

(No Model.)

N. J. POWELL.

FIRE ESCAPE.

No. 291,001.

Patented Dec. 25, 1883.

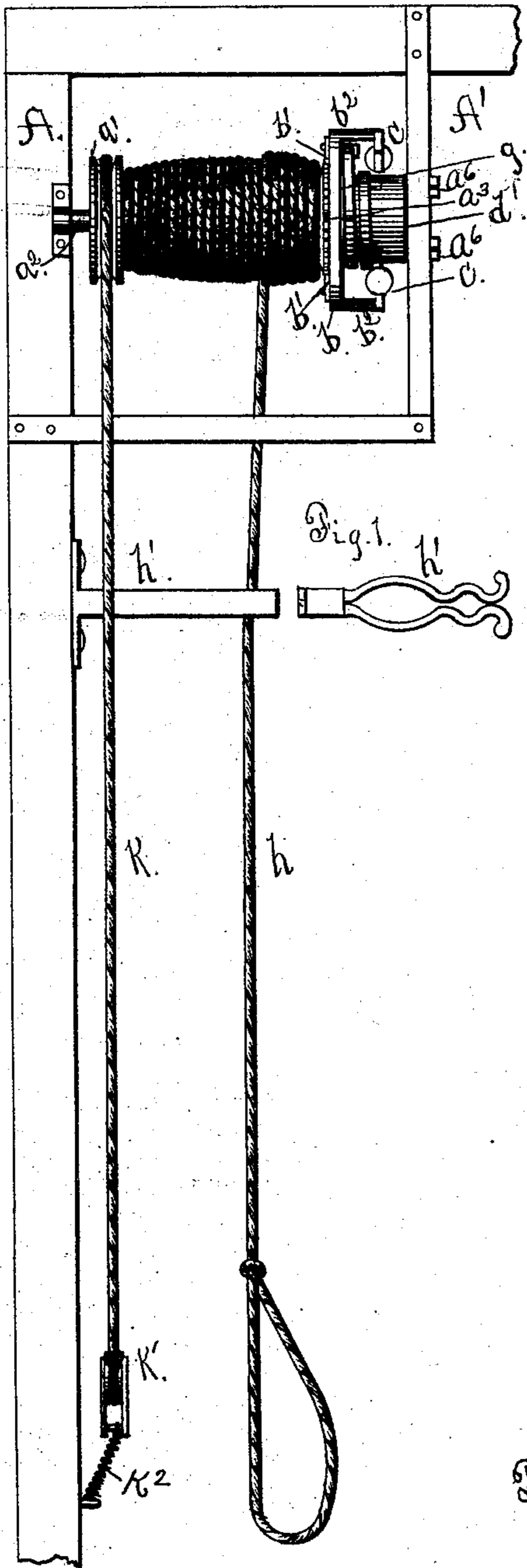


Fig. 1.

