

No. 710,069.

Patented Sept. 30, 1902.

W. A. NICKERSON.

FIRE EXTINGUISHING AND LIFE SAVING APPARATUS.

(Application filed July 6, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1

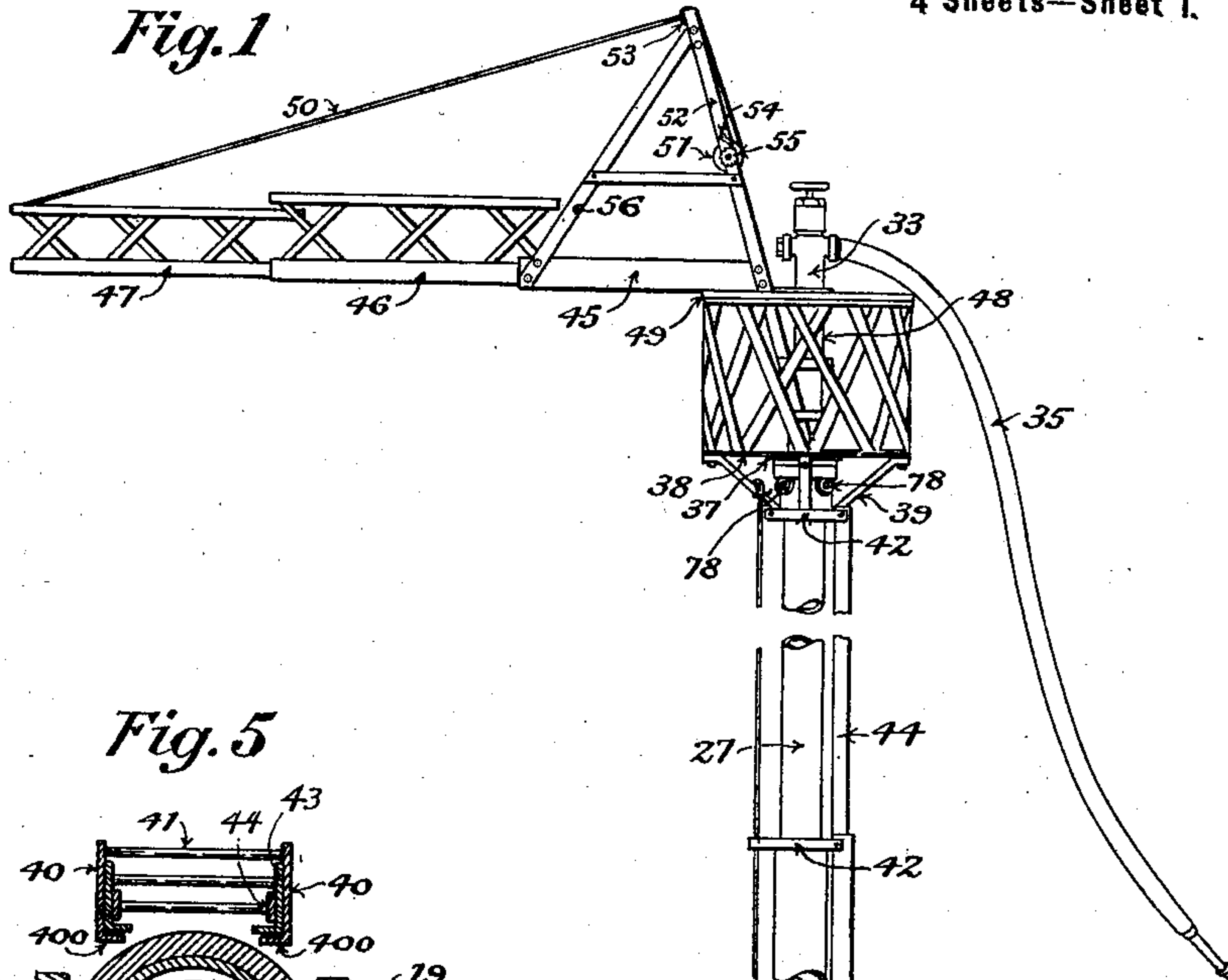
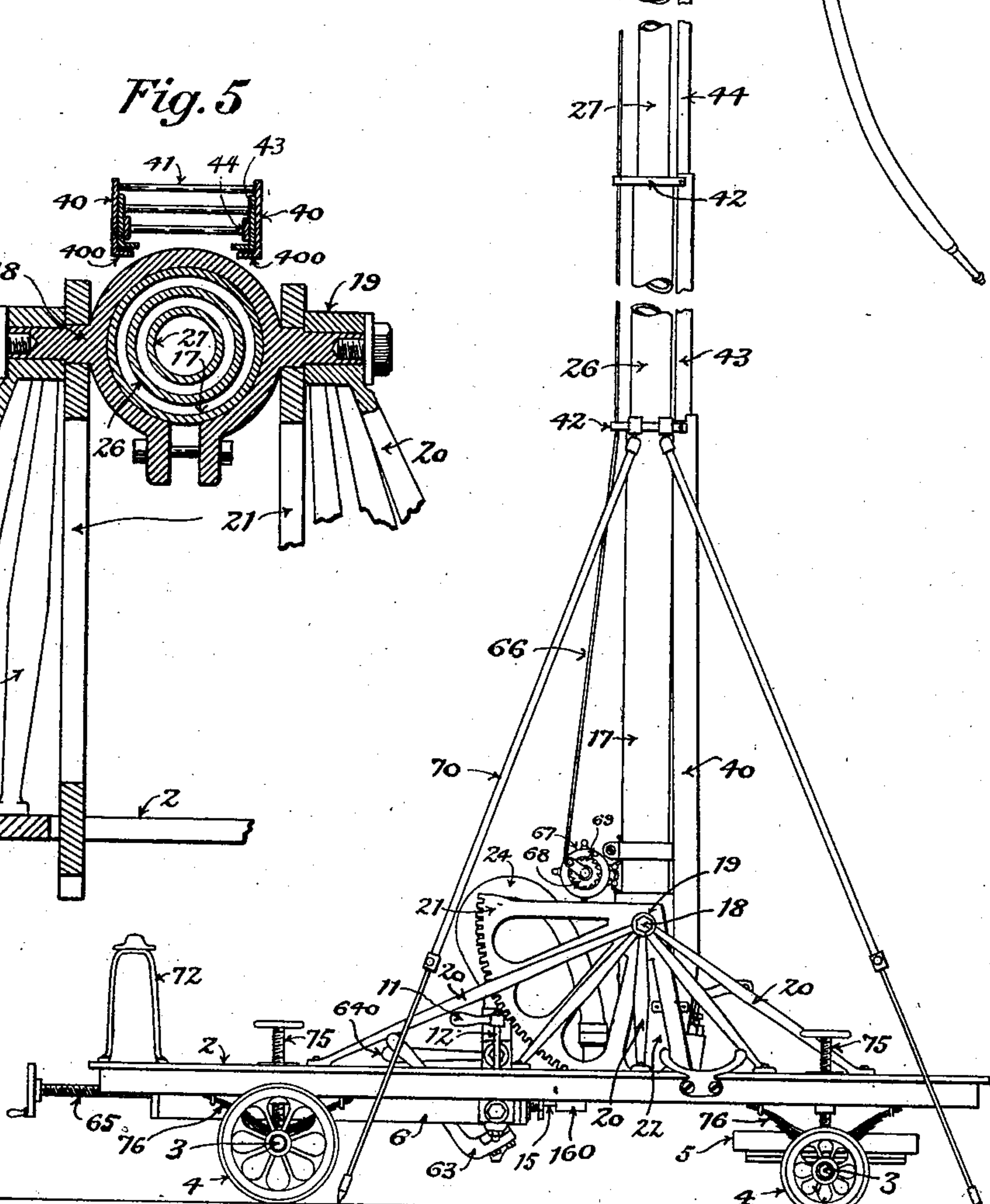
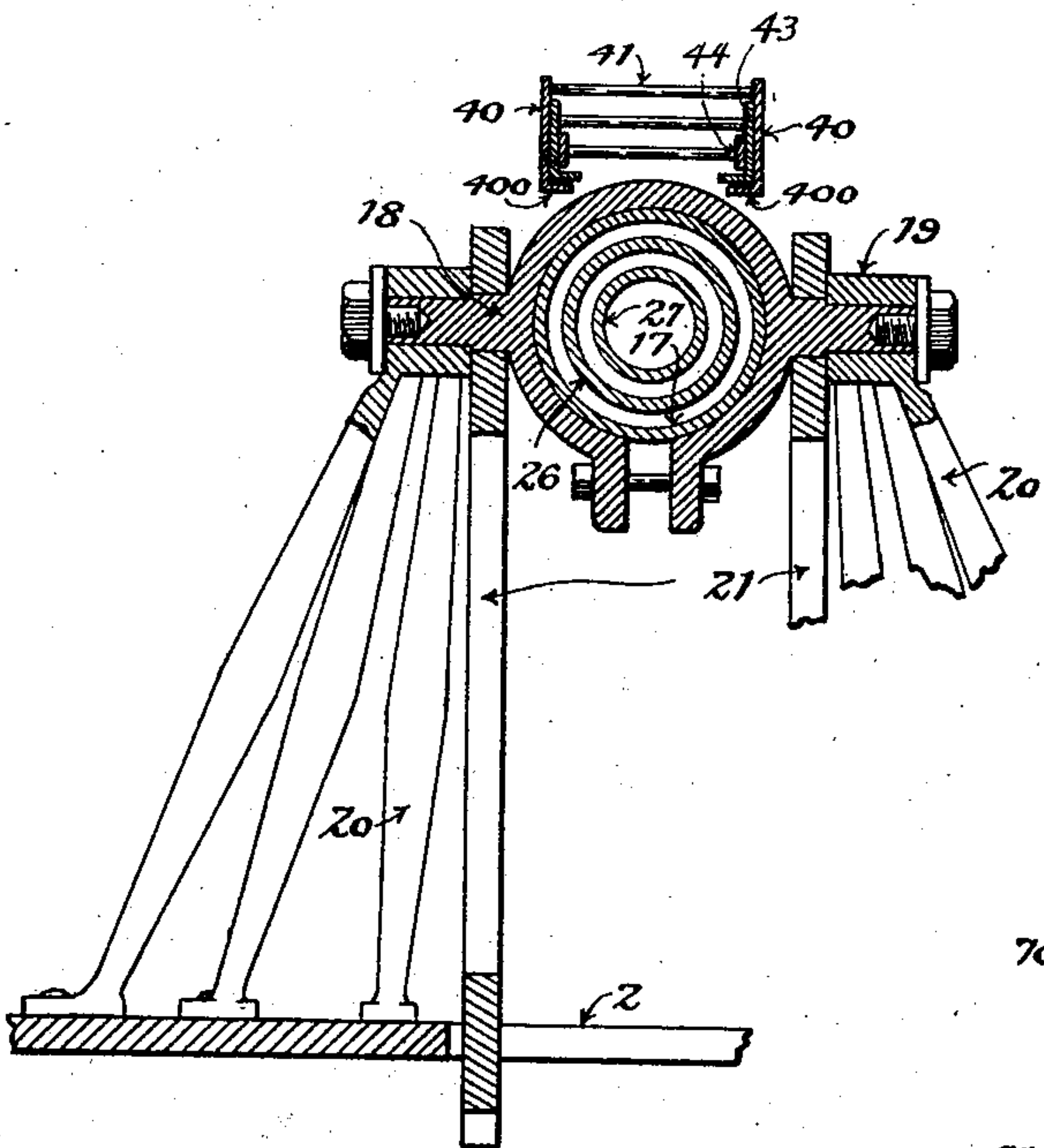


