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[54] **SAFETY AND ESCAPE MECHANISM**

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[51] **Int. Cl.** **A62b 1/02**

[58] **Field of Search** 182/100, 142, 190, 3, 150, 182/5

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[57] **ABSTRACT**

An improved safety and escape mechanism for enabling occupants of upper (second and third) floors of dwellings and other structures to make a quick exodus in case of fire or other emergency comprising bracket means for permanently or detachably securing a centering guide roller on a windowsill, an elongated rope substantially longer than the window to ground dimension, adapted to be passed over the windowsill and roller; basket means at one end of said rope of a size to receive infants, as well as children or adults in a kneeling or standing position, for lowering the same to the ground by an operator inside the window controlling the rate of feed of the rope; and co-operating means on the other end of said rope and on said roller for quickly coupling the same to provide escape means for said operator and other able bodied occupants. The co-operating means can suitably comprise a pair of short rope sections integrally joined to said other end of the rope having loops at the extremities thereof adapted to engage axial extensions at the ends of said roller forming a positive anchoring of said rope to the roller when tension is applied to said rope. Between said loops and rope juncture the short rope sections can be joined by a plurality of rungs to steady an escapee while climbing over the windowsill and preparing to slide down said rope.

The basket suitably has a multi-point suspension arranged to minimize contact between the basket and building wall as the basket is being lowered, and a trip line extending from the inner, building, side of the basket to the window frame facilitating dumping of the basket contents when the basket has reached ground level.

