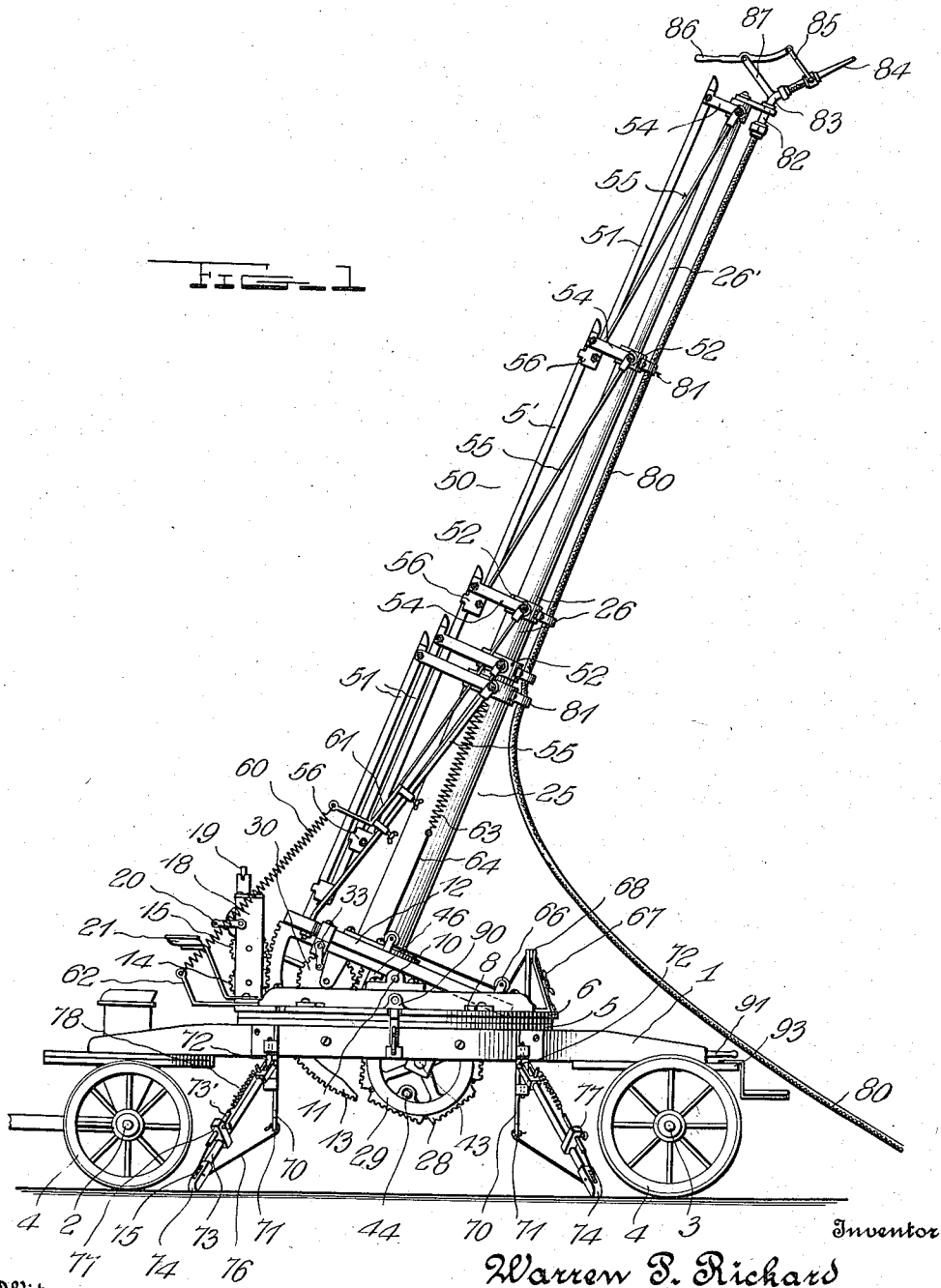


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 FIRE FIGHTING APPARATUS.  
 APPLICATION FILED DEC. 7, 1914.

1,155,958.

Patented Oct. 5, 1915.  
 5 SHEETS—SHEET 1.



