No. 640,645. Patented Jan. 2, 1900.

J. W. FALL.

COMBINED FIRE ESCAPE LADDER AND WATER TOWER.

(Application filed Aug. 30, 1899.)

(No Model.) 3 Sheets—Sheet 1.

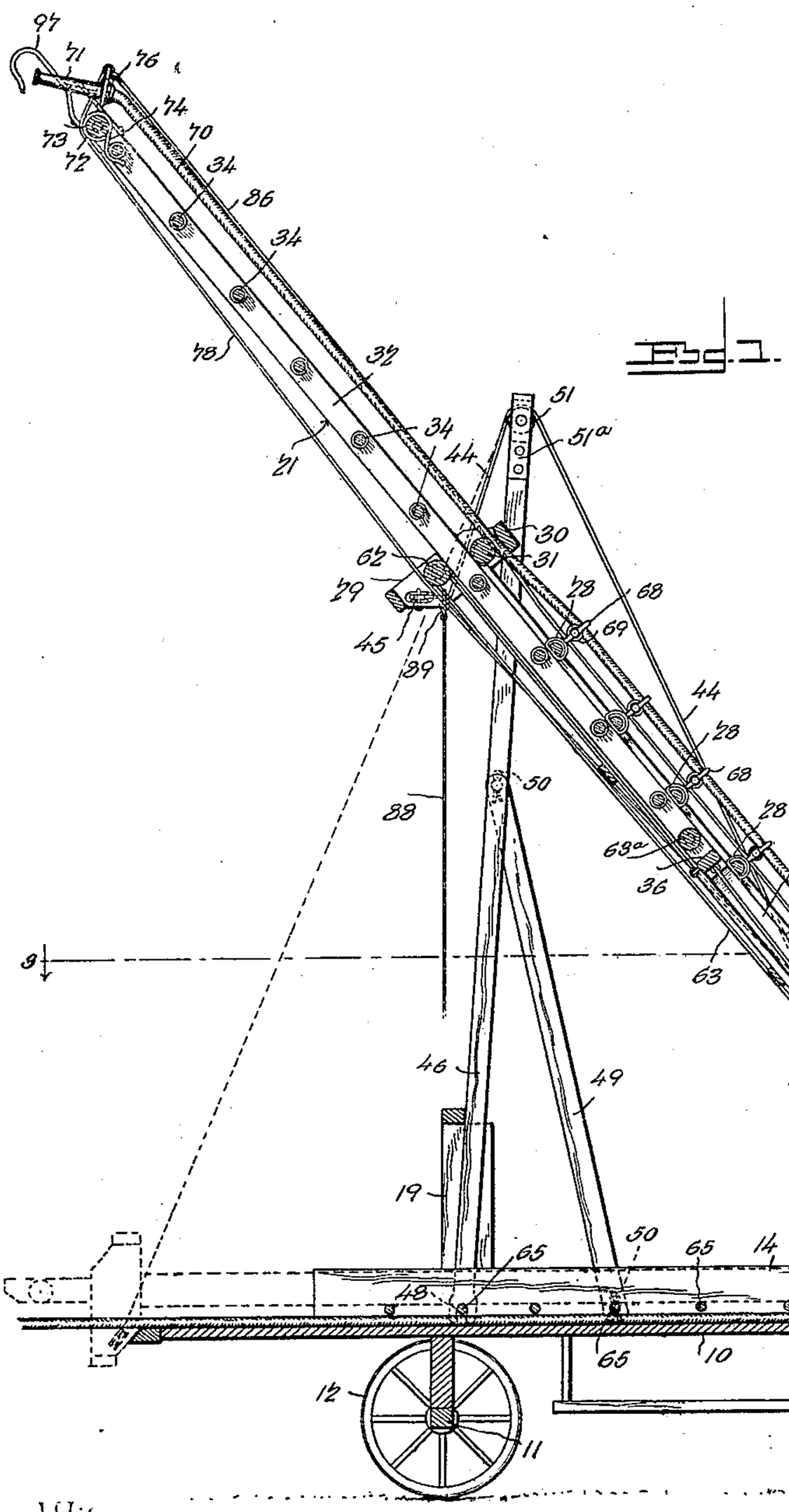

Fig. 1.

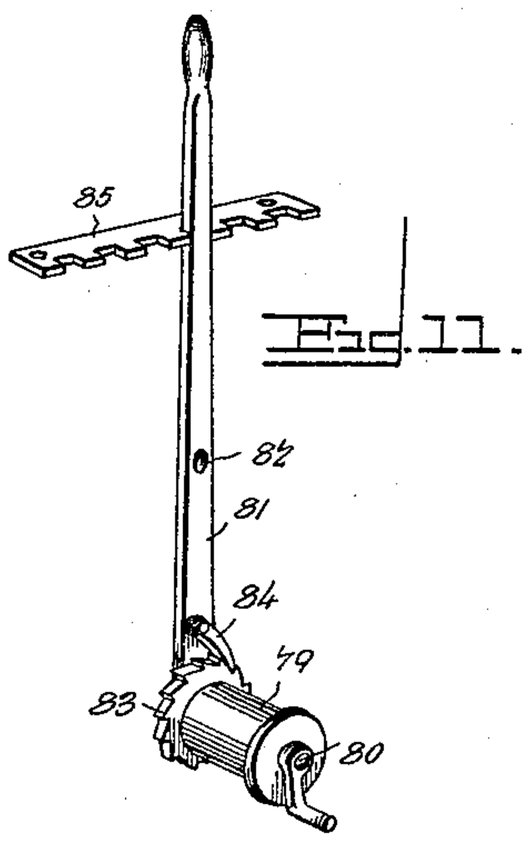

Fig. 11.

Witnesses
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No. 640,645. Patented Jan. 2, 1900.

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COMBINED FIRE ESCAPE LADDER AND WATER TOWER.

(Application filed Aug. 30, 1899.)

(No Model.) 3 Sheets—Sheet 2.

