

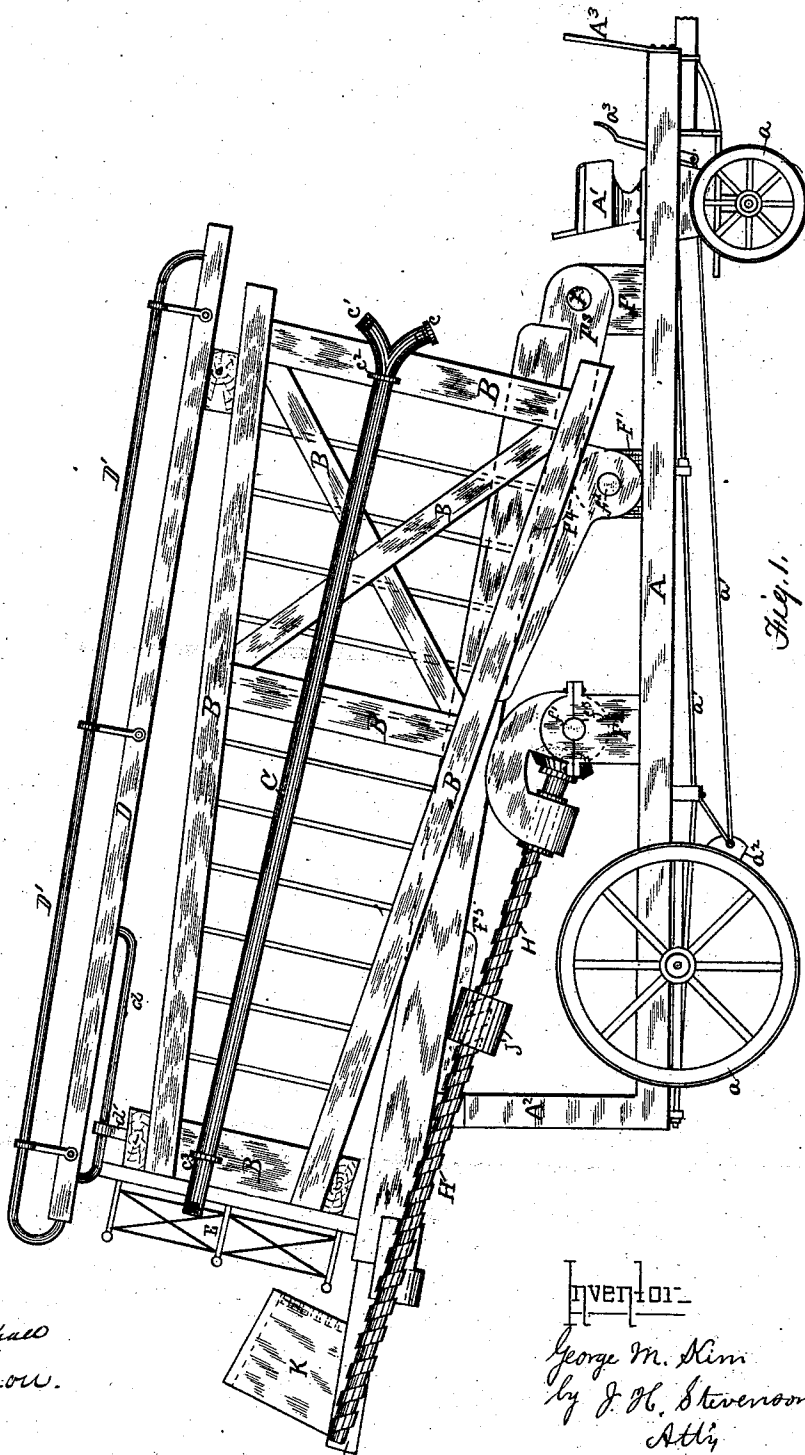
(No Model.)

4 Sheets—Sheet 1.

G. M. KIM.
FIRE ESCAPE.

No. 292,825.

Patented Feb. 5, 1884.



