

No. 708,135.

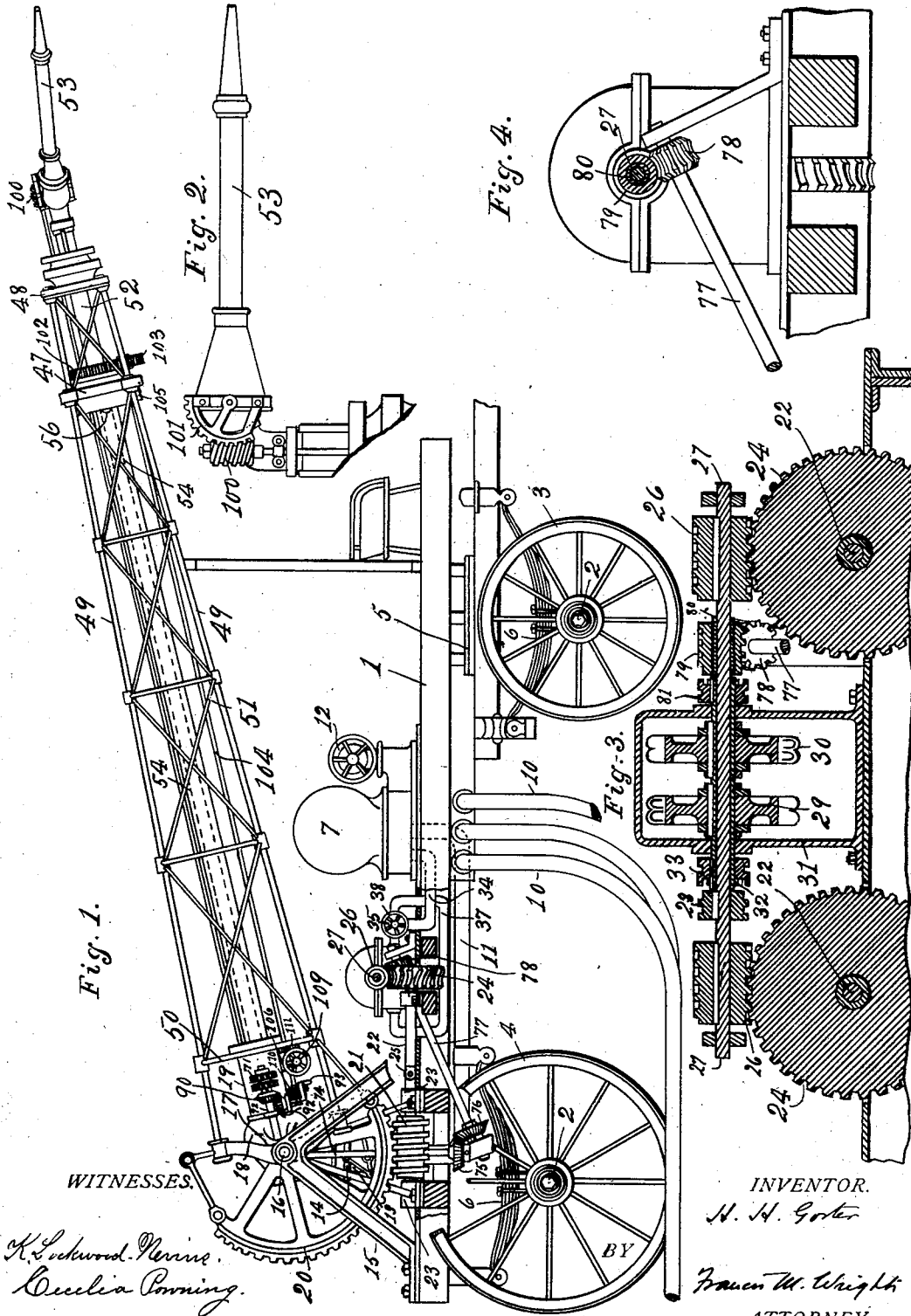
Patented Sept. 2, 1902.

H. H. GORTER.
PORTABLE WATER TOWER.

(Application filed Sept. 9, 1901.)

(No Model.)

5 Sheets—Sheet I.



WITNESSES.

