

(No Model.)

2 Sheets—Sheet 1.

G. M. KIM.  
FIRE TRUCK AND TRIPLE LADDER.

No. 434,512.

Patented Aug. 19, 1890.

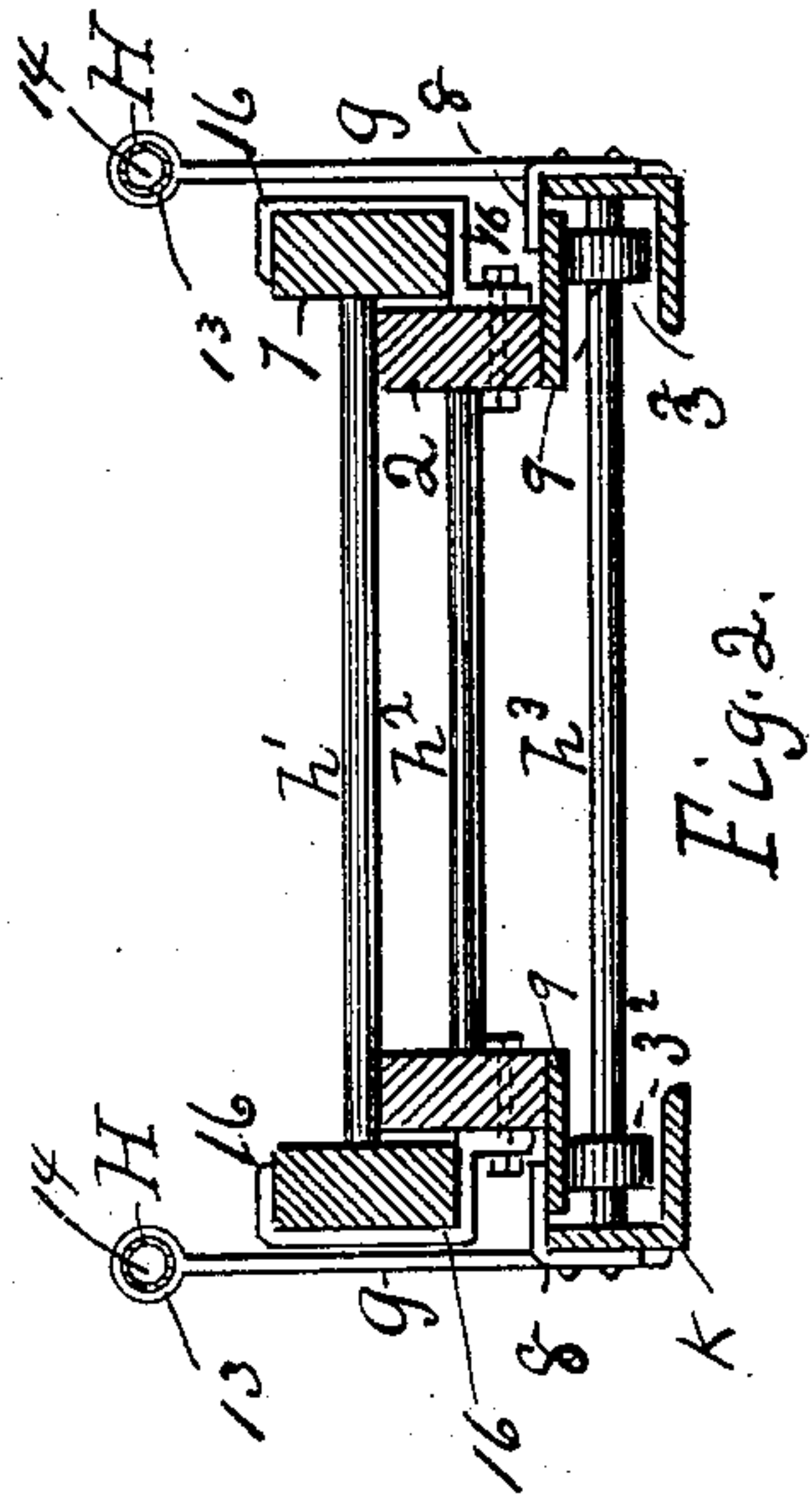


Fig. 2.

