(No Model.) 5 Sheets—Sheet 1.

J. D. RÜLLMANN.

FIRE ESCAPE.

No. 396,175. Patented Jan. 15, 1889.

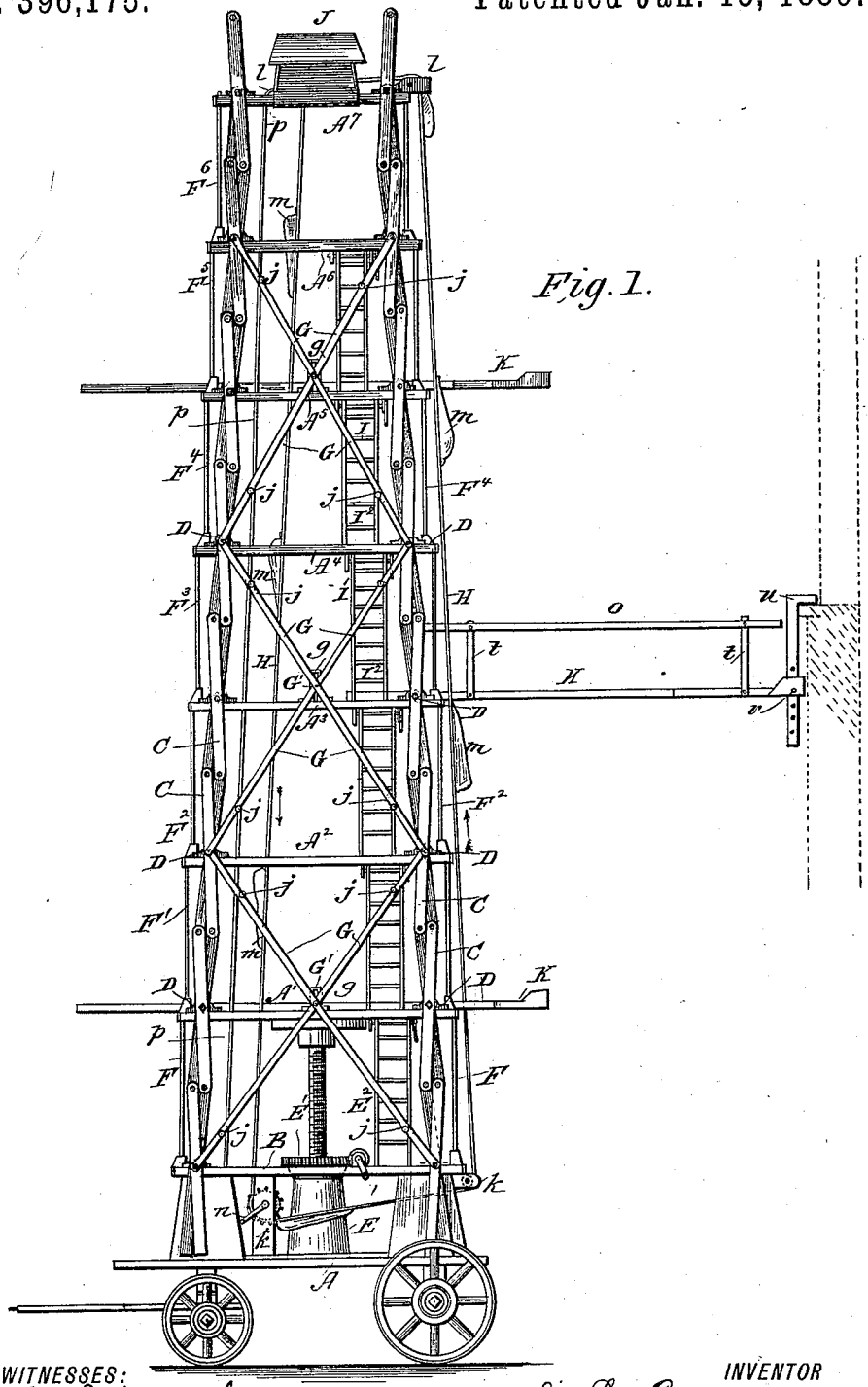


Fig. 1.