14 Claims, 6 Drawing Figures

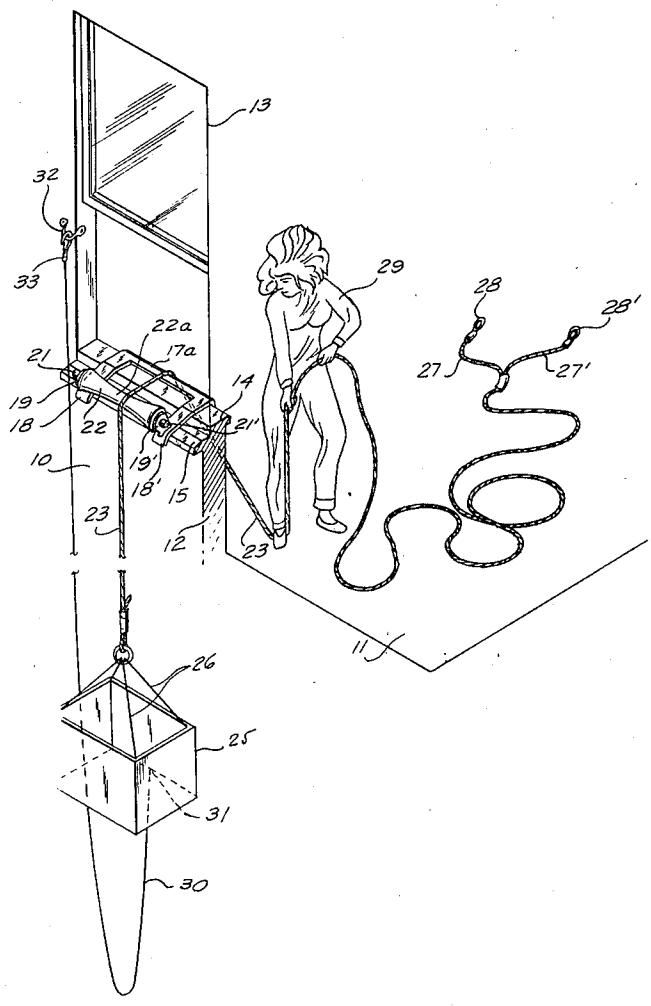
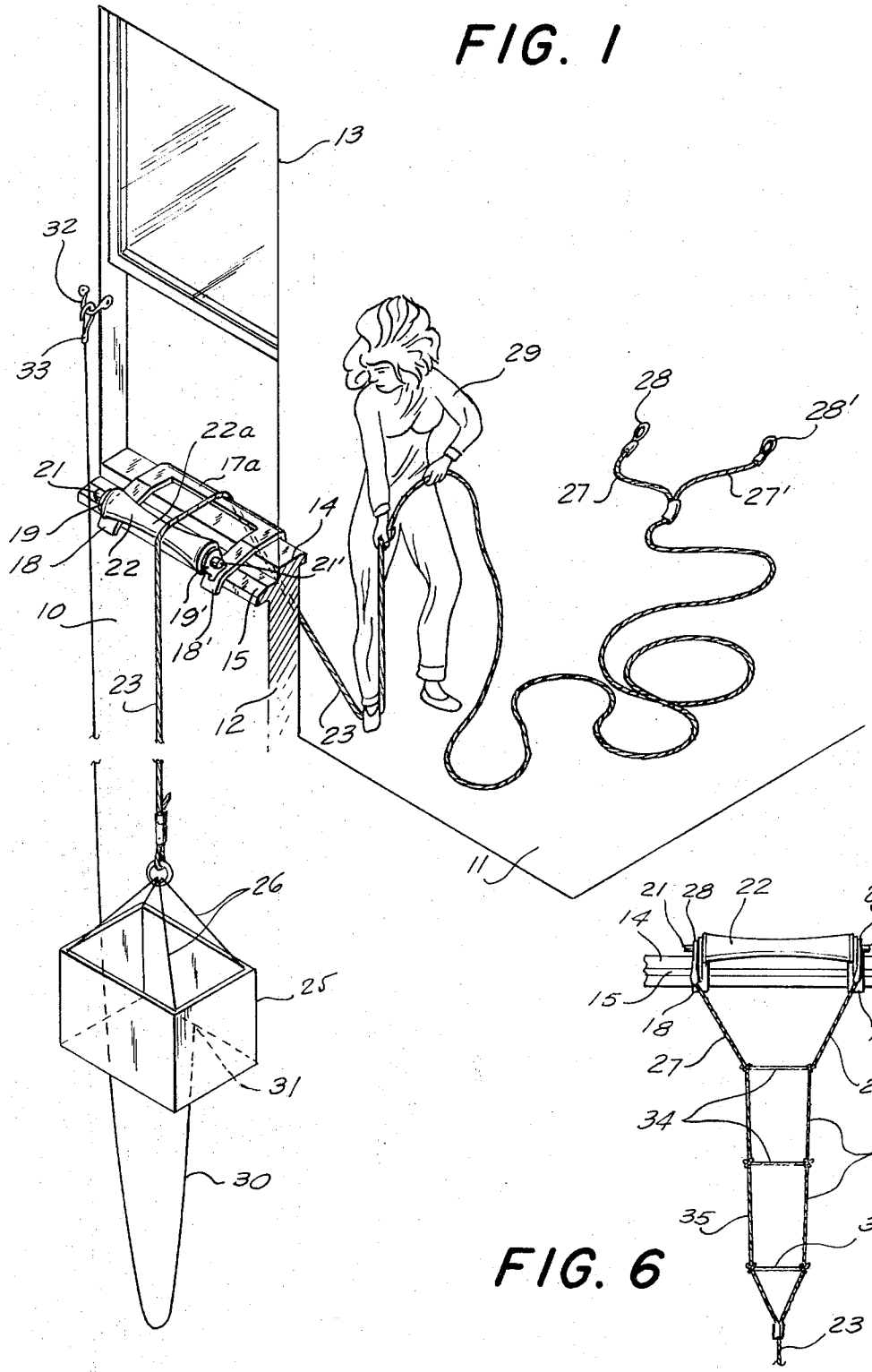


FIG. 1


13
32
33
29
28
28'
27
27'
22a
17a
21
19
18
22
14
21'
10
19'
18'
15
23
12
23
11
26
25
31
30