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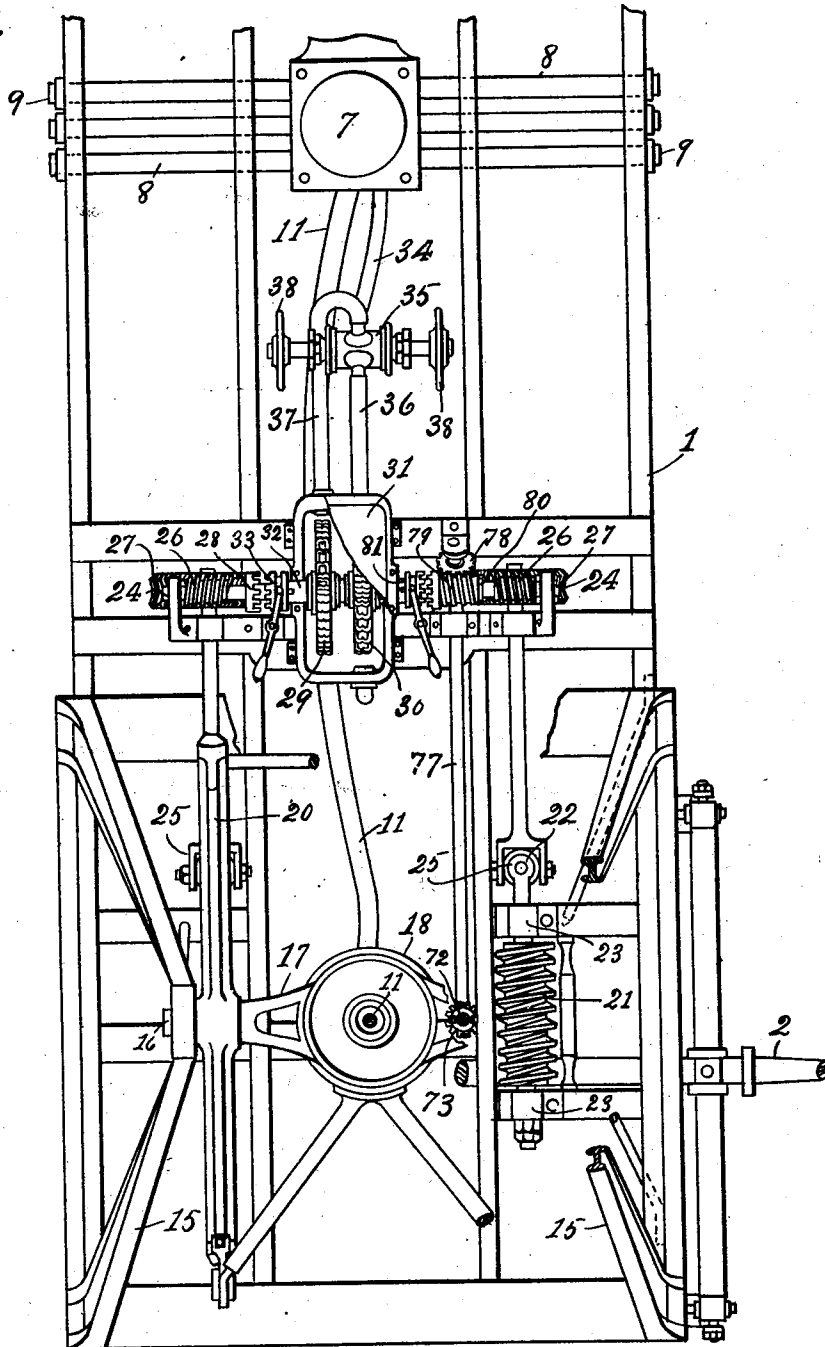
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(No Model.)

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Fig. 5.



