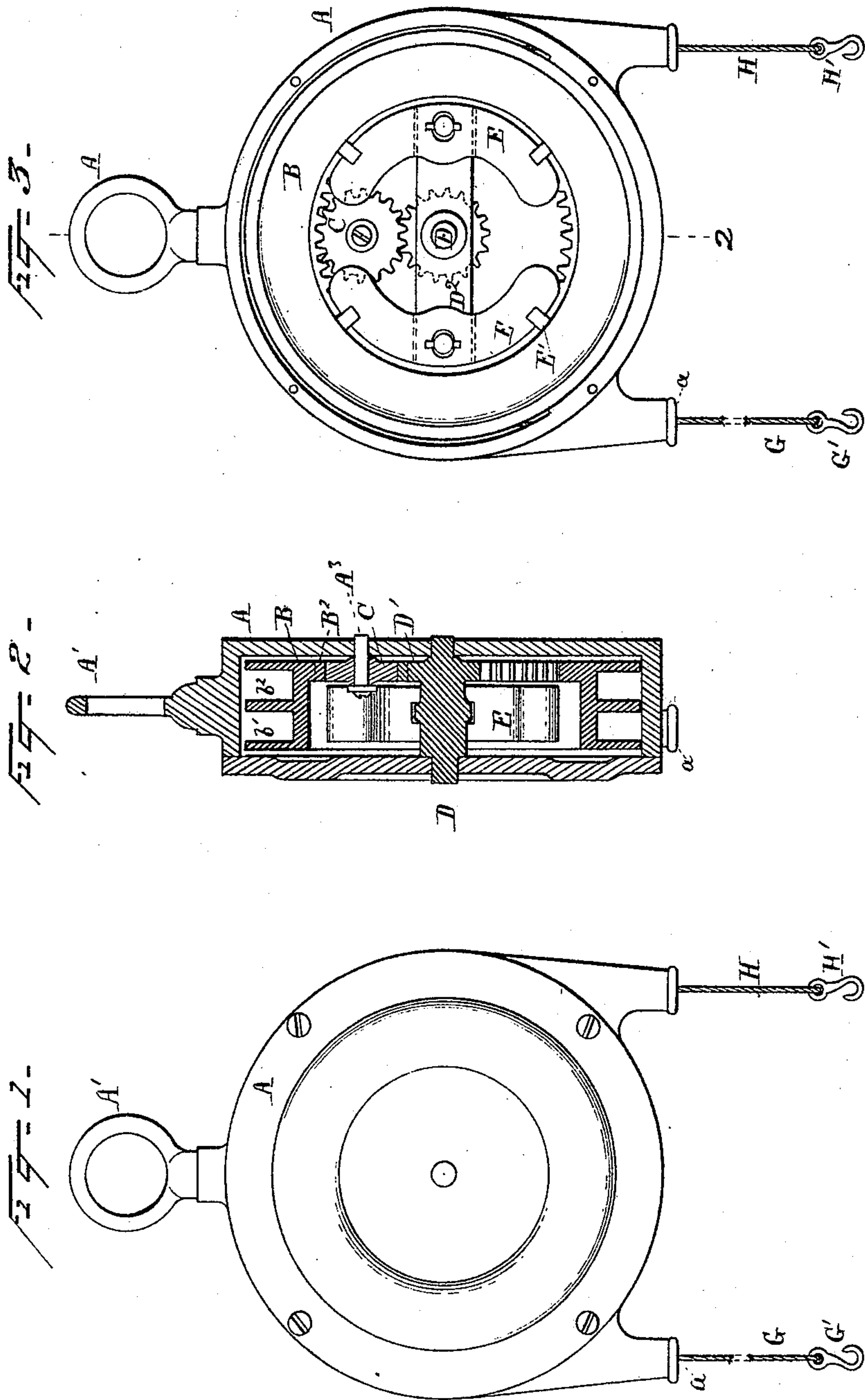


(No Model.)

