T. McCABE.
Fire-Escape.

No. 218,680. Patented Aug. 19, 1879.

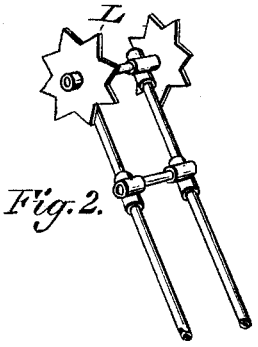

Fig. 2.

Fig. 3.

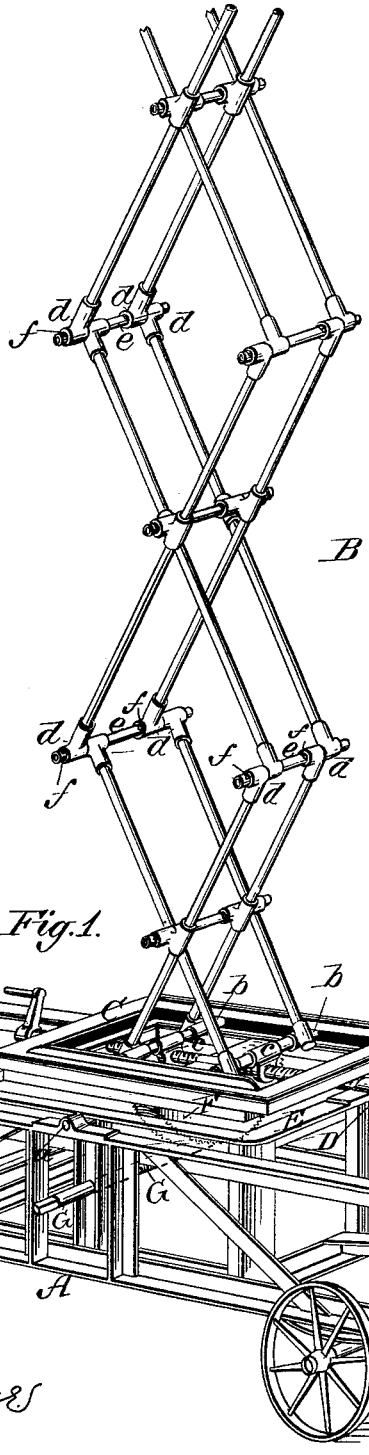

Fig. 1.

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THOMAS McCABE, OF OTTAWA, ONTARIO, CANADA.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **218,680**, dated August 19, 1879; application filed November 9, 1878.

To all whom it may concern:

Be it known that I, THOMAS McCABE, of the city of Ottawa, in the county of Carleton and Province of Ontario, mechanical engineer, have invented certain new and useful Improvements on Fire-Escapes; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to that class of fire-escapes in which the ascending devices are a series of levers crossing each other, the centers pivoted to each other, and each series attached to the others at their extremities consecutively, the whole being elevated or lowered by means of a right-and-left-hand screw passing through nuts attached to the feet of the lower series of levers; and the improvement consist in mounting the series of levers in a base or frame adapted to be oscillated in the truck or carriage, both in the direction of its length and in a direction at right angles thereto; in means for producing such oscillations of the base; in automatic devices adapted to engage the different series of levers at their ends as they fold down upon the truck and support and steady the same; in star-shaped wheel journaled upon a shaft at the upper extremity of the upper series of levers, adapted to support the levers against the wall of a building and permit them to ride readily over projections thereon; and in various details of construction.

In the accompanying drawings, Figure 1 represents a perspective view of my improved apparatus, with the series of levers elevated and the upper end broken away; Fig. 2, a similar view, showing the star-wheels and the manner in which they are applied; Fig. 3, a view illustrating the method of securing the levers upon the connecting-shafts.

The apparatus consists, primarily, of a strong metallic frame, A, preferably constructed of angle-iron, as shown, in order to secure lightness, together with great strength, mounted upon wheels, and adapted to convey the apparatus from place to place, and a series of levers, arranged on the well-known "lazy-tongs" principle, mounted in or upon the truck, and adapted to be elevated for use or folded down upon the truck for conveyance.

