

No. 645,645.

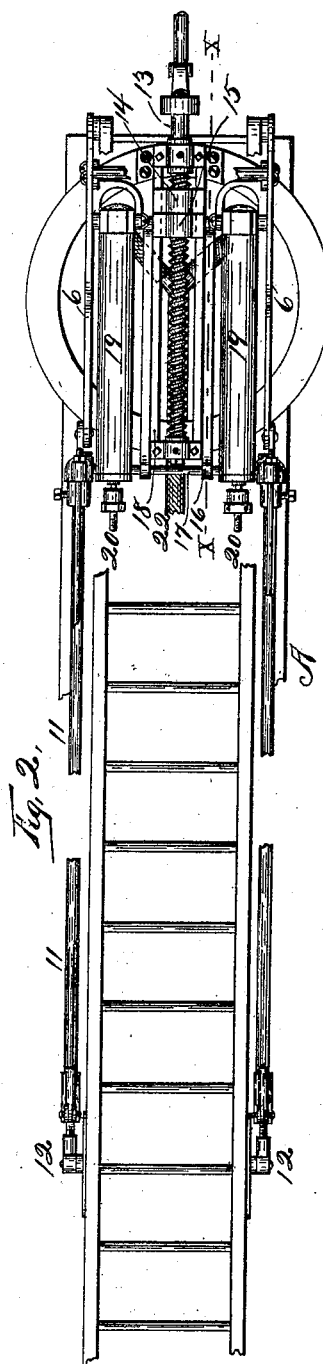
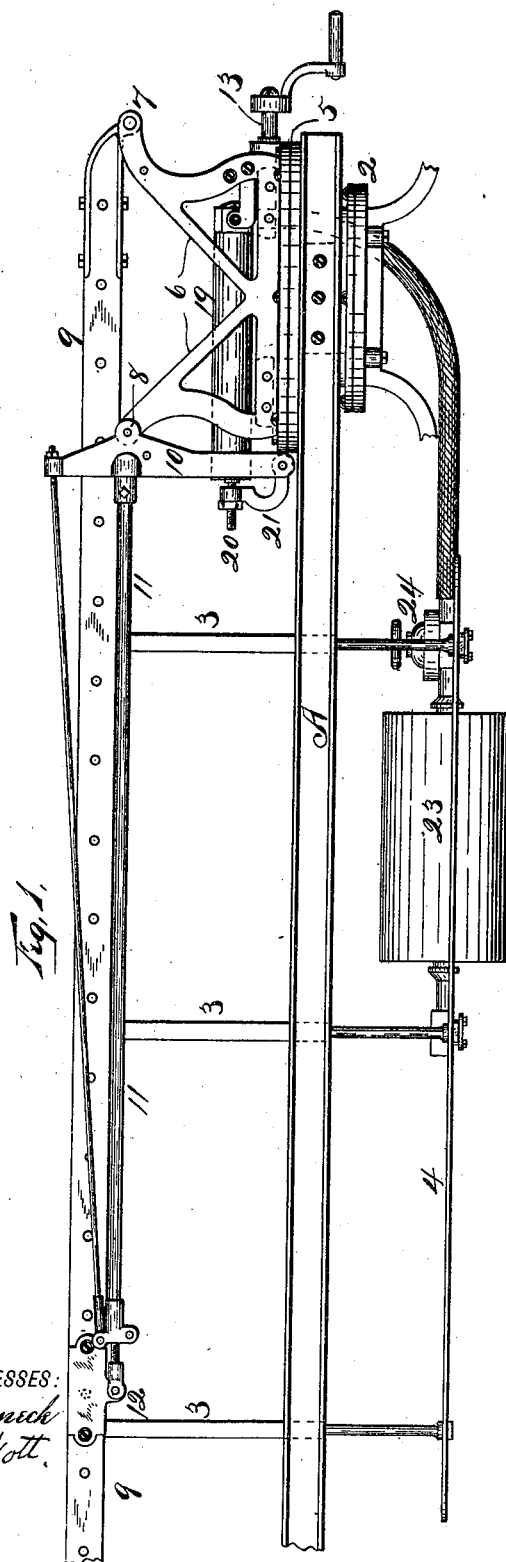
Patented Mar. 20, 1900.

