

A. W. BROWN.
FIREMEN'S LADDER.

No. 175,922.

Patented April 11, 1876.

Witnesses.
Charles E. Doe.
Louis W. Frost.

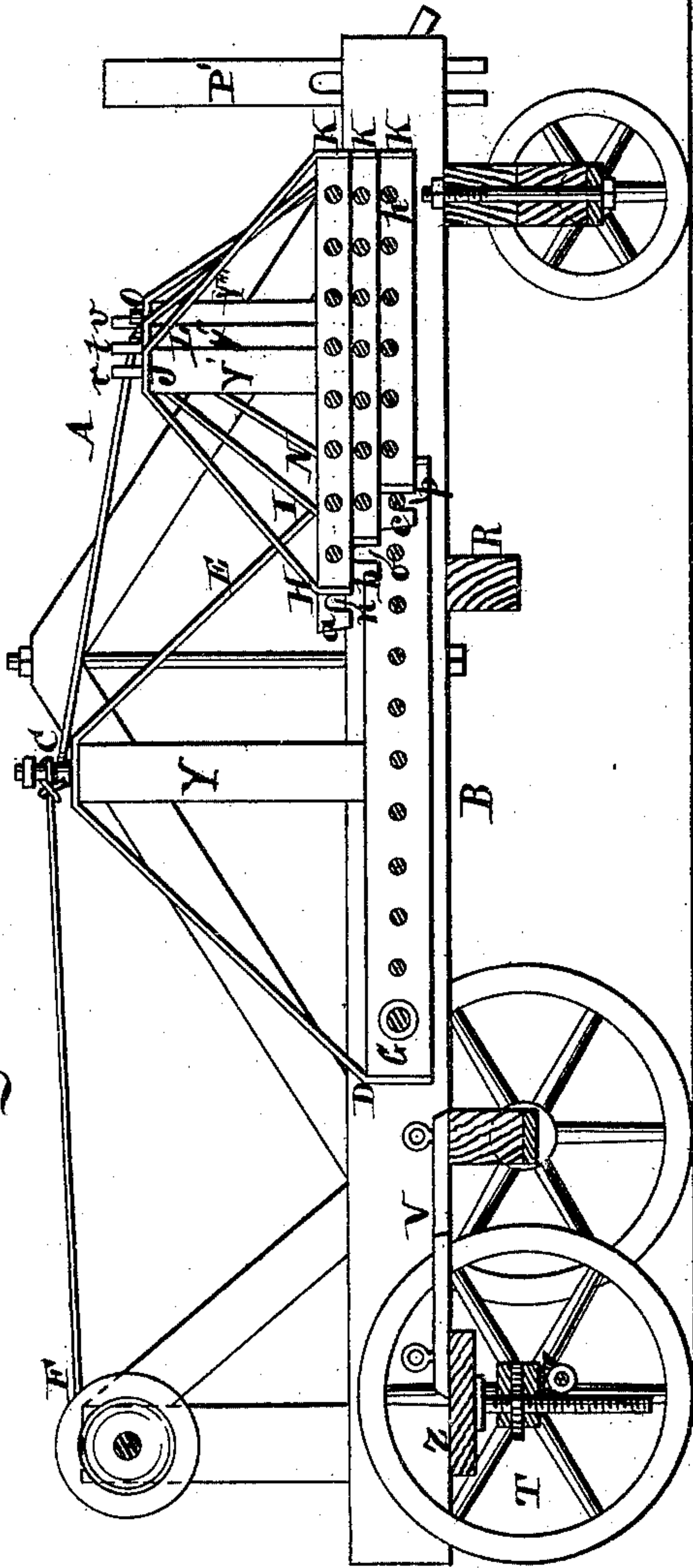
Inventor,
Alvah W. Brown

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Fig. 3.



Witnesses.
Charles S. Love
Louis W. Felt

Fig. 8.

