S. DAVIS.

Fire-Escape Ladder.

No. 204,952. Patented June 18, 1878.

Fig. 2.

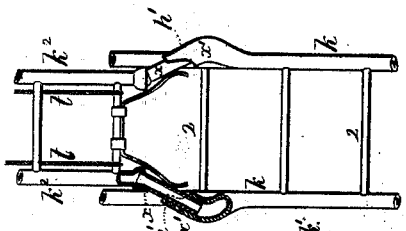
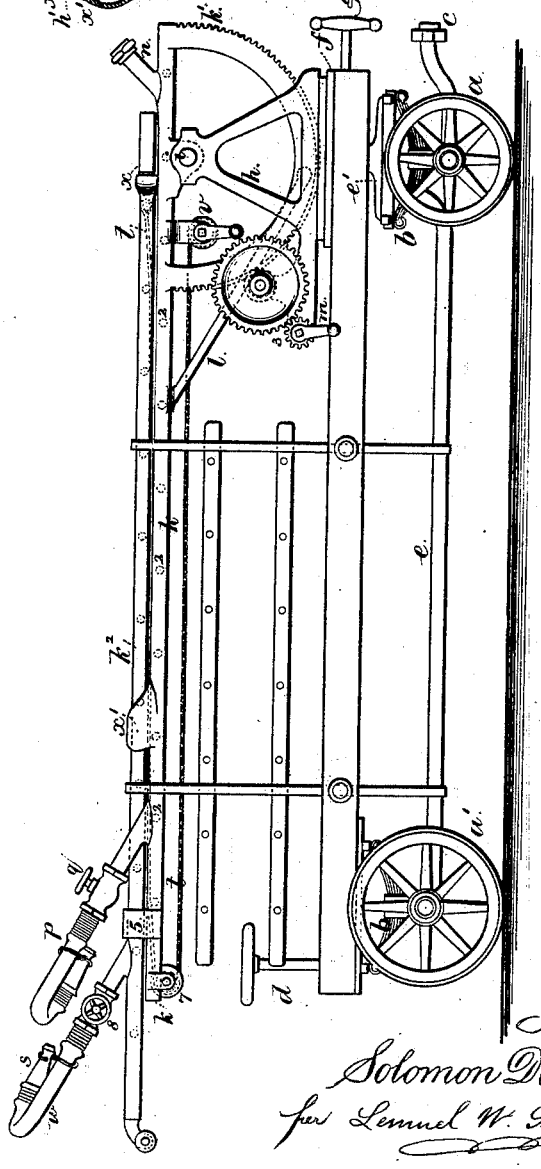


Fig. 1.



Witnesses

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# UNITED STATES PATENT OFFICE.

SOLOMON DAVIS, OF NEW YORK, N. Y.

## IMPROVEMENT IN FIRE-ESCAPE LADDERS.

Specification forming part of Letters Patent No. **204,952**, dated June 18, 1878; application filed September 7, 1877.

*To all whom it may concern:*

Be it known that I, SOLOMON DAVIS, of the city and State of New York, have invented an Improvement in Fire-Ladders, of which the following is a specification:

Fire-ladders have been raised by a pinion and segment upon the truck, and in some instances the ladder has been made of metal tubes.

My invention relates to a ladder made of tubes, with coupling-connections, so that the ladder itself conveys the water, in combination with the supporting-truck and gearing for raising the ladder and swinging it around against the building. I also make use of peculiarly-constructed couplings for uniting one length of tubular ladder to the next.

In the drawings, Figure 1 is an elevation of the ladder and truck, and Fig. 2 is an elevation and partial section of the coupling for uniting the tubular ladders.

The wheels *a a* are upon axles, and the springs *b* and truck-frames are of usual construction. At one end the horses or the draft-ropes are to be attached, as at *c*, and at the other end the steering apparatus *d* is employed; and there are connecting bars or frames *e* from one truck to the other, as now usual.