WITNESSES

R. W. Minkner
E. F. Davison

INVENTOR

George M. Kim
by J. B. Stevenson
Atty

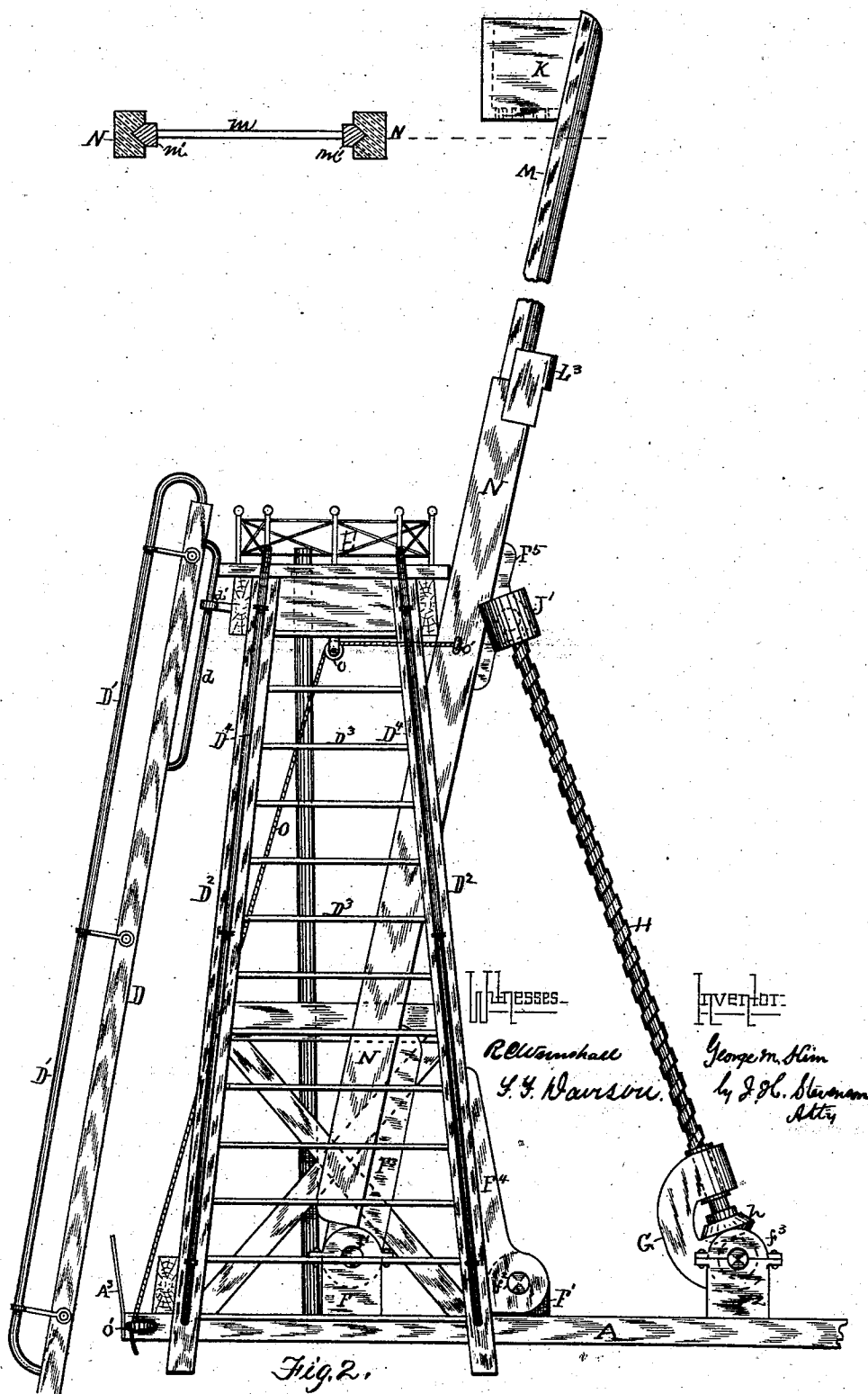
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N. PETERS, Photo-Lithographer, Washington, D. C.