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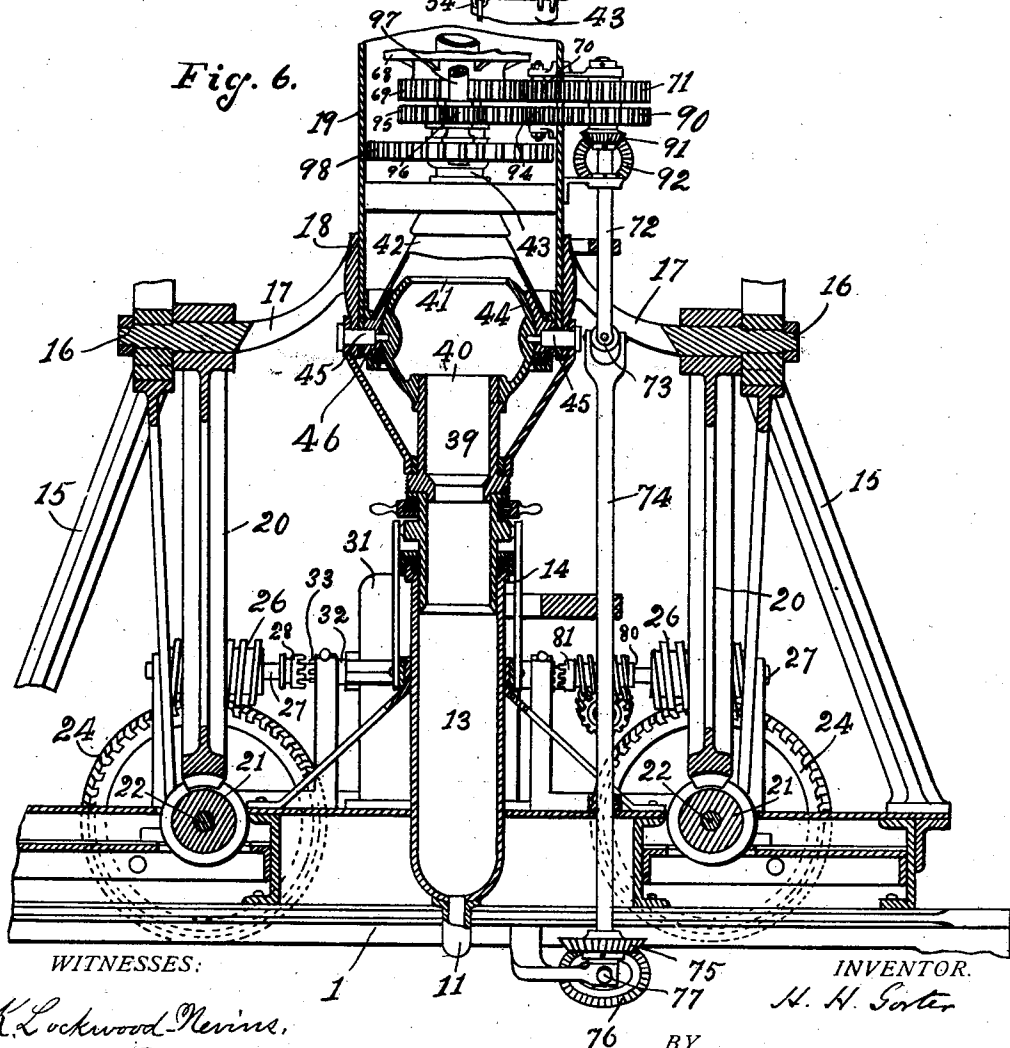
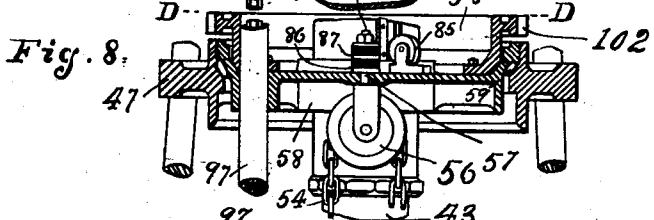
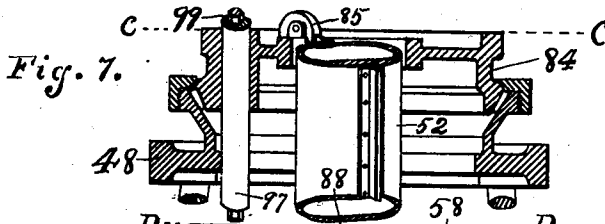
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PORTABLE WATER TOWER.

(Application filed Sept. 9, 1901.)

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5 Sheets—Sheet 3.