J. MORAN.
FIRE ESCAPE.

No. 516,655.

Patented Mar. 20, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES MORAN, OF DUBLIN, IRELAND.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 516,655, dated March 20, 1894.

Application filed May 22, 1893. Serial No. 475,000. (No model.)

To all whom it may concern:

Be it known that I, JAMES MORAN, a subject of the Queen of Great Britain and Ireland, residing at Lower Gardiner Street, Dublin, Ireland, have invented a certain new and Improved Automatic Fire-Escape, of which the following is a specification.

The invention has reference to that class of fire-escapes consisting of an apparatus containing a coil of wire which when required for use is usually hung from a hook or other fastening in the neighborhood of a window or other opening. According to the construction of such apparatus often heretofore employed, when the wire is paid out (as in the descent of a body from a height) it must be rewound by hand, with the aid of a crank supplied for that purpose before it is again available for use. The operation of rewinding each time the wire is paid out involves labor and loss of time, and in the confusion usually attendant in the case of fire may be regarded as an impossible task, so that the fire-escape will only be used once, and only one person will be saved by it.

My invention is of the class which dispenses with all the labor and delay in re-winding. I employ a drum having reversely wound wires and a separate groove for each so that one is wound up when the other is drawn out by the descent of a person or weight, and arrange the parts so that the drum bears by its periphery in the interior of a supporting case, thereby insuring a certain amount of frictional resistance, and combine with all these provisions for generating a variable friction in the interior of the drum, increasing with the velocity of the rotation.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of the device complete. Fig. 2 is a corresponding vertical section, on line 2 of Fig. 3. Fig. 3 is an elevation with the front plate removed.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is the outer case, A' the eye whereby the apparatus is hung from a hook or other stout fixture, not shown; *a* the apertures through which the wire ropes pass from the drum, as hereinafter more fully described.

B is the rotating drum, which is provided with two grooves or channels *b'*, *b*², in which independent lengths G, H, of wire rope are oppositely coiled, their internal ends being made fast by a rivet, while they are free to be drawn out and in through the apertures *a*. Each may be provided with a suitable belt, not shown, whereby the person or other object to be lowered is clapsed. Around the interior of this drum a row of teeth B² is provided, forming an internal gear-wheel for the purpose presently described.

E, E, are governors carried loosely on arms D², whereby the speed of the rotating drum is controlled and maintained approximately constant during the paying out of one coil of wire G, and the reeling in of the other coil H, and the too rapid descent of a body thus prevented. On the outer faces near the ends of these governors I mount a strip of leather or other fibrous and frictional material E', adapted to prevent a metal to metal contact.

D is the central axis or shaft on which the arms D² are set, and on which is also keyed the pinion D' which gears with an intermediate spur wheel C turning loosely on a pin A³ set in the case, the wheel C gearing with the row of teeth B² on the inner circumference of the rotating drum B. The two coils of wire being wound in different directions, while either coil is being drawn out by the weight of a person or other object allowed to run down, the other coil of wire, less loaded or not loaded at all, is being reeled in, the drum B turning with moderate speed in one direction and the shaft D, with its frictional governors E turning rapidly in the opposite direction. Assuming that the coil G is being paid out, the drum B will rotate in the direction of the hands of a clock, while the governors under the action of the intermediate spur wheel C will rotate rapidly in the opposite direction, and being able to move slightly toward and from the center will by centrifugal force press against the inner surface of the drum and automatically check or retard its tendency to rotate too rapidly. It will be thus obvious that the speed of the drum's rotation is kept in constant check by the centrifugal action of the governors, and that while the coil G is being paid out the coil H is being wound up, and the apparatus is im-

mediately available to lower another person so soon as the person or other weight has been removed from the wire C, so that the reverse motion of the apparatus can take place.

5 From this description it will thus be seen that according to my invention the necessity of winding the cord or rope by hand is absolutely dispensed with, and the re-winding of the respective coils is accomplished auto-
10 matically, while time, which is of immense importance in cases of fire, is saved to the utmost extent.

