June 9, 1925.

1,541,590

C. F. RYBA

FIRE ESCAPE

Filed May 10, 1924

Fig. 1.

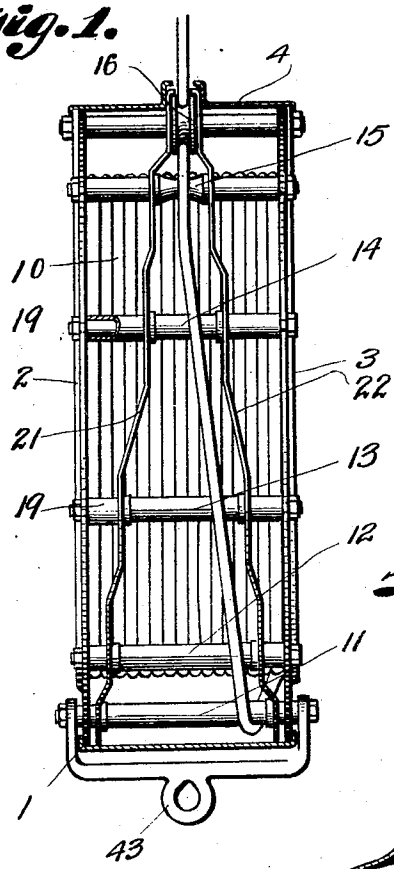


Fig. 2.

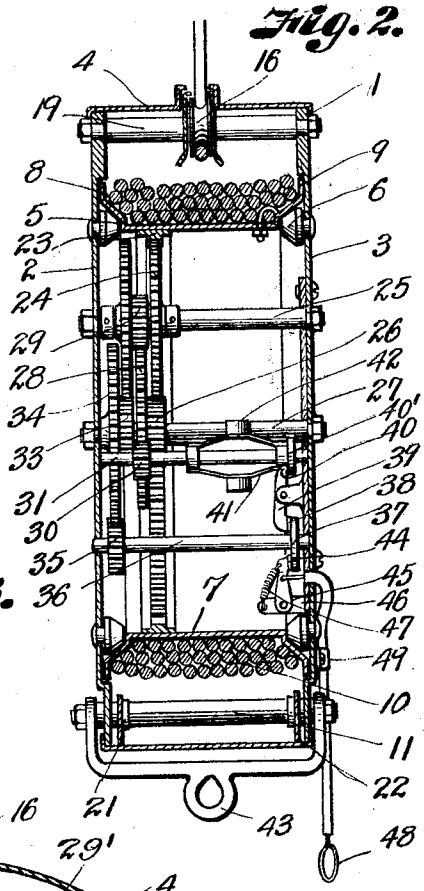


Fig. 3.

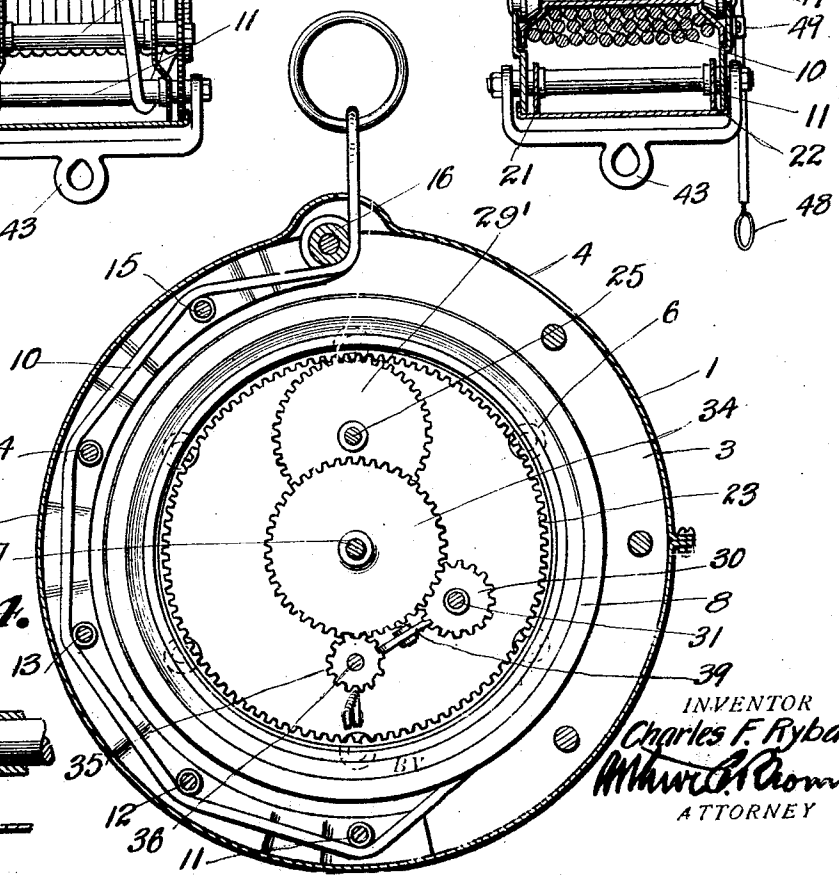
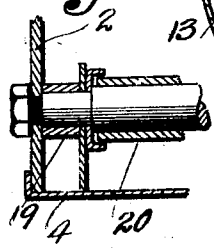


