United States Patent [19]

Huntley

3,880,255

[45] **Apr. 29, 1975**

[54] **EMERGENCY FIRE ESCAPE MECHANISM**

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[22] Filed: **Apr. 4, 1974**

[21] Appl. No.: **458,011**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 316,750, Dec. 20, 1972.

[52] **U.S. Cl.** **182/5**
[51] **Int. Cl.** **A62b 1/08**
[58] **Field of Search** 182/5, 6, 7, 70, 71, 72, 182/73, 74, 75; 254/151, 154, 157

[56] **References Cited**

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1,490,524	4/1924	Wood	182/7
2,558,122	6/1951	Barry	182/5
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Primary Examiner—Reinaldo P. Machado

[57] **ABSTRACT**

A portable, self-contained emergency fire-escape mechanism is provided for use in escaping from fires or other emergencies occuring in hotels, apartments, or office buildings and the like. The mechanism includes an anchoring means which may be mounted by the user on a window sill or the like and which is constructed so that it may be readily positioned by the user on the exterior of the structure. The anchoring means is connected with a lowering assembly having one end of a flexible cable connected thereto. The cable is contained in a canister and is disposed therein in a manner to be readily payable out therefrom. The canister is provided with harness which is arranged so as to engage and hold the body of a person escaping from the building. The lowering assembly is constructed to controllably pay out the cable from the canister.

5 Claims, 11 Drawing Figures

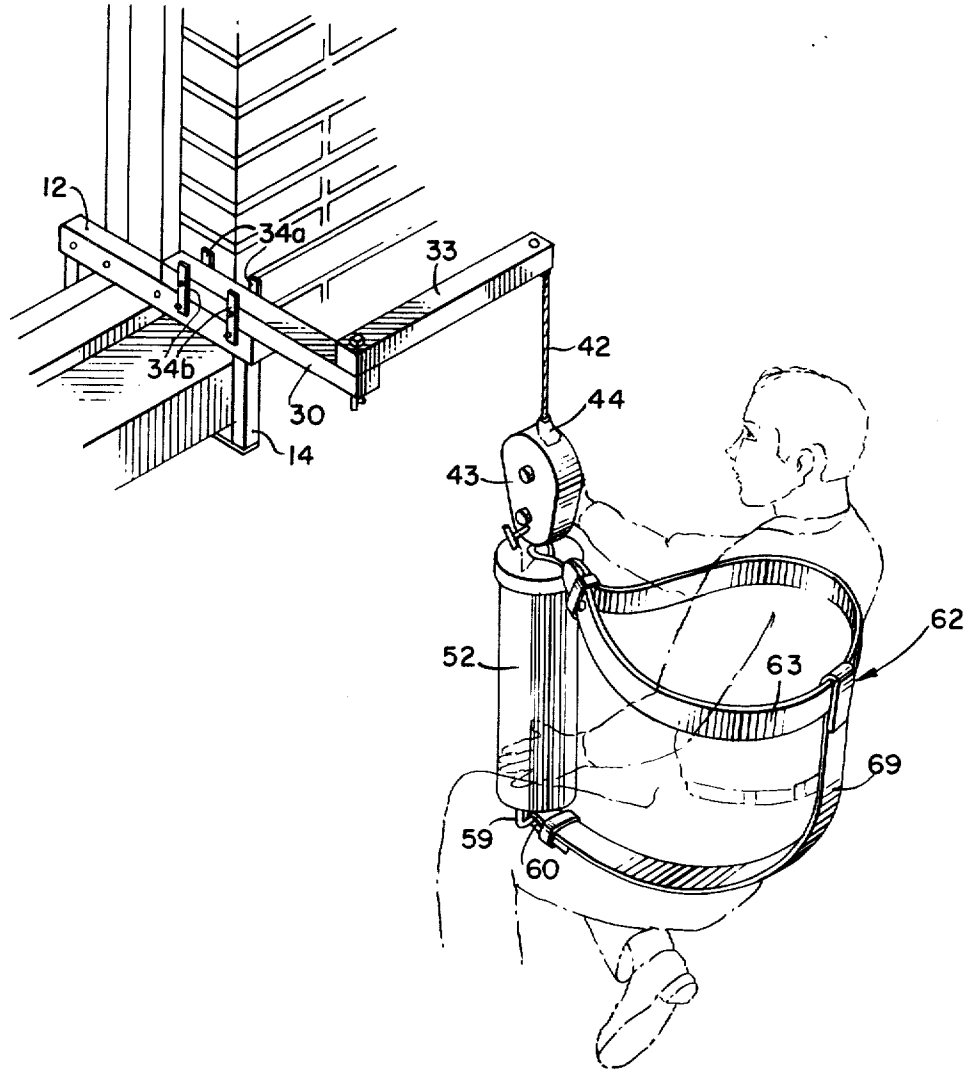


FIG. 1.

