

July 24, 1951

F. R. WILSON  
SAFETY ESCAPE DEVICE

2,561,832

Filed April 17, 1947

2 Sheets-Sheet 1

Fig. 1.

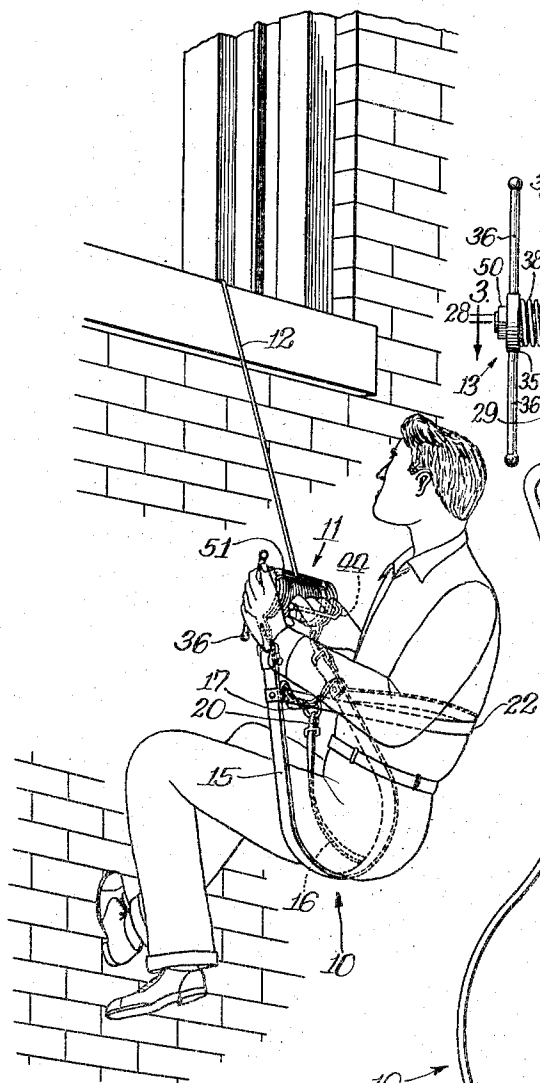
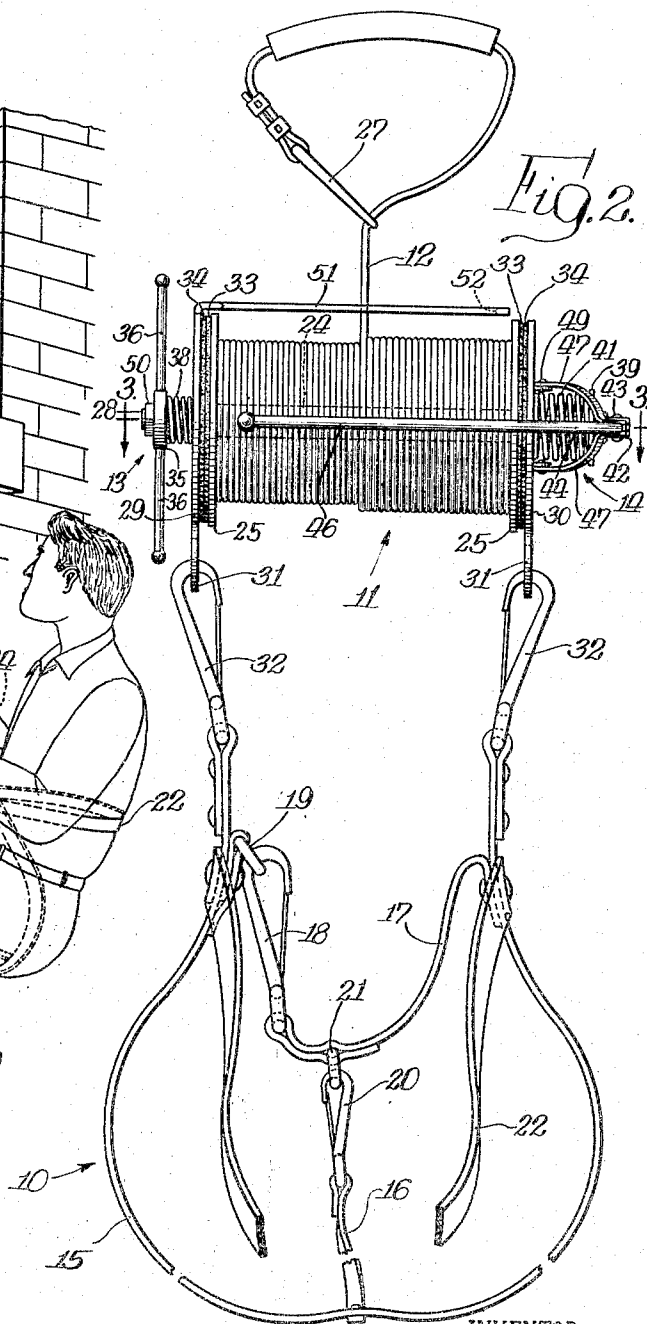


