

No. 649,306.

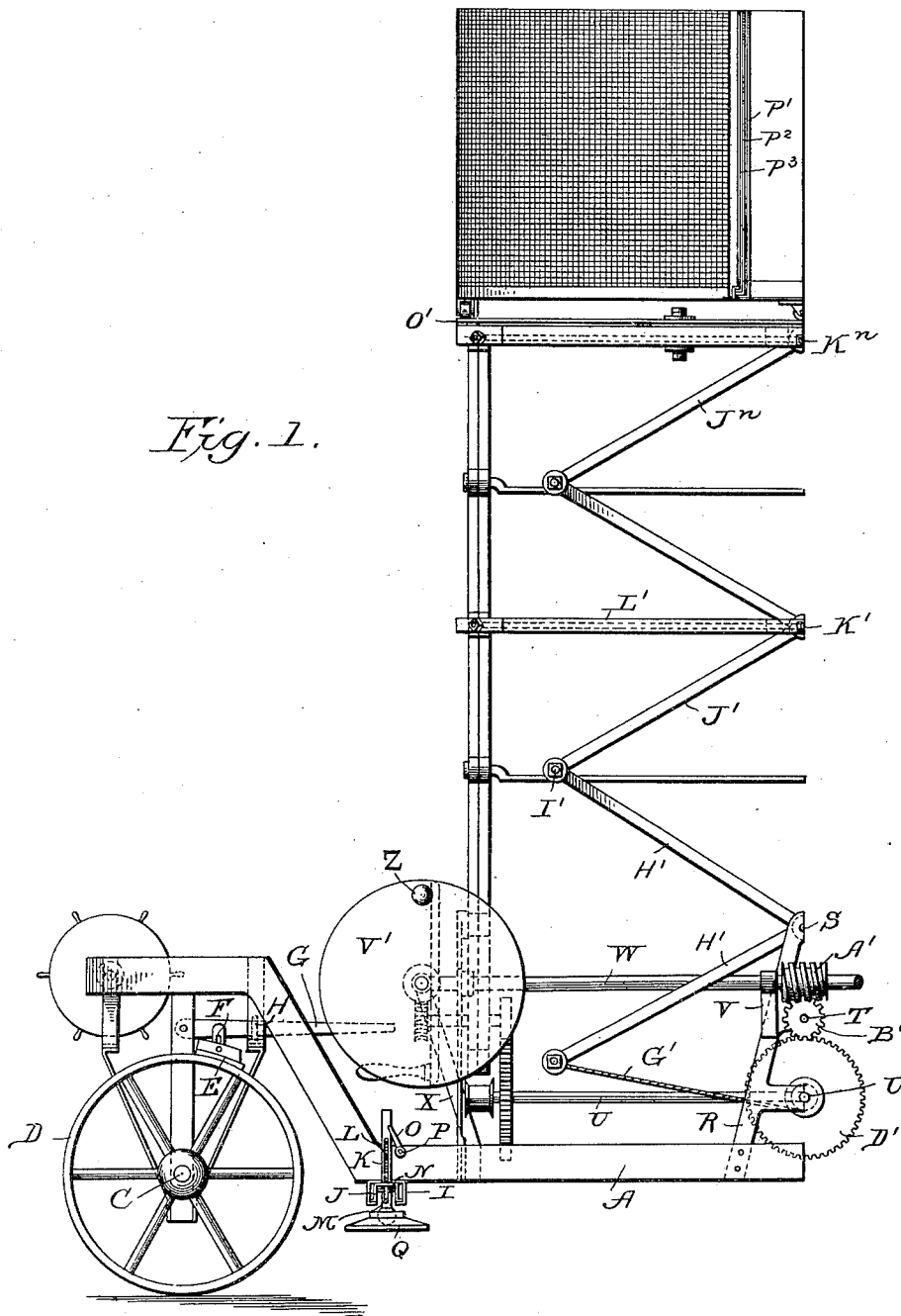
Patented May 8, 1900.

