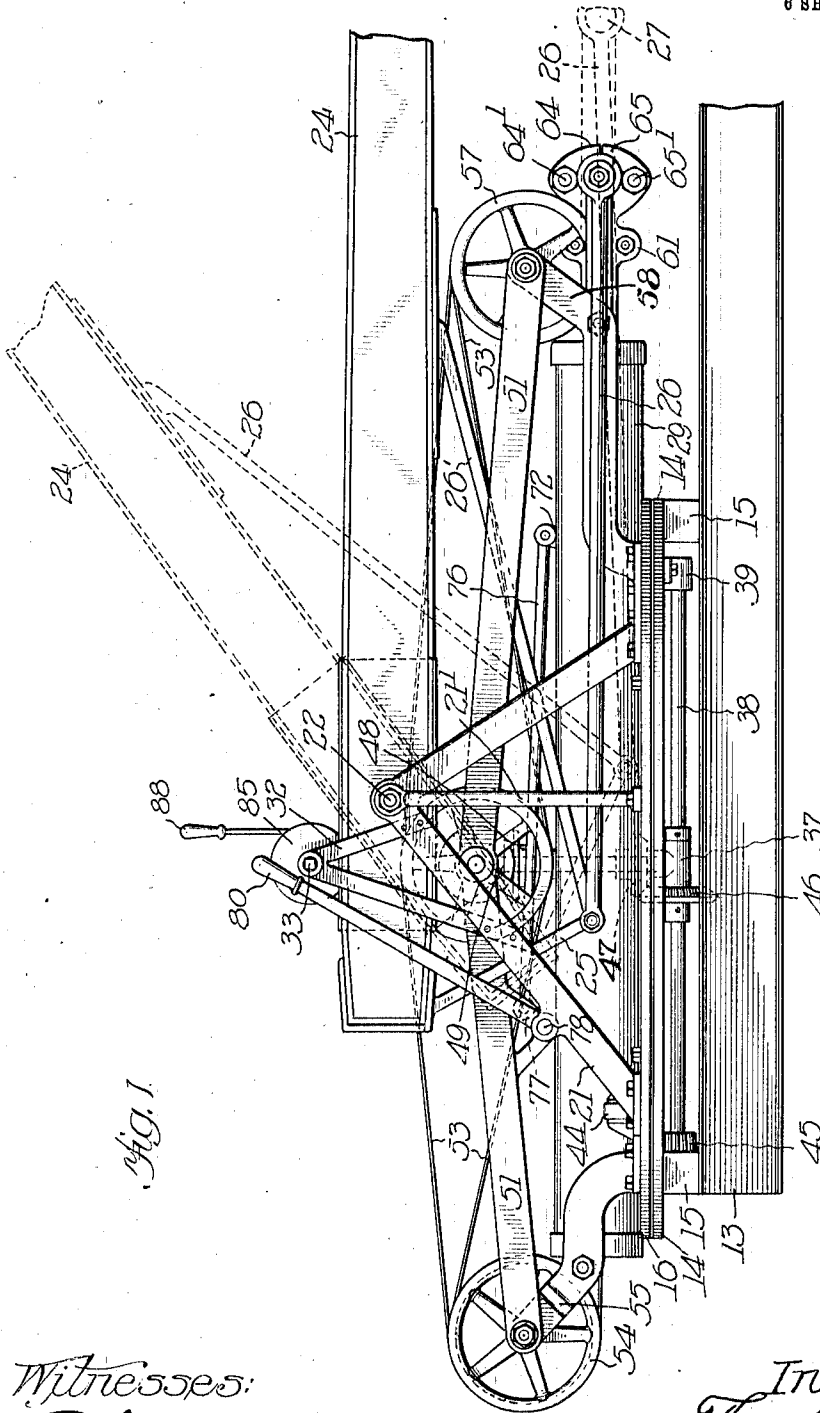


T. N. BURKE.
AERIAL APPARATUS.
APPLICATION FILED FEB. 19, 1910.

1,059,433.

Patented Apr. 22, 1913.

6 SHEETS-SHEET 1.



Witnesses:
Robert H. Meir
J. Wilson

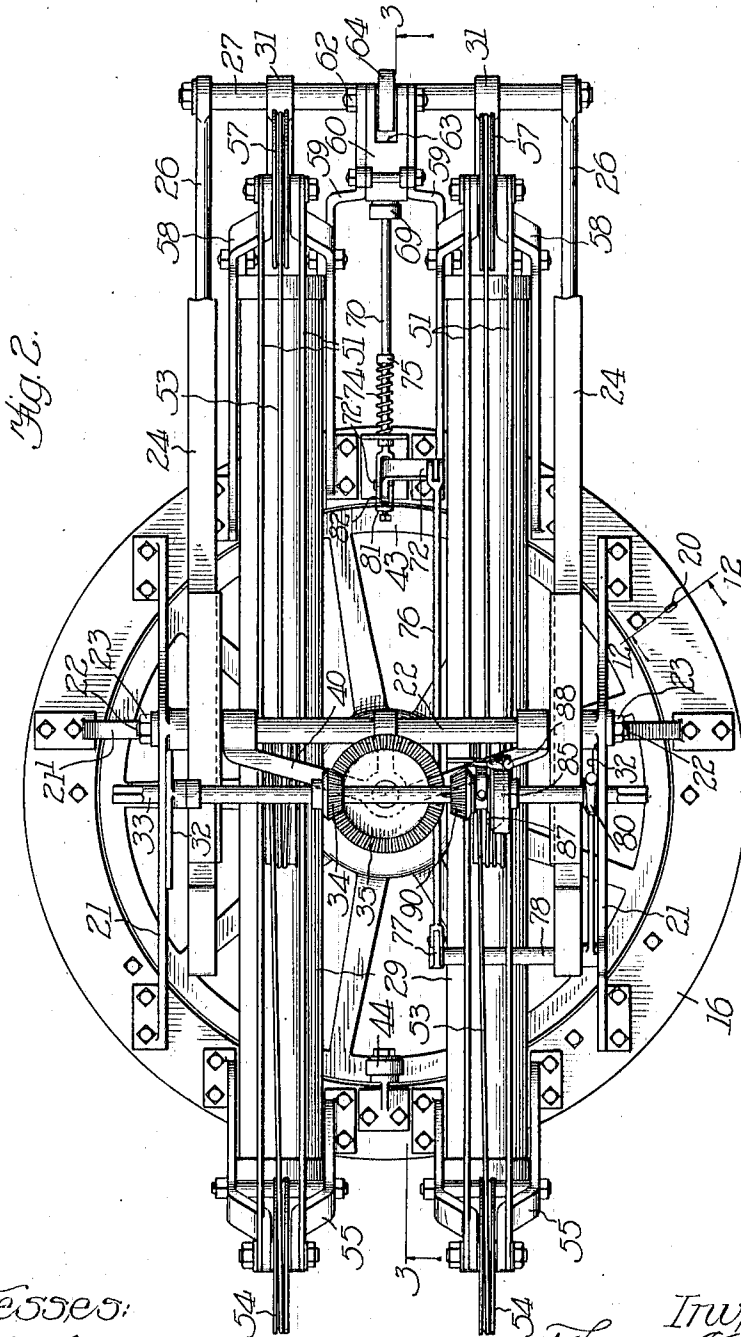
Inventor:
Thomas N. Burke
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6 SHEETS-SHEET 2.



