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Watson & Perry.

Fire Escape.

No. 110,094, Patented Dec. 13, 1870.

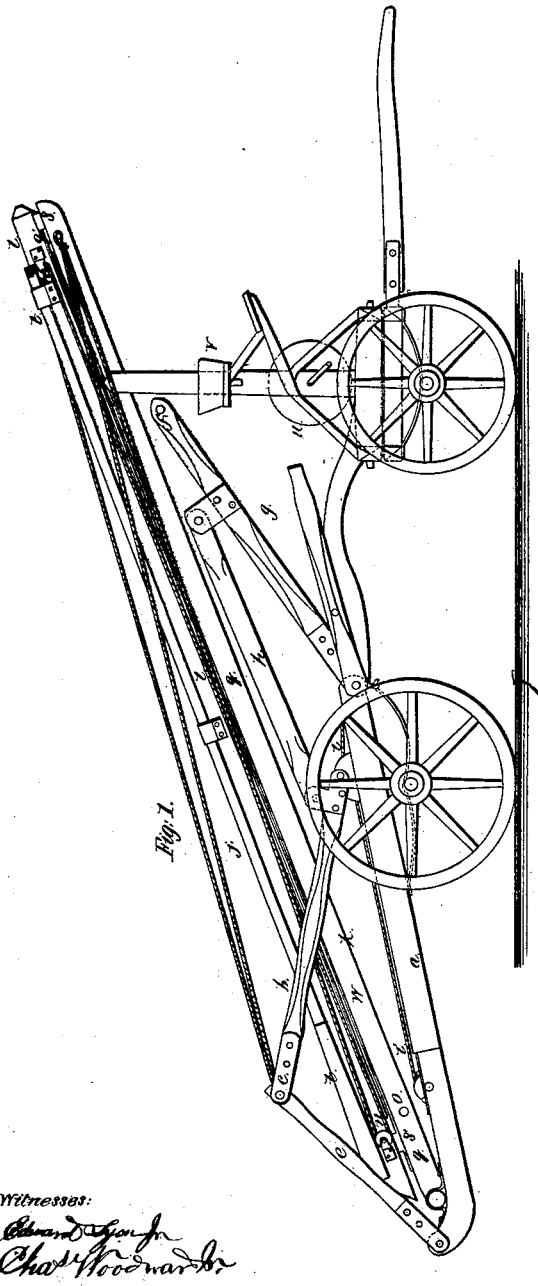

Fig. 1.

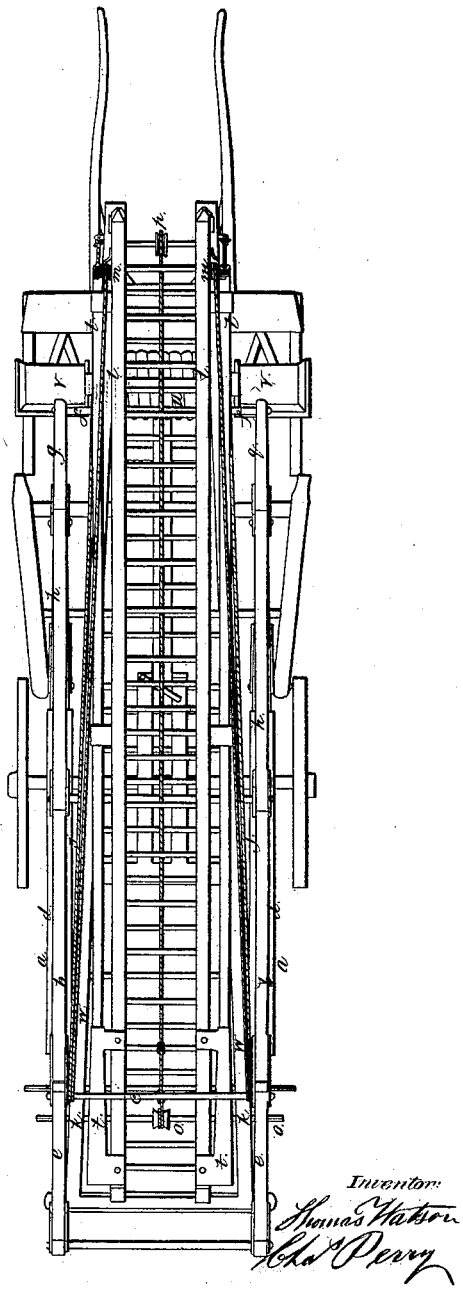

Fig. 2.

Witnesses:
Edward Lyon Jr
Chas. Woodward Jr.