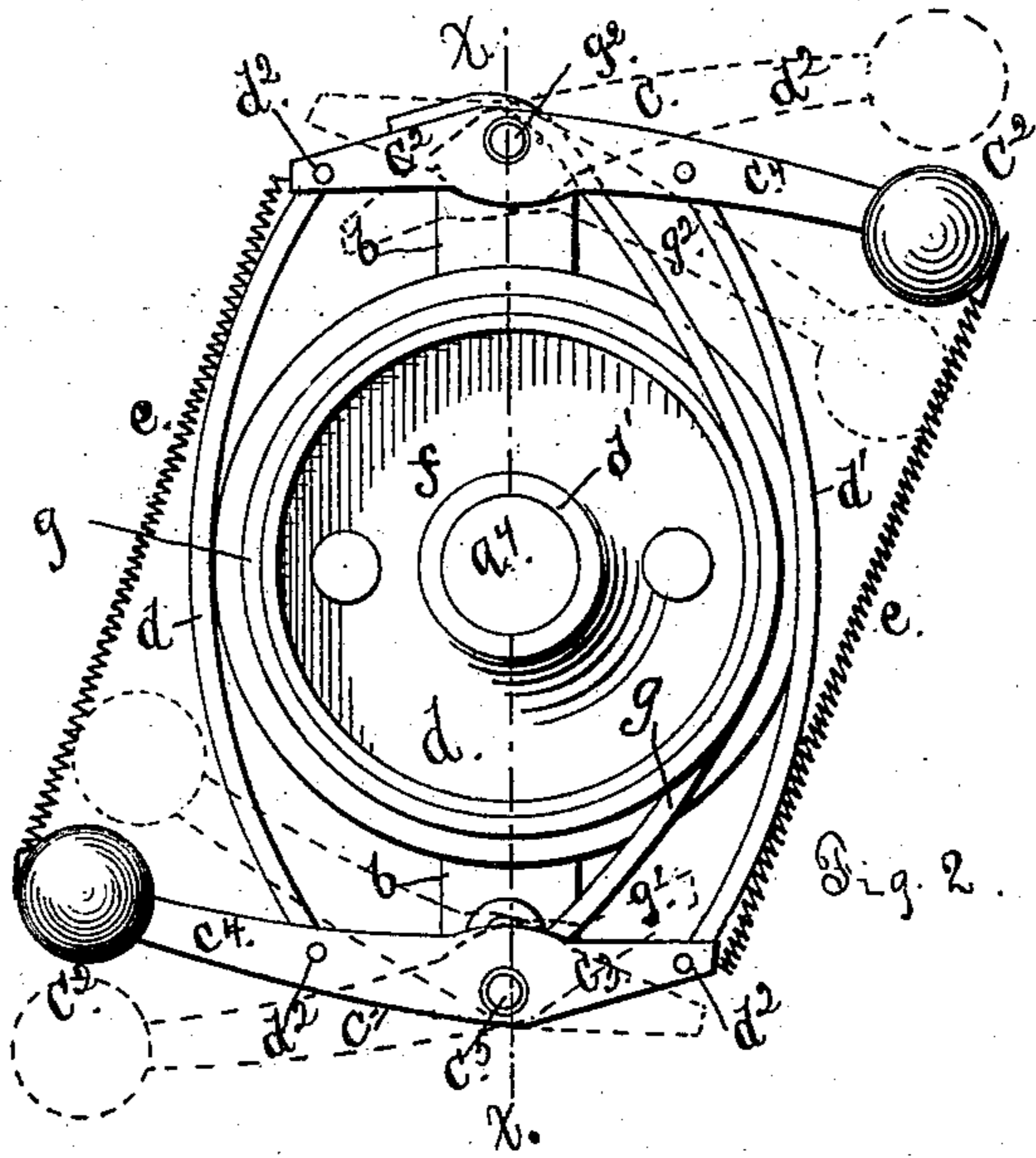


Fig. 2.