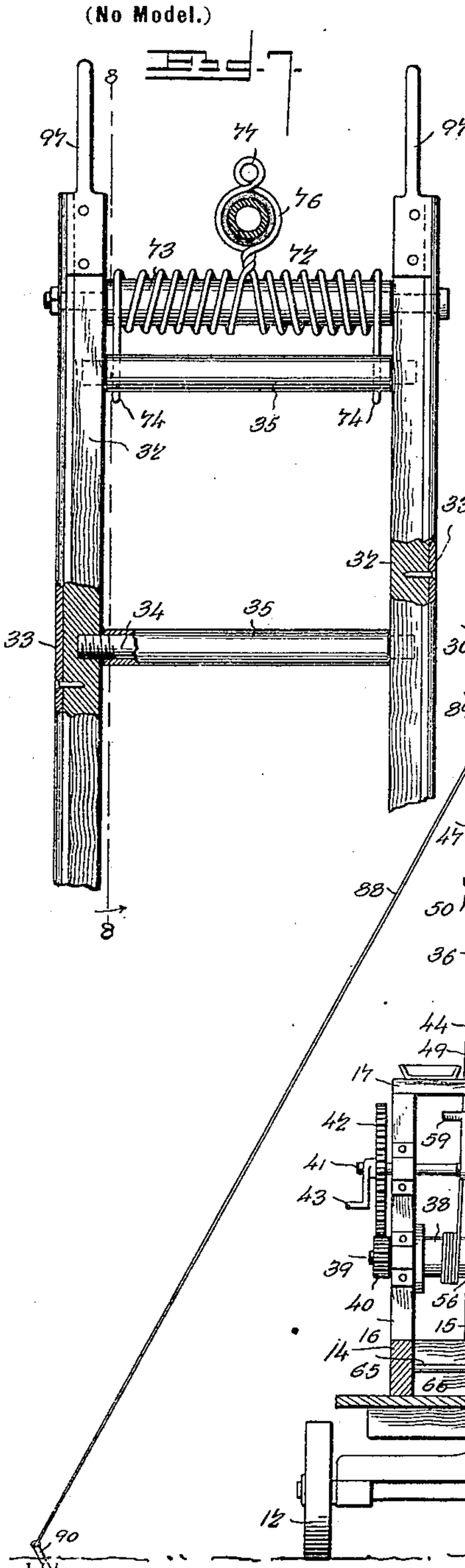
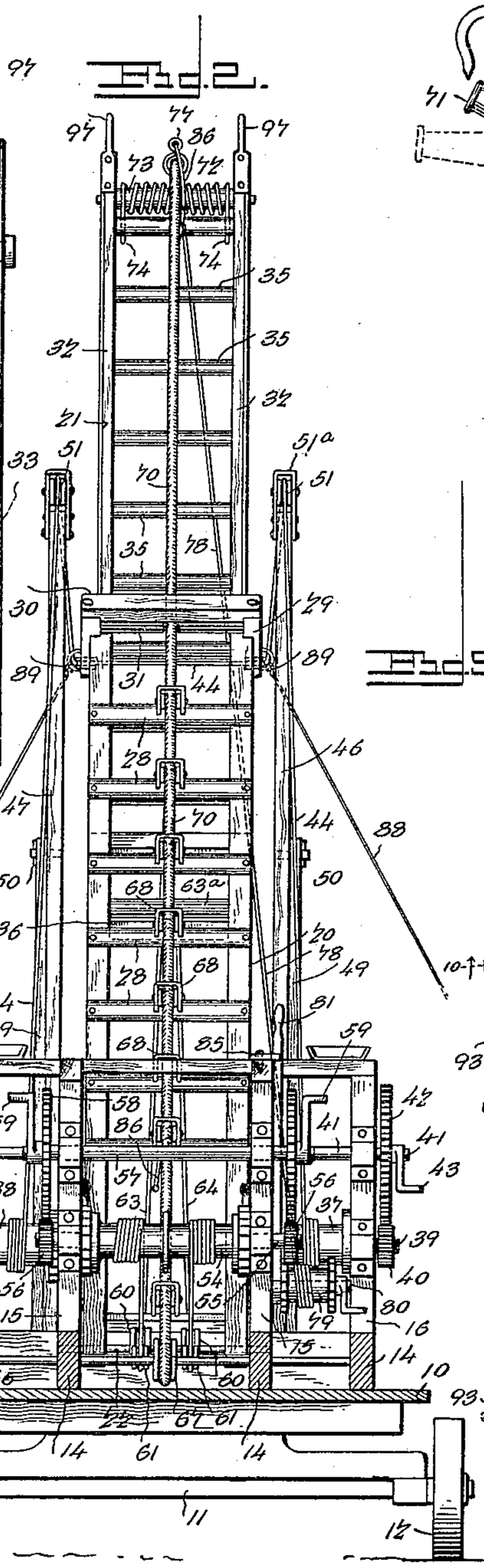


Fig. 2.



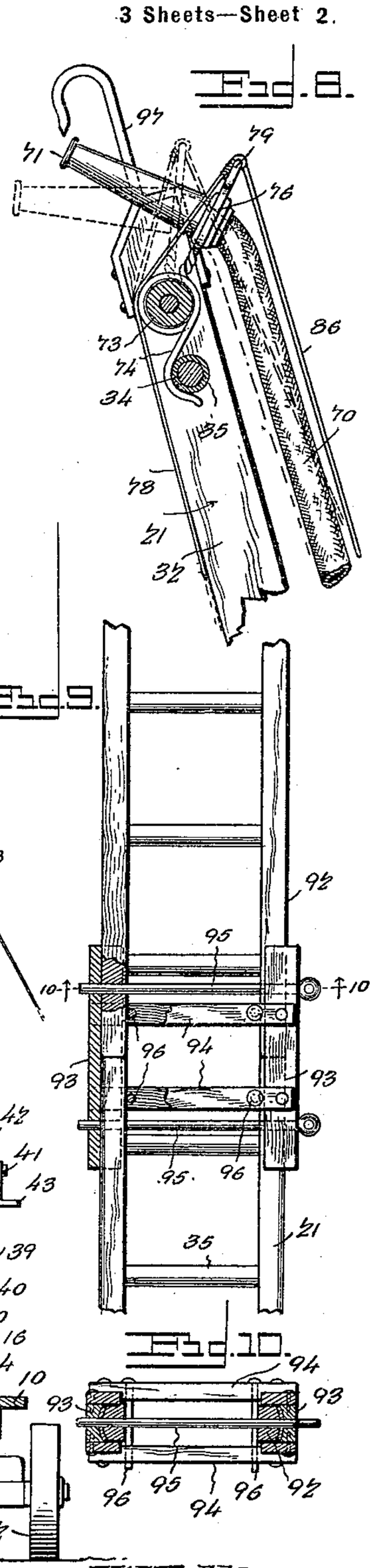


Fig. 9.

Fig. 10.