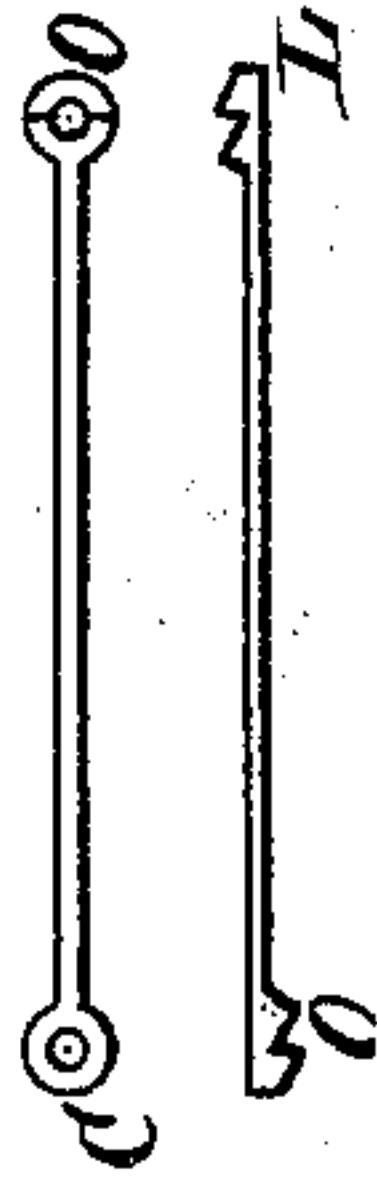


Fig. 7.