WITNESSES:
Fred G. Dieterich
Edw. W. Byrn

INVENTOR
J. D. Rullmann
BY Munn & Co
ATTORNEY

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

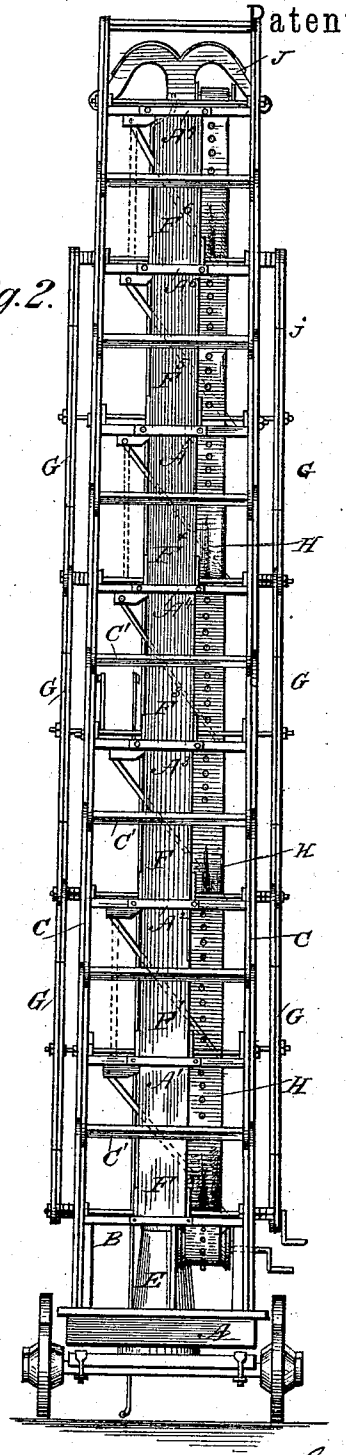
(No Model.) 5 Sheets—Sheet 2.

J. D. RÜLLMANN.

FIRE ESCAPE.

No. 396,175. Patented Jan. 15, 1889.

Fig. 2.



WITNESSES:
Fred G. Dieterich
Edw. H. Byrn.