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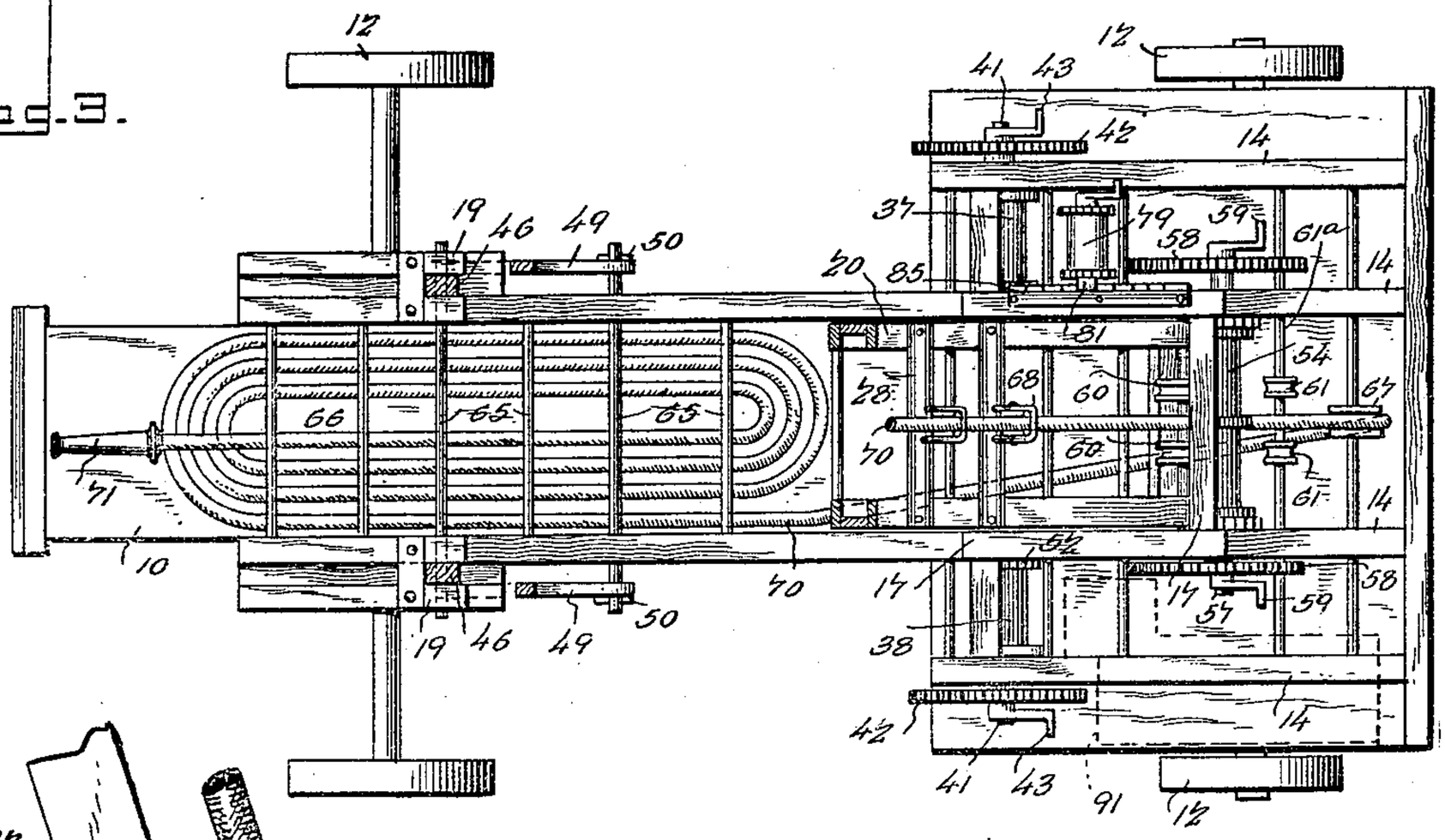
COMBINED FIRE ESCAPE LADDER AND WATER TOWER.

(Application filed Aug. 30, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.



