

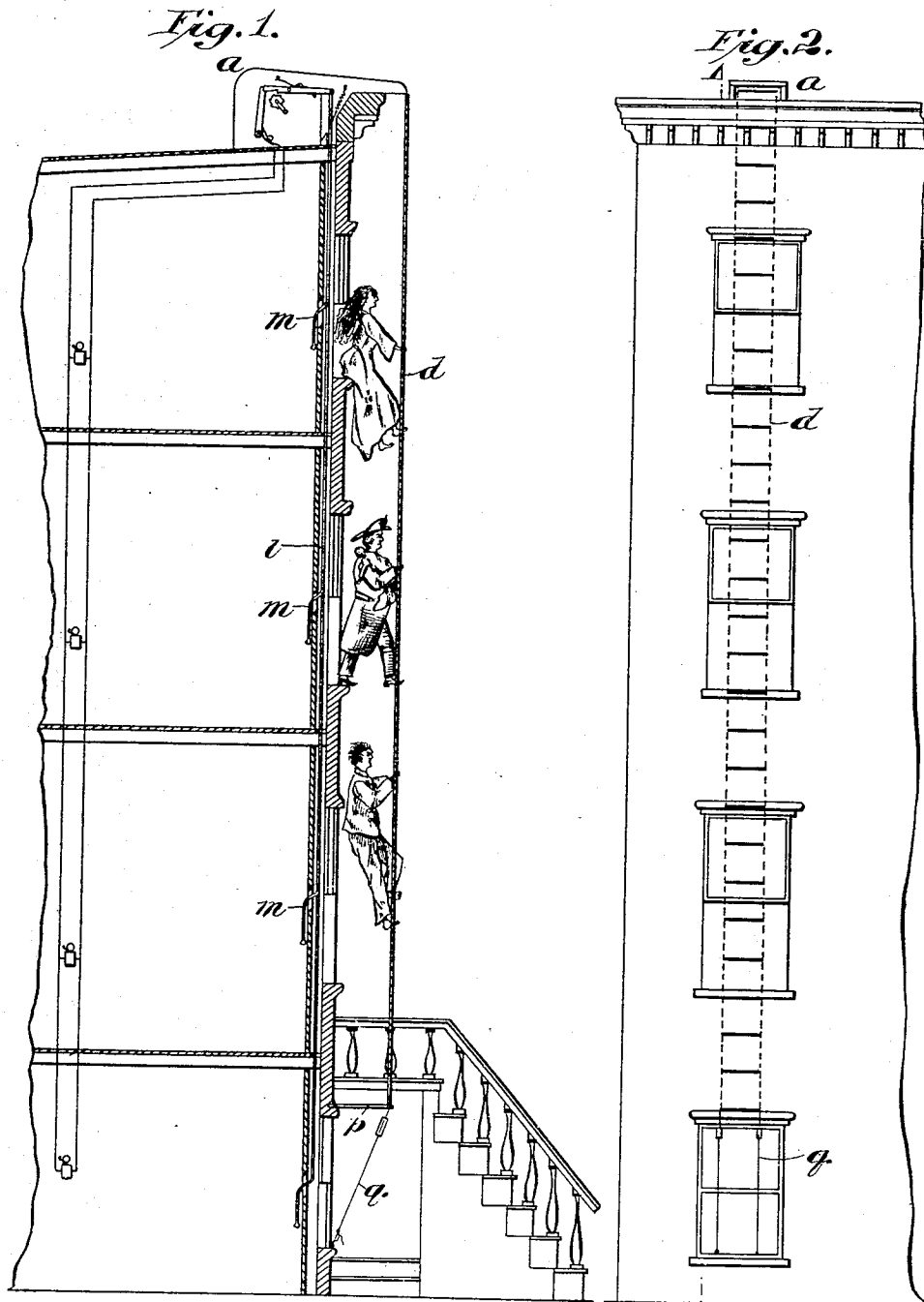
No. 876,004.

PATENTED JAN. 7, 1908.

E. LIBERTY.
FIRE ESCAPE.

APPLICATION FILED APR. 26, 1906.

