

Firemen's Ladders.

No. 144,958.

Patented Nov. 25, 1873.

Fig. 1

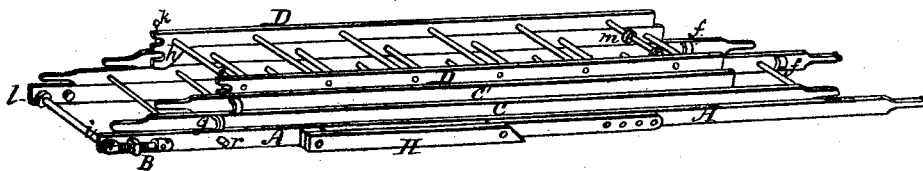


Fig. 2.

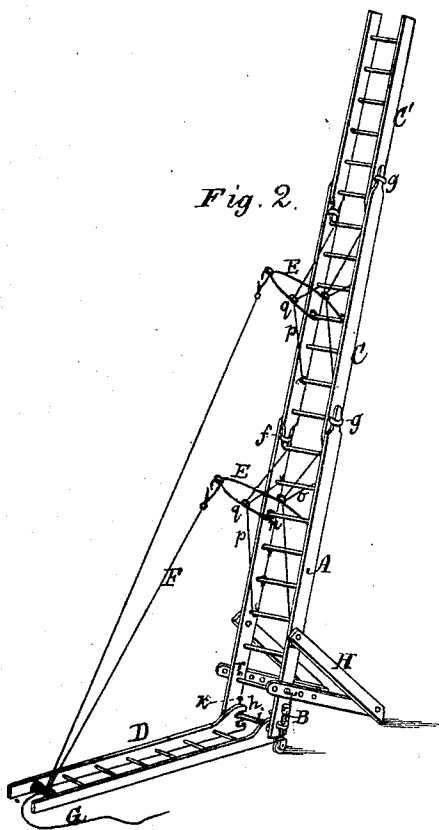


Fig. 4.

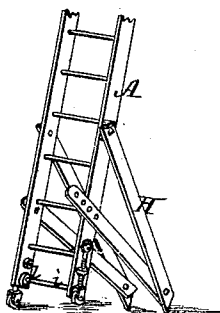


Fig. 5.

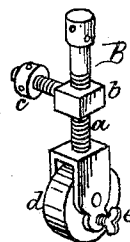
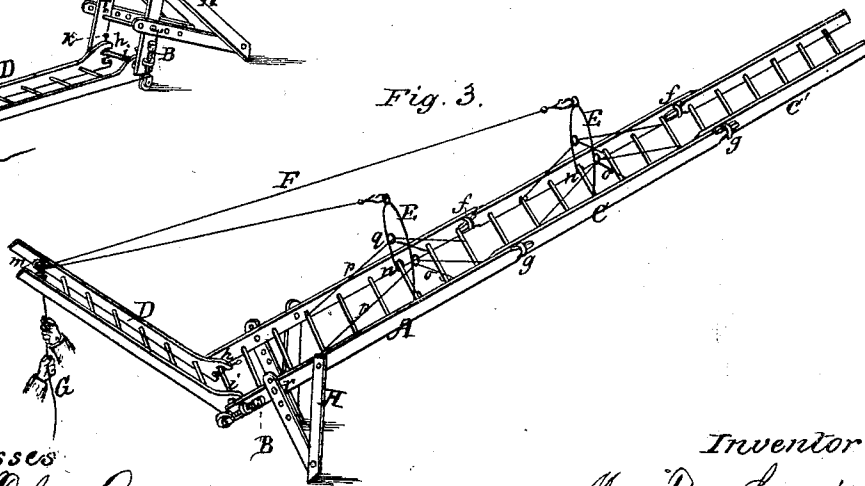


Fig. 3.



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IMPROVEMENT IN FIREMEN'S LADDERS.

Specification forming part of Letters Patent No. 144,958, dated November 25, 1873; application filed October 18, 1873.

To all whom it may concern:

Be it known that I, MARTIN CRONIN, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Fire-Ladders.

