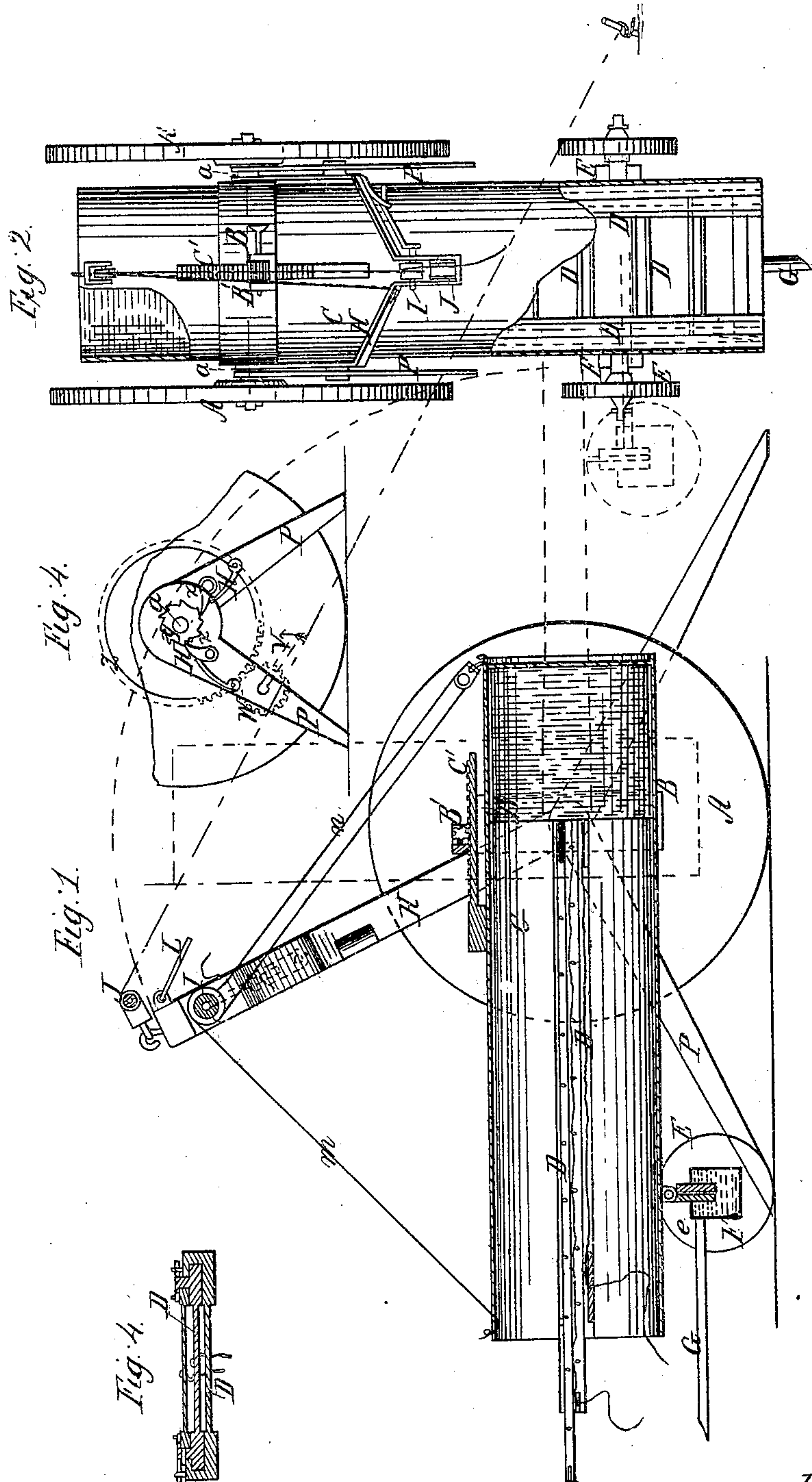


T. Witmer,

Fire Escape.

No. 113,958.

Patented Apr. 18. 1871.



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TOBIAS WITMER, OF BUFFALO, NEW YORK.

Letters Patent No. 113,958, dated April 18, 1871.

IMPROVEMENT IN FIRE-ESCAPE 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 I, TOBIAS WITMER, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Apparatus for Conveying and Raising Ladders, and for other purposes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing which is made part of this specification.

This apparatus may be readily drawn from place to place after the manner of a truck or wagon, and is provided with a number of ladders, or with an extension ladder, which may be turned into an upright position to fulfill the office of a fire-escape or for other purpose, and which may be moved from one point to another (as in rescuing occupants at the different windows of a burning building, for example) without being lowered.

It will obviously appear that the invention is applicable to the raising of hose or water-pipes in connection with the ladders, as well as to the raising of flag-staffs and signal-towers, bridging streams and ditches, storming fortifications, &c.

I shall proceed to describe the invention as illustrated in its adaptation for raising ladders.

Figure 1 is a sectional side elevation of my improved apparatus.

Figure 2 is a sectional plan of the same.

Figure 3 is an end view of a pair of the ladders.

Figure 4 is a modification.

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

A A represent two wheels, which may be mounted upon short axial shafts *a a*, projecting horizontally from an annular band, B, which encircles and sustains the rear end of a casing, C, containing an extensible ladder or a plurality of ladders, D D, which may be projected one beyond the other by cords and pulleys suitably applied, or by other available means.

The forward end of the casing C, when the same is in a horizontal position, rests upon a truck, E, to which it is connected by a king-bolt, *e*, and proper fastenings.