Witnesses  
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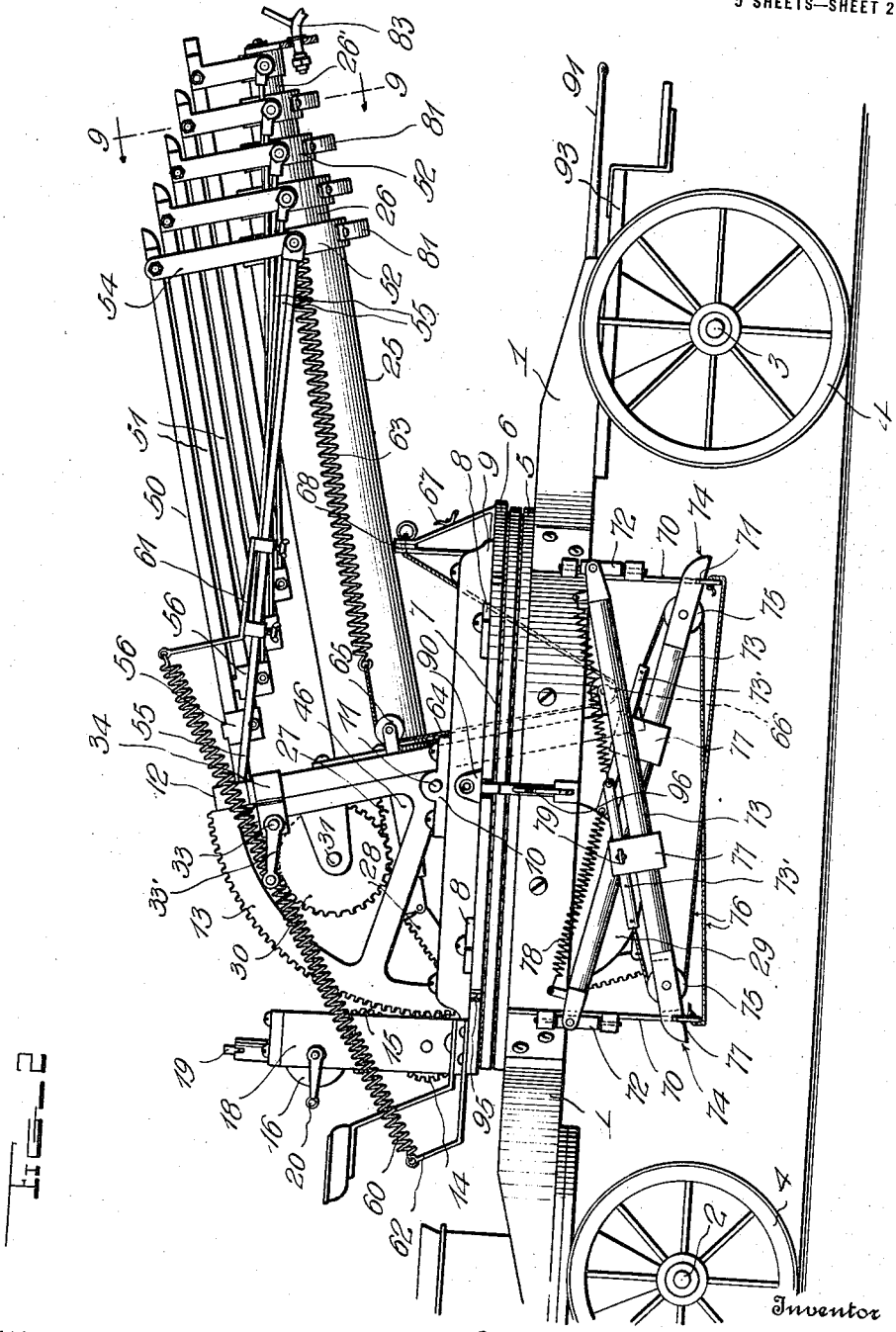


