Aug. 5, 1969 KIICHIRO FUSE 3,459,276

ROPE DEVICE FOR FIRE ESCAPE

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FIG. 1

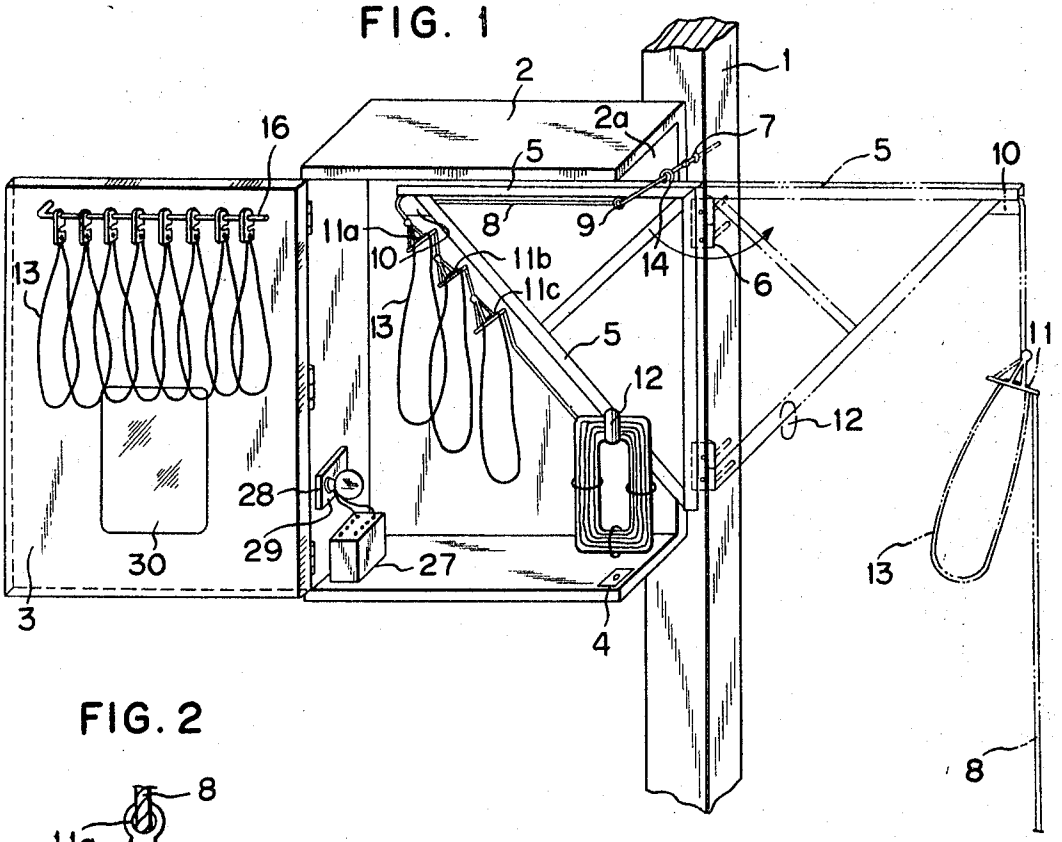


FIG. 2

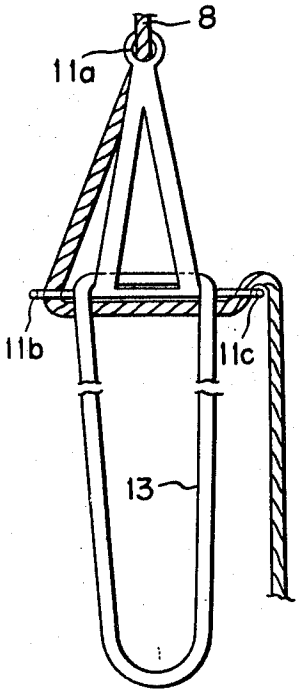


FIG. 3

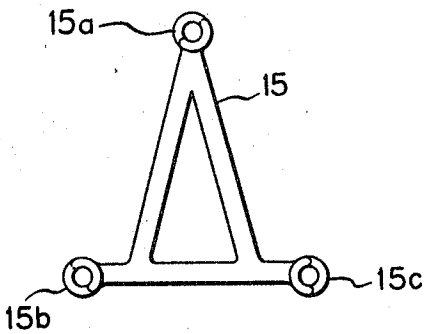
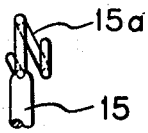


