



# UNITED STATES PATENT OFFICE.

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## FIRE-ESCAPE.

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*To all whom it may concern:*

Be it known that I, ROBERT SUTHERLAND, of Boston, county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof, in which—

Figure 1 is a front elevation of my fire escape located at a window in a building, the front of the case in which the apparatus is contained being removed. Fig. 2 is a vertical section of the same, but showing the top of the case removed and the arm which supports the swinging platform raised and extended in position for use. Fig. 3 is a top view of Fig. 1, with the cover of the case removed and the guides on the outer end of the arm unfolded. Fig. 4 is a detail showing the outer end of the arm with the guide-ropes and platform in position to use.

The object of my invention is the construction of a fire-escape which may be placed beneath a window in the interior of a building without taking up much space in the room, which shall be ready for use at any time, and by which a person or article may be lowered from the window to the ground outside the building with ease, certainty, and safety; and it consists in an arm of the construction shown, arranged to be projected through the window and to support a platform or basket which may be lowered or raised by means of a rope or chain and drum, as hereinafter more fully described, the movement of said platform or basket being controlled from the inside of the room or the outside of the building or from the platform itself.

My invention will be readily understood from the following description and the accompanying drawings, in which like letters of reference are used to indicate like parts.

The walls of the building are represented at A, the window being recessed therein, as usual. The window-sill is shown at B.

In the drawings, the lowering apparatus and the case C, which contains it, are shown as extending above the window-sill; but this is not necessary, as by constructing the case of metal or thin material and diminishing somewhat the size of the brake-wheel D the apparatus may be decreased in size, so that the top of the

case will not rise above the sill of the window. The case C may be of any convenient shape, and is intended as a support for the parts of the device and to protect the apparatus when it is not in use. The back of the case is set a sufficient distance from the window-sill to accommodate the upright *a*, which supports the bracket or arm *b*. (See Fig. 2.) The upright *a* is composed of two pieces, in order that it may be extended. One of these pieces is hinged, as shown at *c*, Fig. 2, to the back of the case C, and has secured to it a band, *d*, through which the upper or extensible part of the upright slides, a similar band *d* being secured to the extensible part. A spring-bolt, *e*, which, when the extensible part of the upright is raised, is projected into a recess therein, acts automatically to secure the extensible part of the upright in its raised position. To the upper end of the sliding or extensible part of the upright the arm *b* is secured, and projects at right angles therefrom, as shown, Fig. 2, the brace *f* serving, as in brackets for carpenters' stages, to stiffen the arm *b*. The arm *b* is also extensible, being constructed in two parts secured together by bands *g*, which permit of the extension of one of the parts in the same manner as do the bands of the upright. A spring-bolt or locking device, *h*, Fig. 3, is also provided on the arm *b* to lock the arm in its extended position.

The hinges *c* on the upright allow it to be turned when it is raised or extended, in order to project the arm *b* out of the window and beyond the wall of the building. Instead of being hinged, the upright might be pivoted or secured in any suitable manner to permit of its being turned to swing out the arm *b*. The outer end of the arm *b* is provided with a sheave set in a slot therein, and over which the rope *k*, to which the basket or platform E is attached, works. Another sheave, *l*, is set in a bracket, or in other convenient manner, on the inner end of the arm *b*, and also receives the rope *k*, which passes thence downward, when the apparatus is in position for use, (see Fig. 2,) over the sheave *m*, set on the end of the case C, thence downward and under the sheave or grooved pulley *n*, set on a short shaft journaled on the lower part of the case. Thence the rope passes on to the drum F. The drum F is journaled in bearings in the case, the front

of the drum being provided with a fly-wheel or brake-wheel, D, to which a friction-brake is applied in the manner and for the purposes hereinafter described. The inner end of the drum-arbor next the wall of the building (see Fig. 2) projects through a circular case, *p*, secured to the case C, and which contains a coiled spring similar to a clock-spring, one end of which is fast to the arbor and the other to the case *p*. As the drum revolves in paying out the rope *k*, the spring *p*' is wound up, so that when the basket or platform E has reached the ground and the occupant has got out of it, it will immediately be raised again to the window by the force of spring *p*' causing the drum to revolve in the opposite direction. The force of the spring *p*' should be sufficient to overcome the weight of the rope *k* and platform E. It is not, however, an essential part of my invention; but I consider it an advantage. For the purpose of revolving the drum and again raising the platform E, I provide a crank of common construction, which may be applied at *q* to the drum-arbor. By this means a person inside of the room may quickly raise the platform if the spring *p* should fail to work, or in case it was desired to raise a weight on the platform.