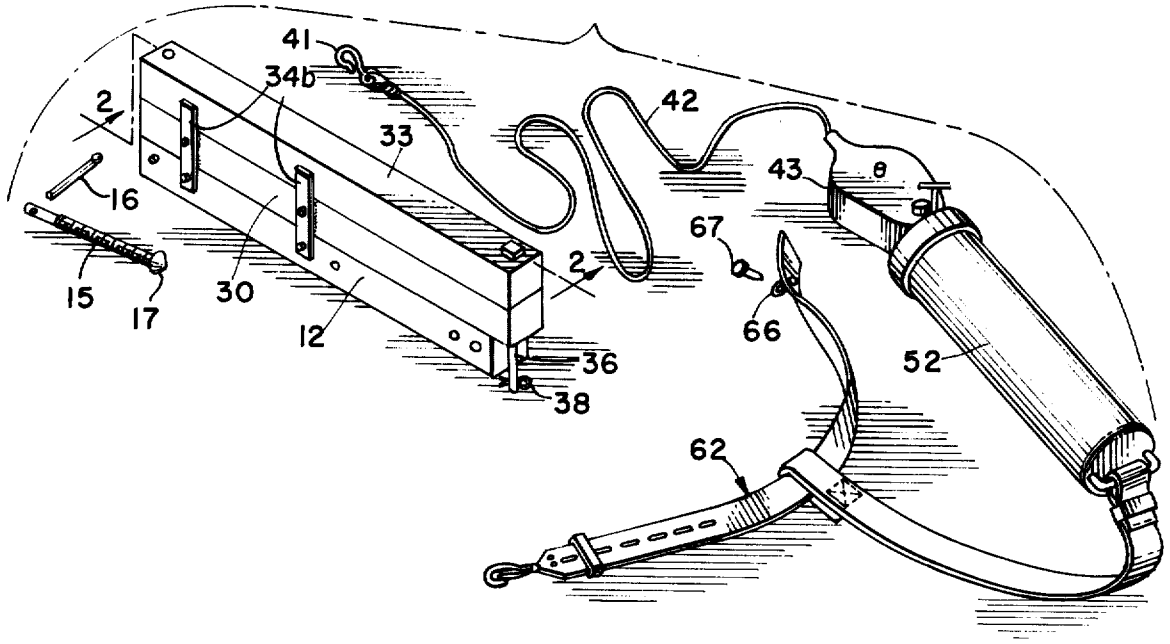


FIG. 2.

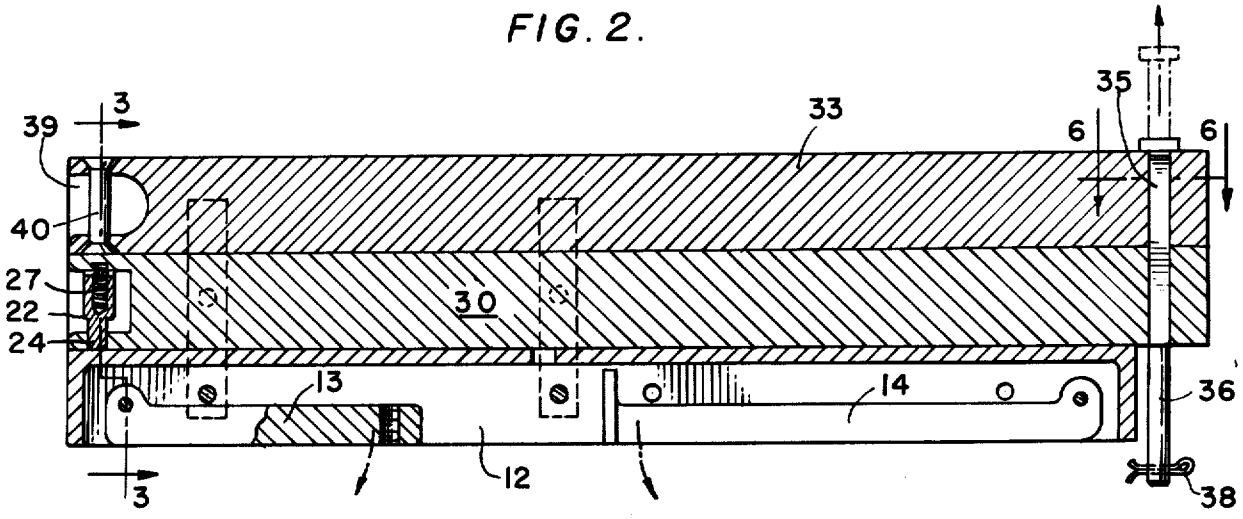


FIG. 3.