Fig. 2.



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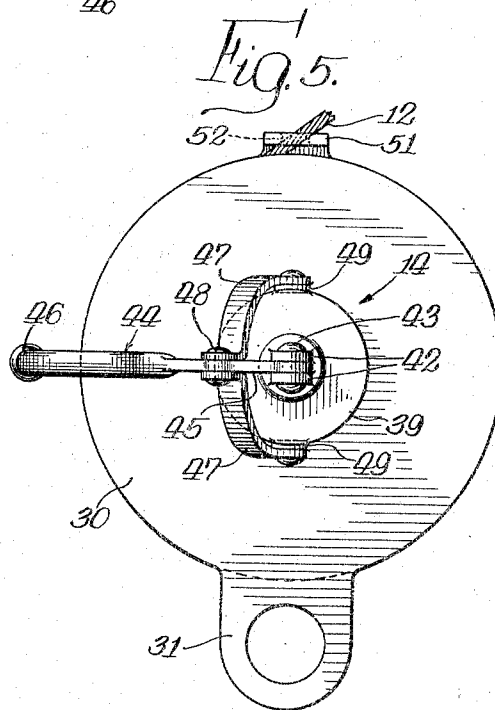
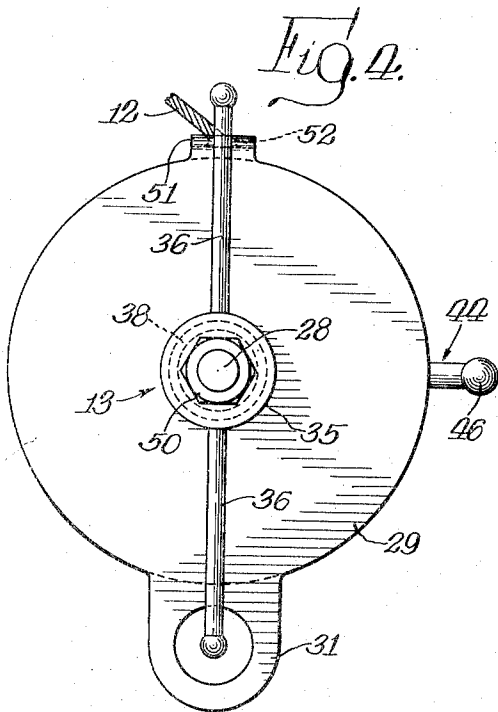
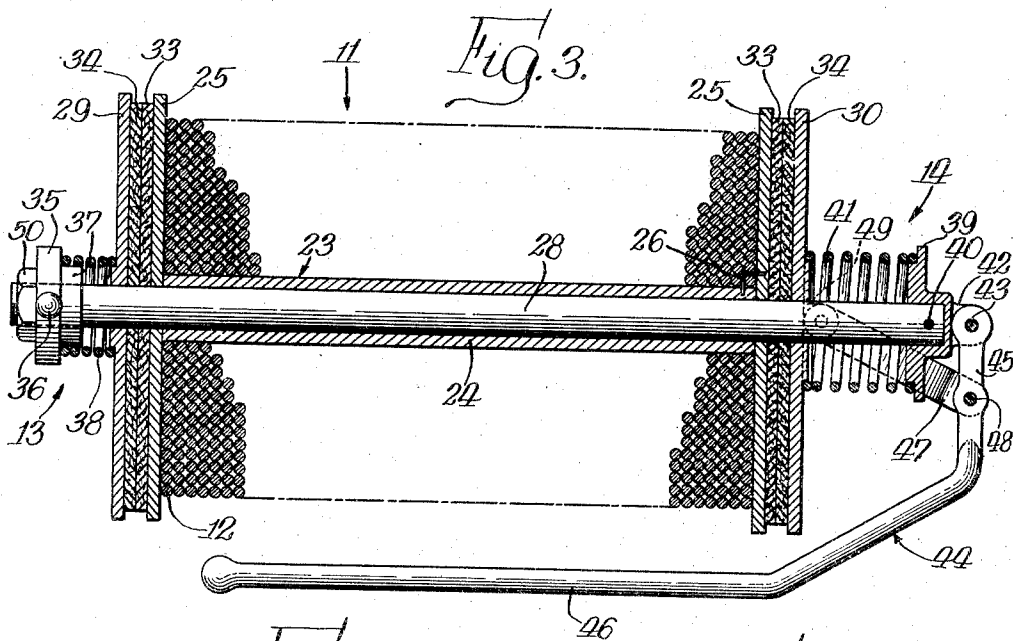
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## UNITED STATES PATENT OFFICE