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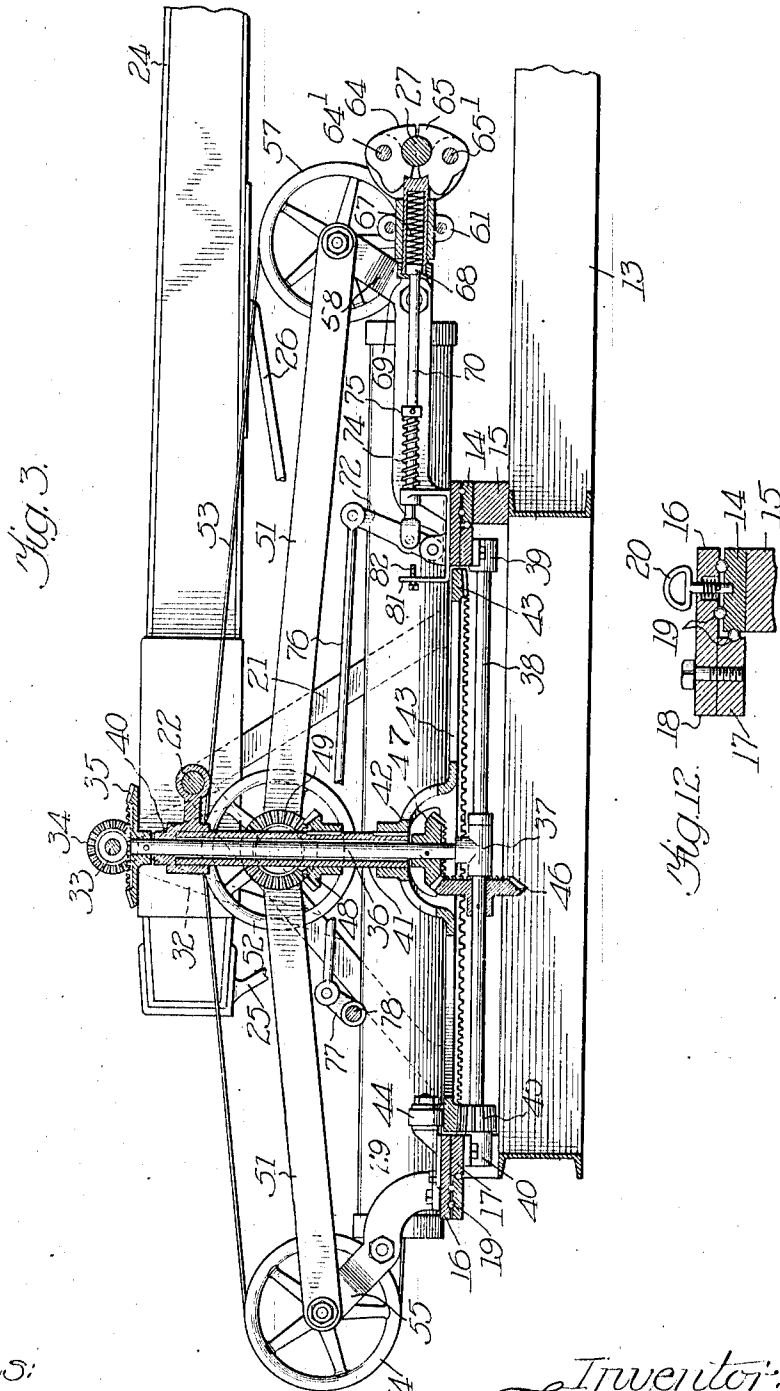
Inventor:
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6 SHEETS—SHEET 3.