C. W. HICKS.
ELEVATING TOWER.

(Application filed May 17, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses
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Ralph H. Warfield

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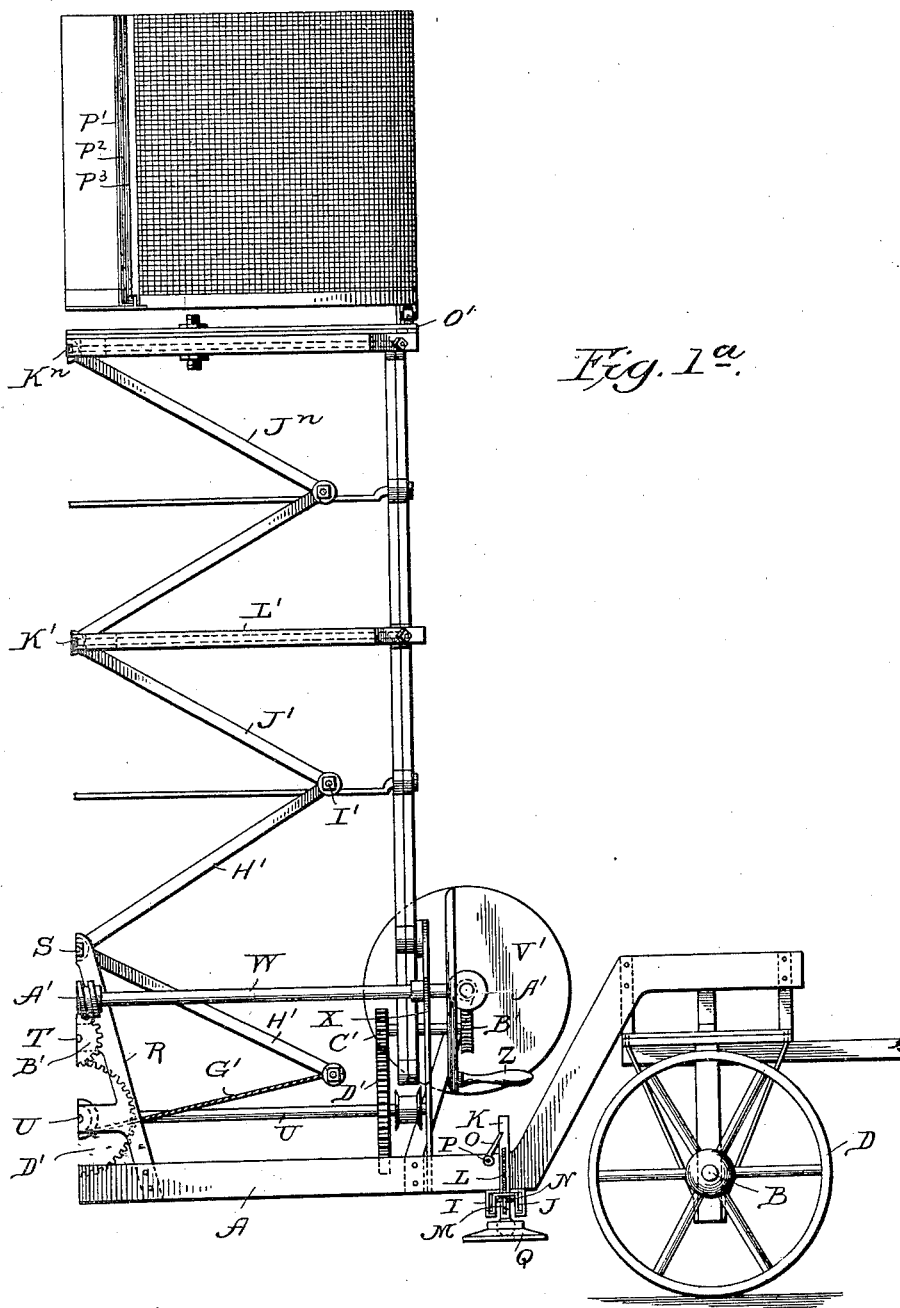
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4 Sheets—Sheet 2.