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## SAFETY ESCAPE DEVICE

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## 4. Claims. (Cl. 227—32)

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The invention relates to a device for use by an individual escaping from a building during an emergency and when the usual means or avenues for exodus are inoperative or blocked.

It is a general object of this invention to provide a device for use by an individual in escaping from a burning building or the like which is of new and improved construction, readily applied and operated by the average member of the public, and readily adjusted to carry any weight individual.

A more particular object is to provide an escape device composed of a harness and a reel of steel cable, the speed of rotation of the reel being under full control of the individual making the descent so that the speed of descent is governed by the individual.

Another object is to provide an escape device of the character defined in which the means controlling the rate of rotation of the reel is so arranged that braking pressure tending to arrest rotation of the reel is automatically applied should the individual making the descent release his grip on the control means either voluntarily or involuntarily, wilfully or unwillfully, through panic or loss of consciousness.

Another object is to provide an escape device of the character described having two means for controlling the braking pressure applied to the reel one of which is provided to adjust the device for the weight to be carried thereby but which may also be employed during descent to adjust the braking pressure, the other of which control means is employed primarily to govern the rate of descent.

A further object is to provide an escape device which is compact and comparatively light in weight so that it may be conveniently stored in each hotel room or even carried about by individuals as part of their luggage.

Still a further object is to provide an escape device which can be economically manufactured, will remain safe and operative without repeated inspection or checking, has a cable that is not readily destroyed by fire, and is so constructed that all parts except the cable descend with the individual making the escape so that the major part of the device is saved as an incident to the safe escape of the individual using the same.

Other objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view illustrating the device in operation.

Fig. 2 is a general elevational view of the device.

Fig. 3 is a diametrical sectional view taken approximately along the line 3—3 of Fig. 2, that is, on a diameter passing through the speed of descent controlling lever.

Fig. 4 is an end elevational view taken from the left in Fig. 3.

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Fig. 5 is an end elevational view taken from the right in Fig. 3.

While the invention is susceptible of various modifications and alternative constructions, it is shown in the drawings and will be hereinafter described in a preferred embodiment. It is not intended, however, that the invention is to be limited thereby to the specific construction shown. On the contrary, it is intended to cover all modifications and alternative constructions falling within the spirit and scope of the invention as defined in the appended claims.

