(No Model.) 3 Sheets—Sheet 1.

F. S. HENNING & W. PIGOTT.

WATER TOWER.

No. 591,603. Patented Oct. 12, 1897.

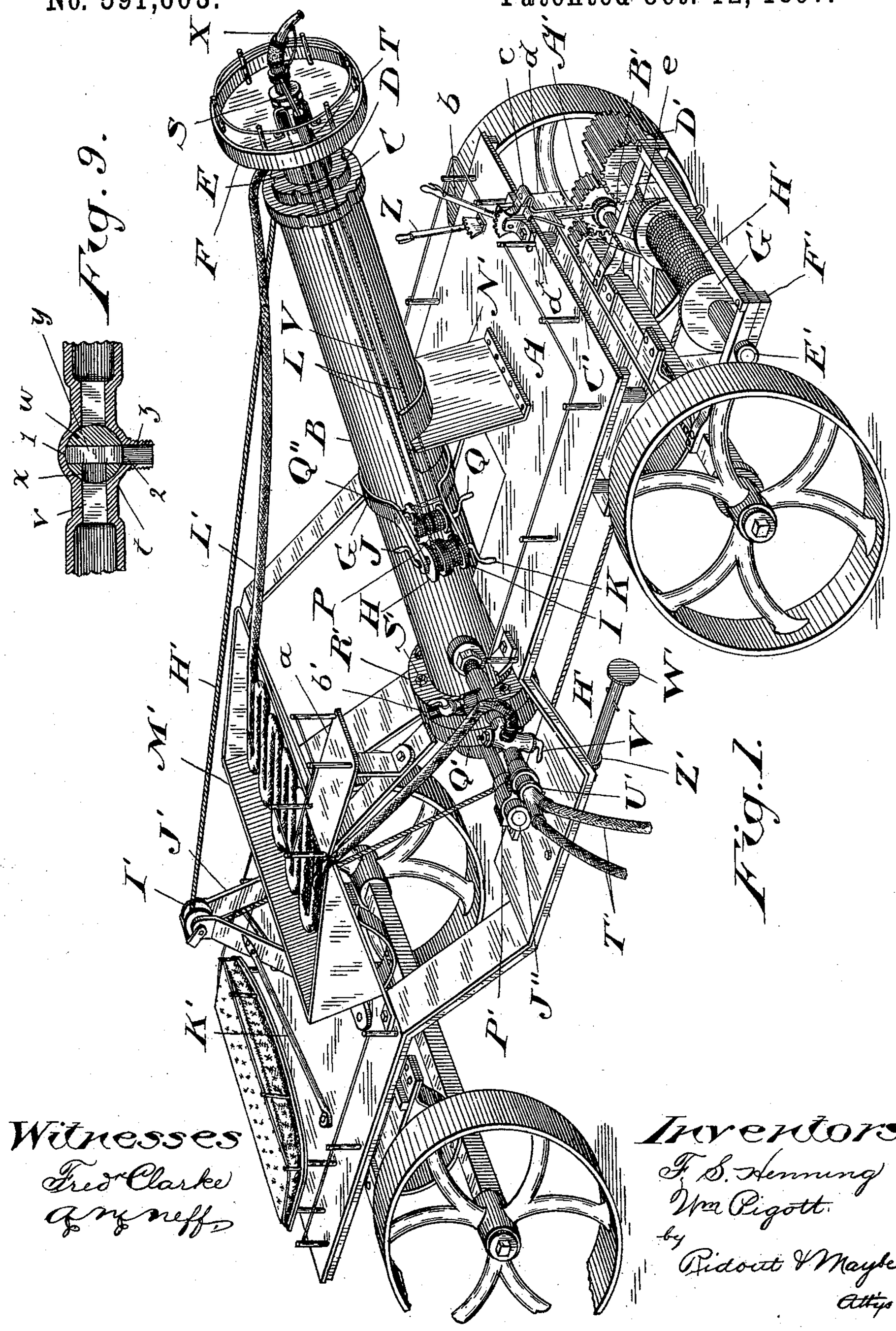

Fig. 9.

Fig. 7.

Witnesses
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(No Model.) 3 Sheets—Sheet 2.

F. S. HENNING & W. PIGOTT.

WATER TOWER.

No. 591,603. Patented Oct. 12, 1897.

