No. 798,666. PATENTED SEPT. 5, 1905.

J. DERX.

FIRE TRUCK.

APPLICATION FILED APR. 28, 1904.

4 SHEETS—SHEET 1.

Fig. 8.

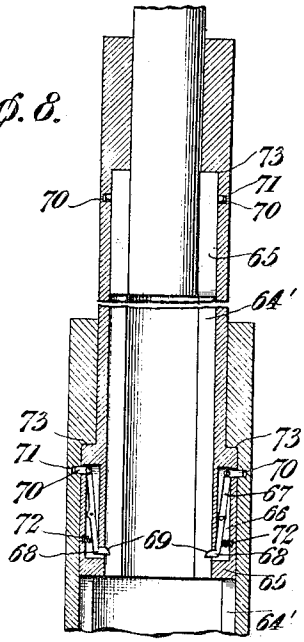


Fig. 1.

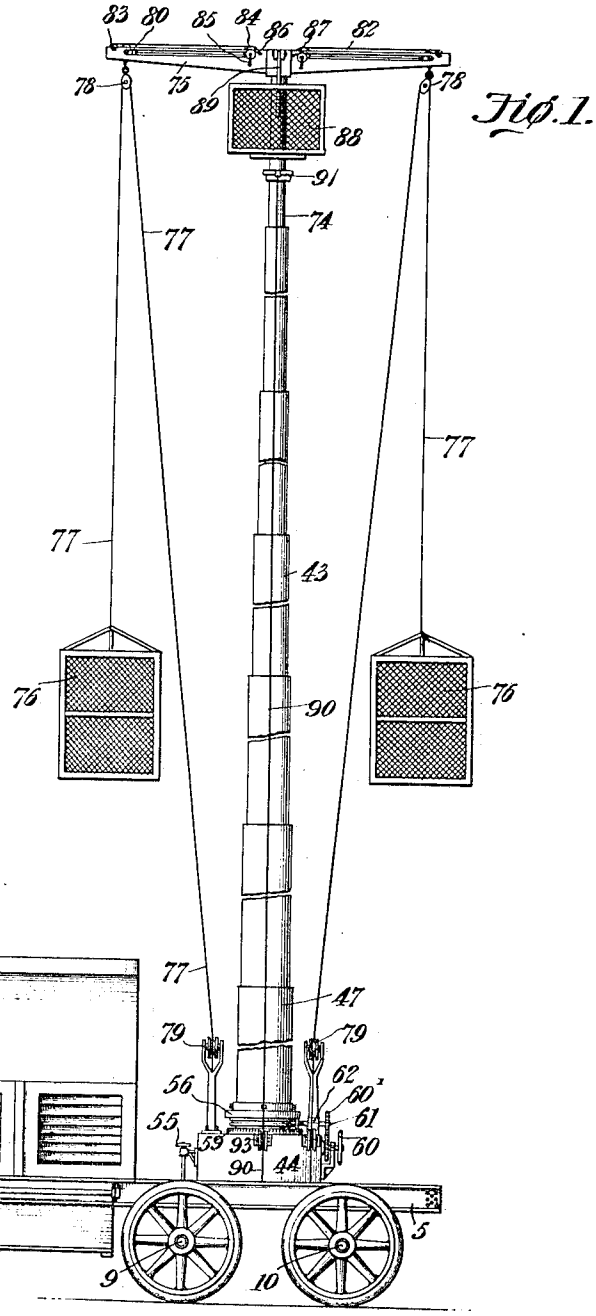
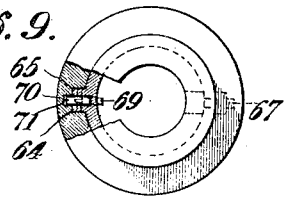


Fig. 9.



Witnesses

E. F. Holland

S. N. Acker.

Jacob Derx Inventor

by C. A. Snow & Co

Attorneys

No. 798,666. PATENTED SEPT. 5, 1905.

J. DERX.

FIRE TRUCK.

APPLICATION FILED APR. 28, 1904.