21
28
22
28'
21'
14
15
18
18'
27
27'
34
35'
35
34
23

FIG. 6

FIG. 2

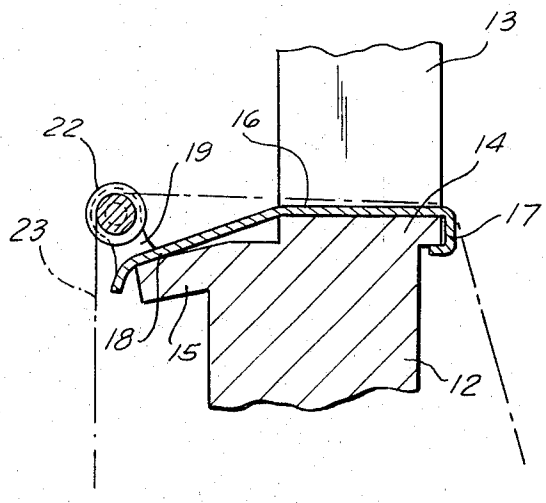


FIG. 3

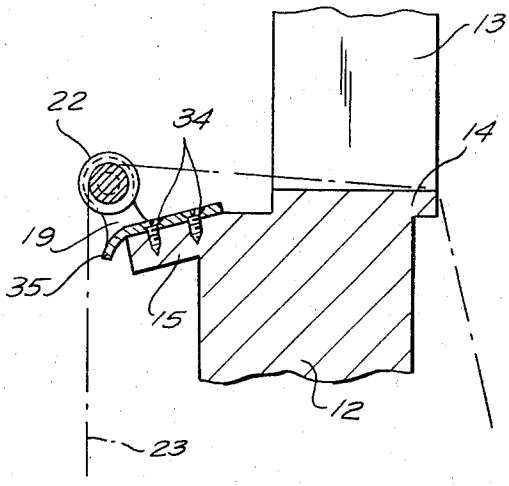


FIG. 4

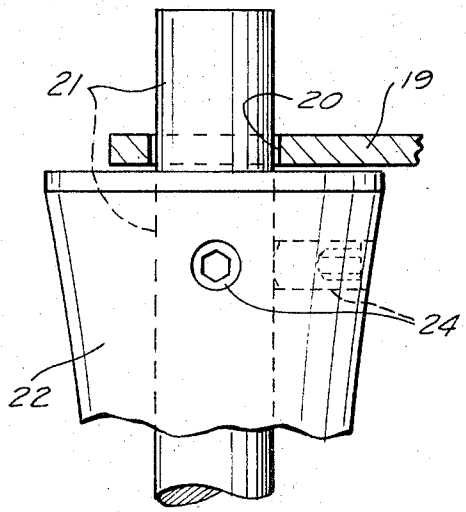
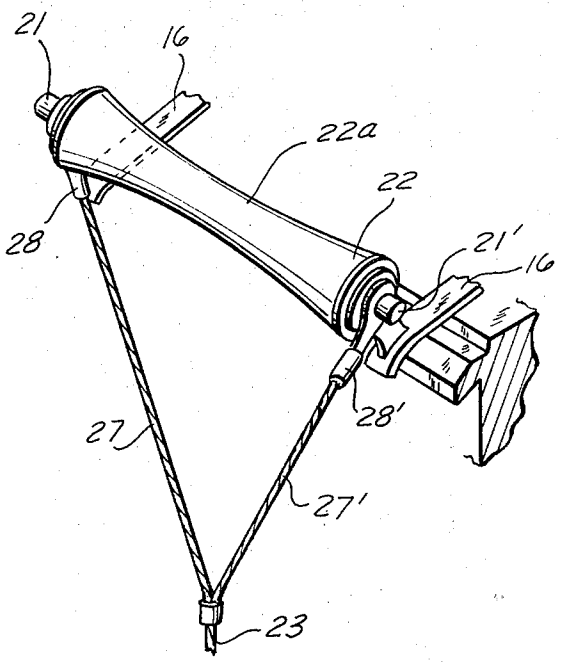


FIG. 5



SAFETY AND ESCAPE MECHANISM

This invention relates to an improved safety and escape mechanism for enabling occupants of upper (second and third) floors of dwellings and other structures to make a quick exodus in case of fire or other emergency, which can be permanently or detachably associated with conventional windowsills, and which is both simple and inexpensive to produce and easy and versatile to use.