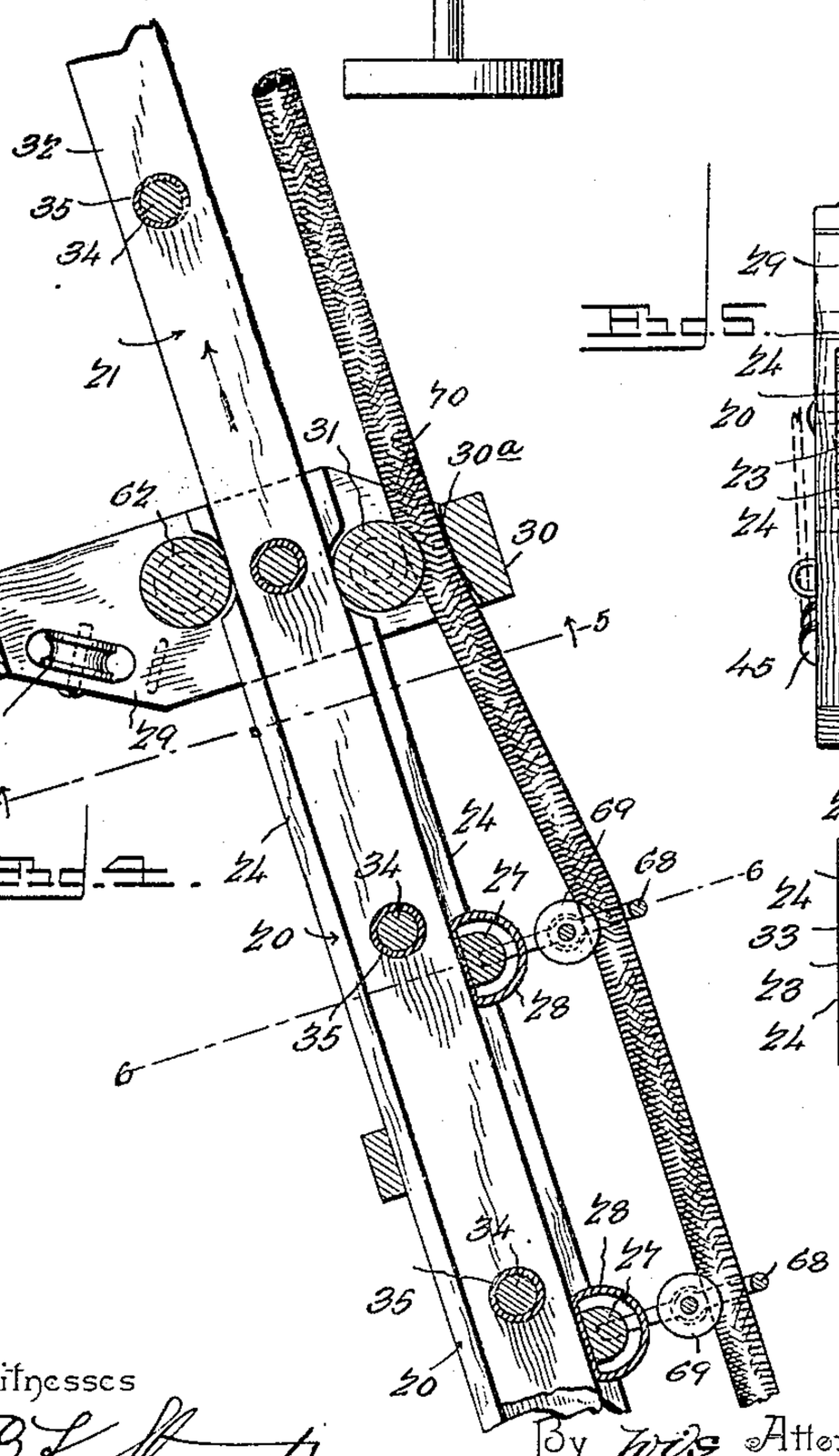


Fig. 4.

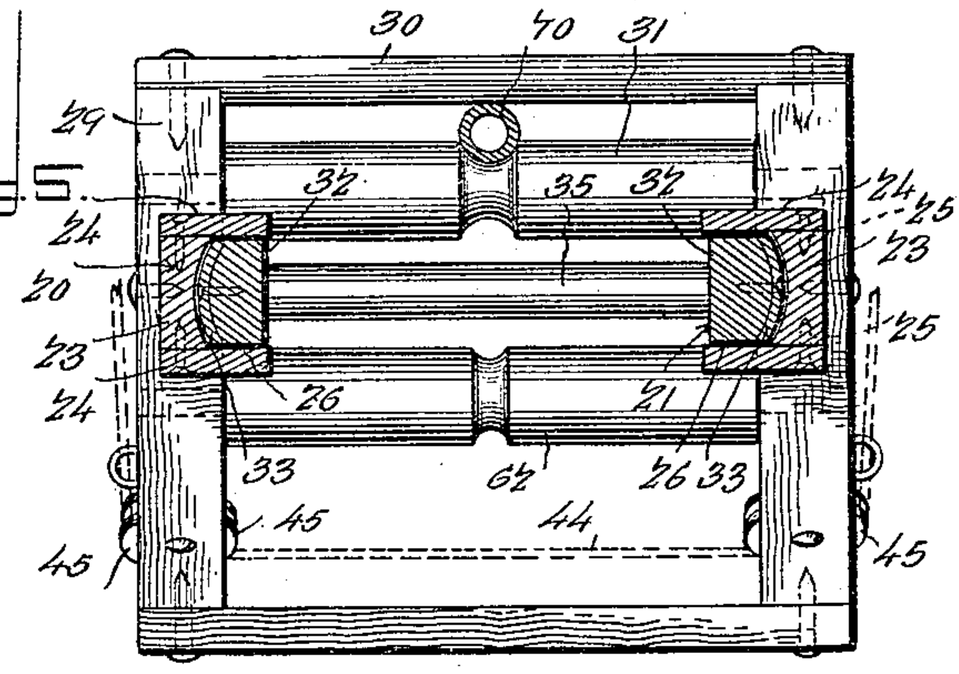


Fig. 5.

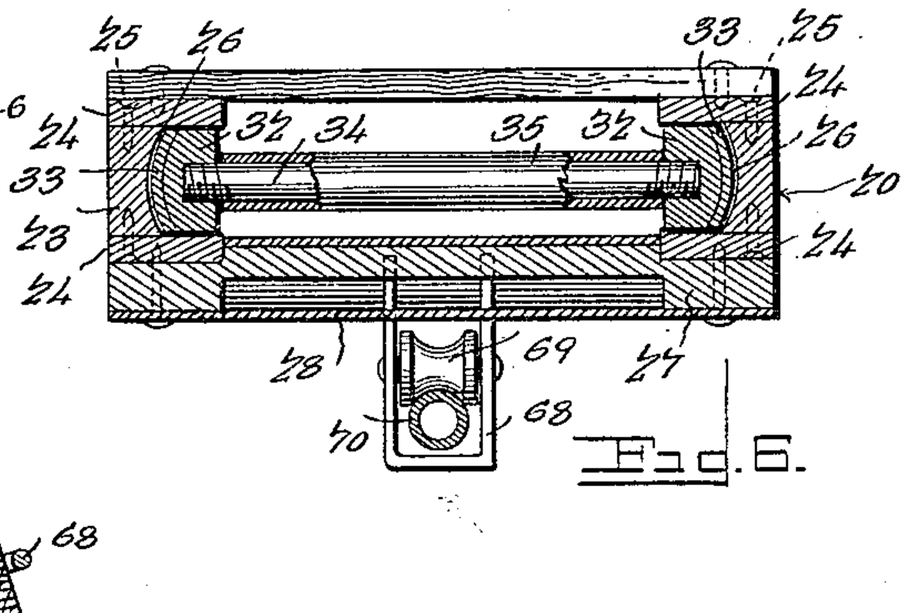


Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN W. FALL, OF CRAWFORDSVILLE, INDIANA.

FIRE-ESCAPE LADDER AND WATER-TOWER.

SPECIFICATION forming part of Letters Patent No. 640,645, dated January 2, 1900.

Application filed August 30, 1899. Serial No. 729,006. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. FALL, a citizen of the United States, residing at Crawfordsville, in the county of Montgomery and State of Indiana, have invented a new and useful Combined Fire-Escape Ladder and Water-Tower, of which the following is a specification.

My invention relates to improvements in fire apparatus, and more particularly to water-towers; and the primary object in view is to provide a comparatively simple and compact apparatus which may be rapidly and easily adjusted in position for service and for directing a stream of water at any elevation into the building without the necessity for a fireman to mount a ladder and handle a hose.

A further object of the invention is to simplify and strengthen the construction of the supporting-frame, including its pivoted and slidable sections, and to provide means by which the slidable frame-section may be manipulated independently of the pivoted section.

A further object is to provide a flexible water-carrying pipe or hose having a stiff nozzle and a novel form of carrier for the nozzle, which remains attached to the slidable frame-section, so as to be adjustable therewith, whereby in the operation of raising the supporting-frame the nozzle and the hose will be elevated at the same time.

A further object is to provide means for conveniently manipulating the hose-nozzle by a fireman stationed on the truck, thus enabling the direction of the nozzle and the stream of water to be changed quickly and without exposing the fireman to the flames and smoke issuing from an elevated floor in a burning building.

