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COLLAPSIBLE FIRE ESCAPE LADDER ASSEMBLY

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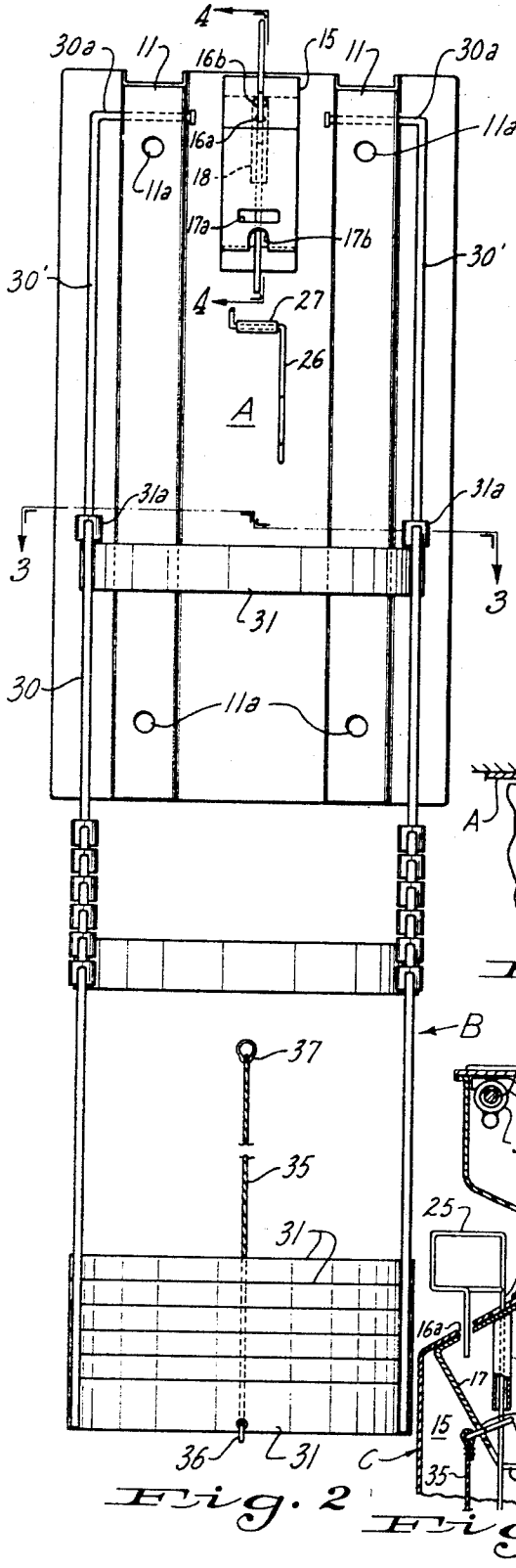