My improvements relate to that class of extensible ladders which are arranged for transportation upon the ordinary truck, and are provided with elevating-halliards and halliard-levers. My invention consists, first, in a novel combination of a lever-ladder and its accompanying requisite halliards with the ladder, whereby the latter may be rapidly and safely elevated, and, as the lever is also a ladder, it is susceptible of use as such for ordinary elevations, and occupies its space on the truck as an ordinary ladder, and does not unnecessarily add to the weight of the apparatus; secondly, in a novel combination, with the base of a ladder, of adjustable legs with caster-wheels, whereby the irregular surfaces or the sinking into the ground of either side of the ladder may be compensated for maintaining its proper equilibrium; thirdly, in combining with the halliard-links and the ladder side lines, so arranged that when the ladder is on the truck the links and side lines will fold down upon the rounds, and when the ladder is elevated and in use the links will so elevate said lines as to cause them to serve not only as braces for stiffening the ladder, but also as hand-lines for the use of persons on the ladder; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a true and accurate description of a ladder embodying my improvements.

Referring to the drawings, Figure 1 represents one of my ladders packed, as if mounted on the truck. Fig. 2 represents, in perspective, the same, elevated and in working position. Fig. 3 represents the same in the process of elevation. Fig. 4 represents, in perspective, a portion of the ladder, as if standing on uneven ground. Fig. 5 represents, in perspective, one of the adjustable legs detached from the ladder.

In all the figures, A denotes the main section of the ladder. In practice, it will preferably be about forty-five feet in length, and of

such proportions as the material employed may demand. At its lower end are two extensible legs, B, composed of a screw, *a*, in a tapped lug or ear, *b*, which is secured to the side of the ladder by means of a threaded neck, and the nut *c*. Whenever the ground on which the ladder stands has an uneven surface, either leg may be made to compensate therefor, and the several parts should be made of sufficient strength to withstand the incident strain. In order to admit of desired movement of the foot of the ladder, the legs B will be provided with the caster-wheel *d* and a set-screw, *e*, arranged to render it incapable of rotation when no movement of the ladder is required. The threaded neck is arranged to turn freely in its bearings on the loosening of the nut *c*, so that the legs may be turned and the wheel be wholly raised from the ground when not required. At the upper end of the ladder, on the inner face of its sides, are strong sockets *f*, for receiving the lower ends of the sections C, which are fitted to enter and be firmly held in said sockets, and each side of the section A at the upper end is so formed as to enter corresponding sockets *g* on the outer faces of the sides of section C.

It seldom occurs that a ladder is required for a height above seventy feet, and I therefore prefer to have three sections, two of which are fitted to interchangeably connect with the one main section, A. One of these upper sections will be, say, about thirty feet in length, and the other about forty feet, and, when desirable either of the three sections may be employed singly, or either of the upper sections with the main section, according to the service required.

Three sections are shown in the drawings, the upper one, C', being adapted for connection only with section C. When so constructed the upper section will be very light, and as the bearing-weight of the ladder, when elevated, will be principally borne by the halliards hereafter described, said section C' may be made comparatively light, and safely increase the length of an eighty-foot ladder to at least one hundred feet. D denotes a lever-ladder, mainly of ordinary construction at all points except at its foot, where it is provided with jaws *h* for embracing the base-round *i* of

the main section Δ . The jaws will be provided with a locking-pin, as at k . The round or bar i of the main section is provided with fixed collars at l , against which the sides of the lever-ladder abut when in position. The upper round of the lever-ladder is provided with fixed collars, as at m , for preventing lateral movement of the snap-hooks of the halliards, hereafter described. The lever-ladder, in practice, should be about one-third of the length of the aggregate length of the sections. The main section Δ and the second section C are each provided with a bow-shaped link, E , pivoted or hinged upon one of the rounds, as at n . On the main section it is located adjacent to the upper end, and on the upper section about midway between the ends. Each is provided at both sides with a brace-chain, o , secured to the next upper round in such a manner that the link can only be moved to a position at about right angles to the front line of the ladder, and be rigidly held in that position. The link is so arranged that when not in use it will fold down between the sides of the ladder and rest on the adjacent rounds. When in use the link, by its form and position, affords no obstacle to the transit of persons up or down on the ladder. At each side of the main and upper sections are side lines, p , which are attached to rounds adjacent to the ends, and pass through eyes q in the links E in such a manner that, when the links are raised, the said lines will be strained, and not only serve as hand-ropes for the safety and convenience of the firemen, but also serve as stays for strengthening the sections and giving them the desired rigidity. Small chains, of proper construction, may be employed as side lines, and whether such or ropes are used, it will be desirable to employ therewith some of the well-known adjustable devices for taking up such slack as would probably occur from the stretching thereof. F denotes, in each instance, the ladder-halliard. Two are shown as attached at one end to the upper end of the lever-ladder, and at their opposite ends to the bow-shaped links on the main and second sections respectively. In practice, the connections at the ends of the halliards will preferably belong to the snap-hook or safety-shackle class, whereby ready and secure attachment may be made, and at the same time be readily detachable. G denotes the hoisting-halliard, which is secured at one end to the upper end of the lever-ladder, adjacent to the point of connection with the ladder-halliards, its opposite end being of sufficient length to admit of its seizure by a sufficient number of firemen. In practice, the ladder, as shown in Fig. 1, is mounted on a truck provided with rollers and an adjustable skid for easing down the forward end of the ladder to the ground after it is drawn off the last roller on the truck. When laid out on the ground the upper section, which lies uppermost in the stack, is carried to the proper distance and laid upon the ground; then the second section is carried