4 SHEETS—SHEET 2.

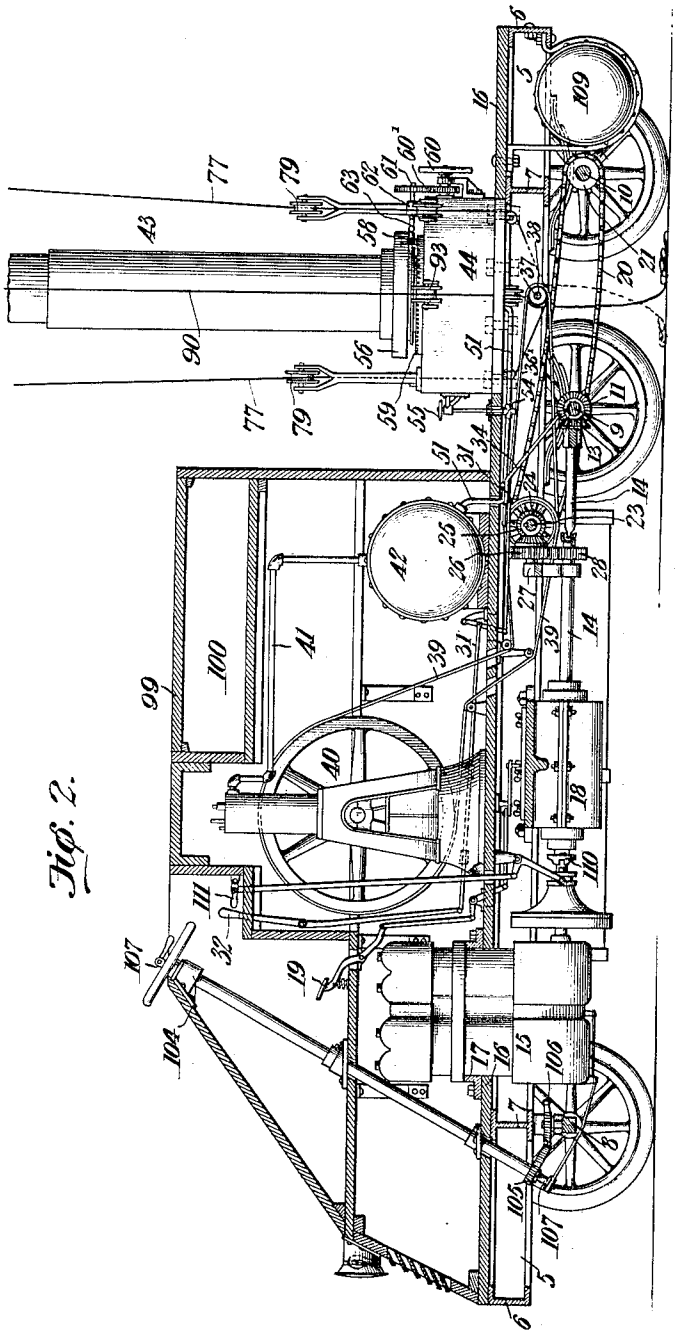


Fig. 2.

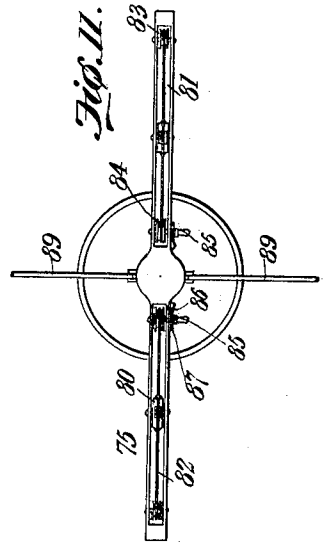


Fig. 11.

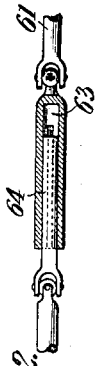


Fig. 12.

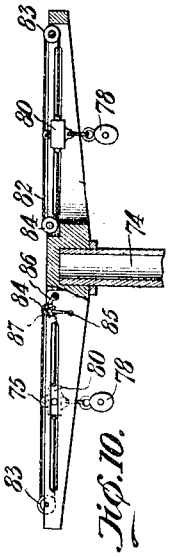


Fig. 10.

Witnesses

E. P. Stewart

S. N. Ackes

Jacob Derx Inventor

by C. A. Snow & Co

Attorneys

No. 798,666. PATENTED SEPT. 5, 1905.

J. DERX.

FIRE TRUCK.

APPLICATION FILED APR. 28, 1904.