FIG. 2

Witnesses  
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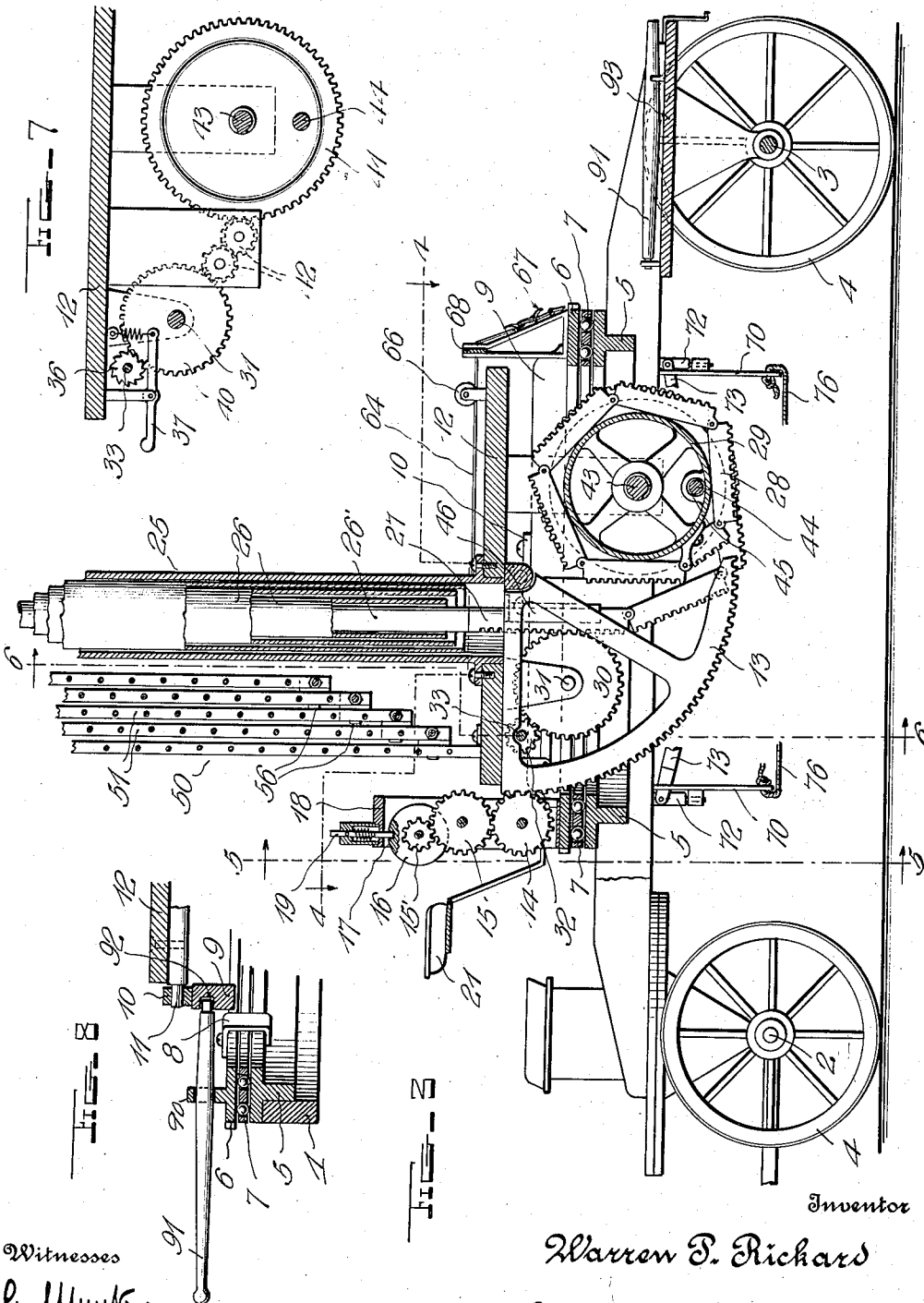
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5 SHEETS—SHEET 3.