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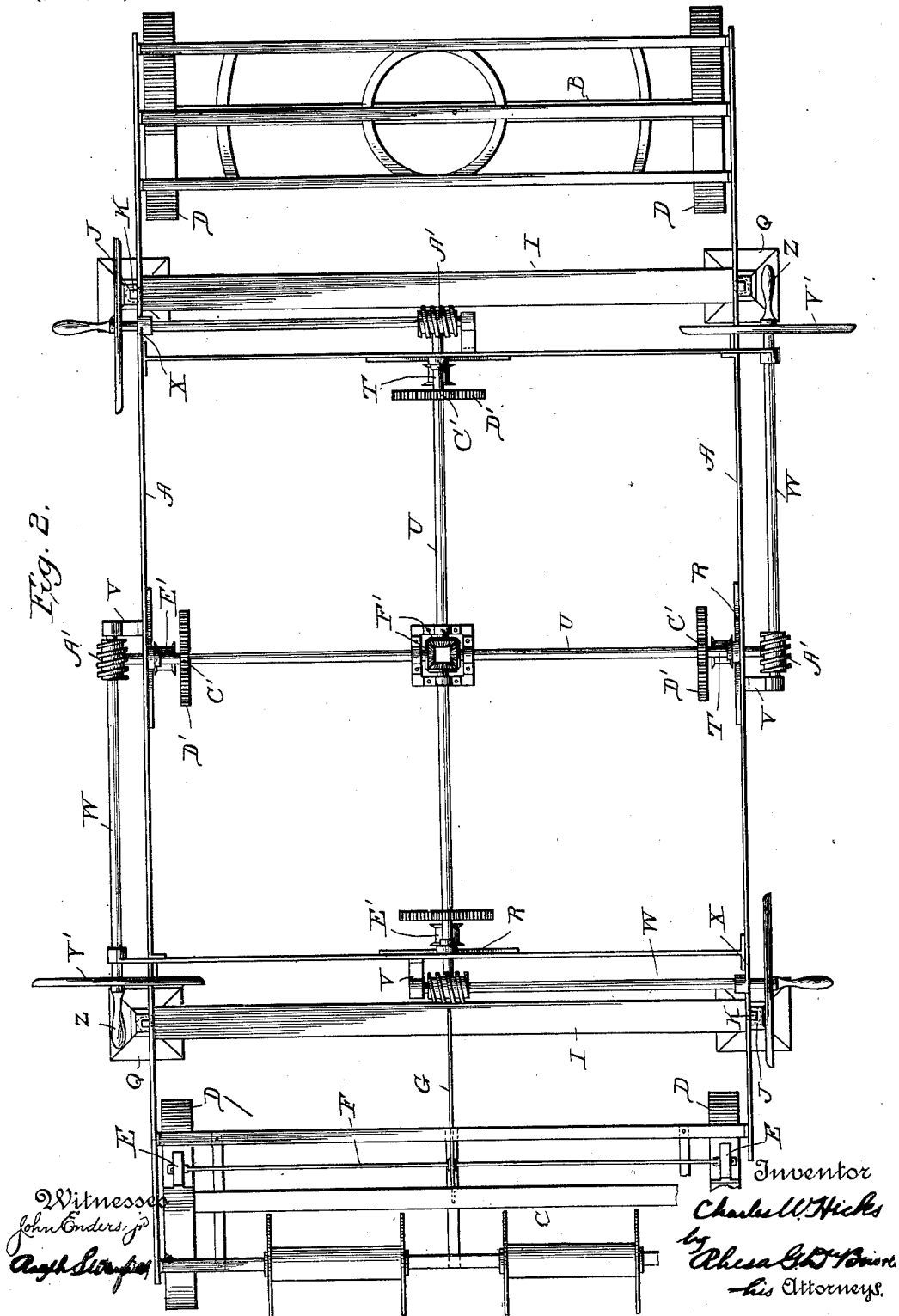
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Fig. 3.