4 SHEETS—SHEET 3.

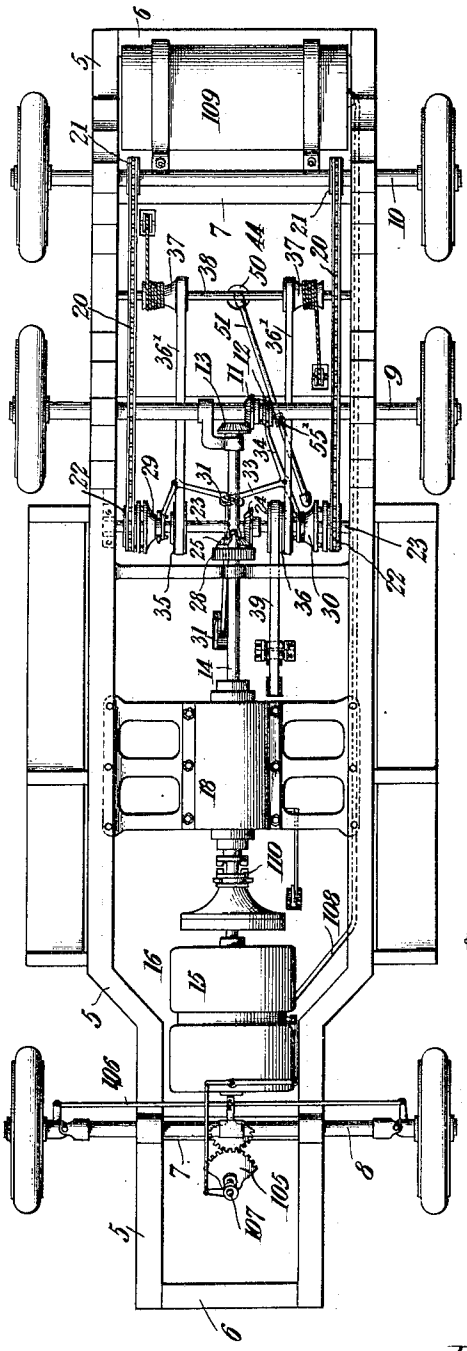


Fig. 3.

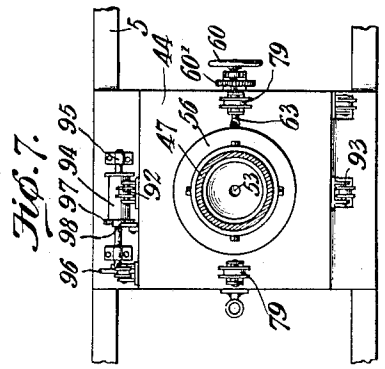


Fig. 7.

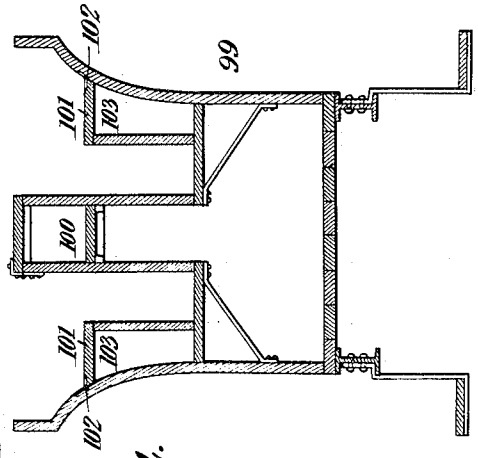


Fig. 4.

Witnesses

E. W. Stewart

S. N. Acker

Jacob Derx Inventor

by C. A. Snow & Co

Attorneys

No. 798,666. PATENTED SEPT. 5, 1905.

J. DERX.

FIRE TRUCK.

APPLICATION FILED APR. 28, 1904.

4 SHEETS—SHEET 4.

Fig. 5.

