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Hynes

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[54] **LIFESAVING SYSTEMS FOR ESCAPING FROM HIGH BUILDINGS IN THE CASE OF FIRES OR OTHER EMERGENCIES**

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[52] **U.S. Cl.** **182/7,** 182/72

[51] **Int. Cl.** **A62b 1/08**

[58] **Field of Search** 182/3, 5, 6, 7, 72

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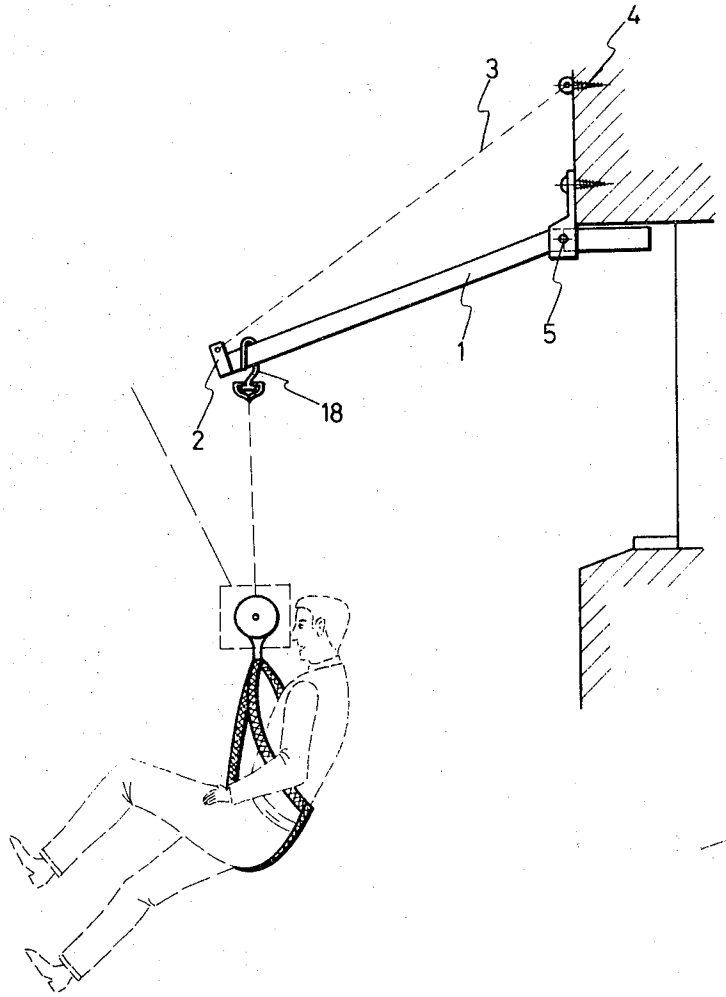
C and M cited to show analogous art.

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[57] **ABSTRACT**

A lifesaving system for escaping from high buildings in case of fires or other emergencies. The system has a descending bar coupled to the upper part of a window and which projects outwardly, such as from a building, or is coupled to a fixed point of a place a person wishes to leave. A harness or belt is provided which snugly surrounds a part of the body. A hermetically closed element is also provided which has an assembly of wheels coupled to each other in its interior. This hermetically closed element is joined by a part to the harness or belt, and therefore to the user; and is also joined by another part, such as a hook, to the descending bar when the persons to be rescued leaves the building by descending vertically.