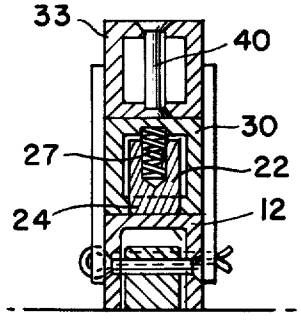


FIG. 4.

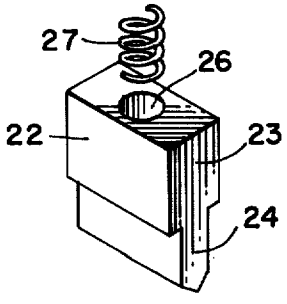


FIG. 5.

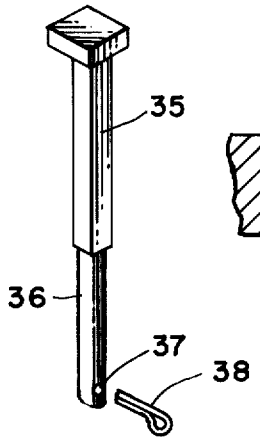
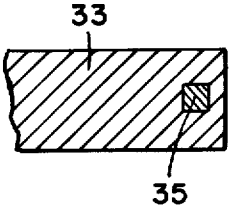


FIG. 6.



