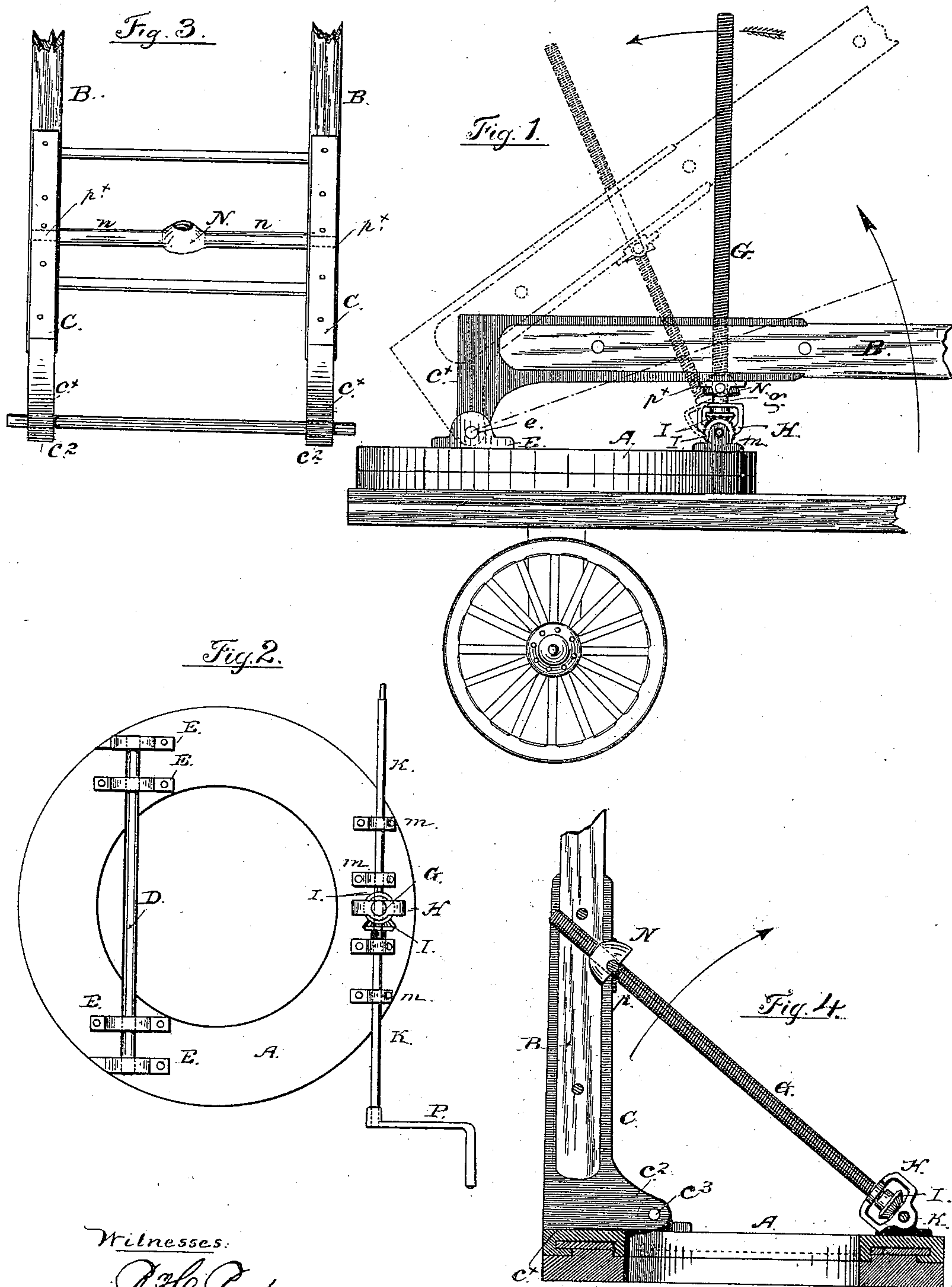


(No Model.)

H. T. HAYES,
FIRE EXTENSION LADDER.

No. 396,564.

Patented Jan. 22, 1889.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY T. HAYES, OF OAKLAND, CALIFORNIA.

FIRE EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 396,564, dated January 22, 1889.

Application filed May 3, 1888. Serial No. 272,705. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. HAYES, a citizen of the United States, residing in the city of Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Fire Extension-Ladders; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings, that form part of this specification.