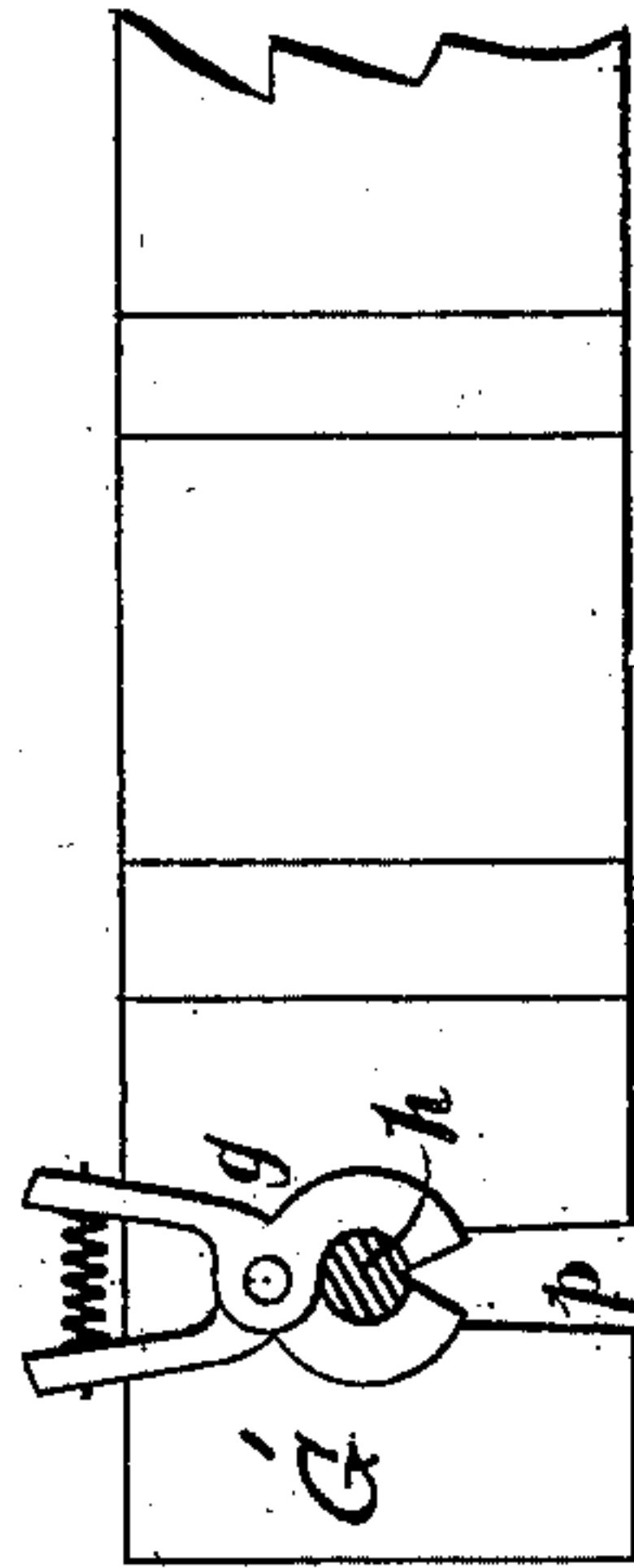
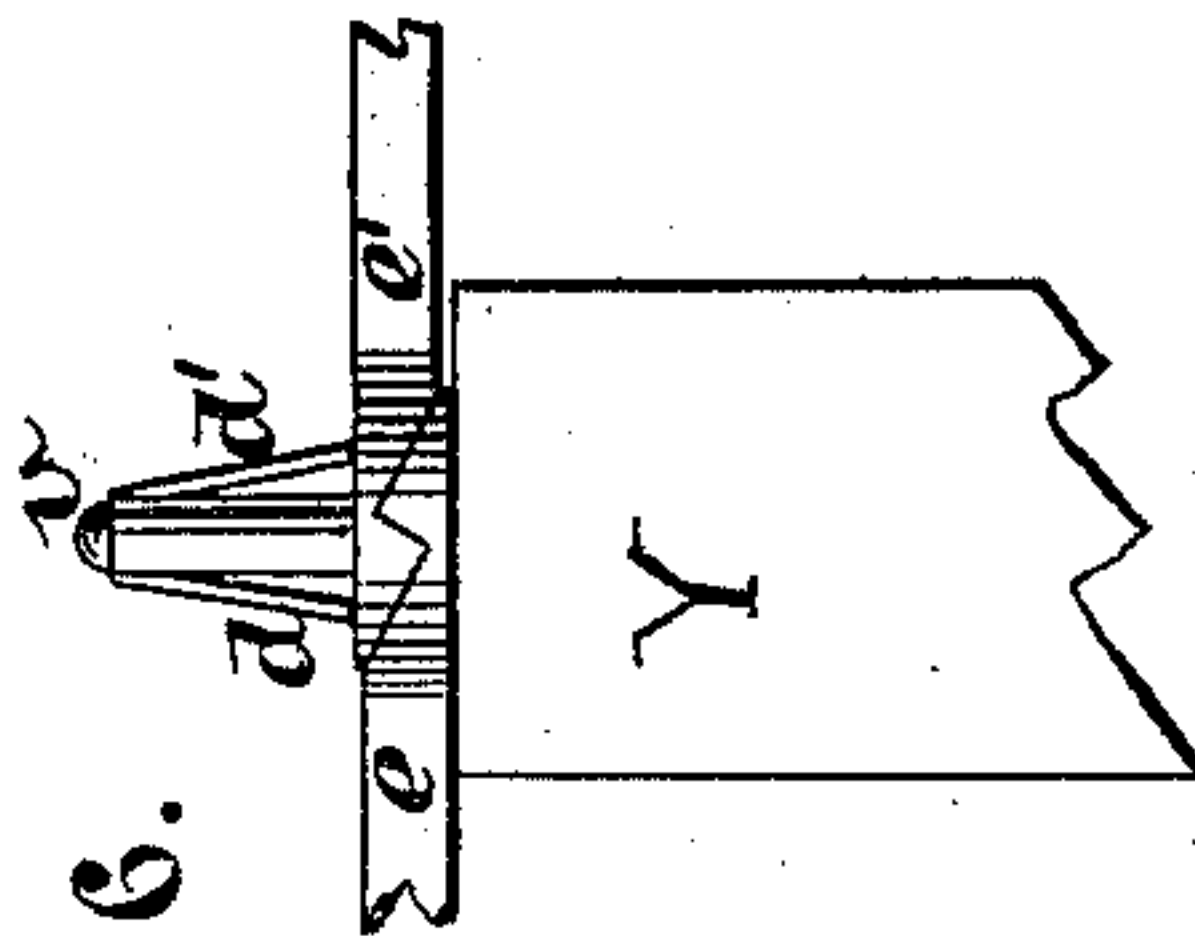


Fig. 6.

