Aug. 25, 1959 E. J. McCONOLOGUE 2,901,056

FIRE ESCAPE LADDER

Filed June 1, 1956 2 Sheets-Sheet 1

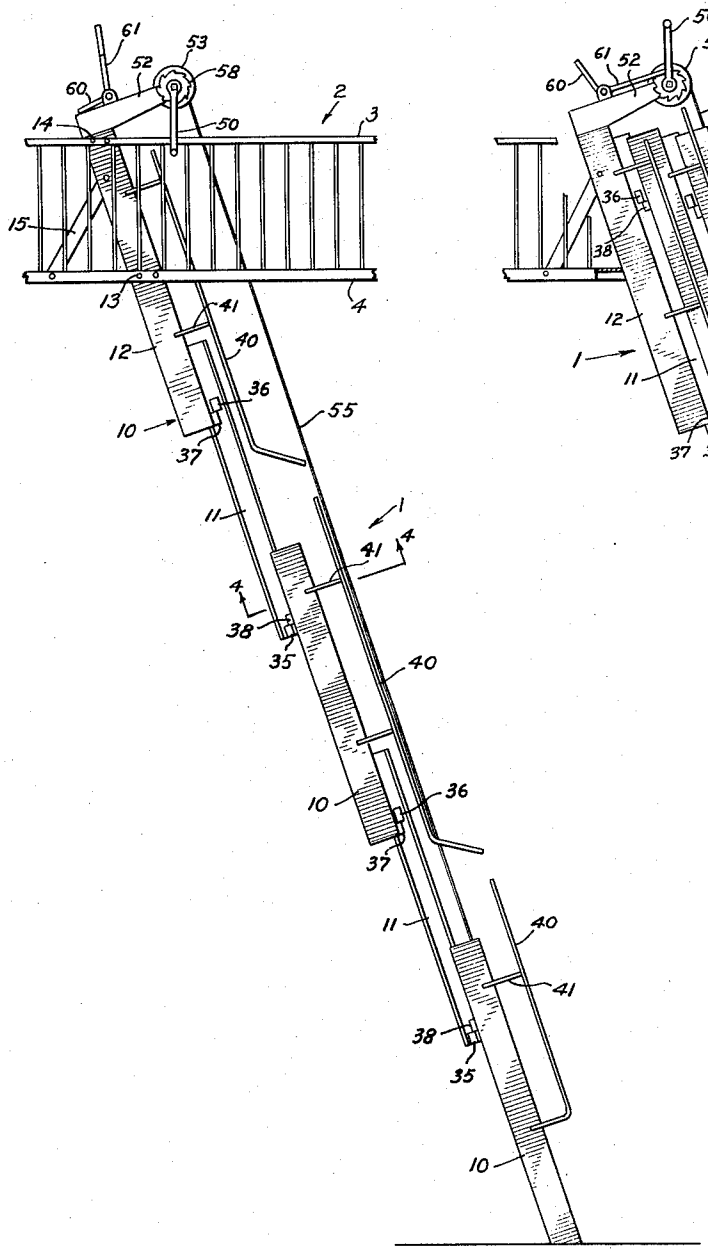


Fig. 1.

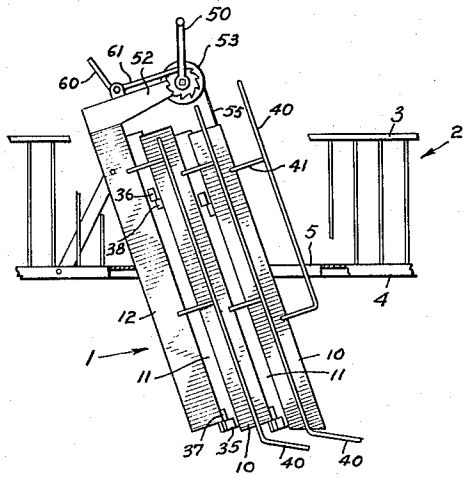


Fig. 2.

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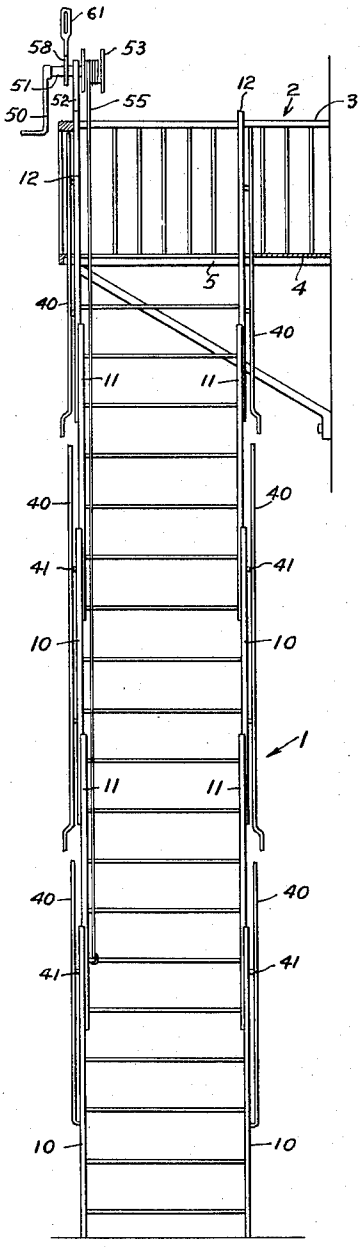


Fig. 3.

