(No Model.)

2 Sheets—Sheet 1.

J. P. DUNN.

FIRE ESCAPE LADDER.

No. 350,047. Patented Sept. 28, 1886.

Fig. 1.

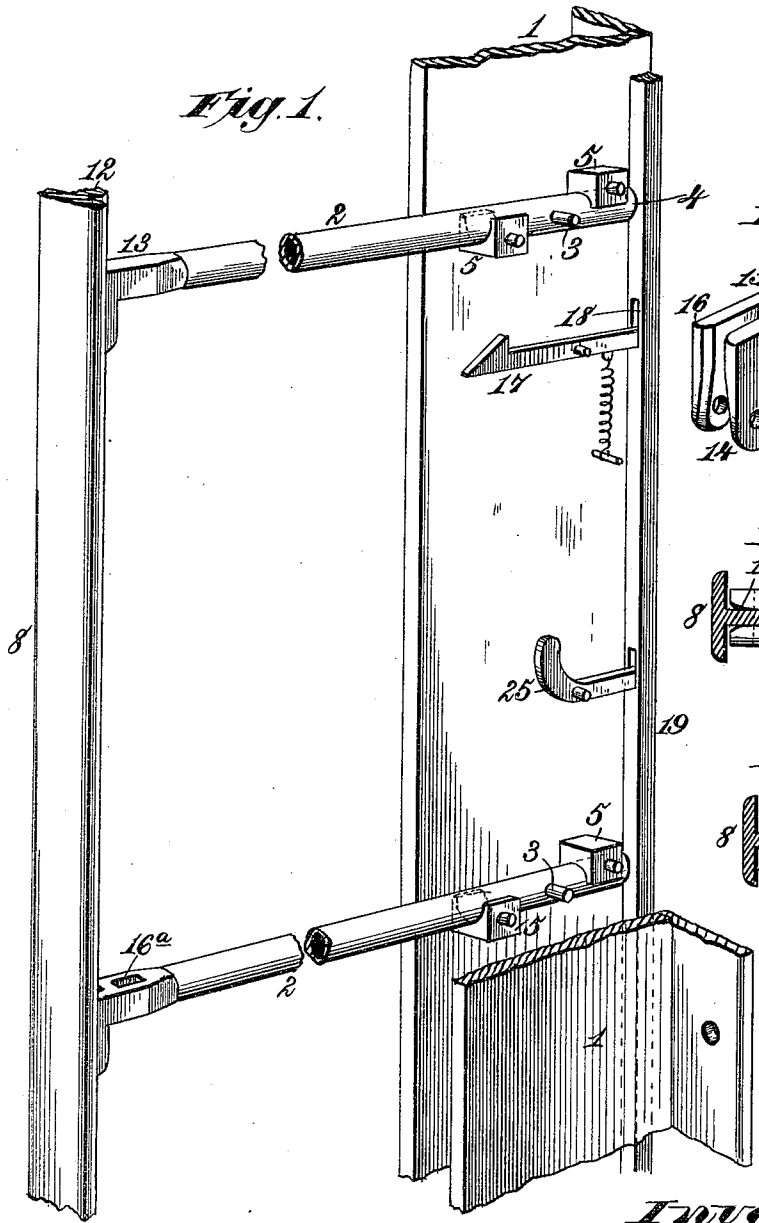


Fig. 2.

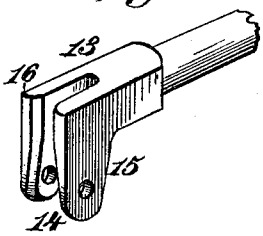


Fig. 3.

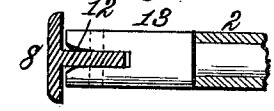
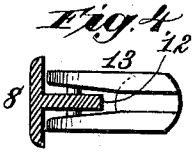


Fig. 4.



Witnesses.
Robt Everett.
Jos L Coombs

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By James L. Norris.
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C

(No Model.) 2 Sheets—Sheet 2.

J. P. DUNN.

FIRE ESCAPE LADDER.

No. 350,047. Patented Sept. 28, 1886.

Fig. 8.

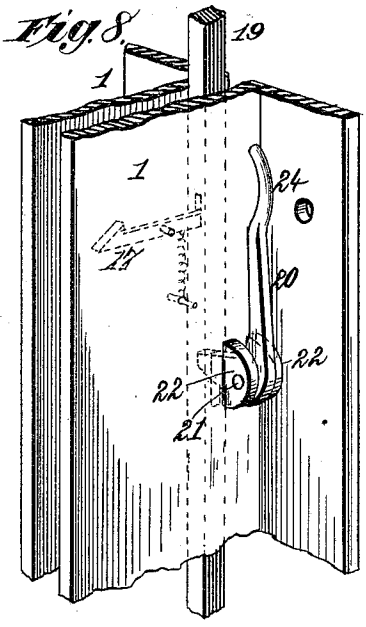


Fig. 9.