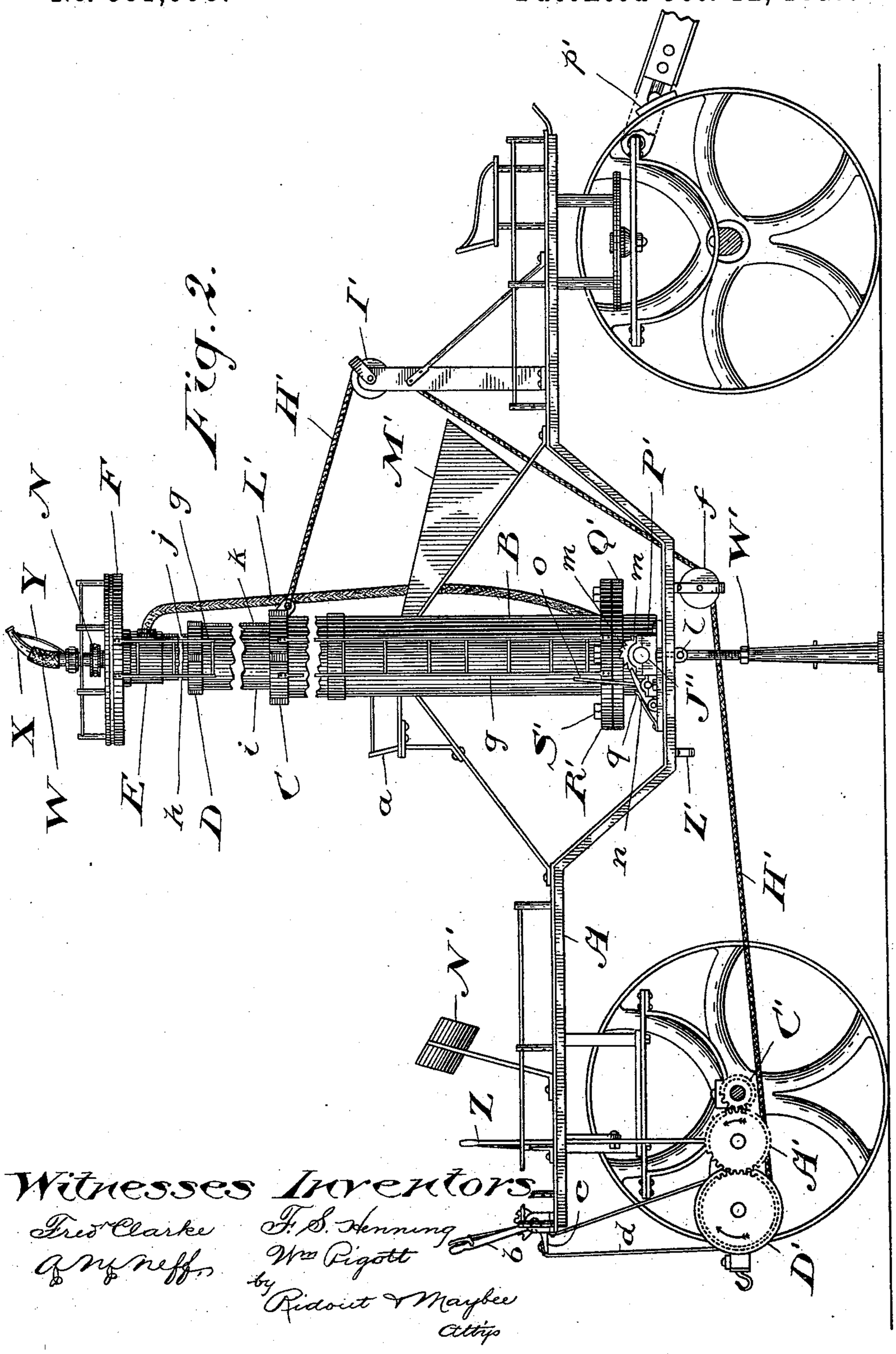

Fig. 2.

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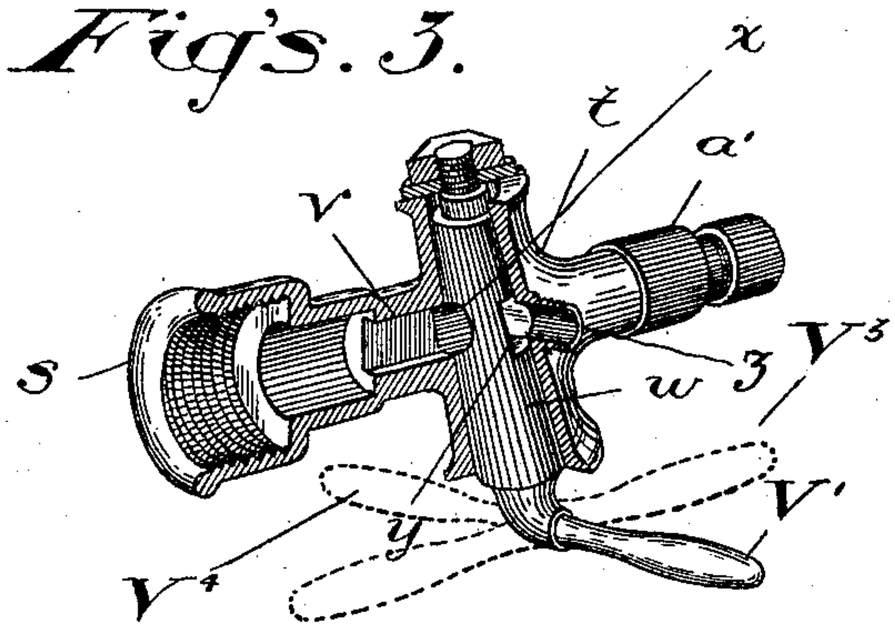
(No Model.) 3 Sheets—Sheet 3.

F. S. HENNING & W. PIGOTT.

WATER TOWER.

No. 591,603. Patented Oct. 12, 1897.

Fig's. 3.



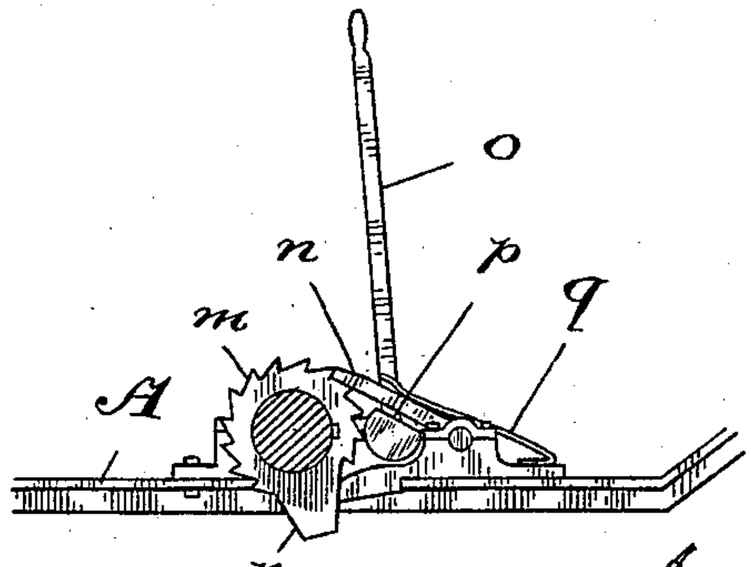


Fig. 5.