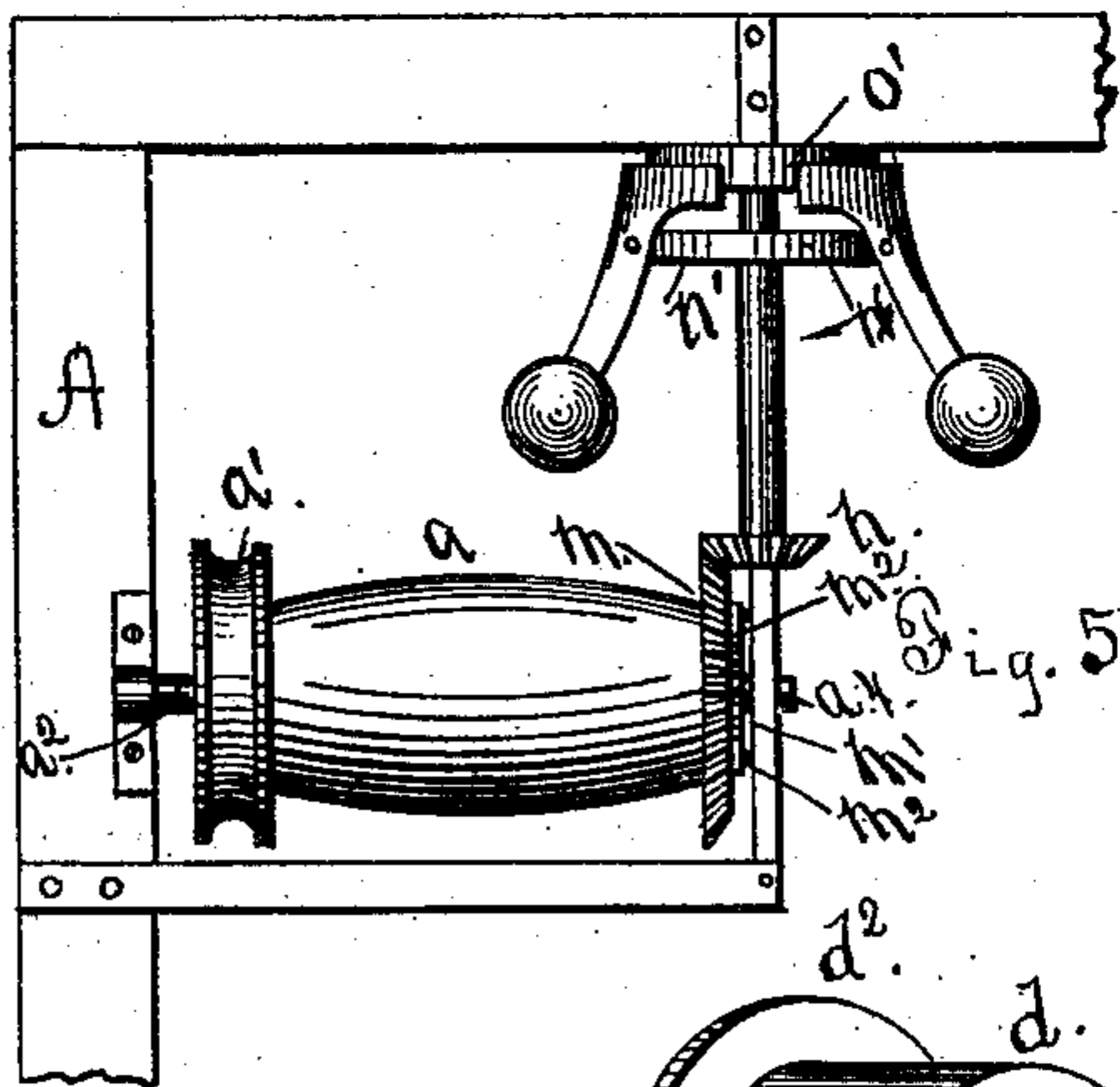


Fig. 3.