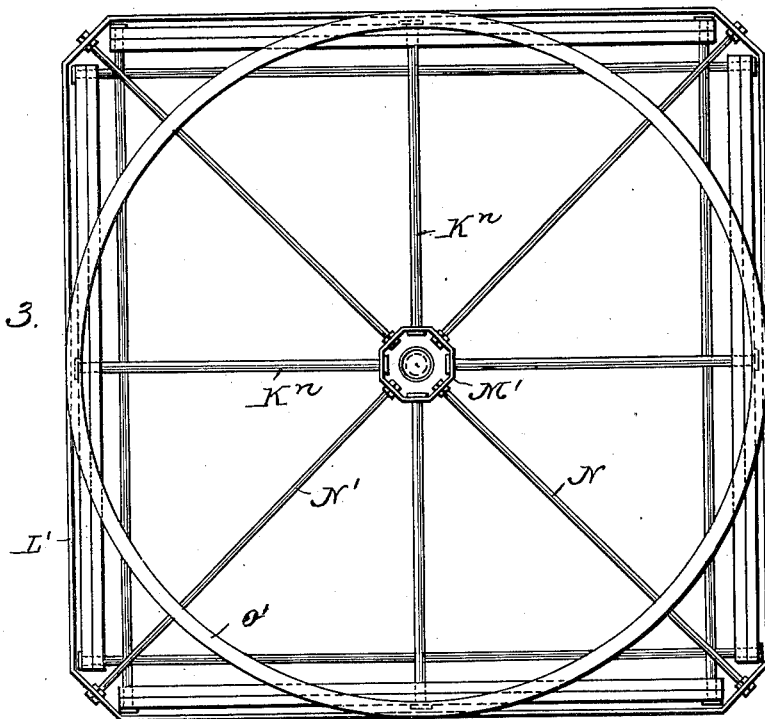
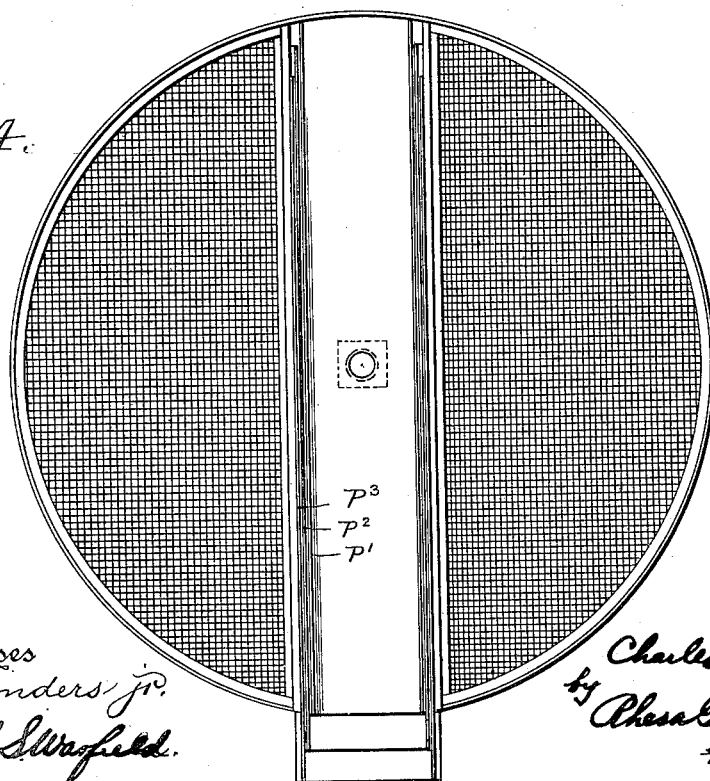


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES W. HICKS, OF ASHBURN, GEORGIA.

ELEVATING-TOWER.

SPECIFICATION forming part of Letters Patent No. 649,306, dated May 8, 1900.

Application filed May 17, 1899. Serial No. 717,165. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HICKS, a citizen of the United States of America, residing at Ashburn, in the county of Worth and State of Georgia, have invented certain new and useful Improvements in Elevating-Towers, of which the following is a specification.

My invention relates to an improvement in elevating-towers capable of use in various arts in which such an apparatus is required—as, for example, for hose-elevator purposes, fire-escape towers, or elsewhere in the fire-department service, or it may be employed in stores, shops, factories, the holds of vessels, or other like situations for the purpose of raising and lowering heavy loads of merchandise or what not; and with the foregoing applications of use in view my invention consists in certain novel features of construction and combinations of parts, which will be more fully described hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figures 1 and 1^a are views in side elevation. Fig. 2 is a plan view, and Figs. 3 and 4 are horizontal sectional views.

A A is a rectangular base-frame, made, preferably, of thin channel-steel bars and carried by a front axle B and a rear axle C, around whose spindle ends broad-tired wheels D rotate while rolling over the ground. The rear axle C is rigidly secured to, under, and across the frame A A; but the front axle B at its center carries its portion of the frame and turns freely horizontally thereunder in the usual manner, so as to enable the machine to pass easily around corners and sharp curves. Brake-shoes E E, connected together by a cross-bar F, can be crowded against the tires of the rear wheels by means of a hand-lever G, pressing on the middle of said cross-bar F, and a latch H over said lever can, if desired, lock it, so as to thereby hold the brake-shoes firmly against the wheel-tires.