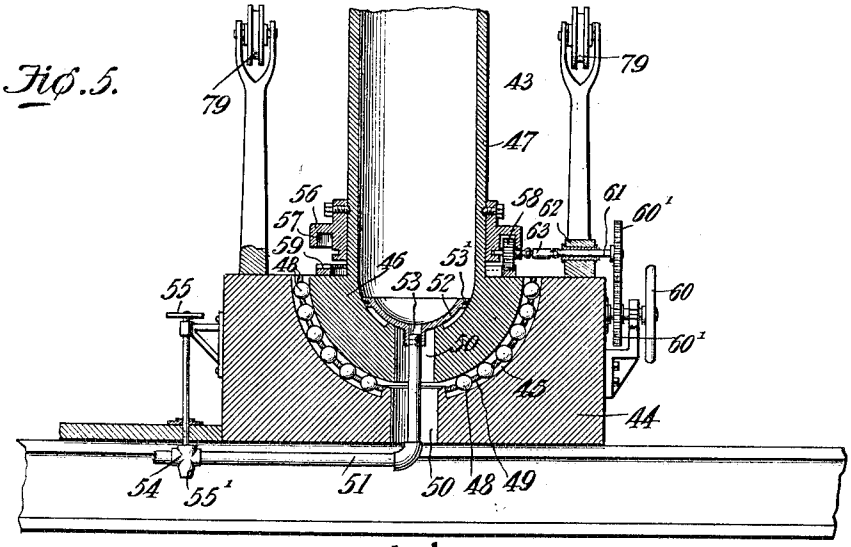
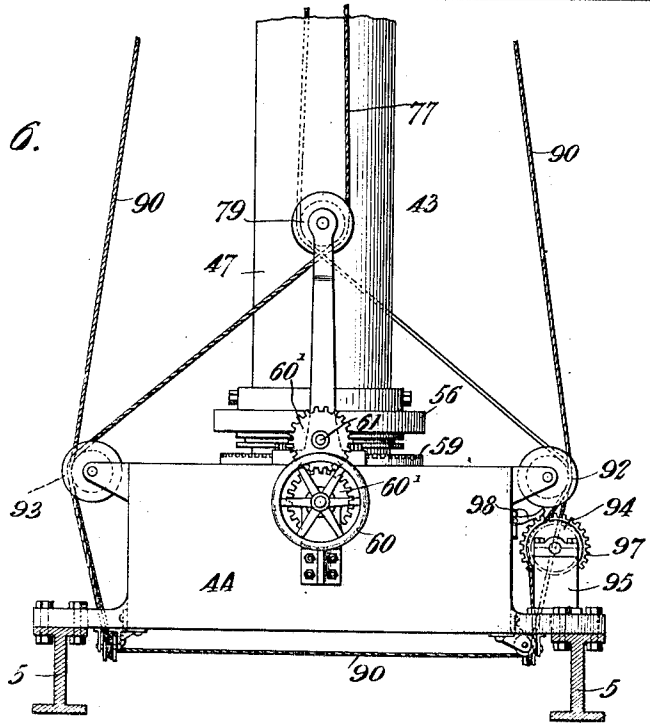


Fig. 6.



Witnesses

E. F. Stewart

E. M. Ackers

Jacob Derx Inventor

by Cushman & Co

Attorneys

UNITED STATES PATENT OFFICE.

JACOB DERX, OF ST. LOUIS, MISSOURI.

FIRE-TRUCK.

No. 798,666. Specification of Letters Patent. Patented Sept. 5, 1905.

Application filed April 28, 1904. Serial No. 205,363.

To all whom it may concern:

Be it known that I, JACOB DERX, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a new and useful Fire-Truck, of which the following is a specification.

This invention relates to an improved life-saving truck particularly designed for use by firemen and others for rescuing the occupants of burning buildings and similar structures.

The primary object of the invention is to provide an inexpensive, durable, and efficient device of this character which may be readily and conveniently transported from place to place for the purpose of gaining access to the upper stories and the roof of the building in order to facilitate the escape of the occupants and the saving of property.

A further object of the invention is to provide the truck with a collapsible tower formed of a plurality of telescopic sections adapted to be elevated or extended to operative position by means of compressed air, and, further, to provide means for locking said sections in extended position and means for automatically releasing the same when the air-pressure is reduced.

A still further object is to provide the tower with a supporting-arm upon which is mounted a pair of life-saving baskets or cars, said baskets being adjustable laterally on the supporting-arm, so as to allow the former to be swung near the window or other portion of a burning building, to thereby permit the occupants to enter and be transported in safety to the ground.

