(No Model.)

2 Sheets—Sheet 1.

E. W. BULLARD.

FIRE ESCAPE.

No. 448,176. Patented Mar. 10, 1891.

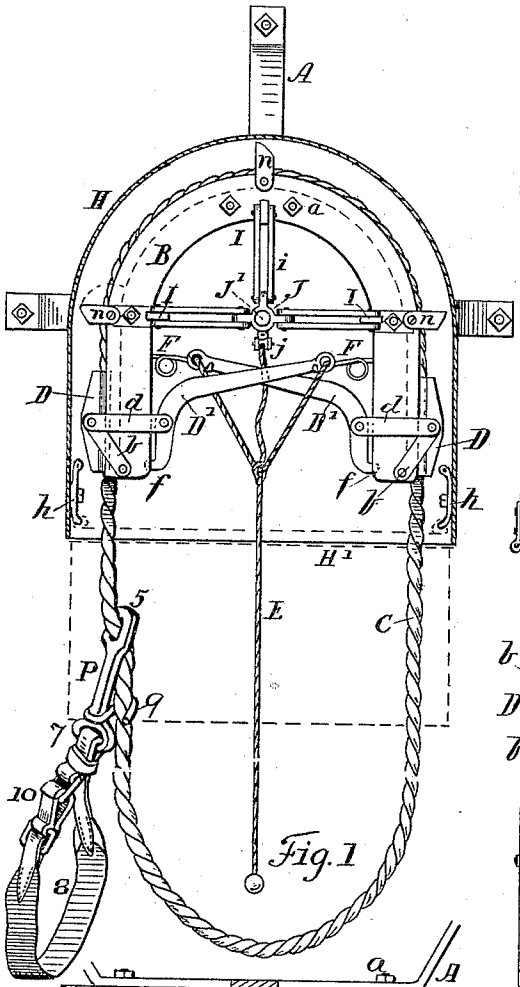

Fig. 1

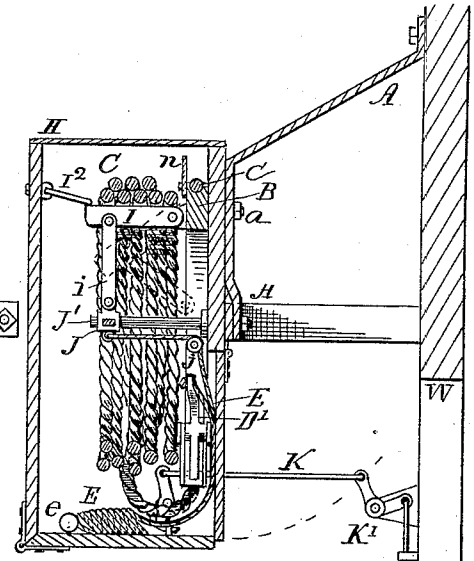

Fig. 2

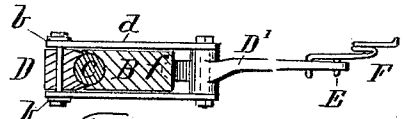

Fig. 5

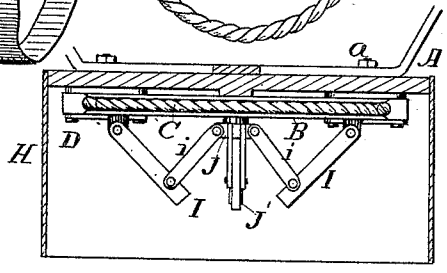

Fig. 4

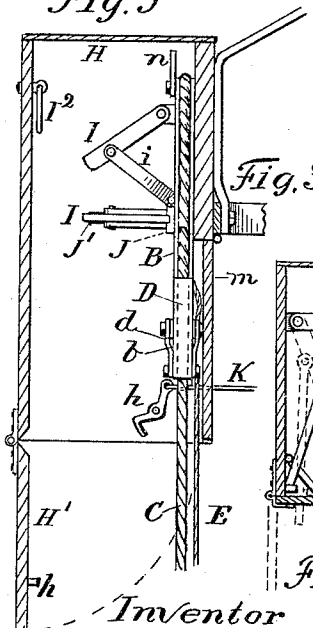

Fig. 3

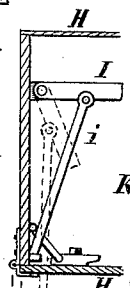

Fig. 7

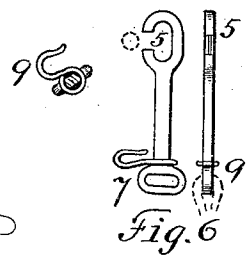

Fig. 6

Witnesses.
Ella P. Blenus.
W. H. Santon

Inventor
Ezekiel W. Bullard
By Chas. A. Burleigh
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

E. W. BULLARD.

FIRE ESCAPE.

No. 448,176. Patented Mar. 10, 1891.