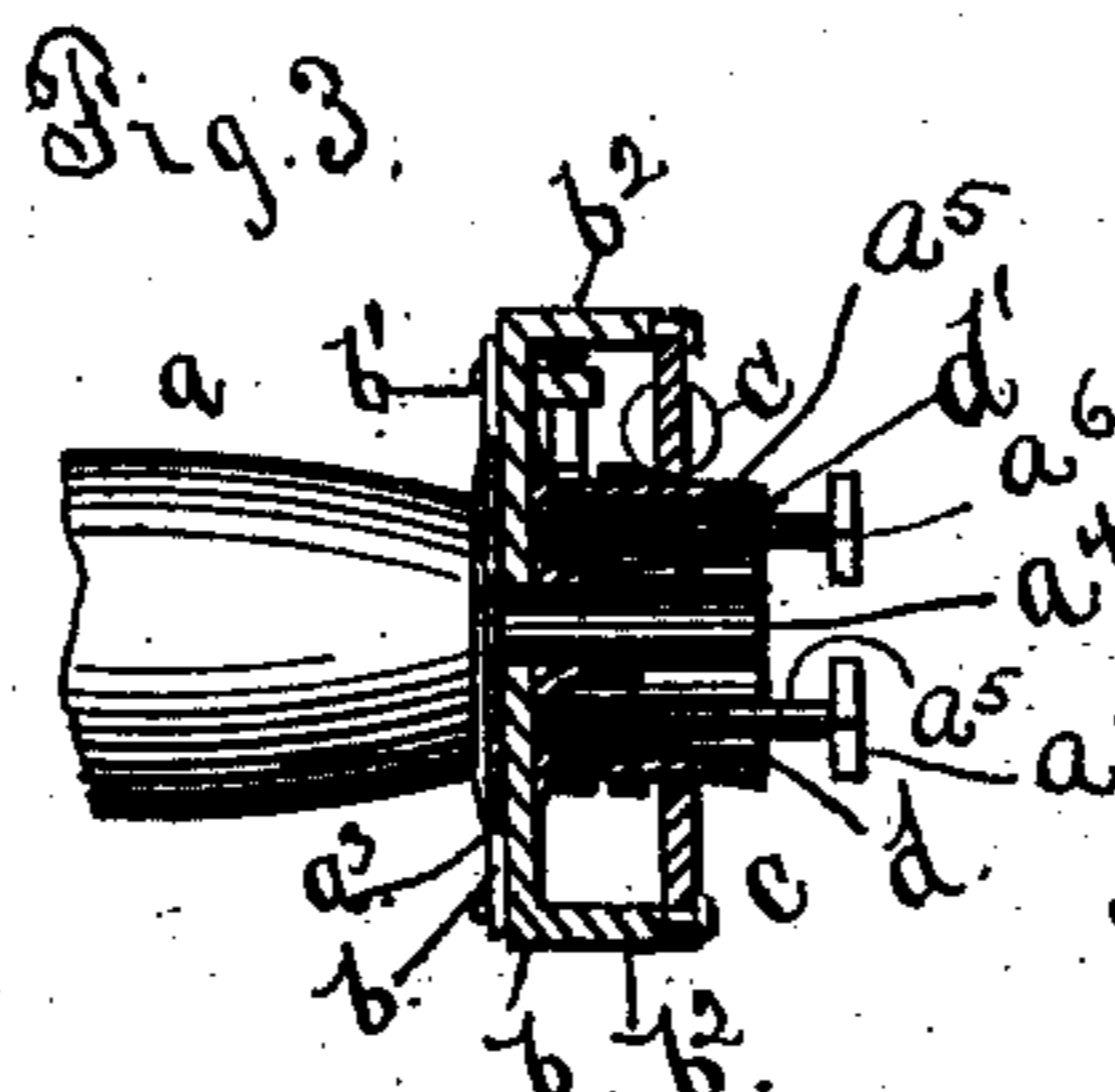
