being first passed through the eye *m'* at the opposite side of the ladder, as shown in Fig. 7. For raising and lowering the nozzle I use the windlass P, located at the lower end of the section C<sup>2</sup> of the folding brace or support C, around which windlass both ropes O O' pass, so that both may be wound up to lower the nozzle, or both released to permit it to be raised by hand or by its own elasticity. To turn the nozzle to the right, both ropes O O' should be released by the windlass P and rope O pulled downward, and to turn it to the left the rope O' should be pulled downward.

When the ladder is folded and placed upon the truck, the ropes O O' will be wound upon the windlass P, as will be understood from Figs. 3 and 4.

The braces *d'* are each made of two parts telescoped together, as shown clearly in Figs. 3 and 5, and when the ladder is folded they are adapted to be held alongside the lower section, D, of the ladder by the hooks *d*<sup>3</sup>, as shown clearly in said figures.

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

1. The combination, with the section D of the ladder, of the folding support C, composed of two sections, C' C<sup>2</sup>, hinged together and arranged to operate substantially as described.

2. The section C' of the folding support, hinged to the turn-table B, and having the lower section, D, of the ladder attached to it, in combination with the section C<sup>2</sup> of the folding support hinged to the section C' and arranged to support the ladder from the ground, substantially as described.

3. The section D of the ladder, provided with the braces *d*, in combination with the adjustable cross-piece E, placed upon the brace or support C of the ladder, substantially as and for the purposes set forth.

4. The support C, provided with ratchet-plates *e*<sup>3</sup>, in combination with the bar E, provided with pawls *e*<sup>2</sup>, and the section D of the ladder provided with braces *d*, adapted to be

attached to the cross-piece E, substantially as and for the purposes set forth.

5. The section D of the ladder, provided with the braces *d*, in combination with the adjustable cross-piece E, pawls *e*<sup>2</sup>, windlass *f*, pulley *f'*, and rope *f*<sup>2</sup>, all arranged to operate substantially as and for the purposes set forth.

6. The sectional folding brace or support C, hinged to the truck or turn-table B, in combination with the sections of the ladder and the windlass J and rope L, attached to the sectional brace or support, substantially as and for the purposes set forth.

7. The sectional folding brace or support C, hinged to the truck or turn-table B, in combination with the windlass J K and ropes L M, attached to the folding brace or support C, substantially as and for the purposes set forth.

8. The combination, with the section D of the ladder, of the water-pipes F<sup>2</sup>, substantially as and for the purposes set forth.

9. The combination, with the section D of the ladder, and section F, sliding thereon, of the water-pipes F' F<sup>2</sup>, adapted to be coupled together when the section F of the ladder is raised, substantially as described.

10. The combination, with the sections D F of the ladder, of the braces *i i'* *i*<sup>2</sup>, arranged to be attached to both sections, substantially as described.

11. The combination, with the sections D F of the ladder and the water-pipes F' F<sup>2</sup>, of the nozzle F<sup>4</sup> and connecting-pipe F<sup>5</sup>, substantially as and for the purposes set forth.

12. The combination, with the sections D F, pipes F' F<sup>2</sup> F, and flexible nozzle F<sup>4</sup>, of the ropes O O', eyes *m m'*, and the windlass P, arranged substantially as and for the purposes set forth.

13. The frame of the truck, provided with the pivoted lifter G, adapted for raising the ladder and brace or support C, substantially as and for the purposes set forth.

14. The lifter G, pivoted in the frame, and provided with arms or levers *k*<sup>3</sup>, in combination with the windlass *k*, pulley *k'*, and ropes *k*<sup>2</sup>, for turning the lifter upon its pivots, substantially as and for the purposes set forth.

CONSTANTIN LAZAREVITCH.

Witnesses:

H. A. WEST,  
C. SEDGWICK.