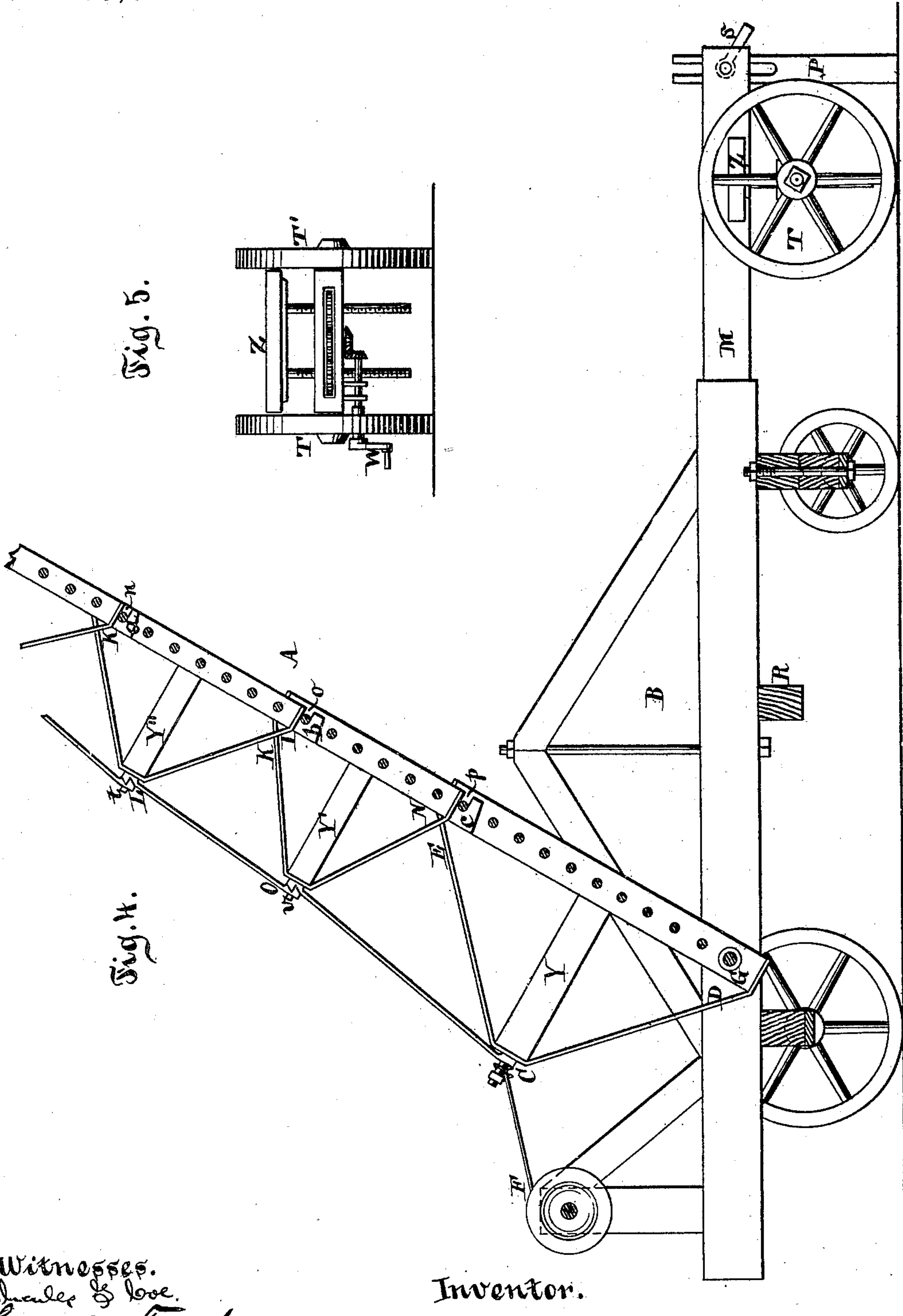


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Alvah W. Brown

UNITED STATES PATENT OFFICE.

ALVAH W. BROWN, OF NEW YORK, N. Y.

IMPROVEMENT IN FIREMEN'S LADDERS.

Specification forming part of Letters Patent No. 175,922, dated April 11, 1876; application filed January 21, 1876.

To all whom it may concern:

Be it known that I, ALVAH W. BROWN, of the city, county, and State of New York, have invented a certain Improvement in Firemen's Ladders, of which the following is a specification:

The object of my invention is the construction of a portable fireman's ladder, which shall be self-supporting, which may be elevated to any desired height, and which shall be more efficient and capable of sustaining strains than any self-supporting ladder at present in use.