As best seen in Figs. 1 and 2, the device comprises generally a harness 10 to be applied to and worn by the individual making the escape, a reel 11 having a cable 12 wound thereon, the reel being rotatable on means attached to the harness, and means 13 and 14 for controlling rotation of the reel for governing the rate of descent of an individual in the harness. The harness may take any one of many forms provided it gives suitable, secure and nonpainful support to the individual to whom it is supplied while leaving the hands of the individual free for use. Preferably also the harness should be simple so as to be readily applied and should either be readily shed by the individual upon reaching safety or readily disconnected from the reel so that the individual may quickly depart from the scene of the disaster and not risk the further hazards of falling walls and the like.

The harness disclosed herein by way of example comprises a main strap 15 of leather or other suitable material which is designed to constitute the main weight-supporting member and functions as a sling suspension seat in which the individual sits, as best seen in Fig. 1. Secured to the approximate midpoint of the strap 15 is a strap 16 which is intended to extend forwardly and then upwardly between the legs of the wearer. At its upper end, it is intended to be secured to the approximate midpoint of a strap 17 which extends between the parts of the main strap 15 near the ends thereof. The strap 17 is preferably permanently secured at one end to the strap 15 while at the other end it carries a snap hook 18 which is snapped into a ring 19 secured in fixed position on the opposite portion of the strap 15. The strap 16 is intended to be secured to the strap 17 at the approximate midpoint thereof and is herein shown as carrying on its free end a snap hook 20 engaging a ring 21 fixedly secured on the strap 17. Preferably the harness is completed by a back strap 22 which is secured to the main strap at approximately the same points as the strap 17 and is intended to encircle the back of the escapee, as shown in Fig. 1, to prevent the individual from tilting backwardly out of the harness.

The reel 11 of this device comprises a metal spool 23 having a hollow tubular center 24 and a circular disk 25 at each end forming the end flanges of the spool. On this spool is wound the

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flexible steel cable 12. This cable preferably is a multiple twisted strand cable having a tensile strength great enough to sustain with ample safety factor any weight that is likely to be placed thereon. At the reel end, the cable is permanently secured to an eye 26 formed as an integral part of the spool, while at its free end it carries a snap hook 27 to facilitate the securing of that end of the cable to some object or element in the room from which the escape is to be made. It will be understood, of course, that if the escape device forms a standard part of the furnishings of a hotel room some means, such as an eye, will be provided at one or more windows in the room into which the hook 27 may be snapped. If, however, the escape device is not standard equipment but is carried by the occupant of the room, the end of the cable can be secured to any one of a variety of objects, such as the radiator, the frame of the bed, etc. The spool 23 will, of course, be made of such size that there can be wound thereon considerable footage of cable and the spool, therefore, may vary in size depending upon the size of the cable and the length of the cable.

The spool 23 is rotatably mounted on a shaft in the form of a bolt 28 extending axially through the spool. Also rotatably mounted on the bolt 28 are a pair of disks 29 and 30 each disposed opposite one of the flanges 25 of the spool 23. Each of the disks 29 and 30, moreover, has an apertured ear 31 for the attachment thereto of the harness 10. Preferably, for the reasons above stated, the harness is detachably connected to the disks 29 and 30 and, to that end, the main strap 15 has at each end a snap hook 32. Thus the harness is secured to the disks 29 and 30 and hence to the reel 11 by engagement of the snap hooks 32 with the ears 31, and thus an individual having made the descent by aid of the escape device can, upon reaching the ground, simply and quickly unsnap the hooks and leave the scene of the disaster without the loss of time that might otherwise be incurred in becoming disengaged from the harness. Non-rotatably secured as by riveting, gluing, or the like, to the outside surface of each of the end flanges 25 is a disk 33 of suitable friction material. Similarly secured to the inner surface of the disk 29 and the disk 30 are disks 34 of friction material.