Secured underneath and across the frame A A are two channel-bars I I, and within each, sliding endwise like the sections of a telescope, are two smaller channel bars or extensions J J, one of the latter being in each end of a bar I I. In the outer end portion of each bar or extension J a vertical hole is formed, through which extends upwardly the center

staff K of a ratchet-jack, an upright series of teeth L L being on the front of said staff. A lower pawl M, pivoted on a pin N, secured horizontally through the end portion of the bar J, points downwardly, so that the lower edge of said pawl can enter between the rack-teeth L L, while an upper pawl O, turning on a pin P, secured horizontally through the side bar of the frame A, points upwardly and is shown with its top edge in a notch in the jack-staff K, so as to hold said jack suspended clear of the ground. This is to be the position occupied by the jack when not in service, the bar J being also slid as far as possible within the bar I. These four jacks are to be used in leveling the frame A A when it happens to be over uneven ground, and this operation is performed as follows: The bar or bars J J on the lowest part of the machine having been drawn out not farther than two-thirds of their length, the upper pawl O is pulled back, so as to allow the jack to drop, landing its broad foot Q on the ground. Then, by means of a hand-lever bar, the frame A is crowded up so that the lower pawl M falls into a notch between two of the teeth L, and thus holds up the bar J, and thereby the frame A A. The importance and necessity of leveling the frame A A before working the machine will be shown hereinafter. It may be noted here that these four jacks, in addition to their previously-described duty, also afford a greatly-enlarged foundation to the machine when they are put into service, thus greatly increasing its stability.

The side bars of the frame A A are tied together by several cross-bars, the two innermost and principal ones of which, with the aforesaid side bars, preferably form the outline of a square. In the center of each side of this square is secured an upright standard R. This standard is provided with holes in which turn three horizontal shafts S T U. Also said standard R has secured to its outer face a plate-bar V, having at the top a bearing in which turns one end of another horizontal shaft W. The other end of this shaft W turns in a bearing fastened at the top of the plate-standard X, secured at its bottom to the nearest principal cross-bar. Now by means of these four shafts W this machine is operated. Each of these shafts has secured

on its rear end a disk-wheel V', turned by the aid of a crank-handle Z, fastened in it, and on the front end of this shaft is keyed a worm-screw wheel A', driving and turning another worm-screw wheel B', secured upon the previously-mentioned shaft T. On this same shaft T is fastened a gear-pinion wheel C', engaging with and rotating another gear-pinion wheel D', and this last wheel is keyed upon the shaft U, upon which are also secured the winding-drum E' and the bevel-gear pinion-wheel F', engaging its teeth with those of two exactly similar pinions F' F' at a common central point. Now it is at once evident that when any crank-wheel V' rotates it drives all the previously-mentioned wheels and shafts belonging to its own combination and also, with the help of the pinions, drives all the other three similar combinations of wheels and shafts. This arrangement is very advantageous, first, because it evidently allows four men, one being at each crank-handle, to utilize their combined efforts in working the machine, and, second, because even one, two, or three men only can work it by turning any disk-wheel V' that may happen to be most convenient or accessible, for in that case the three other disk-wheels V' V' V' must also turn at the same time.

Wound in one and the same direction around and fastened to the drum E' are two cords G' G', one extending forward and the other extending backward to and secured to the lower ends of two exactly-similar channel-steel bars H' H'. These bars are provided with horizontal holes at their centers and near their ends and are balanced and supported at their centers by the horizontal shaft S, passing through them. It is evident that when the drum E' turns to wind up and pull the cords G' G' they will draw downward and toward the drum the lower ends of the bars H' H', which latter previously to experiencing any pull whatever from the cords had lain nearly parallel to and alongside each other, like the blades of a closed pair of scissors. As the cords continue to pull the bars swing out and form, with each other, the contour of the letter X, like a pair of scissors when opening, and the more the cords are wound up and pulled the taller does the X become. Coupled by pins I' I' to the outer extremities of these bars are two other bars J' J' exactly like them and, like them, balanced, crossing each other, and pinned together at their centers. Two other exactly-similar bars J² J² are in their turn coupled by pins to the outer ends of the bars J' J' and are also balanced, pinned together, and placed across each other at their centers in the same way, and so on according to the number of pairs of these bars which it may be intended to use, each pair when opening out forming an X. It is at once evident that when these X-bars or lazy-tongs are shut up they occupy a height only a fraction of that which they reach when opened; also, that by turning

any one or all of the disk-wheels V' the wheels and shafts therewith combined, as described, will be caused to open out very rapidly, all the X-bars moving at once, and that the upper ends of the last pair of bars will rise very fast.