J. KAISER.
AERIAL APPARATUS.

(Application filed May 13, 1899.)

(No Model.)

3 Sheets—Sheet 1.



BY
Smith & Brinson
ATTORNEYS.

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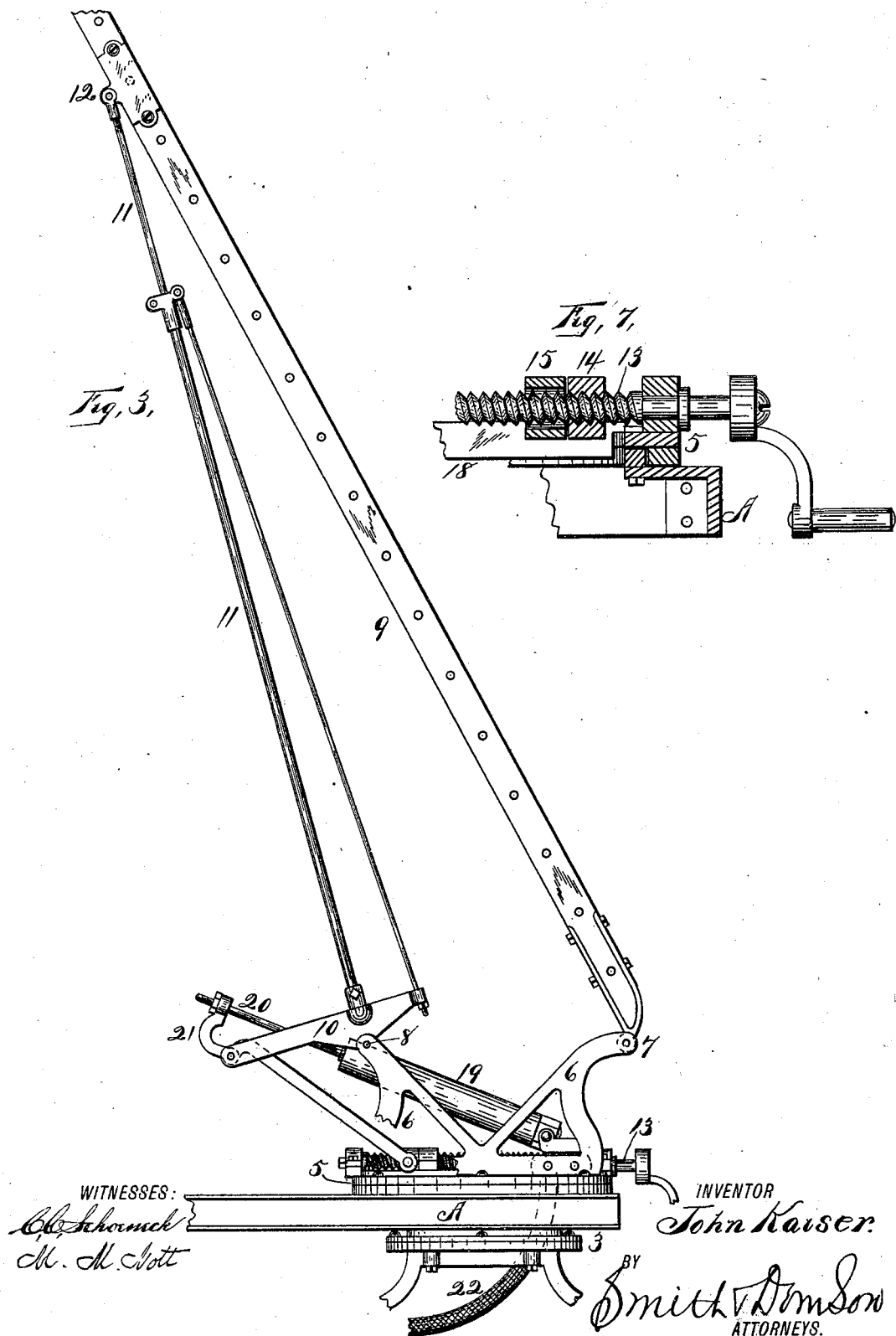