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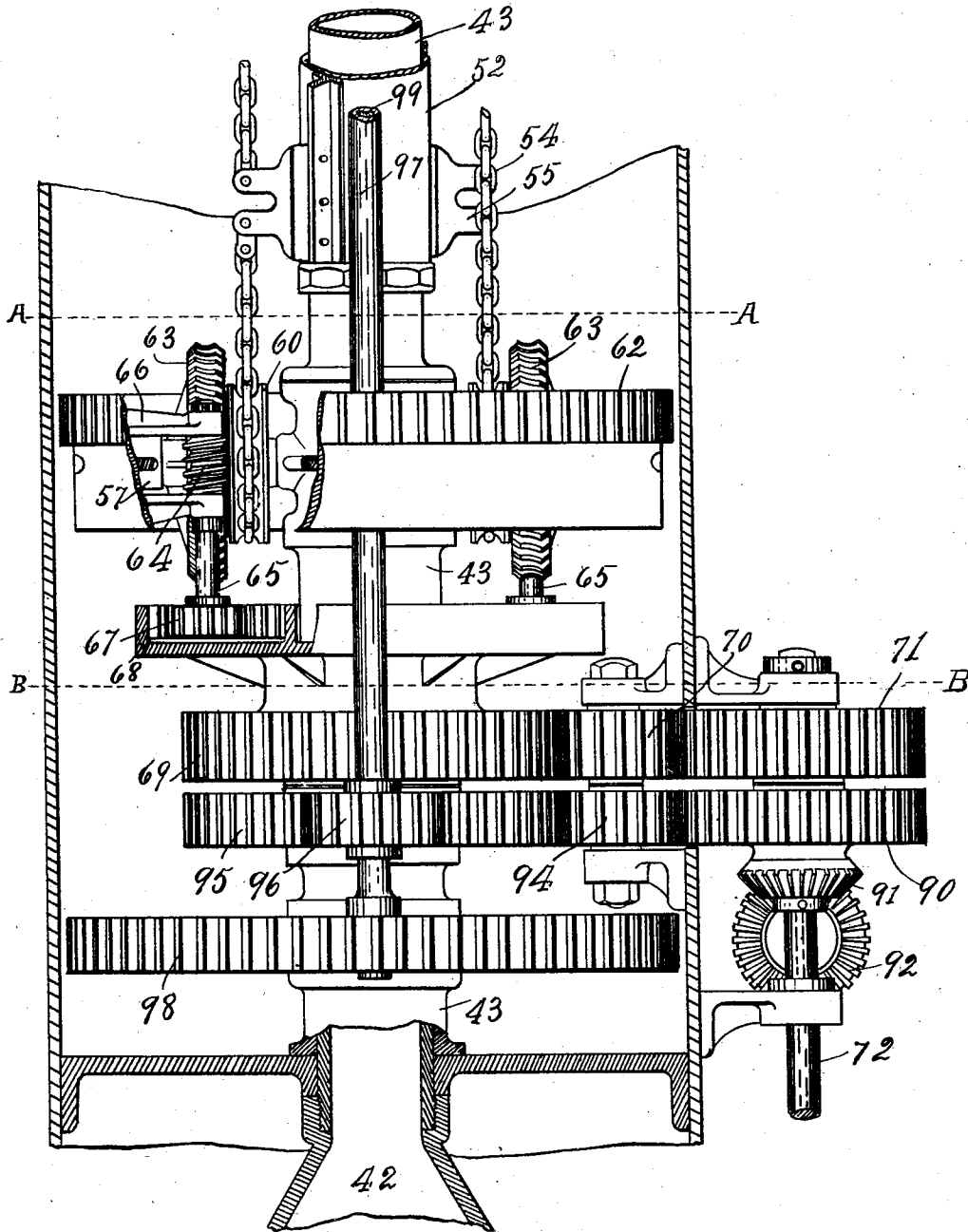
H. H. GORTER.
PORTABLE WATER TOWER.

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(No Model.)

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Fig. 9.



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PORTABLE WATER TOWER.

(Application filed Sept. 9, 1901.)

(No Model.)

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Fig. 10.

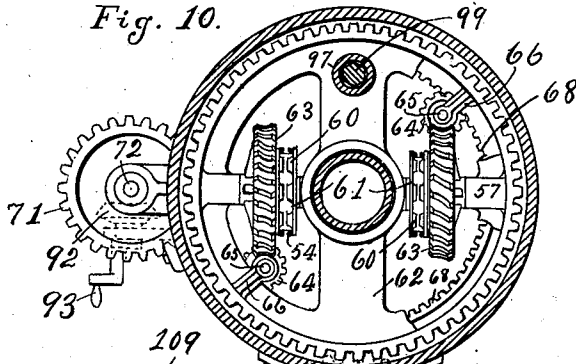


Fig. 12.