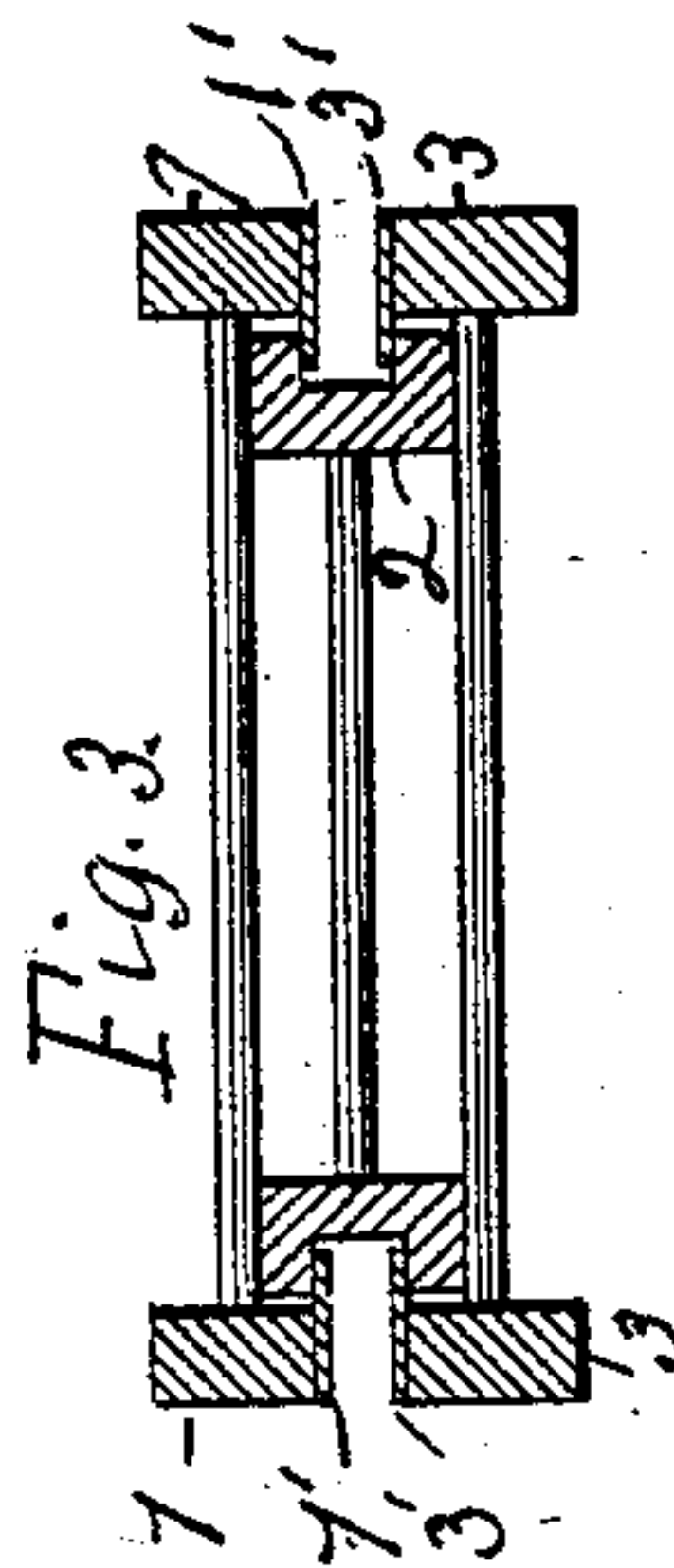
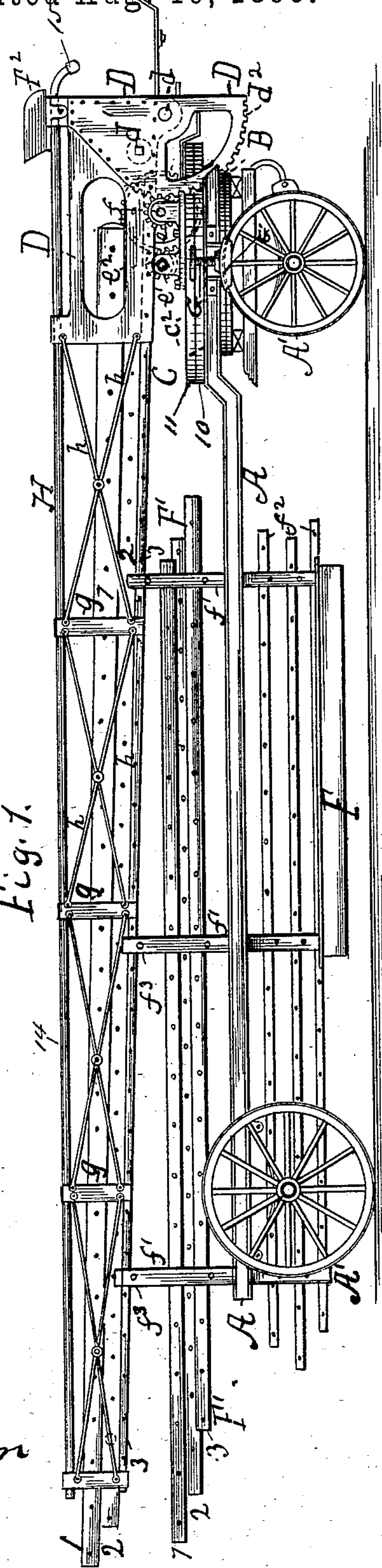