A further object is to provide means by which the length of the slidable frame-section may be increased within desirable limits, and the coupling appliances which I employ for uniting the members of the slidable frame-section render the frame as strong, if not stronger, at the joint than at other places.

With these ends in view the invention consists in the novel combination of mechanisms and in the construction, arrangement, and adaptation of the various parts for service, as will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated a preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a central sectional elevation through a fire apparatus embodying my improvements, showing by full lines the supporting-frame raised and extended to its operative position and by dotted lines the contracted and folded position of the frame. Fig. 2 is a front elevation with part of the truck-bed in section and the apparatus in the full-line position of Fig. 1. Fig. 3 is a sectional plan view of the apparatus, the plane of section being indicated by the dotted line 3 3 of Fig. 1 and showing the water-hose coiled on the bed of the truck. Fig. 4 is an enlarged detail sectional elevation through the upper part of the main pivoted frame-section, a part of the slidable frame-section, and a fragment of the water-hose. Fig. 5 is a transverse sectional view through a part of the extensible frame, the plane of the section being indicated by the dotted line 5 5 of Fig. 4 looking in the direction indicated by the arrow. Fig. 6 is another transverse section through the extensible frame, taken in the plane of the line 6 6 of Fig. 4. Fig. 7 is a detail view in elevation of the upper end of the slidable frame-section, illustrating the hose-nozzle carrier in elevation and the water-hose in transverse section. Fig. 8 is a section on the line 8 8 of Fig. 7, the dotted-line position indicating an adjustment of the hose-nozzle and its carrier. Fig. 9 is a detail view illustrating the coupling employed for connecting the contiguous ends of supporting-frame members, which may form the slidable section of the extensible frame. Fig. 10 is a transverse section in the plane indicated by the dotted line 10 10 of Fig. 9. Fig. 11 is a detail perspective view of the lever and take-up drum, by which the adjusting-line and nozzle-carrier may be manipulated.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

The truck of my apparatus includes a substantially horizontal bed 10, the front and rear axles 11 having the usual wheels 12 and standing-boards 13 on the sides of the bed.

The running-gear on which the bed 10 is mounted may be of the usual or any preferred construction common to apparatus of this class; but I prefer to employ a pivotal front axle, by which the truck may be easily moved by shifting the position of the team or the draft-tongue by hand for the purpose of attaining an adjustment of the hose-nozzle in a horizontal plane, as will hereinafter be referred to. The bed 10 is provided with a series of horizontal side rails 14 14, certain of which extend the full length of the bed. At or near the front end of the bed is erected an upright front frame, which consists of a pair of posts 15, a series of posts 16, and suitable horizontal pieces 17, which are framed into the posts to produce a substantial construction of the frame. At a point intermediate its length the truck-bed has a frame consisting of pairs of posts 19, adapted to stay another pair of posts which assist in supporting the weight of the extensible supporting-frame on the elevation thereof into operative position, as will hereinafter appear, and for the purpose of distinguishing the frame 19 from the frame heretofore described as the "front" frame I will hereinafter refer to said frame 19 as the "rear" frame.

The extensible aerial supporting-frame consists of a main pivotal section 20 and a slidable section 21, each of which consists of side rails and transverse braces, forming, in effect, a ladder to permit ready ascent and descent of the frame. The lower or main frame-section is pivotally supported on the truck-bed, while the slidable frame-section is confined on the pivotal section in a manner to slide lengthwise thereof; but I have devised an improved construction of these frame-sections which simplifies and strengthens the same. The main frame-section 20 has its front end supported pivotally on the truck-bed by a cross rod or bolt 22, which is supported in the side rails 14, and the extensible supporting-frame in its folded condition is adapted to lie compactly upon the truck-bed, as indicated by dotted lines in Fig. 1. The main section 20 of the extensible supporting-frame consists of the side rails 23, having the reinforcement lengths 24 secured thereto by screws or bolts, as at 25, (see Figs. 5 and 6,) said parts 23 and 24 being arranged in such relation as to form the longitudinal guideways 26. The side rails 23 of this frame-section are united together by transverse braces 27, consisting, preferably, of metallic bars or tubes recessed to fit firmly against the side rails and secured firmly thereto by any suitable means. The metallic frame-braces are housed within the jackets 28, of rubber, leather, or other suitable material, which inclose the braces to leave an intermediate air-space, as shown clearly by Figs. 4 and 6, said jackets being fastened in any approved way to the side rails of the frame-section 20. The employment of the jackets prevents the metallic braces from being heated by the fire when the apparatus is in service close to a burning building, and said jackets also prevent slipping of a person in ascending and descending the supporting-frame. A head-frame 29 is secured firmly to the free end of the main frame-section 20, said head-frame lying in a plane substantially at right angles to the axis of the frame-section 20 and serving to support the sheaves that direct the frame-elevating cable. This head-frame has a front rail 30, arranged a suitable distance in advance of the rails of the supporting-frame section, the inner face of said rail being curved, as at 30ª, to form a gripping-surface, which serves, in connection with a roller 31, to grip the water-hose and minimize slippage thereof along the supporting-frame when the same is raised and extended into operative position, the roller 31 being properly journaled in the sides of the head-frame 29.

The slidable section 21 of the extensible supporting-frame consists of the side rails 32, provided with the metallic wear-plates 33 and the transverse braces 34. (See Figs. 4, 5, and 6.) The braces 34 of the slidable frame-section each has the ends thereof provided with right and left hand screw-threads, respectively, said threaded ends of the braces being screwed into the side rails 32 to draw them together and produce a substantial light construction. The side rails of the slidable frame-section are proportioned to fit in the guideways 26, formed by the rails 23 and the reinforcements 24 of the main pivotal frame-section. The opposing faces of the side rails 23, forming a part of the main frame-section, are concave, while the wear-plates 33 of the slidable frame-section are curved to conform to said faces of the main frame-section, thereby insuring snug fitting of the frame-sections one to the other and securing maximum freedom of motion with minimum friction and wear between the two sections of the supporting-frame. The metallic braces of the slidable frame-section are housed by jackets 35 of any suitable material. It is evident that a fireproof jacket, as of asbestos cloth, may be employed as the covering for the metallic braces on the frame-sections. For the attachment of the cables by which the slidable section 21 is manipulated I provide a cross-bar 36 at the inner or lower end of the slidable frame-section 21.