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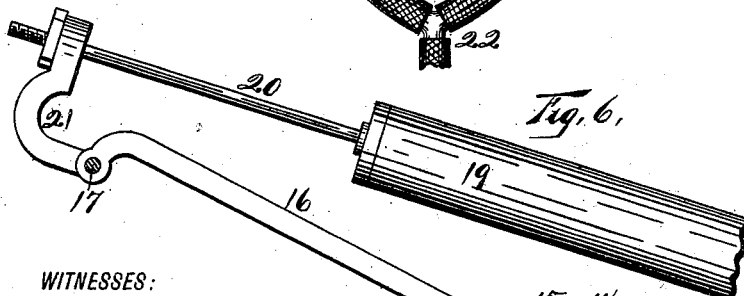
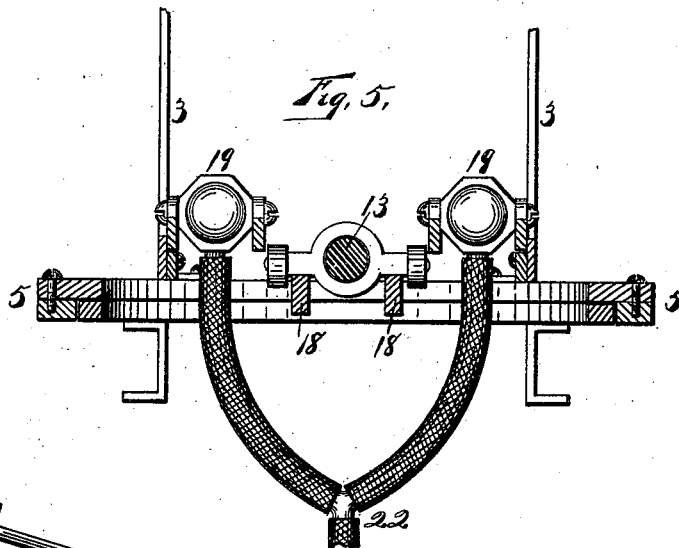
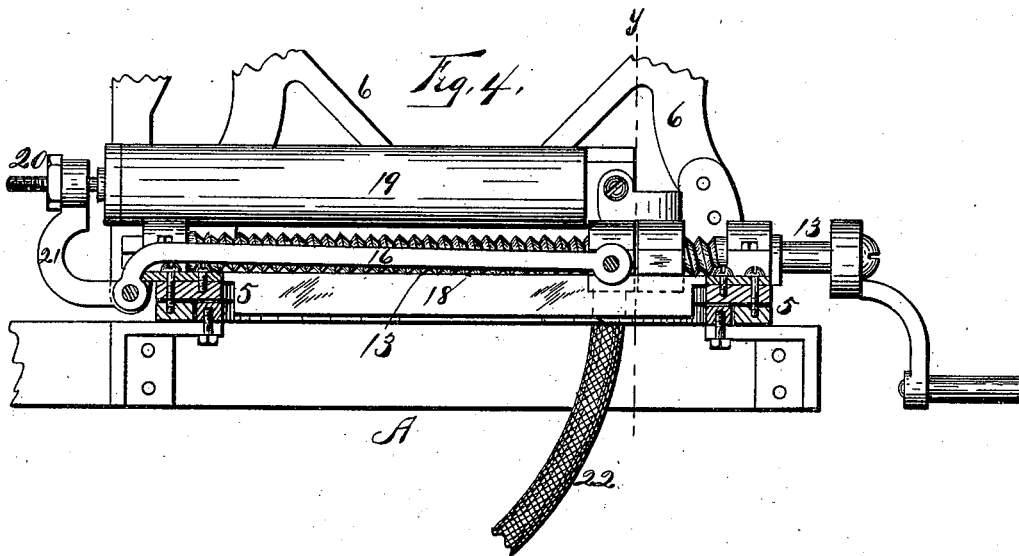
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3 Sheets—Sheet 3.