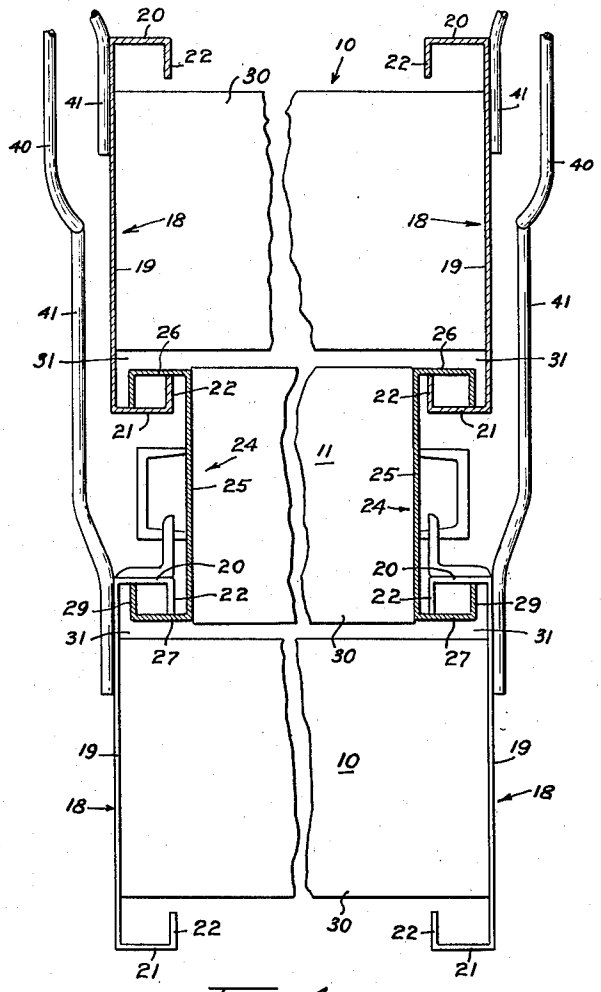


Fig. 4.

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FIRE ESCAPE LADDER

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2 Claims. (Cl. 182—85)

This invention relates to a fire escape ladder.

The object of this invention is to provide a collapsible fire escape ladder, which is simple in construction and operation, safe and durable.

Another object of this invention is to provide a fire escape ladder which is secured to a fire escape balcony, wherein said fire escape ladder is stored in a collapsed form.

Another object of the invention is to provide a fire escape ladder which may be extended from the fire escape balcony to the ground instantly and automatically, by releasing a lever.

Other objects and advantages will appear as the specification proceeds and the novel features of the device will be particularly pointed out in the claims hereto annexed.

In this specification and the annexed drawing, the invention is illustrated in the form considered to be the best but it is understood, that the invention is not limited to such form; and it is also to be understood that in and by the claims following the description, it is desired to cover the invention in whatsoever form it may be embodied.

This invention is illustrated in the accompanying drawings, forming a part of the specification, in which:

Fig. 1 is a side view of the fire escape ladder, showing the same in an extended position.

Fig. 2 is a side view of the fire escape ladder, showing the same collapsed.

Fig. 3 is a front view of the Fig. 1.

Fig. 4 is a cross-section taken along the line 4—4 of Fig. 1.

The fire escape ladder 1 forming the subject matter of this invention is secured to a fire escape balcony 2 having a railing 3 around the same and a floor 4 with a hatch 5 for said ladder.

The latter consists of a plurality of major sections 10 and minor sections 11, arranged in an alternating order and slidably connected to each other. The upper major section is designated as 12 and is affixed to a fire escape balcony 2 at an angle thereto and at an angle to the ground. The balcony includes a floor 4, a railing 3, and a brace 15. The upper section 12 is attached, as seen in Fig. 1, to the brace, to the floor at 13 and to the railing at 14.

Each major section 10 consists of two parallel inward channels 18 each consisting of a web 19, two flanges 20 and 21 extending at right angles to said web and directed toward the opposite channel. Each flange 20 and 21 has an extension 22 directed toward each other and parallel to said web.

Each minor section 11 consists of two parallel outward channels 24, each having a web 25, which is considerably narrower than the web 19, and also having flanges 26 and 27 on the sides of the same directed outwardly. Each of the flanges 26 and 27 has an extension 29 extending toward each other and parallel to the web 25.

Each pair of channels 18 and 24 is connected by a plurality of rungs 30. It shall be noted that the rungs 30 are spaced from the extension 22 of the channels 18 so as to provide a narrow space 31 for the flanges 26 and 27 to slide in.

