2 Sheets—Sheet I.

R. GILCHRIEST.

FIRE-ESCAPE.

No. 191,953. Patented June 12, 1877.

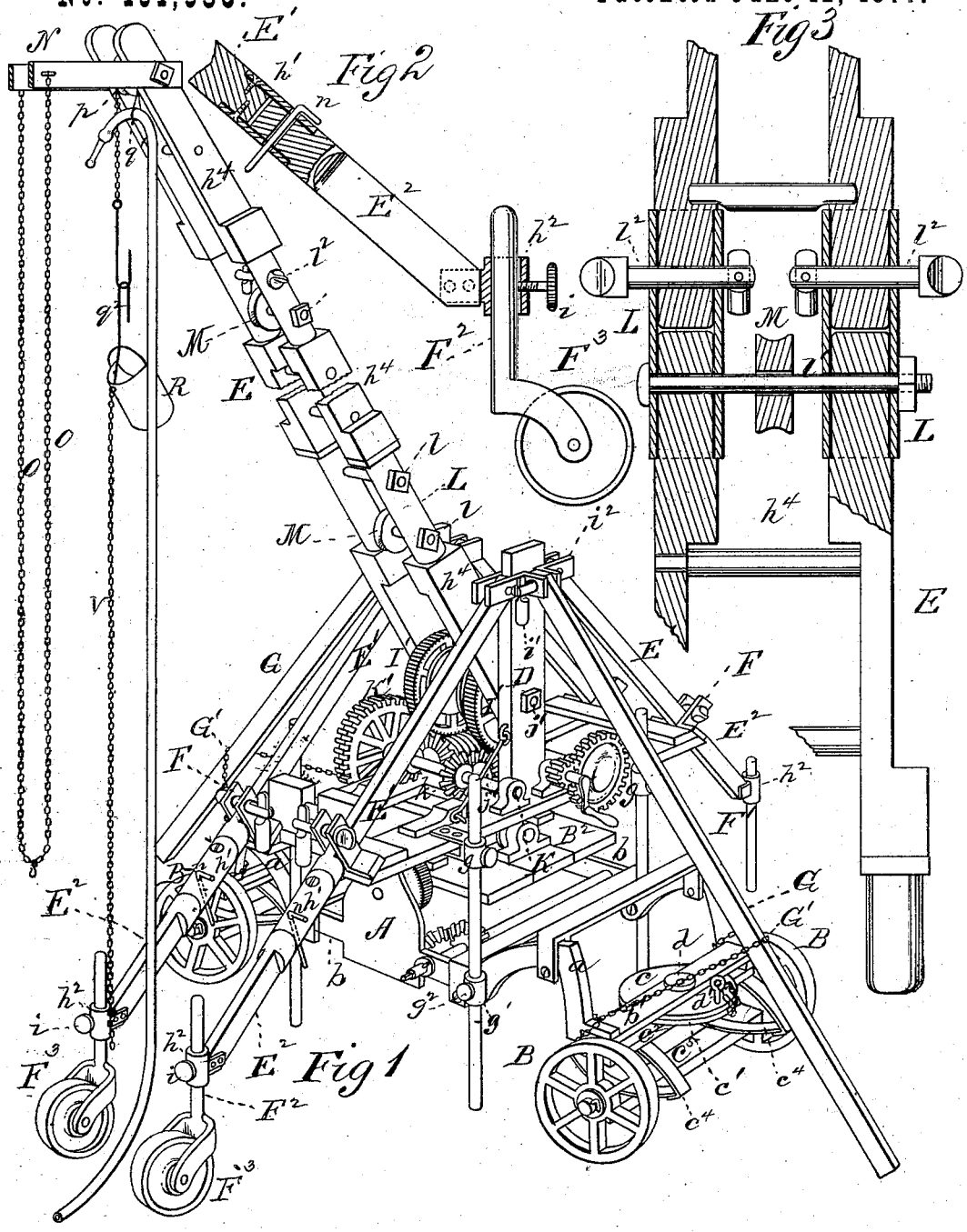

Fig 1

Fig 2

Fig 3

WITNESSES

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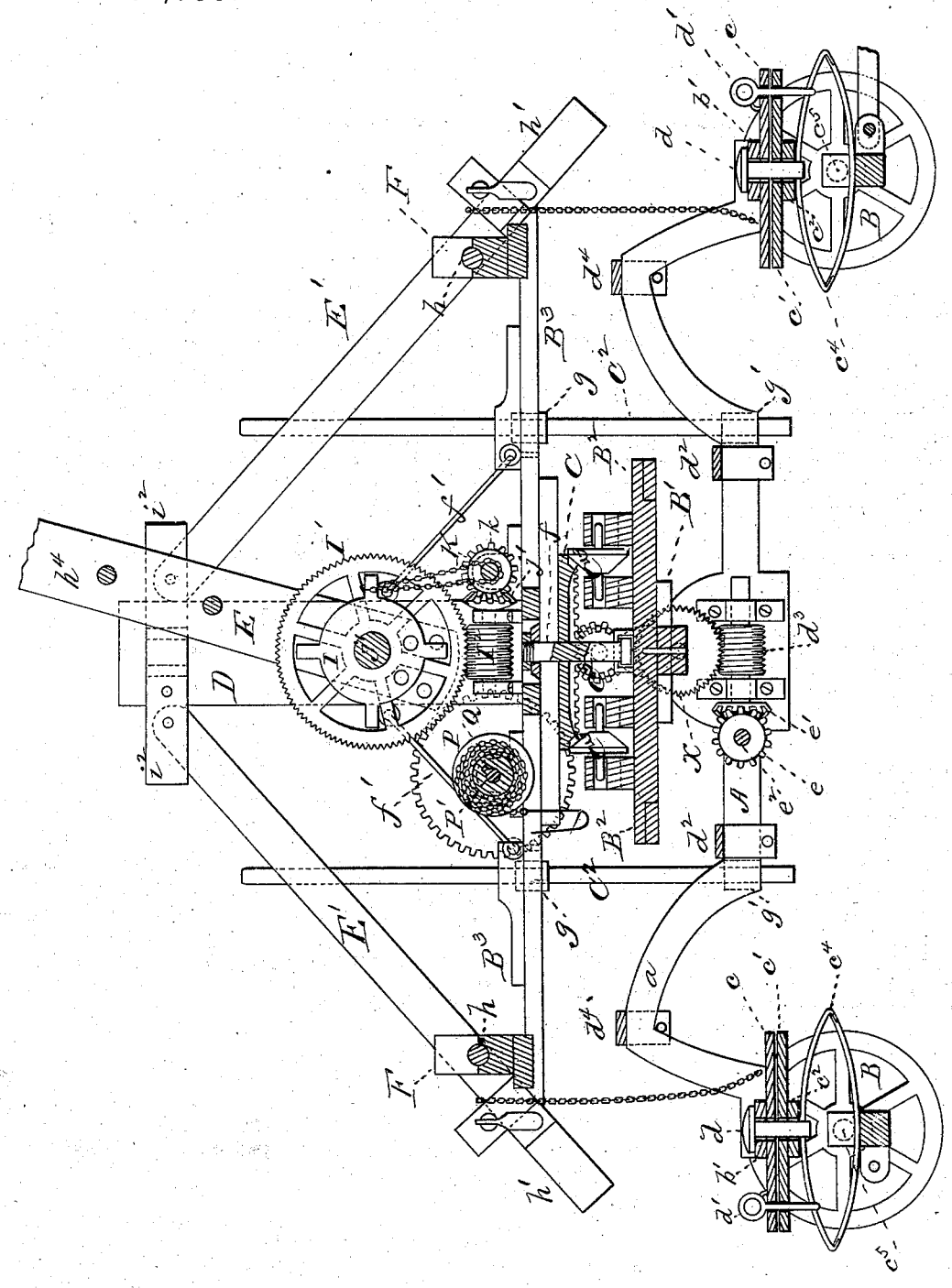

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UNITED STATES PATENT OFFICE.

ROBERT GILCHRIEST, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **191,953**, dated June 12, 1877; application filed March 10, 1877.

To all whom it may concern:

Be it known that I, ROBERT GILCHRIEST, of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and valuable Improvement in Ladders; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

This invention has relation to improvements in portable ladders for firemen's use, and for other purposes; and the nature of the invention consists, first, in an iron truck-frame, having adjustable transverse braces, upon which the ends of a tilting sub-platform will rest, and by which said tilting will be controlled; second, in combining with a truck having a tilting sub-platform and a gear-wheel on the journal thereof, a worm journaled in the truck and engaging with the said gear, and a mechanism for actuating the said worm; third, in combining with a sub-platform and an upper platform, carrying a ladder apparatus, and vibrating horizontally in relation thereto, a master-wheel upon the under side of the latter, a gear-wheel upon the former engaging therewith, and supporting rollers intermediate the two platforms, whereby the ladder-platform may be turned at any angle to the truck, and will be properly supported at all times; fourth, in combining with a ladder-platform and a tilting sub-platform carrying the same, the inclined end braces, detachable sections socketed into the lower ends of the same, adjustable rods at the ends of the said sections at one end of the frame, and adjustable rollers at the other; fifth, in combining a truck of a fire-ladder and a vibrating ladder-platform mounted thereon.