Witnesses:
Robert N. Weir
J. Wilson

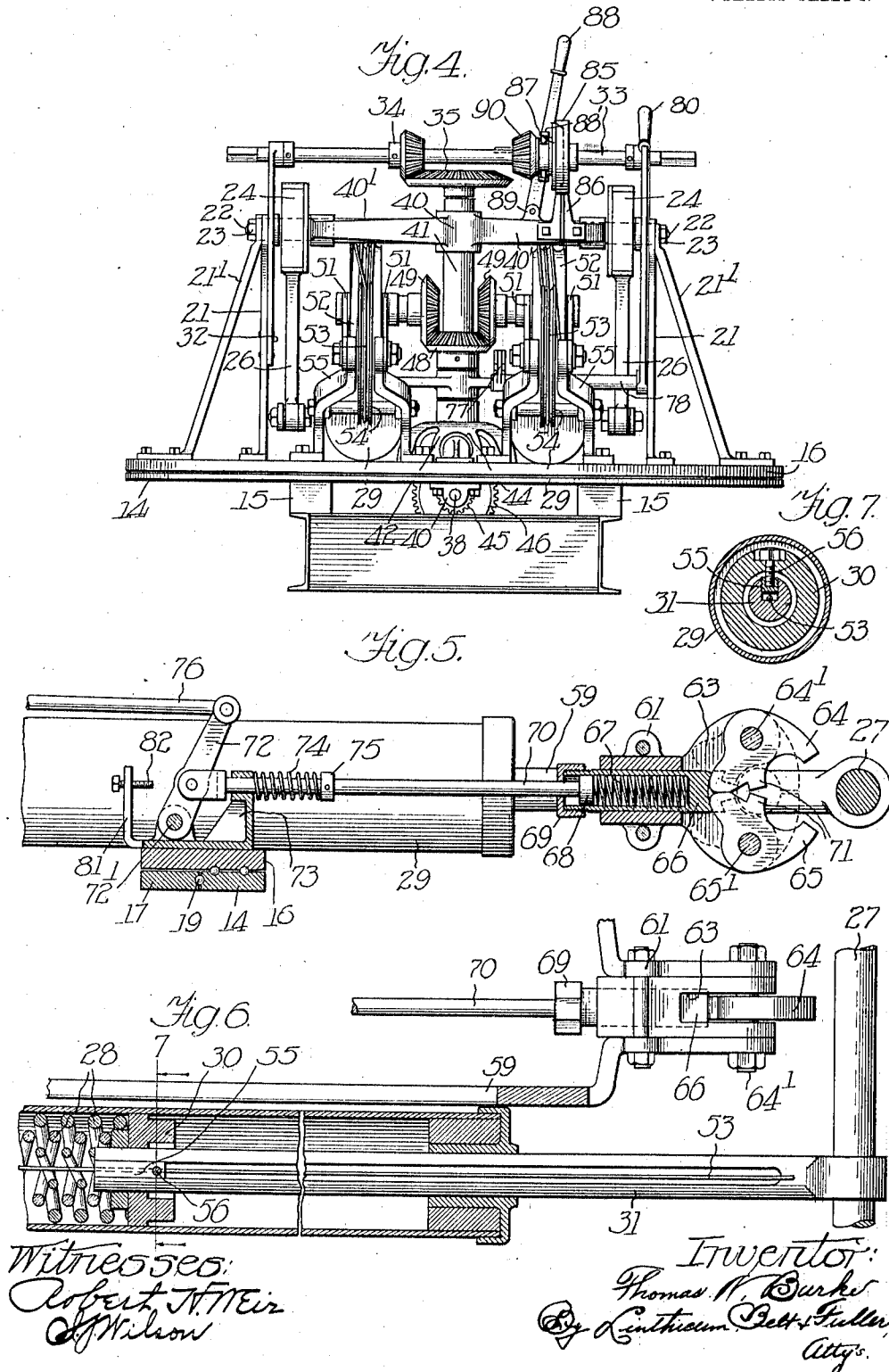
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6 SHEETS—SHEET 4.