6 Claims, 6 Drawing Figures



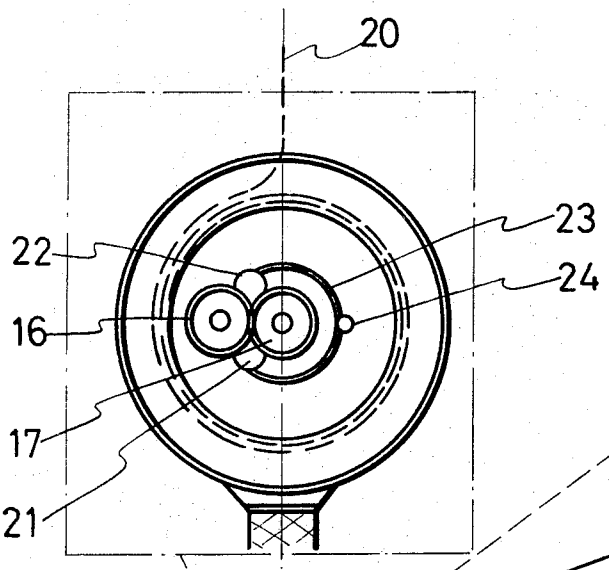


FIG-2

FIG-1

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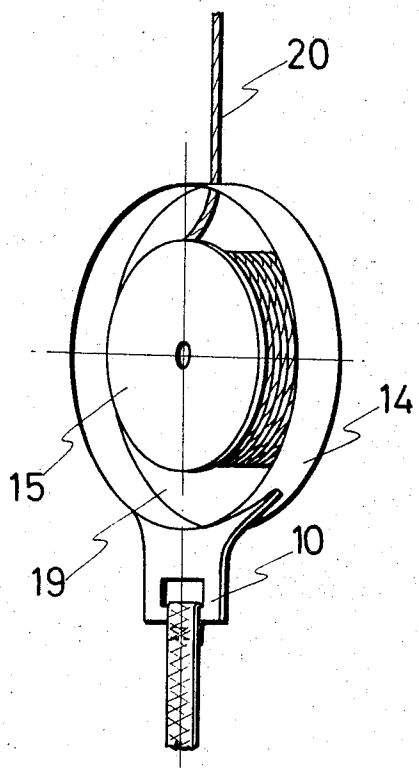


