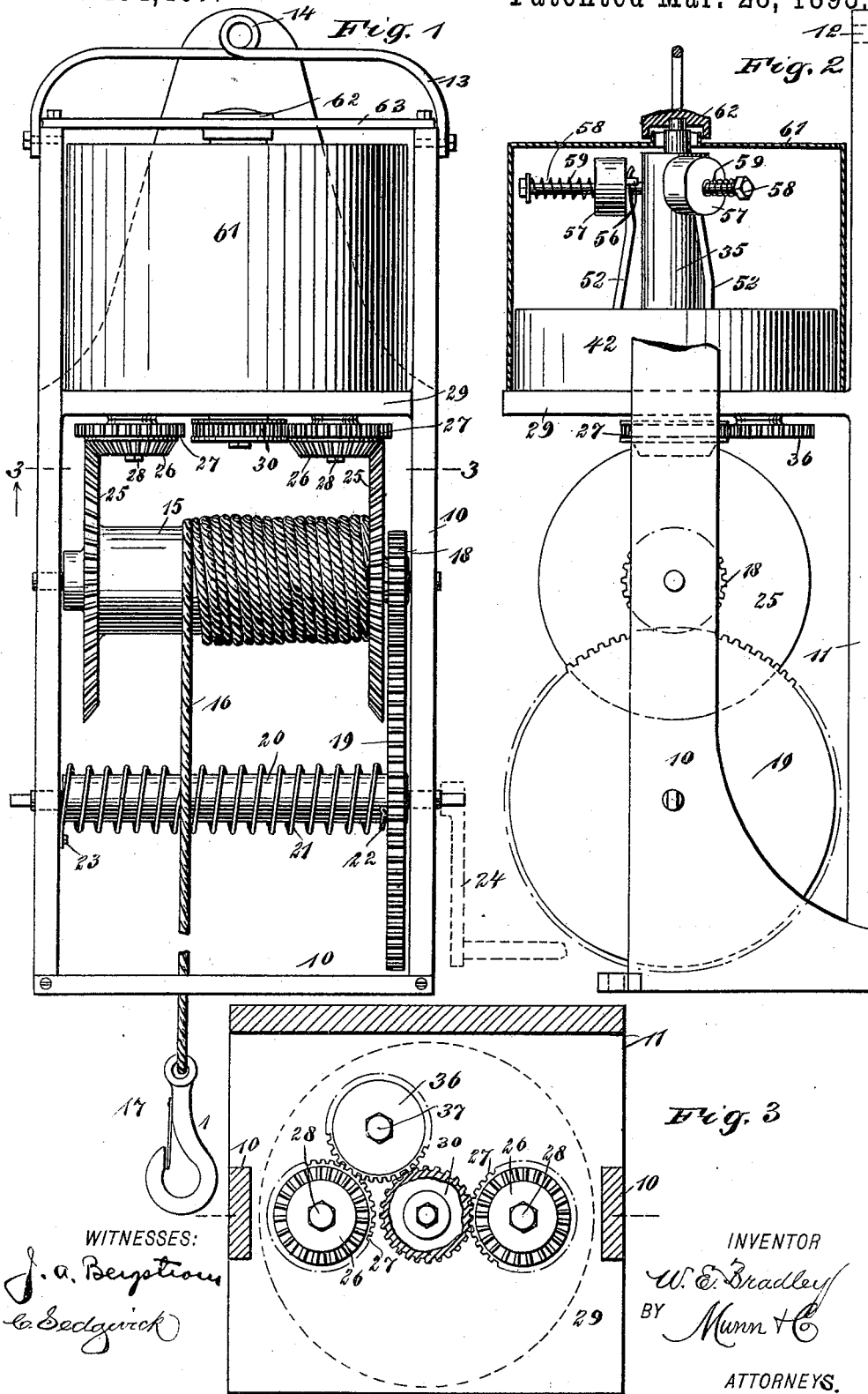


W. E. BRADLEY.
FIRE ESCAPE.

No. 494,407.

Patented Mar. 28, 1893.