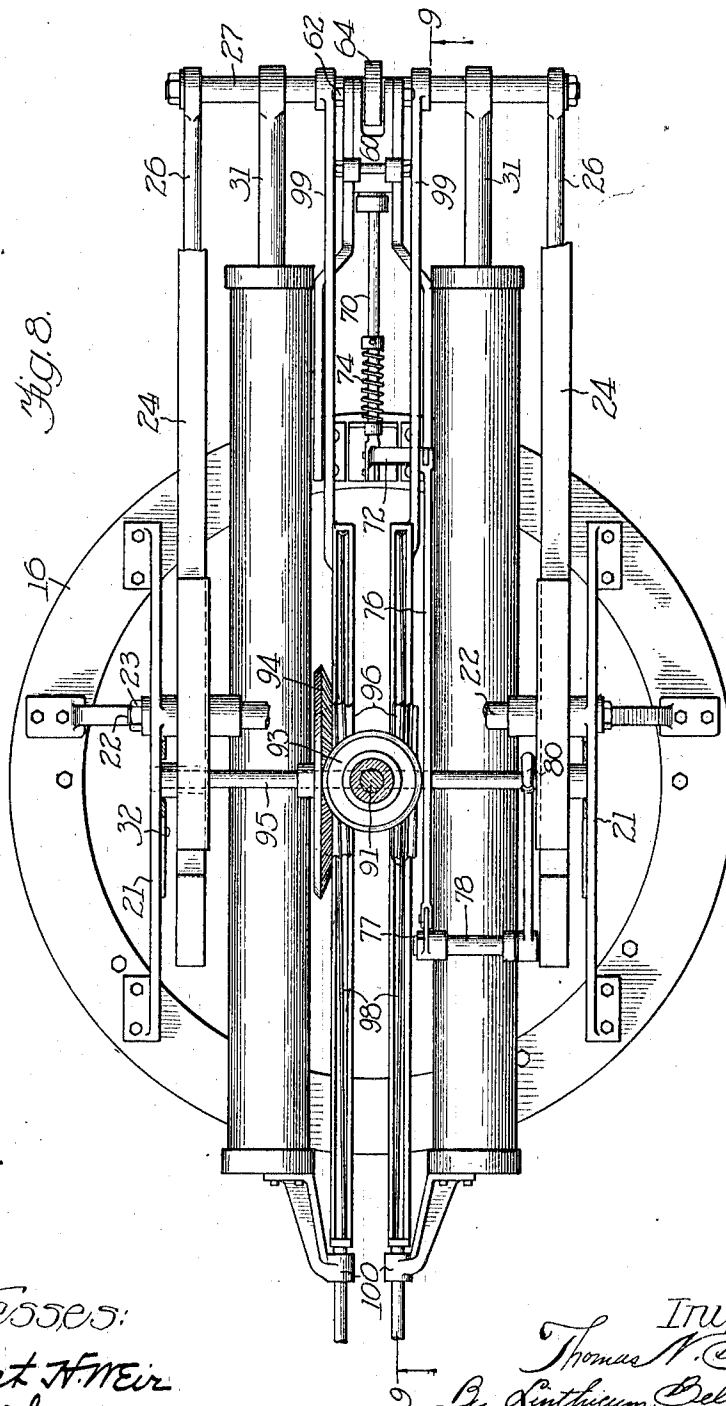


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6 SHEETS—SHEET 6.



Witnesses:
Robert H. Weir
J. Wilson

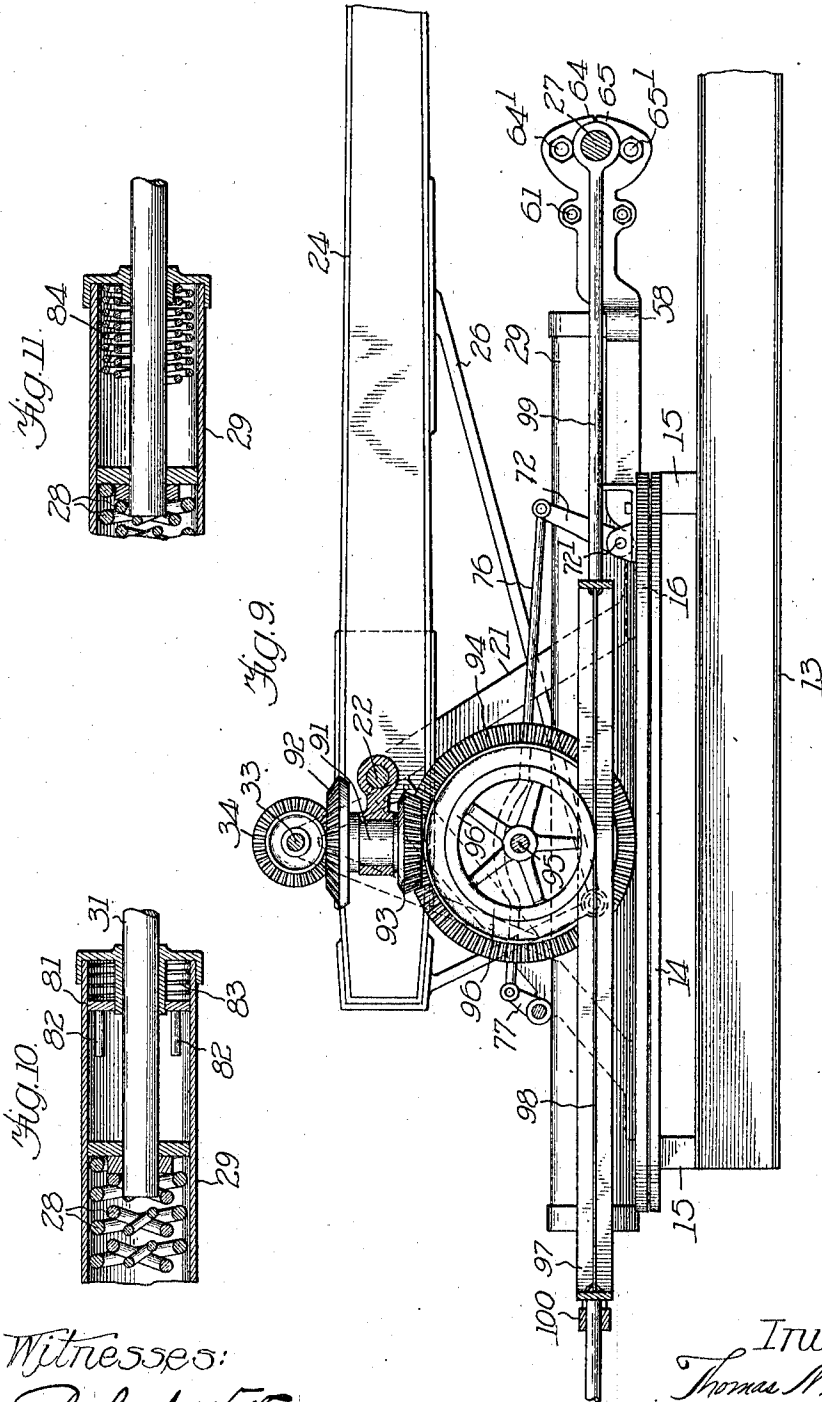
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6 SHEETS—SHEET 6.



Witnesses:
Robert H. Weir
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UNITED STATES PATENT OFFICE.

THOMAS N. BURKE, OF CHICAGO, ILLINOIS.

AERIAL APPARATUS.

1,059,433.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed February 19, 1910. Serial No. 544,729.

To all whom it may concern:

Be it known that I, THOMAS N. BURKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Aerial Apparatus, of which the following is a specification.

My invention relates to improvements in aerial apparatus, having reference more particularly to hook and ladder trucks or apparatus in which a ladder, water tower, fire-escape or other device is elevated from a substantially horizontal position, and consists in certain improvements in the mechanisms which control the raising, lowering and locking of the ladder or other device.

It is an object of my invention to provide improved means whereby the ladder or device may be manually brought to any desired position by the application of a relatively small amount of power.

Another object is to provide cushioning means for absorbing the shock occasioned by the stoppage of the ladder in its upward movement when it has been raised to its extreme elevated position.