Fig. 5



Witnesses:

Walter E. Lombard
Walter S. Coffin

Inventor:

W. A. Nickerson
by Wright Brown & Quincy
Attys.

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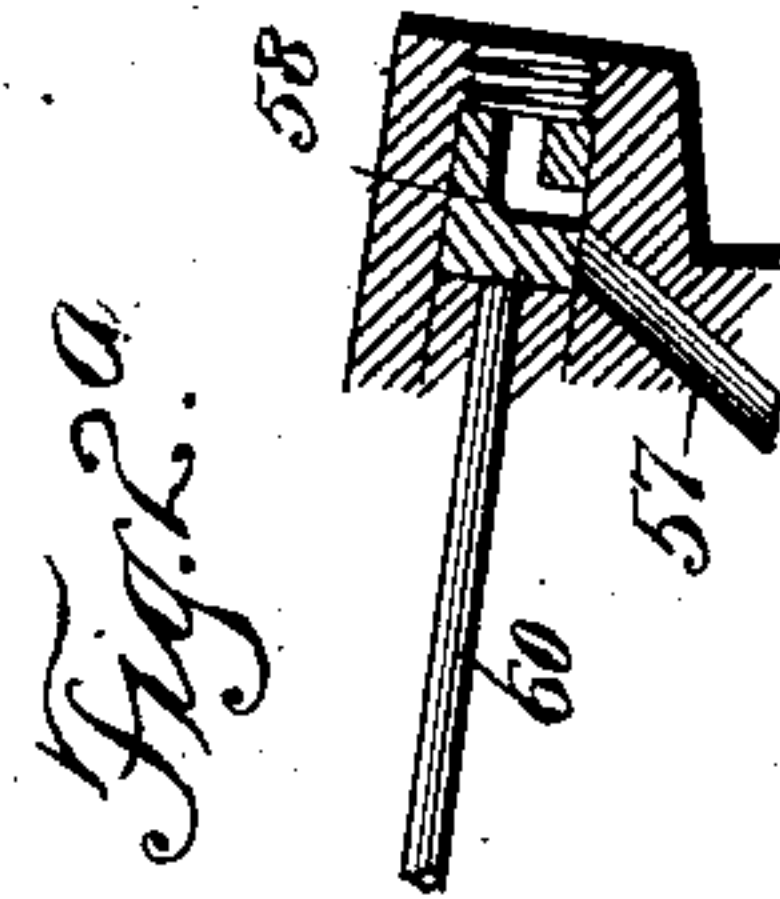
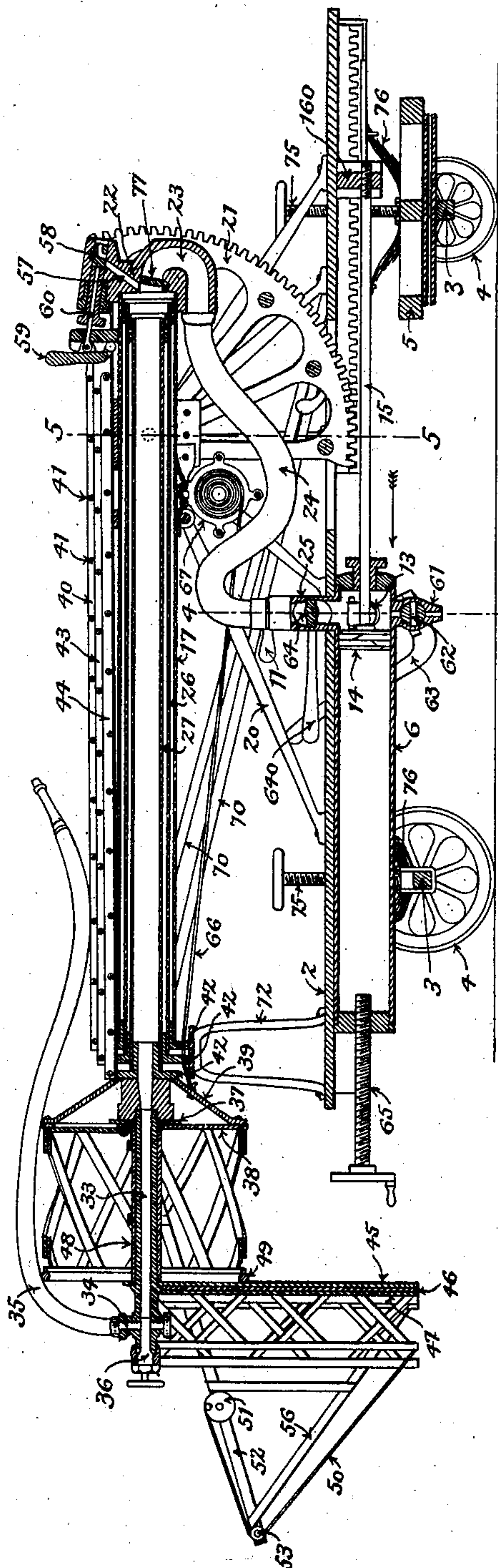
FIRE EXTINGUISHING AND LIFE SAVING APPARATUS.