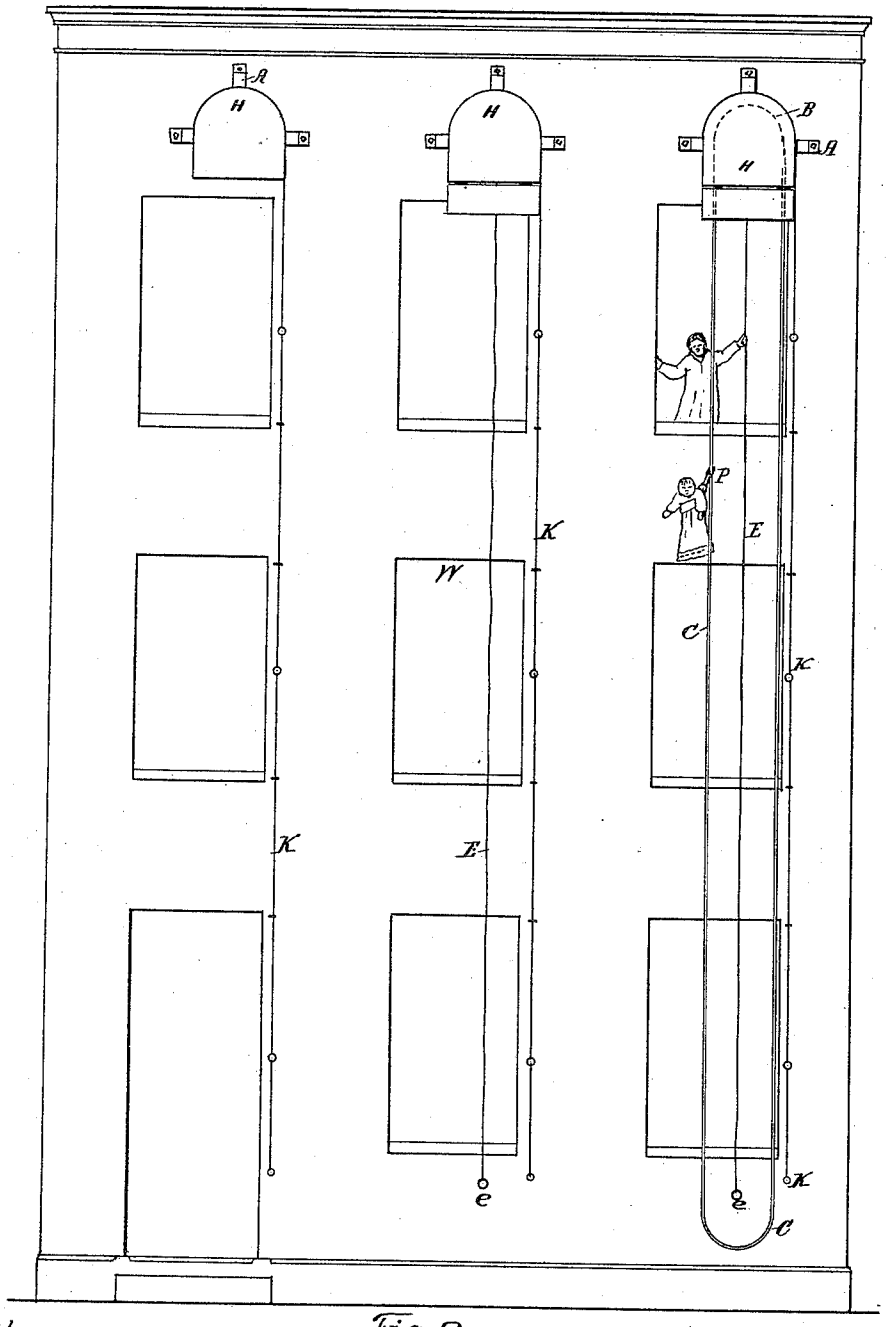

Fig. 8

Witnesses
Ella P. Clemus
W. B. Paston

Inventor
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Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EZEKIEL W. BULLARD, OF BARRE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ASEL N. ELLIOTT, OF PHILADELPHIA, PENNSYLVANIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 448,176, dated March 10, 1891.

Application filed October 18, 1890. Serial No. 368,618. (No model.)

To all whom it may concern:

Be it known that I, EZEKIEL W. BULLARD, a citizen of the United States, residing at Barre, in the county of Worcester and State of Massachusetts, have invented a new and useful Fire-Escape, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide an improved fire-escape to be attached to a building and having an endless rope or traveler, means for inclosing the same when not in use, and facilities for quickly letting out the apparatus when required for service; also, means for controlling and operating the apparatus, as hereinafter explained.

Another object is to provide an efficient means for attaching a person or article to the traveler-rope to be lowered or elevated by the apparatus.

These objects I attain by mechanism constructed and organized for operation, as illustrated and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a front view of my improved fire-escape apparatus. Fig. 2 is a vertical section of the same with the rope coiled within the protecting-hood. Fig. 3 is a section view with the rope depending from its supporting-guide. Fig. 4 is a top or plan section. Fig. 5 is a horizontal section of the brake. Fig. 6 shows the form of the grip-hook. Fig. 7 shows a modification in the structure of the collapsible coil-supporter. Fig. 8 is an elevation view of the fire-escape as arranged upon a building, showing its three conditions of service.

Referring to parts, A denotes the frame or bracket by which the apparatus is attached to the upper part of a building over or near windows or doors from which ready access can be had thereto.