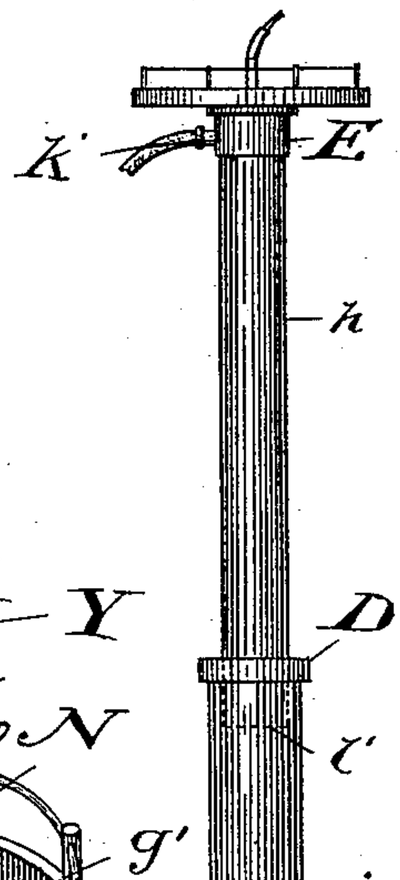
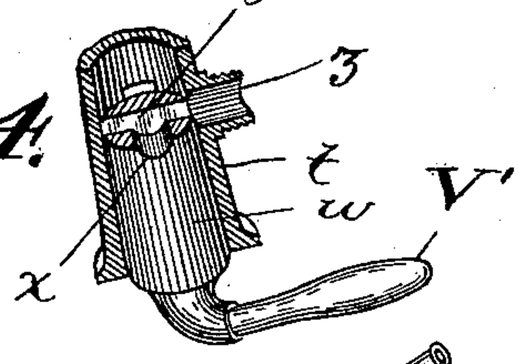


Fig. 4.



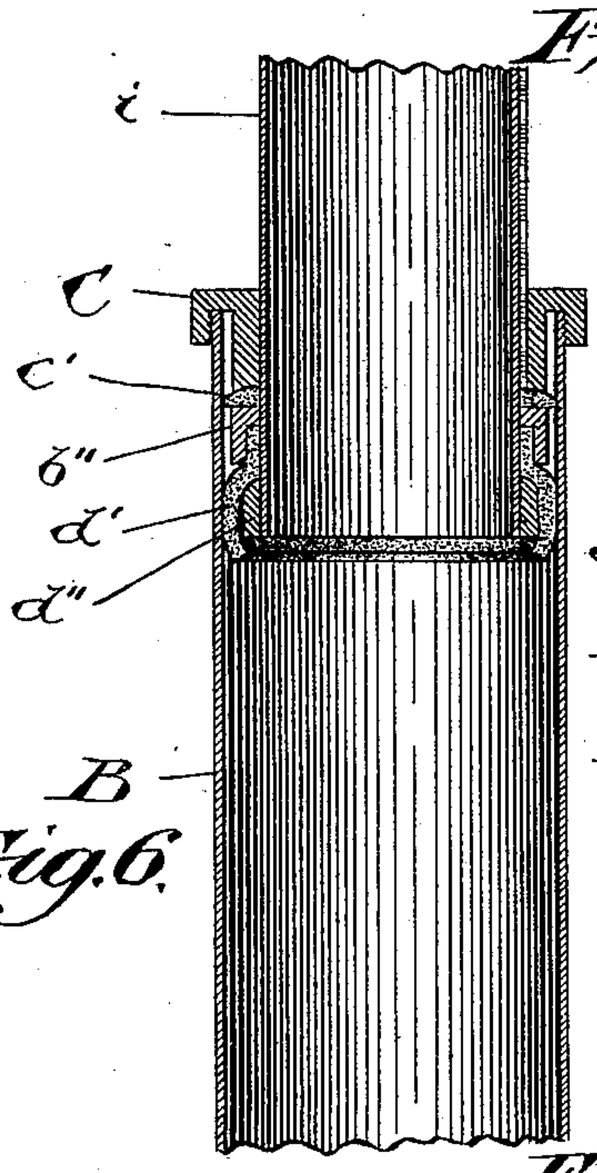


Fig. 6.