Each bar Jⁿ Jⁿ of the topmost pair has only half the length of its predecessors, for reasons which can be seen by consulting the drawings. The pins I' I' through the lower ends of the first pair are just long enough to couple the bars together. All the other end pins through these X-bars are long, extending across the previously-mentioned square parallel with its sides, so as to tie together each pair of bars with the similar pair opposite to it. Also these long pins are offset, those lying across the machine being shown offset upwardly, while those parallel to the length of the machine are offset downwardly. This enables these pins to move over each other without contact. The middle pins K' K' through the X-bars are straight and pass through octagonal bands L', placed outside the bars, as shown in Figs. 1 and 3, having nuts screwed on them outside of said bands, so as to confine them. Also said middle pins extend inwardly to and through the upright flanges of the center plates M', (shown edge-wise in Fig. 1 and in plan in Fig. 3,) there being jam-nuts screwed on these pins against both sides of said flanges, so as to hold them firmly. These long pins, with the nuts, octagonal bands, and the center-plates, are intended to stiffen and brace the four sets of X-bars together, so as to prevent them from canting, spreading sidewise, or bending inwardly. The topmost octagonal band, (see Fig. 3,) through which the bar-pins Kⁿ Kⁿ pass, like those below, also has diagonal truss-rods N' N' through it, crossing the octagon between the pins and inclined at an angle of forty-five degrees to them and also, like them, passed through the center-plate upright flanges and held firmly thereto by jam-nuts screwed on the rod ends against the sides of said flanges.

Laid upon the top edge of and secured to the band and to its long pins and truss-rods, but not covering its center plate, is a floor of light but strong wire-cloth, upon which men can stand, and on this floor is fastened a circular turn-table track O' O', concentric with the center plate. (Shown in dotted plan outline in Figs. 3 and 4 and in edge elevation in Fig. 1.) A turn-table (shown in outline in side elevation in Fig. 1 and in plan in Fig. 4) travels around over this track, having supporting-wheels rolling thereon and a vertical wire-cloth railing secured almost entirely around its edge. This railing has a gap-opening (shown in Fig. 1) through which light horizontal telescoping gangways P' P' P² P², &c., (shown in end elevation in Fig. 1 and in plan in Fig. 4,) may slide out or in. These gangways are light steel frames made of pipe or angle bars, floored with wire-cloth, and having upright wire-cloth railings on the

side, like those of the turn-table. Three of them are shown in the drawings; but more may be used, if desired. They are short enough to be all contained within the contour of the turn-table when slid in and are to have such widths that each shall slide freely within and upon the next widest one. When pushing them out, the widest is to go first, then the next widest, and so on, each gangway moving up to a stop, which prohibits its further passage in that direction. These gangways and the turn-table fulfil a very important mission, being intended, when raised high enough, to afford a passage-way between the latter and a convenient window, door, roof, or other available portion of a burning building. When the machine is placed near a conflagration, by turning the crank-handles the turn-table, with the men stationed thereon, can be quickly raised up to the desired height within the range of the machine's capacity. Then the turntable having been rotated to the proper position, the gangways can be slid out, so that the one reaching farthest can land its end within, near to, or over the endangered building. Persons can then escape over the gangways from the burning structure to the machine, and can thereby be promptly lowered, so as to pass easily and safely to the ground. Also, if hose-clamps are secured on the machine, hose can thereby be raised and carried, if necessary, over the gangways directly to the fire. A double hose-reel can, furthermore, be mounted on the machine, around one portion of whose drum a line of hose can be wound, with its nozzle resting over the turntable, and in this way as the table rises the hose rises with it and is unwound from the reel. A second line of hose, coupled by flexible connections with the first, can be wound around the other portion of the drum, which turns independently of the first and can be unwound and have its outer end promptly connected to another line of hose or to an engine or to a hydrant, thus making of the machine a hose-tower.

