3 Sheets—Sheet 1.

A. D'AMORE.

Fire-Escape Ladder.

No. 198,576. Patented Dec. 25, 1877.

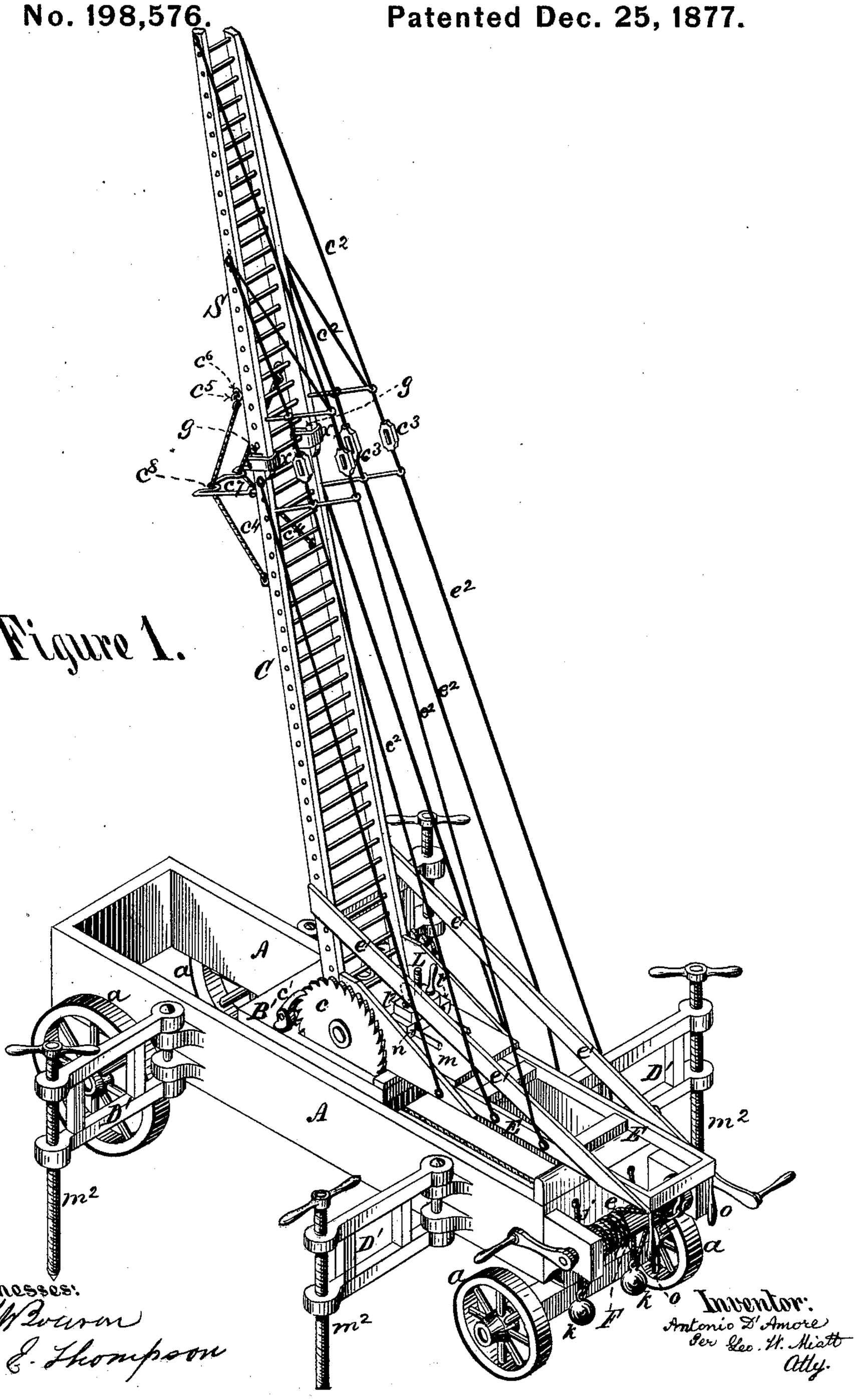

Figure 1.