Each year many persons suffer serious injury or lose their lives by the difficulty or inability of exodus from structures in case of fire, explosion or other emergency. While the problem exists in all type of structures, including high rise apartments and commercial structures, the problem is particularly troublesome in conventional dwellings and other low structures where quick exodus may be needed from a second or third floor of the structure.

Many types of special ropes, rope ladders, metal link ladders and the like are on the market as attempts to solve this problem, but available device of this sort leave much to be desired from the standpoint of ease and dependability in use. Furthermore, they provide no means for aiding in the exodus of infants, small children or invalids of any age who are unable to climb down a rope or ladder.

An object of the present invention is to provide an escape mechanism which can be brought into quick use for lowering from upper (second and third) floors of a structure infants, small children and invalids, while at the same time providing means for able-bodied children or adults to slidably lower themselves to the ground. Another object of the invention is to facilitate quick re-use of the mechanism after lowering an infant or small child by ejecting such infant or small child by control means extending to the operator at the upper level.

Regarded in certain of its broader aspects, the improved safety and escape mechanism of the present invention comprises bracket means for permanently or detachably securing a centering guide roller on a windowsill, an elongated rope substantially longer than the window to ground dimension, adapted to be passed over the windowsill and roller; basket means at one end of said rope of a size to receive infants, as well as children or adults in a kneeling or standing position, for lowering the same to the ground by an operator inside the window controlling the rate of feed of the rope; and co-operating means on the other end of said rope and on said roller for quickly coupling the same to provide escape means for said operator. The co-operating means can suitably comprise a pair of short rope sections integrally joined to said other end of the rope having loops at the extremities thereof adapted to engage axial extensions at the ends of said roller forming a positive anchoring of said rope to the roller when tension is applied to said rope.

The basket suitably has a multi-point suspension arranged to minimize contact between the basket and building wall as the basket is being lowered, and a trip line extending from the inner, building, side of the basket to the window frame facilitating dumping of the basket contents when the basket has reached ground level.

Novel features of the improved safety and escape mechanism will be apparent from a consideration of

the following description having reference to the accompanying drawing, in which preferred embodiments have been illustrated with the parts thereof identified by suitable reference characters in each of the view and in which:

FIG. **1** is a cutaway perspective and foreshortened view showing the safety and escape mechanism in use, with the elongated rope being used as a means for lowering infants, children and invalids from an elevated window.

FIG. **2** is a sectional view illustrating one form of mounting of the roller and bracket mechanism on a windowsill.

FIG. **3** is a view, similar to FIG. **2**, showing a modified form of mounting of the roller and bracket.

FIG. **4** is an enlarged gragmentary view of one end of the roller shown in FIGS. **2** and **3** as interengaged with the bracket.

FIG. **5** is a fragmentary perspective view, similar to the sill portion of FIG. **1**, showing the opposed end of the rope oriented for use by able-bodied children and adults; and

FIG. **6** is a front view of the assemblage of FIG. **5** showing a modified form of rope end.

In FIG. **1** of the drawing there is diagrammatically illustrated a portion of a dwelling or other structure **10**, having an elevated second or third floor **11** bounded by an outer wall **12** carrying a conventional window **13**, with an inner sill **14** and outer sill **15**. The improved safety and escape mechanism, as shown in FIGS. **1** and **2**, comprises a bracket **16** having an inner hooked end **17** for engaging the inner windowsill **14** and downwardly inclined outer ends **18, 18'** adapted to bear against and extend slightly beyond the outer windowsill **15**. The outer ends **18, 18'** of the bracket **16** are supported in aligned position by a crosshead extending therebetween which, for purpose of illustration, has been shown as extending transversely of the bracket at the inner sill engaging portion thereof, as seen at **17'** in FIG. **1**. It should be understood, however, that this spacing and alignment means can be located at any position along the members **18, 18'** or can, if desired, extend the full distance from the hook engaging the inner windowsill to the outer extremity overlying the outer sill.

