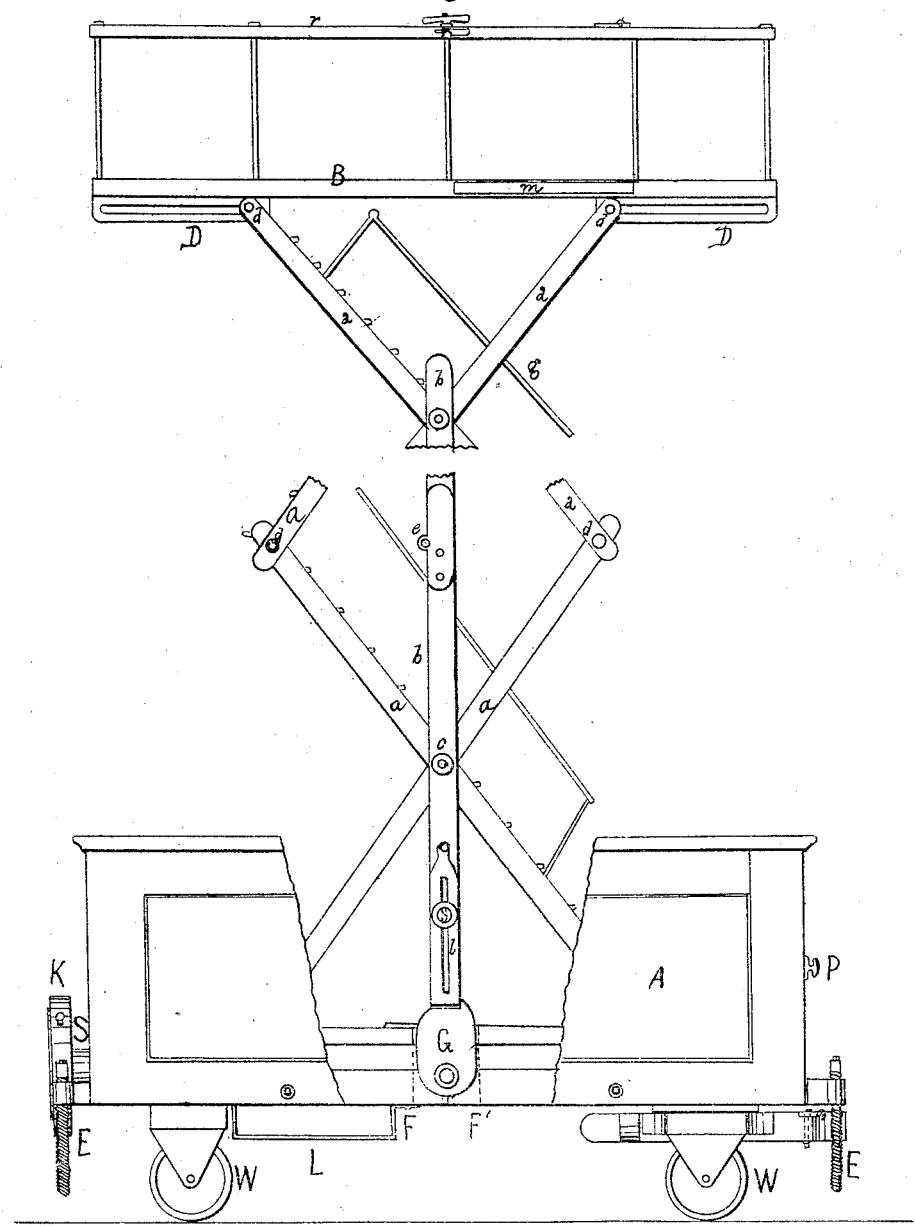


G. A. W. Hultman & C. R. Kornelio.

Fire Ladder.

No 6,155.

Fig. 1. Patented Mar. 6. 1849.



*G. A. W. Hultman & G. F. Kornelio.*

## Fire Ladder

No 6.155.

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Fig. 2.