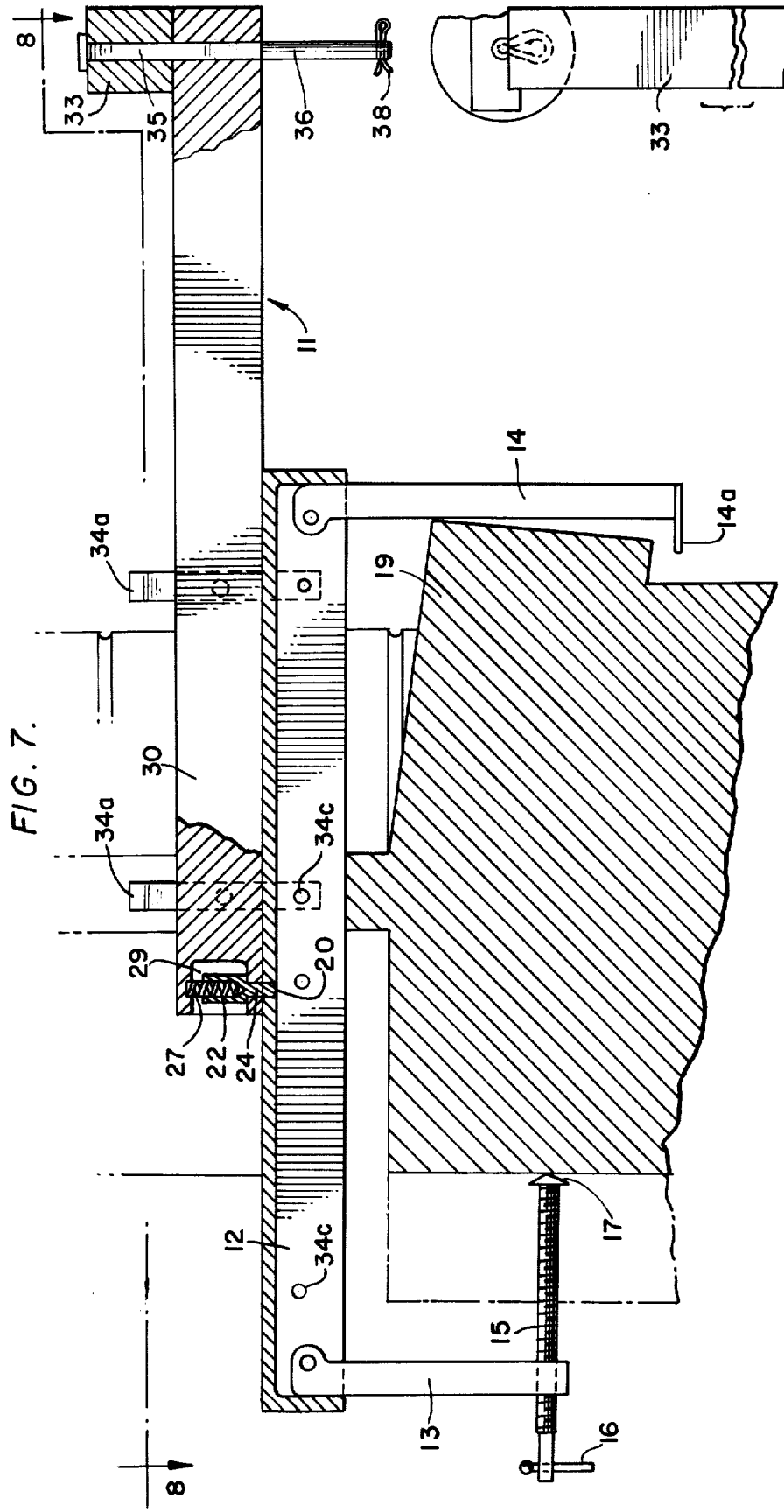

8
33
35
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11
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14a
34a
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FIG. 7.

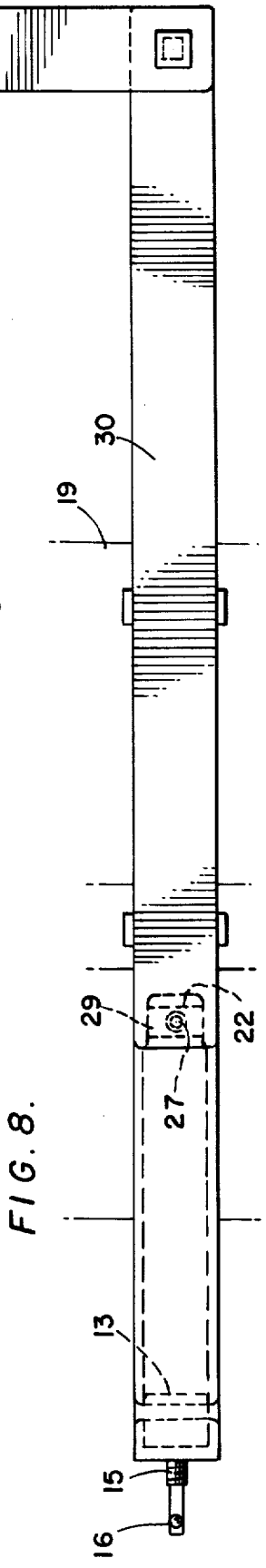

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FIG. 8.

FIG. 9.

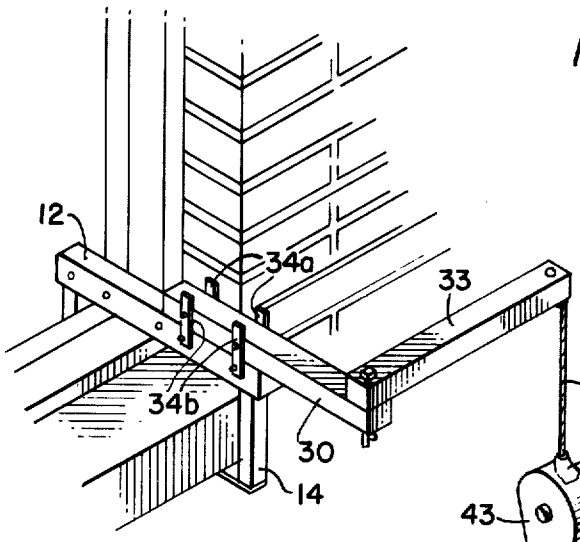
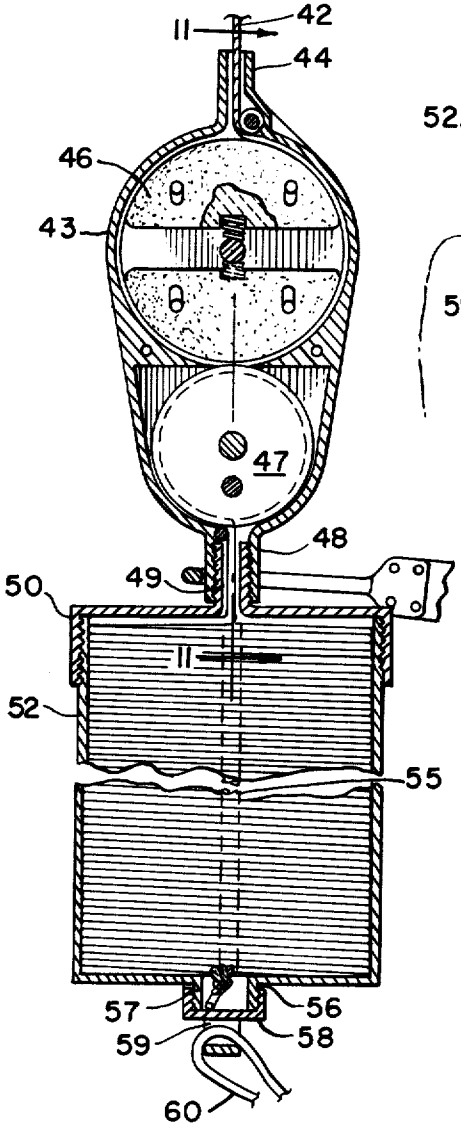