Inventor:
Thomas Watson
Chas. Perry

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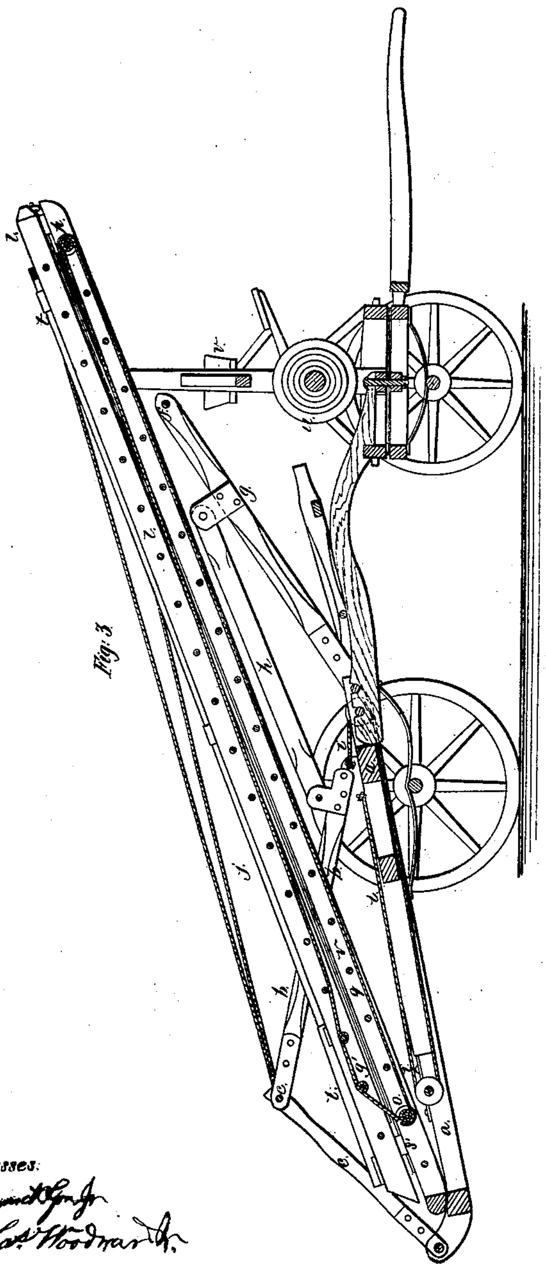

Fig: 3

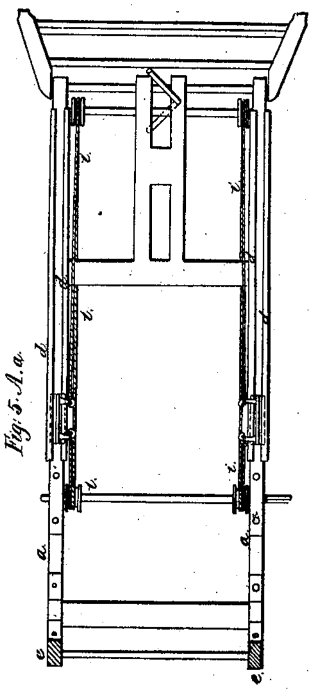

Fig: 5. A.a.

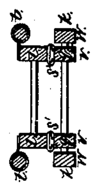

Fig: 6. B.b.

Witnesses:
Edward [illegible]
Chas. Woodward Jr.