In the annexed drawings, the letter A designates the truck of my improved fireman's ladder, having at each end an arched portion, *a*, under which the transporting-wheels B will be received in turning short. The truck-frame is composed of two parallel reach-bars, *b*, rigidly braced at each end by bars *b'*, at the middle of the length of which is a disk, *c*, which is one section of the fifth-wheel. The other sections, c^1, of the fifth-wheels are bolted to strong metallic cross-bars c^2, which are supported by and secured to the springs c^4 at each end, the latter being firmly secured at their under sides to the axles c^5 of the transporting-wheels B. Sections $c\,c^1$ are connected by the usual king-bolts *d*, and either fifth-wheel may be locked against vibration by means of a pin, d^1, passing through registering perforations in the disks $c\,c^1$.

By this means the truck, in taking position before a burning building, can be controlled from either end, and is thus rendered independent of any obstructions in the roadway, which, without backing, would constitute an insurmountable barrier.

B^1 represents a rock-shaft or plate journaled in the reaches of the truck, to which a sub-platform, B^2, is rigidly secured. This platform is of less width than the truck, and vibrates freely in the length thereof. The extent of this vibratory movement is controlled by means of strong metallic bars d^2, extending across the truck from reach to reach, and adjustable to or from the ends of the sub-platform aforesaid. Upon this platform is mounted the whole superstructure of the latter, and it is operated to assume a horizontal position by means of a worm-screw, d^3, journaled in the truck sides, and engaging with a gear-wheel upon the journal of the rock-shaft or plate B^1. Worm d^3 is actuated through the medium of beveled gears $e\,e^1$, a shaft, e^2, and a suitable crank-lever. The truck being upon a hill-side, this property will be indispensable.

B^3 represents a horizontally-vibrating platform, pivotally connected with platform B^2 by means of a center bolt or pin, *f*. This bolt also extends to, and is connected with, the rock-shaft aforesaid. Platform B^3 has upon its under side a master-wheel, C, into which a gear-wheel, C^2, meshes. The latter is actuated to swing the ladder-carrier by means of a crank-arm applied upon the end of the shaft of gear-wheel C^2, and the carrier is supported during such operation on rollers C^3, suitably journaled on platform B^2, and bearing either against the master-wheel or the under side of the carrier. This latter platform has at each side vertical sockets *g*, arranged at the four angles of a square, and registering with similar sockets g^1 upon the truck. Through these

sockets pass strong metallic bars, which, when clamped by set-screws g^2, the carrier-platform being in position for transportation, with its length in the length of the truck, will prevent the said platform from swaying from side to side, or serve as supports, as shown in Fig. 1, when the length of the carrier is at right angles to that of the truck.

Upon the upper platform are two spaced uprights, D, between which the ends of the lower section of the ladder E are applied. These uprights are braced, by suitable iron rods f', to the platform. E^1 represents suitable inclined braces, pivoted at one end to the upper extremity of the uprights, and extending beyond the ends of the carrier through clips F, into which they are secured by means of knuckle-pins h. Upon the lower ends of these braces sockets h^1 are rigidly secured, into which are received extension-arms E^2. These arms are secured to the braces by means of pins n, passing through perforations, respectively, in the socket and said arms, and they fall short of reaching the ground. These arms are readily detachable, and are provided upon their free ends with vertical sockets h^2, having each a set-screw, i. F^1 represents rigid rods, passing through the sockets h^2 at one end of the platform, and clamped in proper position for supporting the same by the set-screws aforesaid, and F^2 the shanks of two strong metallic casters, F^3, which support the remaining end of the carrier-platform, and materially aid in swinging the same. These casters may be used at both ends of the platform, or the rods aforesaid may be employed in those positions.

The rods and casters being vertically adjustable, no difficulty in supporting the standards, owing to inequalities of the soil, will be met with, and, the extensions being detachable, they will not be an obstacle to transportation.

To support the standards laterally I employ strong wooden props, G, pivoted, by means of knuckle-pins i^1, to a suitable hinge-plate, i^2. These rods at their free ends bear against the ground, and will adapt themselves to inequalities in the soil automatically, and they are prevented from loosening their hold thereon by means of a chain, G′, extending around the said stays or props, and secured at both ends to the truck.

The ladder E is composed of several sections, h, detachably secured to each other. The lower section is connected to the uprights by means of a metallic rod, j, extending through the lower end of the ladder. Upon this rod, between the uprights, is a sliding reel, I, upon which is rolled a section or sections of hose, and at each side thereof a gear-wheel, I^1, which is keyed upon the rod or shaft and rigidly secured to the rails of the lower section h^1. Each of gears I^1 meshes with a worm, I^2, arranged in bearings at each side of the platform, to which motion is imparted for raising or lowering the ladder by means of suitable gears j' upon the worm-shafts, which engage with gears k upon a transverse shaft, K, to which motion is imparted directly or through the medium of meshing gears K^1 K^2, and suitable crank-worms I^2 and gears I^1 being at each side of the ladder, and being actuated by the same mechanism, the ladder is prevented from twisting, warping, or being otherwise racked.