A still further object is to provide means for adjusting the tower at any angle or inclination with respect to the truck and to provide an air-compressor, driven by the truck-propelling motor, for extending the telescopic sections comprising said tower.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of a life-saving truck constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a bottom plan view. Fig. 4 is a transverse sectional view. Fig. 5 is an enlarged sectional view of the base of the tower. Fig. 6 is an end view of the same. Fig. 7 is a top plan view of the supporting-base and mechanism for adjusting the tower. Fig. 8 is an enlarged detail sectional view showing two of the telescopic sections locked in extended position. Fig. 9 is a top plan view of the same, a part of the tube being broken away to show the locking mechanism. Fig. 10 is a detail sectional view of the basket or car supporting arms. Fig. 11 is a top plan view of the same. Fig. 12 is a detail sectional view of the telescopic shaft connecting the pinion and operating-gear.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The frame of the truck, which may be formed of wood or other suitable material, is preferably formed of angle-iron, as shown, and consists of the side beams 5, bolted or otherwise rigidly secured together by end beam 6 and intermediate brace-beams 7. The truck is preferably provided with a front axle 8 and a pair of rear axles 9 and 10, on the former of which is loosely mounted a beveled gear 11, controlled by a suitable clutch 12, said bevel-gear being adapted to mesh with a corresponding bevel-gear 13, secured to the main operating-shaft 14. The main shaft 14 is driven in any suitable manner, as by a gas-engine 15, mounted on the bed or platform 16 of the truck and held in position thereon by means of a retaining ring or collar 17. Secured to the side beams 5 of the truck is a gear-casing 18, containing the usual form of differential gearing for driving the truck backward and forward and for changing the speed of the same, said gearing being controlled by a foot operating-lever 19, mounted on the body of the truck within easy reach of the driver, as shown. Motion is transmitted to the rear axle 10 through the medium of sprocket-chains 20, which engage sprocket-wheels 21, secured thereto, and corresponding sprocket-wheels 22, loosely mounted on a counter-shaft 23, journaled in the side beams 5 of the truck-frame. Rigidly secured to the counter-shaft 23 is a bevel-gear 24, which meshes with a similar bevel-gear 25, secured to or formed integral with a spur-gear 26, journaled in suitable bearings 27, motion being imparted to the counter-shaft by a spur-gear 28, keyed

to the main shaft 14 and meshing with the spur-gear 26, as shown. As a means for rotating the sprocket-wheels 22, and thereby transmitting motion to the rear axle 10, I provide a pair of double-faced clutches 29 and 30, slidably mounted on the counter-shaft 23 and adapted to be operated simultaneously through the medium of a system of levers 31, controlled by a hand-operated lever 32, also preferably arranged within easy reach of the driver. The lever 33, operating the clutch 30, is provided with an angular extension 34, which engages the clutch 12 and releases the bevel-gear 11 from contact with the gear 13 on the main shaft when the hand-lever 32 is operated to release the sprocket-wheels 22. It will thus be seen that by throwing the hand-lever 32 in one direction the three clutch members will be simultaneously operated to release the driving-gear of the truck, and thereby stop the latter, while by throwing said lever in the opposite direction said clutch members will be brought into operative engagement with said driving-gear. When the clutch members 29 and 30 are thrown out of operative engagement with the sprockets 22, the inner faces of said clutch members engage pulleys 35 and 36, loosely mounted on the counter-shaft 23, and cause said pulleys to impart motion through the medium of belts 36′ to a pair of winding-drums 37, mounted on a common shaft 38, which latter is journaled in the side beams of the truck-frame. The pulley 36 also serves to transmit motion by means of a belt 39 to an air-compressor 40, mounted in any suitable manner on the bed or platform 16 of the truck.

The compressor 40, which may be of any approved type, is adapted to force air under pressure through a pipe 41 to a storage tank or reservoir 42, to be utilized for elevating or extending the telescopic sections comprising the tower 43. The tower 43 consists of a supporting-base 44, bolted or otherwise rigidly secured to the rear end of the platform 16, said base being provided with a semicircular socket 45, in which is revolubly mounted the correspondingly semicircular head 46 of the lower hollow section 47 of said tower. Interposed between the socket 45 and head 46 are a series of antifriction-balls 48, held in position by a retaining-plate 49, so as to permit a free circular movement of the tower and to allow the latter to be tilted at any angle or inclination with respect to the supporting-base, as will be more fully explained hereinafter. The supporting-base 44 and semicircular head 46 are provided with alined openings 50, in which is arranged a pipe 51, leading from the storage tank or reservoir 42, and through which air under pressure is conducted to the tower for elevating the telescopic sections comprising the latter. A bearing-plate 52 is threaded or otherwise secured to the end of the pipe 51, said plate being provided with a centrally-disposed opening 53 for admitting air to the interior of the tower and having its periphery grooved or recessed for the reception of a packing-ring or gasket 53′, which bears against the inner walls of the lower section 47 and prevents the escape of air through the opening 50. The air-conducting pipe 51 is provided with a three-way valve 54, operated by a suitable hand-wheel 55, so that by opening said valve air is admitted to the interior of the tower for extending the telescopic sections, and by closing the valve the air exhausts through the nozzle 55′, thereby permitting the sections to automatically collapse.