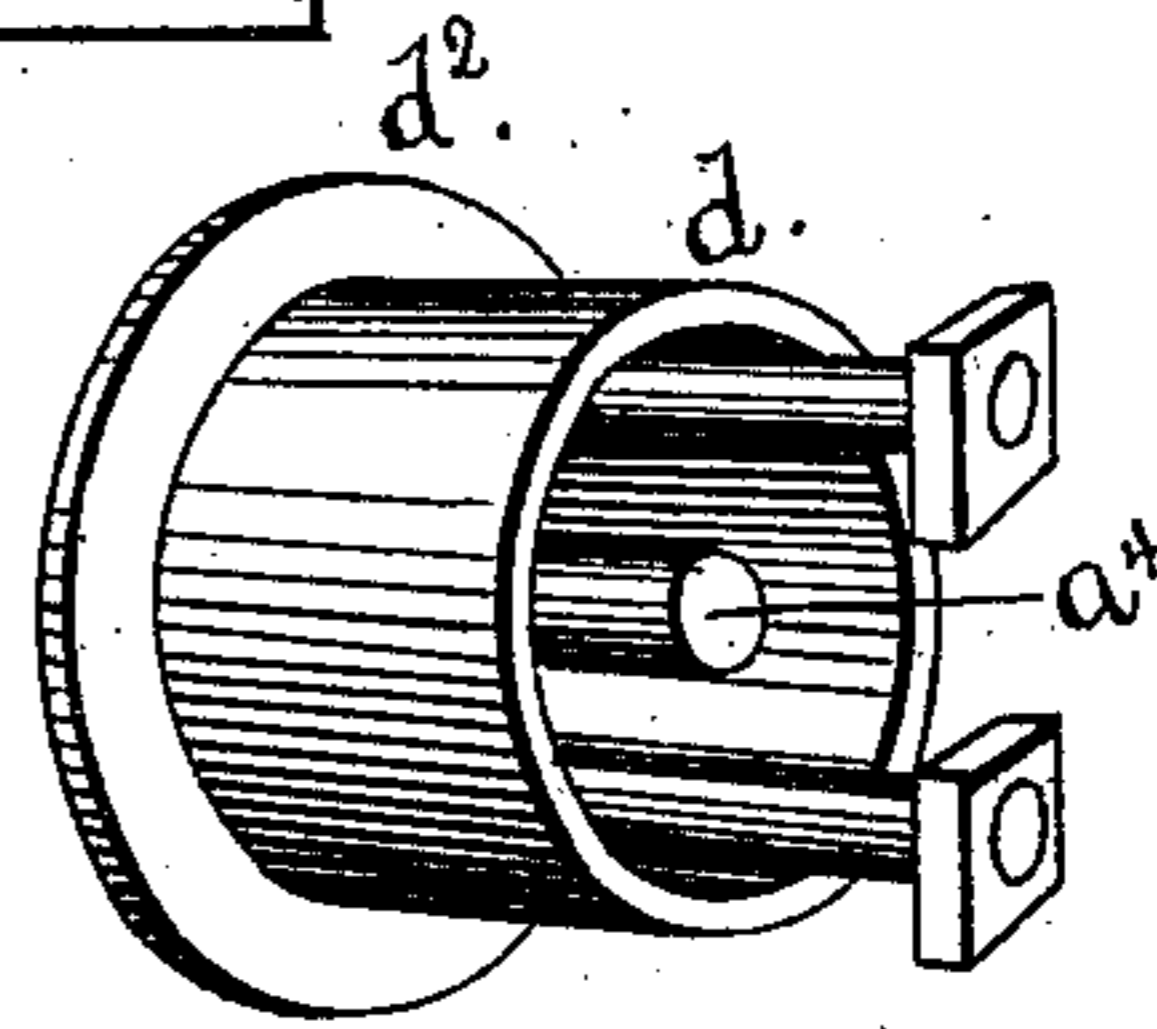