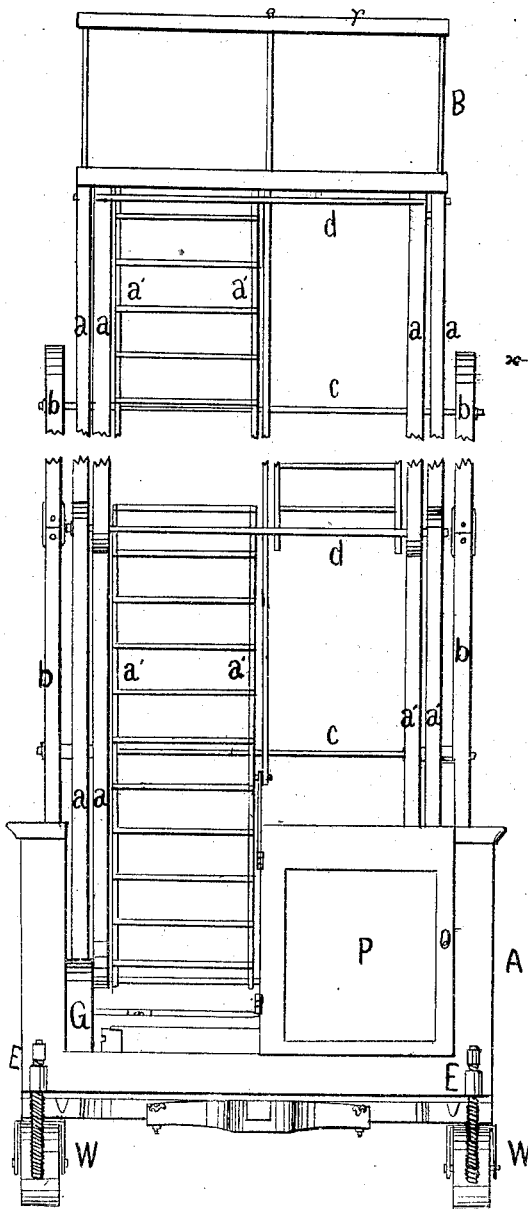
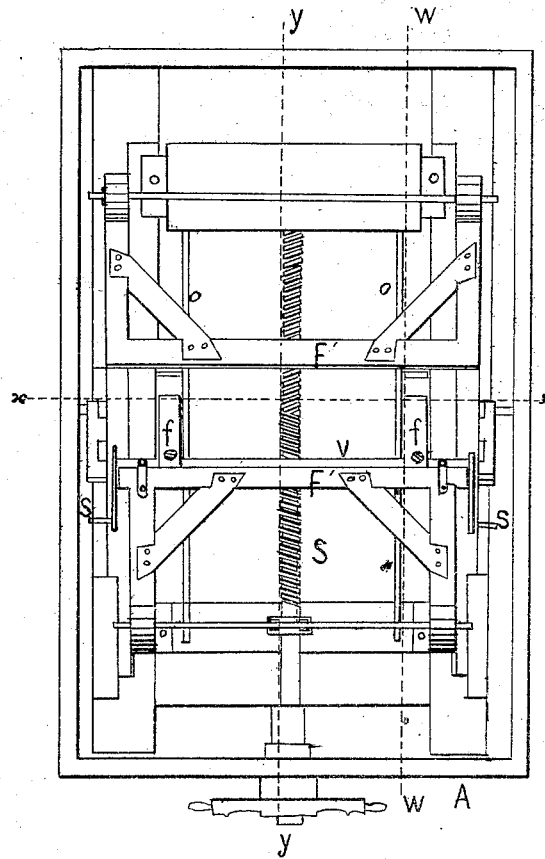


Fig. 3.



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Fig. 4.

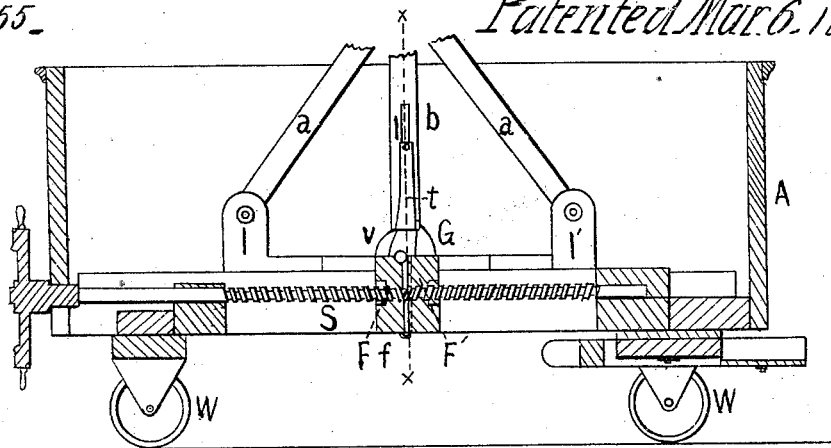


Fig. 5.