3 Sheets—Sheet 2.

A. D'AMORE.

Fire-Escape Ladder.

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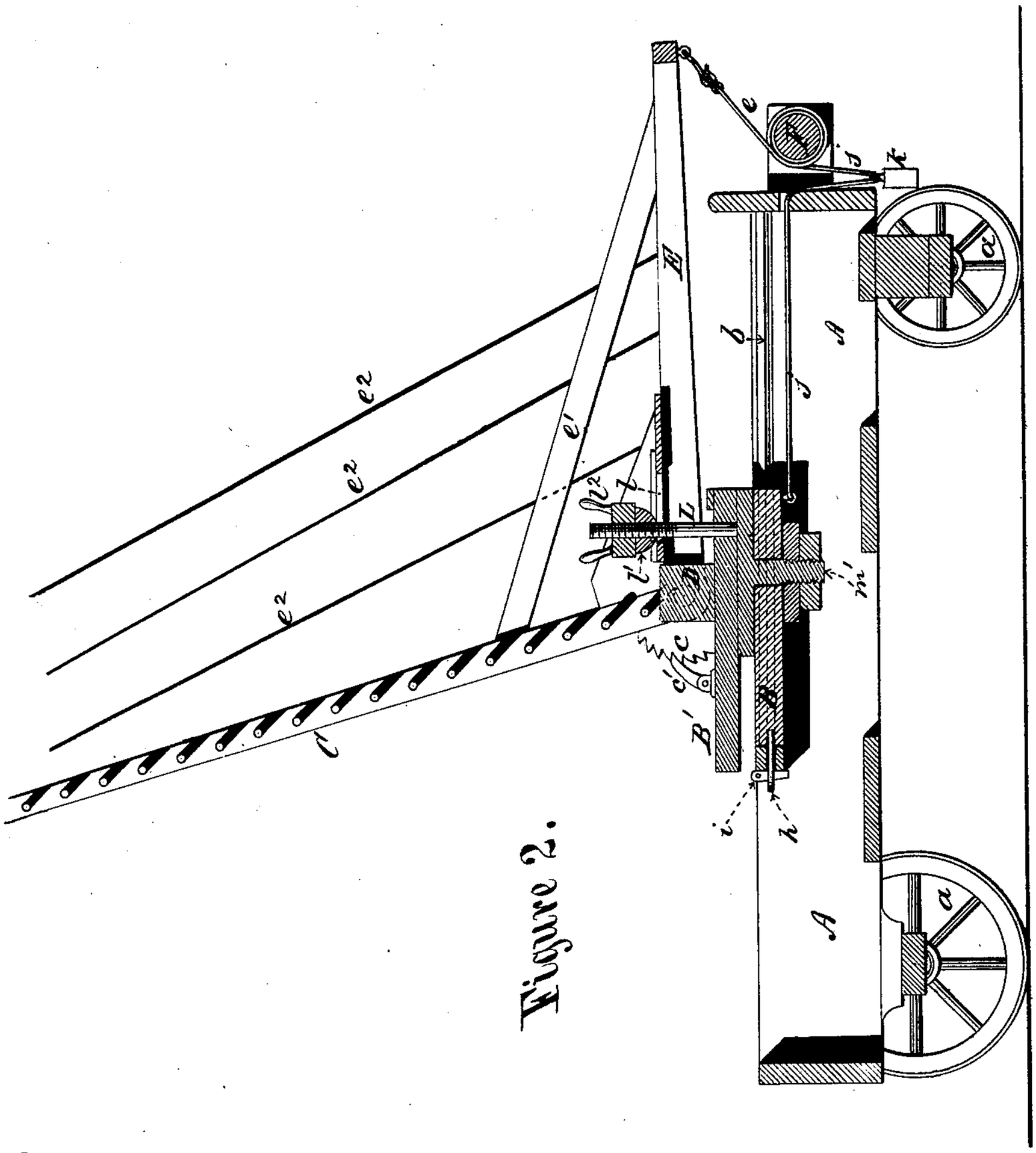

Figure 2.