Fig. 5.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 291,001, dated December 25, 1883.

Application filed March 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, NEWMAN J. POWELL, a citizen of the United States, residing at Pontiac, in the county of Livingston and State of Illinois, have invented certain new and useful Improvements in Fire-Escapes; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to fire-escapes; and it consists in the parts which will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my fire-escape, showing it mounted in a suitable framing, which may be a part of the framing surrounding a window or a framing specially prepared for it and attached in a suitable location on the side of a house. Fig. 2 is an end elevation made on an enlarged scale, and showing governors and the manner of coupling them to the drum. Fig. 3 is a vertical section on line $x x$, Fig. 2, but made on the same scale with the devices, as shown in Fig. 1. Fig. 4 shows the drum made on an enlarged scale, and Fig. 5 shows a modification in the manner of applying the governors.

a is the roller, made slightly oval, as shown, so that the rope will more readily wind thereon in compact form.

On one end of the roller I fix a sheave, a' , and I also provide on this end a journal, a^2 , which is supported in a suitable boxing on the framing-bar A. On the other end of the roller I fix a disk, a^3 , on the periphery of which I form a series of ratchet-teeth; and I also provide the journal a^4 , which is made somewhat longer than the journal a^2 , so that the parts hereinafter described may be placed thereon.

b is a bracket placed on the journal a^4 , and turns loosely thereon. To this bracket I affix pawls b' b' , which are arranged to engage the teeth on the rim of the disk a^3 . The pawls permit the roller to turn freely in one direction without turning the bracket. When the roller is turned in the other direction, the bracket is carried around therewith.

Instead of the pawls and ratchet-teeth, a

clutch of ordinary construction could be formed on the contiguous faces of the disk a^3 and bracket b . I prefer to use the pawls as shown. The bracket is provided with the arms b^2 b^2 arranged on opposite sides of and extended outward in the same direction with the journal a^4 . On the outer ends of these bracket-arms I pivot the governors, arms, or levers c c' , on the ends of which are placed the governor-weights c^2 c^2 . The levers c c' are pivoted at points intermediate between their ends, so as to provide the shorter ends c^3 c^3 and the longer ends c^4 c^4 , on which the weights c^2 c^2 are fixed. I connect the shorter end of one lever with the longer end of the other lever by couplers d d' , which are curved slightly outward at their middle portions to adapt them to pass clear of the brake-drum hereinafter described. The couplers d d' have their ends on opposite sides of and equidistant from the pivotal centers c^5 of the levers c c , and they are held on pivot-pins d^2 d^2 . Said couplers may be made of iron or other suitable material. The governors, when pivoted and coupled together, as described, will swing freely and simultaneously on their pivotal centers, as indicated in dotted lines, Fig. 2.

In order to make more efficient operation to the governors, I employ contracting-springs $e e$, which connect the extreme or outer end of each short arm of the levers c c' with the weight on the opposite arm, as shown. The purpose of this spring is to prevent the governors from applying the brake with too great force to the brake-drum. The device works very well without the springs; but I prefer to use them, as thereby I get better results. The couplers d d' being connected to the levers c c' , as described, they make a perfect balance of the one governor against the other.

f is the brake-drum, which is provided with a central sleeve, d' , which receives and forms a bearing for the journal a^4 of the roller. The drum is provided with bolts a^5 and nuts a^6 , whereby it is made fast to the framing-bar A' and prevented from revolving. On its end next the roller it is provided with the rim d^2 , which prevents the braking-belt from coming in contact with the surface of the bracket b . The governors c c' are carried around the drum by the revolutions of the roller and bracket.

g is the brake-belt, made of any suitable material. It may be made of leather or any suitable flexible material, or it may be in the form of an endless chain consisting of a series of links pivoted or hinged together and bearing on the surface of the drum in such manner as to give the necessary friction to check the speed of the roller when required. I do not limit myself to the use of any particular kind of material out of which to make the brake-belt. The brake-belt g has one of its ends, g' , made fast to one of the arms of the bracket b , and has its other end, g'' , made fast to the governor pivoted on the opposite end of said bracket. The belt is passed once or more times around the drum. I have usually found that one complete turn of the belt around the drum is sufficient for all ordinary purposes; but it can be made long enough to go twice or more times around, if desired. The brake-belt, having one end fixed and immovable and its other end attached to the movable governor, will be drawn tight around the drum whenever the weights c^2 are thrown outward or away from each other, and whenever the weights approach the drum the brake-belt will be slackened.

h is the escape-rope. It is wound upon the roller a , and is provided on its free end with any suitable means whereby the person may hold thereto and be let down to the ground. The rope is wound by close compact folds, and is held by a clasp or tension device, h' , arranged a little way below the roller. The object of this tension device is to hold taut that portion of the rope between it and the roller, so that the said rope will wind up closely on the roller.

k is a rope put over the sheaves a' and around a small anti-friction pulley, k' , arranged a suitable distance below the roller a , and held by suitable means to the frame A .

k^2 is a spring secured to the pulley-frame k' at one end. The lower ends of said spring are secured to the frame A . This spring draws down on the pulley and maintains a tension on the rope k . By this rope k the roller a may be turned and the escape-rope wound up after having been unwound by the descent of a person to the ground.