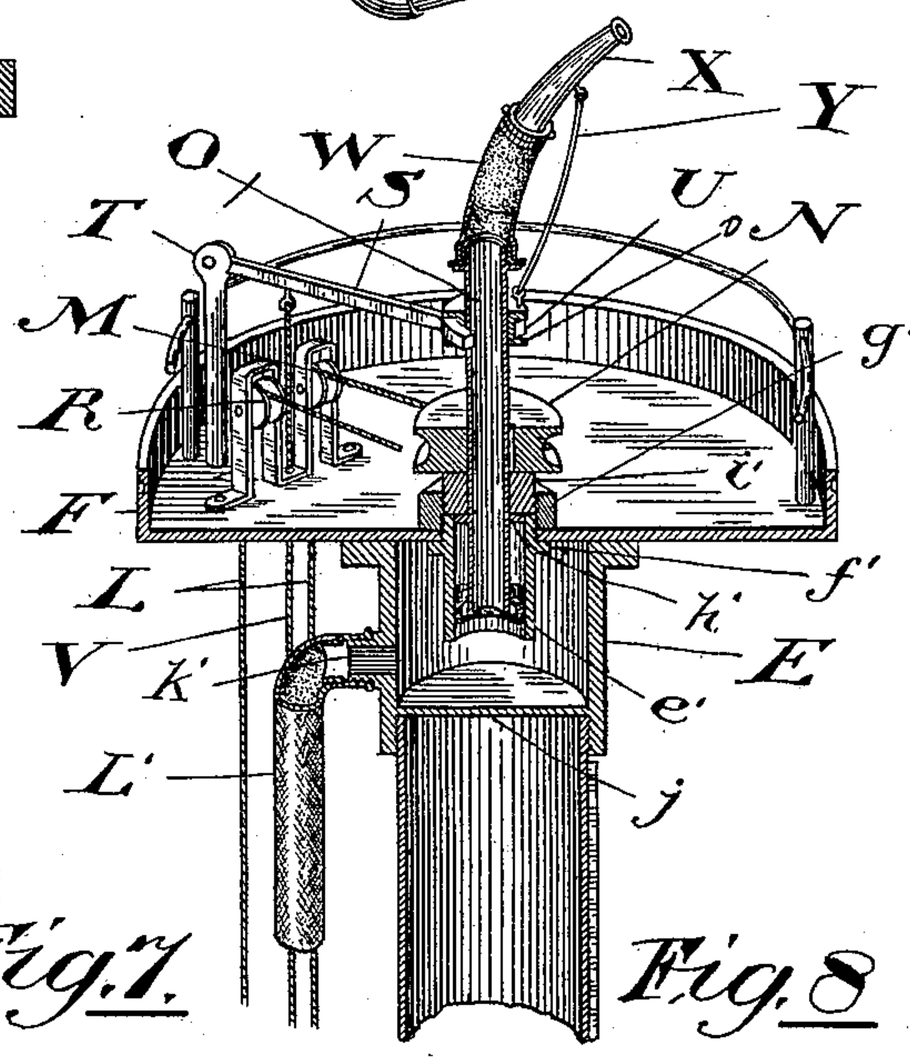


Fig. 7.

Fig. 8

Witnesses

Fred Clarke

A. M. Neff.

Inventors

F. S. Henning

Wm Pigott

by Ridout & Maybee

Attys

UNITED STATES PATENT OFFICE.

FREDERICK SAYERS HENNING AND WILLIAM PIGOTT, OF TORONTO, CANADA, ASSIGNORS OF ONE-THIRD TO HUGH STRAIN, JR., OF SAME PLACE.

WATER-TOWER.

SPECIFICATION forming part of Letters Patent No. 591,603, dated October 12, 1897.

Application filed October 5, 1896. Serial No. 607,940. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK SAYERS HENNING and WILLIAM PIGOTT, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented a certain new and Improved Water-Tower, of which the following is a specification.

The object of the invention is to provide a water-tower which is strong, compact, easily operated, and capable of great extension, and which may be quickly raised by means of horse and hydraulic power; and it consists, essentially, of a column containing one or more telescopic pipes which is suitably trunnioned on the vehicle and adapted for being raised to a vertical position by gearing operated during the forward motion of the vehicle, means for controlling and arresting the movement of the lower column at any desired angle, means whereby the telescopic pipe or pipes within the column may be extended or lowered to any desired height, and whereby a continuous stream may be maintained when the tower is raised to the desired height, as well as while it is being raised or lowered, and means for directing the stream of water on the fire and of controlling such stream, substantially as hereinafter specifically set forth.

Figure 1 is a perspective view of the device while the water-tower is lowered and not in operation. Fig. 2 is a side elevation showing the far side of the device illustrated in Fig. 1. Figs. 3, 4, and 9 are sectional details of the three-way cock for controlling and directing the water-stream from the engine. Fig. 5 is a detail of one of the ratchets and spring-dogs which assist in controlling the motion of the water-tower. Fig. 6 is a sectional detail showing hydraulic packing for the telescopic pipes. Fig. 7 is a perspective detail, partly in section, showing the rotatable nozzle and uppermost portion of the water-tower. Fig. 8 is an elevation showing the lower column stationary and permanently raised with its two telescopic pipes fully extended.

In the drawings like letters of reference indicate corresponding parts in the several figures.

In Fig. 1, A is the platform of the vehicle, which is preferably depressed and open in the center, as indicated, in order to lower the center of gravity of the water-tower when it is erected.

B is the base pipe or column of the water-tower, which is shown as it appears when out of action seated on the rest N′, which is formed on the rear part of the vehicle. This base-pipe is trunnioned to the frame or platform of the vehicle by the trunnion-arms J″, which work in the trunnion-boxes P′, as indicated in Figs. 1 and 2.

C is a cap for the top of the base-pipe B.

D is a similar cap for the outer telescopic pipe *i*, which is shown in Figs. 2 and 8. This cap rests on the cap C when the telescopic pipes are collapsed.

E is the water-chamber, formed on the top of the inner telescopic pipe *h*, which is shown in Figs. 2 and 8. This water-chamber projects beyond the pipe *h* and forms a shoulder which bears against the cap D when the pipe is collapsed.

F is the upper platform, formed on the top of the water-chamber E and forms the top portion of the water-tower when it is extended. This platform carries the rotatable pipe and nozzle, the details of which and mode of manipulation are hereinafter described, and directs the stream of water from the tower onto the desired spot.

G is a bracket fixed to the base-pipe B and affords bearings for the spindles of the drums which operate the rotatable pipe and nozzle, hereinafter described.

H and I are two reels which work independently of each other and are sleeved on the spindle which has bearings in the bracket G. The drum H is provided with a handle J, and to it is attached the rope L, which passes up through a hole in the upper platform F, over the guide-pulley M, thence around the horizonal pulley N, fixed to the rotatable pipe O, which is secured in place, as hereinafter mentioned, thence over the guide-pulley R, and down through a hole in the upper platform to the reel I, which reel is operated by its handle K. It will thus be seen that by turning one of the reels the rotatable pipe which carries the nozzle may be moved to the right or left, as may be desired, by a man stand-

ing on the lower platform *a*, as indicated in Figs. 1 and 2, and thus the stream of water may be directed to right or left, as desired, from below.

