

(No Model.)

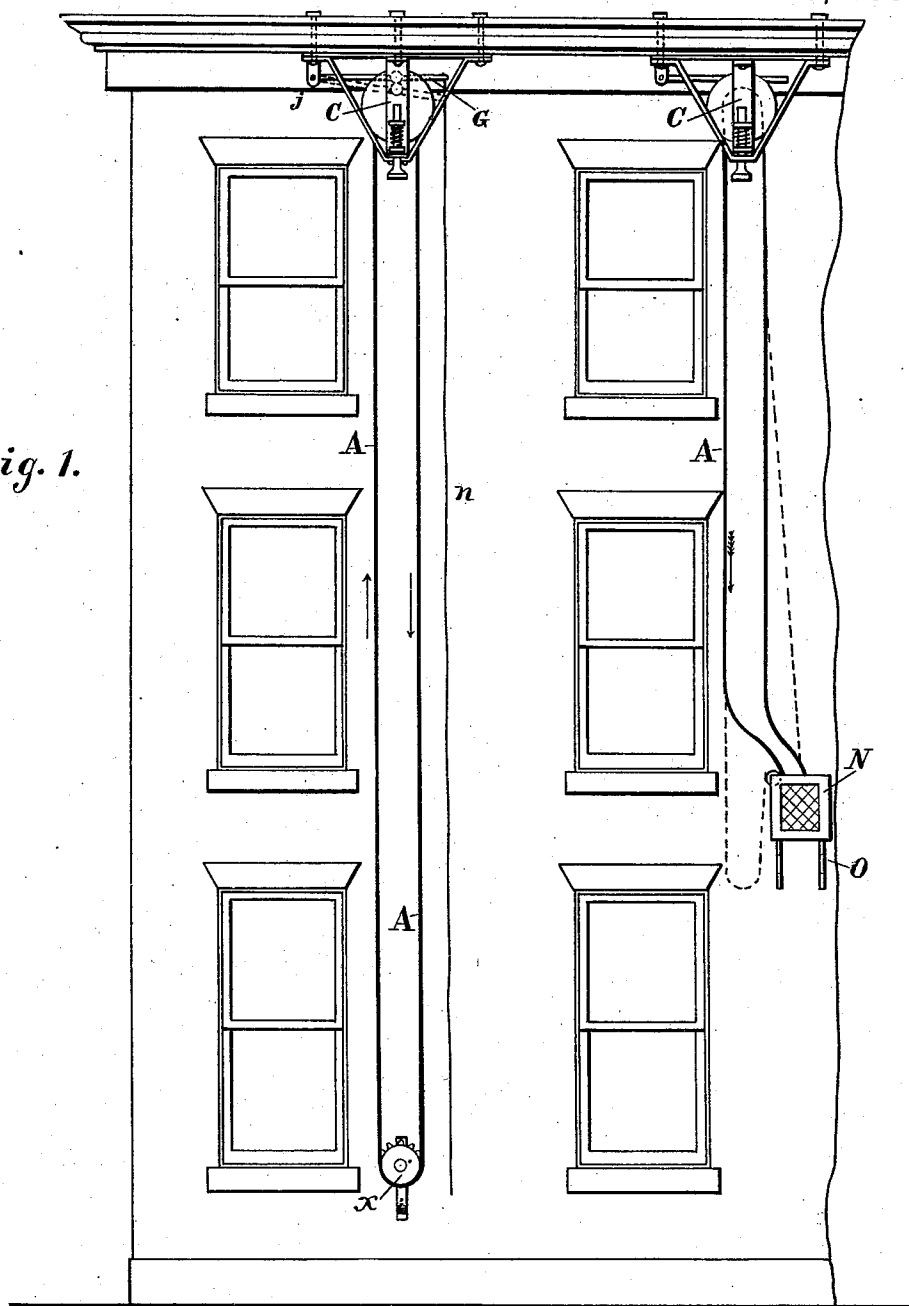
2 Sheets—Sheet 1.

A. BIXBY.
FIRE ESCAPE.

No. 290,961.

Patented Dec. 25, 1883.

Fig. 1.



Witnesses:
A. C. Eader
Geo. E. Morris.

Inventor:
Arthur Bixby
Chas B. Mann
Attorney

(No Model.)

2 Sheets—Sheet 2.

A. BIXBY.
FIRE ESCAPE.

No. 290,961.

Patented Dec. 25, 1883.

Fig. 3.

