Nov. 7, 1950 C. G. STEELE 2,529,112

WINDOW MOUNTED COLLAPSIBLE FIRE ESCAPE

Filed July 26, 1947 2 Sheets-Sheet 1

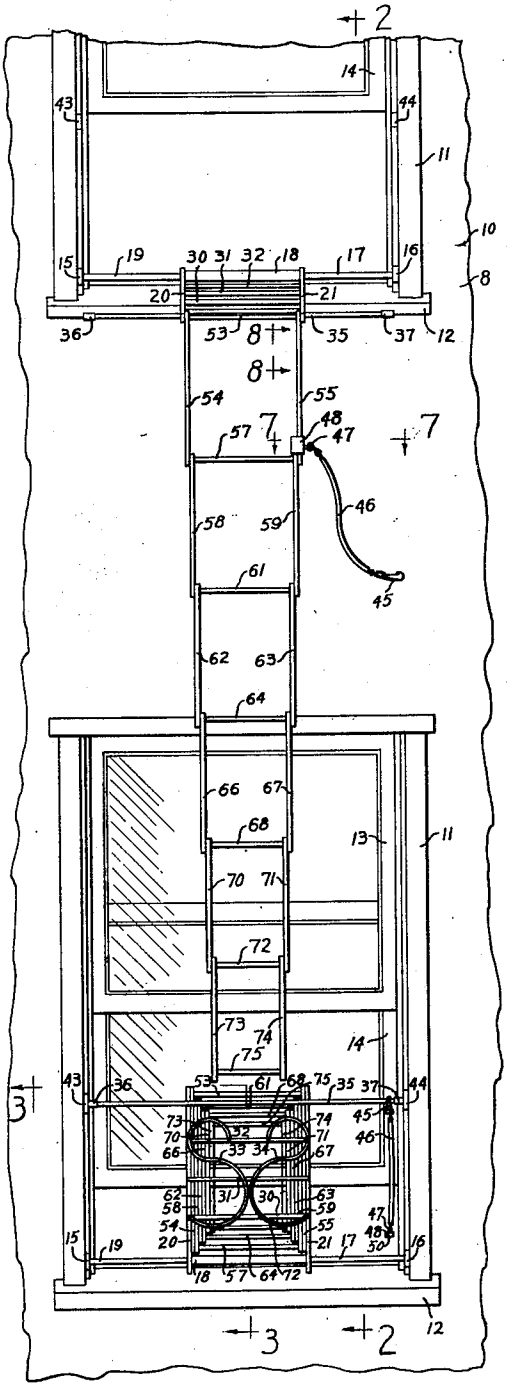


Fig - 1

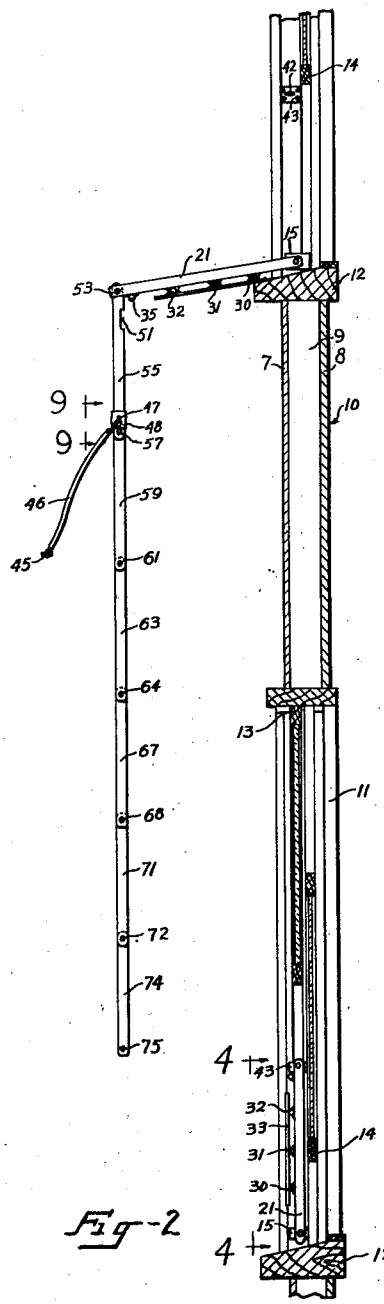


Fig - 2

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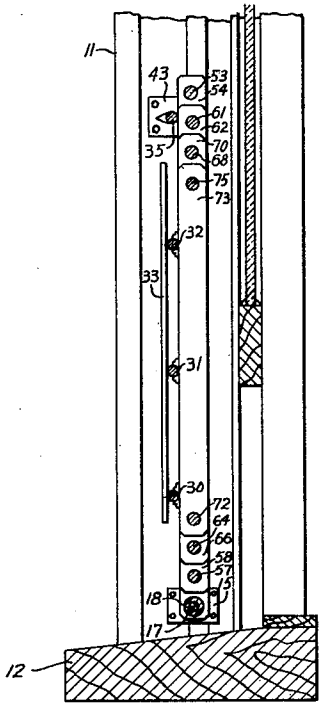


Fig - 3

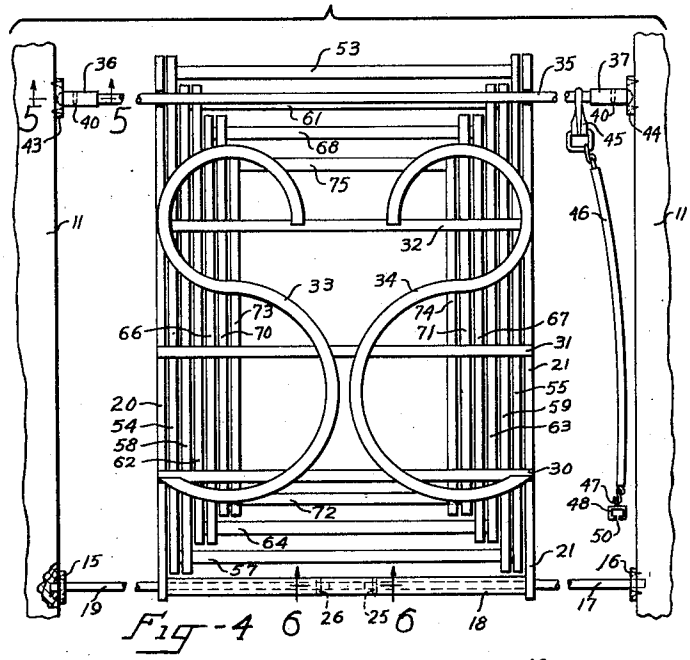


Fig - 4

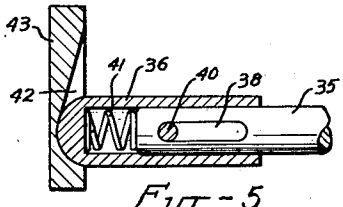