Upwardly extending member **19, 19'** at the extremity of the inclined members **18, 18'** have apertures **20** for receiving coaxial studs **21, 21'** protruding beyond ends of an elongated roller **22** to rotatably support the roller **22** in the bracket **16.**

The roller **22** is uniformly curved from its ends to a smaller diameter mid section **22***a*, as clearly seen in FIGS. **1** and **5**, to assist in centering an elongated rope **23** which is passed over the windowsill and roller **22.** It will be noted, in this connection, that the upwardly extending members **19, 19'** are oriented in substantial alignment with the extremity of outer windowsill **15**, so that the rope **23**, as it passes over the roller **22**, is spaced outwardly from the windowsill and bracket **16.**

To facilitate assemblage of the bracket and roller, as shown in FIGS. **1** and **2**, the projecting lugs **21, 21'**, at one or both ends of the roller, can be in the form of cylindrical rods extending deeply into, or a unitary rod extending through, the roller **22** and locked against axial movement by set screws **24.** This permits easy and dependable mounting of the rotating roller **22** in the

rigid bracket **16**, with the outer surfaces of the lugs **21**, 21' fitting loosely within the bracket apertures **20**.

The bracket and roller assemblage, as shown in FIGS. **1**, **2** and **4**, is normally stored near the particular window **13** intended as an escape window for the dwelling or other structure. By merely opening the window and placing the bracket **16** over the windowsill with its hooked end **17** in engagement with the inner windowsill **14**, the device is immediately ready for use.

The second component of the escape mechanism comprises the rope **23** having a basket **25** joined to one end of the rope **23** by a plurality of strand members **26** suitably extending to the upper corners of the basket. The opposed end of the rope **23** is provided with a pair of equal short extensions **27**, **27'** terminating in loops **28**, **28'** of a size to engage the projecting lugs **21**, **21'** in the manner shown in FIG. **5**. While the loops **28**, **28'** have been illustrated as formed apertured members, it will be understood that the lug engaging portions can comprise simple spliced or otherwise formed loops at the ends of the rope extensions **27**, **27'** .

The rope and basket assemblage will, of course, also be stored near the selected escape windown **13**, and as soon as the bracket and roller assemblage has been mounted on the windowsill and the basket has been passed out through the window, the complete assemblage is ready for use by an operator **29** within the building. The inwardly extending portion of the rope **23** can be engaged between the operator's foot and the floor **11**, as illustrated, or passed around the waist of the operator to provide support of the basket **25** while being loaded close to the windowsill **15**; and thereafter by gradual release of the rope **23** by the operator **29** the basket **25** and contents can be lowered safely to the ground. When it is desired to lower an infant or small child, the operator **29** can, of course, place the infant or small child in the basket while still within the building and then pass the filled basket through the window and lower it gradually to the ground by controlled feeding of the rope **23** over the roller **22**.

To facilitate emptying of the basket, particularly when lowering an infant or small child, a second rope **30** is secured to the rear lower edge of the basket, as seen at **31**, and of sufficient length to more than reach an anchor member **32** secured to the structure adjacent the window **13**, to which the free end of the rope **30** can be secured, suitably by means of a spring clip **33**. When the basket **25** has reached the ground, the operator **29**, by pulling on the second rope **30**, can tilt the basket to roll out an infant or small child and in the same and continuing movements raise the basket again to the windowsill level. It will be seen that this sequence would permit the safe lowering of several small children and/or invalids within a very short period of time. A pet, such as a cat or dog, also trapped on the elevated floor **11** could, of course, be lowered in the same way and rolled out of the basket **25** when it reaches the ground.

