

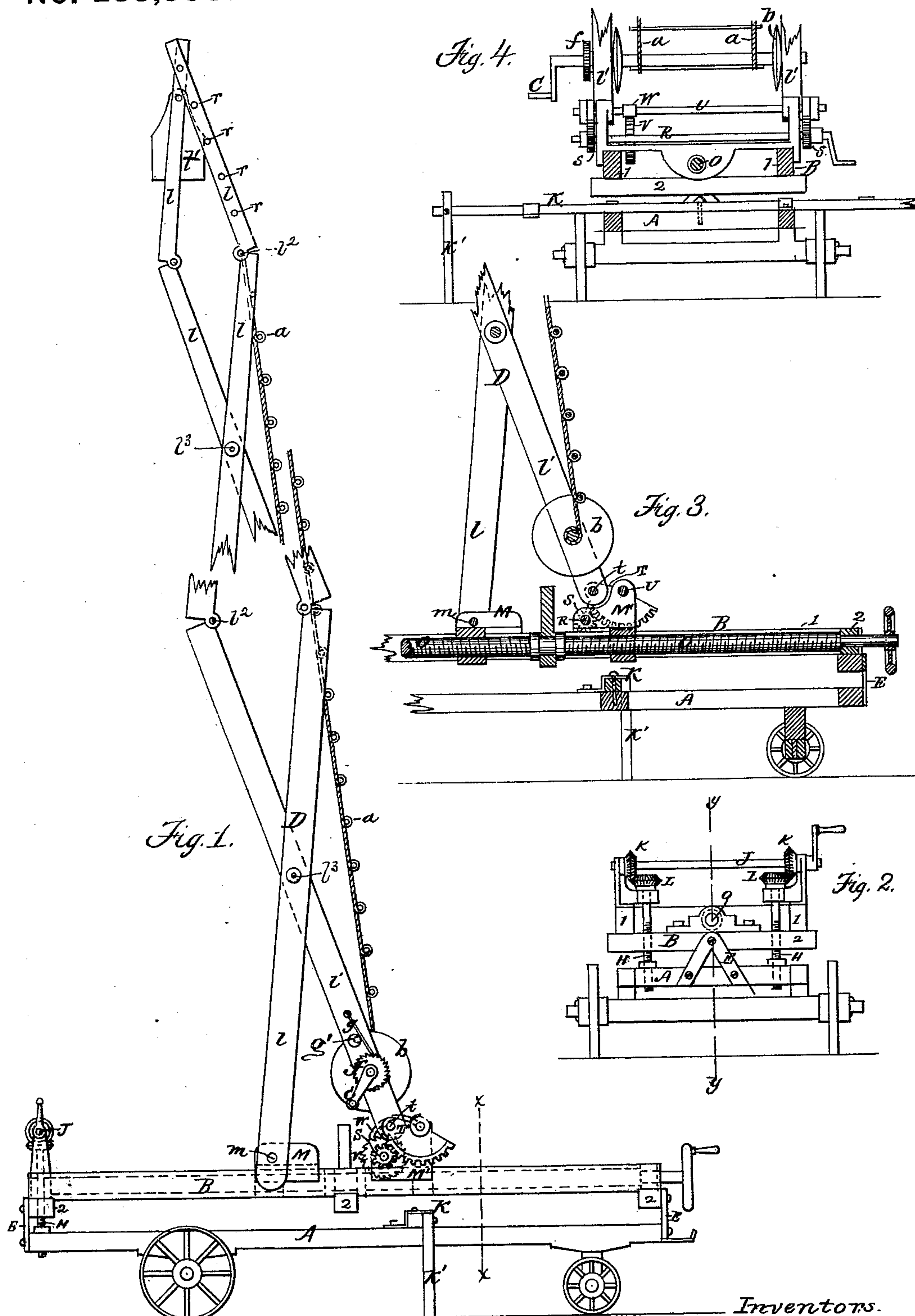
(Model.)