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Witnesses

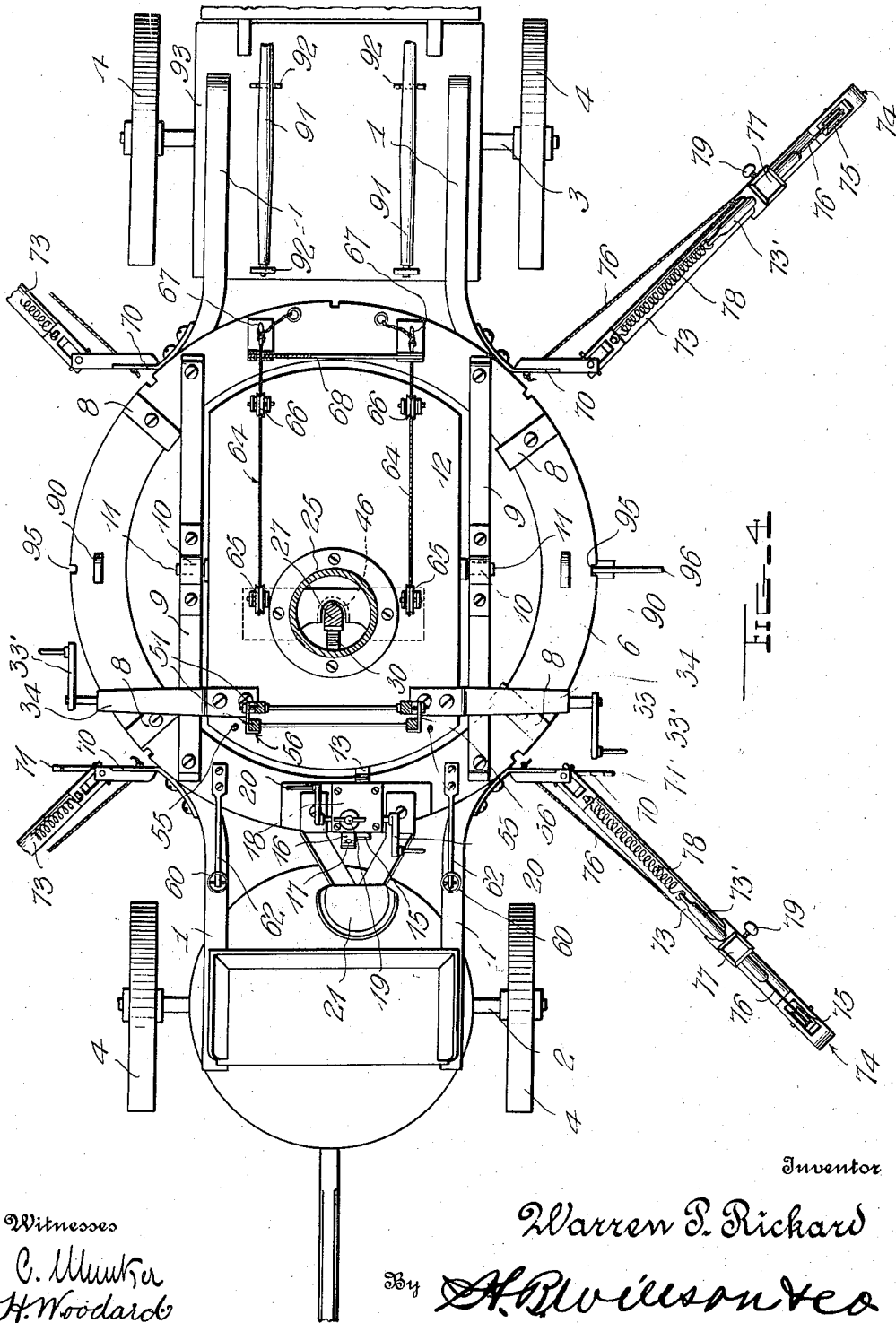
E. Munster  
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5 SHEETS—SHEET 4.