B indicates an arched guide fixed to the frame and having a groove in the periphery of its semicircular top for the reception of the rope or traveling band C, which latter is preferably formed as an endless loop of sufficient length to reach from the upper story of the building to within about two feet (more or less) of the ground or pavement. This rope is best about seven-eighths-inch diameter and is supported to slide in either direction within the groove of the arched guide, resisted by the nominal degree of friction on the semicircular surface of the arch.

D indicates a brake-block having a grooved face for clamping the rope C against the upright part of the guideway B. Inclined links *b*, pivoted to the front of the guide-arch and to the brake-hinge, sustain the brake-block in position, while allowing movement sufficient for clamping and releasing the rope C. A lever D′, for operating said brake D, is connected with the center of the block by links *d*. Said lever is fulcrumed at its lower end on the guide-arch, as at *f*, the rounded end of the lever resting in a recess in the inner lower part of the arch-piece, while the upper arm of said lever extends backward and is fitted with an eye for connection with the pull or controlling-cord E, which latter is a small rope or suitable line attached to and dependent from the lever D′ and of a sufficient length to be reached from the ground or any intermediate station. The cord E is preferably provided with a ball or small weight *e* at its end.

I have herein illustrated the apparatus as having two stop-brakes D; but if in any instance preferred a single brake may be employed, the construction being the same as shown, with one brake and its lever omitted. A suitable spring F is combined with the brake-lever for lifting the lever-arm in opposition to the controlling-cord for relieving the pressure of the brake-block upon the traveler-rope.

H indicates a hood or casing arranged over the arched guide, inclosing and protecting the ropes and mechanism and having at its lower part a drop-bottom H′, hinged at one side, so as to swing downward, and held up by a retractible trip latch or latches *h*, of suitable form that engages or engage with the drop-bottom in a manner to permit it to fall open when the latch is released.