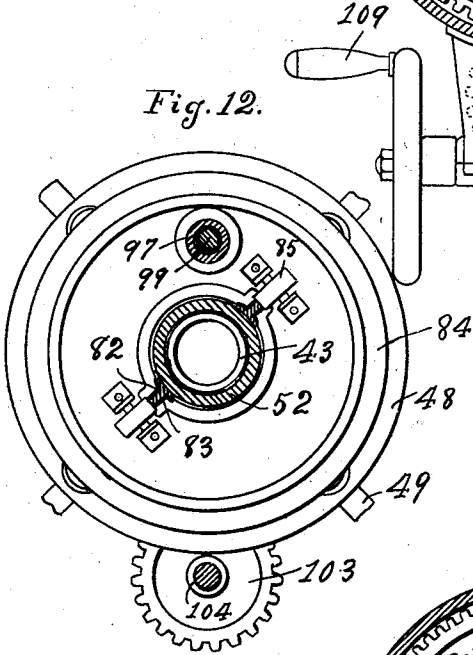


Fig. 13.

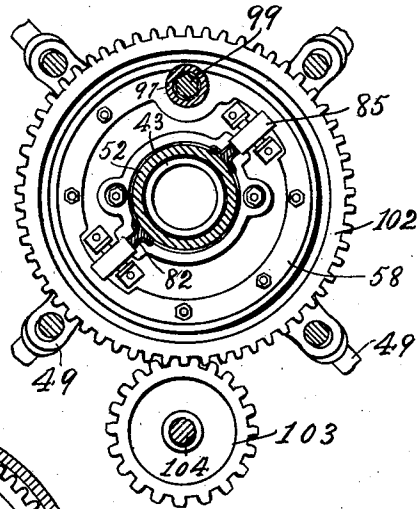
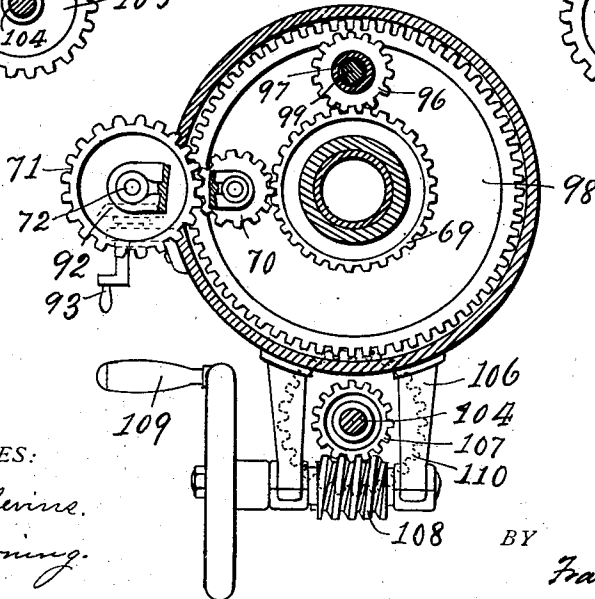


Fig. 11



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UNITED STATES PATENT OFFICE.

HENRY H. GORTER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO MARY E. GORTER, OF SAN FRANCISCO, CALIFORNIA.

PORTABLE WATER-TOWER.

SPECIFICATION forming part of Letters Patent No. 708,135, dated September 2, 1902.

Application filed September 9, 1901. Serial No. 74,758. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. GORTER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Portable Water-Towers, of which the following is a specification.

My invention relates to improvements in portable water-towers such as that invented by me and patented March 13, 1900, No. 645,470.

The object of my invention is to provide improved means for extending the tower or withdrawing the same, said means enabling the mast to be extended from the main tube by means of the force of the pressure-water, which is also used to swing the tower to any desired angle.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the water-tower, certain parts being broken away, shown in sections. Fig. 2 is an enlarged detail view of the nozzle and of the means for tilting the same. Fig. 3 is an enlarged transverse section through the shaft of the water-wheels. Fig. 4 is an enlarged longitudinal section through the oblique shaft for transmitting power from the water-wheel to the vertical shaft for extending the mast. Fig. 5 is a plan view of a portion of the truck, showing the water-pipe connections and the means for elevating and swinging the tower. In this figure the casing of the water-wheel is partly removed and the worm-segment on the right of the figure is also removed. Fig. 6 is a vertical section of the tower-support and its connections. Fig. 7 is a vertical section through the upper ring for supporting the mast. Fig. 8 is a similar section through the lower ring thereof. Fig. 9 is an enlarged elevation, the casing being shown in section, of the lower portion of the main tube and the operative parts adjacent thereto. Fig. 10 is a horizontal section on the line A A of Fig. 9, but on a smaller scale. Fig. 11 is a small section on the line B B of

Fig. 9. Fig. 12 is a section on the line C C of Fig. 7, and Fig. 13 is a section on the line D D of Fig. 8.