Said truck may carry a box, F, to contain water or other weighty appendage, for the purpose of counterbalancing the weight of the ladders when they are placed in an upright position, and when the frame or ladder H has taken the horizontal position of a reach so as to keep the ladder D from tipping over. Said box may also serve as an anchor in raising the apparatus, as hereinafter explained.

The casing C is provided with a water-chamber or box at its rear or lower end for the purpose of giving it weight by filling the water-chamber or box with water or other heavy substance, to aid in placing the

same in an upright position and keeping it in that position while in use; but the said water-chamber may, if preferred, be dispensed with.

A draft-tongue, G, is attached to the truck E, so that the apparatus may be drawn by a team after the manner of a wagon, or by men if more convenient.

H is a frame or ladder, the form of which may be substantially as represented in fig. 2, where it will be seen that the extremities of its side bars are fitted upon the axles *a a* of the wheels A A, and that said bars join at the front in such a manner as to form bearings for a windlass, I, and a point or attachment for a pulley, J, and a king-bolt, L. (See fig. 1.) This frame H may also be provided with rounds and serve as a ladder when no great height is to be attained, and extension ladders may also be attached thereto.

A rope or chain, *m*, extends from the windlass to the forward end of the machine, where it is attached, and a rope or chain, *n*, goes from the upper end of the frame or ladder H to the rear end of the machine, where it may work upon an attached pulley.

I propose by the above-described means or any substantially equivalent to effect the elevation of the ladders and their conveyance from place to place when elevated, the manner of which I shall now proceed to explain.

P P are props having pivotal attachment to the axles *a a*. These props are turned so as to present their pointed ends to the rear, and by catching against the ground prevent the backward movement of the apparatus while the ladders are being made to assume an upright position. A further step preparatory to raising the ladders is to unfasten the king-bolt *e* from the forward truck. Power being now applied at J (for which purpose the truck E may serve as an anchor) to draw backward the upper end of frame H, said frame, in conjunction with the cord or chain *m* and wheels A A, operates after the manner of a lever to place the ladders with their casing in an upright position. This having been done the ladders may, as before stated, be projected upward one beyond the other, to afford a means of ascent and descent or conveyance to and from elevated points. In the act of turning the ladders upright the frame H is brought to a horizontal position, and it is then made to serve the purpose of a reach by having its king-bolt L fastened to the truck E, the latter having been detached from the ladder-casing at the commencement of the elevation thereof, and wheeled into position for its new service, when it may serve as an anchor to keep the apparatus upright. One or more guys or ropes may be employed to steady the apparatus when the ladders are raised. The weight of the lower end of the ladder-casing, (which may be filled with water or

other heavy substance,) as well as its proximity with the ground or supporting surface, may aid in maintaining the upright position of the same.

It is manifest that by thus using the frame H as a reach and adapting the apparatus for the reattachment of the forward truck the apparatus may be wheeled from place to place without first restoring the ladders to their horizontal position. I thus attain a great improvement by facilitating and expediting the important work for which the machine may be employed.

I do not limit myself to the construction herein shown and described, nor to the use of a casing for the ladders, as said casing may be dispensed with.

The band B may be provided with a rigid bearing for a pinion-wheel, B', which meshes with the teeth of a rack, C', fixed rigidly to the casing C of the ladders. By means of this pinion the casing C, when upright, may be let down so as to rest upon its end, or raised out of contact with the supporting surface when it is to be conveyed from one point to another.

Any desired inclination may be given the ladders when set up for use by means of the windlass I and ropes or chains *m m*. If preferred, the office of the wheels may be supplied by runners or other movable support.

The ladders or body of the machine may also be raised to any desired inclination by means of a double ratchet-wheel, (or two ratchet-wheels,) *y*, fig. 4, which are attached firmly to the axle *a*, operated by the pawls *x x'*, fig. 4, which are respectively attached with bolts to the props P P, in which case said props may be used as levers with which to raise the ladders by turning the ratchet-wheel *y*. Or, if preferred, a spur-wheel, Z, fig. 4, may be firmly fastened to the axle *a* so as to gear it into a pinion, W, fig. 4, which may be fastened with its bearings in the prop P and operated by the crank *v* to turn the axle *a*, and thus bring the ladders up to any desired elevation, the ratchets and pawls sustaining it.

One or more braces or props may be hinged to the apparatus so as to retain the casing or ladders at any degree of inclination, and suitable brackets may be applied to the frame or casing to support the same when folded up for transportation.

A series of the frames H may be employed in order to equalize the strain on the rope or chain *m* when the frame is swung toward the ground previously to swinging up the ladders, in case I desire to throw them across a stream to be employed as a bridge, or against a fortification for storming purposes.

The invention may be made to constitute an implement for shifting barrels, bales, or goods from or to upper stories of buildings, or from one to another. It may also be used as a portable crane or derrick for raising goods and commodities into wagons, cars, &c. It may also, by adding a floor and railing to the frame, be adapted for use as a bridge, for shipping cattle into and out of cars, &c.

Having thus described my invention,

What I claim as new herein, and desire to secure by Letters Patent, is—

1. The frame H when pivoted to the same axis with the ladders, and having operating cords or chains *m n* in front and rear, in connection with the detachable truck E and ladders D or casing C, substantially as and for the purpose described.

2. The combination with the ladders D or casing C of the rack C' and pinion B, applied and operating as and for the purpose set forth.

3. The ratchet or ratchets *y y'*, pawls *x x*, and props P, as arranged with the ladders, substantially as and for the purpose described.

To the above specification I have signed my name this 4th day of March, 1869.

TOBIAS WITMER.

Witnesses:

MARTIN WITMER,
T. WITMER, Jr.