Fig - 5

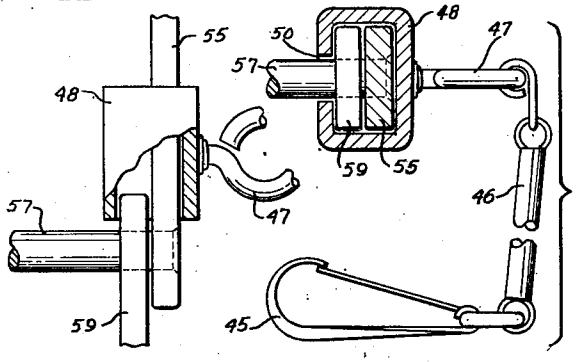


Fig - 9

Fig - 7

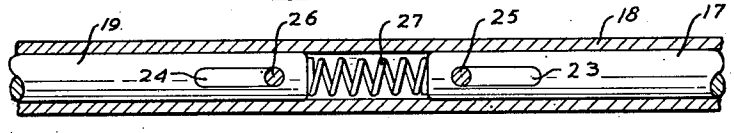


Fig - 6

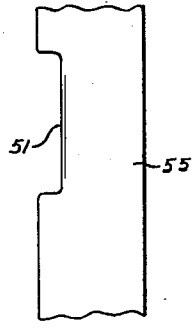


Fig - 8

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UNITED STATES PATENT OFFICE

2,529,112

WINDOW MOUNTED COLLAPSIBLE FIRE ESCAPE

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Application July 26, 1947, Serial No. 763,796