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES F. RYBA, OF BEARDSLEY, KANSAS, ASSIGNOR OF ONE-THIRD TO FRANK RYBA AND ONE-THIRD TO ENOCH RYBA, BOTH OF BEARDSLEY, KANSAS.

FIRE ESCAPE.

Application filed May 10, 1924. Serial No. 712,339.

To all whom it may concern:

Be it known that I, CHARLES F. RYBA, a citizen of the United States, residing at Beardsley, in the county of Rawlins and State of Kansas, have invented certain new and useful Improvements in Fire Escapes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to fire escapes and the primary object thereof is to provide a fire escape which will permit a person to be lowered from any height within the length of a cable forming a part of the fire escape and at a uniform speed irrespective of the weight of the person. In other words, the invention contemplates a reel upon which a cable is wound and a governor, actuated through a train of multiplying gears, the governor being effective in applying a brake when its speed reaches the number of revolutions for which it has been set. The speed of the governor controls the brake uniformly, irrespective of the weight or pull on the cable and I have also provided a hand operated brake by means of which the fire escape can be stopped while it is being lowered or retarded independently of the automatic governor actuated brake.

The novel construction of the invention will be specifically referred to hereinafter, reference being had to the accompanying drawings, in which—

Fig. 1 is an edge view of a fire escape constructed in accordance with my invention.

Fig. 2 is a vertical cross sectional view through the casing, showing the gears, operating shafts, the governor and the brakes in elevation.

Fig. 3 is a vertical sectional view at right angles to the sectional view shown in Fig. 2, and

Fig. 4 is a detailed sectional view showing the bearing for an idle roller and part of the roller over which the cable passes while it is being unwound.

The casing 1 is in the form of a cylinder having end walls 2 and 3 and circular wall 4 connecting them. The end plates 2 and 3 are provided with circular series of rollers, one set for plate 2 being designated 5 and the other set for plate 3 being designated 6. Within the casing 1 is a cable drum 7 having out turned flanges 8 and 9 which ride on the rollers 5 and 6, the drum carrying a cable 10 which may unwind therefrom and pass over a plurality of idler rollers 11, 12, 13, and 14, and over the pulleys 15 and 16. The pulleys 15 and 16 are on shafts 17 and 18. The rollers as well as the shafts are mounted in the end walls of the casing. The rollers are provided with spacing sleeves 19 and additional sleeves 20 as shown in Fig. 4. The spacing levers 19 space the guide members 21 and 22 proper distances apart, the guide members 21 and 22 being constructed so that they will progressively step by step be closed together from the bottom of the fire escape casing, to the top so as to guide the cable 10 and insure its remaining upon the centrally located pulley 16.

The spool or drum 7 has an internal ring gear 23 which meshes with a gear 24 loose on shaft 25 mounted in the end plates 2 and 3. The gear 24 drives a pinion 26 loose on shaft 27. Attached to the pinion 26 is a gear 28 meshing with pinion 29 loose on shaft 25. Fixed to pinion 29 is a gear 29′ meshing with pinion 33 loose on shaft 27. The pinion 33 carries a gear 34 meshing with pinion 35 fixed to brake shaft 36. The gear 28 also drives pinion 30 fixed on governor shaft 31. The shaft 36 mounted in the end plates 2 and 3 carries a friction braking disk 37 adapted to be engaged by the friction face 38 of a pivoted brake shoe 39 having a toe 40 engaged by the disk 40′ on the end of the centrifugal governor 41. Therefore as the drum 7 rotates in its unwinding movement, the governor weights 42 will tend to fly out after the manner of the well known centrifugal governor used as a speed responsive device in all sorts of mechanism.