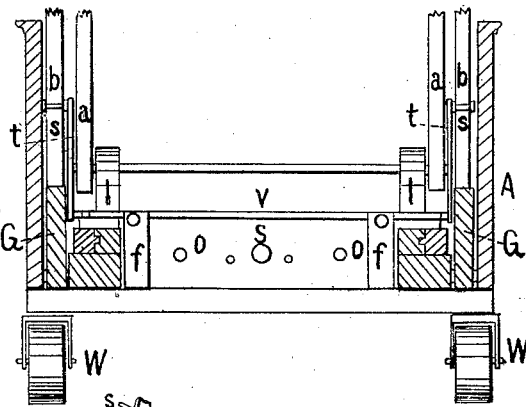


Fig. 7.

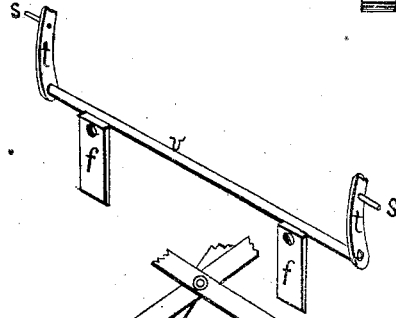
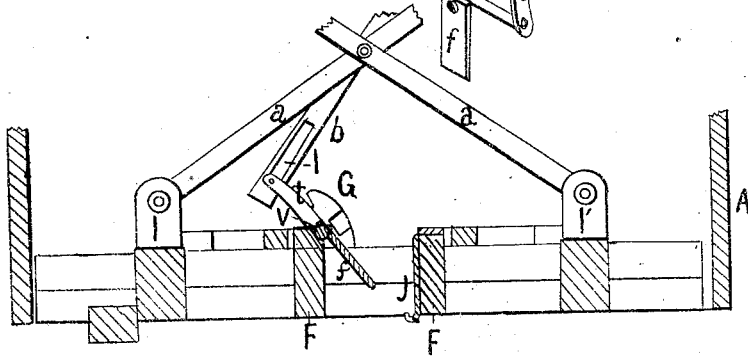


Fig. 6.



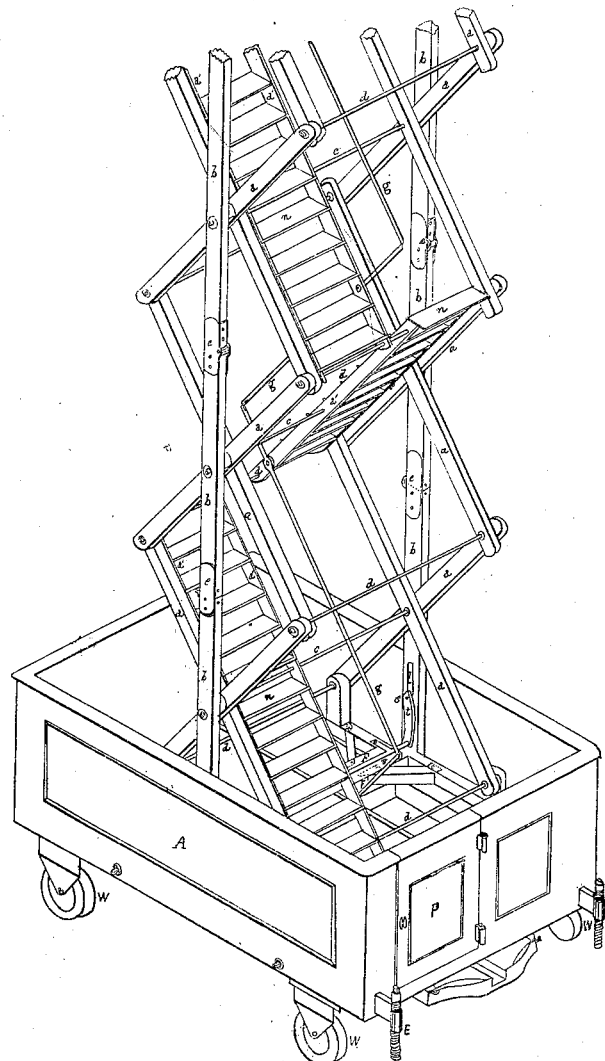
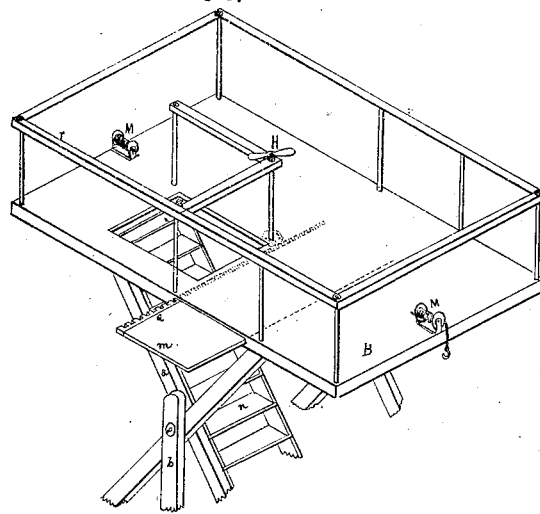
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*Fire Ladder.*