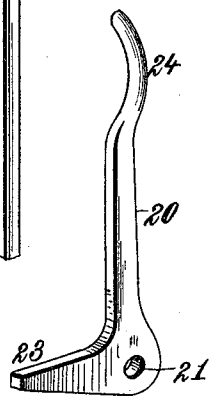


Fig. 5.

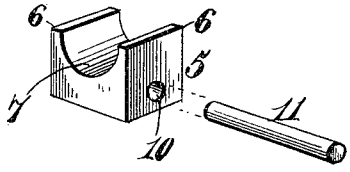


Fig. 6.

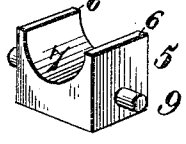
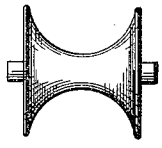


Fig. 7.



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By James L. Norris.
Atty.

N. PETERS. Photo-Lithographer. Washington, D. C

UNITED STATES PATENT OFFICE.

J. PARIS DUNN, OF NEW YORK, N. Y.

FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 350,047, dated September 28, 1886.

Application filed July 10, 1884. Renewed June 22, 1885. Again renewed May 16, 1886. Serial No. 201,404. (No model.)

To all whom it may concern:

Be it known that I, J. PARIS DUNN, a citizen of the United States, residing at New York, N. Y., have invented new and useful Improvements in Fire-Escape Ladders, of which the following is a specification.

This invention relates to improvements in the fire-escapes for which Letters Patent Nos. 250,901 and 267,504 have heretofore been issued to me.

The invention has for its objects to provide novel means to rigidly hold the pivoted ladder-rounds against lateral movement when unfolded for use and to bring the abutting ends of the front rail-sections into proper alignment and squarely upon each other, so as to prevent the ends of the sections from overlapping; to provide novel means whereby the hinge-blocks secured to the front rail-section are prevented from coming in contact with the surfaces of the front rail-section when the ladder-rounds are folded upward for the purpose of permitting the ladder to more easily unfold when desired for use; to provide a novel hinge-block which will come directly against and closely embrace the sides of a central flange on the front rail-section when the ladder-rounds are unfolded, but will not bear against the said central flange when the ladder-rounds are folded, whereby the ladder-rounds will more easily unfold, and when brought to this position the front rail-section will be more firmly and rigidly held in position; and, finally, to provide novel and simple means for moving the latch-operating bar to receive the ladder-rounds and permit them to unfold. These objects of my invention are accomplished in the manner and by the mechanism hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a broken perspective view of sufficient of a fire-escape ladder to illustrate my invention. Fig. 2 is a detached perspective view of one of the hinge-blocks; Fig. 3, a top plan view of the hinge-block, showing its position on the central flange of the outer rail-section when unfolded; Fig. 4, a similar view, showing the position of the parts when folded; Figs. 5 and 6, detached perspective views of the holders and supports for the pivoted ladder-rounds; Fig. 7, a modified construction of the same; Fig. 8, a broken perspective view of sufficient to show the device for moving the latch-operating bar, and Fig. 9, a detached perspective view of the hand-lever for moving the latch-operating bar.

The stationary casing may be of the same construction as that in my patents alluded to, the vertical side plates, 1 1, being secured to the wall of the building between the windows. The ladder-rounds 2 are pivoted to pins or pintles 3 at a short distance from their ends to provide the inner end extensions, 4, and between the plates of the casings are secured the combined guides, holders, and supports 5, each composed of a block having a semicircular concavity in one face, to form two side flanges, 6, and a bottom wall or rest, 7, in which the ladder-round seats. These guides and holders are arranged so that one is in rear of the pivot-pin 3 and above the ladder-round and another in front of the pivot-pin and below the round, a pair of the guides and holders occupying this relation to each round in such manner that when the round is unfolded to a horizontal position, as in Fig. 1, they rest against the bottom wall or rest, 7, and the side flanges closely embrace the round to firmly hold it against any movement in a lateral direction or transversely to the case. The flanges 6 also act on the opposite sides of the rounds in their unfolding movement to accurately guide the same in a straight way to the proper position equidistant between the plates or walls of the case, and, therefore, when the outer or movable rail, 8, of the ladder is made in sections, as in my patents mentioned, the abutting ends of the rail-sections are brought into alignment and squarely and evenly one upon the other to prevent the adjacent ends overlapping, and thereby presenting, as it were, a continuous and even rail. The bottom walls or rests of the guides and holders serve to sustain the ladder-rounds above and below at opposite sides of their pivotal points, whereby the pivots are in a large measure, if not wholly, relieved of strain.