Secured to the base of the hollow section 47 is a flange or housing 56, provided with an annular groove or recess 57, in which is revolubly mounted a pinion 58, adapted to engage a circular rack 59, secured to the flat upper face of the head 46, said pinion being operated to rotate the head by means of a hand-wheel 60, connected through the medium of gears 60′ to the shaft 61. The shaft 61 is journaled in bearings 62, and pivoted to the inner end of said shaft is a tubular socket 63, adapted to receive a rod 64, pivoted to the axle of the pinion 58, as clearly shown in Figs. 5 and 12 of the drawings, said rod being keyed within the socket 63, so as to prevent independent rotary movement of the parts and to permit said parts to be extended or contracted to allow for the tilting movement of the tower. The telescopic sections comprising the tower are each provided with a key-seat 64′, adapted to receive the key 65 of an adjacent section, thereby retaining the several sections in alinement and preventing independent rotary movement thereof. The key 65 of each telescopic section is formed with an opening or recess 66, in which is pivoted a locking-dog 67, one end of which is provided with an angularly-disposed arm 68, having an inclined or cam face 69, and the opposite end thereof provided with a pivotal detent 70, adapted to engage a locking notch or depression 71, formed in the adjacent section when said sections are extended or elevated, as clearly shown in Fig. 8 of the drawings. The cam-faces of the locking-dogs project beyond the inner walls of the telescopic sections, as shown, being normally held in said position by coil-springs 72, and the key-seats 64 of said section preferably terminate a short distance from the top of the same to form shoulders 73, which serve as stops to limit the upward movement of said sections. By this arrangement it will be seen that when the several sections are extended by admitting compressed air to the interior of the tower said sections will be forced upwardly until the locking-dog of one section engages the corresponding locking-recess in the adjacent section, in which position they will be firmly locked. When the air-pressure is reduced, however, the lower end of the top telescopic section 74 will engage the inclined face of the

locking-dog on the succeeding section and automatically release the same, and so on, each section automatically releasing the succeeding section until the tower is completely telescoped or collapsed.

Secured to the top telescopic section 74 is a supporting-arm 75, from which are suspended elevator baskets or cars 76, designed to receive the occupants of the burning building, and by means of which they may be transported in safety to the ground. The cars or baskets are suspended from the supporting-arm by means of cables 77, which latter are fastened to the top of the cars and pass through pulleys 78 and thence over guide-pulleys 79 to the winding-drums 37, as shown. The pulleys 78 are fastened to guide-blocks 80, slidably mounted in recesses 81 in the supporting-arm, said guide-blocks carrying the cars or baskets being adjusted longitudinally of the supporting-arm by endless cables 82, passing over rollers 83 and 84. The shafts of the rollers 84 are preferably extended to form crank-handles 85 to permit the ready adjustment of the guide-blocks, said blocks being locked in adjusted position by suitable pawls 86, engaging ratchets 87, secured to the operating-handles.

An observation platform or cage 88 is secured in any suitable manner to the upper telescopic section 74 to enable the foreman to properly direct his men and to permit the fireman on the tower to adjust the mechanism controlling the cars or baskets. The supporting-arm is provided with a pair of oppositely-disposed pivoted arms or braces 89, designed to bear against the wall of the burning building and prevent the tower from coming in contact therewith when the latter is tilted. As a means for tilting and bracing the tower when the telescopic sections are elevated or extended I provide a cable 90, the ends of which are secured to a collar 91, revolubly mounted on the telescopic section 74, the intermediate portion of the cable passing over guide-pulleys 92 and 93 and thence over a drum 94, journaled in suitable brackets 95, secured to the platform of the truck. The drum 94 is rotated to wind the cable 90, and consequently tilt the tower at any angle or inclination with respect to the platform by means of a hand-wheel 96, said drum being provided with a ratchet-wheel 97, the teeth of which are engaged by a pawl 98, so as to hold the drum in adjusted position.