5 Claims. (Cl. 228—44)

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This invention relates to a fire escape for buildings and more especially to means associated with each window of a building which can be unfolded and allowed to fall by gravity to form a ladder which will reach to the next window and the next window therebelow being equipped with a similar device whereby if that room should be vacant, the person climbing down the unfolded ladder from the upper window can unfold the ladder mechanism at the next window therebelow and allow it to fall downwardly by gravity and this can continue until the street level is reached in the event that the other ladders should not have already been unfolded by the occupants in making their escape therefrom.

It is therefore an object of this invention to provide a collapsible or foldable ladder mechanism associated with each window of a building which can be released at its topmost portion and which is fixedly pivoted at its bottom portion and whereby the ladder would unfold and fall downwardly and extend to within reach of a similar structure disposed on the window therebelow, it being an object to equip all windows in a building with such ladders so that all persons can escape from one room down to the next room and so on down to the street level.

It is also an object of this invention to provide a foldable ladder structure adapted to be disposed in a window and being ornamental in design to therefore present an ornamental appearance and which ladder can be unfolded to allow escape of persons from a room downwardly to the next ladder at the next adjacent window therebelow.

It is also an object of this invention to provide a safety mechanism associated with a collapsible ladder which, when the ladder is unfolded and extended downwardly from the window, the safety mechanism can be applied to the ladder and can be moved downwardly as the person moves downwardly on the ladder and serves to prevent the person from falling from the ladder should he lose his foothold or become dizzy, as this safety mechanism which slides down the ladder has a suitable hook thereon adapted to engage the belt or other portion of clothing of the person escaping from the room so as to hold the person against falling in case he should lose his foothold on the ladder extending downwardly from the window.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which;

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Figure 1 is an elevation of a portion of a side of a building and showing the invention applied thereto, one in unfolded position and the other in folded position;

Figure 2 is a vertical sectional view taken substantially along the line 2—2 in Figure 1;

Figure 3 is a vertical sectional view taken from substantially along the line 3—3 in Figure 1, and on an enlarged scale;

Figure 4 is an elevation of the lower portion of Figures 1 and 2 and taken from along the line 4—4 in Figure 2;

Figure 5 is a sectional view taken along the line 5—5 in Figure 4;

Figure 6 is a sectional view taken substantially along the line 6—6 in Figure 4;

Figure 7 is a sectional plan view taken substantially along the line 7—7 in Figure 1 with portions broken away;

Figure 8 is an elevation taken along the line 8—8 in Figure 1;

Figure 9 is an elevation with portions broken away and taken substantially along the line 9—9 in Figure 2.

Referring more specifically to the drawings, the numeral 10 indicates a portion of the wall of a building having a plurality of window frames 11 therein, each of which has a window sill 12. The building wall 10 may be of any desired construction such as outside sheathing 7, suitable inside sheathing 8, both of which are suitably secured to studs 9.

Within these window frames are mounted for up and down sliding movement, window sashes 13 and 14. Secured to the opposed surfaces of the sash frames 11 are fittings 15 and 16 in which are pivotally mounted shafts or rods 17 and 19. These shafts or rods 17 and 19 are oscillatably mounted in a tube 18 which is fixed to one end of bars 20 and 21. The proximate ends of the rods 17 and 19 are slotted as at 23 and 24 and are penetrated by pins 25 and 26, which also have their ends anchored in the tube 18.

Disposed between the proximate ends of the shafts or rods 17 and 19 is a compression spring 27 which normally forces the shafts or rods 17 and 19 away from each other and into the sockets in the members 15 and 16 to hold them in position. The bars 20 and 21 have welded to themselves a plurality of cross rods 30, 31, and 32, and welded to these are S-shaped members 33 and 34 which not only strengthen the structure but present an ornamental appearance.