In order that the tower formed by the levers when extended may be made to stand in a vertical position with reference to the sides of the truck, regardless of the unevenness of the ground, and inclined forward or backward in the direction of the length of the truck, to rest against a wall or chimney for support when in use, the feet of the lower set of levers are mounted in a frame, C, which is journaled upon a heavy shaft, D, upon the upper side of a second frame, E. Extending transversely across the frame C, with its curved side downward, is a semicircular worm-wheel or plate, F. Concentric with the shaft D, and extending transversely across and journaled in the second frame, E, is a worm or screw-shaft, G, gearing or meshing with the teeth of the worm-wheel or plate F, and adapted to cause by its rotation an oscillation or rocking of the worm-wheel, and with it the frame or base C, and the series of levers mounted thereon, the oscillation being in one or the other direction as the shaft G is turned in one or the other direction.

In this manner the tower or series of levers may be made to stand in a vertical plane, though at the same time inclined toward or away from the burning building in the direction of the length of the truck or carriage, regardless of the position of the truck or unevenness of the ground it stands upon.

In order to incline the tower or levers toward or away from the building, or cause it to stand in a vertical position, the frame E, in or upon which the frame C is mounted, as above described, is hung upon trunnions *a* from the top of the truck-frame A at the sides of the truck, as shown, thus permitting the frame E to oscillate at right angles to the frame C, a rigid yoke, H, extending outward from the end of frame E, and carrying a pivoted block or nut, I, the journals of which pass through slots in the yoke H, and the block or nut being raised or lowered by a vertical screw-shaft, J, journaled in the truck-frame, as shown. By the rotation of the screw-shaft J, the block or nut I, and through it the yoke H, are raised or lowered, and the frame E caused to swing upon the trunnions *a* and incline the tower, as desired.

The base or supporting frame being thus constructed and arranged, the feet of the lower

series of levers are journaled upon two transverse shafts, *b b*, the ends of which are extended into ways in the sides of the frame C, by which means the tower or series of levers B is held from tripping sidewise, while the shafts *b* are free to be carried back and forth to elevate or lower the levers. For this latter purpose the shafts *b b* are each furnished with a nut, *c*, through which the screw-shaft D passes, one of said nuts being provided with a right-hand and the other with a left-hand thread, to correspond with the threading of the shaft. The levers being arranged on the lazy-tongs principle, or in pairs, pivoted together at their centers, and each set pivoted at its extremities to the adjoining sets, it follows that the rotation of the shaft D in one direction, drawing together the feet of the lower set of levers, will cause the entire series of levers to be projected upward, while the rotation in a reverse direction will cause the lowering of the same. The levers are connected by means of L-shaped tubular couplings *d*, journaled upon transverse shafts *e*, and held in place thereon by pins *f*, passed through the shafts *e*, and bent around the shafts, as shown in Fig. 3.

The levers and the shafts *e* are preferably made tubular in form, in order to combine strength and lightness.

In order that the levers when folded down upon the truck may be steadied and prevented from rocking or tipping, the truck is furnished at each end with a hinged frame, K, which stands in a vertical position when in use, but which may turn down into a horizontal position, the frames being formed with short arms to receive the ends of the different sets of levers, and with a pair of longer arms, *h*, which are struck by the lower set of levers in folding down, causing the frames to assume a vertical position and its shorter arms to engage properly under the proper levers.

In order that the tower or series of levers may be allowed to rest against the wall or chimney of a building in ascending and descending, and move freely upon the face of the same, the upper extremity of the upper pair of levers is furnished with a transverse shaft, upon which are journaled two or more star-shaped wheels, L. By making the wheels in the form mentioned their points in meeting with trimmings or other obstructions on the face of the wall will cause the wheels to rotate and pass readily over the same.

I am aware that wheels having a smooth and regular periphery have been heretofore used for this purpose; but these are found, in practice, to lodge under projections and interfere with the ready ascent of the tower—a difficulty entirely obviated by the star-shaped wheels.

The apparatus as above constructed is very efficient and easy of manipulation, and is light and simple in construction, and, being constructed of angle-iron, with levers of tubular form, the whole, properly braced, is exceedingly strong.

Having thus described my invention, what I claim is—

1. The combination of the truck or base-frame, the frame E, mounted therein upon a transverse axis, frame C, mounted upon a longitudinal axis in frame E, tower B, and adjusting devices substantially such as shown.

2. The frame E, pivoted upon the screw D, arranged to actuate the tower-elevating devices.

3. In a fire-escape, supporting-frames K, hinged to the truck-frame and provided with short arms *g* and long arms *h*, substantially as and for the purpose set forth.

4. The combination, substantially as shown, of the transverse shaft *e*, couplings *d*, mounted thereon, and pins *f*, adapted to secure the couplings on the shaft.

5. In a fire-escape substantially such as shown, star-shaped wheels journaled to the upper extremity of the tower, substantially as and for the purpose described.

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