When the only persons remaining on the elevated floor are the operator **29** and other able-bodied children or adults, their exodus from the structure can be expedited by hooking the looped ends **28**, **28'** of the rope **23** on the roller studs, as shown in FIG. **5** and then climbing out the window and sliding down the rope **23**.

In FIG. **6** there is shown a slight modification of the structure in FIG. **5** wherein there is interposed between the rope **23** and roller engaging ends **27**, **27'** a plurality of short, 5 to 6 inches rungs **34** spaced apart by rope sections **35**, **35'** approximately 12 inches long. The rungs permits the escapee to steady himself while getting over and clear of the windowsill and provide multiple hand grip portions for support while engaging the rope **23** with the feet or legs preparatory to sliding down the rope **23**.

The rope **23** is preferably a conventional stout flexible cord of fiber strands, such as hemp, sisal, jute or the like, twisted together, and having a diameter of about ½ to ¾ inch so as to provide the needed tensile strength and also permit firm grasping by an operator, or by one using it for a sliding escape.

While the foregoing description has been directed to the structure shown in FIGS. **1** and **2**, wherein the bracket **16** is detachably secured to the windowsill by engagement of the hook end **17** with the inner sill **14**, an alternative approach, as illustrated in FIG. **3**, is to permanently mount the roller **22** on the outer sill **15**. This can be done, for example, by screws **34** passing through short plates **35**, generally corresponding with end portions of the members **18**, **18'** and carrying the upstanding roller mounts **19**. This adaptation is particularly suited for use in connection with a window **13** which has definitely been selected as an escape window. In such instances, this mounting is preferred, as it reduces slightly the time between awareness of the emergency and the lowering of the first escapee. In instances where there may be alternate escape windows, each of such windows could be provided with the permanent roller mount, as shown in FIG. **3**, and, of course, also provided with the anchor member **32** for receiving the end **33** of the rope **30**. On the other hand, the detachable roller mount, as shown in FIGS. **1** and **2**, could be stored at a point easily accessible to the alternate escape windows.

With both types of roller mounting, it should be noted that the roller and its positioning with respect to the outer windowsill **15** serves several useful functions. Primarily, it eliminates friction between the rope **23** and the outer sill **15** and extends somewhat the spacing of the downwardly extending portion of the structure. Furthermore, the curved contour to provide a reduced diameter at the central portion of the roller has the advantage of keeping the rope **23** on the roller, when under tension, even though the operator **29** may not be directly oriented with the center of the window. In this respect, the structure assures intended operation even though the actions of the operator **29** may be hasty due to excitement and pressures of the emergency.

A special advantage of the escape mechanism is its basic simplicity and versatility in use. For example, when lowering an infant or small child, the operator, after lowering the basket to the ground, can raise the basket slightly and swing it to one side before tilting the basket to roll out the child. This minimizes the danger of injury to the child as others escape by being lowered or sliding down the rope. The ability to tilt the basket to roll out the occupant and yet quickly retrieve the basket for re-use is of special importance because frequently in an emergency there will be no one on the ground to receive the escapees.

It is also significant to note that after the last needed use of the basket, the operator has right at hand the opposed end of the rope **23** so that the loops **28**, **28'** can be very quickly mounted on the roller lugs to ready the mechanism for sliding escape use.

Any able-bodied adult or teen-aged youth should be able with this mechanism to safely lower to the ground one or more infants or small children and then safely slide down the rope in the FIG. **5** configuration within a very short passage of time; and in case of fire, time can frequently be a most critical factor.

For use in business and industrial structures, where infants and small children are not expected to be present, the basket can be omitted as all occupants will be able to use the device in the manner shown in FIG. **5** and **6.** In such installations the roller **22** can be dispensed with and the fixed or movable bracket means can merely carry divergent, spaced rigid members comparable to the roller ends **21, 21'** for engaging the looped ends **28, 28'** of the rope. Thus, for example, most or all windows on the second and third floors of business or industrial structures could have such rigid members permanently mounted thereon, with a plurality of escape ropes having the end structure shown in FIG. **5** or FIG. **6** strategically located for quick access within the structure.