FIG. 10.



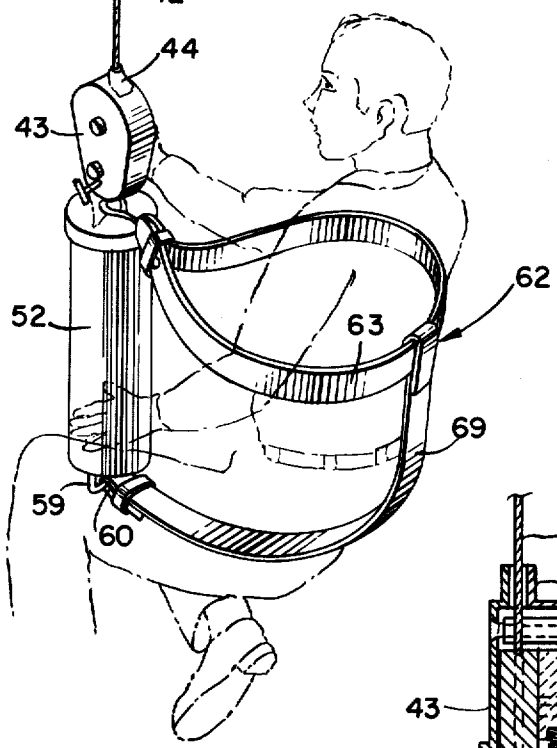
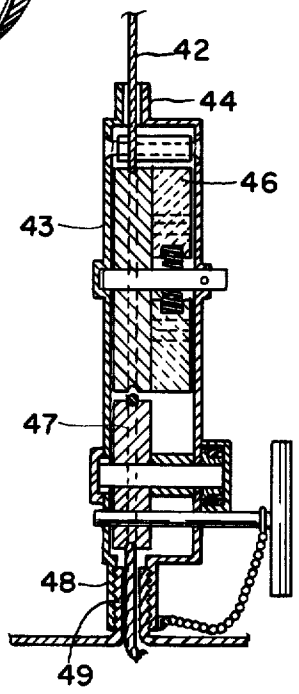


FIG. 11.



EMERGENCY FIRE ESCAPE MECHANISM

This application is a continuation-in-part of my prior application, Ser. No. 316,750, filed Dec. 20, 1972.

This invention relates to a portable, completely self-contained fire-escape mechanism. More particularly, it relates to an emergency type of escape mechanism for use in hotels, motels, apartment buildings, office buildings, and other more or less tall structures where suitable devices are not permanently installed or not otherwise generally provided.

Although some buildings in certain localities are required by the applicable building codes to be of fireproof construction, many other buildings are not thus constructed, either because they are not located in such code-regulated areas or because they were constructed prior to enactment of such codes. Whether for any of the foregoing reasons, or because of the inflammable nature of the furniture or other contents thereof, substantially hazardous conditions are present in the event of a fire arising in, or gaining access to the interior of such buildings.

In the absence of any suitable, readily available means for people to escape from a fire occurring in such a structure, disastrous consequences frequently occur.

A particularly disastrous such tragedy occurred in the earlier part of the current calendar year at Sao Paulo, Brazil, when fire swept through the upper floors of a twenty-two story office building. That tragedy was reported to have resulted in the deaths of more than one hundred persons, many of whom were killed when they jumped out of windows of upper floors of the building.

An object of the present invention is to provide a simple, completely self-contained, compact and reliable mechanism for use as an emergency escape mechanism in the event of fire in such a building structure.

It is a more specific object of the present invention to provide a compact mechanism or unit which will provide an escape mechanism of the aforesaid character.