Fig. 2

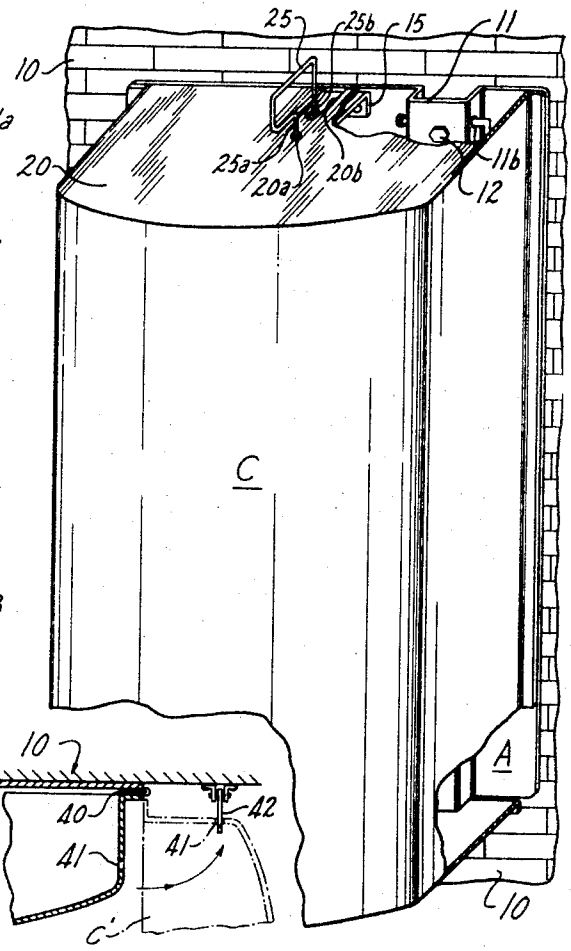


Fig. 4

Fig. 5 Fig. 1

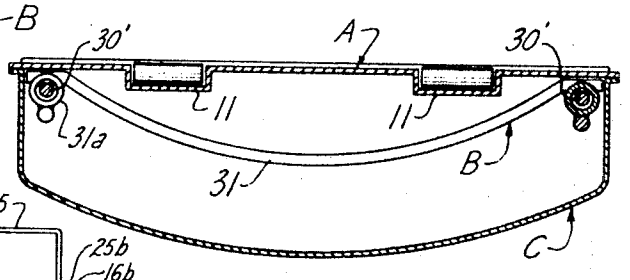


Fig. 3

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COLLAPSIBLE FIRE ESCAPE LADDER ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A compact ladder device or construction is provided which is suitable for mounting below a window sill on the outside vertical wall of a building. The construction uses three main parts, a mounting base member, a removable cover, and a collapsible and extensible ladder assembly. The ladder assembly has a telescopic series of interconnected ladder parts that are adapted to be carried in a collapsed position on the base member and to be enclosed within the cover member for immediate use in an emergency.

This invention relates to an improved emergency type of fire escape device or construction suitable for buildings which will be compact and protected in its collapsed position. A phase of the invention deals with providing a device that will be positive in its action and easily releasable in an emergency.

It has been an object of the invention to provide a simple, practical and substantially foolproof compact type of emergency fire ladder type of construction.

Another object has been to provide a construction which is substantially foolproof and will require a minimum of physical effort to operate.

A further object has been to devise a fire escape ladder construction having improved operating features.

These and other objects of the invention will appear to those skilled in the art from the illustrated embodiments and the appended claims.

In the drawings, FIGURE 1 is a perspective view in elevation showing a device of the invention in a fully assembled relation in which its ladder parts are collapsed and enclosed and supported on a base member and within a cover; portions of this figure have been broken away to illustrate details of the construction.

FIGURE 2 is a front view in elevation on the scale of and of the device of FIGURE 1, with the cover removed and showing the ladder assembly as released, with its first two upper sections or parts fully extended downwardly and with its remaining sections in a telescopically-collapsed relationship.

FIGURE 3 is a horizontal section, on the scale of and taken along the line 3—3 of FIGURE 2, showing the ladder assembly in its collapsed mounted relationship and also showing the cover in position, as represented in FIGURE 1.

FIGURE 4 is a vertical fragmental section on the scale of and taken along the line 4—4 of FIGURE 2, illustrating details of the construction of latching means and showing such means in the position of FIGURE 1 wherein both the ladder assembly and the cover are latched in position.

And, FIGURE 5 is a fragmental horizontal section on the scale of FIGURES 1 to 4 showing a modified construction, wherein the cover is adapted to swing into and out of a closing-off relation with respect to the ladder assembly when its rungs are in a collapsed position.

Referring particularly to FIGURES 1, 2 and 3, the construction or device of the invention employs three main parts, namely, a base plate member A, a ladder assembly B and a cover, housing or protective enclosing casing C. In FIGURES 1 and 4, the parts B and C are shown releasably or removably carried by the substantially planar

base member or plate A of rectangular shape. As shown in FIGURE 2, after a release of the parts B and C, the ladder assembly B is free to drop of its own weight or by gravity to a fully downwardly extended position at which it may be used by occupants of a building.

Referring particularly to FIGURES 1 to 3, the base member or plate A is shown provided with a pair of transversely spaced-apart and longitudinally or vertically-extending, open-end channels **11**. The channels **11** are, in turn, drilled out at **11***a* to provide mounting holes for receiving headed bolts or screws **12** to secure the member to a vertical wall **10** of the building. A mounting or support bracket **15** is secured, as by welding, on the base member A adjacent its upper end and in a spaced relation between the guide channels **11**. The bracket **15**, as shown particularly in FIGURE 4, has a downwardly-outwardly-forwardly sloped upper end wall **16** and a connecting, downwardly-inwardly sloped front or side wall **17** to define a substantially angular shape. The upper end wall **16** is provided with a pair of spaced-apart, front and back, latching hole portions **16***a* and **16***b* and the sidewall **17** is provided with a transverse latching slot **17***a* and a central, open, slotted portion **17***b* at its lower end. A guide sleeve element **18** is secured to project downwardly from the under side of the bracket wall **16** in alignment with the back latching hole portion **16***b* to serve as a guide for a back latching portion or pin **25***b* of a pull-release latching key or element **25**.