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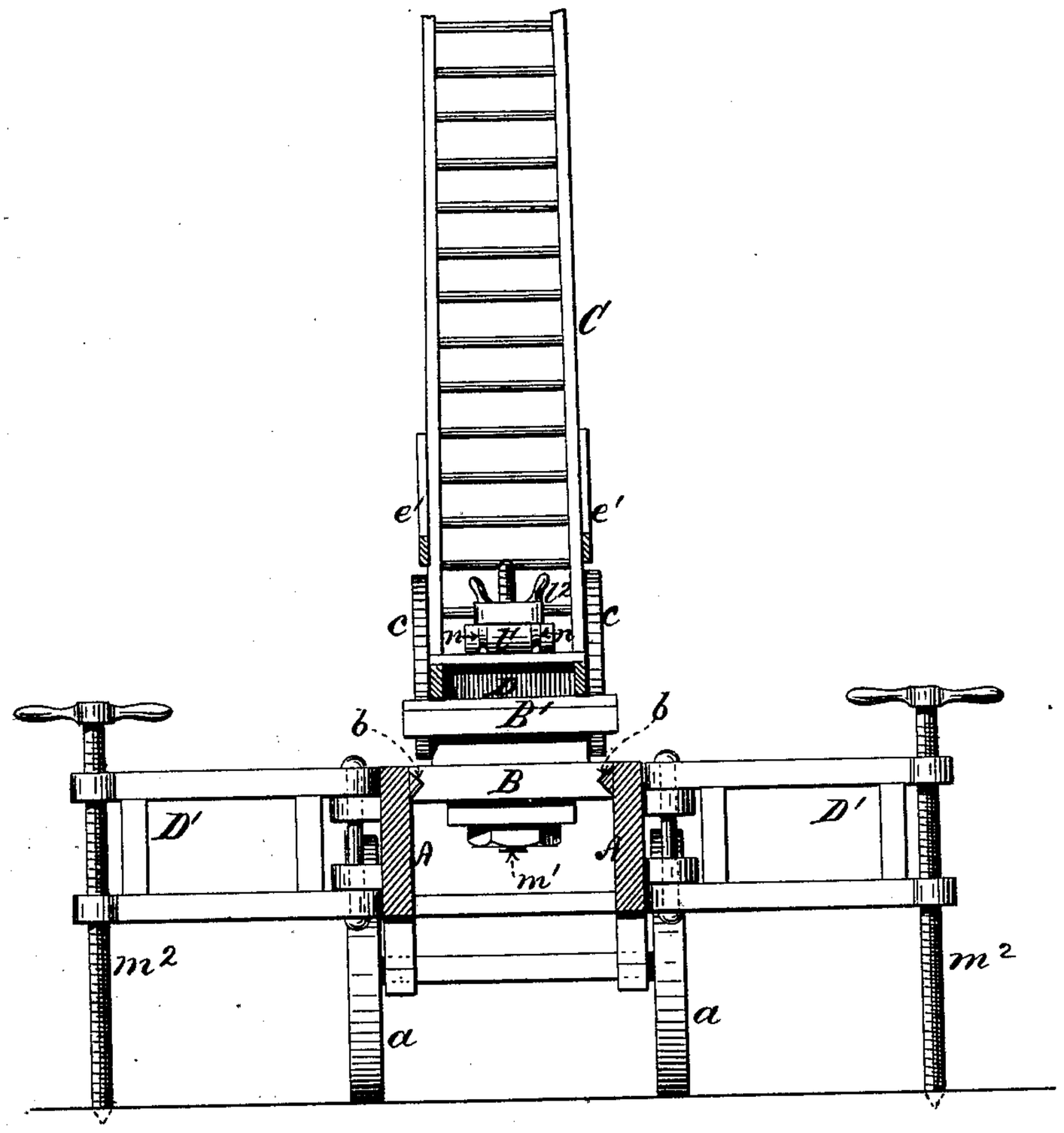
3 Sheets—Sheet 3.