It is another object of the invention to provide a mechanism of the character herein set forth, consisting of an anchoring means constructed to permit the same to be mounted on a window sill or balcony of a building structure and to be rapidly positioned when required for use, on the exterior of an outer vertical face of a building structure. In accordance with the invention, the anchoring means is coupled with a lowering assembly connected to one end of a flexible cable housed within and payable out from a storage canister provided with a harness adapted to hold and fasten the body of a person thereto. In accordance with a further feature of the invention, the lowering assembly is capable of controllably paying out the cable from the canister so that the person utilizing the same in an emergency may lower himself or herself at a controllable rate of descent.

Still another object of the invention is to provide a device of the character indicated, wherein the canister may serve for storing a required or desirable length of cable to enable a person to make a safe descent from buildings of standard construction.

Another object of the invention is to provide an emergency escape mechanism of the character set forth, so constructed that it may be conveniently stored

in a minimum of space and in such a manner that its use for any other purpose will be discouraged.

Still another object of the present invention is to provide such a device as above set forth, which is of simple construction, which is easy to operate and which is of such compact character that it may be carried in a person's luggage.

Other objects and advantages of the invention will be evident or pointed out in detail hereinafter, in connection with the accompanying drawings, wherein there is shown by way of illustration and not of limitation, a preferred embodiment of the invention.

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 by or to the specific construction shown herein. On the contrary, it is intended to cover all modifications and alternative constructions falling within the scope of the invention as defined in the appended claims.

In the accompanying drawings:

FIG. **1** is a dissembled view, in perspective, of the components of the escape apparatus;

FIG. **2** is a vertical longitudinal section taken on line **2—2** of FIG. **1**;

FIG. **3** is a vertical transverse section on line **3—3** of FIG. **2**;

FIG. **4** is a perspective view of one of the parts of the mechanism;

FIG. **5** is a perspective view of one of the other parts thereof;

FIG. **6** is a detail view, in section, on line **6—6** of FIG. **2**;

FIG. **7** is an enlarged sectional view, in a vertical plane, of anchoring means for the device attached to a window sill;

FIG. **8** is a top plan view of the structure of FIG. **7**, taken substantially along line **8—8** of FIG. **7**;

FIG. **9** is a perspective view of the escape apparatus, showing the same in use, substantially at the beginning of a descent by the user;

FIG. **10** is a view in vertical section, taken through the friction lowering means and the canister containing the cable; and

FIG. **11** is a view in cross-section, taken along line **11—11** of FIG. **10**.

Several portable fire-escape mechanisms are known in the prior art. These mechanisms typically embody a means for installing a device in a window-frame, and are provided with ropes passing over rollers or pulleys to allow persons attached to the ropes to descend from the window. Illustrative of such prior art devices are those shown in the following patents:

Bishop et al	119,008	September 19, 1871
Tixier	187,569	February 20, 1877
Wood	1,490,524	April 15, 1924
Barry	2,558,122	June 26, 1951

The most recent of the foregoing patents, namely, Barry, U.S. Pat. No. 2,558,122, discloses a fire-escape mechanism which utilizes an escape cable wound around a brake drum secured to a shaft rotatable in a support. The cable is wound in coils extending longitudinally adjacent one another along the axially extending shaft on which the brake drum is mounted, the arrangement including an enlargement on the cable to

serve as a coupling with a pick-up cable having its opposite end connected to a threaded sleeve having an auxiliary brake drum mounted thereon. The escape cable in the Barry device is wound around the rotatable shaft, the latter being positioned with its axis extending horizontally, and with a pick-up cable wound around the auxiliary brake drum. The Barry device requires the presence of a boom pivotally mounted in lugs carried by a plate fixed to the side of the building or to the window casing. The presence of these mounting plates adjacent each window opening necessarily defaces the outer wall of the building.

As will be evident from the detailed description which follows, the fire-escape mechanism of the present invention, in contrast with those disclosed by the prior art as typified by the patents above-listed, is characterized by its simplicity of construction, ease of manipulation and operation in use.

Referring now more in detail to the drawing, the device of the present invention comprises essentially a slidably extendable anchoring bar capable of being mounted on a window sill or balcony of a building structure, and which is provided with means permitting the same to be pivoted over a portion of its length, through an arc of 90° to 270°. The pivoted portion of the anchoring bar has coupled thereto a lowering assembly which carries one end of a flexible cable. The cable is contained within a storage canister and is payable out of the canister and provided with a harness designed to hold and fasten the body of a person. The lowering assembly is capable of controllably paying out the cable from the canister so as to enable a person to lower himself from the anchoring bar at a controllable rate of descent.