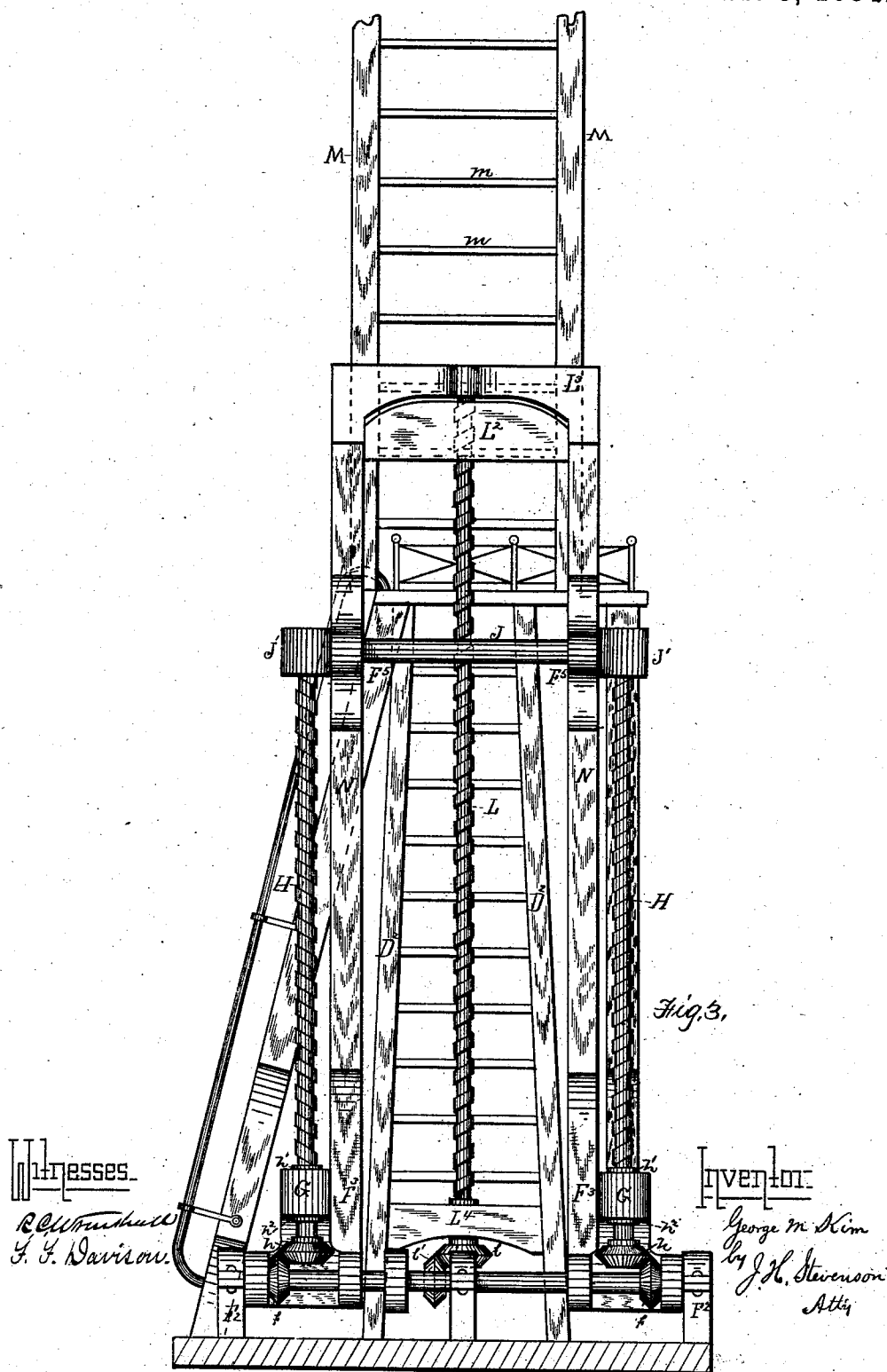
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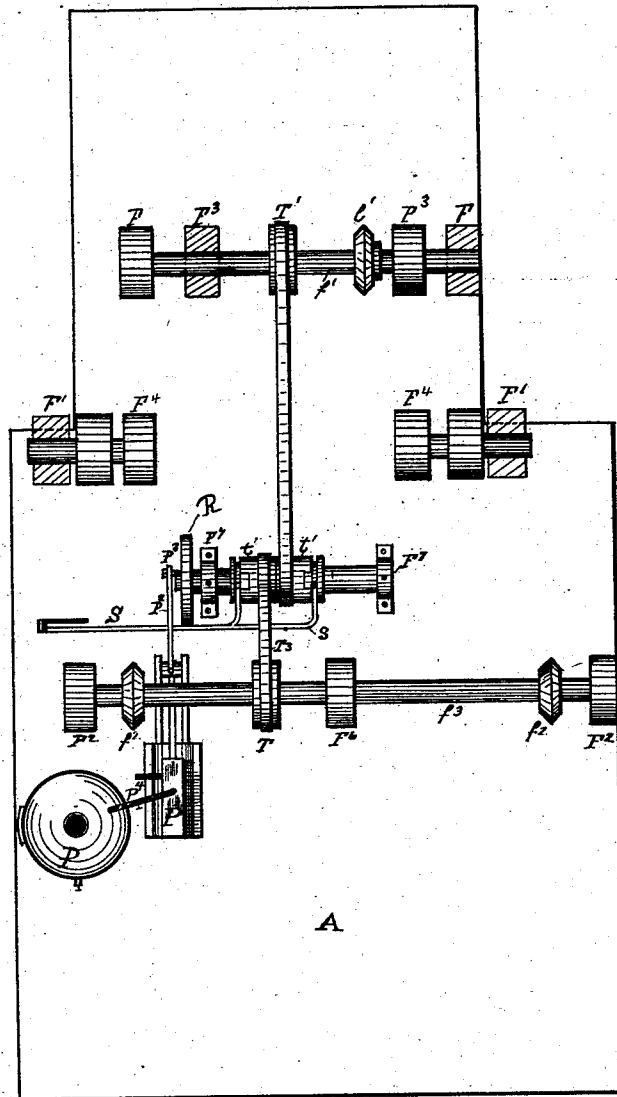