A. D'AMORE.

Fire-Escape Ladder.

No. 198,576. Patented Dec. 25, 1877.

Figure 3.



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UNITED STATES PATENT OFFICE.

ANTONIO D'AMORE, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-ESCAPE LADDERS.

Specification forming part of Letters Patent No. **198,576,** dated December 25, 1877; application filed July 11, 1877.

To all whom it may concern:

Be it known that I, ANTONIO D'AMORE, of the city, county, and State of New York, have invented certain Improvements in Portable Fire-Escapes, of which the following is a specification:

The object of my invention is the production of a fire-escape which shall combine lightness and cheapness of construction with simplicity, portability, and strength, and at the same time enable the ladder or fire-escape to be conveniently and quickly raised and controlled with a comparatively slight expenditure of force.

My invention consists, first, in the peculiar arrangement of the system of stay-rods and their couplings for securely adjusting the supplementary ladder or ladders when they are required in use; secondly, in the peculiar arrangement and construction of the platform-carriage upon which the main ladder is mounted, and in the mechanism for controlling it, hereinafter described, whereby said platform is made to move to or recede from the center of the truck during the operation of elevating or lowering the ladder.

In the accompanying drawings, Figure 1 is a perspective view of the apparatus when extended and arranged for use; Fig. 2, a longitudinal sectional view, showing the mechanism for elevating and lowering the ladder, and for controlling the position of the platform-carriage upon which the ladder is mounted; and Fig. 3, a view in cross-section, showing the rails or ways upon which the platform-carriage rests, and an elevation of the device for accurately adjusting and regulating the angle at which the ladder is required to be placed after it has been elevated more or less by the hoisting mechanism.

In the drawings, A represents the framework or body of the truck, which is mounted upon any required number of wheels, *a*. B is the platform-carriage, upon which the base-ladder C is mounted in suitable bearings D. Secured to the axis of the base-ladder C are ratchet-wheels *c c*, with which engage pawls c^1 c^1, for the purpose of holding the ladder at any required height or angle. From the base of the ladder C extends a braced frame, E, to the outer end of which the hoisting rope or chain *e* (secured to the windlass F) is attached in use. This frame E performs the office of a lever during the operations of raising or lowering the ladder, while at the same time it affords a means of bracing and strengthening the ladder by the use of the braces e^1 e^1 and stay-rods e^2 e^2.

One or more supplementary sections or extensions, S, of the ladder are employed, as required. When the apparatus is not in use these sections are arranged at the sides of the truck in any suitable manner. Straps or loops *x x*, of metal, are secured to either the upper end of the base-ladder or to the lower end of the extension-ladder or supplementary section S. These straps *x x* pass over the ends of the sections of ladder at their point of junction with each other, and secure them against lateral displacement. Shoulders *g g* are also formed upon the lower ends of the supplementary sections S, which rest upon the upper ends of the base-ladder, and prevent the upper ladder from sliding down longitudinally over the lower one. Each section or extension S is provided with rods c^2 c^2, which are connected to the stay-rods e^2 e^2, secured to the base-ladder frame E E by the couplings c^3 c^3.

Stay-ropes c^4 are secured to the side of the base-ladder, opposite the stay-rods c^2 c^2. These stay-ropes c^4 are provided with hooks c^5, which engage eyes c^6 in the upper section of ladder S. A hinged frame or brace, c^7, is provided with notches c^8, which receive the stay-ropes c^4 when the brace c^7 is swung outward at right angles to the ladder. The whole ladder may thus be strongly and rigidly secured at its joints, and at the same time strengthened to resist fracture.