FIG. 4



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FIG. 5

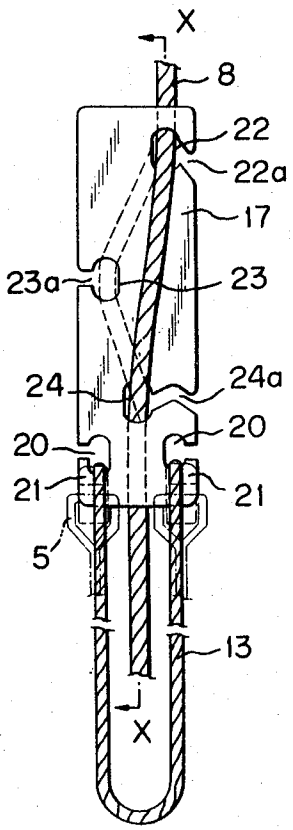


FIG. 6

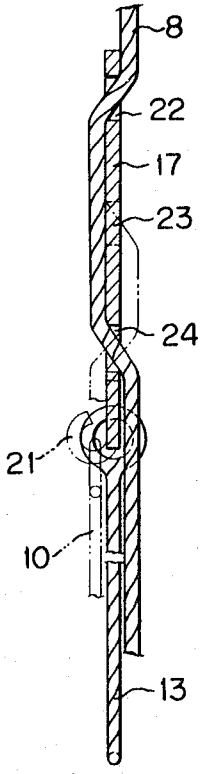


FIG. 8

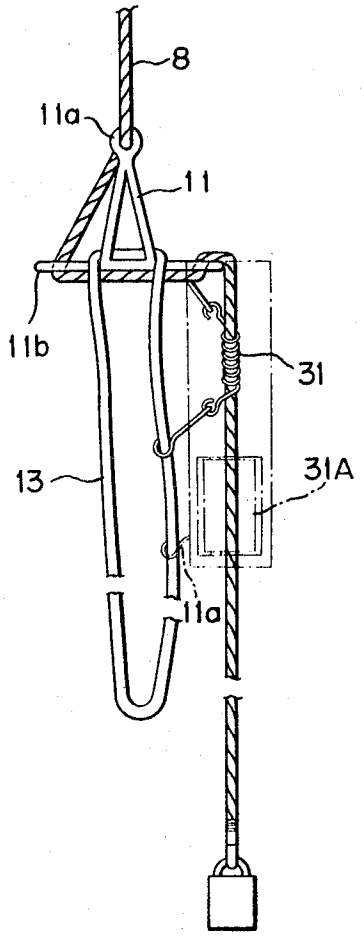
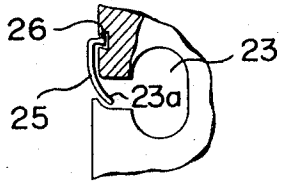


FIG. 7



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ROPE DEVICE FOR FIRE ESCAPE

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Filed Oct. 17, 1967, Ser. No. 675,941
Claims priority, application Japan, Oct. 20, 1966, 41/68,581
Int. Cl. A62b 1/14
U.S. Cl. 182—72 3 Claims

ABSTRACT OF THE DISCLOSURE

The rope device comprises a rope having one end rigidly fixed and the other end extended to lower place, a support means having an end for supporting said rope and a lowering unit consisting of an engaging means for engaging with the rope to produce frictional force for the rope and a support means for a person, wherein said engaging means is provided with at least two holes passed by the rop which is bent and tensioned by weight of the person whereby fire refugees may safely escape to lower floor or ground with lesser preparation.

In usual fire hazards occurring upstairs in city buildings, accidents often cause much loss of lives of refugees due to difficulty of escaping from outlets in smoke. A variety of escape means have been proposed or practically used such as emergency staircases, sliding ladders and cloth chutes which however are not singly usable, or expensive and inconvenient of operation because of trouble of handling complicate equipment and for other reasons.

This invention is to overcome the above drawbacks and to provide a simple rope device for fire escape which is capable of being installed upstairs and in any room and floor of a building whereby fire refugees may safely escape to lower floor or ground with lesser preparation.

According to this invention, the rope device comprises a rope having one end rigidly fixed and the other end extended to lower place, a support means having an end for supporting said rope and a lowering unit consisting of an engaging means for engaging with the rope to produce frictional force for the rope and a support means for a person, wherein said engaging means is provided with at least two holes passed by the rope which is bent and tensioned by weight of the person.

Other object of this invention is to provide a rope device wherein said holes are substantially closed and through which the rope for a lowering unit is previously passed so as to prevent separation of the lowering unit from the rope and the lowering unit can be used most speedily.

Another object of this invention is to provide a rope device wherein said engaging means is provided with a friction regulating means for controlling frictional force caused from the rope in engagement by which lowering speed of refugees may be adequately controlled.

The above and other objects and characteristics of this invention will become clear from the description below by way of example on an embodiment with reference to the accompanying drawings.

FIGURE 1 is a perspective view of a rope device for fire escape according to this invention;

FIGURE 2 is a front view of a lowering device already in arrangement through which a rope is passed;

FIGURE 3 is a front view of a reserve lowering unit through which users can desirably pass a rope and use it;

FIGURE 4 is a view showing details of engagement of a rope of a reserve lowering unit;

FIGURES 5 and 6 are respectively a front view and a side sectional view of another lowering unit;

FIGURE 7 is a detailed view showing engagement of the reserve lowering unit in FIGURES 5 and 6;

FIGURE 8 is an embodiment of this invention including friction regulating means for controlling frictional force of rope in engagement.