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE M. KIM, OF ALLEGHENY, PENNSYLVANIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 292,825, dated February 5, 1884.

Application filed March 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. KIM, of 145 Howardstreet, Allegheny, Pennsylvania, have invented a new and useful improvement in fire-escapes and hook-and-ladder apparatus for fires, with water-pipe connections, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

Similar letters of reference indicate corresponding parts.

In the accompanying drawings, Figure 1 represents a side view or elevation of my fire-escape and hook-and-ladder apparatus for fires, mounted on a carriage and folded back thereon, ready to go or be drawn to a fire. Fig. 2 is a side view of the same, showing the tower raised and ladder extended. Fig. 3 is an end view, looking from the rear toward the front, the tower being raised and ladder extended. Fig. 4 is a top view, looking down upon the carriage.

A A is the body of the carriage.

A' is a seat for the driver.

A² is a fire-fender on rear end of the carriage.

A³ is the dash-board.

a a are carriage-wheels.

a' a' are the brake-irons; a², brake-rubber.

a³ is the brake-lever.

B B B are timbers forming the tower.

C is a water-pipe fixed to the tower, as seen at c² and c³.

c and c' are the two branches of the pipes C at the lower end thereof, and are to afford a double connection when being used, or but one, as desired; and when but one is used a cap will be screwed on the one not in use, as seen at c in Fig. 1.

D is a sliding upright ladder fixed to the tower, as seen at d' in Fig. 1, by means of the iron slide d on both sides. This ladder D has an iron railing, D', made of one and one-fourth inch gas-pipe. This railing will be useful in going up or down the same, especially in aiding feeble or helpless persons down.

E represents the top of the tower. It has a railing around it with an opening or gateway, with the bottom slotted or perforated, so as not to hold water that might fall therein.

D³ D³ are rounds in the ladder D². This ladder D² is a fixed one, forming a portion of

the tower B B, and has a railing, D⁴, on each side, for the same purpose as the railings on the ladder D.

F F are housings fixed to the top of the carriage, and are used to form a pivot for the timbers N N, by means of the bearings F³ F³ on the shaft f¹.

F' F' are fixed housings to the carriage also, and are for the purpose of supporting the bearings or brackets F⁴ F⁴, fixed to the ladder D², as seen in Fig. 1.

f² is a shaft to support the tower-timbers D³ by means of the bearings F⁴ F⁴.

F² F² are also housings fixed to the carriage, as F F and F' F' are fixed, and are to support the shaft f³.

F³ F³ are bearings on the timbers N N, to support the shaft J.

F⁶ is a housing, the counterpart of F² F².