Inventors
Thomas Watson
Chas. Perry

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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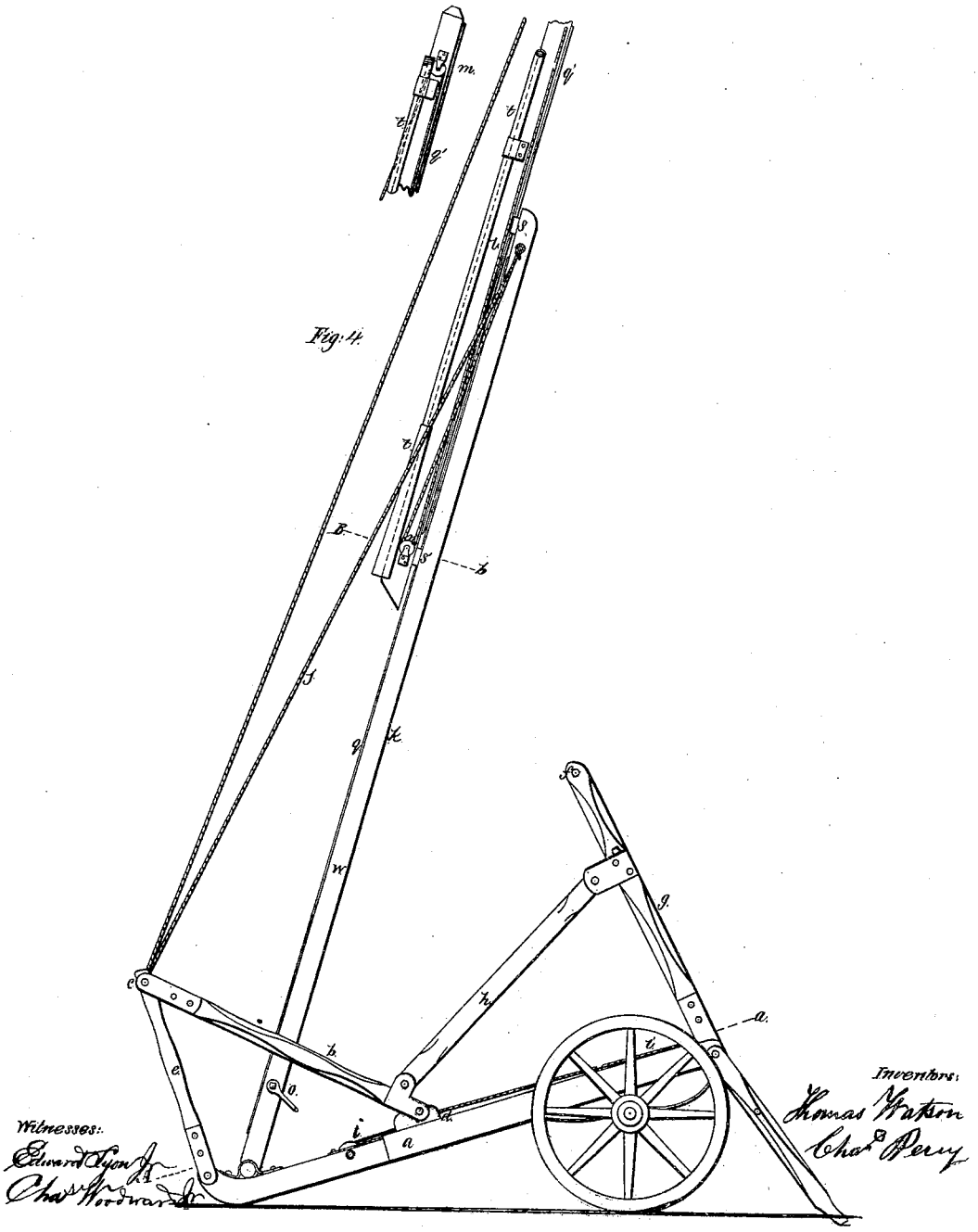
Fig. 4.



Witnesses:
Edward Lyon Jr.
Chas. Woodward

Inventors:
Thomas Watson
Chas. Perry

United States Patent Office.

THOMAS WATSON AND CHARLES PERRY, OF BROOKLYN, NEW YORK.

Letters Patent No. 110,094, dated December 13, 1870.

IMPROVEMENT IN EXTENSION LADDERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, THOMAS WATSON and CHARLES PERRY, both of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Extension Ladders; and do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters and figures thereon.

Of the drawings—

Figure 1 is a side elevation of an extension ladder, containing our improvements;

Figure 2 is a plan view of the same;

Figure 3 is a central longitudinal vertical section;

Figure 4 is a side elevation, with the ladder extended;

Figure 5 is a cross-section of the ladder, taken at A–*a*, fig. 4; and

Figure 6 is a cross-section, taken at B–*b*, fig. 4.

Similar letters of reference indicate corresponding parts in the several figures.

The present inventions have more particular reference to improvements on an extension ladder described in certain other Letters Patent heretofore granted to us, viz: those bearing date October 30, 1866, and those bearing date October 15, 1867.

Many parts that are common to all will not, therefore, be again described.

The first of these improvements consists in a construction of the base and elevating parts that gives greater security to the ladder while it is extended to the required length, and also permits of extending it with the aid of but very few assistants, two being sufficient.

It also consists in the use of a new system or combination and arrangement of guys, which renders the ladder more firm and rigid while extended, and prevents the members of the ladder from separating while in such a position.

It also consists in a new attachment to each other of the two members of the ladder.

It also consists in a new arrangement of the hose-reel.

The construction and operation of these improved parts are as follows:

In each of the upper faces of the side-bars of the truck *a* is placed a groove, in which runs the end of the two inclined bars *b b*, which connect back to the cross-bar *c*, to which latter bar is attached a system of guys, to be presently described.

Inwardly-projecting flanges, *d d*, at each side of the groove, form ways for the outwardly-projecting flanges at the end of the said inclined bars *b b*.