This invention relates to improvements in firemen's ladders—such as are mounted on wheeled trucks and, by means of lifting mechanism, are raised, extended, and held in position at various angles.

The improvements constituting my invention consist of certain novel construction and combination of hinge-joints and lifting mechanism, substantially as hereinafter fully described, whereby a ladder so mounted is quickly raised and securely held not only at an angle, but also in an upright or vertical position.

The nature of these improvements and the manner in which I have constructed, arranged, and applied the same are fully explained in the following description, in which the accompanying drawings are referred to by figures and letters.

Figure 1 of the drawings represents the front end of a ladder, truck, and turn-table with the lower end of the ladder attached to it and the lifting mechanisms applied in accordance with my present invention, the ladder being shown in full lines in horizontal position and in dotted lines at an angle. Fig. 2 is a top view of the turn-table and parts mounted thereon without the ladder. Fig. 3 is a front view of the lower end of the ladder, and Fig. 4 shows the position and the operation of the parts with the ladder raised and set upright on the turn-table.

The object of these improvements is, first, to enable the ladder to be brought and held securely in an upright position without danger of throwing over, under any weight it may be called upon to sustain; and, secondly, to facilitate the work of raising and lowering these ladders under conditions and situations

where the mechanism can not be readily worked—such, for instance, as in alleys, courts, and other narrow and confined quarters where occasion requires a ladder to be raised for use.

The wheeled truck and the turn-table A are of any suitable construction. On the lower ends of each of the rails or side bars, B B, of the ladder is secured a foot-plate, C, that is formed with a square end or bottom face, c^x , and a lateral extension or knuckle, c^2 , having an eye, c^3 , for a hinge-pin. These feet are bolted onto the ends of the rails with the square face or bottom substantially perpendicular to the plane of the ladder and with the knuckles toward the inner sides or center of the turn-table, so that they set closely to the face of the turn-table when the ladder is at horizontal position and come down to a bearing on the turn-table when the latter is turned upright. Suitable knuckles or bearing-blocks, E E, with eyes $e e$ for a pin, D, are formed on or secured upon the face of the turn-table at the front end, and the knuckles on the feet C are set into them to take the pin. This arrangement of the hinge-joint brings the ladder down quite close to the truck-frame and furnishes a strong connection in addition to its other feature of allowing the foot of the ladder to come down to a bearing directly upon the turn-table.

The lifting-screw G is attached at the head g^x by a swinging bracket-piece, H, to the top of the turn-table or the side opposite the ladder-hinge, on which point of attachment it is free to move in a vertical arc. By means of miter-gears I I the screw is connected with a shaft, K, set across the turn-table in boxes m and having the ends carried out beyond the sides of the truck and turn-table a sufficient length to take a hand-crank, P, that is used for turning the shaft. By these parts power is applied to the screw to raise and lower the ladder. The screw is set on line with the center of the ladder, so that it shall work midway between the side bars and thus have the weight of the structure distributed equally on both sides.

The nut N, by which the power of the screw is applied to the ladder is a screw-threaded

block having trunnions *n n* on the sides, that are of suitable length to extend from the middle space to the side bars. At these points they are journaled in boxes *p^x p^x* on the back 5 of the side bars, so that the nut is free to change with the angular movement of the screw in a vertical arc. The position of the nut is such that the screw stands about forty-five degrees or thereabout from the horizontal 10 when the ladder is upright, as this position secures ample power and resistance on the part of the lifting mechanism to hold the ladder. The size and position of the parts, however, will be determined by the size and 15 weight of the structure and will be arranged and applied as may be found advisable.

The hand-shaft is carried out to both sides of the truck, so that power can be applied at one side or the other, or to both sides at once; 20 and, under all conditions, the weight being equally disposed on the screw it turns rapidly and without binding in the nut.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a fireman's ladder, the combination of 25 a hinged ladder having its hinge or pivot located at one side of the ends or feet of the side bars and a lifting mechanism consisting of the screw-shaft capable of movement in a 30 vertical arc, the swiveled nut located in the center of the ladder or midway between the side bars and the power-shaft, constructed and arranged for operation substantially as set forth.

2. In combination, the fire-ladder mounted 35 on a turn-table, the centrally-placed lifting-screw, swiveled nut, and transverse power-shaft geared into said screw and adapted to apply power to the same from either side. 40

In testimony that I claim the foregoing I have hereunto set my hand and seal.

HENRY T. HAYES. [L. S.]

Witnesses:

C. W. M. SMITH,
W. N. KEMPSTON.