F' F' are housings to support the pulley-shaft, on which the clutches t' t' are mounted, as seen in Fig. 4.

f f are beveled cog-wheels fixed to the shaft f².

G G are an adjustable housing, semicircular in form, as will be seen by reference to Fig. 2, and works on the shaft f². By the peculiar construction of this housing, I am enabled to successfully operate the screw H, as one end (the lower) passes through one of the prongs of this housing, and between the other two prongs of this housing G, I place the beveled cog-wheels f f and h h, the latter operating to revolve the screw-shaft H.

h' h' and h² h² are collars on the screws H H, to serve a well-known purpose.

At the top of the shafts H H is the cross-bar J, working in the bearings F⁵ F⁵, and at either end of the bar J is the head J', through which the shafts H H operate to move the same upward or downward. In this operation one of the shafts revolves to the right and the other to the left.

K is a box on the top of the extension-ladder M M.

m m are rounds in the ladder M.

L is an elevating-screw, which is fixed at the top to the cross-bar L³, and at the lower end to the bar L⁴, and at the extreme lower end has the beveled cog-wheel l, and is further fixed to be operated by the beveled cog-wheel l'. This screw works in its revolutions the

cross-bar L^2 , which in turn is fixed to the elevating-ladder or extension-ladder $M M$. The ladder $M M$ is fixed to the cross-bar L^2 , and through this cross-bar the shaft or screw L works, thus raising or lowering the extension-ladder by right or left revolutions of the screw, as will readily be seen and understood by mechanics. The upper end of the screw works loosely in the cross-bar L^3 of the timbers $N N$.

O is a safety-line, which is fixed to the timbers N , as seen at o' , and passes under the top of the tower over a friction or screw pulley, o , and is drawn down and fastened to the carriage, as seen in Fig. 2 at O' .

P is a steam-boiler placed in rear of the shaft f^3 .

P' is an engine.

P^2 is the arm operated by the engine.

P^3 is the crank at the end of the pulley-shaft, as seen in Fig. 4.

P^4 are steam-pipes from the boiler to the engine, and need no description, as to their functions, that being well understood, as will also the mechanism and operation of the engine.

R is a fly-wheel or balance-wheel.

S is a lever to operate the clutch-pulleys t and t' .

T is a pulley on the shaft f^3 .

T' is a pulley on the shaft f' .

T^3 is a band from the pulley T to the clutch-pulley t , and there is also a band from the clutch-pulley t' to the pulley T' on the shaft f' . This band-operating pulley T' is the one that works the extension-ladder M by means of the screw-shaft L and the intermediate system of cog-wheel attachments, and the band T^3 operates the raising and lowering at various angles of the ladder $M M$ by means of the screw-shafts $H H$.

$F^1 F^7$ are housings supporting the shaft that works the clutches $t t'$ and balance-wheel R .

$F^6 F^6$ are housings for the shaft f^2 .

The fire-fender A^2 should be about four feet high and made of iron.

Having thus referred to the various parts of my invention, I will now proceed to explain at some length the leading features of the same, that those who are familiar with mechanics may understand it.

It would readily be observed that a fire-escape apparatus with a tower built high would meet with many obstructions in our cities, from telegraph-wires, and, besides, would be dangerous to be taken rapidly from place to place, as they would readily upset; and for this reason I construct my tower so as to have it lie flat, or nearly so, on the carriage, as seen in Fig. 1, and only raise it when necessary to use it at the place of fire, which raising can be done quickly by means of the screws $H H$, operated either by hand or steam power. If operated by hand, a crank will be put at each end of the shaft operating the pulleys $t t'$. In case of fires, various methods have been de-

vised to aid persons escaping therefrom, but none of these means are free of danger to the escaping party; and to remedy this defect, I furnish by my invention a means of carrying aid to persons thus circumstanced, by means of my sliding or extension ladder and hoisting-screws $H H$. By this means a box capable of holding five or six persons can be put close up to the escaping party, and, if necessary, as is often the case with women, children, or invalids, help can be conveyed to them, and they can be aided to get into the box K and conveyed down to the top of the tower, and from there by way of the ladders to the ground. Women, children, invalids, and often strong men, under great excitement incident to a fire, cannot be trusted to operate any kind of fire-escape. Partly through fear they cannot do it, as well as not understanding the mode of operation, supplemented with weakness and helplessness. By my fire-escape, I can place the box K to any third, fourth, or higher story windows, changing the angle and altitude of the ladders easily and quickly.

