S. H. HARRINGTON.

FIRE-ESCAPE.

No. 192,693. Patented July 3, 1877.

Fig. 1.

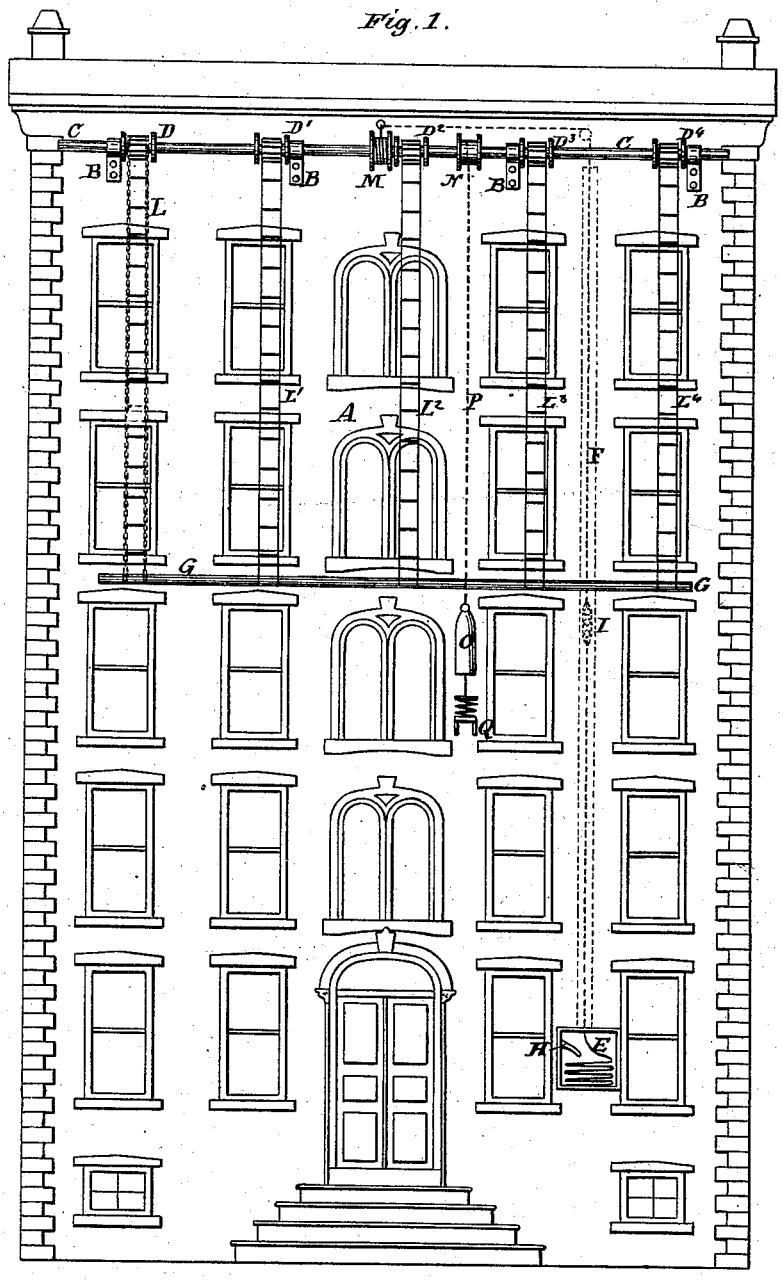


Fig. 2

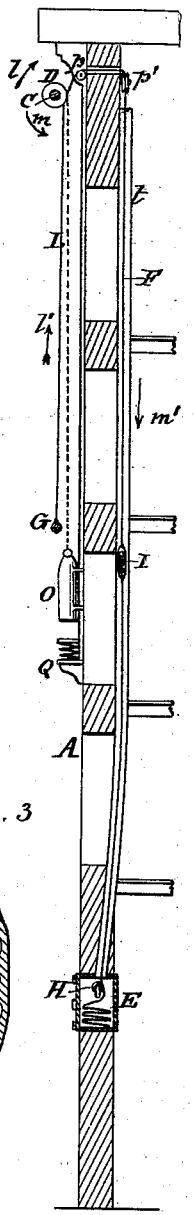
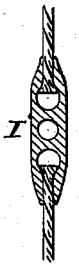


Fig. 3



Attest:

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E. E. Mason

Inventor

Samuel H. Harrington

by A. Pollok his attorney

UNITED STATES PATENT OFFICE.

