E. M. BALL.
Fire-Escape.

No. 215,713. Patented May 27, 1879.

Fig. 1

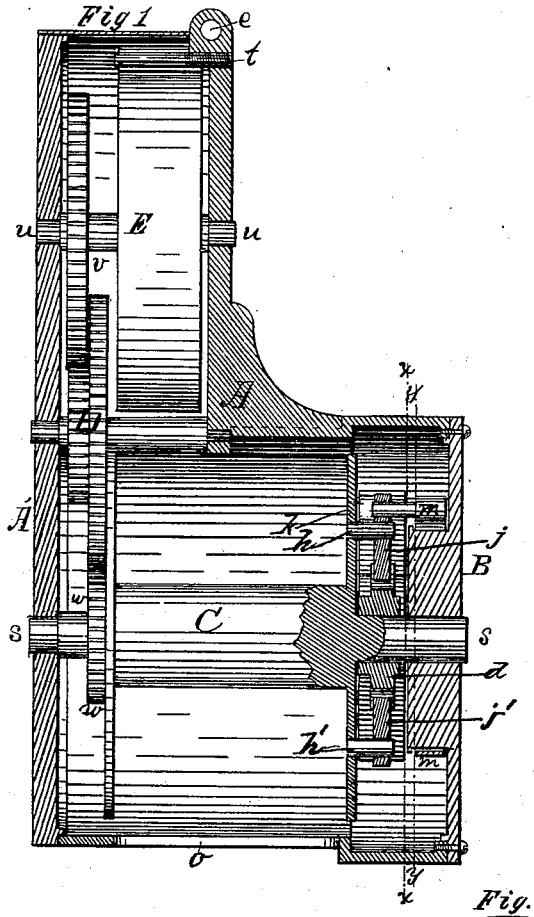


Fig. 2.

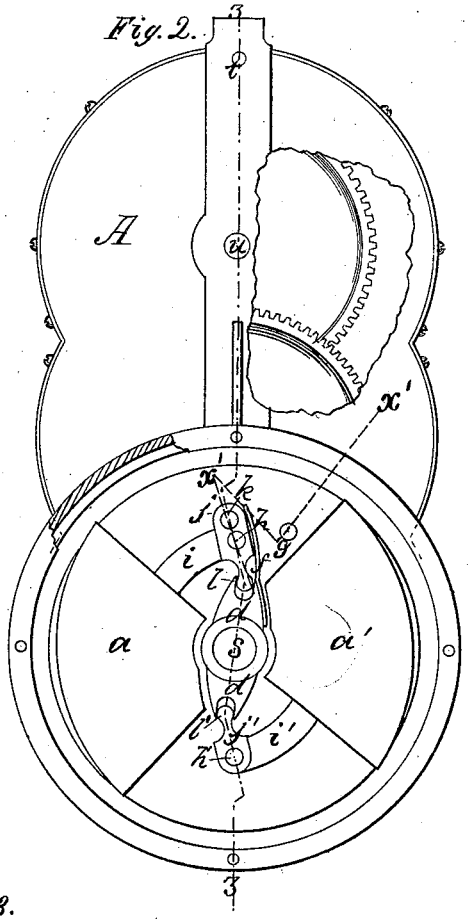


Fig. 3.

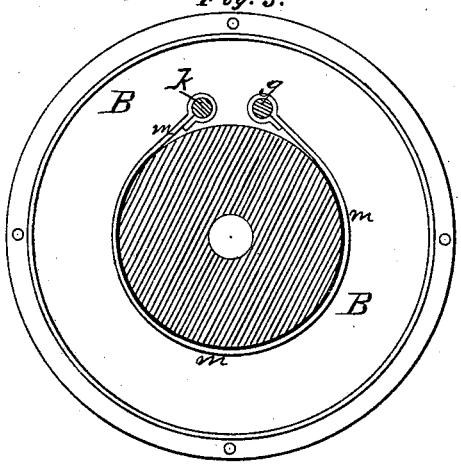
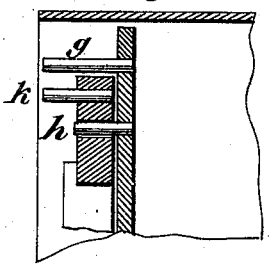


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD M. BALL, OF STANSTEAD, QUEBEC, CANADA.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **215,713**, dated May 27, 1879; application filed March 19, 1879.

To all whom it may concern:

Be it known that I, EDWARD MOSES BALL, of Stanstead, in the county of Stanstead and Province of Quebec, Canada, have invented certain new and useful Improvements in Fire-Escapes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a compact and convenient device so simple in construction as to be easily worked by any one not familiar with machinery, and which will permit the escape of any number of persons (one at a time) from a window, roof, or portico of the upper stories of buildings of any height.