Fig. 3.

Fig. 1.



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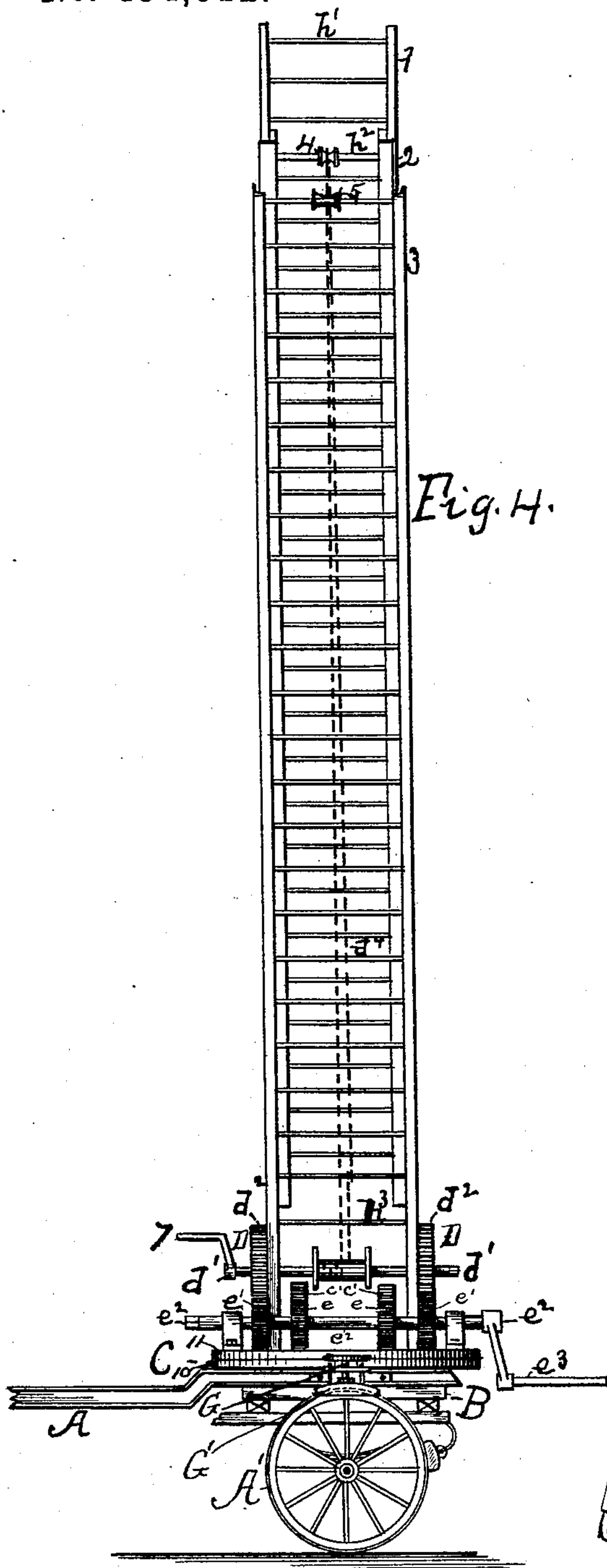


Fig. 4.

