

(No Model.)

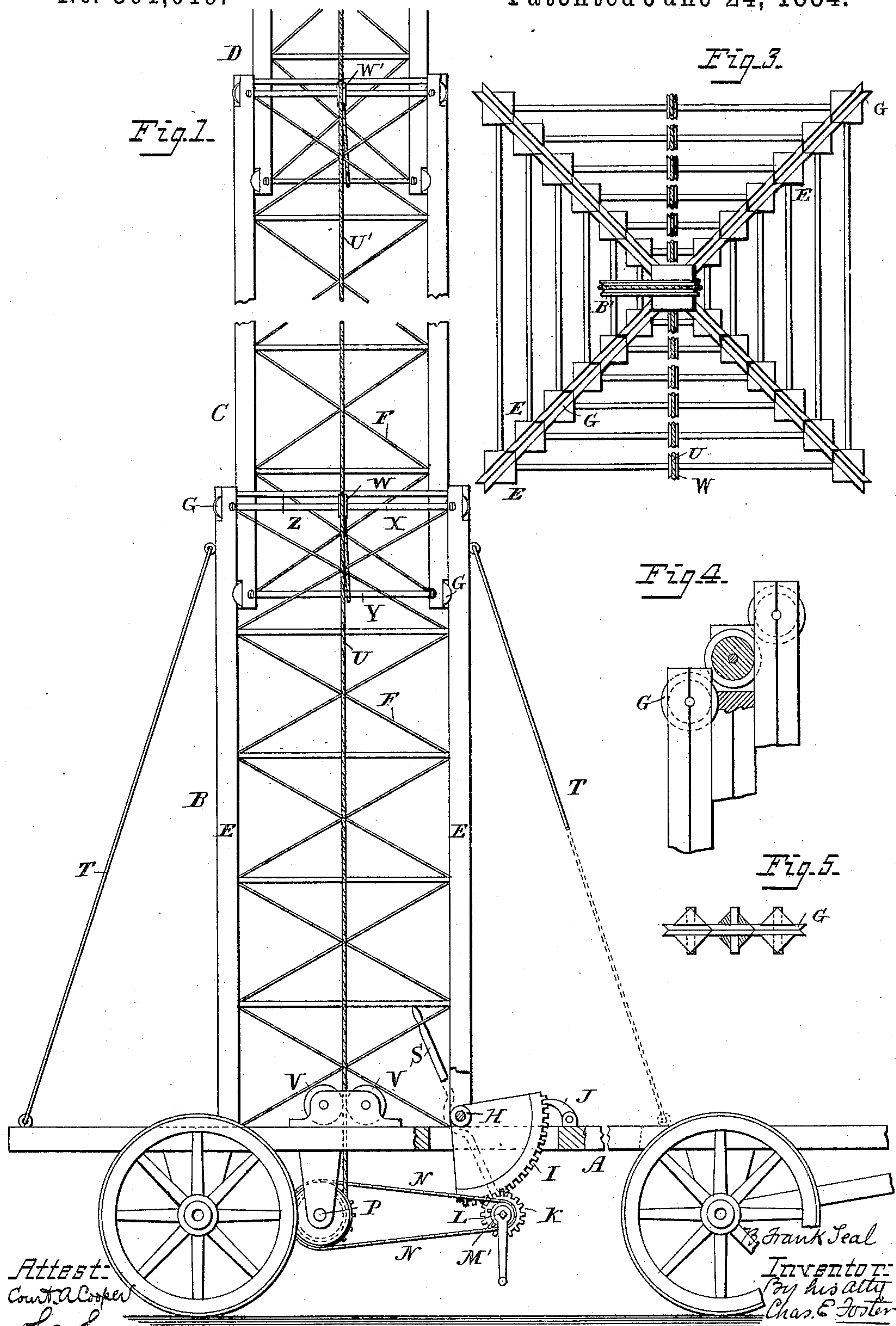
2 Sheets—Sheet 1.

B. F. TEAL.

FIRE ESCAPE.

No. 301,019.

Patented June 24, 1884.