SAMUEL H. HARRINGTON, OF BALTIMORE, MARYLAND, ASSIGNOR TO HIMSELF, JOSEPH K. MILNOR, HUGH G. STEWART, AND HENRY TAYLOR, OF SAME PLACE.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **192,693**, dated July 3, 1877; application filed May 18, 1877.

To all whom it may concern:

Be it known that I, SAMUEL H. HARRINGTON, of the city and county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification:

Of all fire-escapes heretofore devised, a gang of ladders wound upon a shaft in the vicinity of the cornice of the building, and combined with mechanism so as to admit of the instantaneous release of all the ladders simultaneously, thus affording ready means of escape at windows and other openings in the exterior of the building, has been found to embody the essential conditions of safety, and, therefore, presents the elements of practical success. All fire-escapes embodying these principles of construction and operation that have heretofore been made or suggested are defective in certain important particulars, which prevented their application and general adaptation to use.

The object of my invention is to remedy these defects; and consists in means of operating the release of the ladders and the winding of them, in the manner substantially as hereinafter shown and described, whereby, in case of emergency, the ladders may be dropped instantaneously without the employment of machinery, which would obstruct the building, or require special construction of them, or otherwise interfere with the usual plans and methods of building houses. And this I propose to effect, both from within or from without the building, at boxes conveniently contrived for access to them by the officers of the fire or police departments, or by other responsible persons occupying the building. And my invention further consists in proper means of regulating the descent of the ladders, so as to start and then check the ladders, to avoid mishaps which may occur from the force acquired by them, due to the momentum of their fall.

To this end my invention consists, particularly, in the combination, with a system of ladders wound upon a shaft supported on the exterior of the building, over windows or other openings communicating with the interior of the building, of a pulley or windlass fast on said shaft, having wound in the opposite direction of the ladders a cord, or rope, or cable, passing through a tube within the wall, or applied to the inner side of the wall, and terminating in a box provided with a hook or other rope, cord, chain, or cable holding device, the whole being constructed and arranged for operation substantially as hereinafter shown and described; second, in combination with a system of weighted ladders wound upon a shaft on the exterior of the building, as described, of a regulating device, consisting of a pulley having wound upon it a weight-carrying cord, of a length of about half that of the ladders, the same being constructed and arranged for operation substantially as hereinafter shown and described.

To enable others to make and use my said invention, I shall now proceed to describe the same with special reference to the accompanying drawing, in which—

Figure 1 is an elevation of a building five stories high, to which my said invention is shown applied. Fig. 2 is a vertical section of the same, showing the manner in which the ladders are operated; and Fig. 3 is a detail view of the hook, to which reference will be made hereafter.

In brackets B, located under and along the cornice of the building A, is mounted a shaft, C, which is provided with spools or windlasses D, D^1, D^2, D^3, and D^4, arranged immediately above each vertical row of windows or openings in the building. Upon these spools or windlasses are wound ladders L, L^1, L^2, L^3, and L^4, made of some incombustible but flexible material, which may be worked into a wire, chain, or cable, as the case may be. The lower ends of the ladders are united by a cross-bar, G, which is also made of metal of a certain weight, in order to keep the ladders, when unrolled, in proper tension, and to aid their prompt unrolling when released.

The ladders are of a length to extend from the shaft to the ground or sidewalk on the outside of the building, where, as an additional security, the bar may be properly secured by a catch or hook for that purpose provided, or by other means, as convenience may dictate. Upon the same shaft C are two auxiliary spools or windlasses, the object of which is to control the winding or unwinding

of the ladders, and to regulate the fall of them when released to be dropped.