The telescopic tower is preferably mounted on the rear end of the platform directly over the rear axles 9 and 10, the front portion of said platform being provided with a box-like structure or cover 99, which constitutes the body portion of the truck and forms a housing or casing for the air-compressor, storage-tank, and gas-engine, as shown. The body portion is provided with a centrally-disposed compartment 100 for the reception of tools and the like, and arranged on each side of said compartment are a row of seats 101, the bottoms of which are hinged, as indicated at 102, so that the uniforms of the firemen and other necessary articles may be placed in the compartments 103, arranged beneath said seats.

The truck is provided with the usual steering-head 104, to the bottom of which is secured a segmental rack 105, which meshes with a similar rack connected by a rod 106 to the front wheels of said truck. Extending through the steering-head 104 is a rod 107, which is connected in any suitable manner to the starting mechanism of the gas-engine, said engine being supplied with fuel by a pipe 108, communicating with an oil tank or carbureter 109. A clutch member 110, controlled by a hand-operated lever 111, is preferably mounted on the main driving-shaft and by means of which the engine may be operated without affecting the main shaft or driving-gear.

From the foregoing description the construction of the device will be readily understood, and the operation thereof is as follows: The truck being propelled to a point adjacent the burning building, the clutches 29 and 30 are reversed, thereby disconnecting the sprockets 22 and the bevel-gear 11 from the main driving-shaft and throwing into gear the loose pulleys 35 and 36, connected, respectively, to the winding-drums 37 and air-compressor 40. The valve 54 is then opened and the air previously stored in the reservoir 42 admitted through the pipe 51 to hollow telescopic sections comprising the tower, thereby elevating or extending said sections to the position shown in Fig. 1 of the drawings, in which position the sections will be automatically locked, as before described. The tower may then be tilted at any angle or inclination by turning the drum 94 and said tower revolved in its socket, so as to bring the baskets near the roof or windows of the burning building by adjusting the hand-wheel 60, as will be readily understood. The tower being adjusted in the desired position, the cars or baskets may be longitudinally adjusted on the supporting-arm by operating the crank-handles 85 and said baskets raised or lowered to transport the occupants of the building from the upper stories thereof to the ground in safety by manipulating the cables 90, passing over the winding-drums 37. In order to collapse the tower, it is simply necessary to turn the valve, which causes the air to escape through the nozzle 55', thereby reducing the air-pressure in said tower and permitting the several sections to automatically fold or collapse, as before described.

It must be understood that the tower may comprise as many sections as necessary to reach the desired altitude, and the sections may be of any desired length, those comprised between the topmost and lowermost sections being of similar construction and of graduated

sizes, so as to telescope one within the other, as will be readily understood.

Having thus described the invention, what is claimed is—

1. A tower comprising a plurality of tubular telescopic sections having locking-recesses formed therein, and locking members pivoted in said recesses, one end of each locking member projecting in the path of the preceding section and the opposite end thereof being adapted to engage the recess in a succeeding section for automatically locking said sections in extended position.

2. A tower comprising a plurality of tubular telescopic sections having longitudinal locking-recesses formed therein, and spring-actuated locking members carried by said tubular sections one end of each of which is provided with a cam-face projecting in the path of the preceding section and the opposite end thereof being adapted to engage the recess in a succeeding section for automatically locking said sections in extended position.

3. A tower comprising a plurality of telescopic sections each provided with a key and having a key-seat formed therein adapted to receive the key of an adjacent section, and locking members pivoted in recesses in said keys and adapted to engage corresponding locking-recesses formed in the adjacent sections for locking said sections in extended position.

4. In a portable truck, the combination with a platform, of an extensible telescopic tower rotatably mounted thereon, means for propelling the truck, an air-compressor, means driven by the truck-propelling means for operating the compressor to extend the tower, and means for locking the tower in extended position.

5. In a portable truck, the combination with a platform, of a winding-drum, a tower revolubly mounted on said platform, a supporting-arm provided with coincident longitudinal slots secured to the top of said tower, guide-blocks slidably mounted in said slots, pulleys carried by said guide-blocks, and cables passing over said pulleys one end of each of which is fastened to a cage or car and the opposite end thereof secured to the winding-drum.