To the outer edges of the bars 20 and 21 is also welded a shaft 35 which has slidably mounted

on the end thereof tubular members 36 and 37. The outer ends of the shaft 35 are slotted as at 38 and the members 36 and 37 have pins 40 mounted therein which penetrate the slots 38 to slidably support the members 36 and 37 on the ends of the rod 35. Disposed between the ends of the rods and the bottom of the cavity in the members 36 and 37 is a compression spring 41 which normally forces the tubular portions 36 and 37 into suitable slots 42 in suitable fittings 43 and 44, anchored to the opposed surfaces of the window frame portions 11. An occupant of the room can seize the members 36 and 37 and press them inwardly and thus release the upper ends of the bars 20 and 21 from their confined vertical position. Also, adapted to be hooked on the shaft 35, is a snap fastener 45 which has a cable 46 attached thereto and has a loop member 47 secured to its other end which is integral with a sliding fitting 48 which has an opening 50 therein whereby it can be slid over one of the bars such as 55 through a gap 51 cut therein and then when moved downwardly cannot be removed from the ladder structure.

The upper ends of the bars 20 and 21 in Figure 4 or the outer ends of such bars in Figures 1 and 2 have fixed therebetween a shaft or rod 53 which has pivoted thereto bars 54 and 55, the bar 55 having the suitable cut away portion 51 therein for reception of the sliding fitting 48. The lower end of the bars 54 and 55 in Figure 1 have fixed therebetween a rod or shaft 57 to which is pivotally secured the upper ends of bars 58 and 59 which are disposed adjacent the inside surfaces of the members 54 and 55. The bars 58 and 59, at their outer or lower ends in Figure 1, have fixed therebetween a shaft or rod 61 to which is pivotally secured bars 62 and 63 which are disposed adjacent the inside surfaces of the bars 58 and 59. To the lower ends of bars 62 and 63 is secured a shaft or rod 64 and pivotally secured on this shaft or rod and adjacent the inside surfaces of the bars 62 and 63 are other bars 66 and 67 which at their lower ends are joined together by a shaft 68 and pivoted on the shaft 68 and adjacent the inside surfaces of bars 66 and 67 are bars 70 and 71 which have their lower ends joined together by a shaft or rod 72 on which is pivotally mounted the bars 73 and 74 which lie against the inside surfaces of the bars 70 and 71. The lower ends of bars 73 and 74 are joined together by a shaft or rod 75.

It is thus seen that the bars 73 and 74 can be folded up between the bars 70 and 71 and then these two can be folded between bars 66 and 67 and then these three sets of bars can be folded inside the bars 62 and 63 and so on up the ladder until it is completely lifted as shown in the lower portion of Figure 1 or Figures 3 and 4.

It will be observed that the bars 17 and 19 are slidably mounted in the tube 18, so as to accommodate different sizes of windows as they not only penetrate the brackets 15 and 16 secured on the proximate faces of the window frames 11, but also pentrate slightly into suitable holes bored in the proximate faces of the window frames 11 as is evident in Figure 4.

In the event of fire in a room, the occupant will first remove the snap fastener 45 from the shaft 35 and secure it around his belt and then will give a push to the folded structure which will cause it to swing outwardly on shafts 17 and 19 as a pivot to a little past horizontal position where it will rest on the window sill 12 and occupy the position shown in Figure 2. Then the operator will lift rod 57 which will move all of the folded sections out from nested position relative to strap iron members 20 and 21, and they will proceed to unnest automatically and assume the unfolded position shown in Figure 1. The operator will then slip the member 48 around the bar 55 through the opening 50 and it will slide downwardly as the person moves downwardly on the ladder, but it is noted that it is of sufficient diameter as to pass the joints between the adjacent bars such as 55 and 59. This will continue until the operator is standing on the lower rung 75 at which time he can reach out with his toe and it will be observed that the slots 42 in the fittings 43 and 44 slope outwardly, and by exerting pressure with his toe on the shaft 35 in the window therebelow him, in case this room is not occupied and the apparatus has not already been unfolded by the occupant of the lower room, and this will move the apparatus outwardly to slightly below horizontal position where it will rest on the window ledge 12 in the position shown in Figure 2. Then he can engage the cross rod 57 and move all of the nested portions upwardly and past a vertical position at which time they will fall downwardly and unnest automatically to reach the next window therebelow.