A wire or pull K is connected to the latch or trip-dog *h*, and extends down the side of

the building in convenient location to be reached from the adjacent window or the ground, a suitable angle-lever K′ being provided for the turn. This wire or pull serves for unlocking the bottom of the casing when desired.

I indicates a collapsible supporter, upon which the rope C can be coiled up within the casing when not required for use. Said supporter I preferably consists of a hinged bar or series of hinged bars sustained in normal position by a link brace or braces *i*, connected to a trip or slide J, combined with a stud or guide-rod J′, fixed to the frame or casing. This slide is suitably connected with the controlling-cord E, (or with the pull K or a separate pull device,) whereby it can be tripped by a pull of the cord for retracting or drawing back the brace to allow the coil-supporter to collapse or its bars to incline or fall inward for discharging the coil of rope therefrom.

A part of the case, front or rear, whichever is most conveniently accessible in any situation, is made removable or provided with a door, as *m*, to afford access to the interior to facilitate coiling or arranging the rope and controlling-cord therein.

The arched guide is best provided with adjustable guard-buttons *n* to prevent the rope from being displaced from the groove when coiling it on the bars.

The grooved guide-arch is firmly bolted to the bracket-arms A, as at *a*, the back piece of the casing being embraced between the arch and bracket-frame, as shown. The feet of the brackets are bolted to the building W, so that the arched guide and dependent rope stand about one foot (more or less) away from the side of the building.

A loose link or guard I^2 can, if desired, be combined with the coil-supporter I to prevent the coil of rope C from sliding off the bar I. Said link is free to swing up at one end when placing the coils on the holder and to drop down in the manner indicated in Figs. 2 and 5.

The controlling-cord E is preferably extended over a roll at *j* and connected with the trip-dog or slide J, or, if in any instance desired, the trip-slide, can be connected to be operated by the pull K, so that a second tug thereon would operate the trip.

P indicates a grip device which is employed in connection with the traveler or rope C for giving a firm hold thereon. This device consists of a metal bar furnished at one end with an oval eye 5, having at one side a passway or open space sufficiently wide to admit the rope into the eye. (See Fig. 6.) At its opposite end there is an eye 7, to which is attached a sling or belt 8, the latter having a buckle or snap-hook 10, by means of which the belt can be secured around a person or article. A laterally-projecting wire hook 9 is preferably arranged on the shank of the grip device, as shown. This grip device is put onto the rope with the bar P at right angles thereto, and the bar is then laid down along the rope and the hook 9 passed around it, causing the eye to bite on the rope, as indicated in Fig. 1, thus giving a firm grip that will not slip on the rope with any amount of weight supported from the sling or belt 8, and at the same time affording a connection that can be instantly detached or replaced upon the rope. In many instances the grip can be arranged for supporting a stirrup to stand upon, and the side hook 9 can be dispensed with, the bar F and rope being simply held together by the hand of the person using the apparatus.

The operation of my improved apparatus is as follows: In normal condition of storage the traveler or rope C is coiled upon the supporter I, and the controlling-cord E is coiled up and simply laid upon the bottom H′ of the case, as indicated in Fig. 2. The apparatus in this condition remains for any length of time desired, and appears as shown at the left on Fig. 8. In case of a fire, any person from one of the windows or from the ground simply gives a pull upon the wire or line K. This trips or retracts the latch *h* and releases the bottom H′, that drops down and allows the controlling-cord E to fall and uncoil, the cord being straightened by the weight *e*. This brings the apparatus into the condition shown at the center of Fig. 8. A second pull upon the cord E or line connected to the trip or slide *j′* draws back the braces *i*, causing the coil-supporter I to collapse, as indicated in Figs. 3 and 4, thereby permitting the rope C to slide therefrom, uncoil, and fall down into condition for use, as indicated at the right in Fig. 8 or as in Figs. 1 and 3. Then any person can, by taking hold of the rope or by being connected thereto by the grip device P and sling-belt 8, lower himself, or be lowered to the ground, the speed of descension being easily controlled by more or less pull on the controlling-cord E. A person or merchandise can be elevated, if desired, by the aid of other persons pulling on the opposite side of the endless rope. Thus a fireman could be sent to any floor of the building in a ready and convenient manner.