P is another reel similarly journaled on the bracket G, and is shown nearer to the base-pipe. This reel is supplied with handle Q and dog Q^2, and is connected to the rope V, which passes up through a hole in the upper platform, and is connected to the pivoted lever S, as shown in Figs. 1 and 7. This pivoted lever S is provided with jaws U, which encircle a collar *o* on the rotatable pipe O, and is pivoted to the standard T, formed on the upper platform. W is a flexible joint, preferably of rubber, which secures the nozzle X to the rotatable pipe O. Y is a cord or rope connecting the nozzle with said collar *o*, or it may be connected to the jaws or outer end of the pivoted lever S. It will thus be seen that by reeling up the reel P by the handle Q the pivoted lever is pulled down and with it the nozzle, so that the stream of water may have a range downwardly, if so desired.

The normal position of the nozzle when the water-tower is being operated is up, as indicated in the drawings, and requires to be pulled down if the stream is to be directed downwardly. Instead of operating and directing the stream of water from the lower platform *a* a man may be sent up along with the telescopic pipes by first getting up into the platform by means of the divided ladder *g*, (shown in Fig. 2,) when he ascends along with the inner telescopic pipe *h* as it is forced up by the water-pressure supplied by the engines or other means.

Z is a clutch-lever on the rear end of the platform A and is designed to throw the winding-drum, which raises the tower, from the position shown in Fig. 1 to a vertical position by the rotation of the rear axle as the water-tower is being moved by the horses up to the fire. This clutch-lever is of ordinary construction and is supplied with a spring-dog and quadrant, as indicated. The lower end of this lever is connected by means of a collar to the sliding spur-wheel A′, which is adapted to move on the spindle B′, which is journaled or fixed to the frame of the vehicle. This sliding spur-wheel A′ is adapted to be thrown into clutch with the pinion C′, which is fixed to the rotatable axle of the rear wheels, which is suitably journaled to the frame. By moving the lever Z laterally the sliding spur-wheel A′ may be thrown into and out of clutch with the pinion C′ on the rotatable axle, as may be desired.

D′ is a large gear-wheel attached to the axle E′ for the winding-drum, which axle is journaled in the frame F′, as indicated. The gear-wheel D′ is of sufficient width to permit of the sliding spur-wheel A′ moving laterally, so as to come into or out of clutch with the pinion C′, while it still remains in gear with the gear-wheel D′.

G′ is a winding-drum fixed to the axle E′, on which the rope H′ is wound and unwound as the water-tower is being raised or lowered. This rope, which is preferably of wire, passes under a guide-pulley *f*, (shown in Fig. 2,) thence around the pulley I′, which is journaled in the standard J′ in the front part of the vehicle and is preferably secured to the platform by braces K′.

L′ is the hose-pipe, the slack of which appears in folds in the hose-box M′.

In Figs. 1 and 2 is shown the mode of trunnioning the base-pipe B to the frame or platform of the vehicle.

Q′ is the trunnion-base, and R′ is a collar formed on the base-pipe B, which is bolted through to the trunnion-base by means of the bolts S′.

T are hose-pipes which are designed to be attached to a couple of fire-engines and are connected with the Siamese coupling U′. This coupling is provided with check-valves, so that in the event of one engine only being employed to raise the telescopic pipes the return flow of water may be obviated.

V′ is a three-way cock which in Fig. 1 is shown so turned that the water is off both the hose and the pipes.

W′, Fig. 1, shows one of two jacks or other supports, which, when the tower is not elevated, is in the rest Z′.

b is a friction-lever situate at the rear end of the platform and is of the ordinary spring-dog and quadrant type already indicated. This friction-lever is bent and has a short arm *c*, to the end of which is attached one end of the friction-band *d*, which passes from these round the friction-drum *e*, which is fixed to the winding-drum G′, while the other end of the friction-band *d* is connected at *d*″ to the rear end of the platform A. By moving this friction-lever *b* backward and forward the friction-band *d* may be loosened or tightened on its drum, as may be desired, so as to permit the winding-drum to move freely or to check its movement, as may be desired. It will be seen that by this method of gearing and of checking the motion of the tower, by throwing the clutch-lever so as to unclutch the gearing and by arresting the motion of the winding-drum by means of the friction-lever *b*, the motion of the water-tower may be arrested at any time, and it may be held in place so as to permit of the tower passing under overhead wires which may be in the neighborhood of the fire.

b′ (shown in Fig. 1) is the draw-off cock to permit of the escape of water from the tower when it is desired to collapse the telescopic pipes and to lower the tower into the position shown in Fig. 1.

In Fig. 2 the base-pipe B is shown broken away at its upper end and vertical in position, as well as the outer telescopic pipe *i* and inner telescopic pipe *h*, which are also both shown broken away to indicate that they are also both raised to their fullest extent.

j is a feather formed on the inner telescopic

pipe *h*, which is adapted to move in a groove formed in the collar of the pipe immediately below it, and *k* is a feather formed in the outer telescopic pipe, which is adapted to move in a similar groove formed in the collar *c*. By this means the rotating of the telescopic pipes with respect to the base-pipe is obviated.

l is a hinged joint for the jack W′, which is shown down in position immediately under the water-tower, so as to help to support the same when it is raised to a vertical position and full of water.

p′ is a rest attached by arms to the pole of the vehicle, so that when it engages with the tire of the front wheel, as shown, it keeps the end of the pole from off the ground.

m is a ratchet connected to the trunnion-arm, and *n* is a spring-dog which engages therewith. The details and mode of operating this are referred to hereinafter under Fig. 5. It is designed to assist the wire rope H′ in keeping the tower vertical and prevent its falling back. It is supplied with a stop (shown in Fig. 1) to prevent forward movement of the top of the tower.

Referring to Fig. 5, it will be seen that *o* is a lever, to the short arm of which the cam *p* is attached. *n* is the dog, engaged with one of the teeth of the ratchets *m*, and *q* is a spring which keeps the dog so engaged. *r* is a stop formed on the ratchet, which passes through the platform A and engages therewith, as indicated, when the tower is vertical. There are two of these spring-dogs and ratchets, one on each side of the machine, so that their united action control and check the motion of the tower. When it is desired to disengage the dog from the ratchet, the lever *o* is pulled, so that its cam engages with the bottom of the dog and throws it out of connection with the ratchet-tooth. When so disengaged, the operation of lowering the tower may be proceeded with.