It is thus seen that there has been provided a fire escape for each window of a building which will co-operate with a similar fire escape on the windows therebelow so that an ornamental grating effect is produced over the window and which can easily be dislodged to serve as a ladder to escape downwardly into a room therebelow or by unfolding the structure associated with the window therebelow the occupant of a particular room can keep descending until he has reached the street floor.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A fire escape adapted to be secured in the lower portion of a window of a building comprising a shaft having its ends secured to the sides of the window frame, a frame member pivoted at one end of the said shaft and a second frame member pivoted to the free end of the first frame member and a plurality of successive frame members pivoted respectively at their inner ends to the outer ends of the preceding frame member by transverse rungs penetrating the ends of adjacent successive frame members, each succeeding frame member being of less width than the adjacent frame member so that they can all be folded into nested position, and means for holding the members in nested vertical position between the sides of the window frame and a flexible member having means on one end thereof adapted to be secured to the clothing of a person escaping from the room and having a cuff member on the other end of the flexible member for slidably engaging the successive members of the ladder to prevent the falling of a person on the ladder in case of his becoming unbalanced on the ladder, said cuff member having a slot in one side thereof to permit passage of the cuff member past the rungs.

2. A fire escape comprising a foldable ladder made of a plurality of side sections with a transverse rung joining the sections together, succeeding sections in the ladder as it extends in length being narrower than the preceding sections and being pivoted on the rungs joining the ends of the sections together whereby the various sections will fold inside each other, the top section having a tubular member secured thereto and spring pressed shafts mounted in the tubular member and projecting from each end thereof, means on the opposed faces of the window frame immediately above the window sill for receiving the ends of the shafts projecting from the tubular member, the free end of the first section having a shaft secured thereto and fittings secured on the opposed faces on the window frame provided with cavities into which the ends of the shaft project, the ends of the shaft having spring pressed members thereon for entering the cavities in the last named fittings for releasably holding the folded ladder in vertical position.

3. A fire escape ladder for windows in a building, there being a fire escape for each window, each fire escape comprising a pair of side members pivotally secured to the opposed faces of the lower portion of the window frame, a plurality of succeeding sections diminishing in width pivoted end to end and being joined to each other by transverse rungs, so that the various sections will fold one within the other, means secured to the free end of the first section adapted to project toward the opposed surfaces of the window frame and means for receiving the ends of the means secured to the free end of the first section for releasably holding the ladder when in folded position in a vertical position within the confines of the window frame.

4. A fire escape comprising a foldable ladder made of a plurality of side sections with a transverse rung joining the sections together, succeeding sections in the ladder as it extends in length being narrower than the preceding sections and being pivoted on the rungs joining the ends of the sections together whereby the various sections will fold inside each other, the top section having a tubular member secured thereto and spring pressed shafts mounted in the tubular member and projecting from each end thereof, means on the window frame immediately above the window sill for receiving the ends of the shafts projecting from the tubular member, the free end of the first section having a shaft secured thereto and fittings secured on the window frame provided with cavities into which the ends of the shaft project, the ends of the shaft having spring pressed members thereon for entering the cavities in the last named fittings for releasably holding the folded ladder in vertical position.

5. A fire escape ladder for buildings having windows therein and each window provided with a window frame and a window sill, said ladder comprising a plurality of sections joined together at their ends by suitable rungs, each succeeding section as the ladder extends being of less width than the other sections so that the various sections can be folded one within the other, the first section having a transverse tube thereon, spring pressed members extending from the ends of the tube, brackets mounted on the opposed surfaces of the window frame for receiving the ends of the spring pressed members mounted in said tubes so that the ladder can fit windows of varying widths, the free end of the first section having a shaft secured transversely thereon and having spring pressed members on its ends and brackets secured on the opposed faces of the window frame and having cavities into which the spring pressed members of the means mounted on the free end of the first section may project for releasably holding the ladder in vertical position within the confines of the window frame when all the sections are folded one within the other.

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