Referring to the drawings, 1 represents the truck of my improved water-tower mounted on axles 2, front wheels 3, and rear wheels 4, a fifth-wheel 5 and springs 6 being interposed between the truck and the front wheels 3. Upon the middle portion of the truck is mounted a receiver 7, into which receiver conduits 8 lead from the sides of the truck, said conduits being adapted to be connected at their outer ends 9 with fire-hose 10 from the fire-engines. From said receiver a discharge-pipe 11, controlled by a cock 12, leads to the rear of the truck, being there bent upward into a stand-pipe 13 and terminating in the pipe-coupling section 14.

In suitable standards 15, erected on the frame of the truck at its rear end, are pivoted trunnions 16, at the ends of arms 17, extending from a collar 18, shrunk on the tubular casing 19, said arms carrying the segmental worm-gears 20, driven by worms 21 on shafts 22, extending rearwardly through suitable bearings 23 on the truck, the front ends of the shafts carrying worm-gears 24. In said shafts, near the worms 21, there are interposed flexible couplings 25 to avoid strains on the longshafts 22. The gears 24 are driven by worms 26 on a shaft 27, carrying a clutch member 28. Said worms 26 are made right and left handed, respectively, to avoid longitudinal strain on the shaft 27.

29 30 are two water-wheels inclosed in a casing 31 and mounted on a hollow shaft 32, surrounding the shaft 27. Said shaft 32 carries a clutch member 33, which when suitably moved on said shaft 32 engages the clutch member 28, thereby operating the shaft 27 to actuate the segmental worm-gears 20.

To operate the water-wheels 29 30, a feed-pipe 34 leads from the receiver 7 to a three-way valve 35. The construction of said three-way valve is the same as that described in my patent above referred to. Pipes 36 37 lead from the discharge-openings of the valve 35 to the two sides of the casing and operate the two wheels to drive the shaft 32 in opposite directions. Thus after a connection has been made with any one of the hose from the sev-

oral fire-engines and pressure-water has been supplied to the receiver 7 then by operating the handle 38 of the three-way valve the shaft 32 will be actuated in the desired direction 5 by the pressure of the water from the receiver, and then by means of the worms 26, gears 24, shafts 22, worms 21, and segmental gears 20 the tower proper may be raised from its normal position, as shown in Fig. 1, to a sufficiently vertical position for operation. 10 When in this position, the stand-pipe 13 is connected with a depending pipe 39, carried by the tower and brought by the above operation into a position in line with the stand-pipe 13. 15 The pipes 39 and 13 are then coupled together in the manner fully described in my patent above referred to. The pipe 39 terminates in its upper end in a globular chamber 40, open at the top, as shown at 41, and discharging 20 into the converging mouth 42 of the upwardly-extending pipe 43. The lower end of said pipe 43 at its junction with the mouth 42 is supported within the casing by a ring 44 in the same manner as in my former patent. 25 The globular chamber 40 is mounted on trunnions 45, which are supported in a ring 46 in the lower end of the casing 19, the whole of this construction being the same as that in my former patent. The frame of the tower 30 comprises the lower casing 19, upper rings 47 48, tubular rods 49, connected at their lower ends by bars 50 with the lower casing 19 and converging slightly to the upper rings 47 48, and ties 51, holding said rods together. With- 35 in the frame thus formed are inclosed the main tube or pipe 43 and the hollow mast 52, the latter telescoping over the former and carrying a nozzle 53.

For extending the mast 52 from the main 40 tube 43 there are now provided chains 54, attached to lugs 55, secured upon the lower end of the mast on opposite sides thereof, said chains passing over pulleys 56, secured, as shown at 57, to a ring 58, rotatably mounted, 45 as shown at 59, within and upon the lower one, 47, of the upper rings. Said chains also pass around chain-pulleys 60 on shafts 61, mounted between the hub and circumference of a gear-wheel 62, revolubly secured upon 50 the lower end of the main tube 43. On said shaft 61 and connected with the pulleys 60 are worm-wheels 63, driven by worms 64 on short vertical shafts 65, mounted on bearings 66, extending inwardly from the periphery of 55 the wheel 62. Upon the lower ends of said shafts 65 are mounted pinions 67, driven by an internal gear-wheel 68. Said gear-wheel 68 is in one piece with the gear-wheel 69, driven by the pinion 70, meshing with the 60 gear-wheel 71 on the outside of the casing, and mounted on the vertical shaft 72. Said shaft 72 is connected by a knuckle-joint 73, in line with the pivotal axis of the frame, with the vertical shaft 74, the latter being 65 driven by bevel-gears 75 76, inclined shaft 77, worm-wheel 78 from a worm 79. Said worm