Witnesses  
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 H. Woodard

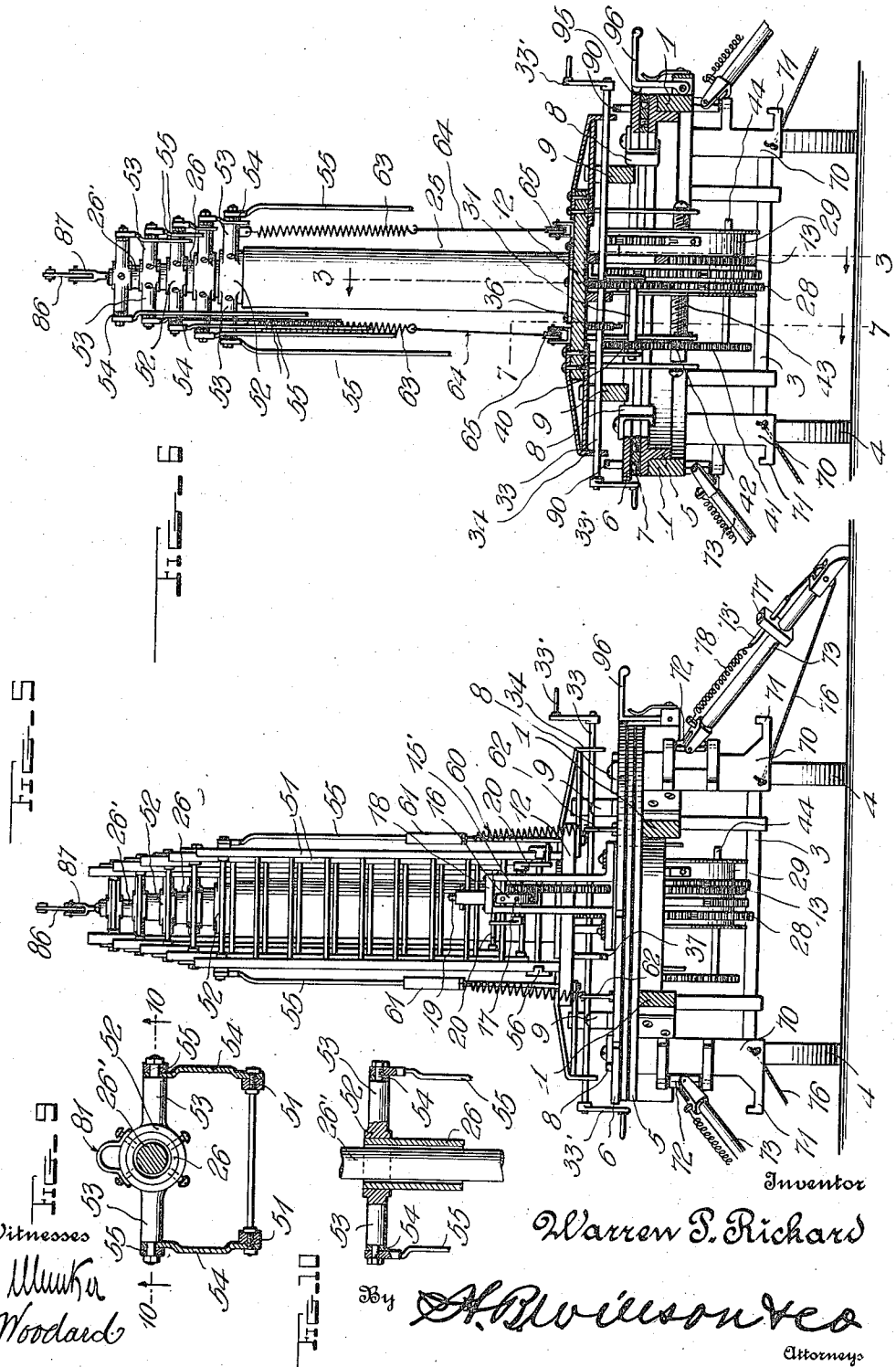
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5 SHEETS—SHEET 5.



# UNITED STATES PATENT OFFICE.

WARREN P. RICKARD, OF PLYMOUTH, MASSACHUSETTS.

## FIRE-FIGHTING APPARATUS.

1,155,958.

Specification of Letters Patent.

Patented Oct. 5, 1915.

Application filed December 7, 1914. Serial No. 875,889.

*To all whom it may concern:*

Be it known that I, WARREN P. RICKARD, a citizen of the United States, residing at Plymouth, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Fire-Fighting Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in fire fighting apparatus and more particularly to what may well be termed a water tower.