(Application filed July 6, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 2



Witnesses:

Walter E. Lombard
Walter S. Coffin

Inventor:

W. A. Nickerson

by Wright Brown Quincy

Attys.

No. 710,069.

Patented Sept. 30, 1902.

W. A. NICKERSON.

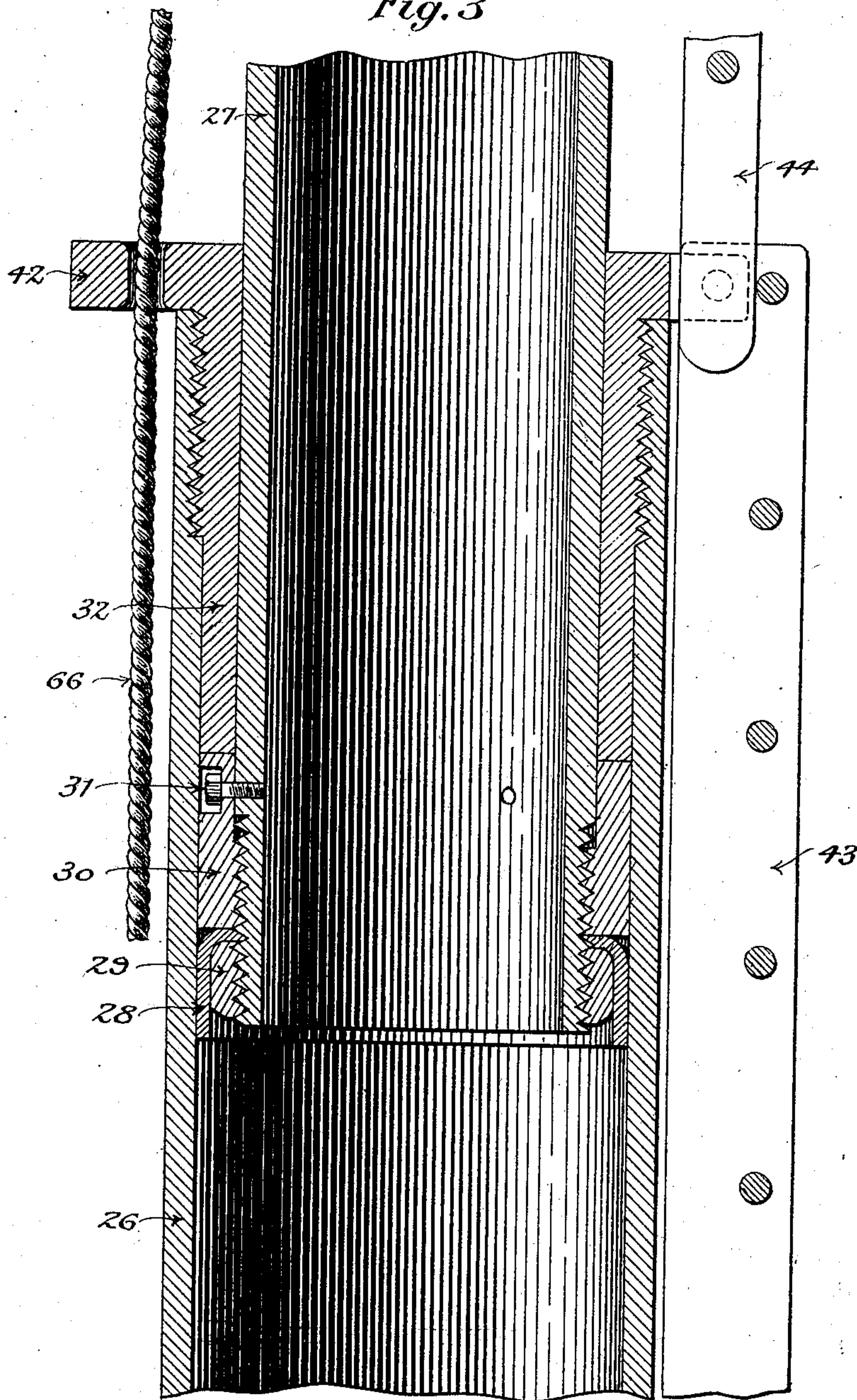
FIRE EXTINGUISHING AND LIFE SAVING APPARATUS.