6. In a portable truck, the combination with a platform, of a supporting-base secured thereto and provided with a recess or socket, a revolving tower formed of a plurality of telescopic sections the lower section of which is provided with an enlarged head adapted to engage said socket, a fluid-supply pipe passing through said supporting-base and head for supplying fluid under pressure to the telescopic sections for extending the latter, and a plate secured to the fluid-supply pipe and adapted to engage the interior walls of the lower telescopic section.

7. In a portable truck, the combination with a platform, of a supporting-base secured thereto and provided with a recess or socket, a revolving tower formed of a plurality of telescopic sections the lower section of which is provided with an enlarged head adapted to engage said socket, antifriction-balls interposed between said head and socket, a rack carried by the head, a pinion engaging said rack for revolving the tower, a shaft journaled on the supporting-base, and an extensible universal connection between the pinion and said shaft.

8. In a portable truck, the combination with a platform, of a tower revolubly mounted thereon, a supporting-arm rigidly secured to the top of said tower, braces pivoted to the supporting-arm, elevator cages or cars suspended from said arm, means for tilting the tower, and means for rotating the latter.

9. In a portable truck, the combination with a platform, of a collapsible tower revolubly mounted thereon, a main driving-shaft, driving-gear adapted to be connected to said shaft, an air-compressor, means connected to the main shaft for operating the compressor to thereby supply air under pressure to the tower for elevating the same, a clutch mechanism for disconnecting the driving-gear from the main shaft and means for simultaneously starting the air-compressor.

10. A tower comprising a plurality of freely-movable tubular telescopic sections having locking-recesses formed therein, and a pivoted spring-actuated locking member carried by each section and adapted to engage the recess in a succeeding section for locking said section in extended position.

11. In a portable truck, the combination with a platform, of a supporting-base rigidly secured thereto and having a socket formed therein, a revolving tower comprising a plurality of telescopic sections the lower section of which is provided with an enlarged head adapted to engage said socket, antifriction-balls interposed between said head and socket, a fluid-supply pipe passing through the supporting-base and head for supplying fluid under pressure to the telescopic sections for extending the latter, a plate secured to the fluid-supply pipe and engaging the interior walls of the lower telescopic section, means for automatically locking said sections in extended position, means for preventing independent rotative movement of the several sections, and means for revolving the tower.

12. In a portable truck, the combination with a platform, of a supporting-base secured thereto and having a socket formed therein, a revolving tower formed of a plurality of telescopic sections, the lower section of which is provided with an enlarged head adapted to engage said socket, a rack carried by the head, a pinion engaging the rack for revolving the tower, an operating-shaft, a universal connection between the pinion and said shaft, a

source of fluid-supply for extending the telescopic sections, means for automatically locking said sections in extended position, and means for successively releasing said sections.

13. In a portable truck, a fluid-pressure-actuated tower comprising a plurality of tubular telescopic sections having interfitting end portions to limit its extensible movement, means for propelling the truck, an air-compressor, means driven by the truck-propelling means for operating the compressor to thereby extend said sections, means for automatically locking each successive section as it reaches the limit of its upward movement, and means for automatically releasing said sections when the fluid-supply is cut off.

14. In a portable truck, a fluid-pressure-actuated tower comprising a plurality of tubular telescopic sections having interfitting end portions to limit its extensible movement, means for propelling the truck, an air-compressor, means driven by the truck-propelling means for operating the compressor to thereby extend said sections, means for automatically locking said sections in extended position, a valve for controlling the supply of air from the compressor to the tower, and means for automatically releasing the telescopic sections when the fluid-supply is cut off.

15. In a portable truck the combination with a platform, of a supporting-base secured thereto and having a socket formed therein, a revolving tower formed of a plurality of telescopic sections the lower one of which is provided with an enlarged head adapted to engage said socket, a fluid-supply pipe passing through said head for supplying fluid under pressure to the telescopic sections for extending the latter, a segmental plate secured to the end of the supply-pipe, and a gasket interposed between said plate and the interior walls of the socket.

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

JACOB DERX.

Witnesses:
J. H. JOCHUM, Jr.,
J. ROSS COLHOUN.