The canister is designed to be held conveniently within the grasp of a person held by the harness while descending from a window located at an above-ground level.

The anchoring member of the apparatus is indicated generally by the numeral **11.** As shown in enlarged detail in FIG. **7,** the anchoring member may comprise a channel-like base member **12** of inverted U-shape transverse cross-section, supporting a superposed bar **30** slidable longitudinally with relation thereto. The channel member **12** has, on the interior thereof, pivoted bars **13, 14** at its opposite ends. The bar **13** has at its free lower end, a threaded opening for the reception of a threaded bolt **15,** and the bar **14** is formed at its free end with a flange **14a** whereby the bar **14** may be engaged with a window sill **19,** so that when the screw-threaded bolt **15** is tightened as by means of a grip **16** to bring its head **17** into firm engagement with a vertical portion on the interior of the window sill **19,** the anchoring member **11** will be firmly anchored to the window sill.

Approximately midway along the lengthwise dimension of the attaching bar **12,** the same is provided in the bridging portion of the U-shape cross-section, with a suitable opening **20** for the reception of a cooperating latching means **22,** shown in more detail in FIG. **4.** The latching means **22** may comprise an upper portion **23** having a relatively narrow lower end **24** extending therefrom, and being provided in the portion **23** with a centrally located cylindrical opening **26** for retaining a coil spring **27,** the lower end of which bears against the lower end of the opening **26.** The latch is disposed within a suitable recess **29** formed at the inner end of the bar **30** and the latter is arranged to be slidable along the horizontal surface of the channel **12.** The upper end of the coil **27** may bear against the downwardly facing horizontal surface of the recess **29.** Thus, when the slidable bar **30** is extended outwardly to a position at which the portion **24** of the latching member **22** is in vertical alignment with the opening **20** in the support bar **12,** the member **30** will be firmly retained in position relative to the supporting member **12.**

The slidable bar **30** is guided in its longitudinal movement relative to the channel member **12** by means of a pair of spaced vertical, relatively rigid, strips **34a** having spring-pressed pins at the lower ends thereof movable into corresponding openings in one side of the channel. There is a similar pair of strips **34b** having similar spring-pressed pins at the lower ends thereof, movable into corresponding openings in the opposite side of the channel. In the collapsed or unextended position of the bar **30** (see FIG. **2**) relative to the channel support **12,** the spring-pressed pins will be engaged with openings **34c** in the side of the channel, and when the bar **30** is in its extended position (see FIG. **7**) the spring-pressed pins will be engaged with openings **34d** on that side of the channel. The same positioning of the spring-pressed pins at the lower ends of the strips **34b** applies with respect to the openings formed in the other side of the channel support member **12.**

A third element of the anchoring means **11** comprises the bar **33** pivoted to the outer end of the extendable intermediate bar **30.** As best shown in FIGS. **2, 7** and **8,** this pivoting may be conveniently achieved by means of a pivot pin **35** extending through vertical opening passing through the corresponding end of the bar **33** and an aligned vertical opening at the outer end of the intermediate bar **30.** Pin **35** has a shank which for the greater part of its length is of square cross-section and which terminates at its lower end in a portion **36** preferably of circular cross-section, having a diameter the same as the length of a side of the square portion of the shank. The lower portion **36** is provided adjacent its lower end with a transversely extending opening **37,** for the reception of a cotter pin **38** or the like to prevent bar **33** from being raised to completely separate bars **30** and **33.**

However, when the bar **33** is raised sufficiently so as to bring circular portion **36** of the shank within the opening bar **30,** the bar **33** may then be pivoted through an arc of 90° to 270° on the exterior of the outer face of the window for receiving a snaphook **41** attached to the upper end of the lowering cable hereinafter referred to.

The cable **42** extends into a casing **43** through a passageway **44** extending axially at the upper end of the casing, and is carried, interiorly of the casing, around the periphery of an upper pulley **46** and then around a lower pulley **47,** preferably of somewhat smaller diameter than that of the pulley **46.** From the casing **43,** the cable is carried through an axially disposed passageway **48** at the lower end of the casing. The interior surface of the passageway **48** is preferably screw-threaded, for cooperation with the screw-threaded outer surface of a stem portion **49** formed centrally of the upper surface of a closure member **50** for the upper end of a canister **52.**

Within the canister, there may be stored a desired length of flexible cable **42.** The cable is formed of wire

or rope of adequate tensile strength to sustain the weight of a heavy person likely to use the device.