The object of the invention is to improve upon the construction shown in the patent issued July 12, 1881, to L. D. B. Shaw, and bearing No. 244,323. In carrying out this object, I employ a number of novel features of construction and combination hereinafter described and claimed and shown in the drawings wherein:—

Figure 1 is a side elevation of a machine constructed in accordance with my invention, showing the vertically adjustable ladder partially extended and also showing the same tilted; Fig. 2 is a view similar to Fig. 1 with the ladder contracted and in position to be transported; Fig. 3 is a vertical longitudinal section taken substantially on the line 3—3 of Fig. 6; Fig. 4 is a horizontal section as seen on the line 4—4 of Fig. 3; Figs. 5 and 6 are vertical transverse sections as seen respectively on the lines 5—5 and 6—6 of Fig. 3; Fig. 7 is a detail vertical longitudinal section taken substantially on the line 7—7 of Fig. 6; Fig. 8 is a detail vertical transverse section through a portion of the truck, the turn table mounted thereon, and the platform which is mounted to tilt on said turn table, showing more particularly the application of one of a number of levers which may be employed for rotating the table; Fig. 9 is a detail section as seen on the line 9—9 of Fig. 2; and Fig. 10 is a similar view taken on the line 10—10 of Fig. 9.

In these drawings, constituting a part of the present application, the numerals designate a pair of longitudinal side bars whose

front and rear ends are supported respectively by front and rear axles 2 and 3, these axles having any appropriate type of wheels 4. The central portions of the side bars 1 are bulged laterally outward to provide supports for a fixed bearing ring 5 which is here shown as T-shaped in cross section and as having its outermost horizontal flange overlying the bars 1, while its upright flange contacts with the inner sides thereof.

Positioned above the ring 5, is a movable bearing ring 6 while a number of ball bearings 7 are interposed between the two rings, these bearings being held against dislocation by suitable means (see more particularly Fig. 8). With the parts in this position, a number of C-shaped clips 8 are secured to the upper ring and extend downwardly within the two rings and beneath the inner flange of the ring 5, whereby the movable ring may rotate upon the fixed ring but may not move vertically in respect thereto.

Extending transversely across the movable ring 6 at suitably spaced intervals, is a pair of supporting sills 9, these sills carrying bearings 10 at their centers, and said bearings revolubly receiving stub shafts 11 which project laterally from a tilting platform 12 which is spaced between said sills 9 as seen in the various figures of the drawings. As shown in Fig. 3, this platform 12 is also spaced slightly above these sills.

Depending from the forward end of the tilting platform 12, is a gear segment 13 with which a driven gear 14 meshes, the gear 14 being in turn driven by an intermediate gear 15 which meshes with a driven pinion 15', the latter being here shown as formed integrally with one side of a wheel 16 whose periphery is provided with a number of recesses or sockets 17 (see more particularly Fig. 3). These various gears and the wheel 16 are revolubly mounted upon transverse shafts and are located between the arms of an arched supporting bracket 18 which rises from the movable ring 6, and the recesses 17 in the periphery of the wheel 16 coact with a spring projected bolt 19, which bolt may be raised and locked in raised position by any suitable means. When said bolt is raised, the pinion 15 is rotated by a pair of

cranks 20 to drive the gear 14 in such a manner as to tilt the platform 12 in the desired direction.

For the purpose of manipulating the cranks 20 to make the above set forth adjustments, a seat 21 is preferably located adjacent the bracket 18 and is supported by suitable standards which rise from the lower end of said bracket or directly from the movable ring 6, as the case may be.

Rising from substantially the center of the platform 12, is a vertically extensible standard 25 which is composed of a plurality of telescoping sections 26 and 26' these sections being of substantially the same length. By reference more particularly to Figs. 3 and 9, it will be seen that the uppermost section 26' of the standard 25 is of solid construction and that the lower end thereof either contacts with or is secured to one section 27 of a flexible rack bar 28, this bar being normally wound upon a drum 29 in the same manner and for the same purpose as shown and described in the patent above referred to.