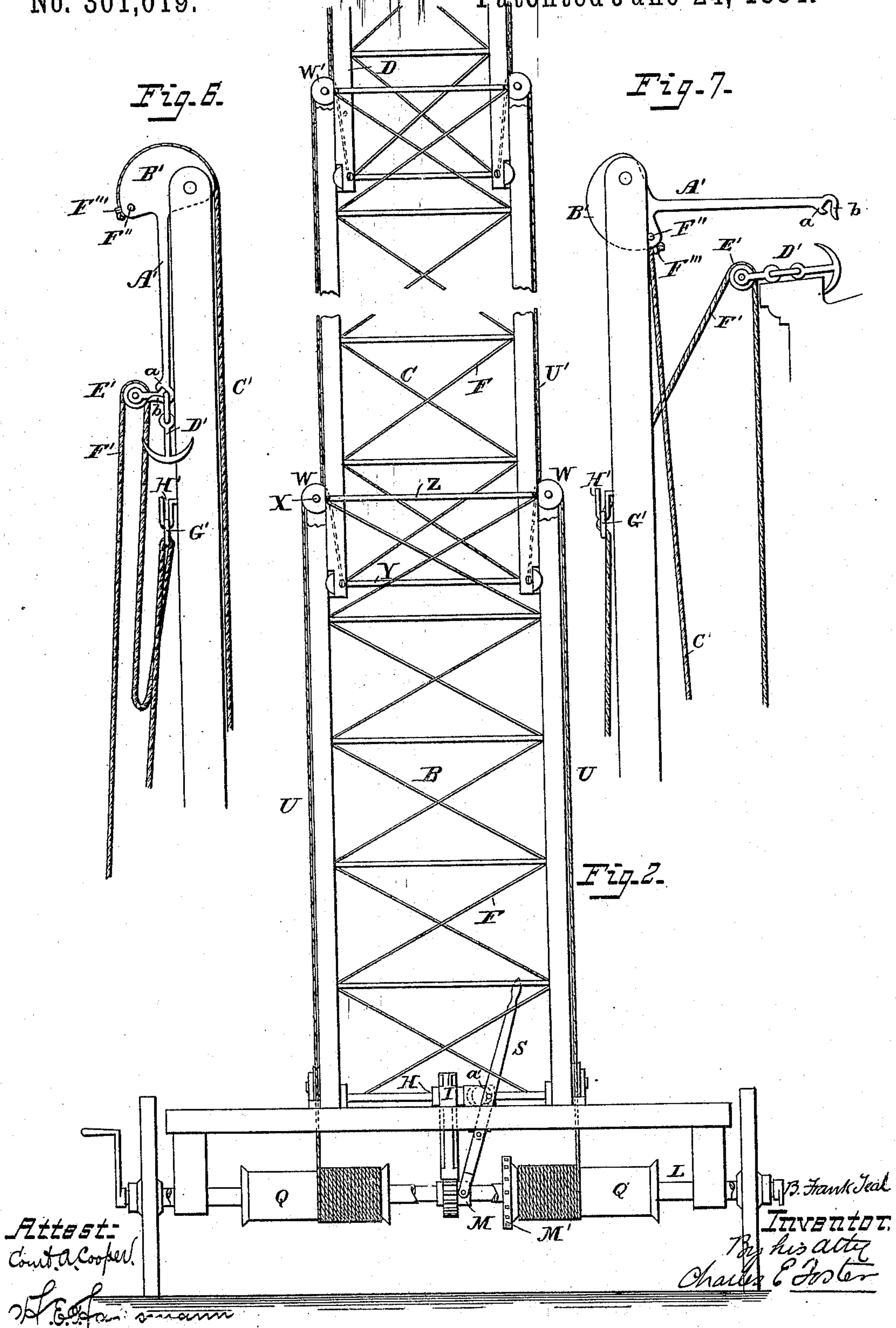


Attest:
Court A. Cooper
L. E. Hansmann.

2 Sheets—Sheet 2.

No. 301,019.

Patented June 24, 1884.



UNITED STATES PATENT OFFICE.

B. FRANK TEAL, OF PHILADELPHIA, PENNSYLVANIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 301,019, dated June 24, 1884.

Application filed April 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, B. FRANK TEAL, of the city and county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Fire-Escapes, of which the following is a specification.

My invention relates to a device for elevating or projecting objects of moderate weight and size, either vertically, horizontally, or at any angle between the two, and may be used for elevating a rope or ladder or other means of escape to the upper part of a building, or to project a ponton or other means of rescue from the shore or beach to a stranded or wrecked vessel; and it consists in the construction and combination of parts hereinafter particularly described, and then sought to be specifically defined by the claims.

In the accompanying drawings, Figure 1 illustrates a side view of the device; Fig. 2, a front end view; Fig. 3, a top view of the telescopic sections only, the sections being closed within each other; Figs. 4 and 5, respectively, detached section and side views illustrating the application of the guide-rollers; and Figs. 6 and 7, detached side views of the grappling device.

A wheeled truck, A, of any suitable construction, supports and carries the elevating device and a series of ladders and such other lowering or rescuing devices as may be employed.