The principal feature of my improvement in firemen's ladders is the method, hereafter described, of applying the principle of the truss to them. By this application all sheering-strains are avoided. The weight to be sustained is borne by longitudinal resistances, there being a longitudinal strain of tension on each of the rods which connect the tops of the trusses of the several sections of the ladder, and longitudinal strains of compression on the longitudinal side pieces of the sections.

The following is a description of my invention, reference being had to the accompanying drawings.

The several figures of the accompanying drawings represent various views and parts of the ladder, viz: Figure 1 is a side view of the truck B, with the ladder A packed on it. G is the gearing, which moves the reels F F', (shown in Fig. 2,) for elevating the ladder A. G F are wire-ropes, which wind on these reels. D C E are the trusses on one side of the lower section of the ladder A. N O K, I L K, and H J K are trusses on three other sections of the ladder A. C O are the tie-rods which connect the tops of the several trusses D C E, N O K, I L K, and H J K when the ladder A is extended. M is one of the extension-beams with which the truck B is fitted. P is a post which, when reversed, is made to support the end of this extension-beam M when it is drawn out. The object of this extension-beam M is to increase the base of the truck B, for the purpose of giving greater security to the ladder A when it is elevated. R is the end of a beam which runs across the truck B. On the

sides of this beam R it is designed to have two other extension-beams, M', similar to the extension-beam M, just described, which will draw out laterally on each side of the truck B, thus increasing the width of its base. T is one wheel of a small truck, represented by Fig. 5, which will be described hereafter.

Fig. 2 shows the truck B, with the ladder A packed on it, as seen from above. N O K, I L K, H J K, N' O' K', I' L' K', and H' J' K' are the trusses on three sections of the ladder A. T and T' are the wheels of a small truck, previously mentioned, and described hereafter. V is a tongue, by means of which this small truck is fastened to the main ladder-truck B. F and F' are the reels, referred to above, on which wind the ropes C D, C' D', for elevating the ladder A.

Fig. 3 is a longitudinal section through the middle of the truck B, and sections and trusses N O K, I L K, H J K packed on it. a, b, and c are iron shoes fitted on the lower ends of the longitudinal side pieces H K, b K, c K of the several sections of the ladder A. These shoes will be described hereafter. T is a section of the small truck already mentioned, and shown in Fig. 5.

Fig. 4 is a longitudinal section through the middle of the truck B and ladder A, when the latter is elevated. G is the axle on which the lower section D C E of the ladder A turns. a, b, and c are the iron shoes previously mentioned, on the lower ends of the longitudinal side pieces N I, I K, D N of the ladder A. C O, O L are the tie-rods, which connect the tops of the trusses D C E, N O K, H J K of the ladder A. T is a wheel of the small truck, already mentioned, whose position in front of the main ladder-truck B will be explained hereafter.

Fig. 5 shows this small truck. It is simply necessary to say of it that by turning the crank W the table Z may be elevated or depressed.

Fig. 6 shows, on a larger scale, the top of one of the truss-posts, which appear in Fig. 4 as Y Y' Y''. It indicates the manner in which the ends e and e' of the rods, which appear in Fig. 4 as C O, O L, fit together, and also the manner in which they are secured by the springs d and d' on the pin v.

Fig. 7 shows the inner face of one of the shoes, which appear in Fig. 4 as *a*, *b*, and *c*. The slot *p* receives the top ring *h h'*, Fig. 2, of the section of the ladder A next below it and forms the joint on which the section of the ladder A to which it belongs plays on the section next below it. *g* is a grapple which secures the sections from slipping apart, as hereafter explained.

Fig. 8 shows two sides of one of the rods, which appear in Fig. 4 as C O, O L.

The following will more fully explain the construction of the ladder A and truck B, and the manner in which they would be used, as combined in my improvement: Suppose the ladder A to be packed upon the truck B; then to elevate the ladder A proceed thus, viz: Transfer the small truck T from its position in the rear of the main ladder-truck B to a position in front of the latter. Then draw out together all the sections I L K, H J K of the ladder A, which are packed on the front of the truck B, resting the forward end of the under one—*i. e.*, I L K—on the table Z of the small truck T.