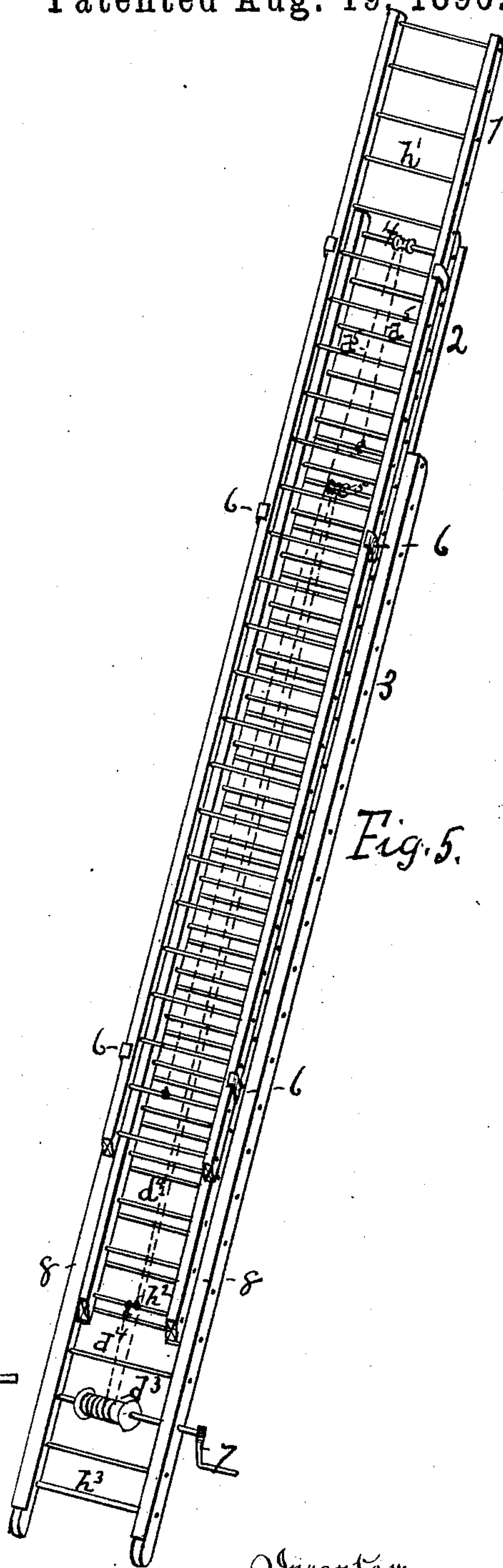


Fig. 5.

Witnesses:  
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A. L. Armstrong

Inventor.  
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# UNITED STATES PATENT OFFICE.

GEORGE MARTIN KIM, OF ALLEGHENY, PENNSYLVANIA.

## FIRE-TRUCK AND TRIPLE LADDER.

**SPECIFICATION** forming part of Letters Patent No. 434,512, dated August 19, 1890.

Application filed April 1, 1890. Serial No. 346,251. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MARTIN KIM, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Fire-Trucks and Triple Extension-Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in fire-trucks and triple ladders, and it has for its object to dispense with the ordinary tiller-wheel and provide a truck of such length that it can be easily turned in narrow streets and other confined places.

A further object of my invention is to reduce the length of the ladders to be carried by the truck and provide a triple extension-ladder which can be easily and quickly adjusted in position.

A further object of my invention is to provide a lifting device for removing the weight of the triple ladder and body of the truck off the springs and holding the same steadily in place.