INVENTOR
J. D. Rullmann
BY Munn & Co

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

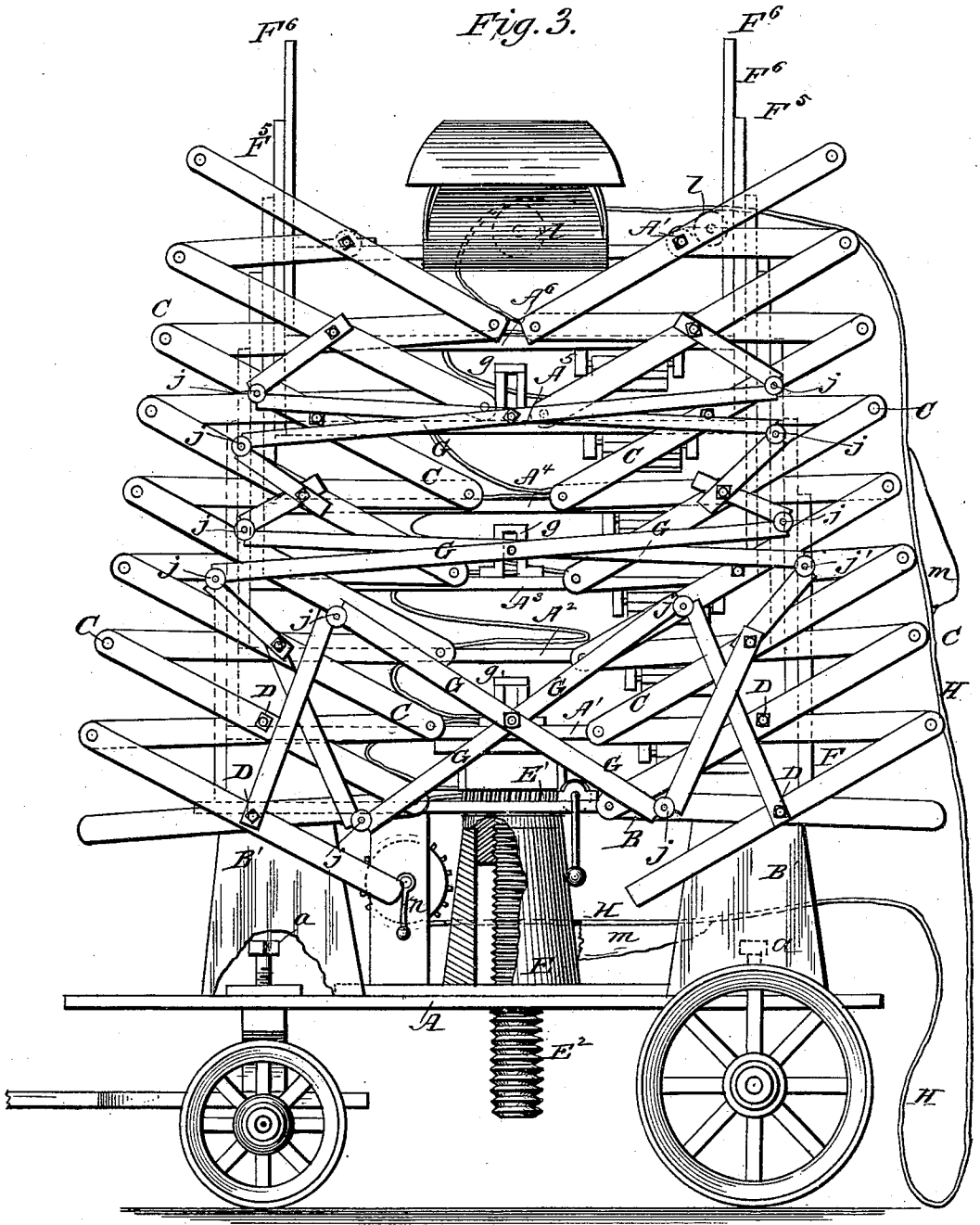
(No Model.) 5 Sheets—Sheet 3.

J. D. RÜLLMANN.

FIRE ESCAPE.

No. 396,175. Patented Jan. 15, 1889.

Fig. 3.



WITNESSES:

Fred G. Dieterich

Edw. W. Byrn.

INVENTOR

J. D. Rullmann

BY Munn & Co

ATTORNEY

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

(No Model.) 5 Sheets—Sheet 4.

J. D. RÜLLMANN.

FIRE ESCAPE.

No. 396,175. Patented Jan. 15, 1889.

Fig. 5.