Sometimes in cities the telegraph-wires are in the way of hoisting ladders; but in the operation of my fire-escape and hook-and-ladder apparatus but little if any difficulty in this regard will be experienced, compared with the old methods and appliances at fires, for in operating my apparatus I can place the truck or wagon at any angle across a street or parallel with it, and then if any difficulty is experienced from wires in hoisting the ladders there will be little difficulty in cutting the wires from the tower or ladder, and shears for this purpose should always be at hand. Under any such circumstances my fire-escape, &c., can be in position for work in a very few minutes.

In the construction of my fire-escape, &c., the tower should be made about thirty-five feet high from the ground, and for one of that height the truck or wagon carrying the same should be about thirty (30) feet from end to end. These proportions would allow of an extension-ladder to reach seventy-five feet from the ground. As to other proportions, the timbers $N N$ would be forty feet and the ladder $M M$ forty feet. The ladder D also should be forty feet long. The screw-shafts $H H$ from the housing G should be about twenty-five feet in length, and the screw L thirty-five feet. The tip C should be thirty-five feet long and of ordinary hose size. The tower at the base should be eight feet and sloping to the top, where it should be four feet lengthwise, this for the width, and lengthwise the tower at the base should be twelve feet and five feet at the top, making the base of the tower eight by twelve feet and the top four by five feet. The railing around the tower should be eighteen inches high and the railing on the ladders $D D^2$ should be the same. The screws $H H$ should be made of Bessemer steel and two and a quarter inches in diameter, and the thread thereon cut so as to make nine inches of a raise at each revolu-

tion. The screw L should also be of Bessemer steel one and three-quarters inch in diameter, and made to carry nine inches at each revolution. The width of the ladder D² should be 5 four feet broad at the base and three feet at the top, and the same proportions should be observed in the ladder D. The ladder M should be three and one-half feet wide. The box K 10 should be about three feet wide and four feet long and three feet deep.

The safety-line O may be of use in case of a break of one of the screws H, and will also be needed in folding the tower back on the truck.

In case of fires where no fire-escape is needed, 15 my invention will be of use in getting water to second, third, and fourth floors, as hose attached to the pipe C can easily be taken where desired by means of the ladder M M in the box K, thus 20 conveying one or more firemen to the desired place. In case but one attachment is made to the pipe C at the bottom, a cap can be placed on the other branch. When the truck arrives 25 at the place of fire, the horses are unhitched and the tongue taken out, and the management of the truck thereafter will be by hand, so far as putting it into position is concerned.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, 30 is—

1. The screws H H and L, and the ladders and additional extension-ladder M, operated thereby, in combination with bevel-wheels 35 mounted on shafts turning on bearings on the carriage and gearing with bevel-wheels on said screws, substantially as set forth.

2. In a fire-escape apparatus, the extension-ladder M, and box K, operated by the screw L in the V-slides *m' m'*, substantially as described and shown.

3. In a fire-escape apparatus, the sliding ladder D D, having the railings D' D', and slides 40 *d d*, fixed to the tower, substantially as shown and set forth.

4. In a fire-escape apparatus, the tower B B, the fixed ladder D² D², sliding ladder D D, 45 and guides attached to said fixed ladder for the said sliding ladder, in combination substantially as described and set forth.

5. In a fire-escape apparatus, the combination of the shaft *f*³, wheels *f f*, screws H H, 50 wheels *h h*, shaft J, screw-head L², with wheels *l' l'*, the head L, and ladder M, substantially as described and shown.

6. In a fire-escape apparatus, the combination of the pulleys T T', clutch-pulleys *t t'*, 55 belts T² T², and crank P³, operated by hand-power or by steam, with the bevel-gear wheels on shafts that turn in bearings on the floor of the carriage, screws H H and L, operated by said bevel-gear wheels, and the extension-lad- 60 ders operated by said screws, substantially as described and shown.

In testimony that I claim the foregoing as my invention I have hereto set my hand in the presence of two witnesses.

GEORGE M. KIM.

Witnesses:

WM. M. DUNCAN,
JOHN S. LAMBIE.