The elevating or projecting device proper consists of a series of telescopic sections, B, C, and D, and so on, each section being composed of upright posts E, connected together and braced by truss-rods F. These sections slide within each other, and when closed appear as shown by Fig. 3, and when extended appear as shown by Figs. 1 and 2. There may be as many telescopic sections as desired; but Fig. 3 represents seven, the seventh one being merely a single post, while the others have four posts each. In Figs. 1 and 2 only three sections are shown, the others being broken away.

In order to guide and steady the sections in their longitudinal movement, grooved rollers G are journaled in the ends of the posts E, as illustrated in Figs. 1, 2, and 4, so that the

edges of the posts will fit into the grooves of the pulleys, as shown by Fig. 4. The lowest section, B, of the series is keyed or otherwise rigidly secured at one side of its lower end to a shaft, H, which is provided with a segmental gear, I, and journaled in suitable bearings on the bed of the truck A, so that it may be lowered till it rests upon the bed or raised and held at any angle between a horizontal and perpendicular by a pawl, J, pivoted to the bed, so as to engage with the teeth of the gear. The segmental gear is turned by a pinion, K, on a crank-shaft, L, journaled in suitable boxes suspended under and from some part of the truck. This pinion may be loose on the shaft and always mesh with the teeth of the gear, and be operated by the shaft when a clutch, M, on the shaft is brought into connection therewith, as illustrated in the drawings, or else it may be connected with the clutch as a part thereof, so as to be moved in and out of mesh with the gear as the clutch is moved back and forth in the manner well known to mechanics. When the clutch is moved away from the segmental gear, it comes into connection with a sprocket-wheel, M', on the shaft L, from which wheel a chain, N, passes to and around another sprocket-wheel on a shaft, P, journaled in the same manner as shaft L.

To the shaft P are keyed two drums, Q, around which is wound the rope or chain by which the telescopic sections are raised. When the clutch is in connection with the sprocket-wheel on shaft L, and that shaft is turned, the motion is of course communicated, through chain N, to the drums Q, and according as they are turned the one way or the other the rope is wound or unwound as the sections are raised or lowered. The clutch M is moved either by a hand-lever, R, or automatically by a lever, S, having at one end a pin fitting into the cam-slot *a*, formed in the sleeve of segmental gear I, which encircles shaft H. If the automatic clutch is used, the movement of the segmental gear throws the clutch into connection with pinion K, so that by the time the sections are raised to a perpendicular the connection is completed and the sections can be elevated by continuing the turning of the shaft

L. When the sections are raised to a perpendicular, they may be held to that position by chains or rods T, each connected at one end to section B, and provided with a hook at the other end to hook into a ring connected to the truck-bed. The elevating ropes or chains U, which wind around drums Q, pass upward between guide-rollers V to the top of section B, where they pass over sheaves W, supported by a cross-rod, X, firmly secured to the posts of the section, and are then securely fastened to the lower part of section C by the cross-rods Y. Another set of chains, U', are connected at one end to cross-rods Z at the top of section B, and then passed over sheaves W', secured to the top of the section C, the same as sheaves W, and then securely fastened to the lower part of section D, the same as chains U to section C. Each succeeding section is secured to the one before it, and following it in the manner that section C has been described as secured to sections B and D. With the parts constructed and connected as described, the sections are elevated by revolving the drums Q, so as to wind up the chains thereon. As the chains are wound around the drums, section C is elevated out of section B, carrying with it the other sections, and at the same time each section is raised out of the one within which it is inclosed at the same speed as the one next below it is raised out of its surrounding section, so that as a consequence there is a relatively-increasing speed of each section from the first starting point, and as a result the topmost section is very rapidly projected to the point desired. A ratchet-and-pawl device will be connected with the elevating-shaft in any of the well-known ways to hold the sections at their projected height, and when the sections are to be lowered the pawl is released and the chain allowed gradually to unwind from the drums. Any device such as is well known in mechanics may be used to prevent the sections from descending too rapidly. The projector and elevator is strong and yet light in weight, so that it can be quickly and easily transferred from one point to another, and it can be projected or elevated and lowered with great dispatch.

When the device is not in use, the sections are inclosed within each other and the group turned down by the same means used for raising it, so as to rest horizontally on the bed of the truck.

The construction so far described relates to the elevating mechanism, and may be used without other appliances to effect connection with a burning building; but I intend to use it in connection with devices which I will hereinafter describe.