The first of these spools (shown in the drawings at M) has wound upon it, in a direction inverse or opposite to that of the ladders, a cord, F, of incombustible and flexible material, which passes over suitable friction-pulleys *p p'*, &c., through the thickness of the wall, and down upon the inside of the wall, through a tube, *t*, located within the thickness of or contiguous to the wall, down to the first or basement floor, into a box or chamber, E, which is provided with doors on the exterior and interior of the building. In the interior of the box a stout hook, H, is provided, to which the cord may be attached. The cord may have a loop or link, *i*, arranged in such part of the length of the cord as that when it (the link) is brought down into the box and hooked onto the hook H, the ladders will be all wound upon the shaft.

It will be understood that the cord is the means of winding and unwinding the ladders. The cord being wound upon its spool in the direction indicated by the arrow *m*, while the ladders being wound up upon the same shaft in their respective spools in the direction indicated by arrow *l*, it will be understood that the unwinding of the cord F, or the pulling of it down in the direction of the arrow *m'*, will cause the winding up of the ladders or their moving up in the direction of the arrow *l'*. In order therefore to wind up the ladders it is only necessary for the operator or operators to pull upon the cord F until the link or loop I comes opposite to the hook which corresponds to the complete winding of the ladders, when the cord may be secured by engaging the loop into the hook. When it is necessary to release the ladders in order to allow them to drop, it is only necessary to unhook the cord F, when the ladders will by their weight descend, unwinding from the shaft as it (the shaft) winds up the cord.

To effect this in a most convenient manner the box is accessible from without and within the building through doors, which are locked by keys in possession of responsible parties.

I propose to provide boxes giving access to the tube containing the cord in the different stories, so that any person who may have the key to the boxes may in case of emergency release the ladders by simply pulling on the cord. The weighted link I is thus caused to slide off the inclined hook H and become disengaged. It has been found that the ladders, when being tightly wound up for a long time, become set, and when so set the weight of the bar G is often insufficient to start them on their descending movement. On the other hand, when they do start they come down with increasing rapidity, and acquire a momentum which renders it extremely dangerous, both to the structure itself, which is liable to break, as well as to persons who may be in the vicinity.

To remedy this evil I have a second auxiliary spool, N, upon which is wound a cord, P, of a length equal to about one-half of that of the ladders. This cord is wound in the same direction as the ladders, and carries on its free extremity a weight, O. A bracket, Q, with a supporting-shelf, upon which I prefer to place an india-rubber or other spring to afford cushion, receives the weight at the end of its descent.

This simple means will obviate the difficulty referred to in the manner as follows: When the ladders are wound up, and with them the cord P, the weight O will afford additional force to rotate the shaft to effect the unwinding of the ladders. The weight will thus aid the ladders to descend until they reach about midway their descent, when the weight is suddenly removed by its coming in contact with the bracket Q.

The acquired momentum of the ladders will cause them to continue their descending course, and will now wind the cord P in an opposite direction, and thus raise the weight, which now acts as a counter-weight to the ladders, and checks their descent to such an extent that when the weight O reaches the top of the building the bar G will reach the ground with a greatly-diminished force.

This apparatus, simple in its construction, dispenses with machinery to actuate it, is not liable to get out of order, and is substantially automatic in its operation.

Having thus described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a system of ladders wound upon a shaft supported on the exterior of the building, over windows or other openings communicating with the interior of the building, of a pulley or windlass fast on said shaft, having wound in the opposite direction of the ladders a cord, or rope, or cable, passing through a tube within the wall, or applied to the inner side of the wall, and terminating in a box provided with a hook or other rope, cord, chain, or cable holding device, the whole being constructed and arranged for operation substantially as herein shown and described.

2. The combination, with a system of weighted ladders wound upon a shaft on the exterior of the building, as described, of a regulating device, consisting of a pulley having wound upon it a weight-carrying cord of a length of about half that of the ladders, the same being constructed and arranged for operation substantially as herein shown and described.

In testimony whereof I have hereunto signed my name this 14th day of May, A. D. 1877.

SAML. H. HARRINGTON.

Witnesses:
EWELL A. DICK,
A. POLLOK.