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE

JOHN KAISER, OF SENECA FALLS, NEW YORK.

AERIAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 645,645, dated March 20, 1900.

Application filed May 13, 1899. Serial No. 716,629. (No model.)

To all whom it may concern:

Be it known that I, JOHN KAISER, of Seneca Falls, in the county of Seneca, in the State of New York, have invented new and useful Improvements in Aerial Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to hook-and-ladder trucks or apparatus in which a ladder, water-tower pipe, fire-escape, or other device is elevated from substantially a horizontal position.

My object is to provide a means by which an aerial ladder, water-tower pipe, fire-escape, or other device can be easily and quickly elevated for use. It comprises the application of the elevating power or force to the ladder at a fixed point forward of the turn-table and intermediate to the length of the ladder, said force being applied by the introduction of a liquid or fluid into an oscillating cylinder (or cylinders) having its piston-rod connected to a pivoted bell-crank, the rear arm of which is connected to a fixed point upon the side of the ladder, said rear arm consisting of telescopic sections, whereby the power applied to the cylinder-piston is exerted as a lifting force upon the ladder through said bell-crank, the rear arm or lifting member thereof elongating as the ladder arises.

My invention consists in connecting the rearward arm of a bell-crank or angular lever to a ladder and applying power to the other arm thereof, whereby said rearward arm exerts a lifting force upon the ladder at a point rearward of its foot-mounting and of the separate crank-mounting, and in the several other elements specifically set forth in the claims. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of sufficient of a hook-and-ladder truck to illustrate my invention, the running-gear being also omitted and showing the ladder in its normal position. Fig. 2 is a top plan of the same, some of the members being broken away. Fig. 3 is a side elevation of Fig. 1, showing the ladder raised. Fig. 4 is an enlarged sectional elevation on line X X in Fig. 2. Fig. 5 is a section on line Y Y in Fig. 4. Fig. 6 is a detail in elevation

of an elevating-cylinder, showing the piston extended, its connection to the traveling slide, the hand-screw, and the traveling nut thereon. Fig. 7 is a sectional detail of the hand-screw, the traveling nut, the traveling slide, and the weight-supported bar across the turn-table of the ladder.

A is a suitable main frame of the vehicle, 2 is a suitable fifth-wheel device, 3 3 are suitable standards on said frame, 4 is a suitable footboard suspended below said frame, and 5 is a suitable turn-table upon said frame, and as these several parts are all of ordinary construction no specific description of them is here necessary further than to hereinafter point out specifically the novel features added thereto. Upon this turn-table parallel frames 6 are mounted, as standards or other suitable device for elevating the bearings 7 8 above it. In the bearings 7 the foot of the ladder 9 is journaled, here illustrated as single, but which may be of any suitable sectional or extension type.

In the bearings 8 bell-cranks 10 are journaled, having their rear arms 11 suitably hinged or otherwise connected to bearings 12, secured to the ladder, said arms being sectional, one section being tubular and the other a suitable rod fitting loosely into it, said rod being connected to said bearing, said sections together constituting a reinforced and extensible ladder-lifting bar, variable in length, and by which the lifting force is applied to the ladder at a point more or less distant from the foot and rearward of both said foot and of said bell-crank bearing 8, ordinarily at a point nearly, if not actually, midway of the length of the ladder.