(Application filed July 6, 1901.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 3



Witnesses:

Walter G. Lombard
Walter S. Coffin

Inventor:

W. A. Nickerson
by *Wright Brown & Quincy*
Attys.

No. 710,069.

Patented Sept. 30, 1902.

W. A. NICKERSON.

FIRE EXTINGUISHING AND LIFE SAVING APPARATUS.

(Application filed July 8, 1901.)

(No Model.)

4 Sheets—Sheet 4.

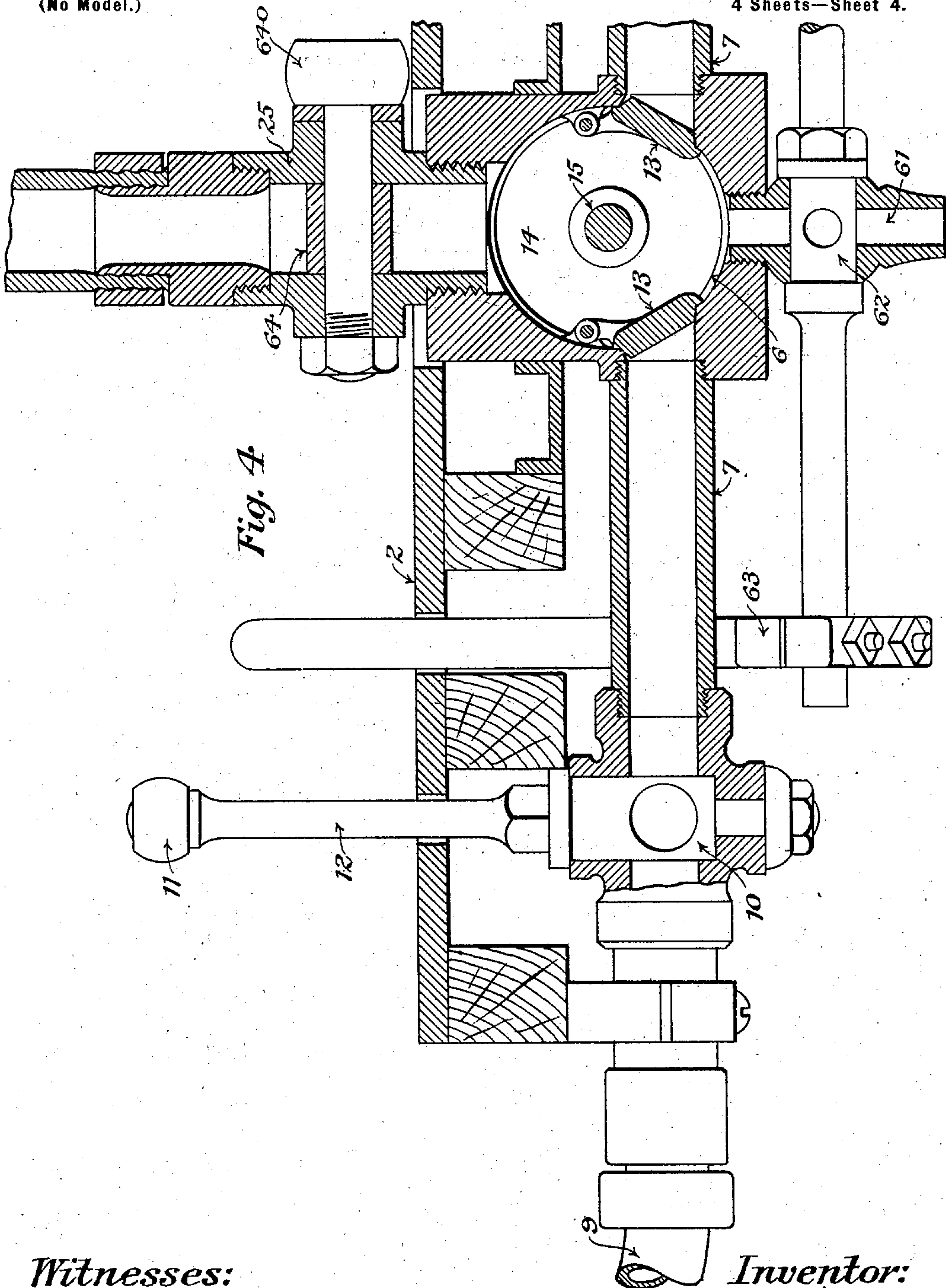


Fig. 4

Witnesses:

Walter E. Lombard
Walter S. Roffin

Inventor:

W. A. Nickerson
by *Night Broom & Quincy*
Attys.

UNITED STATES PATENT OFFICE.

WALTER A. NICKERSON, OF HOULTON, MAINE.

FIRE-EXTINGUISHING AND LIFE-SAVING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 710,069, dated September 30, 1902.

Application filed July 6, 1901. Serial No. 67,363. (No model.)