I will now proceed to describe the means by which the extensible supporting-frame in its entirety may be raised or lowered on the pivotal rod or bolt 22. Hoisting-drums 37 38 are disposed in horizontal positions on opposite sides of the frame-section 20, and each drum has its shaft 39 journaled in proper bearings provided on a pair of the uprights 16, each shaft 39 being equipped with a gear 40. Associated with each drum 37 or 38 is a power-shaft 41, journaled in proper bearings on the uprights 16, each power-shaft having a gear 42 and a hand-crank 43, said gears 42 arranged to mesh directly with the gears 40 on

the drum-shafts. It is to be observed that the driving-shafts 41 are located above the hoisting-drums and on opposite sides of the supporting-frame and in positions to be easily manipulated by firemen stationed on the truck-bed, whereby the services of two attendants may be availed of in quickly raising the supporting-frame. In connection with the hoisting-drum I employ a cable 44, which extends from the drums 37 38 through the head-frame 29 at the free end of the main pivotal frame-section, and in connection with this cable a pair of posts are employed and provided with pulleys, through which are reeved the hoisting-cable. A pair of sheaves 45 are journaled in the head-frame 29 at the rear side of the supporting-frame. (See Figs. 4 and 5.) The supporting-posts are indicated by the numerals 46 47, (see Figs. 2 and 3,) said posts being disposed on opposite sides of the supporting-frame and stepped detachably on the bed of the truck. I prefer to provide each post with a notched foot, as at 48, (see dotted lines in Fig. 1,) each foot engaging with one of the series of rods 65, supported in the side rails 14 of the truck-bed. The lower notched feet of the posts 46 47 are fitted between the uprights 19 of the rear frame, (see Fig. 3,) and the posts 46 47 are thus confined by the cross-rod 65 and the posts 19 against movement when the supporting-frame is raised. To brace the posts 46 47 in their upright positions, I employ the stay-posts 49, the upper end of one post 49 being connected detachably by a pin 50 to one supporting-post 46 or 47 at a point intermediate its length, while the lower end of each stay-post is fitted removably on one of the series of cross-rods 65 of the truck-bed. (See Fig. 1.) The supporting-posts 46 47 are provided at their upper ends with suitable brackets 51ª, in which are journaled the sheaves 51. These posts 46 47 and the stay-posts 49 therefor may remain in their upright position when the supporting-frame is contracted and folded upon the truck-bed; but it is evident that the posts 46 47 may be raised slightly to free the notched feet 48 from the pin 65, thus permitting the supporting-posts and the stays 49 therefor to be folded upon the truck without disengaging the stay-post 49 from the truck-bed or the supporting-posts. The method of reeving the elevating-cable 44 is as follows: One end of this cable is made fast to one drum, as at 37. From thence the cable extends over the sheave 51 in the post 46, thence to and around the sheaves 45 in the head-frame 29 on the pivoted frame-section 20, thence to and over the sheave 51 in the upper end of the supporting-post 47, and finally the cable is carried to and coiled on the drum 38. It is evident that the drums may be operated individually or jointly to coil the cable 44 on one or both of the drums, and thereby shorten the length of cable, so as to raise the supporting-frame to any desired angle for service; but the weight of the supporting-frame is borne by the cable and the supporting-posts 46 47, said supporting-posts being stayed securely in place by the pins 65, the upright frame 19, and the stay-posts 49. As is usual in devices of this character, I provide each hoisting-drum with a ratchet 52, adapted to be engaged by the pawl 53, which holds the drum against rotation and prevents the supporting-frame from lowering when weight is imposed thereon.

I will now proceed to describe the means for adjusting the slidable frame-section 21 lengthwise of the pivoted section 20, and in this connection it is to be observed that the slidable section may be adjusted independently of the pivoted main section 20 and at any point in the position of the ladder. In embodying the adjusting mechanism for the slidable frame-section I employ a double drum 54, arranged in a horizontal position between the uprights 15 and with a shaft 55, journaled in suitable bearings on said uprights. This drum-shaft has a gear 56 at each end, which intermeshes with a similar gear 58 on a driving-shaft 57, said shaft being equipped with hand-cranks 59. An elevating-cable 63 has one end attached to and coiled in one direction on a part or section of the drum 54, while the other end of this elevating-cable passes over a roller 62, journaled on the head-frame 29 of the pivotal frame-section, the extremity of the cable 63 being attached to the cross-bar 36 at the foot of the slidable frame-section 21, the arrangement of the roller or sheave 62 and the hoisting-cable 63 being such as to make the cable exert an upward pull on the frame-section 20 when the double drum is rotated in a direction to coil the cable 63 thereon. The elevating-cable for the slidable frame-section passes along the pivotal frame-section 20 beneath one of a pair of guide-sheaves 60, fitted loosely on the pivotal rod 22, thence beneath one of a pair of guide-sheaves 61, supported on a rod 61ª, attached to the rails 14 on the truck-bed, and finally is carried to and coiled in one direction on the double drum. A lowering-cable 64 passes from the double drum 54 beneath the other sheaves 61 60 of the pairs of sheaves and is carried along the frame-section 20 to the cross-bar 36 at the foot of the slidable frame-section, said cables 63 64 being fastened securely in any approved way to said cross-bar 36 of the frame-section 21. The lowering-cable 64 is coiled on the double drum 54 in a reverse direction to the cable 63, and when the drum is rotated in either direction one cable will be paid out, while the other cable will be coiled on the drum, whereby the frame-section 21 may be actuated positively in either direction. The bed 10 of the truck is provided with a series of cross-rods 65, which are supported in the side rails 14, all of said cross-rods being disposed in the same horizontal plane. These cross-rods lie above the bottom of the truck-bed, so as to form a compartment 66, in which a length of fire-hose may be compactly stored by coiling the same

in the manner represented by Fig. 3. The rods 65 also serve the purpose of affording a support for the supporting-frame when it is contracted and lowered to the dotted-line position of Fig. 1, and thus the weight of the supporting-frame is not imposed upon the coiled water-hose when the apparatus is folded for transportation or storage, whereby on the elevation of the supporting-frame the hose is free to be drawn from its compartment.