As best seen in Figs. 2, 3 and 4, the left hand end of the bolt 28 is threaded and has threaded thereon a nut 35. This nut preferably is of the wing type and herein is provided with long slender diametrical extensions 36 to enable the nut to be readily adjusted manually. The nut is also provided with an inwardly extending annular boss 37 providing a guide or seat for a compression spring 38 interposed between the nut 35 and the disk 29.

At its opposite end, the bolt 28 has a cap 39 secured thereto as by means of a pin 40 extending diametrically through the cap and the bolt 28. Interposed between this cap and the disk 30 is a second compression spring 41. A pair of ears 42 extend axially from the cap and received between the ears and pivoted therein as by a pin 43 is one end of a lever 44. The lever has a straight portion 45 at its pivoted end which thus extends substantially at right angles to the bolt 28. It is also formed with a second straight portion 46 which extends generally parallel with the bolt 28 and forms a hand grip portion. A pair of links 47 are connected at one end one to

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each side of the lever 44 at the portion 45, again through the medium of a pin 48. At the remaining ends, the links 47 are pivotally connected one each to upstanding ears 49 formed integrally with the disk 30 on the outer surface thereof.

It will readily be apparent that the springs 38 and 41, being compression springs, will urge the friction disks 33 and 34 into engagement with one another with varying force, depending upon the adjustment of the nut 35 and the position of the lever 44. The disks 29 and 30, being non-rotatably held by the weight of the individual in the harness, will act as brakes tending to prevent rotation of the reel 11. What is more, it will be appreciated that the nut 35 may be utilized in a dual capacity, namely, that of pre-adjusting the weight that has to be placed on the reel before the same will rotate, and adjustment of the braking action during descent. The lever 44 is employed primarily as a control for governing the rate of descent. It will be noted, particularly from Fig. 3, that as the lever 44 is swung toward the individual making the descent the spring 41 is compressed and thus the pressure on the frictional disks is reduced with consequent reduced resistance to rotation of the spool 23. Should the individual using the device release the lever 44, the spring 41 will automatically restore the lever 44 to its normal position, shown in Fig. 3, and will also restore the full braking action for which the device was initially adjusted so as to prevent uncontrolled descent under those circumstances.

Preferably a lock nut 50 is provided at the threaded end of the bolt 28 to prevent the control nut 35 from being backed off and thereby reduce the braking action below a certain desired minimum. Completing the device is a cable guide 51 secured at one end to the disk 29 and extending longitudinally of the reel. The guide 51 has a slot 52 formed therein extending longitudinally thereof and through which the cable 12 is preferably threaded. The guide 51 eliminates the tendency of the entire unit to revolve, especially when the reel is held against rotation, and thus serves a very important function.

The operation of the device is believed readily understandable from the foregoing description. Suffice it to say, therefore, that in the event of a fire in a hotel in which the device above described is available for use either because furnished as standard equipment of the hotel or brought in by the occupant of the room, the occupant would first secure the free end of the cable to some object within the room. As previously pointed out, this might be a suitable eye located near a window and into which the hook 27 might be snapped. If such an eye is not provided, the occupant of the room can loop the free end of the cable once or twice about a pipe leading to a radiator or about the frame of the bed and then snap the hook 27 back over the cable. Next the occupant puts on the harness 10, opens the window and climbs out feet first and on his stomach, holding onto the window sill with his hands until he has lowered himself so that his entire body is outside of the window. At this stage, the device should be supporting the individual with the cable taut and the individual now ready to make his descent.

The individual now releases his left hand from the window sill and grasps the wing nut 35. He next releases his right hand from the window sill and grasps the lever 44 at the portion 46.

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He next pulls the lever 44 toward him gradually, thereby permitting rotation of the reel to unwind the cable and hence his descent. Depending upon the extent to which the individual actuates the lever 44, the descent may be made gradually or more rapidly, but is at all times under the absolute control of the individual. Should, by chance, the weight of the individual be so small as not to cause rotation of the reel even when the lever 44 is actuated to the limit of its movement, further reduction in braking action can be obtained by adjustment of the nut 35. As stated above, preferably means is provided limiting the extent to which the nut 35 may be backed off so that it is never possible to have the reel run absolutely free but a certain minimum braking action is provided even when the nut 35 is backed off to its limit and the lever 44 is actuated to its limit of brake releasing position.