The cable may be of a length of from, say, 20 feet to several hundred or more feet, to enable the device to be sufficient for the emergency escape of a person from either a lower floor of a building or from a higher elevation, such as in the case of a so-called high-rise building, including even those of so-called sky scraper height, such as are prevelant in large cities in various geographical locations.

The cable is preferably wrapped or otherwise arranged in the canister, suitably in the form of a coil around a spindle **55**, of, say, one-quarter inch in diameter.

As best shown in FIG. **10**, the spindle extends axially of the canister, in alignment with an externally threaded stem **57**. The stem receives a threaded cap **58** provided on its exterior with bail **59** for receiving a hook or buckle **60** at one end of a strap member **61** having a similar connection **62** with a body-encircling strap or the like **63** adapted to serve as a harness for securely holding the body of a person when the latter is properly positioned therein for descent from a building from which the person is to escape in the event of a fire or other emergency.

The strap portion **69** of the harness extends downwardly from the body-encircling portion **63** along the lower back region and through the crotch of the person, for connection at the loop or hook **60**, to the bail **59** at the lower end of the canister.

The manner of use and operation of the mechanism of the invention will be apparent from the foregoing description. However, it may be pointed out that when a person is occupying a room or balcony of a building, and an emergency arises therein requiring his escape therefrom, the person may readily clamp the anchoring member **11** to the sill of a window or the like, by clamping arm **12**, tightening the clamping screw **15** to the vertical face of the sill, and thereupon sliding the bar **30** outwardly until the outer portion thereof extends, say, approximately 14 or 15 inches beyond the exterior face of the building. Thereupon, the pivoted arm **33** may be rotated in a horizontal plane to the right or left (as circumstances of construction may dictate) to clear the vertical guide strips **34***a*, **34***b*.

When the extendable bar **30** is at is outermost position, the spring-pressed pins in vertical guide strips are in position at which the openings **34***c* in the vertical legs of the channel bar become aligned therewith. This permits the locking together again of the support bar **12** and the extendable arm **30**. To the foregoing end, the pivoted pin **35** may now be raised from its locking position until the lower end portion **36** of round cross-section permits rotation of the bar **33**, followed by return of the pivot pin **35** to its non-rotatable or locking position.

The escapee may then readily enter the harness and fasten himself therein and make certain that all components of the mechanism are positioned to preclude their entaglement during the descending process.

The escapee may now lower himself, stabilizing his bodily position during the descent. The metal snap hook **41** at the upper end of cable **42** may be rapidly engaged with the rivet pin **40** disposed at the outer free end of the bar **33**.

After stabilizing himself in position beneath pivoted arm **33**, the escapee may remove a cotter safety pin from the pulley **47** of the lowering assembly, thus activating the speed control mechanism and enabling the pulleys **46**, **47** to lower the escapee to the ground.

The upper pulley **46** has two brakes, preferably of asbestos or other suitable non-heat conducting material. When the rotational speed of the pulley **46** exceeds a predetermined maximum, the braking force becomes sufficient to decrease the rate of descent. When the speed is less than the predetermined minimum, the rotation of speed of the pulley is allowed to increase. This spring-mass braking system accordingly acts as a governor to control the rate of the escapee's descent.

After the first escapee has descended to ground level, the mechanism may be used by other persons having a cable and canister with a lowering assembly for attachment to the anchoring member **11**.

What is claimed is:

1. A portable, self-contained fire-escape mechanism, said mechanism comprising an anchoring bar capable of being mounted on a window sill or balcony of a building structure, a longitudinally slidably extendable bar mounted on said anchoring bar, a bar having means at one end thereof permitting the same to be pivoted to said extendable through an arc of 90° to 270° on the exterior of an outer vertical face of said building structure, said pivoted bar having coupled thereto a lowering assembly carrying one end of a flexible cable contained within and payable out from a storage canister, said canister being provided with harness adapted to hold and fasten the body of a person thereto, said lowering assembly being capable of controllably paying out said cable from said canister, whereby said body will be lowered from said anchoring bar at a controllable rate of descent.

2. The fire-escape mechanism defined in claim **1**, wherein said lowering assembly comprises a friction-type pulley.

3. The fire-escape mechanism defined in claim **1**, wherein said canister is dimensioned such that it has a volumetric capacity adequate to hold a cable of a length of at least about 20 feet.

4. The fire-escape mechanism defined in claim **3**, wherein said canister is dimensioned to accommodate a cable of a length of from about 20 feet to a length of the order of several hundred feet.

5. The fire-escape mechanism defined in claim **3**, wherein the length of said cable is from about 100 feet to the order of 1,000 feet.

* * * * *