Referring now to FIGURE 1, there is shown a container **2** for housing a rope device which is fixed on a pole **1** or a wall at a part connected to a window or outside of a building. The container **2** is in a box form and opened at a part **2***a* to outside of the building. On the opposite side of the open part **2***a* is hinged a cover **3** capable of opening or closing but it is usually closed by any fixing means **4**. A support **5** is held for example by a shaft **6** movably from the container **2** to the outside of the building. The support is usually housed in the container **2** and can project for use outside the building. Above the shaft **6** of the support **5** is provided a rope fixing rod **7**, at the open end **9** of which a rope **8** is fixed. A rope **8** is provided to have a length reaching the ground from upstairs where the container **2** is located. From said open end **9** and an end **10** of the support **5** through holes **11***a*, **11***b* and **11***c* of a lowering unit **11** is passed the rope which is wound at the end part and supported by a support element **12** at the lower part of said support **5**. The holes **11***a*, **11***b* and **11***c* for passing the rope are provided in three places at end parts of the lowering unit **11** respectively on each end. A suspension band **13** is supported on the lower end of the lowering unit **11** on which the rope **8** is previously passed through the hole as shown in the drawings. **14** is a fixing pin holding the support **5** housed in place in the container. Users may take out the fixing pin **14** and hold the support **5** in place as shown by chain line in FIGURE 1.

There is provided a holding bar **16** for supporting reserve units **15** on the upper part of the cover **3**. As shown in FIGURE 3, a reserve lowering unit **15** having a suspension band **13** may be hung to be freely disengaged. Said reserve lowering unit **15** shown in FIGURE 3 is same as shown in FIGURE 2 in features except in the shape of the rope engaging holes. Each of these holes **15***a*, **15***b* and **15***c* for passing the rope is provided on the inside with spiral portions over one pitch at the end as shown in FIGURE 4. The rope **8** is for example passed through the hole **15A** without inserting its end therethrough so that it is possible to fiit the lowering unit **15** readily at a predetermined position of hte rope **8** while leaving the rope **8** in suspended condition at each time for use. The reserve lowering unit shown in FIGURES 5, 6 and 7 are provided with notch **20** or curved portion **21** for hanging the suspension band **13** near the lower end of a plate **17** as for example of metal. On both sides of the plate **17** are provided engaging parts of rope which is provided with holes **22**, **23** and **24** and notches **22***a*, **23***a* for passing the rope therethrough, each of said holes being provided with a closing piece **25** which is movable only inwardly and fixed on the plate by adequate means **26**. If the rope **8** is passed through the hole to the surface of the plate **17** in an alternate manner and when weight of a person is applied on a suspension band, the rope **8** is hung up as shown in FIGURE 6. Therefore, the rope is bent and tensioned so that the lowering unit may not fall excessively rapidly due to friction of the rope **8** with the plate **17**. If required, there may be provided a battery **27**, a lamp **28** and a switch **29** at preferred places in the container **2** or a torch adapted to light, when the container is opened, to meet an emergency at night. The rope may be painted such as in red and the band in blue to be readily discernible when the lowering unit is shone by light. Any luminous paint may be applied on the rope or on any other parts of the lowering unit if desired.

The cover **3** may be provided with a glass window **30** to inspect the inside thereof as desired.

The rope **8** may be provided with an adequate means **31** for controlling the friction of the engaged rope as shown in FIGURE 8. There may be used a holding means **31A** consisting of hinged two plates holding the rope **8**. Said means may have a spring device which engages the rope **8** and connects at one end to the lowering unit and at the other end to the band **13**. The frictional force of the rope can be increased by pulling the other end. The rope **8** may be attached at the free end to a weight.

When lowering, the cover **3** of the container **2** is opened, the support **5** is turned outward and the end of the rope **8** is lowered to ground. Then user gets on the suspension band **13** and grips the rope **8** and goes outside of the building. In the lowering unit **11** weight of the user is applied on the rope **8** which is bent and tensioned so that the user may be safely lowered, regulating frictional force between the rope and the holes of the lowering unit.

If the lowering units in the container are less in number than the number of users waiting for lowering, they may take out reserve lowering units to start lowering. Although electricity is cut off in emergency at night, the lowering may be accomplished without fail by lighting the lamp or by means of the luminous paint applied on the landing units.

What I claim is:

1. A fire escape device for a building comprising:

(a) a housing fixedly secured to said building adjacent the exterior thereof,

(b) support means carried by said housing and movable from a position inwardly thereof to a position exteriorly of said building,

(c) a rope having one end fixedly connected to said support means,

(d) a lowering unit having means for engaging said rope and frictionally movable with respect thereto,

(e) means carried by said lowering unit for supporting a person,

(f) said lowering unit engaging means comprising at least two apertures through which said rope is passed whereby the weight of a person carried in the support means therefor causes bending and tensioning of said rope relative to said lowering unit,

(g) and a closure for said housing whereby said rope is storable inwardly of said housing, when not in use, and easily movable exteriorly of said building for ready use.

2. A device in accordance with claim **1** wherein there are provided means operable by said person for adjusting the frictional force of the rope relative to the lowering unit in order to adjust the speed of said unit.

3. A device in accordance with claim **2** wherein at least one additional lowering unit is provided for engagement with said rope and in which reserve lowering units are removably carried by said housing closure.

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