A. CUMMINGS & J. H. HARRISON.

Fire Escape Ladder.

No. 233,998.

Patented Nov. 2, 1880.



Witnesses.

Sam^l M. Barton
E. B. Fairchild

Inventors.

A. Cummings.
J. H. Harrison.

by Wright & Brown Attys

UNITED STATES PATENT OFFICE.

AMOS CUMMINGS AND JAMISON H. HARRISON, OF BOSTON, MASS.

FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 233,998, dated November 2, 1880.

Application filed July 15, 1880. (Model.)

To all whom it may concern:

Be it known that we, AMOS CUMMINGS and JAMISON H. HARRISON, both of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Fire-Escapes and Ladders, of which the following is a specification.

This invention relates to that class of fire-escapes and ladders in which a lazy-tongs or jointed frame is employed, adapted to be extended and supported by a suitable carriage.

The object of the invention is, first, to provide improved means for inclining the extensible frame longitudinally of the carriage; second, to provide the extensible frame with a flexible ladder adapted to be extended with it and constitute at once a ladder and a truss for the frame when the latter is inclined; third, to provide improved means for steadying the carriage of an extensible frame or ladder.

To these ends our invention consists in the several improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side view of an apparatus embodying our improvements, part of the extensible frame being broken away. Fig. 2 represents an end view of the same. Fig. 3 represents a section of a portion of the apparatus on line *y y*, Fig. 2. Fig. 4 represents a section on line *x x*, Fig. 1.

Similar letters of reference indicate like parts in all the figures.

In the drawings, A represents the frame or truck which carries the apparatus, said frame being mounted on wheels, as usual.

B represents a secondary frame, which directly supports the apparatus to be described. The frame B is composed of two parallel bars, 1 1, which are connected by suitable cross-bars 2, and constitute guides or ways for sliding cross-heads, which support the extensible frame or lazy-tongs D. The frame B is suitably attached to the frame A, preferably in such manner that it can be tilted or inclined laterally.

The extensible frame or lazy-tongs consists of a series of levers, *l l* and *l' l'*, jointed at their centers and extremities in the usual manner and crossing or intersecting each other.

Two sets of levers, forming, so to speak, two distinct lazy-tongs, are employed in the pres-

ent instance, a set of levers being arranged at both sides of the wheeled frame, running parallel therewith, and both sets being connected so as to form a single frame by means of the center connecting-rods, *l³*, and the end cross-rods, *l²*.

The frame is supported on sliding cross-heads M M', which are adapted to move on the ways 1 1 of the frame B, and are movable simultaneously in opposite directions by a right-and-left screw, O, journaled in the cross-bars of the frame B, and working in screw-sockets in the sliding cross-heads M M'.

The four levers *l l' l' l'*, which compose the base of the frame D, are supported by the cross-heads M M', and may be called the "legs" of the frame D. The legs *l l* are pivoted directly at *m* to ears or lugs on the cross-head M; but the legs *l' l'* are connected to the cross-head M' by intermediate mechanism which admits of said legs being raised and lowered, so as to incline the frame D longitudinally of the carriage. The intermediate mechanism is, of course, supported on and moves with the cross-head M', and consists, in the present instance, of a shaft, R, journaled in lugs rising from the cross-head M' and provided with pinions S S and plates T T, pivoted at *t* to the legs *l' l'* of the frame D, supported on a shaft, U, which is journaled in lugs rising from the cross-head M', and provided with rack-segments, which mesh with the pinions S S. By rotating the pinions S the plates T will be correspondingly rotated, and the legs *l'* of the frame will be raised or lowered according as the plates are rotated. The raising of said legs obviously tilts or inclines the extensible frame D in a plane lengthwise of the frame A.

The shaft R is provided with a ratchet, V, which is held at any desired point by a pawl, W, which locks the intermediate mechanism.