FIG-3

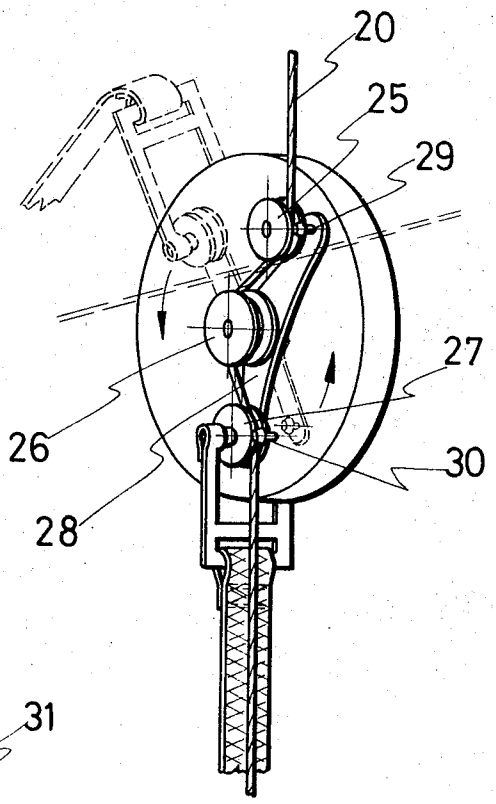


FIG-4

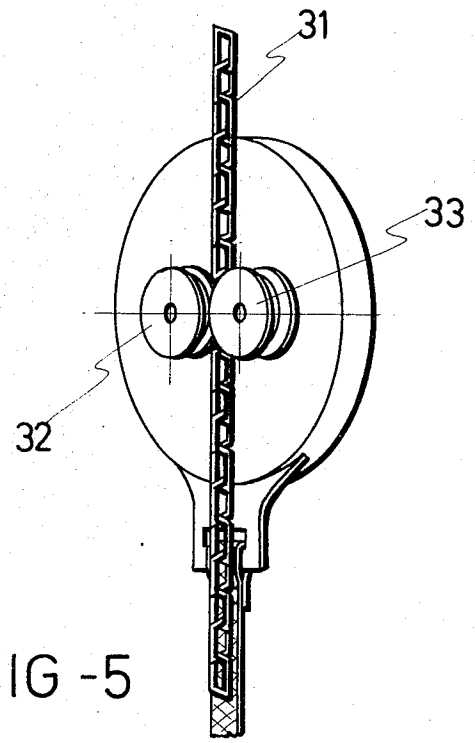


FIG-5

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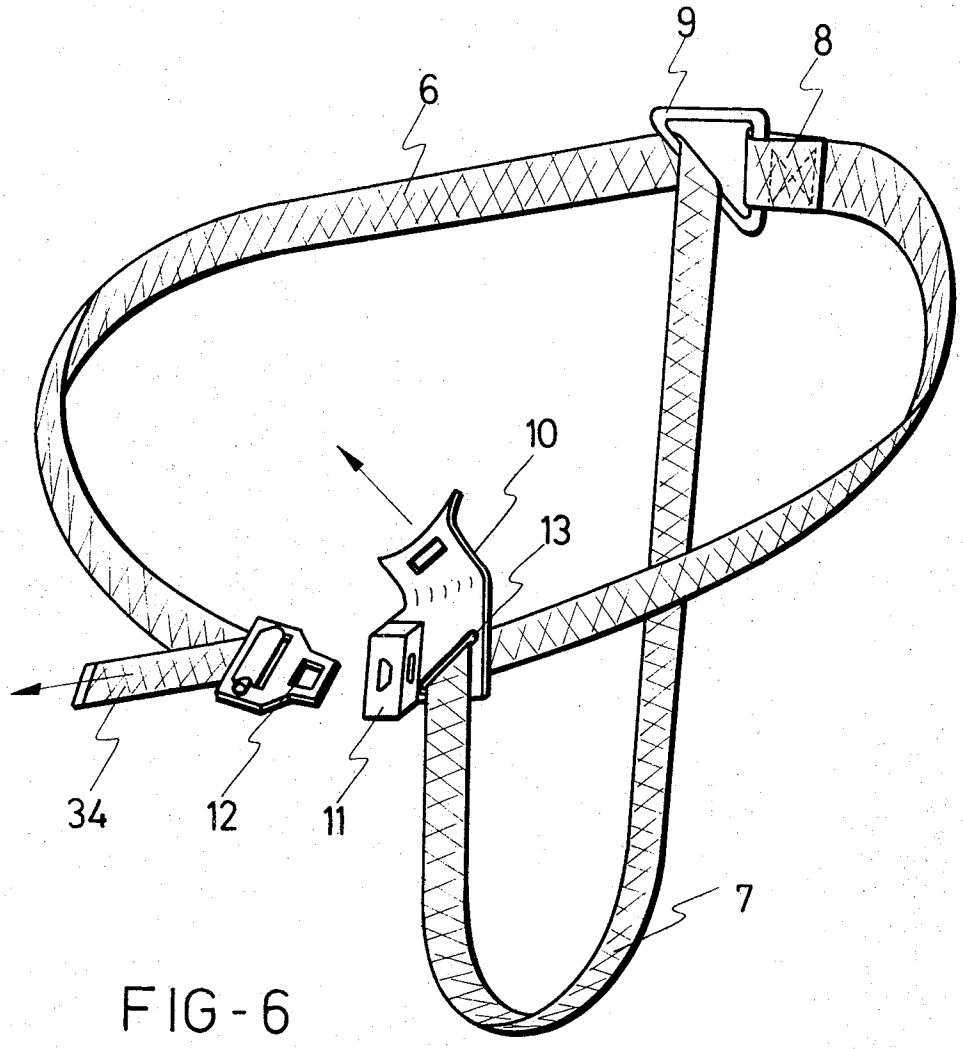


FIG-6

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LIFESAVING SYSTEMS FOR ESCAPING FROM HIGH BUILDINGS IN THE CASE OF FIRES OR OTHER EMERGENCIES

The present invention relates to improvements in lifesaving systems for escaping from high buildings in case of fire or any other emergency. The purpose of such improvements is to permit the easy escape of persons from a flaming building or from dangerous heights.

The systems and/or apparatus which exist heretofore, applicable in lifesaving of persons who are trapped in flaming buildings, are the following:

1. Permanent fire escapes on the outside of buildings.
2. Telescopic ladders, which are extended from the interior of buildings in case of accidents.
3. Other common types of ladders applicable to lifesaving in cases of emergency.
4. Other methods employed by firemen in order to "save lives from the outside of buildings" (ladders, lifesaving nets, etc.)

DISADVANTAGES OF THE PRIOR ART

The above mentioned systems and/or apparatus however, have the following obstacles.

With regards No. 1

a. They are antiaesthetic
b. The building is easily accessible to strangers from the outside the buildings (trespassers, thieves, vagabonds, etc.)
c. The swiftness of escape is hampered by the stairways which are normally narrow and winding.
d. Installation and upkeep of fire escapes are costly.

With regards No. 2

a. They function badly and do not function at all after a prolonged period of inactivity.
b. Its efficiency is very limited.
c. Its use by women, children and aged or nervous persons is difficult and the speed of escape is always limited.
d. In order to descend from a height of various floors it is essential to pull out many extension ladders.

With regards No. 3

a. They take up lots of space in the inside of a building when they are not in use.
b. They require a certain amount of agility on the part of the user in order to operate same.
c. Its length restricts its use to very limited heights.
d. The speed of escape is very slow.

With regards No. 4

These methods always depend on specialized help from outside with adequate equipment.

a. Rescue cannot be simultaneous for all persons trapped within the flaming building.
b. Injuries can easily be produced during rescue.
c. They are faced with restrictions, which sometimes do not permit its use, on account of position, form, etc. of a building.