The platform-carriage B rests upon rails or ways *b* arranged upon the truck, so as to allow the carriage B to move to the center of the truck during or after the operation of elevating the ladder. This is accomplished by the strain of the hoisting-rope *e* after the ladder has been elevated sufficiently to throw its center of gravity over or slightly beyond the axis upon which the ladder turns vertically. When this point in the operation of elevating the ladder is reached, the strain of the hoisting-rope *e* during or after the further elevation of the ladder forces the platform-carriage along the rails or ways to the center of the truck. In

this position the platform-carriage is secured against movement on the truck by the link *h* and coupling-pin *i*, or other suitable device.

In order to provide for the return of the platform-carriage B B′ to its original position at one end of the truck during or after the descent of the ladder, said carriage is connected with the windlass F by one or more chains or ropes, *j*. The windlass, while unwinding the hoisting-rope to allow the descent of the ladder, at the same time winds up the rope or ropes *j*, and pulls the platform-carriage B back to its original position at one end of the truck.

Weights *k k* may be arranged upon the ropes or chains *j j*, for the purpose of keeping the ropes or chains taut as they are unwound from the windlass while the hoisting-rope is being either wound or unwound upon the windlass to hoist or lower the ladder, and before and while the platform-carriage is being moved to the center of the truck.

A screw, L, projects upward from the platform B′, and enters and passes through a longitudinal slot, *l*, in the cross-piece *m* of the frame E after the ladder has been elevated a certain distance. When the screw L projects a sufficient distance through the slot *l*, a semi-cylindrical washer, l^1, is passed over its end, so as to rest upon the cross-piece *m* and furnish a bearing for the handled nut l^2, which is then screwed upon the projecting end of the screw L.

Grooves *n n* are formed in the curved under surface of the washer, which coincide with and embrace corresponding tongues or ridges upon the cross-piece *m*. By thus making the washer l^1 semi-cylindrical I enable it to adapt itself to the varying angles which the cross-piece *m* assumes when the nut l^2 is moved up or down upon the screw L to adjust the angle of the ladder.

The object of this device is to furnish a means of securing the ladder when the latter has been elevated more or less by the action of the windlass, and also, more especially, to allow the ladder to be rapidly and easily adjusted with great nicety to a required position.

It will be seen in Fig. 2 that the platform B^1 is pivoted upon its carriage so as to admit of its being turned or revolved in either direction, in order to present the upper end of the ladder when elevated at any degree of a circle of which the pivot *m* will be the center. For convenience in thus revolving the ladder and the platform B^1, handles *o o* may be attached to the outer end of the lever-frame E.

Securely hinged to the sides of the truck are any desired number of braces or rests, D′, which, when not in use, are folded against the truck to be out of the way. At the outer ends of these bearings screws m^2 m^2, or equivalent devices, are arranged, which may be adjusted so as to secure a firm bearing upon the ground, even though the surface of the latter may be irregular. These swinging arms D′ in use tend to brace the truck and extend its bearings laterally upon the ground, so as to include the center of gravity of the whole apparatus, no matter at what elevation, inclination, or angle the ladder may be placed.

Among the advantages of my apparatus are its simplicity of construction and the ease and rapidity with which it may be controlled in operation.

Provision is made for the rapid elevation of the ladder, and for afterward adjusting the upper end of the ladder to the required position with accuracy. The whole ladder and its supporting-platform may also be quickly swung around to occupy a position at any angle to the body of the truck, while the adjustable braces or rests secure the apparatus against the possibility of tipping over or falling, in whatever position the ladder may be placed. These features are especially desirable in a portable fire-escape.

What I claim as my invention is—

1. In combination with a sectional ladder fire escape provided with the stay-rods e^2 e^2 c^2 c^2 and couplings c^3 c^3, the stay-ropes c^4 c^4 and brace c^7, when arranged and operating substantially in the manner and for the purpose herein described.

2. In a portable fire-escape, substantially such as described, the special combination of the platform-carriage B, the extension-ladder C S, hoisting-rope *e*, the ropes *j j*, and the windlass F, mounted on the truck A, when arranged so as to automatically regulate and control the position of the platform-carriage B during the operations of raising or lowering the ladder, substantially in the manner and for the purposes herein described and set forth.

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