At the connection of these bars with the cross-bar *c* are bars *e e*, connecting at their other ends below with the extended or rear portion of the truck. This gives a solid and strong base for the whole weight of the ladders received through our new system of guys, no matter at what angle of elevation the ladders are placed or distance they are extended out, throwing such weight over a large extent of the surface of the rear truck.

At a small angle of elevation with the horizontal plane, (and when the angle made by the guys with such plane is being diminished,) a portion of the weight of the ladders is received on a forward structure composed of the cross-bar *f*, or ladder-rest, having two bars, *g g*, the lower ends of which are attached to the forward part of the truck *a*, and have two oblique bars, *h h*, attached at their upper ends, at or near to the cross-bar *f*, and at their lower ends to the lower ends of the bars *b b*.

This whole frame-work, at the back and front part of the rear truck *a*, receives its motion through a windlass and chain or rope, *i*, placed as shown in the drawing, or at any other convenient point on the base of the truck *a*.

Attached to the cross-bar *c* is a double system of guys, one set, *j j*, being fixed and attached at their lower ends on the bar *c*, just inside of the inclined bars *b b e e*, and at their other ends to the outside of the upper end of the lower member, *k*, of the ladder.

The other set of guys being movable are attached at some place on the cross-bar *c*, as the fixed ones, and extend up to the top of upper member, *l*, of the ladder through eyes or over rollers, *m*, and down along the outside of the side-bars of the ladder to the eyes or rollers *n*, placed at the lower end of such upper member, from whence they cross over to the upper part of the outside portion of the lower member of the ladder, and are there attached at the point of attachment of the upper ends of the stationary set of guys.

Each member of the ladder used in this improved apparatus is about thirty-five feet in length, thus giving, (the lap being allowed for at the junction of the members,) when at their greatest extension, an extension of about seventy feet. This length can be increased by attaching at the outer end of the upper member a socket-ladder of about twelve feet in length. This attains a sufficient height for all practical purposes.

These members are extended by means of windlass *o*, at the base of the lower member, and an endless chain or rope running up back of and over a pulley, *p*, at the top of the lower member, and around over and down in front, and rigidly attached to one or more stout rings of the lower part of the upper member, *l*. Thus the operation of the windlass and chain carries the upper member out and in, the movable guy is let out or taken up during the same movement, and serves

to support and sustain the upper member, and, from its arrangement before described, tends to bind the two members together.

The upper member, *l*, slides on metallic ways, *q q q' q'*, placed on the upper faces of the two side-pieces *r r* of the lower member *k*, and the lower faces of the side-pieces of the upper member *l*, and is connected therewith by clip-pieces *s s*, on the extreme end of the metallic ways, which clasp the ways on the upper member, while clip-pieces *s' s'*, on the extreme end of the ways on the upper member clasp the ways of the lower member.

At the side of the upper member of the ladder we construct tubes, *t t*, reaching the whole length thereof. By means of these we are enabled to obviate the carrying of hose and pipe up the ladder, by simply attaching the hose to the lower portion of the tube before extending or elevating the ladder, and thus, with the aid of a hydrant, a stream of water can easily be thrown, in many localities, directly on a fire through a window or opening in a house.

We arrange with our extension ladder a reel, *u*, carrying the hose necessary, by placing it over the front truck and between or beneath the seats *v v* of the attendants, the ends of the members of the ladders passing over it and between such seats.

The arrangement of the base and ladders with respect to the rear truck permits of the detaching and operating the same with ease and facility, by the aid of at least two attendants. This is effected by so adjusting the members of the ladder to the base-frames, and the base-frames to the truck and axle, that all will turn and operate when detached from the forward truck as if their parts were hung and counterpoised on a center pivot.

We construct the lower member *k* with the additional sides *w w*. This adds to the strength and rigidity of both members.

Claims.

1. The combination of the double system of guys with the members of the ladder, all operating substantially as described.

2. The combination of the double system of guys with the inclined bars *b b* and *e e*, substantially as described.

3. The combination of the double system of guys with the members of the ladder and inclined bars *b b* and *e e*, operating substantially as described.

4. The arrangement of ways and clip-pieces on and between the members of the ladder, substantially as described.

5. The inclined connecting-bars *b b* and *h h* at the front portion of the rear truck, and the bars *e e* and *g g*, in combination with the members of the ladder, substantially as described.

6. The arrangement of the reel on the front truck, as described.

7. The arrangement of the members of the ladder relatively to the base and rear truck and to the axle thereof, as described.

THOMAS WATSON.
CHAS. PERRY.

Witnesses:
EDWARD LYON, Jr.,
CHAS. WOODWARD, Jr.