When the governor weights 42 fly out, the collar 40′ will act on the toe 40 of the pivoted brake shoe 39 and cause the other end of the brake shoe to bind or frictionally engage against the disk 37, thereby loading the shaft 36 and since the shaft is driven by a multiplying gearing, that is at a greater ratio than the speed of the drum 7,

it will be obvious that a slight pressure against the disk 37 will so load the shaft that the weight of the person on the cable 10 will be insufficient to allow the casing and drum to be lowered at a very rapid rate.

When the brake shoe is applied to the disk the speed of the gearing will be reduced, then the governor weights 42 will move in toward the axis of the shaft 31 releasing the brake shoe and permitting the drum to unwind but as soon as the speed increases, the brake shoe will again be applied. It is understood of course that the load is suspended from the casing through some suitable means as for example a sling 43.

If the passenger or passengers suspended from the sling 43 desire to stop the descent of the fire escape, this can be accomplished by means of the hand operated brake consisting of a brake shoe 44 pivoted at 45 to the bracket 46 and normally urged away from the disk 37 by a spring 47, the brake shoe 44 however being applied by the flexible cable 48 in guide tube 49 and connected to the brake shoe 44. The cable 48 will be within convenient reach of the occupant or occupants suspended from the sling 43.

It is to be here noted that the device employing an unwinding drum does not employ a spring or springs for winding the cable. The cable is first wound upon the drum by hand, therefore the unwinding movement of the cable does not depend upon any spring tension but upon a multiplying train of gears, one gear being mounted upon a shaft with which is associated a governor actuator braking mechanism directly responsive to the speed of the train of gears and so arranged that the braking mechanism will prevent the speed of the gears exceeding a determined value, the governor being responsive to the speed rather than the power or load, consequently the cable cannot unwind faster than a given amount no matter what the weight may be so the unwinding movement and consequently the descent of the fire escape will be uniform at all times.

The free end of the cable 10 can be fastened to any suitable anchor in the building by any suitable means, so I have deemed it unnecessary to specifically show how the free end of the cable will be fastened to its anchorage.

It will be apparent that the spool or drum may freely rotate since it is supported upon the rollers 5 and 6 carried by the end plates of the casing, but the free rotation can only continue up to a certain speed. Beyond that speed the automatic brake will come into play actuated by the speed responsive device or governor.

In view of the fact that the cable is first wound upon the drum by hand, before it is inserted in the case, it will be apparent that the mechanism need employ no winding device. It is not intended that the drum be rewound while in the case. Indeed it is the purpose of this invention to so construct it so that when the cable is first paid out it must be removed and a new cable wound upon the drum. The rewinding will be done outside while the drum is removed from the case. The object of so constructing the mechanism is that once the cable has passed through a fire it is liable to become so deteriorated as to make it unsafe for subsequent use so if the device is so constructed that the drum must be taken out and a new cable wound upon it, liability of repeatedly used cables being used will be reduced to a minimum.

What I claim and desire to secure by Letters Patent is:

1. In a fire escape, a casing, a rotatable drum mounted in the casing, a gear carried by the drum, a train of gears driven by the first named gear, a shaft receiving its motion from the train of gears, a governor on the shaft, a second shaft driven by the fastest moving gear in the train and a brake disk on the last named shaft, and a shoe actuated by the governer to frictionally engage the disk.

2. In a fire escape, a casing having end walls, a circular series of rollers mounted in each end wall, a drum between the end walls supported by the rollers, an internal gear carried by the drum, a train of gears driven by the internal gears, a shaft driven by the train of gears, a governor on the shaft, a brake disk on a shaft controlled by the fastest moving gear and a brake member controlled by the governor to co-operate with the brake disk in slowing up the gears to retard the rotation of the drum.

3. A fire escape comprising a casing, a rotatable drum in the casing, a train of gears driven by the drum having a fast moving shaft, a brake disk on the fast moving shaft, another shaft driven by the train of gears, a governor on the last mentioned shaft and means controlled by the governor for frictionally engaging the brake disk.

In testimony whereof I affix my signature.

CHARLES F. RYBA