A further object is the provision of braking means for controlling the raising and lowering movement of the ladder, and locking means whereby the ladder may be locked against movement in any desired position.

Still another object is the provision of an automatic lock for automatically locking and retaining the ladder in its lowered position.

Additional aims and purposes of my invention will become apparent as it is better understood by reference to the following description when taken in connection with the accompanying drawings thereof, while its scope will be more particularly pointed out in the appended claims.

Referring to the drawings—Figure 1 is a side elevation of a portion of a truck and ladder and showing one embodiment of my invention applied thereto. Fig. 2 is a plan. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is an elevation looking from the left in Figs. 1 and 2. Fig. 5 is an enlarged elevation partly in section, of the lock for holding the ladder in lowered position. Fig. 6 is a horizontal section showing the interior of one of the spring cylinders. Fig. 7 is a section on the line 7—7 of Fig. 6. Fig. 8 is a plan of a modified form of my invention. Fig. 9 is a section on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged section of one end of the spring cylinder showing the shock-absorbing or cushioning mechanism. Fig. 11 is a similar view showing a modified form of cushioning device, and, Fig. 12 is a section on the line 12—12 of Fig. 2, showing the turn table lock.

In the drawings, 13 designates the frame of an ordinary fire truck upon which is mounted the circular track or raceway 14 preferably elevated a slight distance above the truck frame by supporting blocks 15. A turn table 16 adapted to travel on the track or raceway, comprises a circular plate 18, and a smaller plate 17 preferably bolted or otherwise secured to the plate 18. In order that the table may be turned easily and readily upon its track, a series of balls 19 are employed to provide an antifriction bearing between the table and its raceway. The plate 18 is provided with a spring-pressed latch 20 adapted to be engaged in a recess in the upper face of the track 14 to lock the turn table against rotation. If desired, the track may be provided with a number of recesses adapted to receive the end of the spring-pressed latch so that the table and locking mechanism and ladder carried thereby, may be locked in any one of a number of different positions when occasion requires.

The turn table has rigidly secured upon its upper side a plurality of standards 21 and lateral braces 21' connected together at their upper extremities by the bearing shaft 22. This shaft is threaded at either end for engagement with the nuts 23. A ladder or other aerial apparatus 24 is pivotally mounted upon the rod or shaft 22 and is adapted to turn thereon during its raising and lowering movements. While I have shown a ladder in this connection, it will be understood that a water tower, fire-escape or other device might be substituted therefor and manipulated by the mechanism to be hereinafter described. A V-shaped brace or member comprising the integral arms 25 and 26', is rigidly secured to each side piece of the ladder, as shown in Fig. 1. A plurality of links 26 connect the V-shaped members with a cross-bar 27. It will be evident that transverse movement of this cross-bar will impart to the ladder an angular movement about its pivot by means of the links and V-shaped members secured to the ladder.

Although the ladder may be both raised and lowered manually, I prefer to provide means for automatically raising it and to resort to manual manipulation only for the purpose of lowering the ladder again to horizontal position. The raising mechanism comprises preferably a plurality of heavy coiled expansion elevating springs 28 inclosed in cylindrical casings 29 and adapted to bear at one end against the rear of the casings and at the other end against plungers 30 rigidly secured upon longitudinally movable rods or connections 31 attached to the cross-bar 27. Expansion of the springs 28 will thrust the plungers toward the front ends of the cylindrical casings and through the connections 31, the cross-bar 27 and the links 26 will turn the ladder about its pivot to raised position.

In order to lower the ladder against the force of the expansion springs or to assist such springs in raising the ladder, if necessary, I have provided a manually operated mechanism comprising an operating shaft, a drum, and cables adapted to be wound upon the drum and connected to the cross-bar 27 in any preferred manner.

In the embodiment shown in Figs. 1 to 7 inclusive, I have shown a bearing support 32 secured upon each of the standards 21 and affording bearings for the operating shaft 33 which extends beyond the bearing supports at either end and is adapted to receive operating handles or cranks by means of which the shaft may be turned. Rigidly secured upon the operating shaft midway its ends, is a bevel-gear 34 adapted to mesh with a bevel-gear 35, secured upon the upper end of the vertically disposed shaft 36, supported at its lower end in a bearing 37, carried upon the horizontal shaft 38 which is mounted in bearings 39 and 40, bolted or otherwise secured to the lower plate 17 of the turn table. The upper end of the shaft 36 is maintained in position by a collar 40 carried by arms 40' attached to and extending laterally from the pivot shaft 22. The opening through the collar 40 is enlarged to serve as a bearing for the upper end of the sleeve 41 which surrounds the shaft 36 and is rigidly secured at its lower end in the hub 42 of an annular bevel-gear 43. The diameter of the gear 43 is slightly less than that of the turn table within which the gear is adapted to rotate. A guide roller 44 mounted upon the turn table is adapted to engage the upper face of the gear 43 and maintain it in mesh with a bevel-gear 45 secured upon the shaft 38 as shown in Fig. 3. The shaft 38 has also secured thereon, a bevel-gear 46 adapted to mesh with the bevel-gear 47 carried upon the shaft 36, while the sleeve 41 has secured thereon, a bevel-gear 48 adapted to mesh with and drive a plurality of bevel-gears 49 rotatably

supported between the pairs of elongated bars 51, and having secured thereon the drums 52.