Various changes and modifications in the safety and escape mechanism herein disclosed may occur to those skilled in the art, and to the extent that such changes and modifications are embraced by the appended claims it is to be understood that they constitute part of the present invention. I claim:

1. A safety mechanism for escape from buildings via above ground windows comprising in combination a guide roller having bracket means for securing the same parallel to a windowsill in a manner to protrude outwardly therefrom, and a rope substantially longer than the windowsill to ground dimension, basket means at one end of said rope of a size to receive infants and small children in lying or seated position and larger individuals in a kneeling or standing position whereby an able-bodied operator within the building can quickly lower one or more individuals to ground level by controlling feed of said rope over the windowsill and roller, the other end of said rope terminating in a pair of integral rope extensions having loops at the extermities thereof, and said roller having axial extensions at opposed ends thereof adapted to be engaged by said loops with said engagement being enhanced by the application of tension to said rope, thereby providing a safe sliding escape means for said operator and other able-bodied individuals.

2. A safety mechanism as defined in claim **1,** wherein said roller extends a substantial distance along said windowsill and is smoothly curved from a relatively small diameter at its central portion to substantially larger diameter at the ends thereof, to thereby facilitate substantial centering of the tensioned, downwardly extending portion of said rope when in use in spite of possible transverse movement of the operator controlling feed of the rope over said roller.

3. A safety mechanism as defined in claim **1,** wherein the bracket means are adapted for permanent mounting to the windowsill by suitable fastening means.

4. A safety mechanism as defined in claim **1,** wherein the bracket means have offset inner ends adapting the same to be detachably secured to the inner sill portion of a windown frame.

5. A safety mechanism as defined in claim **1,** wherein said basket means is elongated in a direction parallel to the building wall and is supported by strand extensions to the upper corners thereof and so sized and positioned as to minimize contact of the basket with the building wall.

6. A safety mechanism as defined in claim **5,** wherein the inner, building, side of said basket means is provided with a trip line of sufficient length to reach said window facilitating tilting of the basket to dump its contents when the basket has reached ground level.

7. A safety mechanism as defined in claim **6,** wherein the trip line carries at its free end quick engaging means for securing the same to an anchor member adjacent said window.

8. A safety mechanism as defined in claim **1** wherein said integral rope extensions are joined between said rope and loops by a plurality of short rungs spaced apart about 12 inches providing means for an escapee to steady himself in climbing through and clear of the window and in preparing for a sliding descent down the rope.

9. A safety mechanism as deined in claim **8** wherein there are three of said short rungs each 5 to 6 inches long.

10. A safety mechanism for escape of ablebodied individuals from a building via an above ground window, said mechanism comprising in combination bracket means having a pair of divergent lugs centrally and longitudinally spaced with respect to the outer sill of said window, and an elongated rope having a length greater than the window sill to ground dimension, one end of said rope terminating as two short rope sections having loop means at the extremities thereof for engaging said divergent lugs, said short rope sections being of equal length to position the suspended rope beneath a point substantially midway between said divergent lugs, whereby the weight of said rope, and any escapee using said rope, urges said loop means into firm supporting engagement with said divergent lugs.

11. A safety mechanism as defined in claim **10** wherein said bracket means are adapted for permanent mounting on said windowsill.

12. A saftey mechanism as defined in claim **10** wherein said bracket means extends over both inner and outer sills of said window and is adapted for detachable engagement with said inner sill.

13. A safety mechanism as defined in claim **10** wherein said short rope sections, between said looped ends and the juncture with said rope, are joined by a plurality of short rungs for steadying an escapee while climbing over said windowsill and preparing to slide down said rope.

14. A safety mechanism as defined in claim **13** having three of said rungs, each about 5 to 6 inches long, which are spaced apart by about 12 inches.

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