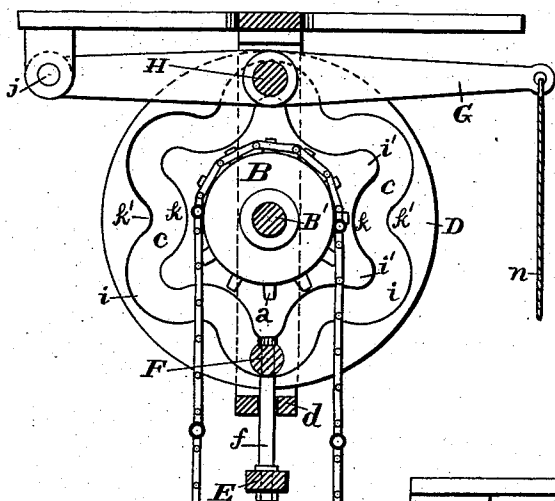


Fig. 2.

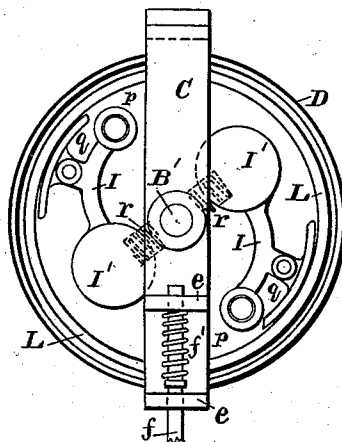
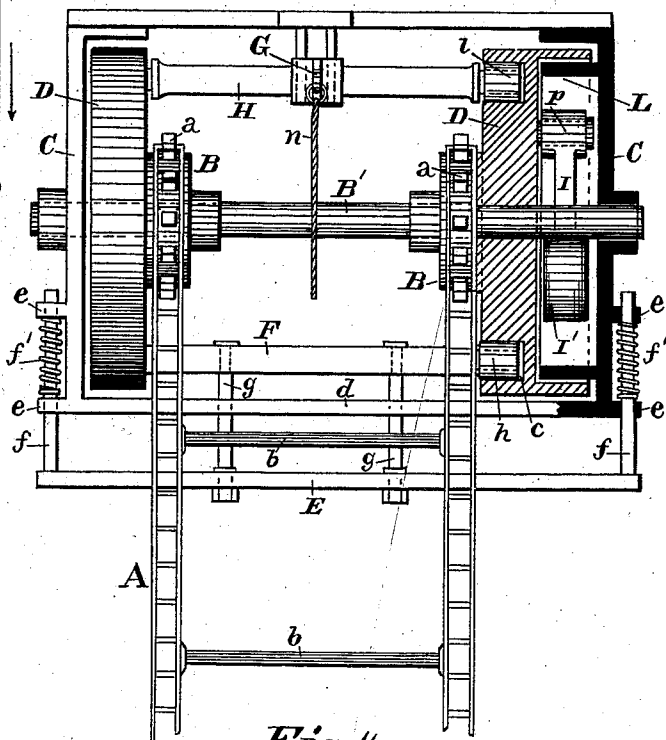


Fig. 4.

Witnesses:
A. C. Eader
Jno. E. Morris

Inventor:
Arthur Bixby.
Chas B. Mann
Attorney.

UNITED STATES PATENT OFFICE.

ARTHUR BIXBY, OF BALTIMORE, MARYLAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE INTERNATIONAL FIRE ESCAPE COMPANY, OF SAME PLACE.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 290,961, dated December 25, 1883.

Application filed August 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR BIXBY, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

My invention relates to improvements in fire-escapes which employ an endless ladder suspended from pulleys.

The nature and mode of operation of the improvements will first be described, and the invention will then be designated in the claims.

In the drawings hereto annexed, Figure 1 shows the application of the fire-escape to a building. Fig. 2 is a vertical section of the fire-escape. Fig. 3 is a side view, showing the speed-governor. Fig. 4 is a front view, showing the head at each side, but the parts on the right side are in section.

The letter A designates the endless ladder, which may be composed of links like an ordinary chain, or of wire cable. Two chains or cables are employed which are connected by rungs *b*. The endless ladder is suspended from pulleys B, provided with sprockets *a*, and mounted on a shaft, B', which has bearings in a hanger, C, attached to a building, as shown in Fig. 1, in any suitable manner. Thus provision is made for the endless ladder to hang, and to allow one side to descend and serve as means to lower persons from the building while the other side ascends.

To control the movement of the endless ladder a check, a stop-brake, and an automatic speed-governor are provided and so combined with the ladder as to adapt it to operate as a lowering apparatus under all emergencies or conditions.

The check consists of two circular heads, D, mounted on the shaft B', one at each end. One side of the head is provided with an endless serpentine groove, *c*. A stationary horizontal bar, *d*, connects the lower ends of the two vertical sides of the hanger, and on the outer face of each vertical side are guides *e*. A bar, E, has at each end an upward-projecting rod, *f*, adapted to move vertically in the guides *e*, and a spiral spring, *f'*, about each rod and between the guides serves

to keep the bar E normally depressed or held down, but allowing the bar to have vertical movement. Two rods, *g*, are attached to the bar and project up freely through holes in the stationary bar *d*. The check-bar F is supported on these rods *g*, and at each end of the check-bar is a roller, *h*, which occupies the serpentine groove.