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*Sheet 4.*

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*Patented Mar. 6. 1849.*

Fig. 8.



# UNITED STATES PATENT OFFICE.

GEORGE A. W. HÜTTMANN AND GEORGE KOCH KORNELIO, OF PHILADELPHIA,  
PENNSYLVANIA.

## FIRE-ESCAPE.

Specification of Letters Patent No. 6,155, dated March 10, 1849.

*To all whom it may concern:*

Be it known that we, GEORGE A. W. HÜTTMANN and GEORGE KOCH KORNELIO, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and Improved Fire-Escape Ladder, and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1, is a longitudinal side elevation, and Fig. 2 a front end elevation; Fig. 3, is a horizontal plan; Fig. 4, is a longitudinal vertical section through *y, y*, of Fig. 3; Fig. 5 is a vertical transverse section through *x, x*, of Figs. 3 and 4; Fig. 6, is a longitudinal vertical section through *w, w*, Fig. 3; Fig. 7 is a perspective view of the tumbling shaft *v*, and its appendages, (Fig. 3), and Fig. 8 is a general perspective view of the carriage, the elevating frame, ladder, and platform, when erected.

The principle on which we construct the elevating and supporting frame of our ladder is that of forming two or more sets, of two pairs each, of folding, jointed lattice-pieces, or oblique braces, capable of being placed at different angles with each other, or of being folded down upon each other, in a compact form, and thus rendered portable in a carriage not larger than that of an ordinary fire engine. Each of the pairs of folding pieces, or braces is connected by a bolt through its center, with a third bar shorter than the other two, and which when the frame is elevated, and the platform or scaffold carried to its full height, stand in a vertical position while all the other frame pieces are inclined in a given angle to each other and to the horizon.

Our ladder, when elevated, is either a stair case, with the flights of steps alternately placed on one side and the other within the lattice frame-work, or a series of common or of flexible ladders. The whole carriage, frame, ladder and machinery, may, when desirable, be constructed of metal so as to be fire proof.

The manner of elevating the frame, ladder and platform from the box or body of the carriage in which it is conveyed, is by turning the right and left hand screw *S*, (Figs. 1, 3, 4 and 5) and thereby bringing toward each other the two horizontal sliding frames *F* and *F'*, with their strong upright posts *I* and *I'* (Figs. 4, 5 and 6,) by

the approach of which toward each other the lower jointed bars *a a* are elevated in an angle to the horizon, increasing as *F* and *F'* approach each other, as seen in Fig. 6, and are finally brought into the position exhibited in Figs. 4 and 8. At the same time that the lower joint of the lattice frame is thus elevated, all the other joints *a, a, a, a*, &c. will of necessity assume to each other the same angles of inclination as that given to the lower joint, and will continue to higher and higher angles of inclination to the horizon, until as above mentioned the frames *F* and *F'* are brought into contact with each other, as in Fig. 4.

Through the middles of all the bars *a, a*, pass the cross bolts *c, c*, serving as axes of motion about which the joints of the frame or sets of bars are flexed. On the outer extremities of these bolts are fixed by their centers the shorter bars *b, b*. At their extremities these latter bars are connected with each other by hinge joints *e, e*, alternating in their directions of flexure, and they are so adjusted in length as to stand erect and form one continuous upright support, when the bars *a, a*, have come to their highest intended angle of elevation as seen in Figs. 1 and 8.