Figs. 3, 4, and 9 indicate the interior arrangement and mode of operating the three-way cock. In Fig. 3 the position of the handle, as at V′, indicates, as may be hereinafter seen, that the stream of water proceeding from the engine passes up entirely through the hose-pipe, which is coupled to the hose outlet-pipe *z*. *s* is a hose-coupling which forms a connection for the stream of water from the engine or other source. *t* is the casing for the cock, which is provided with the water-passage *v*, which is shown as an oblong opening in the drawings. For the purpose of passing the water to the hose-pipe this water-passage *v* coincides or is opposite to the round hole *x*, which is shown in the plug *w*. *y* is an oblong hole formed in the plug, which passes entirely through the same, and its position is at right angles to the water-passage of which the hole *x* is the entrance. This arrangement of openings in the plug is more readily seen in Fig. 9. *a′* is the pipe for feeding water to the water-tower, which pipe is connected with the water-outlet passage formed in the casing *t* immediately opposite to the water-passage *v*, already described, as in the casing on the opposite side of the plug. This plug is secured in place in the usual way by a screw-cap which bears against the top of the casing. The dotted lines for the handles (shown in Fig. 3) indicate the various positions of the cock when the tower is being used. V^4 indicates its position when the water is turned off both the tower and the hose. V^2 indicates its position when the water is passing solely up to the water-tower. V′ indicates its position when the water is passing solely up through the hose-pipe and is the position indicated in Figs. 3, 4, and 9. V^3 is the position the handle assumes when the water is passing up both through the hose and through the water-tower. By referring to Fig. 9 it will be seen that when the water is passing up alone through the hose the opening *x* coincides with the water passage-way *v* and the oblong hole in the plug *w* is opposite to the opening for the hose outlet-pipe *z*. By numbering the ends of the oblong hole *y* in the plug, as numbers 1 and 2, respectively, it is seen that when the water is turned on for the hose alone, 2 coincides with the opening *z*. When the cock is turned into the position shown at V″ in Fig. 3, the end 2 coincides with the water-passage *v* and the end 1 coincides with the opening *a′*. When the cock is turned into the position shown at V^3 in Fig. 3, the end 1 of the oblong hole *y* coincides with the water-passage *v*, while the end 2 coincides with the opening *a′*. In this position of the plug it is evident that the water passes straight through to the tower as well as being diverted to the right through the hose. When the plug is shown in the position V^4, the solid side of the plug *w*, in which there is no opening, comes against the opening of the water-passage *v* and entirely shuts off the water from both the hose and the tower. In Fig. 4 it will be seen that the plug is cut in two through the center of the water passage-ways and the section is transverse to that shown in Fig. 3. The opening into the water-tower outlet-pipe *a′* is indicated. As shown in this view, Fig. 4, the water is of course shut out from the water-tower and is passing up through the hose by the opening *z*.

In Fig. 6 is shown a method of hydraulic packing for the pipes. The outer telescopic pipe *i* is provided with a collar *b″*. On top of this collar rests the small leather collar *c′*, which when this telescopic pipe is raised to its fullest extent, as indicated in the drawings, forces the small leather collar *c′* against the bottom of the cap C. *d′* is a leather collar, the edges of which extend down below the bottom of the telescopic pipe *i*. The upper edge of this leather collar is gripped between the pipe *i* and the collar *b″* and is thus held in place. It passes over the metal ring *d″* at the base of the pipe *i*. It is thus forced

outwardly when the water-pressure is thrown on against the inside of the base-pipe B, and it and the small collar c' effectually prevent the passage of any water between the pipe i and the pipe B. A similar mode of hydraulic packing is adopted for the joint between the telescopic pipe h and the telescopic pipe i, as well as for a packing around the bottom of the rotatable pipe O within the pipe e'. (Shown in Fig. 7.)

In Fig. 7 is shown more particularly the mode of holding in place the rotatable pipe O. e' is a pipe provided at its upper end with shoulders f'. The upper end of this pipe, which extends up through a hole in the upper platform, is threaded, and on it is screwed the nut g'. This pipe only extends partly through the water-chamber E, so as to allow of the passage of the water from the inlet k' up through the nozzle. The upper end of the hose L′ is coupled to the inlet k' of the water-chamber E in the usual manner. h' is a collar formed on the rotatable pipe O, and i' is a nut, externally threaded, which screws within the nut g'. This nut is located immediately below the horizontal pulley N, the bottom of which pulley is of a smooth surface, so as to permit of its easy movement over the top of the nut i'. The lower side of this nut i' when screwed down butts against the collar h', formed on the rotatable pipe O. In this method, or in a similar method, the upward or downward motion of the rotatable pipe may be controlled. In this drawing, j is a diaphragm or part of the water-chamber, with which it may be formed integral, against the lower face of which the water-pressure comes when the telescopic pipes are being raised by hydraulic pressure to their operative position. As a matter of fact the water may not possibly reach this diaphragm, as an air-cushion will be formed between the column of water and the diaphragm.

Fig. 8 is a detail showing the base-pipe permanently built in a vertical position, o' being masonry to retain it in this position. It is designed as a form of tower which may be adapted for use in large buildings or warehouses or in the roadways. At l' and m' is indicated how the ends of the telescopic pipes are located so as to have good bearings and render the tower, when extended, rigid. n' is the water-inlet pipe for this class of water-towers. On each of the telescopic pipes i and h collars b'' are formed, which engage with the respective caps C and D when the telescopic pipes are extended.