is mounted on a sleeve 80, revolving on the shaft 27, and is adapted to be brought into operative connection with the water-wheel shaft 32 by means of a clutch 81. Thus it 70 will be seen that the water-wheels 29 30 may be employed to tilt the whole frame of the tower by operating the clutch 33 and may also be employed to extend or lower the mast on the main tube by operating the clutch 81. 75 The mast 52 is guided in its telescopic movement by means of fins 82, moving in recesses 83 in the ring 58 and in a ring 84, rotatably mounted in the upper ring 48, and the rings 47 48 carry rollers 85, which abut against said 80 fins 82. The pulleys 56 are resiliently secured to the ring 58, there being provided alternating strips of rubber 86 and metal 87 on the bars 88, which support the pulleys 56 between the ring 58 and the nuts 89. This 85 avoids danger of breaking the chains 54 by permitting the necessary lost motion.

In order to change the inclination of the nozzle to the mast, there is revolubly mounted upon the shaft 72 a gear-wheel 90, driven by 90 miter-gears 91 92, the latter being operated by a handle 93. The gear-wheel 90 drives a pinion 94, which again drives a gear-wheel 95, revolubly mounted on the main tube, thereby operating a pinion 96, mounted upon a hollow 95 shaft 97, the latter being stepped in a wheel 98 and also extending through the wheels 62 and rings 58 and 84. Said hollow shaft has an octagonal bore at its upper end and in said bore carries an extensible rod 99, which 100 rotates with the hollow shaft and has mounted thereon a worm 100, which engages a segmental gear 101, mounted upon the nozzle 53. Thus by rotating the handle 93 the nozzle may be inclined at any angle, and this notwithstanding the extension given to the mast. 105 In order to turn the nozzle in any direction around the axis of the mast, the mast itself is turned by means of a toothed gear 102, formed on the outside of the ring 58, in which 110 the mast slides, said gear being driven by a pinion 103 in the end of a shaft 104, extending the length of the main tube, and mounted in bearings 105 106, secured on the ring 47 and casing 19, respectively, said shaft being 115 driven through a worm-gear 107 thereon by means of a worm 108 and handle 109. In order to avoid strain upon the hollow shaft 97, caused by the rotation of the gear-ring 58, carrying the upper end of said shaft, while 120 the lower end is supported on the wheel 98 and passes through the wheel 62, said wheels 98 62 are formed with external gear-teeth, which are engaged by pinions 110 111 on the shaft 104, and are thus revolved at the same 125 rate as the ring 58.

I claim—

1. In a water-tower, the combination of a truck, a swinging tower thereon, an extensible mast carried thereby, a motor on the truck 130 and an operative connection between said motor and extensible mast to extend the same,

said connection being flexibly jointed on an axis in line with the pivotal axis of the tower, substantially as described.

2. In a water-tower, the combination of a motor-shaft, a worm driven thereby, a shaft having a worm-wheel operated by said worm, a vertical shaft, said shafts having coengaging beveled gears, a swinging tower, a shaft swinging with said tower and connected with the vertical shaft by a knuckle-joint in line with the pivotal axis of the tower, an extensible portion for said tower and means operated by the swinging shaft for actuating said extensible portion, substantially as described.

3. In a water-tower, the combination of a motor, a worm driven thereby, an oblique shaft having a worm-wheel operated by said worm, a vertical shaft, said oblique and vertical shafts having coengaging bevel-gears, a swinging tower, a shaft swinging with said tower and connected to the vertical shaft by a knuckle-joint in line with the pivotal axis of the tower, an extensible portion for said tower, and means operated by the swinging shaft for actuating said extensible portion, substantially as described.

4. In a water-tower, the combination of a truck, a pivoted frame, a main tube carried thereon, a motor on the truck, a shaft driven thereby, a vertical shaft operatively connected with said motor-shaft to be driven thereby, said vertical shaft having a flexible connection substantially in line with the pivotal axis of the frame, a mast extensible from the main tube, and means for extending said mast operated by said vertical shaft, substantially as described.