Each of the drums 52 is grooved on its outer surface to receive a cable 53 which is wrapped one or more times around the drum and is secured thereto at one point to prevent longitudinal slipping of the cable in the grooves. By the term "cable" I mean to include any flexible connection such as chain, hemp-rope, or other preferred means, which is adapted to wind around a drum, but I have shown and preferably employ a cable composed of strands of steel wire. Each of the cables is led from its drum over guide sheaves 54 mounted in brackets 55, bolted or otherwise secured upon the turn table 16, and passes through the center of the rear end of the cylinders 29 and extends longitudinally of the cylinders through the center of the coil springs 28. Each connecting rod 31 is grooved on its upper side as shown in Figs. 6 and 7, for the reception of a cable and is provided with a clamp block or wedge 55 adapted to be forced, by means of a bolt 56 which is threaded through the wall of the plunger 30 as shown in Fig. 7, against the cable, clamping it between the bottom of the block and the bottom of the groove in the member 31. By screwing down the bolt 56 the cable is rigidly clamped to the member 31 and the plunger 30. From the forward end of the cylinder, each cable is led over a guide sheave 57 rotatably mounted in a bracket 58, secured upon and extending outwardly from the turn table. When the drums are operated to wind the endless cables therearound the plungers 30 and the connecting rods 31 secured to the cables will impart movement to the cross-bar 27 to turn the ladder about its pivotal bearing. Since both of the drums are driven from the bevel-gear 48 it will be evident that they will turn in opposite directions, and in order that both cables and the attached plungers may be moved in the same direction simultaneously, it is necessary that one of the cables be led from the bottom of its drum over sheaves 54 and 57, while the other cable is led from the top of its drum over the sheaves as shown in Fig. 1.

The ladder may be moved around its pivot 22 to either raise or lower it, by turning the operating shaft 33 by means of cranks or handles which may be applied to the end thereto, the rotation of the drums which wind the cables around themselves, being effected through the intermediary of the bevel-gears 34, 35, 47, 46, 45, 43, 48, and 49. The difference in size between the driving gear 34 and the driven gear 35 and more particularly between the driving gear 45 and driven gear 43, will multiply the power applied to the operating shaft 33 so that a long

and heavy ladder can be easily and readily manipulated.

The springs 28 as shown on the drawings, act to raise the ladder or to assist in the raising operation, depending upon the weight of the ladder and the strength of the springs. Obviously the springs might be dispensed with entirely and the ladder manipulated wholly by hand through the drum and cable connections. The springs ordinarily employed, however, are of sufficient strength to raise the ladder automatically and the manual mechanism is brought into operation only to restore the ladder to normal horizontal position.

In order that the ladder and the operating mechanism may be released from the strain of the compressed springs when the truck is not in use, I have provided a lock adapted to automatically engage the bar 27 and hold it with the springs in retracted position as shown in Figs. 1, 2 and 3. The lock is supported between a plurality of arms 59, extending forwardly from the brackets 58 and embracing a block 60 which is secured in place by means of bolts 61 and 62. The block is slotted at its forward end as shown at 63 for the reception of a plurality of locking fingers or knuckles 64 and 65. The knuckles are pivoted upon the bolts 64' and 65' and are adapted to swing from the open position shown in full lines in Fig. 5 to the closed position shown in dotted lines in the same figure. When in closed position the forward ends of the fingers come together around the cross-bar 27 and retain it in its extreme rearward position. The knuckles are maintained in closed or locked position by means of a plunger 66 adapted to slide longitudinally of the block 60 and to enter between the tails of the knuckles 64 and 65 to hold said tails apart and maintain the locking fingers together, as shown in dotted lines in Fig. 5.

The plunger, which is of hollow construction, is pressed toward the knuckles by a light coil spring 67 positioned within the plunger and adapted to bear against the enlarged end 68 of a rod 70 extending through the cap 69, threaded upon the rearward end of the plunger, and provided with an opening through which the rod 70 is adapted to pass. The front end of the plunger is curved or concaved to conform to and engage with the curved ends of the knuckle tails to yieldingly maintain the knuckles in open position, as shown in full lines in Fig. 5. When the cross-bar is drawn back by the drum and cable mechanism into its rearward position so that it engages with the shoulders 71 on the knuckles, the knuckles will be swung thereby about their pivots to bring their curved locking fingers into engagement with the cross-bar. Closing of the knuckle fingers around the cross-bar will

separate the knuckle tails thereby permitting the plunger 61 to be thrust forwardly by the spring 67 into position between the tails. The knuckles are thus automatically closed and locked to retain the cross-bar in retracted position against the force of the elevating springs.

The rod 70 is pivotally connected at its rearward end to a lever 72 pivotally mounted at 72' upon the base of a bracket 73 secured on the turn table and provided with a bearing through which the rod 70 is adapted to slide longitudinally. A coil expansion spring 74 is maintained in position on the rod between the bracket 73 and a collar 75 secured on the rod, and tends normally to thrust the rod forwardly into the position shown in Fig. 5. To the upper end of the lever 72 there is attached a link 76 connected at its outer end with an arm 77 on a rock-shaft 78, which has secured upon its outer end an operating lever 80. The bracket 73 has at its rear side an upwardly projecting finger 81 provided with an adjustable stop in the form of a screw 82 against which the rear face of the lever 72 is adapted to abut to limit the rearward longitudinal movement of the rod 70 and plunger 65.

Assuming that the ladder is in lowered position and is locked in that position by engagement of the locking knuckles with the cross-bars 27, as shown in Fig. 3, if it is desired to raise the ladder the lever 80 is moved to the left in Fig. 2, thereby through the rock-shaft 78 and the link 76 rocking the lever 72 on its pivot and withdrawing the plunger 65 by means of the connecting rod 70 from between the tails of the knuckles 64 and 65. When the plunger has been nearly withdrawn from between the tails it will be snapped out against the force of the light spring 68. This action is occasioned by the enormous force of the elevating springs tending to force the cross-bar forwardly and turn the knuckles on their pivots to open or releasing position, the curved formation of the inner ends of the tails exerting a cam action on the plunger and accelerating its exit from between the tails. As soon as the cross-bar is released and the knuckles have assumed their open position, the plunger will be urged forward to bring its concaved end into engagement with the curved rear ends of the knuckle tails to yieldingly maintain them in open position. The rod 70 together with the lever 80, and intermediate connections, will be restored to normal position by the expansion spring 74, which, being stronger than the spring 67 will force the rod 70 into the plunger to the position shown in Fig. 5. The ladder in the meantime will be automatically raised by the expansion of the elevating springs 28.