By reference to Fig. 2 it will be seen the serpentine groove *c* passes all around the shaft on which the head D is mounted. Considering, now, the depressions or curves of which the serpentine groove is composed, they consist of two—the outward depression *i* and the inward depression *k*. Between each two outward depressions is an inward point, *k'*, and between each two inward depressions is an outward point, *i'*. The pressure of the springs *f'* tends to keep the check-rollers *h* in one of the outward depressions *i*. Now, to permit one side of the ladder to lower, the heads D must turn, which causes the springs *f'* to be compressed by the action of the serpentine groove, forcing the check-rollers up until each of them occupy one of the inward depressions, *k*. In this movement the rollers first bear against one side of the groove and turn a certain way until they pass one of the points *i'* or *k'*. The heads D, now continuing to turn, the rollers are brought against the opposite side of the groove, and thereby the direction of their turning is reversed. Thus the check-rollers are compelled to turn first one way and then the other, and the effect is to retard the rotation of the pulleys B, and consequently to check the lowering of the loaded side of the ladder.

The stop-brake consists of a lever, G, pivoted at one end, *j*, to the hanger above the pulleys. This lever carries the brake-bar H, having at each end a roller, *l*, which occupies the serpentine groove. Side braces may be attached from the brake-bar to the lever, to give rigidity to the parts. A rope or wire, *n*, at the end of the brake-lever G depends, when the ladder is in use, to the ground, and by drawing on the cord, the rollers of the brake-bar are applied in the groove, so as to create a great pressure, and thereby stop the head from turning and the ladder from lowering.

The automatic speed-governor consists of a

curved arm, I, pivoted by one end, *p*, to the outer side of the circular head and near the perimeter. The other end of the arm carries a weight, I', and near the pivot the arm is provided with a brake-shoe, *q*. Light springs serve to keep the weights toward the shaft or center. The vertical side C of the hanger is provided with an annular rim, L, the inner surface of which serves as a face upon which the brake-shoe *q* bears. The weighted arms are carried around with the rotating head, and when going at a moderate or slow speed are held near the center by the springs. The annular rim is stationary. By the action of the centrifugal force the weights have a tendency to be thrown outward or away from the axis of rotation. When the speed of the rotating head increases beyond that which it is designed to have, the centrifugal force overcomes the light spring and applies the brake-shoes to the annular rim, and thereby reduces the speed. Thus the speed of the lowering of the ladder is automatically regulated.

In the drawings a speed-governor is shown at one side only, but another may be applied at the other side. The lower part of the endless ladder may hang free, or may pass around a roller or pulleys, as shown at *x* in Fig. 1. Where the roller is employed, it may be best to inclose the lower part of the ladder to prevent it from being used improperly. I prefer, however, to allow the ladder to hang free—that is, without a roller—and to secure it from improper use by folding the lower part in a receptacle, N, supported on an elevated bracket, O, attached to the wall of the building. When the lower part of the ladder is folded in this receptacle, which should be above the first story of the building, it is secure from use by any one outside of the building, and yet it is ready for use by any one within the upper part of the building. When thus folded a person may get upon the ladder, whereupon the one side will begin lowering and will drop down outside of the receptacle, and the other side will begin ascending, thereby lifting or drawing the folded part out of the receptacle. Continuing this process, the

lower part of the ladder is soon entirely released from the receptacle, the operation being wholly automatic.

When the ladder is not in use, the lower end of the brake-rope should be coiled and put in the receptacle. The brake-rope should hang in such position as to be within convenient reach of persons on the ladder, and also within reach of persons in the windows of the building.

I am aware that endless ladders passing over drums are well known, and that a zigzag groove around the periphery of a wheel in connection with a pendulous lever, has heretofore been employed as a friction device to retard movement of the ladder.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a fire-escape, the combination, substantially as set forth, of an endless ladder suspended from pulleys, a head adapted to rotate as the ladder moves, and provided with a serpentine groove, a check-bar having rollers which occupy the groove, and means to exert, automatically, a pressure on the check-bar.

2. In a fire-escape, the combination, substantially as set forth, of an endless ladder suspended from pulleys, a head adapted to rotate as the ladder moves, and provided with a serpentine groove, a brake-bar having rollers which occupy the groove, and a lever provided with a rope to apply the brake-bar.

3. In a fire-escape, the combination, substantially as set forth, of an endless ladder suspended from pulleys, and a receptacle, N, supported above the first story of the building, and adapted to receive the lower end of the ladder folded, whereby when a person gets on the ladder to be lowered the ladder will release itself from the receptacle automatically.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR BIXBY.

Witnesses:

ERNEST RIALI,

ARTHUR L. BENOIT.