5. In a water-tower, the combination of a truck, a pivoted frame, a main tube carried thereon, a water-wheel, means for supplying pressure-water to said water-wheel, a vertical shaft operatively connected with said water-wheel shaft to be driven thereby, said vertical shaft having a flexible joint substantially in line with the pivotal axis of the frame, a mast extensible from the main tube, and means for extending said mast, operated by said vertical shaft, substantially as described.

6. In a water-tower, the combination of a truck, a pivoted frame, a main tube carried thereon, a receiver, a conduit and flexible coupling for connecting the receiver with the main tube, means for supplying pressure-water to the receiver from the fire-hose, a water-wheel, a feed or branch pipe from the receiver to the water-wheel to supply pressure-water thereto to operate the same, a vertical shaft operatively connected with said water-wheel shaft to be driven thereby, said vertical shaft having a flexible joint substantially in line with the pivotal axis of the frame, a mast extensible from the main tube, and means for extending said mast operated by said vertical shaft, substantially as described.

7. In a water-tower, the combination of standards, a tower swinging thereon, a trans-

verse shaft, an operative connection from the transverse shaft to the tower to swing the same, an extensible mast carried by said tower, means mounted loosely on the transverse shaft connected operatively to the extensible mast to extend the same, a motor-shaft, and means for connecting said motor-shaft with the transverse shaft and with the means mounted loosely thereon, substantially as described.

8. In a water-tower, the combination of standards, a tower swinging thereon, a transverse shaft, an operative connection from the transverse shaft to the tower to swing the same, a hollow motor-shaft loosely mounted on said transverse shaft, an extensible mast carried by said tower, means mounted loosely on the transverse shaft connected operatively to the extensible mast to extend the same, and clutches on said transverse shaft, arranged to be thrown into engagement with the hollow motor-shaft, one of said clutches connecting said motor-shaft with the transverse shaft to swing the tower, and the other being arranged to engage the means for extending the mast, substantially as described.

9. In a water-tower, the combination of standards, a tower swinging thereon, segmental gears carried by said tower, worms engaging said gears, longitudinal shafts carrying said worms, worm-wheels on said shafts, a transverse shaft having worms engaging said worm-wheels, a motor-shaft mounted loosely on said transverse shaft, an extensible mast carried by said tower, a worm mounted loosely on the transverse shaft, an operative connection from said worm to said extensible mast to extend the same, and clutches on said transverse shaft arranged to be thrown into engagement with the motor-shaft, one of said clutches connecting said motor-shaft with the transverse shaft to swing the tower by means of said segmental gears and the other being arranged to engage the worm to extend the mast, substantially as described.

10. In a water-tower, the combination of a tube, a mast extensible thereon, a casing at the lower end of the tube, a ring at the upper end of the tube rigidly connected with said casing, an internal gear-wheel revoluble about the lower end of said tube, gear-wheels engaged by said internal gear, worms on the gear-wheel shafts, vertical worm-wheels operated by said worms, pulleys attached to said worm-wheels, a ring revoluble in the upper ring, pulleys carried by said revoluble ring, and chains passed around said pulleys and attached to said mast to extend the same, substantially as described.

11. In a water-tower, the combination of a tube, a mast extensible thereon, a casing at the lower end of the tube, a ring at the upper end of the tube rigidly connected with said casing, a ring revoluble in the upper ring, a wheel revoluble about the lower end of the tube, pulleys carried by the ring and chain-pulleys carried by the wheel, chains passed

around said pulleys and attached to the mast to extend the same, and means for revolving the chain-pulleys, substantially as described.

12. In a water-tower, the combination of the tower proper, a pivoted support thereon, a vertical shaft swinging with said tower, means for rotating said shaft, a main tube carried by said tower, a mast extensible thereon, means for extending said mast operatively connected with said swinging shaft, a gear-wheel mounted loosely on said swinging shaft, means for operating said gear-wheel, a nozzle upon the end of said mast, an extensible shaft, and means for supporting the same

parallel with said tube and mast, an operative connection between the upper end of said extensible shaft and the nozzle to swing the same, and an operative connection between said gear-wheel and the lower end of said extensible shaft to rotate the same to swing the nozzle, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY H. GORTER.

Witnesses:

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FRANCIS M. WRIGHT.