In Fig. 5 I have shown a modified form of governors applied to the roller. A miter gear-wheel, m , is placed loosely on the journal a^4 of the roller. Just outside of this gear I fix rigidly to the journal a^4 a ratchet-disk, m' , which is engaged by pawls m^2 , pivoted on the side of the gear m . The gear m meshes with a miter-pinion, n , the shaft of which is provided with fixed arms $n' n'$, to which the governors are pivoted. The governors are provided with brake-shoes $o o$, which bear upon a fixed brake-drum, o' . I have other methods by which I connect the governors to the roller; but I prefer that method first hereinbefore described.

I have described the governors as discon-

nected from the roller, so that they will not be turned when the rope is being wound up; but this construction, while it is very desirable and gives improved results, need not be followed. The bracket b could be made fast to the end of the roller, and I have frequently made it so. In this construction the governors would revolve with the roller when the escape-rope is being wound up.

The operation of the device is very easily comprehended. If the roller a be turned with great speed, the centrifugal force will cause the weights $c^2 c^2$ to be thrown outward, which movement will tighten the brake-belts on the brake-drum, and thereby the speed of the roller will be checked. A person or weight suspended on the escape-rope will descend with a gradual and reasonably slow movement to the ground.

It will be understood also that I employ the two governors $c c'$ in order to get balanced governors and to increase the efficiency of the device. Very excellent results are obtained by using the single governor c ; but the machine does not work so perfectly as when the two are employed.

It is not always necessary that a brake-belt put round an intermediate drum should be used. Brake-shoes suitably attached to the ends $c^3 c^3$ and arranged to bear on a drum or friction surface fixed to the frame A' could be employed. I do not employ such constructions, because they are not so perfect in their operation nor so safe as the construction shown in the drawings and hereinbefore described.

I have shown the journal of the roller held in a bearing in the drum d . Instead of this, the journal a^4 could be made longer and held in a suitable bearing or boxing in the framing A' . The drum in this instance would be independent of the roller and be fixed to the framing A' by any suitable means. It will be further understood that it is not necessary that the ends $g' g''$ of the belt g be arranged on opposite sides of the drum d . The end g' could be lengthened and carried around the drum and made fast to the bracket-arm on which the governor c is pivoted.

The brake belt or shoes employed in my device are never permitted to be wholly released from the brake-drum. The construction is such that slight friction may be maintained at all times when the roller is in motion. I sometimes employ a small device which aids in maintaining this constant friction; but I have not shown this device in my drawings, as it is of ordinary construction.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the roller, of a ratchet-disk fixed to the end thereof, support or bracket placed loosely on the journal and against the end of the roller, pawls pivoted to the bracket and engaging with the teeth on the ratchet-disk, a governor pivoted to the bracket, a brake mechanism connected to the

governor, and a fixed brake-drum, substantially as set forth.

2. The combination, with the roller, a bracket placed at the end of the roller and extended
5 on opposite sides of the journal thereof, and a fixed braking-drum or friction-surface, of the governors $c c'$, pivoted on the opposite ends of the bracket, couplers pivoted to and on opposite sides of the pivotal centers of the govern-
10 ors, whereby the latter are balanced, the one against the other, and a brake mechanism connected to the said bracket and governors and adapted to bear upon the fixed braking-drum, substantially as set forth.

15 3. In a fire-escape, the combination, with the governors $c c'$, arranged on opposite sides of the journal of the roller and supported on

pivots placed intermediately between their ends, and the couplers $d d'$, pivoted to and on opposite sides of the pivotal centers of the
20 governors, of the tension-springs $e e$, arranged to operate as and for the purpose set forth.

4. The combination, with the roller having a sheave, a' , the escape-rope h , and an anti-friction pulley, k' , and spring k^2 , of a winding-
25 cord, k , and clasp h' , all arranged to operate as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

NEWMAN J. POWELL.

Witnesses:

P. B. TURPIN,
R. W. BISHOP.