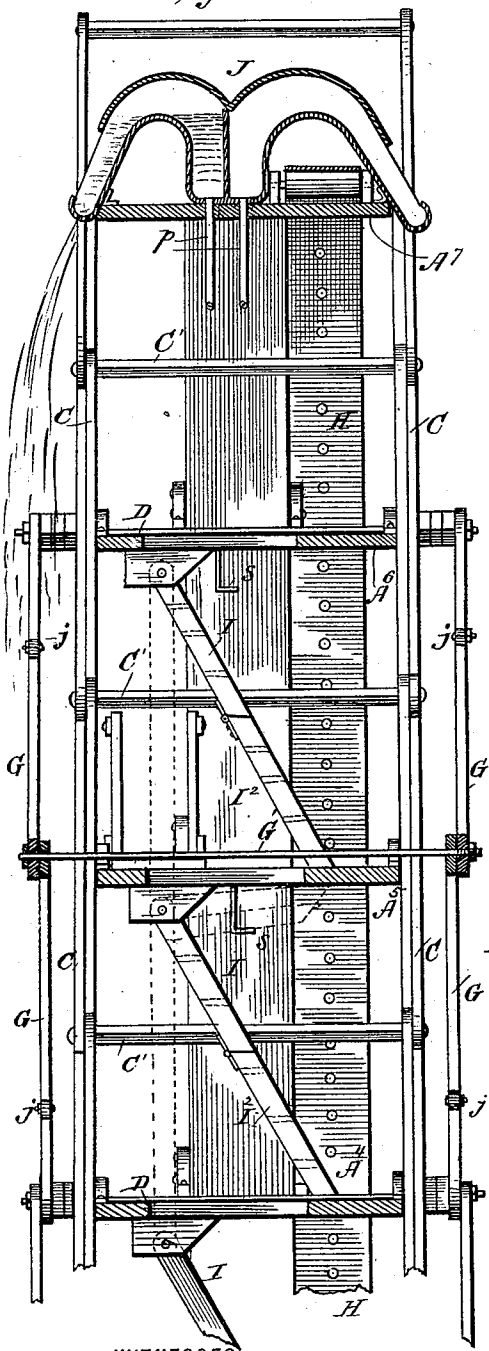
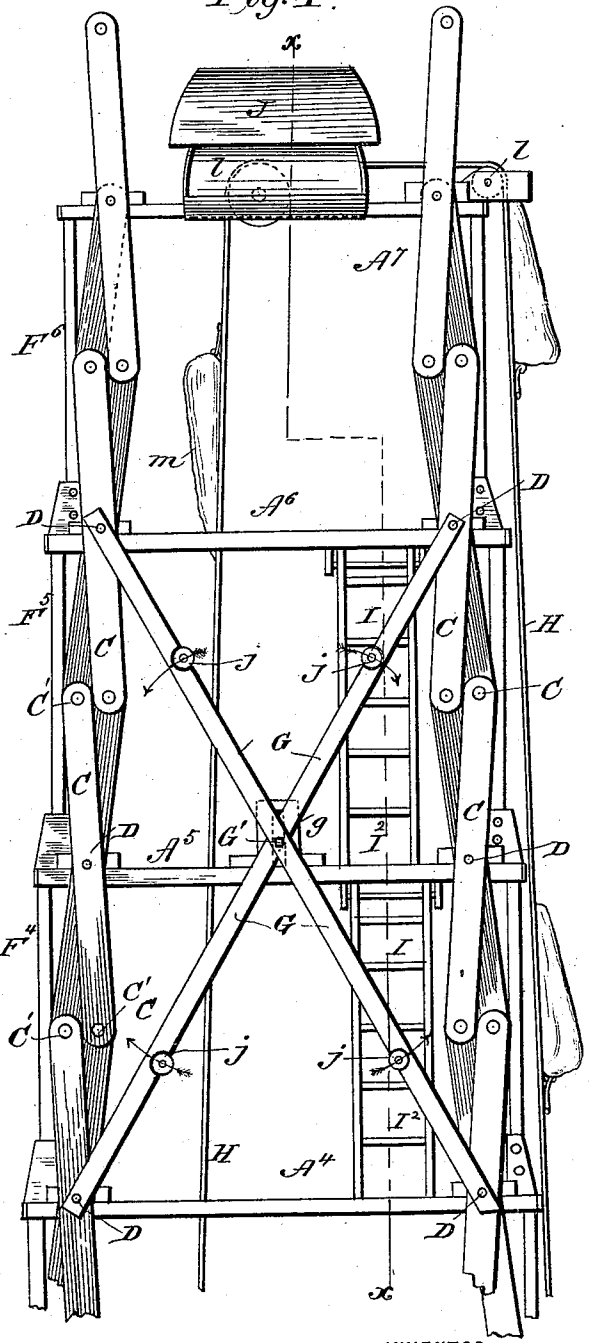


Fig. 4.



WITNESSES:

Fred G. Dieterich

Edw. W. Byrn

INVENTOR

J. D. Rullmann

BY Munn & Co

ATTORNEY

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

(No Model.) 5 Sheets—Sheet 5.

J. D. RÜLLMANN.

FIRE ESCAPE.

No. 396,175. Patented Jan. 15, 1889.

Fig. 6.