The bed-plate *f* is circular and attached by a center-bolt, and it rests upon the part *e'* of the front truck; and there is a handle, *g*, and pinion acting upon gear-teeth at the under side of the bed *f*, so as to revolve the bed and the parts connected to the same, to bring the ladder into position after it has been raised.

Upon the bed *f* there are the vertical side frames *h* that support the cross-shaft *i*, carrying the ladder. This ladder is made of metal tubes *k*, with cross-tubes 2, forming the rungs. These cross-tubes are, by preference, brazed to the vertical tubes, but may be connected in any convenient manner. The tubes *k* are attached to the shaft *i*, and also to the segmental gears $k^1$; and there are also braces *l* from the ladder-tubes to the segments $k^1$. The pinion 3 and crank *m* are employed to act upon the segmental gears $k^1$, and there may also be intermediate gearing to increase the purchase. By this device the ladder is raised or lowered, the parts being proportioned so that the power required can be exerted through the gearing and segments $k^1$ to elevate such ladders according to their size, the shaft *i* being the axis of motion.

When the ladder is raised it can be swung around against the building by partially revolving the bed, as aforesaid.

There is a tube, *n*, connected near the bottom of the ladder-tube *k* with a coupling-connection for the hose from the hydrant or engine; and near the top of such tube there is an outlet, with a flexible hose, *p*, and nozzle, and it is preferable to employ a gate or stop-cock at *q*. There may be similar inlet and outlet connections to each of the tubes forming the sides of the ladder.

Where the ladder is made of more than one length, the second length is made of tubes, the same as the first; but it is narrower, so as to sit between the side tubes *k* and in front of the rungs 2. There are guides at 5, and the tubes $k^2$ are between such guides, so that the second length may be drawn up or lowered down by a rope or chain, *t*, passing from the windlass-shaft *v* over a pulley, 7, and thence to the lower part of the ladder.

There are to be gates 8, flexible tubes *w*, and nozzles *s* upon the tubes of the upper ladder, so that the water may be passed through such tubes and prevent the necessity of separate hose; and there may be nozzles and hose connected near the middle part of the tubes *k* and $k^2$; but, in order to connect the upper ladder-tubes $k^2$ with the lower ladder-tubes *k*, I make use of jointed tubes *x* and sockets *x'*. These sockets have holes in them that are slightly tapering, and they are upon the ladder-tubes *k*; and at the lower ends of the upper ladder-tubes $k^2$ there are short tubular sections, jointed at their upper ends, so as to swing laterally. When the lower ladder has been drawn up to its full extent, the lower ends of the joint-tubes come above the sockets *x'*. Hence if the said tubes are spread apart their lower ends will come above the socket *x'*; and by lowering such ladder the tubes will enter the said sockets and complete the water-connection between the water-tubes of one ladder and the next.

If a spring is employed against the side of

the laterally-swinging tube $x$ to press it outwardly, the said tube will be moved to place automatically as the ladder is raised, a plate or guide at $h'$ (see Fig. 2) serving to arrest the movement of the lower end of the said tube and direct the same into the socket as the ladder is lowered.

I do not claim a segment-gear attached to a wooden ladder and operated by a pinion. Neither do I claim a tubular ladder with rungs and with hose-connections to the tubes. In my ladder the connections for the hose are contiguous to the segments $k^1$; but the one does not interfere with the other.

I claim as my invention—

1. In combination with the metallic tubular ladder $k$ and tube $n$, the segments $k^1$, connected directly to such tubes $k$, the braces $l$, extending from the ladder-tubes $k$ to the segments $k^1$, the cross-shaft $i$, sustaining-frames $h$, pinion 3, and crank $m$, substantially as set forth.

2. The tubular ladder provided with inlet-pipe $n$ and socket $x'$, in combination with the extension-ladder $k^2$ and tubular sections $x$, substantially as and for the purposes set forth.

Signed by me this 4th day of September, A. D. 1877.

SOLOMON DAVIS.

Witnesses:

S. ROSSIN,

JOSEPH ALTSCHUL.