The above cited disadvantages can be overcome by the subject invention due to the following reasons:

1. During normal conditions, i.e., when fire does not occur, no apparatus of any kind is visible in the building.
2. There is no exterior-interior connection of the building whatsoever.
3. The time a person requires to escape from a flaming building is independent of the number of persons who wish to escape simultaneously. Furthermore, such rescue time is less than that required when using any of the techniques known heretofore.
4. The apparatus of the present invention is ready for use at any time, independent of the period of time in which it has remained inactive.
5. Said apparatus can be used for escape from any height, and is especially suitable for such purpose.
6. They take up very little space in the interior of a building.
7. Escape is totally independent of any outside help.
8. They can be used in all types of buildings irrespective of its shape or position.

The functioning of the instant invention is as follows:

In case of alarm, each person should go to the window where an apparatus is located. The left leg of the individual should be inserted into the harness loop and same should be fitted to the chest of the user, pulling at the loop end and holding said hermetically closed loop end against his body. This element should then be connected to the fixed hook or to the bar and the person should then slide down through the window. The hermetically closed element controls the speed of descent without any further action on the part of the user. On safely reaching ground level, the individual will free himself, with a simple movement, from the harness and from the hermetically closed element attached to his body and will hurry away from the danger zone, abandoning the apparatus.

If an obstacle is encountered, between the starting off point and that of arrival, the user may use his arms and legs to free himself from same, and furthermore should he come across terraces or any other intermediary horizontal surfaces he will walk along same until he reaches the border or edge of said obstacles and will once again initiate the sliding down process.

With the purpose of graphically clarifying the object of the present invention, a set of drawings is attached to the specification and forms part of same. Said drawings show the following:

FIG. 1 is a side view of the position of a person descending from a determined height.

FIG. 2 is an esquematic view of the hermetically closed element.

FIG. 3 shows a perspective view of the zone on which the cable is wound.

FIG. 4 shows a perspective view of a second embodiment of the casing in which the pressure mechanism is situated where the haulage cable passes over three exterior pulleys instead of being wound on to said casing as shown in FIG. 3.

FIG. 5 shows the same device as represented in FIG. 4 with the exception that the cable was substituted by a chain in which case only two opposed pulleys are required.

Finally, FIG. 6 shows the harness or safety belt.

Referring to the drawings, it will be seen that the improvements consist of providing the user with three perfectly combinable elements. One element consists of a descending bar 1, either joined to the upper part of a window which projects outwardly, as in the case of a building, or joined to a fixed point of the place a person wishes to leave.

The descending bar 1 consists of a tubular body having an elliptic or rectangular section, having a type of butt 2 of oval shape, on its free end, from which butt

two cables or chains 3 emerge. These cables or chains are pierced into the wall at two points 4, symetrically arranged with respect to the axis of the bar.

The descending bar 1 is fixed to the wall above the window, hinged at point 5 so that it is adjacent to the wall when not in use, and it is able to unfold itself in such a way that the free end remains at a height inferior to that of the hinged end of the bar.

When the building, to which the descending devices of the present invention are to be installed, has an upper projecting zone, no more than the anchorage of a hook in the wall is required, in which case the use of the descending bar is not essential.

Another of the three mentioned elements is the harness or belt shown in FIG. 6 which snugly surrounds various parts of the user's body.

The harness is constituted by a band 6 which covers the diaphragm and enfolds the chest; as well as of an extension 7 which passes between the user's legs. One end 8 of the band 6 has a ring 9 in the form of a rectangular triangle. An element 11 is solidarized to a body 10 which is coupled to the harness. A male piece 12 is joined to the element 11 in order to adjust and secure the harness to the body. The flange 10, welded to the casing 14 of the hermetically closed element, presents an inclined groove 13 through which the band of the harness passes.

Finally, the third of the constitutive elements already mentioned, is represented in FIG. 2, which shows the interior thereof. Said hermetically closed element shows in its interior an assembly of wheels 16 and 17. The aforementioned element is joined to the harness by a part 10, and therefore to the user; and to the descending bar 1 by another part, by means of a hook 18, when the person to be rescued tries to descend vertically from the building.

The hermetically closed element consists of a cylindrical body 15 of reduced height (FIG. 3) which together with the annular band 14 gives rise to the formation of a chamber or gorge 19 on which the descending cable 20 is wound.