The drum B has no contact with the shaft. The weight of the drum and of the descend-
15 ing person, or other load, is directly supported by the contact of the large periphery of the drum with the smoothly rounded interior of the casing A.

I attach importance to the fact that there
20 are two wires G, H, wound in opposite directions, lying in separate grooves b' , b^2 , in the periphery of the drum B, and that the drum is equipped to bear by its periphery so as to thereby induce considerable frictional resist-
25 ance to the rotation but not so much as is necessary to insure safety, in combination with the means for inducing a variable friction in the interior of the drum, increasing with the speed of rotation. My combination
30 allows a rapid, but not dangerously rapid, descent of the weight, and insures that a wire is in condition to commence to lower a second object or person without a moment's delay as soon as the load on the first wire has been
35 completely lowered and detached.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

40 Instead of the solid governors E, double governors may be used, similar in action but each composed of two arms swinging on the same pivot, and acting independently and pressing outward like the governors E in the other form shown.

45 I use the term "wire" to indicate a single wire, or a small wire rope or other cord of suitable size and strength. There may be provisions for slightly lubricating the surfaces. It is desired to have considerable friction be-
50 tween the large periphery of the drum B and the interior of the case A, and to have a variable friction between the interior of the drum and the leathers or other friction pieces E' on the exteriors of the governors E, the
55 amount of such resistance varying with the centrifugal force as the speed increases.

It will be obvious that my improved apparatus may be used with advantage for purposes other than cases of fire,—for instance,
60 in descending from roofs of buildings, or in descending wells, lowering goods from warehouses, and such like purposes.

I claim as my invention—

65 1. In a fire-escape, the drum B, having two circumferential grooves b' , b^2 , and two wires G, H, wound oppositely therein, the wire G in the groove b' being wound in one direction

and the wire H in the groove b^2 wound in the opposite direction, with means as the hooks G', H', for conveniently attaching a person
70 or weight to one wire and allowing its descent to revolve the drum by its gravity and draw the other wire up, in combination with an inclosing casing A arranged to support the drum by its periphery so as to offer great
75 frictional resistance to the rotation and thereby retard the motion, as herein specified.

2. In a fire-escape, the casing A, inclosed drum B supported by the contact of its periphery with the interior of the casing A so
80 as to induce much friction and reversely wound wires G, H, coiled on such drum the drum being internally geared, in combination with the central shaft D capable of independent motion, and having a pinion D', and
85 means as the intermediate gear-wheel C for causing the rotation of the drum to revolve the shaft in the opposite direction and thereby retard the revolutions of the drum, as
90 herein specified.

3. In a fire-escape, the casing A, inclosed drum B supported by the contact of its periphery with the interior of the casing A so
95 as to induce much friction and reversely wound wires G, H, the drum being internally geared, in combination with the central shaft D, capable of independent motion, and having a pinion D' with means for communicating a rapid rotatory motion thereto, in the direction opposite to the rotation of the drum
100 and arms D² and governors E carried on such arms with liberty to press outward with variable force against the interior of the drum, increasing as the velocity increases, and thus automatically regulate the motion, substan-
105 tially as herein specified.

4. In a fire-escape, two wires G, H, wound in opposite directions on a drum, which latter has two grooves b' , b^2 and is allowed to revolve, supported by the contact of its periphery with the interior of the casing A so
110 as to induce much friction means as the hooks shown for conveniently connecting a person or other weight to either one of the wires to induce rotation by the descent thereof, in
115 combination with the central shaft D capable of independent motion, provision as the gear-wheel C for communicating a different motion from the drum to such shaft, governors E, E, revolved by such shaft with liberty to
120 press outward by centrifugal force, and friction pieces E' on the outer faces of the governors adapted to be pressed outward against an inclosing surface, as the drum B, all arranged for joint operation substantially as
125 specified.

Dated the 5th day of May, 1893.

JAMES MORAN.

Witnesses:

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