In order that a person on the platform E may regulate the speed at which he descends, I provide a friction-brake and apply it to the fly-wheel D. The brake consists of a band, *r*, preferably of metal, having some flexibility, and provided with a series of blocks, *s*, secured thereto, and which bear on the periphery of the wheel D (see Fig. 1) when the brake is applied. The band *r* is secured at one end directly over the fly-wheel by pin *t*, Figs. 2 and 3, to the upper frame of the case C, and is carried around the wheel, the other end being secured by a link and pin, or in other suitable manner, to a brake-lever, *w*, Fig. 3, which is pivoted at one end to the frame of the case. It is plain that if this lever be moved in one direction the blocks *s* of the band *r* will be forced against the periphery of the fly-wheel D, thus applying the brake, and if moved in the opposite direction they will be freed from the wheel and the brake will be off. In order that this lever may be moved in either direction by the occupant of the platform E while he is descending, I provide two cords. The cord *a*' (see Fig. 3) is secured to the free end of the lever and passes through an eye, *a*<sup>2</sup>, in the end of the case, thence through a guide, *y*, on the outer end of the arm *b*, and thence past the platform E to the ground. The cord *b*', which moves the lever *w* in the opposite direction, thus applying the brake, passes from the lever *w* through an eye, *b*<sup>2</sup>, at one end of the frame, thence across the case to an eye, *b*<sup>3</sup>, at the other end, thence through the eye *b*<sup>4</sup> on the arm *b*, thence through the other end of guide *y*, and to the ground. One arm of the guide *y* is hinged, as shown at *d*', Fig. 3, so that it may be folded back when the apparatus is not in use. The other ex-

tension of the guide does not require to fold, but may extend when the apparatus is not in use into the case. A spiral spring, *f*', fast at one end to the lever *w* and at the other to the end of the case, (see Fig. 3,) acts to apply the brake and keep the platform from descending until the occupant has got onto it and is ready to start. The platform H, secured to the building outside the window, forms no part of my invention, but would be a convenience in using the apparatus in case ladies or invalids were to be lowered.

In place of the platform E, which I have shown suspended by four ropes, *h*' *h*<sup>2</sup> *h*<sup>3</sup> *h*<sup>4</sup>, (see Figs. 2 and 4,) a basket, chair, cage, box, or other suitable receptacle may be provided and may be made, as also the ropes, of fire-proof or partially fire-proof material. I have shown the flat platform, because it may be conveniently stowed away when not in use behind the case underneath the arm *b*.

The top of the case may be secured as shown, Fig. 1, or in any convenient manner, it being desirable, however, that it be so secured that it can be readily taken off and laid aside out of the way.

What I claim is—

1. In a fire-escape, the combination, with the case C, the drum F, the lowering-rope, and the brake mechanism, of the hinged and vertically-extensible upright *a* and the horizontally-extensible arm *b*, attached to the said upright, substantially as set forth.

2. In a fire-escape, the combination, with the lowering-rope, its platform or receptacle, and means for holding the latter clear of a building, of the rope-drum, the friction-band *r*, the brake-lever *w*, the cords *a*' *b*', for operating the latter, and the retracting-spring *f*', substantially as set forth.

3. In a fire-escape, the combination, with the rope drum and its brake, of a hinged upright, as *a*, having an extensible arm, as *b*, whereby the lowering-rope and platform may be suspended clear of the building, as set forth.

4. The combination, with the rope-drum, the lowering-rope, the platform or receptacle E, and means for holding the latter clear of a building, of the wheel D, the friction-band *r*, provided with the blocks *s*, the brake-lever *w*, and means for controlling the latter, substantially as set forth.

5. In a fire-escape, the combination, with the case C, the hinged and vertically-extensible upright *a*, the horizontally-extensible arm *b*, and the brace *f*, of the rope-drum, the lowering-rope having a receptacle or platform, the wheel D, the friction-band *r*, the brake-lever *w*, means for controlling the latter, and a retracting-spring, *p*, for winding up the rope when the receptacle or platform is empty, substantially as set forth.

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Witnesses:

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