In order to absorb the shock incident to the springs reaching the limit of their expansive movement, I preferably provide the outer ends of the cylinders with cushioning means, one form of which I have disclosed in Fig. 10 and another in Fig. 11. It will be understood, of course, that these cushioning means may be omitted, if desired, as shown in Fig. 6, without materially detracting from the efficiency of the device; but I prefer to employ some sort of shock absorber. In Fig. 10 I have shown an annular plate 81 surrounding the bearing for the rod 31 and fitting tightly within the casing of the cylinder 29. This plate is preferably provided with a plurality of rearwardly extending pins 82 adapted to be engaged by the plunger 30 when it approaches the end of the cylinder. Engagement of the plunger with the pins will force the plate 81 toward the end of the cylinder against the cushion of air behind the plate, which absorbs the shock of the springs and prevents the plunger 30 from striking against the end of the cylinder. A light expansion spring 83 is preferably provided to return the plate 81 to normal position.

In the embodiment shown in Fig. 11 I have simply provided a plurality of coil springs 84 positioned in the end of the cylinder and adapted to absorb the shock of the expanding springs 28.

For the purpose of controlling the speed at which the ladder is raised and lowered, I have provided a friction brake adapted to be manually operated and comprising a stationary friction member 85, carried by a bracket 86 mounted on the member 40, and a rotary friction member 87 splined on the shaft 33 and adapted to frictionally engage with the member 85. The friction members are brought into operative engagement by means of a brake handle or lever 88 pivotally mounted at 89 and provided with a collar 88' engaging in an annular groove on the member 87, by means of which the member may be adjusted longitudinally of the shaft 33.

I have also provided means for locking the operating mechanism against movement, comprising a bevel-gear 90 integral with the friction member 87 and adapted to mesh with the bevel-gear 35. The lever 88 may be operated to bring gear 90 into mesh with gear 35 thereby locking all the gears against rotation. By this locking means the ladder may be locked in any desired position either at the extreme limits of its movement or at any intermediate point. It will be evident that by moving the lever 88 to the right in Fig. 4, the friction member 87 will be brought into engagement with the friction member 85 and the frictional engagement between the two members will act as a brake to regulate the speed of the

shaft 33. By moving the lever 88 to the left in Fig. 4, the gear 90 will be thrown into meshing engagement with the gear 35 and the shaft will be effectually locked against rotation and the ladder will be locked against movement. This lock might be employed, if desired, to lock the ladder in its normal or horizontal position, but since all of the force of the heavy springs 28 would be exerted upon the cables, drums, and intermediate gears, when the truck was not in use thereby subjecting the mechanism to an unnecessary strain, I prefer to employ the automatic lock which engages the cross-bar 27 and resists the force of the compressed springs for holding the ladder in lowered position. By means, however, of my combined lock and brake, both manipulated from the same lever, I am enabled to maintain the ladder under perfect control during its raising and lowering movements.

The structure described is intended for the manipulation of ladders of extreme length and great weight, and is especially adapted for this purpose because of the multiplication of the applied power by means of the large bevel-gear 43. In smaller sizes of ladders which can be handled more easily, it is not always necessary to so materially increase the power applied to the operating shaft. To provide a structure of simple construction adapted for handling lighter ladders, I have shown in Figs. 8 and 9, a modification of the operating mechanism wherein the large gear 43 is omitted. In the structure therein disclosed, the long vertical shaft 36, the horizontal shaft 38, the sleeve 41, and the connecting bevel-gears of the previously described modification, are replaced by a stub-shaft 91 carrying at its upper end the bevel-gear 92 adapted to mesh with the ordinary bevel-gear 34 and at its lower end a bevel-gear 93 with which is adapted to mesh a large bevel-gear 94 mounted on a drum-shaft 95. This drum shaft carries the two drums 96 similar to the drums 52, but rigidly secured on the shaft. If preferred, a solid drum might be substituted for the two drums shown in this modification. Instead of running the cables which are wound around the drums over sheaves and into the spring cylinder casings, I employ an elongated loop or eye 97 positioned substantially in alinement with the lower edge of each drum, to the inner ends of which the ends of the cables 98 are secured. Each loop or eye is connected to the cross-bar 27 by an integral link 99 similar to the link 31 in the previously described modification. The rear ends of the loops or eyes are guided in bearing brackets 100 secured to the rear ends of the cylinder casings. In this modification also, the elevating springs will sometimes be found unnecessary if ladders of very small

size are to be manipulated, but when the springs are employed and are heavy and strong enough to automatically raise the ladder without the assistance of the manual mechanism, the automatic lock for engaging the cross-bar 27 to hold it in its rearward position with the ladder in horizontal position, is preferably employed.

In the operation of my invention, assuming that the ladder is in its normal horizontal position and it is desired to elevate the same quickly, the locking lever 80 is manipulated to withdraw the plunger from between the tails of the locking knuckles to thereby release the cross-bar and permit it to be forced outwardly by the elevating expansion springs 28. The rapidity of the upward movement of the ladder may be controlled by the operator by manipulation of the brake from the handle 88, and if it is desired to stop the ascent of the ladder and lock it into any point intermediate its horizontal and vertical positions, the lever 88 is manipulated to throw the gear 90 into engagement with the gear 35 thereby effectually locking the ladder against movement in either direction. If the ascent of the ladder is permitted to continue until it reaches a vertical position, the shock which would result from the impact of the heavy expansion springs against the ends of the cylinder casings, will be absorbed by the cushioning devices, as previously described. When it is desired to lower the ladder, handles are applied to the ends of the shaft 33 whereupon the drums may be rotated to wind the cables there-around and draw the cross-bar rearwardly against the force of the elevating springs until it engages with the inner curved surfaces of the knuckles 64 and 65, whereupon the knuckles will turn on their pivots and automatically lock the bar in retracted position.