Two pieces 16 and 17, having a geometrical form, are found in the internal section 15. This geometrical form urges the fluid, wherein the two mentioned pieces are contained, from a suction chamber 21 to a pressure chamber 22. The relative position between the above cited pieces always forms the closure between the two mentioned chambers 21 and 22.

The suction and pressure chambers are reached by means of a duct 23, in which a valve 24 is provided, which may be accessible or not from the outside. In the case of accesibility being possible the handling of the valve can be effected to regulate the pressure between the chambers, whereas in the case of non accessibility said valve will be regulated previously so that a predetermined pressure always exists.

The descending cable 20 could be fixed to the harness (FIG. 6) or to the axis of one of the two pieces 16 and 17, or either fixed to the upper hook passing over three pulleys 25, 26 and 27, situated in the casing of the hermetically closed element. In this case, chamber 19 is not required.

As can be seen in FIG. 4, pulley 26 is mounted on the housing so as to rotate with wheel 17. In addition, pulley 25 and guide 30 are mounted directly on the housing, as shown. On the other hand, pulley 27 and guide 29 are rotatably mounted at opposite ends of mounting flange 28. This flange is mounted so as to rotate or pivot about the axis of pulley 26.

These pulleys 25, 26 and 27 take up two extreme positions. In FIG. 4 it can be seen that one of the positions is represented by dotted lines and the other by a continued line. The position which corresponds to that of the dotted lines is that in which the apparatus is at rest, and a spring which is not shown urges the mounting flange 28 to remain in said position while a person does not hang from the apparatus.

Should a person hang from the apparatus, previously placing the apparatus with respect to the cable shownin dotted lines,indicated in FIG. 4, the device takes up the position shown in continued lines. In this case the cable 20 is guided by the the three mentioned pulleys, as well as by two small guides 29 and 30, respectively, situated on the flange 28 and in the general casing of the apparatus.

In the last mentioned case, when the cable 20 is substituted by a chain, no more than two pulleys 32 and 33 having a suitable gorge are required, of which pulleys only one will move one of the elements 16 and 17.

From the previous description of the drawings, the function of the instant invention is practically deduced, which is as follows:

In the case of alarm, each person should go to the window where the apparatus of the kind described is located. The left leg of the person should be inserted into the harness loop and same should be adjusted to the chest of the user, pulling the loop end 34 and keeping the hermetically closed element against him. Said element will then be connected to the fixed hook or to the bar 1 and the person will then allow himself to descend from the window as illustrated in FIG. 1. The hermetically closed element will control the descending speed without any other action on the part of the user. On safely reaching ground level the person will free himself, with a simple movement, from the harness and from the hermetically closed element which is attached to his body and the user will rapidly leave the danger zone, thus abandoning the apparatus.

If an obstacle is found between the descending point and that of arrival, the user may use his arms and legs to evade same and furthermore should terraces or other intermediary horizontal surfaces be encountered, the person will walk over them in order to once again slide down the building on reaching the border of said obstacles.

It is to be understood that various modifications and changes can be made without departing from the spirit and scope of the instant invention as defined by the appended claims.

I claim:

1. A device for use with fire and other emergency escape equipment utilizing a descending cable, said device descending as the user descends and comprising a housing means, rotatable means to positively engage said cable mounted on said housing means, a hermetically sealed compartment also mounted on said housing means and containing a fluid pump means comprising first and second wheels, said wheels having parallel axes and the circumferences of said wheels being in contact with each other, one of said wheels being operatively connected to said cable engaging means to rotate therewith, a suction chamber located at one side of the junction of said wheels and a pressure chamber located on the other side of the junction of said wheels,

conduit means connecting said suction chamber to said pressure chamber and valve means located within said conduit means said valve means being controllable by the user, whereby the user can control his rate of descent.

2. A device as claimed in claim **1** wherein said cable engaging means comprises a cylindrical drum whereby said cable can be wound about said drum.

3. A device as claimed in claim **1** wherein said cable engaging means comprises a main pulley operatively connected to said one wheel, and two guide pulleys for guiding said cable against said main pulley.

4. A device as claimed in claim **3** further including mounting means mounting one of said guide pulleys for movement between an operative and a non-operative position and spring means urging said mounting means towards said non-operative position.

5. A device as claimed in claim **4** further including two pivot means for further guiding said cable, one of said pivot means being mounted on said mounting means and the other of said pivot means being mounted on said housing.

6. A device as claimed in claim **1** wherein said cable is in the form of a chain and said cable engaging means comprises a pair of spaced apart pulleys, said pulleys having means on their periphery for engaging said chain and said chain passing between said pulleys.

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