The section 27 is shown, in Fig. 3, as meshing with a gear 30 which is revolubly mounted beneath and supported by the platform 12, said gear 30 being mounted upon a transverse shaft 31 and being driven by a pinion 32, the latter being rigidly keyed to a transverse shaft 33 whose opposite ends are provided with cranks 33' whereby it may be rotated. As most clearly seen in Figs. 4 and 6, the shaft 33 is revolubly mounted in bearings 34 which project laterally in opposite directions from the forward end of the platform 12. As also seen in Fig. 6, but more particularly in Fig. 7, the shaft 33 is provided with a ratchet wheel 36 which coacts with a locking lever 37 for preventing retrograde movement of said shaft, whereby the flexible rack 28 may be locked in any one of its vertically adjusted positions, it being understood that the rotation of the members 33 by means of the cranks 33' will project the various sections of the standard 25.

In addition to the gear 30 which is mounted upon the shaft 31 and which imparts rotary movement to said shaft, a second gear 40 is rigidly keyed thereto, this gear being adapted to drive the drum 29 through the instrumentality of a gear 41, a pair of idlers 42 being interposed between said gears 40 and 41 as clearly seen in Fig. 7. This gear 41 is revolubly mounted upon a fixed shaft 43 which is provided with a plurality of coarsely pitched screw threads, similar threads on the hub of the drum 29 being engaged with said threads on the shaft 43. The drum is driven from the gear 41 by the provision of a finger 44 which projects slidably from said gear into a keeper 45 on one end of the drum. The action of this

mechanism is identical with that of the parts seen in Fig. 4 of the patent above referred to, the screw threads being provided on the shaft 43 in order that as the drum rotates, it will shift endwise and will thus be properly located in respect to the standard, at all times, to allow the numerous sections of the flexible rack bar 28 to pass freely through the guide 46 and upwardly into the telescopic standard.

Rising from the forward end of the platform 12 is an extensible ladder 50 which comprises a plurality of slidably engaged sections 51, said sections being equal in number to the number of sections of the standard 25. Secured in any suitable manner to the upper ends of the various sections is a plurality of rings 52 from which rigid arms 53 extend in opposite directions. The outer ends of these arms are reduced and pass through one end of links 54 and through the upper ends of truss rods 55 as clearly seen in Figs. 1 and 9, while the other ends of said links 54 are secured by bolts or other suitable means to the upper ends of the sections 51. In order that upward movement on the part of the uppermost ladder may raise other sections of the ladder, when said upper section has moved beyond a predetermined point, the lower ends of all the sections, with the exception of the lowermost, are provided with slides 56 which contact with the links 54 when the various sections have been raised to their limits. (See more particularly Fig. 1). It is to these slides 56 that the lower ends of the truss rods 55 are secured, the lowermost of these rods, however, being secured to the front end of the platform 12 as clearly seen in Fig. 1.

For the purpose of aiding the operator in tilting the platform 12 to move the ladder from an oblique to an upright position, four tension devices are provided. Two of these devices are in the form of coil spring 60 whose upper ends are secured to brackets 61 adjustably mounted on the lowermost truss rods 55 while their lower ends are secured to other brackets 62 which project forwardly from the upper movable ring 6. By this construction, it will be seen that tilting of the ladder will place these springs under tension, which tension will be exerted to assist in returning said ladder to normal position.

The other two tension devices comprise a pair of coil springs 63 which are connected at their upper ends to the lowermost section of the standard 25, while their lower ends are secured to cables 64 which latter are passed around guide pulleys 65 located near the axis of the platform 12 and around similar pulleys 66 which are located eccentrically on said platform, the pulleys 66 being here shown as located near the rear

end of said platform. The free ends of these cables 64 are then adjustably secured as at 67 to an inverted U-shaped frame 68 which rises from the rear side of the ring 6, the cross bar of this frame constituting a support for the telescopic standard when the ladder is in lowered position as seen in Fig. 2. By this last described construction, when the platform is tilted to move the ladder from the position seen in Fig. 1 to that seen in Fig. 2, the springs 63 will be placed under tension, this tension being likewise exerted to assist in returning the parts to their normal positions.