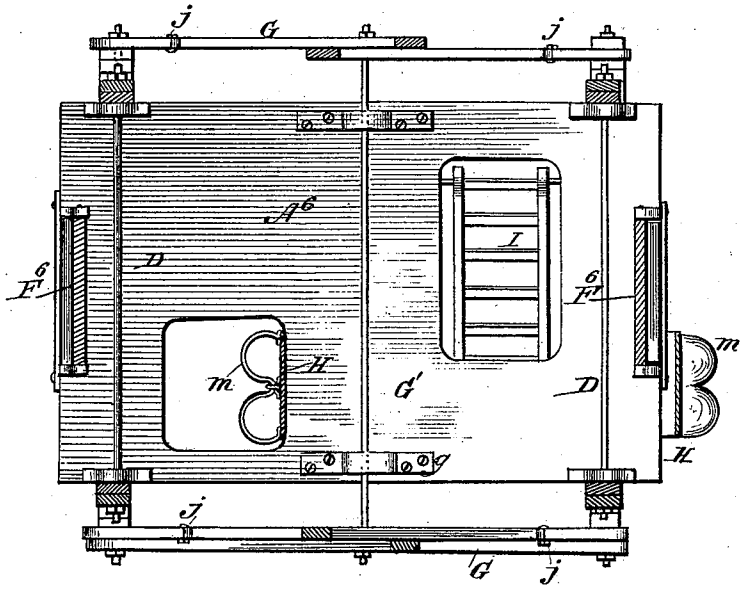


Fig. 7.

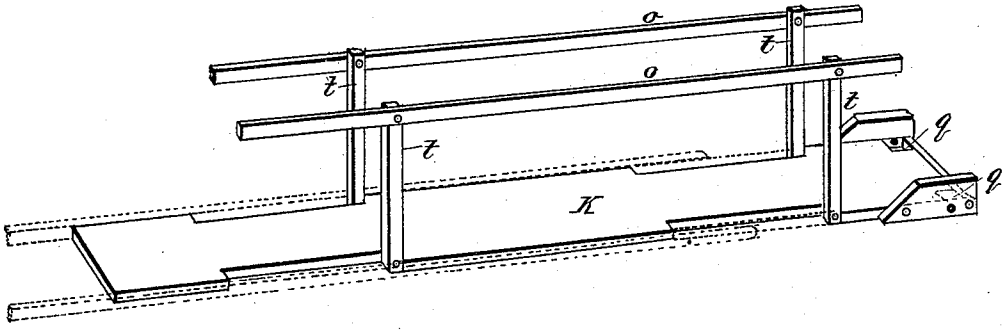
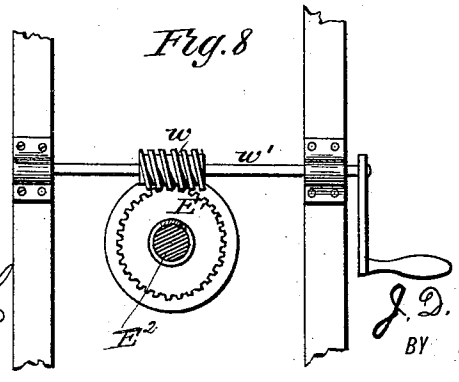


Fig. 8.



WITNESSES:
Fred G. Dieterich
Edw. W. Byrn.

INVENTOR
J. D. Rullmann
BY Munn & Co
ATTORNEY

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

UNITED STATES PATENT OFFICE.

JOHN D. RÜLLMANN, OF SAN ANTONIO, TEXAS.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 396,175, dated January 15, 1889.

Application filed April 18, 1888. Serial No. 271,109. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. RÜLLMANN, of San Antonio, in the county of Bexar and State of Texas, have invented a new and useful Improvement in Fire-Escapes, of which the following is a specification.

My invention is in the nature of a fire-escape and observation-tower, which may be raised or extended at any point, or be lowered and compactly folded for transportation.

It consists in the peculiar construction and arrangement of the tower and various parts of the same, which I will now proceed to fully describe with reference to the drawings, in which—

Figure 1 is a side elevation of the tower in its raised or elevated position. Fig. 2 is an end elevation of the same. Fig. 3 is a side elevation, on a larger scale, showing the tower lowered or collapsed. Fig. 4 is a side elevation of the top part of the tower. Fig. 5 is a section of the same through line $x\ x$. Fig. 6 is a horizontal section of the tower. Fig. 7 is a perspective view of the folding bridge; and Fig. 8 is a sectional plan view of the worm-gear for raising the tower.