It consists, first, in inclosing within a case of iron or other metal a spool (carrying a rope of sufficient strength) connected by gearing to a coiled spring, which, as the person descends, will be wound up, and thus made to serve to rewind the rope on the spool, in order that another person may take advantage of the means thus afforded for escape; second, in a metallic friction-strap brake, automatically worked by a governor, which serves to regulate the speed of descent to a sufficiently moderate degree to prevent injury when reaching the ground.

A A′ is the case; B, the cap; C, the spool; D, the intermediate double gear-wheel, and E the spring.

Figure 1 represents a vertical transverse section taken on the line *z z* of the case; Fig. 2, the cap B, a portion of the spool C, and the governor of a machine embodying my invention. Fig. 3 is an interior sectional view, taken on the line *y y*, Fig. 1, of the cap B and friction-strap *m*. Fig. 4 is a sectional view on line *x′ x′* of Fig. 2.

The case is composed of two parts, A being the cylindrical part, with the vertical ribbed plate surmounted by the eye *e*, and A′ the back, being a ribbed plate conforming in shape to the contour of the spring E, double gear-wheel D, and spool C, the plates A A′ and the cap B serving as a frame, in which are the bearings for the machinery within.

The spool C is journaled at one end in the cap B, and at the other in the back A′ of the case. Near the left-hand end of the spool-shaft *s* is mounted and securely fastened thereto a pinion, *w*, which gears with the periphery of the wheel D, the smaller wheel of which gears with the wheel *v*, mounted on the shaft *u*. The coiled spring E is hooked to this shaft in the usual manner, the outer end of the spring being attached to the pin *t* in any substantial manner.

The spool C may carry any kind of rope; but I prefer to use wire-rope composed of very fine wire. The rope should be wound on the said spool in such a manner that when unwinding the tension of spring E, by means of its connections, will be increased to the extent necessary to rewind the rope.

A person being attached to the free end of the rope, (which passes through the case by the opening *o* at the bottom of the cylindrical portion,) by means of a belt or other safe contrivance, the speed of descent is regulated by the governor, composed of the parts and operating as follows:

The weights *a a′* are rigidly connected by arms *i i′* to the heads *j j′*, respectively, which are pivoted on the pins *h h′*, screwed or otherwise secured to the contiguous flange of the spool C. The head *j* carries a pin, *k*, the said flange carrying a similar one, *g*. Inwardly-projecting knobs *l l′* enter a connecting-block, *d*, having for its axis the spool-shaft *s*, thus connecting the weight *a* with the one *a′*, making the centrifugal force of the latter to supplement that of the weight *a*. The centrifugal force generated by the motion of the spool C separates the weights *a* and *a′*, which, swinging on the pins *h h′*, causes the pins *g* and *k* to approach each other, and they, being connected to an ordinary metallic friction-strap, *m*, which encircles the inwardly circular portion of the cap B, cause the said friction-strap to be drawn closely in contact with it, creating friction, which arrests the speed of the spool C and its connections. To counteract the centrifugal force of the weights *a a′*, and prevent them acting until the requisite speed is attained, the spring *f* is provided. Said spring is secured to the connecting-block *d*, as shown in Fig. 1, its free end bearing on the head *j*. The ten-

sion or force with which the spring so bears determines the tension of the friction-strap *m*, and, consequently, the speed of descent, a stiffer spring causing the revolutions of the spool C to be more rapid.

To attach the machine to a window, roof, or portico, any desired form of grapple may be connected with the eye *e*.

I claim as my invention—

1. The combination, with the spool or cylinder C and case A B, of the weights *a a'*, connected thereto by arms *i i'*, blocks *j j'*, knobs *l l'*, and block *d*, and a frictional device, substantially as and for the purpose set forth.

2. The combination, with the spool C, case A B, and a frictional device, of the weights *a a'*, having the arms *i i'*, connected to blocks *j j'*, provided with knobs *l l'*, attached to a block, *d*, upon the shaft of the spool C, and spring *f*, attached to the block *d*, and bearing against one of the blocks *j j'*, substantially as and for the purpose specified.

3. The spring E and gears *v*, D, and *w*, acting in combination with the spool C and governor, made as described, also with the cap B, case A A', and eye *e*, the whole to operate substantially as and for the purpose stated.

4. The combination, with the inclosed weights *a a'* and spool C, to which the weights are connected by mechanism consisting of the arms *i i'*, blocks *j j'*, knobs *l l'*, and block *d*, of the pins *g k*, connected to a friction-strap, *m*, embracing an inner head upon the inclosing-case, substantially as and for the purpose set forth.

5. The combination, with the inclosed spring E, gearing with the spool C, having the block or arms *d*, of the inclosed weights *a a'*, arms *i i'*, blocks *j j'*, knobs *l l'*, spring *f*, pins *k g*, and friction-strap *m*, encompassing an inner head upon the inclosing-case, substantially as and for the purposes specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

EDWARD MOSES BALL.

Witnesses:

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WM. ONEILL.