Upon the turn-table a screw 13 is suitably journaled, upon which a traveling nut 14 is mounted to be traversed by the rotation of said screw. A traveling slide 15 is loose upon said screw and is connected by connecting-rods 16 to a cross-bar 17, connecting the lower ends of said bell-cranks, whereby when said screw is driven in one direction said slide and links swing said bell-cranks and raise the ladder. Said slide normally rests upon and is guided by parallel ways 18 across said turn-table, said ways operating to sustain the load of the weight of the ladder when it is raised, and thus relieve the screw therefrom and pre-

vent its becoming bent or binding in its bearings, said nut also bearing on said ways.

Upon the turn-table one or more oscillating cylinders 19 are mounted, having their front ends suitably pivoted, and 20 are suitable piston-rods, each having a suitable head within the cylinder, and these piston-rods are connected by suitable links 21 either to the bell-cranks or to said cross-bar 17, connecting them, whereby when force, as compressed air, is applied to said piston-heads, as by means of a hose 22, connecting a storage-reservoir 23 to the front ends of said cylinders, the lower ends of said bell-cranks will be forced rearward, raising the ladder by the swing of said bell-cranks, and at the same time the lifting-bar (crank-arm) will be elongated proportionately. This bell-crank bearing on the ladder can be made by any good mechanic in the form of a slide to traverse the side of the ladder in case it is desired to make this lifting-bar in one piece. A suitable valve 24 regulates the power applied. When the ladder is thus raised, the slide will be drawn away from the traveling nut and may remain so; but for greater security said nut can be readily run up to it, when the lifting force can be removed from said cylinders.

It will be seen that as long as the air-pressure remains in the cylinder the lifting-bar will, as a brace, resist the bending of the ladder, as also when the traveling nut is run up against the slide and the air-pressure is removed. A truss-stay 25 resists the flexing of the lifting-bar.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with an aerial apparatus supported at one end, of an extensible lifting-rod connected to said apparatus at a fixed point, and means to apply power to said rod at one end whereby its other end exerts a lifting force to raise said apparatus from substantially a horizontal position.

2. The combination with an aerial apparatus having one end supported, of a bell-crank one arm of which is automatically variable in length and is connected to said apparatus, and means to apply power to the other arm of said crank whereby said bell-crank exerts a lifting force upon said apparatus at said point of connection.

3. The combination with a turn-table front and rear bearings erected thereon, and a lad-

der mounted upon the front bearing of an angular lever mounted upon the rear bearing and having its rearwardly-extending arm connected to said ladder rearward of its pivot-mounting, an oscillating cylinder, a piston-rod therein, a link connecting said piston-rod to the downward arm of said lever and means to apply force to said piston-rod within said cylinder, whereby said lever is rocked, and the ladder is raised.

4. The combination with an apparatus to be raised upon one end, of a bell-crank having one arm sectional and automatically variable in length and connected to said apparatus, a cylinder having a piston connected to the other arm of said bell-crank, and means to apply power to said piston to rock said bell-crank and raise said apparatus.

5. The combination with an apparatus to be raised upon one end, and a bell-crank having one arm connected to said apparatus, of a screw, a traveling nut thereon, a slide loose upon said screw, and a link connecting said slide to the other arm of said bell-crank.

6. The combination with an apparatus to be raised upon one end and a bell-crank having one arm connected to said apparatus, of a screw, a traveling nut thereon, a slide loose upon said screw, ways upon which said slide has a bearing, and a link connecting said slide to the other arm of said bell-crank.

7. The combination with an apparatus to be raised upon one end and a bell-crank having one arm connected to said apparatus, of a screw, a nut thereon, a slide loose upon said screw, ways upon which said slide has a bearing, a link connecting said slide to the other arm of said bell-crank, and a cylinder having a piston connected to said bell-crank arm.

8. The combination with a turn-table, an apparatus thereon to be elevated upon one end, and an elevating device, of a way across said turn-table upon the line of the length of said apparatus, a slide traversed upon said way actuated by the elevating device, and means to lock said slide, whereby said ways will support said apparatus in an elevated position.

In witness whereof I have hereunto set my hand this 26th day of April, 1899.

JOHN KAISER.

Witnesses:

C. W. SMITH,
HOWARD P. DENISON.