With these ends in view and such others as pertain to my invention it consists of a frame supported on carrying-wheels having a fifth-wheel on the forward axle, and above this fifth-wheel is the turn-table upon which the triple extension-ladder is mounted.

Upon suitable upright supports on the frame the triple extension-ladder normally rests, and it has toothed segments at its lower larger end, which are operated by suitable gearing arranged on the turn-table, by means of which the triple ladder can be raised or lowered, as will more fully appear.

On the channel-iron forming the frame above the front wheels, I provide locking and lifting devices adapted to be secured to said wheels, and by which the weight of the forward end of the truck can be lifted from the springs and placed on the wheels.

My invention further consists of an extension-ladder composed of three ladders adapted

to be quickly and easily elevated in position by the peculiar arrangement of the ropes or chains which hold them together, as will more fully appear.

My invention further consists of the peculiar construction and arrangement of parts and combination of devices, as will be hereinafter more fully described and claimed.

To enable others to more readily understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure 1 is a side elevation of a fire-truck embodying my invention. Fig. 2 is a cross-section of the triple extension-ladder. Fig. 3 is a cross-section of a modified form of my triple extension-ladder. Fig. 4 is a side elevation of the forward part of the truck, showing the extension-ladder elevated and turned one-quarter way around on the turn-table. Fig. 5 is a detail perspective view of the triple extension-ladder partly extended.

Referring to the drawings, in which like letters and numerals of reference denote corresponding parts in all the figures, A designates the frame of my improved truck made of channel-iron and supported on axles which have the carrying-wheels A' on their ends. This frame A is made in the usual form and has the upright pieces  $f'$ , arranged thereon at suitable intervals adapted to support the short ladders  $f^2$ , and the triple extension-ladder H, which rests on the transverse pieces  $f^3$ . Above the frame A and resting on suitable transverse pieces fixed on the uprights  $f'$ , is a removable extension-ladder F' for use in case of an emergency.

Below the ladders and supported by the uprights  $f'$ , I provide a tool-chest F, which may also be used as a platform for the fireman to stand upon.

B designates the fifth-wheel of my improved truck. Above the fifth-wheel B is the turn-table C, which is composed of two sections, the lower section 10 being firmly secured to the frame A, and upon which the upper section 11 is adapted to revolve, when desired.

The triple extension-ladder has a frame H, on the lower or larger end of which I provide a casting D, pivoted on a shaft  $d$ , arranged in



suitable bearings on the turn-table C. This casting may be made in one or more pieces; but I prefer to use two pieces, as shown in Fig. 1, in which D designates the lower piece, on which are formed the toothed segments  $d^2$ . On the upper side of the casting D is placed a seat  $F^2$ , and in front of said casting is the brake-lever  $F^3$ .

On the turn-table C, I arrange the shaft  $e^2$  in suitable bearings and operate said shaft by the handle  $e^3$ , one or more of which may be provided, said shaft having two small gear-wheels  $e$ , which mesh with the larger gear-wheels  $c'$   $c'$  on the shaft  $f$ , which is journaled in stationary bearing on the turn-table C. On the ends of this shaft  $f$  are two pinions  $e'$   $e'$ , which mesh with the two segments  $d^2$  of the casting D. By turning the handle  $e^3$  on the shaft  $e^2$  the shaft  $f$  is revolved, and the pinions which mesh with the segments D operate to lift the frame  $H'$  and the triple extension-ladder H inclosed therein.

Through the channel-irons of the frame A, just above the front wheels  $A'$ , are two threaded screws G, having clamps  $G'$  on the lower ends adapted to fit over the rim of the wheels  $A'$ . On the upper ends of these screws are suitable hand-pieces 12, which when turned depress the screws and clamps  $G'$  upon the wheels and remove the weight of the frame and triple extension-ladder from the springs of the truck, thus forming a firm and steady support for the tripple ladder when elevated to its proper position.