It is believed that I have perfected an escape device which primarily and foremost will permit of the safe descent of an individual from above ground level floors of a building in the event of the necessity of emergency exit. The device can be adjusted to carry any weight from that of a small child to that of a large adult. Moreover, the device is so simple in operation that any member of the public, including comparatively young children, could successfully manipulate the same.

I claim as my invention:

1. A device for making an emergency descent from a building comprising, in combination, a harness to be worn by the person making the descent, a cable having an end adapted to be secured at the point of origin of the descent, a reel upon which the cable is wound, means for rotatably supporting said reel comprising a pair of disk-like elements adapted to be attached to said harness and a bolt extending through both said elements and through said reel with said reel rotatable on said bolt and at least one of said elements movable axially of said bolt, friction material interposed between each end of said reel and the adjacent disk-like element, a compression spring encircling a portion of said bolt projecting outwardly beyond one of said disk-like elements and bearing at one end against the adjacent one of said disk-like elements, and a nut threaded on the projecting end of said bolt forming an abutment for the remaining end of said spring, said nut being formed with hand-engaging surfaces to facilitate manual adjustment of said nut to vary the frictional braking effect on the rotation of said reel.

2. A device for making an emergency descent from a building comprising, in combination, a harness to be worn by the person making the descent, a cable having an end adapted to be secured at the point of origin of the descent, a reel upon which the cable is wound, means for rotatably supporting said reel comprising a pair of disk-like elements adapted to be attached to said harness and a bolt extending through both said elements and through said reel with said reel rotatable on said bolt and at least one of said elements movable axially of said bolt, friction material interposed between each end of said reel and the adjacent disk-like element, a compression spring encircling a portion of said bolt projecting outwardly beyond one of said disk-like elements and bearing at one end against the adjacent one of said disk-like elements, a cap secured on the projecting end of said bolt to form an abutment for the remaining end of said spring,

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a lever pivotally mounted on said cap, and a pair of links pivotally connected at one of their ends to said lever and at the other of their ends to the adjacent disk-like element whereby pivoting of the lever alters the braking effect on said reel.

3. A device for making an emergency descent from a building comprising, in combination, a harness to be worn by the person making the descent, a cable having an end adapted to be secured at the point of origin of the descent, a reel upon which the cable is wound, means for rotatably supporting said reel comprising a pair of disk-like elements adapted to be attached to said harness and a bolt extending through both said elements and through said reel with said reel rotatable on said bolt and each of said disk-like elements and said reel being movable axially of said bolt, friction material interposed between each end of said reel and the adjacent one of said disk-like elements, means at one end of said reel for adjusting the device normally to support a predetermined weight suspended in said harness, and means at the other end of said reel including a lever operable to reduce the braking effect on said reel.

4. A device for making an emergency descent from a building comprising, in combination, a harness to be worn by the person making the descent, a cable having an end adapted to be secured at the point of origin of the descent, a reel upon which the cable is wound, means for rotatably supporting said reel comprising a pair of disk-like elements adapted to be attached to said harness and a bolt extending through both said elements and through said reel with said reel rotatable on said bolt and each of said disk-like elements and said reel being movable axially of said bolt, friction material interposed between each end of said reel and the adjacent one of said disk-like elements, means at one end of said reel for adjusting the device normally to support a predetermined weight suspended in said harness, including a compression spring bearing at one end against one of said disk-like elements and a nut threaded on the same end of said shaft and forming a limiting abutment for the other end of said spring, and means at the other end of said reel for controlling the braking effect on said reel during descent to govern the rate of descent comprising a cap fixed on said bolt, a compression spring interposed between said cap and the adjacent one of said disk-like elements, and a lever operable to relieve to varying extents, depending upon the extent of movement of said lever, the force exerted by said last named spring to restrict the rate of rotation of said reel.

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