Any other suitable devices supported on the cross-head M', for raising and lowering the legs *l' l'*, may be substituted for those shown.

a represents a flexible ladder, which may be wholly or partially of rope, or the side pieces thereof may be composed of metal links adapted to be wound on a drum. This ladder is provided with suitable cross-pieces or rungs, and is attached at its lower end to a windlass, *b*, which is journaled in the legs *l' l'* of the

frame D and is provided with a suitable crank, *c*. The upper end of the ladder is attached to the upper portion of the frame D. When the frame D is extended, as shown, the ladder *a* extends with it and bears against its cross-bars and is supported thereby, so that it will not sway and can be easily ascended. The windlass *b* is provided with a ratchet, *f*, and the adjoining leg of the lazy-tongs carries a pawl, *g*, engaging with said ratchet. As the frame is being extended or raised the ladder will be unwound from the windlass, the pawl being disengaged from the ratchet for permitting this operation to take place. An eccentric, *g'*, is employed in connection with the pawl for the purpose of lifting the same. When the ladder has been sufficiently extended, together with the frame, it is held in a stretched condition by dropping the pawl into the ratchet. The ladder will serve to brace or stiffen the frame when it is extended and so inclined that the center of gravity falls rearward of the base, as it acts in such case in the nature of a truss. When the frame is to be lowered the pawl is disengaged from the ratchet of the windlass, and then the ladder can be wound on the windlass by turning its shaft.

K represents a bar which is pivoted to the central portion of the carriage A and is adapted to swing horizontally, so as to extend across the carriage, as shown in Fig. 4, or to extend parallel therewith when not in use. The bar K has at its ends legs or bars *k' k'*, which are adapted to bear upon the ground, as shown, the whole constituting a device for bracing or laterally steadying the carriage and its attachments. When the bar and its legs are not in use they can be turned into the space between the frames A B, so as to be out of the way.

It will be seen that by the described improvements we are enabled to incline the extensible frame by raising two of its legs, provide a ladder which is always ready for use when the frame is wholly extended, and can be easily made taut and operative when the frame is partially extended, and is easily rolled up out of the way, and, finally brace or support the carriage laterally by devices which are always accessible and are easily adjusted and folded away.

If desired, the upper section of the extensible frame may be provided with rungs or cross-bars *r r*, to serve as an extension of the ladder *a* in case the same is not extended to the extreme upper end of the frame.

We prefer to provide the upper end of the frame with a box or receptacle, *t'*, pivoted to one of the cross-bars so as to swing freely.

I am aware of the existence of a fire-escape apparatus in which an extensible lazy-tongs frame is employed for the purpose of raising and supporting a flexible ladder, the latter being secured at its top to the extensible frame and detachably connected at its lower end with a drum mounted on a tilting frame. In the construction referred to a single lazy-tongs constitutes the extensible frame, and the ladder is arranged parallel with the broader side thereof, thus rendering it necessary, in order to clear said frame, to maintain the ladder at a distance from the same. When the ladder is thus arranged the extensible frame will not be braced by the ladder; but, on the contrary, the presence of a weight on the ladder will have a tendency to bend or buckle the extensible frame. The presence of a double frame and the arrangement of a windlass and flexible ladder, as heretofore described, will tend to make our fire-escape stronger and more practicable than the one disclaimed.

We claim as our invention—

1. In a fire-escape and ladder, a jointed extensible frame or lazy-tongs, supported on sliding cross-heads, combined with mechanism supported on one of the cross-heads for tilting or inclining the extensible frame, as set forth.

2. In a fire-escape and ladder, the combination of the extensible frame formed of two parallel lazy-tongs, the transverse windlass journaled in the lower portion of said frame, the flexible ladder arranged between the two lazy-tongs and connected with the latter and with the windlass, and mechanism whereby the windlass is controlled and the ladder is made taut and operative whether it is extended more or less, as set forth.

3. The combination of the pivoted bar having pivoted legs with the truck or carriage of an extensible fire-escape and ladder, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

AMOS CUMMINGS.
JAMISON H. HARRISON.

Witnesses:

DAVID T. BUNKER,
WM. D. BUCKWOOD.