It will be noted from FIGURE 4 that the key **25** is employed to removably-secure the cover C in its mounted position on the base member A and, at the same time, to retain the ladder assembly B in a collapsed position on the base member A. To removably-secure the ladder assembly B in its collapsed position on the base member A, the pin **25***b* projects downwardly along the guided sleeve or portion **18** and through an eyelet **37** that is carried by the upper end of a wire link **35** that is secured to a lower end portion of the ladder assembly B. The eyelet **37** extends through the latching slot portion **17***b* of the bracket **17**. The cover C, as shown, has side and end and top closure walls, and its end wall **20** has a front hole portion **20***a* for receiving a front, shorter-length, latching portion or pin **25***a* of the latching key **25** that is adapted to extend through aligned, front, latching hole portion **16***a* of the bracket **15**. The end wall **20** also has an open-end, back slot portion **20***b* for bypassing the back longer pin **25***b*. It will thus be seen that due to the difference in length of the pins **25***a* and **25***b* and the fact that the slot **20***b* is open, an upward movement of the key **25** will first release the cover C before the link blank or ladder assembly B is released.

Referring particularly to FIGURE 2 of the drawings, an angle-shaped spring finger **26** is pivotally-secured on the base member A by a sleeve mount **27** to engage the under side of the cover C when it is positioned on the base member A. The finger **26** is flexed when the cover C is mounted on the base member A and thus, tends to force it outwardly into a released position for providing a quick, snap type of releasing removal of the cover C when the front pin **25***a* of the key **25** is pulled out or raised sufficiently to clear aligned, latching hole portions **16***a* and **20***a* of the support bracket **15** and cover C.

The ladder assembly B, as shown particularly in FIGURES 2 and 3, comprises a series or group of ladder parts, each of which has a pair of spaced-apart, longitudinally or vertically-extending guide rails **30**, and a cross-extending bottom rung **31** of curvilinear, outwardly-bowed or convex shape that is secured to lower ends of an associated pair of rails **30**.The rails **30'** of the uppermost part, as distinguished from the other parts of the ladder assembly B, have a pair of inwardly-projecting pivot fingers **30***a* which extend sideways through pivot

openings 11*b* in the pair of channels 11. The rails 30 of the other ladder parts of the assembly, at their upper ends, are each provided with a slide collar 31*a* that rides on the associated line rail 30 of the next upper ladder part. The slide collars 31*a* limit the downward movement of their associated ladder part by abutment with the upper edges of the cross-extending rung 31 of a preceding ladder part.

The pivoted mounting of fingers 30*a* permits the assembly of ladder parts B to swing outwardly with respect to the base member A, and also permits the rungs 31 to be telescoped in the manner indicated in the lower portion of FIGURE 2 when the ladder assembly is to be retained in a collapsed position on the base member A. The assembly is retained in such a collapsed position by the link 35 which, at its lower end, is connected by a loop 36 to the lower end of the ladder assembly and specifically, to the lowermost rung 31. The link 35 may be of wire cable construction and, as previously mentioned, is, at its upper end, provided with an eyelet or loop 37 that, as shown in FIGURE 4, is adapted to be inserted within the slot 17*a* of the bracket 15 to receive the longer pin element 25*b*. The latching threading or extension of the pin element 25*b* through the eyelet 37 and the support provided by the front wall 17 on the eyelet 37, adjacent the slot 17*a*, positively retains the ladder assembly B in its collapsed position until pin element 25*b* is moved or raised sufficiently to clear the eyelet 37.

In the modified embodiment of FIGURE 5, hood C′ is of the same general construction as the hood C of FIGURE 1, except that it is pivotally-mounted by hinge means 40 on the base member A, and is biased or balanced to normally swing to an open position or from the solid line to the dot and dash line position of FIGURE 5 when it is released by the pin 25*a* of the latching key 25. Also, the cover C′ has a small aperture portion 41 therein which is engaged by a conventional swing latch 42 that is shown pivotally mounted on the wall 10. A lower lip of the aperture portion 41*a* rides under the latching finger of 42 when the cover C′ swings from left to right in FIGURE 5 to thus automatically secure the cover C′ in its open position.

Although specific embodiments of the invention have been shown for the purpose of illustration, it will be apparent that various modifications, substitutions, additions or adaptations may be made without departing from its spirit and scope as set forth in the appended claims.