To all whom it may concern:

Be it known that I, WALTER A. NICKERSON, of Houlton, in the county of Aroostook and State of Maine, have invented certain new and useful Improvements in Fire-Extinguishing and Life-Saving Apparatus, of which the following is a specification.

This invention has for its object to provide a reliable and effective apparatus for extinguishing fires and permitting the escape of persons from burning buildings.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of an apparatus embodying my invention. Fig. 2 represents a longitudinal section of the same, the tower being lowered. Fig. 2^a represents an enlarged detail view of a portion of Fig. 2 and hereinafter more fully referred to. Fig. 3 represents a longitudinal section of a part of the tower. Fig. 4 represents a section on line 4 4 of Fig. 2. Fig. 5 represents a section on line 5 5 of Fig. 2.

The same reference characters indicate the same parts in all the figures.

In the drawings, 2 represents a platform or body having front and rear axles 3 and wheels 4 on said axles, the front axle being pivotally connected with a frame 5, connected with the body, so that the front axle, which is or may be provided with a pole or other means (not shown) for the connection of horses with the machine, may be turned to guide the apparatus. The body may, however, be provided with a motor and with suitable steering mechanism.

6 represents a horizontal cylinder attached to the body 2 and extending lengthwise thereof. One end of the cylinder is located near the center of length of the body and is provided with two supply-pipes 7 7, which extend laterally to the opposite sides of the body, each pipe being provided at its outer end with a coupling member adapted to be connected with a flexible pipe or hose 9, which in turn is adapted to be connected with a street-hydrant or with a fire-engine. The two supply-pipes 7 7 are to be used interchangeably, one supply-pipe being used when the hydrant or

source of supply is at one side of the machine and the other supply-pipe when the hydrant is at the opposite side, or both pipes may be used simultaneously and connected with two sources of supply. Each supply-pipe is provided with a valve 10, operated by a handle 11 on a stem 12, projecting above the body 2, whereby the pipe may be opened or closed. Within the cylinder are two inwardly-opening check-valves 13 13. When water is entering the cylinder through one of the supply-pipes, the check-valve 13 connected therewith yields to admit water to the cylinder, and the check-valve connected with the other cylinder is closed by the water-pressure in the cylinder.

14 represents a piston adapted to be moved from the inner toward the outer end of the cylinder by water admitted through one or both of the supply-pipes, the piston having a rod 15, to which is affixed a cross-head 16. Two parallel racks 16 are affixed to the cross-head, said cross-head and racks being movable lengthwise of the body 2 on suitable guides. The racks may have pin-teeth separated by openings to permit falling debris to pass through the racks without clogging the same.

17 represents the tubular base-section of a telescopic tower, which section is provided near one end with trunnions 18 18, which are journaled in bearings 19 19, elevated above the body and rigidly supported by suitable brackets affixed to the body, said brackets being here shown as composed of brace-rods 20, affixed to the bearings and bolted at their lower ends to the body. To the base-section 17 are affixed two gear-segments 21, which project through the body 2 and are engaged with the racks 16, the teeth of the segments 21 being concentric with the trunnions 18. To the lower end of the base-section 17 is affixed an end piece or casting 22, having a U-shaped passage 23, one end of which opens into the interior of said base-section, its other end being connected by a flexible pipe 24 with an outlet pipe or branch 25, communicating with the cylinder 6, said outlet-pipe being at the receiving end of the cylinder and in close proximity to the supply-pipes 7. The outlet-pipe 25 has a valve 64, operated by a handle or lever 640.

The above-mentioned telescopic tower comprises, in addition to the tubular base-section 17, a series of sliding sections 26 27, of which there may be any desired number, two being shown in the present embodiment of my invention. These will be referred to as the "intermediate" section 26 and the "end" section 27, the intermediate section having a sliding fit in the base-section, while the end section has a sliding fit in the intermediate section. The lower end of each sliding section has a flexible cup-washer 28, clamped between two collars 29 30, affixed to the sliding section, said collars being internally screw-threaded and engaged with an external thread on the sliding section. The upper collar is additionally secured by screws 31, the heads of which occupy countersunk recesses in the outer surface of the upper collar. Both the base-section and the intermediate section have a stop-sleeve 32, screwed into its inner end, said sleeve arresting the collar 30 when the section to which said collar is affixed has reached its full height. Water under pressure admitted to the base-section acts on the lower ends of the sliding sections and on the cup-washers to project the sliding sections from the base-section.

On the outer end of the upper section is mounted a hydrant 33, which constitutes an extension of said upper section and has an outlet 34, to which a water-delivering hose 35 is attached, the hydrant having a suitable valve 36, whereby the passage leading to the hose may be opened or closed. The base portion of the hydrant is enlarged to form a shoulder 37, on which rests a circular platform 38, which is additionally supported by braces 39 and is adapted to support one or more persons at the top of the tower when the latter is raised, as shown in Fig. 1.