This machine is intended to combine a maximum of strength with a minimum of weight, being principally made up of light channel, steel bars, pipe, thin plates, and wire-cloth, no wood or other combustible materials whatsoever being used in its construction. The side frames, instead of being offset upwardly at the rear, as shown, may be straight and hung under the back axle instead of being bolted over it. If so desired, six or more sets of X-bars, with their machinery, instead of four, can be employed. The screw-gearing exhibited, while powerful and sufficiently quick in its action, enables the turn-table to stop and be held at any height desired within the range of the machine, and instead of the cords G' G' additional screw-gearing can be used to draw down or thrust upward the X-bars. By properly proportioning the length and number of these bars the turn-table can

be raised to a very great height, and a second and somewhat shorter set of X-bars, with their machinery, instead of a turn-table, can surmount this machine at its top, so as to nearly double its height and its lifting capacity. Its range is intended to be from one hundred to two hundred feet. Hence the necessity of having it stand level and firm when in service, and for this provision has been made, as has been shown.

The utility of this machine is not limited to fire-department service. Large sizes of it can be permanently stationed in stores, shops, factories, the holds of ships, or other like situations for the purpose of raising or lowering heavy merchandise.

In army service this machine could be made effective in various ways. If concealed from an enemy's observation, men could be stationed upon it raised up in the air to take observations with telescopes or exchange signals with distant parts of the army by means of lights or other apparatus, and if an iron or steel shield be mounted upon its top men stationed behind it and armed with quick-firing light long-range guns could make effective war on the enemy's sharpshooters. As the machine could raise and lower its load very quickly and could be hauled from one location to another, the enemy's batteries would find it difficult to get its range, so as to destroy or cripple it.

As a substitute for the cords G' G' wire cables or steel tested chains of suitable design may be employed, and if it is desired to use steam, compressed air, water, gas, or other motive agency in working this machine it may be effected by substituting belt or friction pulleys for the disk-wheels V', so that by belts or friction contact from the motor said pulleys, and by their aid the whole machine, may be operated.

It is evident that other slight changes than those above mentioned might be made in the form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but,

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a base-frame, the ends of which are offset and in a higher plane than the central portion, front and rear axles beneath said ends, of jacks connected with the lower central portion of the frame.

2. The combination with a base-frame, the ends of which are offset and in a higher plane than the central portion, front and rear axles beneath said ends, of jacks having slidable lateral connection with said lower central portion of the frame.

3. The combination with a truck and platform, of lazy-tongs for connecting said platform with the truck and for raising and low-

ering the same, and rods connecting the lazy-tongs in opposite pairs; the rods of two opposite pairs having slidable connection with the rods of two alternately-opposite pairs.

5 4. The combination with a truck and platform, of lazy-tongs connecting the two for raising and lowering the platform and offset rods connecting the lazy-tongs in pairs, the rods of one pair having slidable connection with
10 the rods of alternate pairs.

5. The combination with a truck-frame having a depressed center and elevated at the front and rear ends, and a platform, of lazy-tongs interposed between and connecting the
15 platform with the depressed center of the truck for raising and lowering the platform.

6. The combination with a truck-frame, consisting of side bars and cross-bars secured together in rectangular relation with one another, of a platform and four sets of lazy-tongs one set connected with each side of this rectangular frame and cross-rods connecting
20 opposite sets in pairs, the rods of one set having slidable connection with the rods of the alternate sets.
25

7. The combination with a truck-frame and platform of lazy-tongs interposed between and connected with the truck and platform, center plates, octagonal bands, middle pins
30 secured to said center plates and octagonal bands and with which the lazy-tongs have pivotal connection, and truss-rods also con-

necting the center plates with the octagonal bands.

8. The combination with a truck-frame; 35 cross-bars and standards secured to the frame and cross-bars, of lazy-tongs pivotally connected with said standards, a platform supported by the lazy-tongs, center plates, outer bands, pins connecting said plates and bands 40 and cross-rods connecting the lazy-tongs in opposite pairs, the rods connecting two pairs crossing.

9. The combination with a truck-frame, a platform and lazy-tongs interposed between 45 the frame and platform, of several radially-disposed shafts intergeared at their inner ends and having drums at their outer ends, flexible connections between the lazy-tongs and these drums and a worm-gear connected 50 with each shaft for driving and locking it, said worm-gears having windlasses at their outer ends.

10. The combination with a truck, a platform and lazy-tongs connection between the 55 truck and platform, of a revolving tower which turns upon the platform, said tower having an open center and an extension-gangway having slidable connection in the open center of the tower.

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In presence of—

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