Any desired number of the grip-hooks P and sling-belts 8 can be provided and kept at convenient positions in the different stories of the building whereon the escape is arranged, so as to accommodate any number of persons to be carried down by the apparatus. After being used the supporter I can be readjusted and the rope C can again be coiled up, the cord E recoiled, and the casing closed, thus restoring the apparatus to normal condition ready for further use at any time.

In Fig. 7 I have illustrated a connection for tripping the supporter I by the fall of the drop-bottom H′. In this the brace *i* stands upon a stud and a link J^2, connected with the drop H′, engages behind the brace and forces it off the stud as the drop descends.

I claim as my invention herein, to be secured by Letters Patent—

1. The combination, substantially as described, of the grooved semicircular arched guide having supporting brackets or frame whereby it is attached to the building, the endless rope suspended in the groove of said guide, a brake for clamping said rope, a brake-operating lever, and the controlling-cord, for the purposes set forth.

2. The combination, substantially as described, of a grooved arched guide, the endless rope suspended therefrom, the collapsible coil-supporter, the coil-supporter trip, the brake, (or brakes,) the brake-actuating lever and connections, and the controlling cord (or cords) connected with said brake-levers, for the purposes set forth.

3. The combination, substantially as described, with the arched guide, traveler-rope, brake mechanism, and controlling-cord, of the protecting-hood having the drop-bottom, a trip-latch (or latches) for sustaining and releasing said bottom, and the trip-pull for retracting said latch, extending down the side of the building to position for convenient reach, for the purposes set forth.

4. The combination, substantially as described, of the arched guide, attaching-brackets for supporting the same on a building, the rope or traveler suspended in the groove of said guide, the brake, (or brakes,) the brake lever, (or levers,) brake connections, a collapsible coil-supporter, a coil-supporter trip and pull-cord for discharging said coil-supporter, and the protecting hood or casing inclosing said apparatus, as set forth.

5. The combination, substantially as described, in a fire-escape having a traveler-rope and a collapsible coil-supporter whereon said rope is coiled preparatory for use, of a hood or inclosing casing having the drop-bottom, a trip-latch (or latches) for sustaining said bottom, and pull mechanism arranged for operation in the manner described, whereby the first pull releases the drop-bottom and the second pull releases the coil-supporter for discharging the traveler-rope therefrom, for the purposes set forth.

6. The combination, substantially as described, with the grooved arched guide, the traveler-rope, and coil-supporter, of the adjustable buttons *n*, for the purpose set forth.

7. The grip-hook P, having the loop 5, with open side for receiving the rope, and the sling or belt 8, connected with its opposite end, of the laterally-projecting hook 9 on the shank of said grip-hook, adapted for holding the same adjacent to the side of the traveler-rope, in combination with the arched guide, the traveler-rope sustained in the groove of said guide, the brake, brake-operating connections, and controlling-cord, substantially as and for the purpose set forth.

8. The combination, substantially as set forth, of the exteriorly-grooved arched guide, the endless rope sustained in said groove, the brake-block D, connected to the said arched guide by links *b*, the brake-operating lever D′, fulcrumed on the inner side of said arch at *f* and connected with the brake-block by links *d*, the relieving-spring F for raising the arm of said brake-lever, and the controlling-cord attached to the end of the lever, for the purposes set forth.

9. The collapsible coil-supporter consisting of a hinged bar (or bars) sustained by an adjustable brace *i*, a trip or slide for displacing the end of said brace, and a pull-line for actuating said trip, in combination with a fire-escape, substantially as and for the purposes set forth.

Witness my hand this 15th day of October, A. D. 1890.

EZEKIEL W. BULLARD.

Witnesses:

CHAS. H. BURLEIGH,

ELLA P. BLENUS.