The mode of operating the tower is as follows: When in the neighborhood of the fire, the clutch-lever Z is so thrown as to make the sliding spur-wheel A′ engage with the pinion C′ on the rotatable axle. The gearing is then thrown into operation as the vehicle progresses, and the wire rope H′ commences to wind up on the drum. As its other end is connected with the upper part of the base-pipe B, this pipe, which contains the telescopic pipes, commences to assume the vertical position shown in Fig. 2. When the tower is vertical, the clutch-lever is thrown so as to throw the gearing out, when the winding ceases, and the ratchets and dogs m and n, as well as the stop R, engage, so as to arrest any further motion of the base-pipe. The vehicle having come to rest at the appropriate position, the hose T′ is coupled on and water pumped from the engine. If it is desired to raise the telescopic pipes alone without throwing the hose into operation, the cock is turned into the position indicated at V″ in Fig. 3, when the whole force of the stream from the engine or other source passes up the base-pipe, impinges against the diaphragm j' in the inner telescopic pipe, and the inner pipe h gradually rises. When the pipe h has become fully raised from the pipe i, it still continues to rise, carrying with it this pipe i, which is also carried up until the tower is fully extended, as indicated in Fig. 8, or until the tower has been raised to the desired height. The water may be so turned, as indicated in Fig. 3, that it may pass entirely up through the hose and out through the nozzle and be directed onto the fire, as may be desired, either from the lower platform a or by a man on the upper platform F. Should a man direct the nozzle from the upper platform, he may be supplied with a lever to move the horizontal pulley N or to depress the lever-arm S, as required. When it is desired to lower the tower again, the draw-off cock b' is turned so as to allow the column of water to escape from the water-tower when the telescopic pipes commence to lower. When the water is drained off, the spring-dogs n are raised from the ratchets on either side of the machine, the gearing is thrown out of clutch, and the friction-lever is released, so as to allow the wire rope H′ to move as freely as desired on the winding-drum G, the motion of which is controlled by the friction-lever b, when the tower is collapsed and is lowered again into the position shown in Fig. 1 and the jacks W′ are raised from the ground and put on their rests Z′, when the vehicle is ready for removal from the fire.

Instead of raising the tower to the full height, as already described, in a case of lower buildings, its extension may be checked at any time by shutting off the water from the tower, as already indicated. It is also evident that if the cock is so turned that the water may pass both up the base-pipe B as well as through the hose-pipe L′, the stream from the nozzle may be kept playing while the tower is raised to its desired height. It is also evident that the tower may be also used as a fire-escape and may be extended at any desired angle and held in position so that its upper end may be made to approach any window, when the telescopic pipes may be collapsed by letting out the water by the draw-off cock b' and the tower again lowered. While the tower is being utilized as a fire-es-

cape, the stream of water may be still kept on, so as to render the fire-escape more available in the event of flames proceeding from the window to which the upper platform has been advanced. It is also evident that the gearing may be so arranged as to give greater or less power, as may be desired, and also that the water-tower may be arranged so as to be connected with one or more sources of water pressure and supply, as already indicated, and that instead of two telescopic pipes, as described, one telescopic pipe may alone be utilized for the purposes of the water-tower.

What we claim as our invention is—

1. In a device of the class described, the combination of a vehicle, a tilting tower mounted thereon, and mechanism connecting said tower to the driving power of said vehicle, whereby said tower is tilted by the operation of the driving power of said vehicle, substantially as described.

2. In a device of the class described, the combination of a vehicle having the usual ground-wheels, a movable tower carried thereby, mechanism arranged to connect the ground-wheels of the vehicle and said tower, whereby the movement of said wheels raises the tower, substantially as described.

3. In a device of the class described, the combination with a vehicle having the usual ground-wheels, of a tilting tower, mechanism whereby the tower is raised from the ground-wheels, the said tilting tower being formed of two or more telescopic sections arranged to be extended by hydraulic power, substantially as and for the purpose specified.

4. In a water-tower, the combination of a base-pipe suitably trunnioned on the vehicle, a winding-drum suitably journaled and driven by one of the wheels of the vehicle, a rope suitably connected to the top of said base-pipe and to said winding-drum and means for throwing said winding-drum out of gear with said wheel, substantially as specified.

5. In a water-tower, the combination of a base-pipe suitably trunnioned on the vehicle and containing one or more telescopic pipes, a rope suitably connected to the top of the base-pipe and to a winding-drum suitably journaled; gearing connecting with a pinion on a rotatable axle of the vehicle to operate the winding-drum; and means for throwing the gearing into or out of clutch with said pinion, substantially as specified.

6. In a water-tower, the combination of a base-pipe suitably trunnioned on the vehicle containing one or more telescopic pipes, a rope suitably connected to the top of the base-pipe and to a winding-drum which is suitably journaled; gearing connecting with a pinion on a rotatable axle of the vehicle to operate the winding-drum; means for throwing the gearing into or out of clutch with said pinion; and means for controlling the motion of the winding-drum when the gearing is out of clutch, substantially as specified.

7. In a water-tower, the combination of a base-pipe suitably trunnioned on the vehicle and containing one or more telescopic pipes; a rope suitably connected to the top of the base-pipe and to a winding-drum, which is suitably journaled; gearing connecting with a pinion on a rotatable axle to operate the winding-drum; means for throwing the gearing into or out of clutch with said pinion; means for controlling the motion of the winding-drum when the gearing is out of clutch and of retaining the water-tower at any desired angle; a hose-pipe connected to a nozzle which is suitably held on the top of the tower and means for controlling the movement of said nozzle; and means for directing the water from the engine or other source of power either through the tower, or through the hose-pipe, or through both the tower and hose-pipe simultaneously, as well as cutting off the water-supply; and means for permitting the water forced into the tower to escape, substantially as specified.