The triple extension-ladder consists of the three ladders 1, 2, and 3, which are inclosed within the frame  $H'$ , secured to the casting D. The lower one of these ladders 3 is composed of angle-irons K and the transverse rounds  $h^3$ , each of which is provided at its end with friction-rollers  $3^2$ , upon which the middle ladder 2 rests and is adapted to slide. On the upper side of the lower ladder 3 is fixed a clamping-plate 8, which overlaps a similar plate 9, fixed on the lower side of the middle ladder 2, which plates operate to hold the middle ladder 2 in place and allow the ladders to slide one upon the other in extending or contracting the ladders. Firmly bolted to the middle ladder 2 is another clamp 6, which incloses three sides of the top ladder 1 and forms a guide, in which said top ladder is adapted to slide. These three ladders are all provided with suitable rounds  $h'$   $h^2$   $h^3$  of any preferred form and material. The lower ladder 3 forms part of the frame  $H'$  and has the right-angled standards  $g$ , projecting outwardly therefrom at suitable intervals, said standards being bent to form the rings 13 at their ends, through which are passed the hollow pipes 14, having the hose-connections 15 at their lower ends, whereby said pipes serve as a conduit for water. The standards are held firmly in place by means of suitable braces  $h$ .

On the shaft  $d'$ , operated by the handle 7, I place a drum  $d^3$ , over which the rope  $d^4$

passes, and by means of which the ladders are extended. The rope  $d^4$  is fastened to the lower round of the middle ladder 2, then passed around the drum  $d^3$  and over the spool 5 on the top round of the lower ladder 3, and fastened again on the lower round of the middle ladder 2. On the lower round of the top ladder 1 is fastened another rope  $d^5$ , which passes up over the spool 4 on the top round of the middle ladder 2, and is then firmly fastened to the top round of the lower ladder 3.

In Fig. 3 I have shown a modification of the arrangement of the triple extension-ladder. The outer side of the middle ladder 2 is grooved, and a channel-iron 16 is firmly seated therein, in which the plates or guides 1' and 3' on the lower and upper faces of ladders 1 and 3, respectively, are arranged to slide.

In practice the front end of the truck is run up as close as possible to the building upon which it is desired to operate and the triple extension-ladder turned one-quarter way around on the turn-table C and the clamps G, adjusted in place over the wheels  $A'$  on the front axle, and the weight of the ladder is removed from the springs of the truck and placed on the wheels through the clamps. The operator then turns the handle  $e^3$ , which operates the gearing to raise the extension-ladder to an upright position. If the operator then finds the ladder to be too short, the handle is turned to cause the triple ladder to be extended. The rope  $d^4$  passes around the drum  $d^3$  as the shaft  $d$  is rotated, and the middle ladder 2 is drawn up to the top of the lower stationary ladder 3. At the same time the top ladder 1 is automatically drawn up to the top of the middle ladder 2 as the rope  $d^5$  is drawn over the spool 4 by the pull of the middle ladder 2 as it is elevated.

I am aware that changes and modifications in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of my invention, and I would therefore have it understood that I reserve the right to make such alterations as fairly fall within the scope of my invention.

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

1. In a fire-truck and triple extension-ladder, the combination, with a frame, of a clamp secured to said frame above the front wheels of the truck, for the purpose set forth, substantially as described.

2. The combination, with a truck and a carrying-wheel thereof, of a vertically-adjustable screw supported in a fixed bearing on the truck and having the shoe adapted to engage the carrying-wheel, substantially as described, for the purpose set forth.

3. The combination of a ladder having friction-rollers, an intermediate ladder resting on said friction-rollers, a top ladder fitted in guides rigid with the intermediate ladder,



the engaging guide-plate on the lower and intermediate ladders, and means for extending the ladders longitudinally with respect to each other, substantially as described.

- 5 4. In a triple ladder for fire-trucks, a lower ladder having the angle-shaped side pieces and the rounds provided with friction-rollers, in combination with an intermediate ladder which rests on the friction-rollers, the inter-  
10 locking guide-plates rigid with the lower and intermediate ladders, an upper ladder, and

guides on the intermediate ladder on which the upper ladder is free to slide, substantially as described.

In testimony that I claim the foregoing I 15  
hereunto affix my signature this 15th day of  
February, A. D. 1890.

GEORGE MARTIN KIM. [L. s.]

In presence of—

JOHN H. CRATTY,  
A. L. ARMSTRONG.