A guide-sheave 67 is loosely journaled in the plane of the median line of the truck-bed at the front end thereof, and around this sheave is fitted the length of water-hose 70. A series of guide-brackets 68 are secured firmly to the rungs 27 of the main supporting-frame section 20, and in these brackets are the guide rollers or sheaves 69, the latter being disposed in alinement with the sheave 67 for the purpose of directing the water-hose from the compartment 66 lengthwise along the supporting-frame section 20 to and between the clamping-rail 30 of the head-frame 29 and the guide sheave or roller 31. At its free extremity a directing-nozzle 71 is coupled to the water-hose 70, and in the normal condition of the apparatus this hose-nozzle is confined in a nozzle-carrier 72. In the embodiment of this nozzle-carrier shown by Figs. 1, 2, 7, and 8 I have constructed said carrier in the form of a coiled spring, which is bent to provide the arms 74, form the nozzle-clamp 76, and a cable or rope eye 77. The coiled section of the nozzle-carrier is fitted loosely on a roller 73, which is supported between the side rails of the slidable frame-section 21 at the upper free end thereof, said carrier having its arms 74 fitted around a roller or one of the braces of the frame-section 21 for the purpose of normally holding the nozzle-clamp 76 in a certain position, as indicated by the full lines in Figs. 1 and 8. The nozzle-clamp 76 of the carrier is made to firmly engage the nozzle 71 of the water-hose, and this carrier is thus adapted to support the hose-nozzle on the ladder-section 21 in a manner to permit said nozzle to have a certain amount of movement or play in a vertical plane, because the nozzle-carrier itself is rendered yieldable or elastic by reason of the coiled-spring construction thereof. An adjusting-line 78 passes around the roller 73, one end of said line being fastened to the eye 77 of the nozzle-carrier. This adjusting-line is carried to and coiled on a drum 79, said drum being fitted loosely on an arbor 80, which is made fast to one end of an adjusting-lever 81. This lever is disposed in an upright position at one side of the front frame on the truck-bed, said lever being fulcrumed at a point intermediate its length, as at 82. The drum 79 for the adjusting-line is provided with a ratchet 83, which is engaged by a pawl 84, pivoted or otherwise mounted on said lever 81, so as to hold the drum normally in a stationary position on the lever; but said drum and its locking devices are adapted to be shifted back and forth with the lever in order to strain the adjusting-line 78, and thereby pull on the nozzle-carrier, so as to overcome in part the resistance of the coiled spring thereof, whereby the position of the hose-nozzle 71 may be shifted in a vertical direction. It is evident that the take-up drum 79 should be provided with a suitable crank for the purpose of rotating it to coil the adjusting-line 78 thereon, and after the undue slack in the line shall have been taken up the pawl 84 serves to hold the drum in a fixed position with relation to the lever 81. This lever is held in either of its several adjusted positions by means of a notched bar 85, which is supported on the upright part of the frame of the truck-bed, and thus the lever may be held firmly in place by the notched bar to prevent slack in the adjusting-line 78. Another line or rope 86 is connected to the eye 77 of the nozzle-carrier, and this rope 86 is arranged above the nozzle-carrier in an opposite direction to the adjusting-line 78, the cable 86 being led through the brackets 68 between the sheaves 69 and the rungs 27 of the frame-section 20.

The head-frame 29 of the supporting-frame section 20 is provided with suitable hooks or eyes on opposite sides of the ladder, and with these eyes are engaged the hooks 89 on the guy-ropes 88, the latter being fastened to suitable stakes 90. It is understood that these ropes and stakes may be used to steady the supporting-frame when it is in service; but it is evident that the ropes may be omitted, if desired.

My apparatus may be used to direct through the water-hose and the nozzle a stream of water upon a fire on any floor of the building. The line of hose may be connected with a fire-plug, or water may be forced through the hose from a fire-engine. I also contemplate the employment of a chemical tank 91, which may be secured to the truck-bed at one side of the supporting-frame, as indicated by dotted lines in Fig. 3. This tank may be charged with any suitable fire-extinguishing chemical, and the line of hose 70 may be coupled to the tank for the conveyance of the chemical to the hose-nozzle.

Under some conditions in the service of the apparatus—as, for instance, in fighting a fire in a very tall building—it may be found that the aggregate length of the supporting-frame comprising the sections 20 21 is not sufficient to elevate the hose-nozzle to a point from which the stream may be advantageously directed upon the fire. When these conditions prevail, it is my purpose to employ one or more lengths of supplemental supporting-frame sections 92, which may be advantageously attached to the frame-section 21 by means of the coupling shown more clearly by Figs. 9 and 10 of the drawings. This coupling consists of a pair of grooved side rails 93, united together by suitable cross-bars 94. The contiguous ends of the frame-section 21

and one length of supplemental ladder 92 may be slipped into the grooved side rails of the coupling-frame until said supporting-frames 21 92 have endwise abutting engagement, as shown by Fig. 9. Suitable locking-rods 95 may then be passed through the coupling-frame and the supporting-frame sections 21 92, after which the pins 96 may be fitted in the rails 94 of the coupling-frame to hold the frame-sections against endwise movement. The coupling-frame which I employ serves as a substantial means for connecting one or more lengths of supplemental frame-sections to the section 21 for the purpose of materially elongating the same, and this coupling-frame serves to substantially join the parts together, so as to render the supporting-frame at the joint fully as strong as at other points. Of course the nozzle-carrier should be detached from the frame-section 21 when the supplemental frame-section is united thereto, said nozzle-carrier being fitted to the free end of a supplemental section.

As is usual in structures of this type, the extensible frame is provided with grappling-hooks 97, which are secured to the side rails of the extensible section 21. In the operation of raising the supporting-frame and adjusting the apparatus for service the frame may be so manipulated as to make the grappling-hooks break the glass in a window of the floor on which the fire exists, thus permitting the stream from the hose-nozzle to be delivered advantageously on the fire.