The combined guides and supports may be composed of metal blocks forged into the described configuration with the side lugs, 9, as in Fig. 6, to engage recesses in the plates or walls of the case; or the blocks may be transversely perforated at 10 to receive separate pin 11, as in Fig. 5. They may also be com-

posed of a pin to constitute the bottom wall or rest, 7, and circular flanges, as in Fig. 7; or the flanges on the pin may be oblong or of other suitable shape instead of circular. If the flanges are circular, they may be rigid or loose on the pin.

The front rail-section is composed of a T-shaped iron bar, and the ladder-rounds are connected with the central flange, 12, through the medium of hinge-blocks 13 of novel construction. These blocks may be of cast-iron or other metal, and each one is constructed at its outer end with an open slot, the sides of which converge from the toe end 14 of the flanges 15 to the heel end 16 thereof, so that the slot is practically wedge-shaped or decreases in width from toe to heel in such manner that when the ladder-rounds are folded the flanges 15 do not come in contact with the surfaces of the central rail-flange, 12; but when the rounds are unfolded the heel ends of the flanges closely embrace and bear against the said central rail-flange and act to render them firm and substantial, which, in conjunction with the flanged round-supports 5, renders the ladder practically rigid and steady when unfolded for use.

Some difficulty exists in the operation of the ladder as heretofore constructed, due to the fact that the hinge-block closely fits the central rail-flange when folded, and when the ladder stands for a length of time without attention the flanges of the hinge-block stick to the central rail-flange by the formation of rust or from other causes, and consequently it is sometimes impossible or very difficult to unfold the ladder. This is entirely avoided by my invention and the ladder rendered easy of operation at all times. The hinge-block—one or more on each ladder-section—is provided with a recess, 16^a, to receive and engage the hooked end of the pivoted latch 17, which enters a slot, 18, in the vertically sliding bar 19, so that when the front rail-section is folded up the latch will engage the hinge-block and retain the ladder in its folded position. To move the sliding bar vertically, I provide a lever, 20, pivoted at its lower end, as at 21, between ears 22 on one of the side plates of the case, said lever having an inward-projecting tail-piece, 23, which passes through an opening in the side plate and enters a recess or slot in the sliding bar, so that by drawing the handle 24 of the lever outward, the tail-piece, acting directly on the sliding bar, lifts it and operates the latch to release the hinge-blocks and permit the ladder to unfold by gravity. A pivoted pusher, 25, may be used to start the ladder when the latch-operating bar is raised. This provides a simple and convenient means for operating the ladder from the outside of the case, the lever being readily accessible from a window, but the lever may be connected by devices with the interior of the building, so that it can be swung from the inside.

The hinge-blocks constructed as described may be made integral with the ladder-rounds, but I prefer to make them separate and afterward attach them to the rounds.

Having thus described my invention, what I claim is—

1. The combination, with the pivoted rounds of a folding ladder, of a guide and support composed of a bottom rest and side flanges for guiding the rounds and holding them against lateral movement, substantially as described.

2. The combination, with the pivoted rounds of a folding ladder, of a pair of guides and holders for each round arranged respectively above and below and in front and rear of the pivot, and each composed of a bottom rest and side flanges for holding the round against lateral movement, substantially as described.

3. The combination of the pivoted ladder-rounds and the flanges for embracing the rounds when unfolded and holding them against lateral movement, substantially as described.

4. The combination, with the pivoted ladder-rounds and the flanged rail, of a hinge having flanges, which closely embrace and steady the rail-flange when unfolded, and are free from contact with the rail-flange when folded, substantially as described.

5. The hinge-block constructed with a slot decreasing in width from the toe to the heel, substantially as described.

6. The combination, with the ladder-rounds and the flanged rail, of a hinge-block having a slot decreasing in width from the toe to the heel end portion, substantially as described.

7. The combination, with the pivoted rounds and the flanged rail-section, of the hinge-block having two flanges embracing and pivotally connected with the rail-flange at their toe portion, said flanges being separated by a slot, the sides of which converge from toe to heel, substantially as described.

8. The combination, with the case, the pivoted rounds, a front rail, and the vertical latch-operating bar, of a pivoted lever having an attached tail end directly engaging the bar, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

J. PARIS DUNN.

Witnesses:
EWELL A. DICK,
JAMES L. NORRIS.