A, Figs. 1 and 3, represents a platform, which is mounted upon a strong running-gear composed of heavy wheels and axles, by which the tower is made portable. This platform is adjusted to a true level by leveling-screws *a*.

B is a strong deck mounted upon the platform by means of strong upright end supports, B′.

A′ is the first of a series of movable platforms, A′ A^2 A^3 A^4 A^5 A^6 A^7. These platforms are connected to and supported by a series of toggle-levers, C C, at each of their four corners, which toggle-levers are arranged in pairs, after the manner of lazy-tongs, and are fulcrumed on rods D, that are fixed in the platforms and extend from the toggle-levers on one side to those on the other. About the center of the lower platform, A, is mounted a hollow conical casing, E, Fig. 3, surmounted by a large and strong screw-nut, E′, that fits the thread of a large screw-shaft, E^2, which is firmly attached to the center of the under side of the first movable platform, A′. As this screw-nut E′ is turned, it causes the shaft, with the platform A′, to rise, and this motion of the platform A′, in tending to straighten or bring together the toggle-levers C of the lazy-tongs, causes each of the higher platforms to rise, each higher one rising with an accelerated motion.

The toggle-levers C C have their ends on one side connected to the moving ends of the pair on the other side by rods C′ C′, Figs. 2 and 5, and when the tower is fully extended the two levers C C of each pair have their ends (which are connected to the rods C′) lying against each other, as in Figs. 1 and 4.

To hold the tower against swaying while it is being elevated and to brace it when elevated, I use two sets of devices. One of these is a series of guide-bars, F F′ F^2, &c. These guide-bars are mounted vertically upon opposite ends of each platform and are strongly braced to said platforms. The top of each guide-bar slides through a slot or opening in the platform next above, and thus the platforms are kept in vertical alignment. To brace the tower when extended, I employ on each side of the tower a set of supplemental toggle-levers, G G, which are fulcrumed on a rod, G′, extending across the platforms, which rods are free to move vertically, but are restricted as to lateral motion by guides *g* on the platforms. These bracing toggle-levers cross each other at one platform, and are jointed to the fulcrum or cross-rods at D at the outer ends of the platforms above and below. Said bracing toggle-levers have a reverse action to the toggle-levers which raise the platform—*i. e.*, the lifting toggle-levers close toward a vertical position when the platforms are being raised, while the bracing toggle-levers open from a horizontal position at the same time. To prevent these brace-toggles from interfering with the folding of the lifting toggle-levers C, I make in the toggle-levers G knuckle-joints *j*, which, after the manner of carriage-top props, bend in one direction and lock in the other. These knuckle-joints *j* in my tower are arranged to fold outwardly, as indicated in dotted lines in Fig. 4, and lock by inward movement when the tower is fully extended.

H is an endless flexible belt, which is distended around two rollers, *k k*, on the main

frame below, and two rollers, *l l*, at the top of the tower. This belt passes down through a hatchway in each platform (see Fig. 6) and rises outside of the tower on the other side. This belt is provided with pockets *m*, which are designed for the reception of articles taken from the upper stories of the burning building, and also for the reception of children and helpless or insensible persons. These pockets are provided with a hook and eye or other fastening for closing the tops of the pockets. To stop or retard the descent of this belt, one of the pulleys *k* below is provided (see Fig. 1) with a crank, *n*, and has teeth that engage with eyelets in the belt.

At the opposite end of each platform from that which has the hatchway for the belt there are formed other gangways for folding ladders composed of hinged sections I I². (See Figs. 6 and 5.) These ladders are hung to the under side of each platform and descend to the platform below; or they may, as shown by dotted lines, Fig. 5, hang straight down the gangways, as may be desirable for the quick ascent of firemen with the hose. When not in use and the tower is to be folded, the ladders are folded and fastened by hooks *s* to the under side of their platforms, as in Fig. 5.