I claim:

1. An improved fire escape ladder construction for a vertical side wall of a building which comprises, a base member adapted to be mounted on the side wall of the building, a ladder assembly of interconnected collapsible rungs secured at its upper end to said base member, said rungs being vertically-slidably collapsible and extensible with respect to each other for compact storage in a collapsed position on said base plate and for usage when in a downwardly-extending position, a removable cover having side and end and top closure walls and being adapted to be positioned on said base member and over said ladder assembly when said rungs are in their collapsed position, and pull release means having a pair of latching parts, one of said latching parts releasably-securing said cover in position on said base plate over said ladder assembly when said rungs are in their collapsed position, and the other of said latching parts releasably-holding said rungs in their collapsed position on said base member.

2. A ladder construction as defined in claim 1 wherein, a support bracket is mounted on said base member adjacent an upper end thereof, and said latching parts releasably-engage said bracket.

3. A ladder construction as defined in claim 2, wherein, said bracket has a pair of latching hole portions, the one latching part is a pin adapted to be inserted into one of said latching hole portions, and the other latching part is a longer length pin adapted to be inserted into the other of said latching hole portions, and a link is attached to a lower end of said ladder assembly to extend upwardly into alignment with said other latching hole portion and removably-engage said longer length pin.

4. A ladder construction as defined in claim 3 wherein said link has a latching eyelet portion at its upper end to removably-engage said longer length pin.

5. A ladder construction as defined in claim 4 wherein, said bracket has a side slot portion therein, and said eyelet portion is adapted to extend into said slot portion to align with and receive said longer length pin.

6. A ladder construction as defined in claim 5 wherein, a guide element projects downwardly from the other of said latching hole portions for slidably-receiving said longer length pin therein.

7. A ladder construction as defined in claim 1 wherein, said base member has a pair of transversely-spaced-apart and vertically-extending guide channels therealong, said cover has a bottom end wall provided with a pair of inwardly-projecting lugs for engagement within open lower end portions of said pair of guide channels, a support bracket is mounted on said base member adjacent its upper end portion and is adapted to engage an upper end wall of said cover to hold said lugs in releasable latching engagement within the open lower end portions of said guide channels.

8. A ladder construction as defined in claim 1 wherein, a pair of transversely spaced-apart guide channels extend along said base member, said ladder assembly is pivotally-secured to project along outer sides of said pair of guide channels, and said rungs in their collapsed position extend across said pair of guide channel portions into sliding engagement with said base member.

9. A ladder construction as defined in claim 8 wherein, said ladder assembly has a series of ladder parts, each ladder part comprises a pair of transversely-spaced-apart and vertically-extending side rails and a cross-extending rung secured to lower end portions of said pair of side rails, an upper one of said ladder parts has its side rails pivotally-extending within side portions of said guide channels, and the rungs of each of said ladder parts project transversely-frontwardly over said pair of guide channels for guidable slidable movement with respect thereto.

10. A ladder construction as defined in claim 1 wherein a support bracket is mounted on said base member and has a pair of front and back latching hole portions, said cover has a front latching hole portion adapted to be aligned with the front latching hole portion of said bracket and has a back open slot portion adapted to be aligned with the back latching hole portion of said bracket when said cover is in a mounted position on said base member, and the one latching part is a pin adapted to be inserted through the latching hole portion of said cover into the front latching hole portion of said bracket for releasably-positioning said cover on said base member.

11. A ladder construction as defined in claim 10 wherein, a link is attached to a lower end of said ladder assembly to extend upwardly into alignment with said latching back hole portion, said link has an eyelet at its upper end, said bracket has means for aligning said eyelet with said back latching hole portion, and the other latching part is a pin adapted to extend downwardly through said back open slot portion into said back latching hole portion and into latching engagement with said eyelet.

12. A ladder construction as defined in claim 1 wherein, a support bracket is mounted on said base member adjacent an upper end thereof, a pair of guide channels extend along said base member in a transversely-spaced relation with each other on opposite sides of said support bracket, said support bracket has an upper end wall

and a downwardly-sloped side wall, said upper end wall has a pair of spaced-apart latching hole portions therein, said side wall has a cross-extending slot portion therein, the one latching part of said pull release means is a latching pin and the other latching part is a latching pin of greater length, said cover has a pair of hole portions in its upper end wall adapted to align with the latching hole portions of said bracket when said cover is in a mounted position on said base member, a link is connected to a lower end of said ladder assembly to extend upwardly over the outside of said side wall of said bracket, said link has an eyelet portion adapted to extend trough said slot portion of said side wall, and a guide sleeve extends downwardly from one of said latching hole

portions to guide said longer latching pin therealong downwardly into latching engagement with said eyelet portion for releasably-holding said ladder assembly in a collapsed position on said base member.

References Cited

UNITED STATES PATENTS

674,584	5/1901	Porter	182—70
2,513,835	7/1950	Allen	182—195
2,534,202	12/1950	McCall	182—195

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