Since the mechanism supported by the truck is comparatively heavy and is of great height, it becomes necessary to provide means for bracing said truck to prevent it from tilting. For this purpose, four brackets 70 are secured to the side bars 1, these brackets having their lower ends formed into outwardly extending hooks 71 (see more particularly Fig. 5) while their upper ends are equipped with pairs of outwardly extending ears in which upright shafts 72 are mounted to oscillate. To these shafts 72 the upper forked ends of brace rods 73 are pivoted, in such a manner as to allow said rods to move vertically. The rods 73 are provided with sharpened noses 74 which are adapted to bite into the pavement when the machine is being used. At suitable points, these noses 74 are provided with upright openings and pulleys 75 are revolvably mounted in said openings, these pulleys receiving the intermediate portions of cables 76 which are anchored at one end to the lower ends of the brackets 70, while their other ends are secured to bolts 73' which lie parallel to the bars 73 and which may slide in bearings 77 which rise from said bars, the other ends of the bolts 73' being connected to the lower ends of coil springs 78 having their upper ends anchored to the forks. Under normal conditions, these brace rods are swung to the position seen in Fig. 2 and are supported by the hooks 71 and when the device is applied to use they are extended as seen in Figs. 1 and 4, the tension of the springs 78 being then exerted to retain the noses 74 in contact with the street or pavement. With the parts in this position, the bolts 73' are locked against movement by the provision of set screws 79 (see more particularly Fig. 4), whereby the lower stretches of the cables 76 act to positively prevent the rods 73 from being moved upwardly.

The structure above described may be equipped with any appropriate type of hose 80, the latter being here shown as passing loosely through a number of guides 81 which extend rearwardly from the rings 52 (see Figs. 1 and 9), the upper end of said hose being connected to a neck 82 which depends from an angular coupling 83, a nozzle 84

being flexibly connected to the upper end of said coupling and being linked at 85 to one end of an operating lever 86, the latter being fulcrumed upon an arm 87 which projects laterally from the coupling 83, all of this structure being clearly seen in Fig. 1.

At times it becomes very desirable to rotate the turn table to vary the position of the upper end of the ladder. For this purpose, (see more particularly Figs. 4 and 8) the upper ring 6 is provided with a number of upright guides 90 through which a pair of levers 91 may be inserted, said levers having their inner ends reduced and adapted for insertion into recesses 92 which are formed in the outer sides of the sills 9. The levers 91 may be normally positioned upon a suitable platform 93 and any suitable rests which rise therefrom, but may be applied to use as seen in Fig. 8 to rotate the ring 6 upon the ring 5 as hereinbefore suggested. It also becomes expedient to provide means for locking the ring 6 or turn table as it may well be termed against rotation. For this purpose, said ring is provided with a number of notches 95 in its periphery, these notches coacting with a suitable spring pressed latch 96 which is pivoted to one of the side bars 1 (see more particularly Fig. 6).

From the foregoing description taken in connection with the accompanying drawings, it will be seen that a comparatively simple and rigid device has been provided for carrying out the object of the invention, yet that the efficiency thereof will not be impaired by such simplicity.

The device may be applied to a great number of uses well known to those skilled in the art, and may be adjusted to a great many different positions, it being thought unnecessary to go further into the details of construction and operation.

I claim:

1. A fire fighting apparatus comprising a truck, a standard rising therefrom and composed of a plurality of telescopic sections, radial arms projecting from the upper ends of said sections in opposite directions, links secured to and projecting laterally from said arms, a plurality of slidably engaged ladder sections, one pair of links being secured to the top of each section, inclined truss rods leading from the lower ends of said ladder sections to the remote ends of the links, means to raise the uppermost standard sections, and a series of stops on the ladder sections to cause the latter to be successively raised.

2. The combination with a truck and fire fighting means rising therefrom, of a plurality of inclined brace rods pivoted to said truck to swing downwardly, bearings on said rods, guides near the lower ends thereof, bolts slidable in said bearings, coiled springs



connected to the upper ends of said bolts and to relatively fixed parts of the device, flexible elements depending from said bolts around said guides, said elements then continuing inwardly and being secured to a relatively fixed part of the machine below the pivot of the rods, and means for locking the bolts against sliding movement.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 10

WARREN P. RICKARD.

Witnesses:

JOHN F. MOORE,  
EDWARD A. BURNETT.