When the elevator is used by itself, the rope ladder or other means of escape is hung on a hook secured to the top section, and is detached therefrom either by the persons in the building who are to be rescued or by some person ascending the elevator and making

connection between the ladder and building, after which the elevator may be transferred to other parts for further use. The device, however, which I intend to use with the elevator, and which has been referred to, consists of a lever, A', which has a hook, a b, at one end and a curved arm or cam, B', at the other end. The cam end of this lever is set into a slot made in the post of the top section and pivoted so as to move in a three-quarter circle, whereby it may be swung over the top of the post from one side to the other, a pin, F, in the cam preventing the lever from falling below a horizontal when swung around. A rope or chain, C', is connected to the cam end of the lever at the point F'', and when the lever is in position for operation the rope passes around the edge of the cam and hangs down, as shown in Fig. 6, so that the end of the rope may be pulled to swing the lever around. If desired, a second rope may be connected to the cam at a point opposite to rope C', so as to swing the lever back again. The hook at the end of the lever is formed, as shown, with a barb, b, so as to receive the ring of the grappling-hooks D', and hold them until the lever is turned around to a horizontal position, as shown in Fig. 7, when the ring drops out of the hook and the grappling-hooks engage with the object to which they are to hold. To the ring of the grappling-hook there is also connected the sheave-pulley E', through which is run the rope F'. Both ends of this rope will extend to the ground; but a portion of it will be looped and suspended by a ring, G', from a hook, H', secured to the post of the top section, so as to relieve partially the lever A' of its weight; but still there is slack enough of the rope to permit the lever to be swung around to its horizontal position. When the lever is in position for operation, it hangs perpendicularly and holds the looped rope as shown in Fig. 6, and after the lever has been swung around to the position shown in Fig. 7 and the connection made with the edge of the building, as shown in the same figure, the lever is swung back to its first position and the sections of the elevator drawn downward, thus releasing the ring G' from the hook H' and leaving the rope suspended from the house. A ladder may now be connected to rope F' and raised to the desired point and there held by securing rope F'.

Instead of the ladder, or in connection with it, there may be used a basket connected to a rope working over a pulley, so as to be raised and lowered, the basket-rope being secured to the house or to the rope F', the same as the ladder.

The elevating or projecting device can be employed for projecting lines or other objects, either horizontally or vertically, for various purposes, although it is particularly adapted to projecting fire-escapes, especially when used in connection with the grappling device described.

I do not confine myself to the arrangement of devices described and illustrated for raising and lowering the sections, as I have found a single shaft to answer the purpose admirably when arranged as follows: The shaft L may carry the clutch M, the pinion K, and a single drum, Q. The clutch being keyed to shaft, and the pinion and drum loose on it—one on each side of the clutch—the latter is made to engage either pinion or drum at will by simply moving the shaft laterally through its journal-bearings. When this device is used, the shaft must be so located with reference to the sections as to bring the drum in proper position for the ropes or chains U to wind upon it. This method of engaging the clutch with pinion or drum may also be used in connection with the two shafts, as previously described, in place of the automatic device or the hand-lever R.

Having described my invention and set forth its merits, what I claim is—

1. The combination of the supporting-truck, the series of telescopic sections, the lowest section being hinged to the truck, the segmental gear connected with the lowest section, the shaft carrying a pinion to mesh with the gear, and a sprocket-wheel, the ropes for elevating or projecting the sections, the shaft provided with a drum for carrying the ropes, and with a sprocket-wheel, a chain connecting the two sprocket-wheels, and the clutch for connecting with the pinion and sprocket-wheel on the same shaft, substantially as and for the purposes set forth.

2. The combination of the series of sliding

sections, means for elevating the sections, a swinging lever pivoted to the top section, and adapted to hang perpendicularly on one side, and to be swung to the other side of the section, and means for swinging the lever, substantially as and for the purpose set forth.

3. The combination of the series of sliding sections, means for elevating or projecting the sections, a lever hinged to the top section, having a curved arm at one end and a hook at the other end of the form described, having the barb b, and means for swinging the lever, substantially as and for the purpose set forth.

4. The combination of the series of telescopic sections, means for elevating or projecting the sections, a lever hinged to the top section, having a curved arm at one end and hook of the form described at the other end, a grappling-hook and its rope suspended from the hook end of the lever and from a hook on the top section, and means for swinging the lever, substantially as and for the purpose set forth.

5. The combination of the series of telescopic sections, means for elevating or projecting the sections, and the grooved guide-rollers set into the ends of the posts composing one section, so as to embrace the edges of the posts composing another section, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

B. FRANK TEAL.

Witnesses:

WM. I. MANN,

WILLIAM M. HENDERSON.