3 SHEETS—SHEET 1.



Attest:
Cornithell
A. L. O'Brien

Inventor:
Emory Liberty
by *Dickerson, Brown, Reagen & Bimney*
Attys

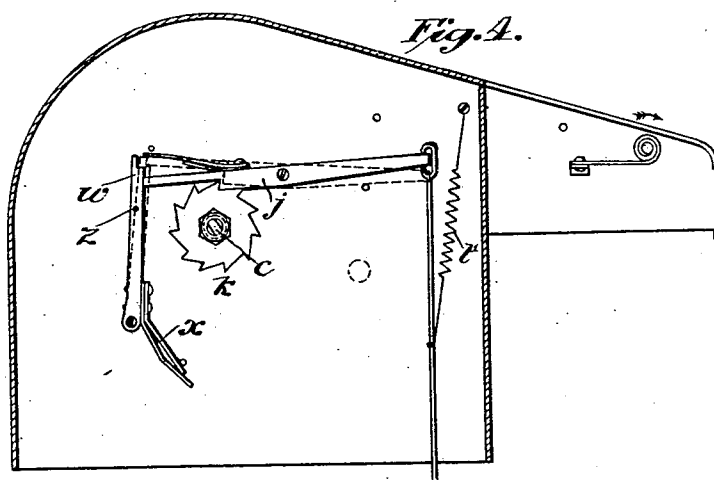
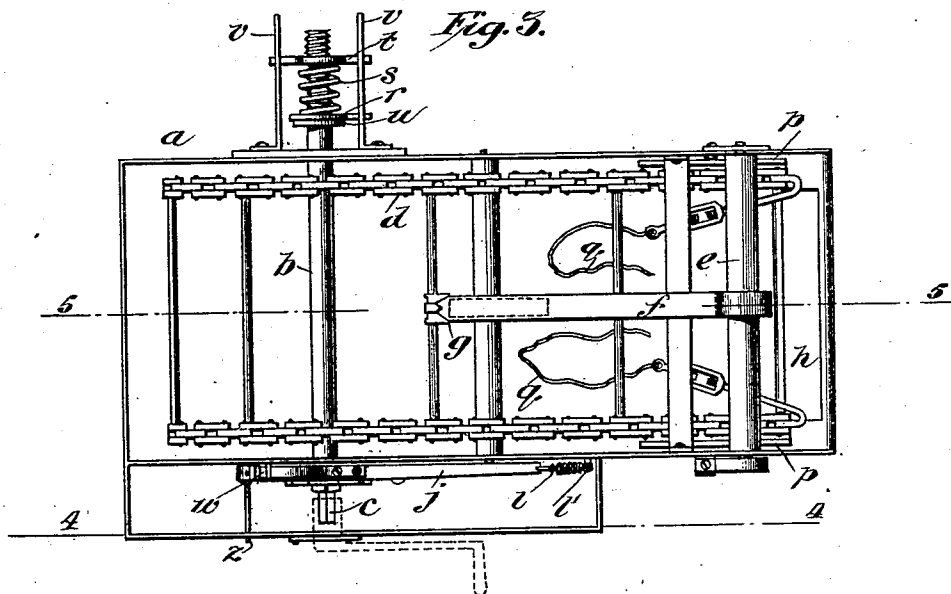
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3 SHEETS—SHEET 2.



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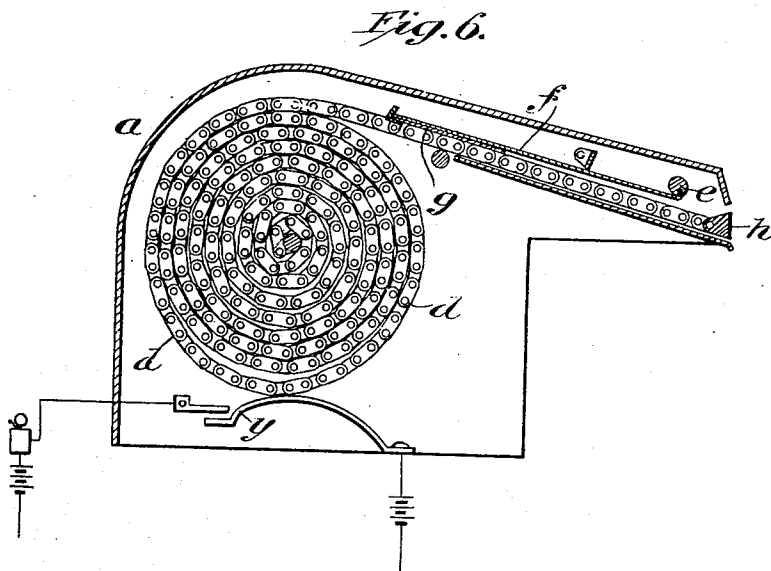
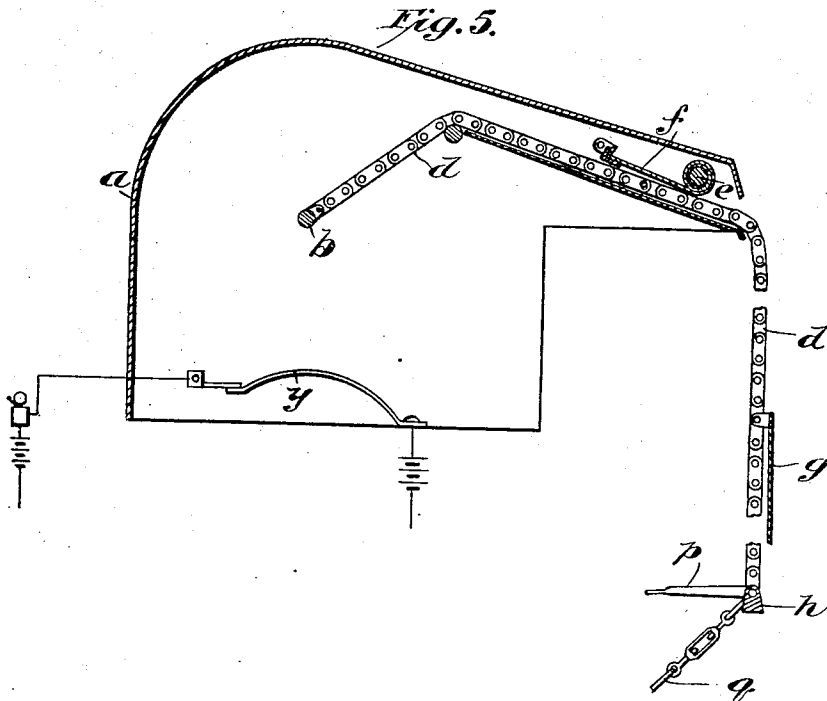
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE

EMERY LIBERTY, OF NEW YORK, N. Y.

FIRE-ESCAPE.

No. 876,004.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed April 26, 1906. Serial No. 313,735.

To all whom it may concern:

Be it known that I, EMERY LIBERTY, a citizen of the United States, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

This invention relates to a folding fire escape with which an alarm mechanism for different parts of the house is so connected that alarms will continually ring while the ladder is in position for use.

In the accompanying drawings, the preferred form of my invention is illustrated, and in the claims the characteristic features are specified.

Figure 1 is a side view of the apparatus, adjusted for the escape of the inmates of the house. Fig. 2 is a front view of the same. Fig. 3 is a plan view of the apparatus, with the top removed and in its normal or out-of-use position. Fig. 4 is a section on the plane 4-4 of Fig. 3. Fig. 5 is a section on the plane 5-5 of Fig. 3, showing the ladder unwound for use. Fig. 6 is a similar section showing the ladder wound up.

Throughout the drawings similar letters indicate similar parts.

Firstly, I desire to specify as an equivalent for a ladder any known means for permitting persons to descend without injury, such, for instance, as a rope, with or without knots, flights, steps, or friction-controlled sliding mechanism.

Within the casing *a* is mounted the reel *b*, provided with a square end *c*, or other means for turning it by hand or power. The ladder *d*, preferably consisting of links, as illustrated, is normally wound upon the reel, and the whole apparatus may be secured upon the roof of a house, as seen in Figs. 1 and 2. Preferably the casing will be placed so as not to be seen from the street, and therefore I provide means for carrying the end of the ladder over the coping and starting it downwards. For this purpose a plate *e'* is disposed in said casing under the free end of the ladder and serves as a guide and support therefor. A spring roller is disposed above said plate in said casing near the mouth thereof. A strap *f* is connected at one end with said spring roller and provided at its free end with a hook *f'*. The ladder is provided with a plate *g* and the casing is provided with a strap *g'*. When the ladder is wound up as in Fig. 6, the

strap *f* is unwound against the tension of the spring of the roller and the hook *f'* engages the ladder by the plate *g* or otherwise. When the reel is released the tension of the roller spring starts the unwinding of the ladder by winding up the strap *f* and causing the hook *f'* to pull the ladder outward over the guide plate *e'*. After the start is made the hook *f'* engages by its upper flange the stop *g'* and remains in this position, as shown in Fig. 5, until engaged and carried back by the plate *g* when the ladder is wound up on the reel. A weight *h* attached to the free end of the ladder insures the complete unwinding thereof. The reel is held from unwinding by means of the pawl *j* and ratchet *k*. The pawl is released by a rod or cord *l*, preferably incombustible, extending down through the house near the windows adjacent to the ladder, as seen in Fig. 1. I have shown the rod *l* hidden within the wall of the house and provided with short pull-ropes *m* in each chamber. Pulling any of these will raise the pawl, releasing the ratchet and therefore causing the ladder to be quickly unwound and dropped in front of the windows, as seen in Figs. 1 and 2. I provide short braces *p* at the foot of the ladder and guy-ropes *q*, in order that the foot of the ladder may be held away from the wall of the house and drawn taut and secured, as in Figs. 1 and 2.