The flanges 21 and the extensions 22 of the channel 18 interlock with the flanges 26 and the extension 29 of the channel 24, while the flanges 27 and extensions 29 of the latter channel interlock with the flanges 20 and extensions 22 of the next adjoining channel 18, as shown in Fig. 4. Such arrangement permits sections 10 and 11 to slide in relation to each other. This relative motion is limited, however, by stops 35 and 36 affixed to each channel 24, the stop 35 being located at the lower end of said channel and the stop 36 near the upper end of the same. Said stops 35 and 36 cooperate with abutments 37 secured to the flange 20 of the channel 18 at the lower end thereof and abutments 38 secured to the flanges 21 of said channel in close vicinity of the upper end thereof.

Each major section 10 carries hand railings 40 secured to the channels 18 by posts 41.

Means are provided on the upper major section 10 for lifting and collapsing said ladder and holding the same in collapsed form. Said means may be of various forms and are shown here as consisting of a crank 50 secured to a shaft 51 rotatable in a support 52 and adapted to wind a pulley 53 secured to the same shaft. The pulley 53 carries a steel cable 55 extending therefrom to the last section and is secured thereto. By rotating the pulley 52 by means of said crank 50, the sections are lifted to the balcony 2. The shaft 51 also carries a ratchet wheel 58 secured thereto. A level 60 is pivotally secured to the support 52, which lever has an arm 61 engaging the teeth of the ratchet wheel 58. When the crank 50 is rotated in a counter clock-wise direction, looking at Fig. 1, the teeth of the ratchet wheel 58 lift the arm 61 and pass thereunder, but said arm does not permit the shaft 51 and the pulley 53 to rotate in opposite directions as the arm 61 immediately engages one of said teeth. In order to release the pulley 53 and allow the same to rotate in a clock-wise direction, the lever 60 is moved in counter clock-wise direction, looking at Fig. 1. The arm 61 releases the ratchet wheel 58 and the weight of the sections 10 and 11 unwinds the pulley very rapidly and the ladder momentarily and automatically reaches the ground. If desired, some means may be used for slowing the downward motion of the said sections.

The operation of the device is as follows: The ladder 1 is kept in collapsed form at the balcony 2 as shown in Fig. 2. In order to extend it to the ground, a person pulls the lever 60 in to counter clock-wise direction so as to disengage the arm 61 from the teeth of the ratchet wheel 58. The sections 10 and 11 immediately drop down to the ground at an angle, thus forming a ladder inclined to the ground at an angle, as shown in Fig. 1. In order to lift the sections and thus collapse the ladder, the lever 60 is brought in its normal position, so that the arm 61 rests on the ratchet wheel 58. Thereupon, the crank 50 is rotated until the sections are brought into a position shown in Fig. 2.

I claim:

1. The combination with a fire escape balcony of a collapsible fire escape ladder extending from said balcony to the ground at an angle to the latter, when in extended position, said ladder consisting of a plurality of major and minor sections, the upper section being rigidly secured to said balcony at an angle, the remaining major and minor section being arranged in an alternating order; each major section consisting of a pair of inward channels each channel including a pair of flanges and extensions depending therefrom, said flanges and extensions being

arranged inwardly; each minor section consisting of a pair of outward channels, each channel including a pair of outward flanges and extensions; a flange and its extension of each channel of a major section being interlocked with a flange and its extension of a channel of a next adjoining minor section, a plurality of rungs carried by said channels; stops secured to the channels of the minor sections; abutments secured to the channels of the major sections, said abutments in cooperation with said stops limiting the upward and downward slide of one section in relation to the other; means carried by said upper section for lifting the remaining sections adjacent said upper sections; means for retaining said sections in elevated position.

2. The combination with a fire escape balcony of a collapsible fire escape ladder extendible from said balcony to the ground at an angle to the latter; said ladder consisting of a plurality of major and minor sections, the upper section being rigidly secured to said balcony at an angle, the remaining major and minor sections being arranged in alternating order; each major section comprising a pair of parallel spaced inward channels, each channel including a pair of opposite flanges directed inwardly toward the other channel, each flange having an extension formed at the right angle to said flange and directed toward another flange; each minor section consisting of a pair of parallel spaced outward channels, each latter channel having a pair of opposite flanges directed outwardly and away from the other channel, each flange

having an extension formed at the right angle to said flange and directed toward the other flange; a plurality of rungs connecting the channels of the major and minor sections; said flanges and extensions of one side of a channel of each pair of adjoining major and minor sections being interlocked for sliding in relation to each other; means for limiting the longitudinal movement of each major section in relation to an adjoining minor section; the flange and the extension thereof of each outward channel of the minor section being arranged for sliding between the respective flange and extension of the inward channel of the major section and the rungs of the latter; means for collapsing said ladder by pulling said sections upwardly, and means for releasably holding said collapsed ladder at the balcony.

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