To the base-section is attached a base ladder-section composed of side bars 40 and rungs 41. The upper ends of the side bars 40 are attached to a collar 42, affixed to the base-section. To flanges 42 42 on the upper ends of the intermediate and upper sections are attached the side bars of intermediate and end ladder-sections 43 44. The side bars of the intermediate ladder-section are narrower than the side bars of the base ladder-section, and located between the latter and between its rungs and the tower, so that the intermediate ladder-section is guided by the side bars and rungs of the base-section. The side bars of the top ladder-section are in turn narrower than the side bars of the intermediate ladder-section and are located between the side bars and within the line of rungs of the intermediate ladder-section, so that the top section is guided by the intermediate section. The base ladder-section, which is secured to the base tower-section at both ends, therefore confines and guides the other two sections when the tower is being raised and lowered, said sliding sections being attached to the corresponding tower-sections only at

their upper ends, the top ladder-section being guided and confined by the intermediate ladder-section when the tower is extended sufficiently to withdraw the top section from the base-section. The side bars of the base and intermediate ladder-sections are made of angle-pieces, each of said side bars therefore having an inwardly-projecting flange 400, the flanges on the base-section constituting inner guides for the side bars of the intermediate section, while the flanges on the intermediate section constitute inner guides for the side bars of the top section, the latter requiring no flanges.

45 represents the inner section of a telescopic platform which comprises sliding sections 46 47, adapted to be nested or closed on the section 45, as shown in Fig. 2, or extended, as shown in Fig. 1. The inner end of the platform-section 45 has a sleeve 48, which encircles the hydrant 33 and is adapted to turn horizontally thereon to permit the telescopic platform to project in any desired direction from the tower, the inner section 45 resting upon and being in sliding contact with a horizontal railing 49, surrounding the circular platform 38. The telescopic platform may therefore be pointed in any desired direction and extended from the tower, as shown in Fig. 1, and when so extended enables the firemen and other persons to stand at a considerable distance from the tower and to walk therefrom to a window or roof or from such window or roof to the tower. When the platform is extended, its outer end is supported by a guy-rope 50, attached to a drum 51, journaled between inclined standards 52, attached to the inner section 45 and sleeve 48, the rope 50 extending from said drum over a pulley 53 between the upper ends of said standards and from thence to the outer end of the section 47. The drum 51 is locked by a pawl 54 and ratchet 55 when the platform is extended. When the platform is contracted, the surplus portion of the guy-rope is wound on the drum. Braces 56 additionally support the standards 52, said standards and braces constituting a guy-rope-supporting frame.

An outlet 57 is provided at the lower end of the base-section of the tower to release water therefrom when it is desired to lower the tower wholly or in part, said outlet having a valve 58, operated by a pivoted lever 59, connected with stem 60 of the valve. The valve 58 or the casing in which it moves may be formed for connection with a hose through which the water escaping from the tower may be conducted for fire-extinguishing or other purposes. The said connection of a hose with the casing may be provided for by internally screw-threading the outlet of the passage which contains the valve 58, as indicated in Fig. 2^a. An outlet 61 is provided to release water from the cylinder 6 when it is desired to lower the tower wholly or in part, said outlet having a valve 62 operated by a lever or handle 63.

Operation: The tower and cylinder being empty and the tower contracted and placed horizontally, as shown in Fig. 2, water is first admitted to the cylinder through one or both of the supply-pipes. The valve 64 in the conduit connecting the cylinder with the tower is at this time closed, so that the water acts only in the cylinder, moving the piston and racks in the direction indicated by the arrow in Fig. 2, and thus causing the racks to move the segments 21 and the tower to a vertical position, as shown in Fig. 1. A movable stop consisting of a screw-threaded rod 65 is engaged with the outer head of the cylinder and can be adjusted to arrest the outward movement of the piston at any desired point, so that if the apparatus is standing on a sloping surface with one end higher than the other the upward movement of the tower may be arrested when the tower is in a vertical position, whatever may be its angle with the body 2. It is obvious that the stop 65 may be arranged to abut against the cross-head 160 or any other part moving with the piston instead of being located within the cylinder. The valve 64 is then opened, and the water is permitted to flow through the pipe 24 to the tower and fill and extend the sections thereof, the sliding sections being extended to the limit provided by the stop-sleeves 32, or, if desired, the extension of the tower may be limited by a rope 66, extending from a reel 67, journaled in bearings on the base-section and attached to the upper tower-section. The reel may be locked by a pawl 68 and ratchet 69 when the tower has been extended to the desired height, thus causing the rope to prevent further extension of the tower, provision being thus made for locating the platform and hydrant at any desired height within the limit of the extensibility of the tower. The ladder is of course extended with the tower and enables the firemen to readily reach the platform and hydrant and also enables persons to descend from a burning building.

The capacity of the outlet from the hydrant is less than that of the inlet to the tower, so that the pressure in the tower keeps the latter extended when the apparatus is in use. The tower is supported laterally by braces 70, jointed at their upper ends to the base-section of the tower, their lower ends engaging the street-surface. These braces are preferably telescopic, so that they can be lengthened and shortened. The braces may also serve as stops to prevent the apparatus from running down on an inclined surface. When the tower is to be contracted and restored to a horizontal position, the water is shut off from the supply-pipe, and the outlet-valve in the base-section 58 is opened until the water escapes from the tower and allows the sliding sections thereof to descend by gravitation. The outlet-valve 62 of the cylinder is then opened, and as the water escapes from the cylinder the tower swings downwardly until

it reaches a horizontal position, its outer portion bearing on a rest 72 on the body 2. It will be seen that after coupling the supply-pipe 7 to a street-hydrant or other source of supply and opening the communication between the latter and the cylinder only a single operation is required to elevate the tower to a position for use—namely, to open the valve 64 in the conduit connecting the cylinder with the tower, this being done after the tower has been swung to a vertical position. Hence the apparatus may be very quickly made operative. The body 2 may be made rigid on the axles and may be leveled when standing on a sloping surface by means of screws 75, engaged with the body 2, the lower ends of said screws bearing on the axles when they are adjusted downwardly. When the screws are raised, they permit the springs 76 to yieldingly support the body. 77 represents a gravity check-valve located in the passage 23 at the base of the tower, said valve being adapted to be closed by pressure of water in the tower, so that in case the flexible pipe 24 should burst the valve 77 would close and prevent the escape of water from the tower.