The toggle-levers and smaller members of the upper structure of the tower are made of hollow steel for lightness, strength, and protection from fire. It may be necessary, however, to protect the platforms and persons on them from the heat of flames bursting through the side of the burning building, and for this purpose a hose-pipe, *p*, passes through a hole in each platform and extends to a double trough-shaped receptacle, J, Figs. 4 and 5, at the top, with which it communicates. This receptacle has a sort of eaves-trough on opposite sides of the tower, whose bottom is pierced with perforations, and when water is forced into the hose *p* from the engine the water issuing into the troughs above falls in sheets of spray down beside the tower, so as to afford a protection to the tower and persons in it from the flames or radiated heat of the building.

In order to take persons from the windows of the burning building, every other platform is provided with an extensible bridge, (see Fig. 7,) and in order to allow these bridges to remain on the platforms when the tower is lowered without occupying much space said bridge is made to fold flat, so as to occupy only the thickness of its board. For this purpose the foot-board or gang-plank K of the bridge is cut away at four places along its edges, and in these cut-away portions are pivoted folding standards *t*, which at their opposite ends are pivoted to a hand-rail, *o*. When folded, the standards *t* drop into the plane of the foot-board in the cut-away portions thereof, and the hand-rail folds into the same plane along the outer edge thereof, as shown in dotted lines, so that the whole bridge occupies but the space of the thickness of the foot-board between the platforms of the tower. When the hand-rail of the bridge is raised, it is preferably stiffened and locked by any well-known form of brace.

At the end of the bridge are two openings, *q*, through which pass hooked suspending-bars *u*, Fig. 1. When the bridge does not reach the level of a window when run out from its platform, these adjustable hooked bars are fastened by pins *v* at the right height, and their upper hooked ends are made to catch in the window-sill and sustain that end of the bridge while persons are escaping from the window.

Turning the screw-nut E′ for raising the tower may be done in various ways. I prefer, however, to make the outer edge of the nut (see Fig. 8) with teeth, into which meshes a worm, *w*, on a shaft, *w′*, which latter is arranged in bearings on the main frame, and is provided with a crank for turning it.

In making use of my invention I do not confine it to use as a fire-escape, but may employ it as an observation-tower or for other analogous purpose.

Having thus described my invention, what I claim as new is—

1. An extensible tower consisting of a series of platforms, a series of lifting toggle-levers arranged in pairs as lazy-tongs at the four corners, and a series of bracing toggle-levers arranged, as described, to work reversely to the lifting-toggles, substantially as and for the purpose set forth.

2. An extensible tower consisting of a series of platforms, a series of lifting toggle-levers arranged in pairs as lazy-tongs at the four corners, and a series of bracing toggle-levers arranged to work reversely to the lifting-toggles, and having in their lengths outwardly-folding and inwardly-locking knuckle-joints *j*, substantially as and for the purpose described.

3. An extensible tower consisting of a series of vertically-adjustable platforms with hatchways, combined with a series of supporting toggle-levers, and folding ladders extending from one platform to the next, substantially as shown and described.

4. The combination, with an extensible tower, of a water-receptacle arranged at the top of the same and having perforated eaves-troughs and a hose-pipe leading thereto from below for showering spray down between the tower and a burning building, as described.

5. The combination, in an extensible tower, of the vertically-adjustable platforms, the series of lazy-tongs for lifting the same, and a set of rigid upright guide-bars arranged on each platform and extending through an opening in the platform above, substantially as and for the purpose described.

6. The combination, with an extensible tower consisting of a series of vertically-adjustable platforms having hatchways and lifting devices, as described, of a set of pulleys or rollers arranged at the top and bottom

of the tower, and an endless belt with pockets passing around said rollers and through the hatchways for the safe lowering of goods and persons, as set forth.

7. The combination, with an extensible tower consisting of a series of vertically-adjustable platforms and a series of toggle-levers arranged as lazy-tongs for raising and lowering them, of a set of bridges or gang-planks having folding hand-rails adapted to be folded and rest between the platforms when lowered, substantially as shown and described.

JOHN D. RÜLLMANN.

Witnesses:
SOLON C. KEMON,
CHAS. A. PETTIT.