It is desirable to prevent the rapidly unwinding ladder from stopping with a jerk when the reel is entirely unwound. There are several ways of doing this, just as there are several ways of embodying the other elements of my invention. I show, however, a simple friction-brake *r* pressed by a spring *s* and follower plate *t*, against a disk *u* carried on the shaft of the reel *b*. The follower plate *t* is screw-threaded on the shaft of the reel and the spring is of such length that when the ladder is nearly unwound, the follower plate *t* will have been screwed along the shaft to a position to press the brake-shoe *r* against the disk *u*. As the ladder unwinds further, the turning of the shaft screws the plate *t* more and more toward the brake-shoe *r*, strongly compressing the spring *s* and producing retarding friction against the disk *u*. To prevent the turning of the plate *t* with the shaft, I provide guides *r*.

After the ladder has been let down for practice, repair or inspection, and when it is desired to wind it up again, the reel is turned by hand or power, applied by a crank or other-

wise to the square end *c*. Before doing so, however, the movable stop *w* is withdrawn from the end of the pawl *j*, so as to allow the pawl to engage the ratchet. The movable stop *w* is provided to catch and engage the pawl when the pawl is raised by the releasing rod *l*, so as to keep the pawl from interfering with the unwinding of the reel. The spring *x* presses the stop *w* towards the pawl. When the pawl and ratchet mechanism are inclosed in the casing, as shown in Figs. 3 and 4, I may provide a small rod *z* projecting from the stop *w* through the casing, so that the stop may be readily moved to release the pawl *j* without requiring the opening of the casing.

As soon as the reel is released and the ladder unwinds, my automatic fire alarm rings. I place electric bells at convenient places, preferably on each floor of the building and arrange a circuit controller *y* in position to be actuated by the escape mechanism, as soon as the ladder is put in operation. In Figs. 5 and 6 I have shown this accomplished by means of the rolled-up ladder which presses against one member of the circuit controller, when completely wound up, but leaves it as soon as the ladder begins to unwind, Figs. 5 and 6.

The operation of the device as illustrated, is as follows: On pulling the rod *l* downwards, the reel is released and the ladder is free to unwind. Thereupon the spring band *f* pulls the end of the ladder violently toward the right of Fig. 6 and projects the weighted end of the ladder over the coping of the house, permitting it to fall and unwind the whole length of the ladder. The brake *r* checks the unwinding movement before the ladder is entirely unwound. The ladder then hangs in front of the windows of the building and the fire alarms are ringing to alarm the inhabitants. If there is no one below to secure the guys *q*, the first person to descend the ladder should do this, as the ladder then becomes far more rigid and easier to descend. The ladder may be wound up again on its reel, after releasing the guys *q*, in the manner already described.

What I claim is:—

1. In a fire escape the combination of a reel, means for supporting it at the top of a building, means for locking and releasing said reel, a flexible ladder adapted to be wound on said reel, alarm devices located in various parts of the building, an electric circuit connected with said alarm devices for actuating them, a circuit controller disposed adjacent to said reel and in position to be engaged by the ladder when wound on the reel, said circuit controller being released by the unwinding of the ladder and being operative to hold the circuit closed while the ladder is in position for use.

2. The combination of a reel, means for supporting it at the top of a building, a flexible fire escape ladder connected to said reel and adapted to be wound thereon, means for locking and releasing said reel, alarm devices located in various parts of the building, an electric circuit connected with said alarm devices for actuating them, means actuated automatically by said fire escape mechanism for opening and closing said circuit, said means being operative to hold the circuit open while said ladder is being wound and to hold it closed while said ladder is in position for use.

3. In a fire escape the combination of a casing, a reel disposed therein, a flexible ladder adapted to be wound on said reel, means for locking and releasing said reel, a guide plate adjacent to said reel for supporting the free end of the ladder when in folded position, a spring roller disposed adjacent to said guide plate, a flexible strap connected at one end to said roller and provided at its other end with a hook adapted to engage said ladder for starting it when the reel is released and a stop device in said casing engaged by said hook when the ladder is drawn out.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EMERY LIBERTY.

Witnesses:

WILLIAM A. PERRY, Jr.

AUGUST A. VOFREL.