The ladder-section h has upon its upper ends strong metallic sockets L, into which the rabbeted ends of the sections next above are adapted to be received. The sockets L are secured in place by means of bolts l, which pass through the said sockets from side to side, and are secured into position by nuts tapped on their projecting ends. The upper sections are secured to the lower ones by means of similar bolts l^1, similarly applied, or by means of knuckle pins or bolts l^2. Bolts l will each be provided with a sheave or pulley, M, which is loosely applied thereon, and may be adjustably placed in any desired position between the rails of the ladder-sections, to correspond with the position of the reel aforesaid, which is also loosely applied upon its shaft, and has a like adjustment thereon.

N represents legs or arms loosely pivoted to the upper ends of the rails of the upper section, from which chains O depend.

These legs may be used as guys to steady the ladder by fixing their free ends upon a ledge or sill of the burning building, and the chains attached thereto may be drawn close to the windows below the top of the ladder by persons on the ground, so that by clinging to the chains the occupants of the lower stories may lower themselves to the ground, or be drawn inward to the ladder. P represents a winding-drum, sliding freely upon a spline, r, on a shaft, P′, having its bearings on the carrier-platform, and held against rotation by the said spline. The drum has lateral adjustment on its shaft, in order that its position may be changed to suit that of the sheaves on the ladder-sections aforesaid. Upon this drum is secured, in any suitable manner, a chain or rope, Q, which, when in use to raise up the hose or safety-bucket, will pass up over the sheaves aforesaid, round a pulley, p, at the top of the upper section of the ladder, down to the ground. The hose-section is provided with a hook, q^1, by means of which it is engaged with chain Q, and it is raised by rotating the drum through the medium of a gear-wheel, s, upon the drum-shaft, and the gear-wheel s' meshing therewith, and actuated by a suitable crank. The hose being raised, its hook q^1 is engaged over the upper rung of the ladder, at one side thereof. Should the safety-bucket be needed to rescue the occupants of the house, the drum and sheaves are shifted to the opposite side of the ladder, chain Q is lowered, and its end engaged with the bail of the bucket R. It is then hoisted to the desired point, as aforesaid, for the hose. Bucket R is provided with a strong metallic hook, q^2, by means of

which it may be hung upon the upper rung of the ladder and carried up as the said ladder is raised. It is also provided with a rope or chain, V, by means of which it may be steadied in ascending or descending with its load.

The upper platform may be also sustained at its front and rear ends by means of adjustable transverse metallic braces d^4, identical in construction with the braces d^2 aforementioned, but applied to the truck-frame at its arched portions *a*.

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

1. In combination with a tilting platform, the adjustable transverse braces d^2 of the truck-frame, substantially as specified.

2. The combination, with a truck, having a vibrating platform journaled therein, of a gear-wheel on the journal of the platform, a worm-screw journaled in the truck engaging therewith, and an actuating device for the screw, substantially as specified.

3. The combination, with a sub-platform and an upper platform, vibrating thereon horizontally, a master-wheel upon the under side of the latter, a gear-wheel upon the former meshing therewith, and supporting rollers between the platforms, substantially as specified.

4. The combination of the inclined end braces E^1, having extension-arms E^2, and adjustable supporting-legs F^1, with the carrier-platform and the vibrating and adjustable sub-platform supporting the carrier, substantially as specified.

5. The combination, with a ladder-platform and a tilting sub-platform carrying the same, of the inclined end braces, the detachable end sections socketed into the ends thereof, the sockets upon the lower ends of said sections, the adjustable rods or casters fitting in said sockets, and adjusting set-screws, substantially as specified.

6. The combination, with a ladder-truck, a tilting platform journaled therein, and a horizontally-vibrating ladder-carrying platform mounted thereon, of a king-bolt extending through both platforms, and secured to the tilting or lower one, substantially as specified.

7. In combination with the standards D, ladder E, and shaft g^1, the lateral gears I^1 I^1, secured to said shaft and side rails of the ladder, the worm-screws I^2 at each side thereof, the shaft K having, bevel-gears *k*, and an actuating mechanism for rotating said shaft, substantially as specified.

8. The reel I, sliding laterally on shaft g^1, and the winding-drum P, laterally adjustable on its splined shaft, in combination with the ladder-sections, having laterally-adjustable sheaves or pulleys, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ROBERT GILCHRIEST.

Witnesses:
EDW. KAISER,
W. G. BAIRD.