The lower pair of the bars *b, b*, is furnished each with a slot *l*, in which works the pin *s*, (Figs. 3, 4, 6 and 7,) which with the arm *t* and the flap *f* makes a partial revolution about the tumbling shaft *v*, while the rods *b, b*, are approaching to their vertical position. At the moment before reaching the latter position, the flap *f*, attached by the axis *v* to the front edge of the frame *F*, by coming in contact with the metallic strap *j* on the front of the frame *F'* (Fig. 6) is made to assume a perfectly vertical position as seen in Fig. 4. At the same time the lower end of *b*, coming in contact with an offset on the notched revolving block *G*, which is seen inclined in Fig. 6, brings it up into the vertical position seen in Figs. 1 and 4, and in that position the block constitutes a firm support for the vertical rod *b*. When the ladder is again to be lowered the action of the screw *S* by separating the frames *F* and *F'* causes the small hook at the bottom of *j*, to draw back the flap *f*, and dislodge *b*, from its position on *G*. This latter movement is important, as without it, the action of the screw in a horizontal di-

rection could not flux the joints *e, e*, (Figs. 1 and 8), and would only tend to break the machine.

Fig. 8, exhibits the staircase *n*, with its sides *a', a'*, ascending by alternating flights from the bottom of the carriage A, to the platform B. The entrance to A, is through a door P, at one end. The side pieces *a'* of the ladder *n*, being traversed by all the bolts *c, c*, and *d, d*, constitute additional means of stiffening the frame when erect, and from this structure and arrangement on alternate sides come into a compact form, when folded down. The hand rail *g*, secures the person while ascending and descending the ladder. While the carriage A, containing the ladder is in motion, the wheels W, rest, of course, upon the ground; but when the ladder is to be elevated, the screws, E, may be driven down upon suitable blocks or planks of solid material or upon pavements, when affording the necessary stability, thus taking the weight from the wheels. In order to secure still further the ladder and carriage from the danger of upsetting, quadrangular straps L, Fig. 1, are attached beneath the bottom of the carriage on both sides, through which long planks or scantling may be passed, when the latter is about to be erected, and which by being blocked up at the ends give the whole a greater degree of stability in the lateral direction than it would otherwise possess. A platform *m* Figs. 1, and 8, is placed within a space in the bottom of the scaffold B, and is capable of being thrust forward so as to enter windows etc., by means of a rack *q* on its side, and a pinion, which matches into it and is driven by the axis and handle H. Pulleys and hooks M, serve to lower furniture or other goods from the platform B, or they may be used to secure the platform itself to the sides of a building in a firm position.

In constructing our frames and ladders we do not limit ourselves to any particular proportion of parts, number of joints, or

kinds of materials to be employed. To render it light, we may construct it mostly of wood, or to render it fireproof may make the whole of iron. Neither do we limit ourselves to using flights of steps constructed as above described, but may vary them by substituting ladders of any of the usual kinds, as the same shall be found most desirable. Neither do we limit the application of our ladder to the use, which may be made of it at fires, but shall employ it wherever a height greater or less is to be speedily attained as in the repairing of buildings, the collection of fruit from trees, the putting up of furniture on high walls or ceilings and for any similar purposes. Instead of the right and left hand screw employed to bring together the frames F and F', we contemplate using in some cases racks and pinions, in others rollers on which to wind rope or chains or we shall employ any other equivalent machinery.

What we claim as our invention and desire to secure by Letters Patent is—

1. The manner of bringing the upright or vertical jointed bar (*b*,) of the framework herein described into their erect position by means of the tumbling shaft (*v*,) slot (*z*,) pin (*s*,) arm (*t*,) and flap (*f*,) when acted upon by the horizontal frames which are moved toward each other by a right and left hand screw (*S*,) or other equivalent machinery for the purposes herein set forth.

2. We also claim the manner of bringing into their position on the notched revolving block (*G*,) and of sustaining thereby the vertical jointed bars (*b*,) as likewise that of removing the feet of the uprights from said blocks, when the frame is to be lowered, in the manner and for the purposes substantially as herein set forth.

GEORGE A. W. HÜTTMANN.  
GEORGE KOCH KORNELIO, Jr.

Witnesses:

LAZENUS SHLOSS,  
COLMARO LEVY.