in the same direction, until its lower end is adjacent to the upper end of the main section, when the proper connection is made by means of the sockets. The lever-ladder is then placed on top of the main section, with their bases properly connected, the ladder-halliards are duly attached, as shown, and the fireman, by raising the ladder-lever while walking on or between the rounds of the main section, raises it to the position at which the ladder-halliards will be strained. A portion of the force will be applied to the hoisting-halliard, and such force may be readily augmented, when required, by any desired number of men ascending the front side of the lever-ladder, and contributing, by their weight, to its prompt depression and the consequent raising of the ladder. When raised, it will be, of course, desirable to be able to promptly dispense with the men at the lever-ladder, and therefore the adjustable foot-braces H are provided, which are attached by a pivoted connection, one on each side of the main section, at a proper distance from the foot. These foot-braces are, respectively, provided with a tie-rod, pivoted to the outer end of the foot-brace, and provided at its opposite end with holes for receiving a stud or bolts, r , projecting from the outer faces of the sides of the main section. These several holes admit of the proper adjustment of the foot-braces with relation to the angle at which the ladder rests, as against a building, or at which it may be desired to use it without such a rest. The more the ladder is inclined the longer the distance should be on the tie-rod from the stud on the ladder to the lower end of the foot-brace, and vice versa, as will be fully obvious. Whenever the surface of the ground adjacent to the bases of the foot-braces is uneven they may be adjusted thereto, as by the shortening or lengthening of the tie-rods the foot-braces are proportionately lengthened or shortened, respectively, and hence can be adapted to afford a firm and general bearing in any case.

It will be seen that either of the several sections and the lever-ladder may be separately employed for ordinary purposes, and that all may be combined for use as one ladder, and be readily raised when so combined; also, that, by the use of the lever-ladder instead of a simple lever, such as has heretofore been employed by me, a greater number of men may be successfully employed in the raising, and that the most inefficient may give service by their mere weight on the rounds of said ladder; also, that the lever-ladder, by being capable of use both as lever and ladder, the truck is not burdened by unnecessary weight, for such a ladder need be but little, if any, heavier than a proper lever would be, which could be useful in but one capacity.

Whenever it is desirable to slightly change the location of the ladder while elevated, as away from a building, it can be safely and readily accomplished by setting the legs B at

a proper angle, or in a vertical position, and lifting the base of the ladder free from the ground, leaving the foot-braces in proper bearing, but admitting of the practical movement of the ladder, the weight of which will be principally borne by the wheels. If it be necessary to move the ladder to a position at right angles to the one occupied, as after raising and for lowering after use, one of the foot-braces will be raised slightly from contact with the ground, by adjusting the stud to the proper hole in the tie-rod, and setting the caster-wheels so that they will readily travel in the proposed direction, and thereby admit of the rolling of the base of the ladder in the arc of a circle, of which the point of contact of the foot-brace with the ground will be the center. The foot-brace which is not in contact with the ground will be so slightly elevated therefrom that, should the ladder rock a little, it will prevent any undue tilting by performing its proper function. During this operation, for additional security, the lever-ladder may be

retained in its position, and used as a means for steadying the ladder and more easily effecting the movement.

- Having thus described my invention, I claim as new, to be secured by Letters Patent—

1. The combination, with a ladder, of the lever-ladder D, the links E, ladder-halliards F, and hoisting-halliard G, constructed and arranged substantially as described.

2. The combination, with the ladder, of the extensible legs B and their caster-wheels, substantially as described.

3. The combination of the ladder, the extensible legs B, and the caster-wheels with the separately adjustable foot-braces H, as and for the purposes specified.

4. The halliard-links F, in combination with side lines p, constructed and arranged as and for the purposes specified.

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