While I have shown and described preferred embodiments of my invention, it will be apparent that various changes in mechanical details may be resorted to without departing from the spirit of the invention or sacrificing any of the material advantages thereof.

What I claim is:

1. In an aerial apparatus, the combination of a vertically tiltable aerial member, an elevating spring working in a horizontal direction, a plunger rod actuated by the spring, a connection between the plunger rod and the aerial member, an endless flexible element connected to the plunger rod, front and rear guides for the flexible element, a winding drum having the flexible element wound thereon, and means for rotating the drum.

2. In an aerial apparatus, the combination of a vertically tiltable aerial member, an elevating spring working in a horizontal direc-

tion, a casing for the spring, a plunger rod associated with the spring and working through the casing, a connection between the plunger rod and the aerial member, a winding drum above the casing and between its ends, an endless flexible element wound upon the drum, connected with the plunger rod and working through the casing, and means for actuating the drum.

3. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross-bar, connections from said cross-bar to said pivotal member, means for moving the cross-bar outwardly to turn said pivotal member on its pivot, means for returning said bar and pivotal member to normal position, and automatic locking means to engage said bar and prevent movement thereof.

4. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross-bar, connections between said cross-bar and pivotal member, means for moving the cross-bar inwardly and outwardly to lower and raise the pivotal member, and automatic locking means to engage said bar and prevent movement thereof.

5. In an aerial apparatus, the combination of a pivotal member, a support therefor, a transversely movable cross-bar, operative connections between said cross-bar and pivotal member, means for positively moving said bar in opposite directions to raise and lower the pivotal member, and a lock adapted to automatically engage said cross-bar when in retracted position to prevent movement thereof.

6. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross-bar, connections from said cross-bar to said pivotal member, springs for moving the cross-bar outwardly to turn said pivotal member on its pivot, means for returning said bar and pivotal member to normal position, and automatic locking means to engage said bar and prevent movement thereof.

7. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross-bar, connections from said cross-bar to said pivotal member, springs for moving the cross-bar outwardly to turn said pivotal member on its pivot, means for returning said bar and pivotal member to normal position, and means for automatically locking said cross-bar against the action of said springs, said means comprising a plurality of pivoted members adapted to be opened and closed by the movement of the cross-bar, and mechanism for automatically locking said members in open or closed position.

8. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross bar, connections between said cross bar and pivotal member, means for moving the cross bar inwardly and outwardly to lower

and raise the pivotal member, and automatic locking means to engage said bar and prevent movement thereof including a pair of knuckles to embrace and retain said bar against movement, and means to automatically lock the knuckles in bar-retaining position and to yieldingly lock said knuckles in bar-releasing position, substantially as described.

9. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross bar, connections between said cross-bar and pivotal member, means for moving the cross-bar inwardly and outwardly to lower and raise the pivotal member, and automatic locking means to engage said bar and prevent movement thereof including a plurality of locking knuckles provided with rearwardly extending tails, a spring-pressed plunger adapted to be engaged between the tails of the knuckles to lock said knuckles in closed position, said plunger being also adapted to engage the rear ends of the knuckles to yieldingly maintain said knuckles in open position, means to move said bar into position to be engaged by said knuckles, means to withdraw said plunger from locking position, and means for withdrawing the cross bar from said knuckles upon release of the knuckles by the plunger, substantially as described.

10. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross bar, connections between said cross-bar and pivotal member, means for moving the cross bar inwardly and outwardly to lower and raise the pivotal member, a pair of knuckles pivoted to grasp and hold the bar, means for locking said knuckles in position comprising a spring-pressed plunger to engage the ends of the knuckles, and manual means for withdrawing said plunger to release the knuckles, substantially as described.

11. In an aerial apparatus, the combination of a pivotal member, a support therefor, a cross bar, connections between said cross bar and pivotal member, means for moving the cross bar inwardly and outwardly to lower and raise the pivotal member, a pair of knuckles pivoted to embrace and retain said bar, a spring-pressed plunger to automatically hold said knuckles in open

and closed position, and an operating rod slidably connected with said plunger whereby the plunger may be withdrawn to release the knuckles, substantially as described.

12. In an aerial apparatus, the combination of a pivotal member, tension means for positively raising and lowering said member, an automatic lock for holding said member in lowered position against the elevating action of the tensioned means, a brake for controlling the speed of the raising and lowering member, and means for locking the member against movement at any desired elevation.

13. In an aerial apparatus, in combination, a pivotal member, means for raising said member, means for lowering said member, means for locking said member in lowered position, and a braking and locking mechanism adapted when moved bodily in one direction to act as a brake to control the movement of the pivotal member, and when moved bodily in the other direction to lock the pivotal member in any position against movement.

14. In an aerial apparatus, the combination of a pivotal member, an operating shaft, connections from said operating shaft to said pivotal member whereby said pivotal member may be turned on its pivot, a braking and locking member mounted on said operating shaft, and means for moving said member in one direction to brake and control the movement of the pivotal member, and for moving said member in the other direction to lock the pivotal member against movement.

15. In an aerial apparatus, the combination of a pivotal member, a plurality of springs, connections between said springs and said member whereby the member may be turned by said springs on its pivot, means for cushioning the action of said springs, means for turning the pivotal member on its pivot against the force of said springs, and means for automatically locking said member against movement when it has been brought to its extreme position against the force of the said springs.

THOMAS N. BURKE.

Witnesses:

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M. ROBERTSON.