The tower when extended may be additionally supported laterally by guy-ropes attached to eyes 78, affixed to the top section and secured to any convenient fixed supports.

I claim—

1. An apparatus of the character referred to, comprising a body, a telescopic water-tower pivotally connected with the body, a fixed cylinder attached to the body, a supply-pipe entering the inner end portion of the cylinder and adapted for connection with a source of water-supply, a conduit having a flexible portion connecting the inner end portion of the cylinder with the tower, a piston in the cylinder and having its rod provided with a cross-head, gearing connecting the piston with the tower, said gearing comprising racks attached to said cross-head and gear-segments connected with said tower, and a valve in the said conduit between the cylinder, and tower, whereby water admitted to the cylinder at the said inner end thereof may be first confined therein and caused to swing the tower upwardly, and may then be admitted to the tower to extend the latter.

2. An apparatus of the character referred to, comprising a vehicle-body, a fixed cylinder thereon having duplicate supply-pipes entering its inner end portion from opposite sides, automatic outwardly-closing check-valves at the inner ends of said pipes, whereby when either pipe is in use the other is kept closed by the liquid-pressure in the cylinder, a piston in the cylinder, a swinging tower having direct fluid connection with the said inner portion of the cylinder, and mechanical connections between the piston and tower, said connections comprising a cross-head and racks connected with the piston-rod and gear-segments connected with the tower.

3. An apparatus of the character referred to, comprising a fixed cylinder having a supply-pipe entering its inner end portion, a swinging tower, direct liquid connections between the inner end portion of the cylinder and the tower, a piston in the cylinder, a piston-rod passing out from the inner end of the cylinder, mechanical connections between the piston-rod and the tower, said connections comprising a cross-head and racks connected with the piston-rod and gear-segments connected with the tower, and a valved outlet at the inner end portion of the cylinder.

4. An apparatus of the character referred to, comprising a cylinder having a supply-pipe entering its inner end portion, a swinging tower, liquid connections between the inner end portion of the cylinder and the tower, a piston in the cylinder, mechanical connections between the piston and the tower, and an adjustable rigid stop located in the path of movement of the liquid-impeled mechanism whereby the movement of the piston and the tower-raising parts connected therewith may be arrested at any desired point.

5. An apparatus of the character referred to, comprising a fixed cylinder having a supply-pipe entering its inner end portion, a swinging tower, direct liquid connections between the inner end portion of the cylinder and the tower, a piston in the cylinder, a piston-rod passing out from the inner end of the cylinder, mechanical connections between the piston-rod and the tower, said connections comprising a cross-head and racks connected with the piston-rod and gear-segments connected with the tower and a valved outlet at the lower portion of the tower.

6. In an apparatus of the character referred to, a water-tower comprising an oscillating base-section secured against longitudinal movement, a sliding intermediate section within the base-section, a sliding end section within the intermediate section, and a telescopic ladder composed of a base-section attached at both ends to the base-section of the tower, and intermediate and end sections attached at their upper ends to the upper ends of

the intermediate and top sections of the tower respectively, the intermediate section being narrower than and guided and confined between the side bars and rungs of the base-section, while the top section is narrower than and guided between the side bars and rungs of the intermediate section, the side bars of the base and intermediate sections of the ladder being made of angle-pieces having a uniform shape in cross-section to form tracks or guides for the next narrower section.

7. An apparatus of the character referred to, comprising a telescopic water-tower, a hydrant on the top section of the tower, a sleeve or collar surrounding the hydrant, a platform affixed to the said top section, a railing around said platform, a telescopic platform the inner section of which is secured to and partially supported by said sleeve or collar, and is additionally supported by said railing.

8. An apparatus of the character referred to, comprising a telescopic water-tower, a hydrant on the top section of the tower, a sleeve or collar surrounding the hydrant, a platform affixed to the said top section, a railing around said platform, a telescopic platform the inner section of which is secured to and partially supported by said sleeve or collar, and is additionally supported by said railing, a guy-rope-supporting frame affixed to said inner section, and a guy-rope adjustably secured to said frame and connected with the outer section of the telescopic platform.

9. A water-tower section having a cup-washer at its lower portion, clamping collars engaged with the flange of said washer, one collar being above and the other below said flange, and screws securing the upper collar, the heads of said screws being countersunk in the said upper collar whereby the screws may be prevented from removal by the inner wall of another section.

In testimony whereof I have affixed my signature in presence of two witnesses.

WALTER A. NICKERSON.

Witnesses:

C. F. BROWN,
E. BATCHELDER.