The operation may be described, briefly, as follows: The apparatus is drawn to the scene of a fire by a team or by other suitable means, and the apparatus is then backed up adjacent to the building. The posts 46 47 having been raised and the several operating-cables properly adjusted, one or two firemen may operate the cranks 43 to coil the cable 44 on one or both of the drums 37 or 38, thereby raising the hose-supporting frame to the desired inclination. The crank 59 on one or both ends of the shaft 57 may be rotated for the purpose of coiling the cable 63 on one section of the drum 64, thereby paying out the other cable 64 and sliding the frame-section 21 lengthwise the frame-section 20 for any desired distance. In the operation of raising the supporting-frame and of extending the section 21 thereof the nozzle-carrier 72 moves with the frame, and hence the line of hose 70 will be drawn through the brackets on the supporting-frame and truck, thus withdrawing the proper length of hose from the compartment 66, whereby the nozzle and hose are adjusted for service at the same time the supporting-frame is raised and extended. The hose may receive a supply of liquid from a plug, steamer, or tank, and the water under pressure flows through the hose, so as to be directed by the nozzle upon the fire. In the operation of raising the supporting-frame the line of hose is collapsed and free from liquid, so that it may move freely through the guide-brackets 68 and sheaves 69 and also through the space between the rail 30 and the sheave 31; but when the liquid is forced under pressure through the hose the latter is distended, so that the curved face 30^a of the rail and the roller 31 will operate to grip the hose and prevent the weight of the column of water from dragging down on the nozzle and rendering the nozzle and its carrier difficult of manipulation. It is evident that the firemen stationed on the truck may shift the lever 81 to draw on the line 78 in order to depress the nozzle; but the movement of the nozzle in the reverse direction is effected by moving the lever to slacken the line 78, whereupon the elasticity of the nozzle-carrier will operate to raise the hose-nozzle. If this is not sufficient, the line 86 may be drawn downward by hand to move the carrier and the nozzle clamped therein. The described means operates very efficiently to elevate or depress the nozzle in a vertical plane; but to adjust the nozzle in a horizontal direction I find it desirable to slightly shift the position of the apparatus. This may be conveniently effected by turning the draft-tongue a few inches, and as the nozzle is located some distance from the truck-bed by the extension of the supporting-frame a very wide sweep or range of adjustment may be given to the hose-nozzle by a slight movement of the draft-tongue. It is evident that the supplemental frame-section 92 may be used to extend the length of the main supporting-frame. The slidable section 21 may be retracted within the limits of the main supporting-frame section 20, after which the frame may be lowered upon the bed, the hose may be coiled within its compartment 66, and the posts 46, 47, and 49 may be folded upon the truck.

The apparatus may be equipped with the usual accessories, such as hand-ladders, axes, and other devices.

Changes may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

By reference to Fig. 1 it will be noted that the upper part of the slidable frame-section 21 rests on the roller 62, and in the lower part of the ladder is journaled a roller 63^a, adapted to ride against the guideway in the pivoted frame-section. This arrangement supports the slidable frame-section by roller-bearings, and it is important, because it prevents the slidable section from binding or cramping in the pivoted section, so that the section 21 will always move freely and easily in the pivoted section.

Having thus described the invention, what I claim is—

1. In a fire apparatus, the combination with a truck, of an extensible hose-supporting frame pivoted thereon, supporting-posts fold-

ably mounted on the truck and carrying guide-sheaves, a hoisting-drum, and an elevating-cable reeved through the supporting-posts and one section of the supporting-frame and connected with the hoisting-drum, substantially as described.

2. In a fire apparatus, the combination with a truck, of an extensible pivotal hose-supporting frame having its main section provided with a head-frame, supporting-posts foldably mounted on the truck, on opposite sides of the frame, and provided with guide-sheaves, hoisting-drums mounted on the truck adjacent to the supporting-frame and each having a suitable operating appliance, and a hoisting-cable connected to said drums and reeved through the head-frame and the supporting-posts, substantially as described.

3. In a fire apparatus, the combination with a truck, and an extensible hose-supporting frame, of supporting-posts stepped detachably on the truck and carrying guide-sheaves, stay-posts having pivotal connection with the truck and the supporting-posts, the hoisting mechanism, and a hoisting-cable reeved through the supporting-posts and connected operatively with said supporting-frame and the hoisting mechanism, substantially as described.

4. In a fire apparatus, the combination with a truck comprising side rails, a hose-compartment between the side rails, cross-bars connecting the rails and lying above the hose-compartment, an extensible hose-supporting frame mounted pivotally on the truck and adapted to lie upon the supporting-bars, means for raising and extending said frame, a nozzle-carrier mounted upon the frame, and a hose passed through the hose-compartment and longitudinally of the frame and engaging the nozzle-carrier.

5. In a fire apparatus, the combination with an extensible hose-supporting frame, of an adjustable nozzle-carrier fitted normally to a slidable section of said frame, a line of hose having its nozzle clamped in said carrier, means for gripping said hose to relieve the weight of the column of fluid from the nozzle-carrier, and means for adjusting said nozzle-carrier independently of the adjustment of the supporting-frame, substantially as described.

6. In a fire apparatus, the combination with a hose-supporting frame comprising side rails and cross-braces, of a yieldable nozzle-carrier engaged with one of the braces, and comprising a spring-wire bent upon itself and having its end portions wrapped around the brace and engaged at its terminals with the side rails, the central portion of the wire being twisted to form a nozzle-receiving loop.

7. In a fire apparatus, the combination with an extensible hose-supporting frame, of a spring-nozzle carrier mounted on said frame, a line of hose having a nozzle clamped in the carrier, and means for adjusting the carrier against the tension of its spring, substantially as described.

8. In a fire apparatus, the combination of an extensible hose-supporting frame having one section thereof provided with a roller, a coiled-spring nozzle-carrier fitted on said roller and provided with arms which are seated against the frame-section, a line of hose having a nozzle clamped in said carrier, and means for adjusting the carrier against the tension of its spring, substantially as described.

9. In a fire apparatus, the combination with an extensible hose-supporting frame, of a yieldable nozzle-carrier, a line of hose clamped in said carrier, a lever carrying a take-up drum, and an adjusting-line coiled on said drum and connected to the nozzle-carrier, substantially as described.

10. In a fire apparatus, the combination with an extensible hose-supporting frame, of a yieldable nozzle-carrier, a line of hose, a nozzle, a shiftable lever having means for locking the same in its adjusted position, a take-up drum mounted on the lever and shiftable therewith, means for making said drum fast with the lever, and an adjusting-line attached to the nozzle-carrier and coiled on the drum, substantially as described.

11. In a fire apparatus, the combination of an extensible hose-supporting frame one section of which is provided with a head-frame having a gripping-rail and a sheave which coacts therewith, a line of hose passing between said rail and shoe and adapted to be gripped thereby, a nozzle-carrier, a nozzle clamped in said carrier and connected to the hose, and means for adjusting said nozzle-carrier, substantially as described.

12. The combination with a hose-supporting frame having metallic rungs, of heat-resisting jackets fitted to and inclosing said rungs and separated therefrom by interspaces to receive air, substantially as described.

13. A fire apparatus comprising side rails having metallic braces and fireproof jackets secured to the rails and inclosing the braces to leave intermediate air-spaces, substantially as described.

14. A supporting-frame consisting of separable sections, a coupling-frame having grooved side rails and cross-bars and fitted to said sections for the latter to occupy the grooves in its side rails, locking-pins passing through the rails of the coupling-frame and the frame-sections, and other pins fitted in the cross-bars of the coupling-frame, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN W. FALL.

Witnesses:
DAVID C. BARNHILL,
TILLMAN E. WEIL.