When the slots, of which *o* is one, of the shoes, of which *b* is one, are vertically over the top rung *h h'*, Fig. 2, of the section of the ladder A, next below that to which these shoes belong, the section I L K drops, the grapples *g*, Fig. 7, on the inner faces of these shoes open, and afterward close around the rung *h h'*, Fig. 2, and the shoes, of which *b* is one, then serve as joints, by means of which the section I L K plays on the section N O K next below it. Now adjust the rods, of which O L, Fig. 4, is one, over the pins, of which *v* is one, raising or lowering, if it be necessary for this purpose, the front end of the section I L K, by turning the crank W of the small truck T, and proceed in the same manner with the remaining sections of the ladder A.

When the ladder A has been fully extended in this way, elevate it by the gearing G. It will be sustained in its elevated position by the ratchet on this gearing. Next draw out in front of the truck B the extension-beams M and M', Fig. 2, till the point *w* comes to about *w'*, and allow the posts, of which P is one, to drop firmly onto the ground. Secure these posts by turning the screws S and S', Fig. 2, which cause the jaws X and Y, X' and Y', Fig. 2, to close upon them.

In the same manner draw out the transverse extension-beams on the side of the beam R, and the ladder is ready for use.

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

1. A section of a compound ladder provided on each side, at or near its middle, with a king-post and with truss-rods, the whole being constructed, arranged, and applied substantially as shown at Y, D, C, and E, for the purposes set forth.

2. A self-supporting ladder, consisting of

a truck, B, and two or more sectional ladders, each of which is trussed in the manner substantially as described—that is to say, by means of a king-post at each side, such as that shown at Y, and truss-rods, constructed, arranged, and applied like those shown at D, C, and E, for the purpose set forth.

3. The self-supporting sectional trussed ladder A, in combination with the main ladder-truck B and small truck T.

4. In combination with a section of a compound ladder, a king-post, provided with a pin or stud, *v*, arranged as described, for the purpose set forth.

5. In combination with a ladder, consisting of two or more independent sections, each of which is trussed on each side by means of a king-post and truss-rods, two or more tie-rods, arranged substantially as shown at C O and O L, for the purpose set forth.

6. A tie-rod, C O, constructed substantially as shown, for the purpose set forth.

7. A tie-rod, O L, constructed substantially as shown, for the purpose set forth.

8. In combination with a ladder, composed of two or more sections, one or more pairs of shoes *a b c*, each being provided with a grapple *g*, and applied in the manner substantially as and for the purposes set forth.

9. In combination with a ladder, consisting of two or more independent sections, the side beams of each of which is trussed by means of a king-post arranged at or near its center, and by truss-rods constructed like those shown at D C E, and said sections connected together by tie-rods arranged like those shown at C O and O L, a truck-frame, B, substantially as and for the purpose set forth.

10. The combination of the rods C O, O L, trusses D C E, N O K, I L K, and sections D N, N I, I K of ladder A with main ladder-truck B and small truck T.

11. The springs *d* and *d'*, as applied to and in combination with the pins *r*, *t*, and *v* and rods C O, O L.

12. The shoe G', as applied to and in combination with the several sections D N, N I, I K of the ladder A.

13. An auxiliary truck, provided with an adjustable table, Z, substantially as and for the purpose set forth.

14. In combination with the truck-frame of a self-supporting ladder, two extension slide-beams, M, arranged to slide lengthwise of the frame, each having a slotted pedestal adjustably secured thereto by means of a screw-bolt and wrench-nut, substantially as and for the purposes set forth.

15. In combination with the truck-frame of a self-supporting ladder, two laterally-sliding beams, M', arranged to slide transversely to the length of the truck, each having a slotted pedestal adjustably secured thereto by means of a screw-bolt and wrench-nut, substantially as and for the purposes set forth.

16. The combination, with the main-truck

frame of a self-supporting ladder, of two longitudinally-adjustable extension-beams, M, and two laterally-adjustable beams, M', each having an adjustable pedestal secured thereto, as and for the purposes set forth.

17. The combination of the drums F F' and ropes or wires C F, C' F' with the king-post

Y of a trussed ladder, the inner end of which is pivoted to the main-truck frame, as shown at G, substantially as set forth.

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Witnesses:

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