8. In a device of the class described, the combination with a vehicle having a platform A formed thereon, of a base-pipe B having trunnion-arms J″ journaled in box P′, an axle E′, a winding-drum G′ carried thereby, a gear-wheel D′ connected to said axle E′, a pinion C′ connected with a rotating shaft, a spur-wheel A′ interposed between said gear-wheel D′ and pinion C′, suitable guide-pulleys, a rope H′ passing over said guide-pulleys and having one end connected with said base-pipe B and its other end connected with said winding-drum G′, substantially as described.

9. In a device of the class described, the combination with a vehicle having a platform A formed thereon, of a base-pipe B suitably journaled on said vehicle and arranged to be tilted, a rotatable shaft carrying a pinion C′, a shaft E′ carrying a winding-drum G′ and having a gear-wheel D′ connected thereto, means as the rope H′ connecting said base-pipe B with said winding-drum G′, a spindle B′ interposed between said pinion C′ and gear-wheel D′, a spur-wheel A′ slidingly secured to said spindle B′, and a clutch-lever Z connected with said sliding spur-wheel, substantially as and for the purpose specified.

10. In a vehicle of the class described, the combination with a vehicle having a platform A formed thereon, of a base-pipe B suitably journaled on said vehicle and arranged to be tilted, a rotatable shaft carrying a pinion C′, a shaft E′ carrying a winding-drum G′ and having a gear-wheel D′ connected thereto, means as the rope H′ connecting said base-pipe B with said winding-drum G′, a spindle B′ interposed between said pinion C′ and gear-wheel D′, a spur-wheel A′ slidingly secured to said spindle B′, a clutch-lever Z′ connected with said sliding spur-wheel A′, a friction-drum *e* located on one of said shafts, a friction-band *d* coacting with said friction-drum, and a friction-lever *b* controlling said friction-band, substantially as described.

11. In a device of the class described, the

combination of a longitudinally-extensible water-tower having the usual nozzle X, flexible joint W and rotatable pipe O suitably secured in position, an upper platform F, guide-pulleys M and R supported thereby, a pulley as N on said rotatable pipe O, and a rope L passing around said pulley N and over said guide-pulleys M and R, a bracket as G, and independent reels H and I suitably journaled on said bracket and having the ends of the rope L wound thereon, substantially as described.

12. In a device of the class described, a water-tower having the usual nozzle X, flexible joint W and rotatable pipe O suitably secured in position, in combination with an upper platform F, a standard T supported thereby, a lever S having one end pivoted to said standard T and its other end having a connection with said nozzle X, a bracket G connected with the base-pipe and having a reel P suitably journaled thereon, and a cord V connecting said pivoted lever S with said reel P, substantially as described.

13. In a device of the class described, a water-tower having the usual nozzle X, flexible joint W and rotatable pipe O suitably secured in position, in combination with an upper platform F, a pulley N connected with said rotatable pipe O, guide-pulleys M and R supported on said platform, independent reels H and I suitably journaled, and a rope L passing around said pulley N over said guide-pulleys and having its ends connected with said independent reels H and I, a standard T supported by said platform, a lever S having one end pivoted to said standard T and its other end having a connection with said nozzle X, a reel P, and a cord V connecting said pivoted lever S with said reel, substantially as described.

14. In a device of the class described, the combination of a water-tower, having a platform F near the top thereof, a rotatable pipe O, a pipe e' projecting through said platform and connecting the upper end of said tower with said pipe O, a collar f' on the said pipe e' bearing against the lower side of said platform, a nut g' secured to said pipe e' and firmly connecting said pipe e' and said platform, and a nut i connecting said rotatable pipe O with said pipe e', substantially as described.

15. In a device of the class described, the combination of a water-tower having a platform F near the top thereof, a water-chamber E at the top of said water-tower and beneath said platform, a rotatable pipe O having a nozzle X and flexible joint W above said platform, a pipe e' located in said water-chamber E and projecting through said platform and having a collar h' thereon bearing against the bottom of said platform, a nut g' secured to the upper part of said pipe e' and firmly connecting said pipe e' and platform, a nut i' connecting said pipes O and e', and a water-inlet as k', substantially as described.

16. In a water-tower, the combination with a platform as A and a base-pipe as B, of a trunnion-arm J″ fixed to said base-pipe and suitably journaled, a ratchet m connected with said trunnion-arm J″, a dog n engaging said ratchet, a spring Q acting on said dog, a lever as o carrying a cam p arranged to coact with said dog n, and a stop R arranged to control the movement of said trunnion-arm J″, substantially as described.

17. In a water-tower, the combination with a base-pipe as B having one or more pipes arranged to coact therewith and be extended therefrom by hydraulic pressure, the uppermost of said pipes being closed at its top, of a water-chamber located in the top of the said uppermost pipe, a water-cock communicating with said base-pipe, a pipe as L′ connecting said cock with said water-chamber, the said cock being constructed to supply water to said pipes and chamber, substantially as described.

18. In a water-tower, the combination with the base-pipe B, suitably trunnioned on the vehicle and adapted to be raised vertically as well as lowered; of the telescopic pipes i and h, suitably connected together and to the base-pipe B; the water-chamber E; the water-tower pipe a'; hose-pipe L connecting said pipe a' and chamber E; the three-way cock; the draw-off cock b'; and the hose outlet-pipe z, substantially as described.

19. In a water-tower, the combination with the base-pipe B, suitably trunnioned on the vehicle and adapted to be raised vertically, as well as lowered; of the telescopic pipes i and h suitably connected together and to the base-pipe B; the water-chamber E; the rotatable pipe O, suitably held in operative position on the upper platform F and within the water-chamber; nozzle X, flexibly connected to the rotatable pipe O, and means for controlling the motion of the nozzle; the water-tower pipe a'; the three-way cock; the draw-off cock b'; the hose outlet-pipe z; and hose-pipe L, substantially as described.

Toronto, September 29, 1896.

FREDERICK SAYERS HENNING.
WILLIAM PIGOTT.

In presence of—
FREDK. CLARKE,
JOHN G. RIDOUT.