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Fig. 4

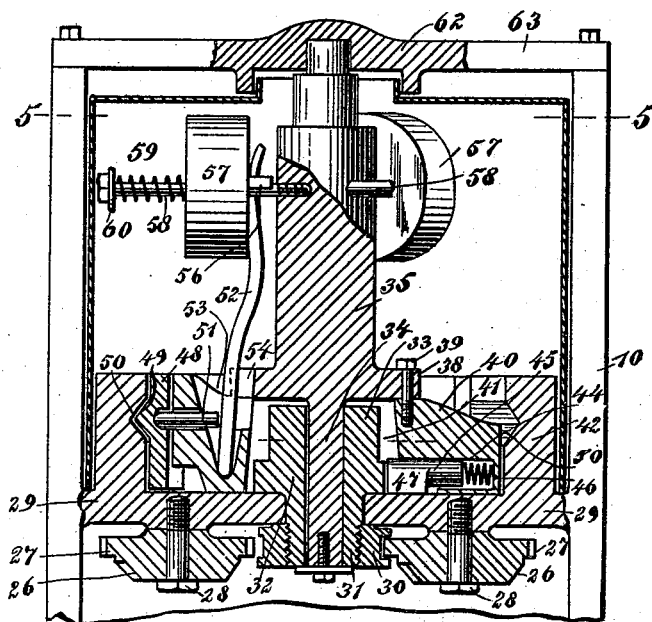


Fig. 5

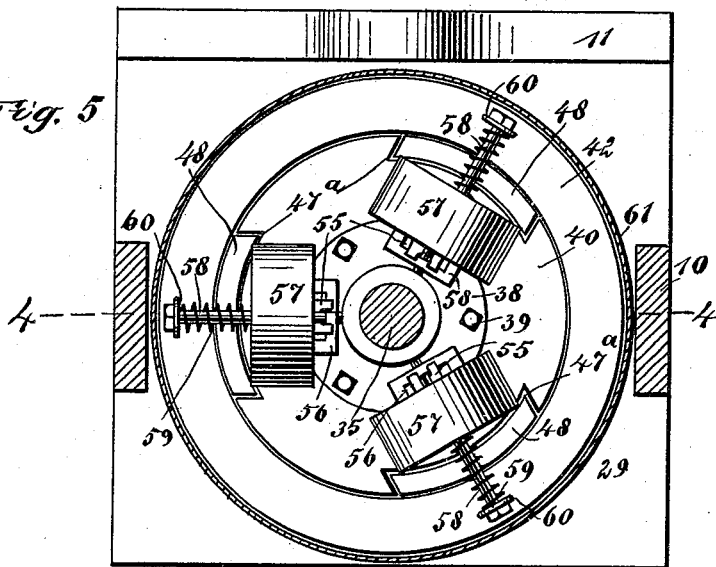
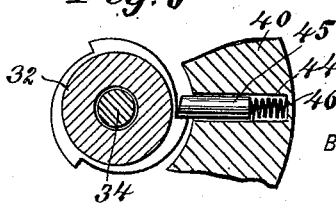


Fig. 6



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM E. BRADLEY, OF MIDDLETOWN, NEW YORK.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 494,407, dated March 28, 1893.

Application filed May 31, 1892. Serial No. 434,950. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. BRADLEY, of Middletown, in the county of Orange and State of New York, have invented a new and
5 Improved Fire-Escape, of which the following is a full, clear, and exact description.

My invention relates to improvements in fire escapes, and the object of my invention is to produce a light and portable, but extremely strong device which may be quickly and firmly fastened upon a support adjacent to a window or other opening in a building, which will permit a person or other load to be safely, quickly and automatically lowered to the ground, which will automatically wind up the lowering cable after it has been once used, which may be used a great many times in succession without injury, and which is constructed with certain of its parts in duplicate,
15 so that if by any possibility a portion of the mechanism should break, the remaining portion would cause the device to operate nicely.

To these ends my invention consists in certain features of construction, and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate
30 corresponding parts in all the views.

Figure 1 is a front elevation of the fire escape embodying my invention. Fig. 2 is a broken side elevation with parts in section. Fig. 3 is an inverted sectional plan of the top gear mechanism on the line 3—3 in Fig. 1.
35 Fig. 4 is an enlarged vertical section of the brake and ratchet mechanism on the line 4—4 in Fig. 5. Fig. 5 is a sectional plan on the line 5—5 of Fig. 4; and Fig. 6 is a detail sectional
40 plan of the connection between the ratchet wheel and the brake pulley.

The machine is provided with a suitable frame 10 which has a rigid back 11, this being reduced at the top and provided with a hole
45 or eye 12, which enables it to be suspended from a spike or other support, and the frame is also provided with a top bail 13, having a central eye 14, so that it may, if desired, be conveniently suspended upon a crane which
50 may be hung adjacent to a window.

Journaled transversely in the frame 12 is a winding drum 15, upon which is wound a ca-

ble 16, which should be long enough to reach from the top of a tall building to the ground, and this cable terminates at one end in a hook
55 17, which may be secured to any convenient harness adapted to carry a person or other load, but it will be understood that any fastening device or car may be used in connection with the cable.

On one end of the winding drum 15 is a pinion 18, which meshes with a gear wheel 19, carried by a shaft 20, which is journaled below and parallel with the drum 15, and the shaft 20 has coiled thereon a spring 21, one
65 end of which is secured to the shaft as shown at 22, and the other end to the frame as shown at 23 in Fig. 1. By this arrangement when the cable 16 is unwound the gear connection with the shaft 20 causes the shaft to turn in
70 a direction to tighten the spring 21 and when the weight is removed from the cable, the resistance of the spring rewinds the drum and cable.

A crank 24 may be provided for the shaft
75 20, as shown by dotted lines in Fig. 1, so that in case the spring should break, the shaft may be rewound by hand. The drum 15 is provided at each end with a bevel gear wheel 25, and these gear wheels mesh with bevel
80 pinions 26 above them, the latter being formed integral with gear wheels 27, which are journaled on bolts 28, secured to the under side of a partition or rib 29, which extends transversely across the frame 10. One
85 of the gear wheels 27 meshes with a central gear wheel 30 which has side flanges to increase its strength and which is screwed upon the elongated lower end 31 of the hub of a ratchet wheel 32 which wheel turns on the
90 upper side of the partition 29, and has its hub arranged to project through the same. The ratchet wheel has also an upwardly-extending cylindrical hub portion 33, and it is held loosely to a spindle 34 formed on the
95 lower end of a vertical shaft 35 which is journaled above the partition 29. The opposite gear wheel 27 engages the gear wheel 30 by means of an intermediate gear 36, as shown
100 in Figs. 2 and 3, this gear wheel being journaled on a bolt 37 which is secured in the partition 29. The object of the intermediate gear wheel is to enable both the gear wheels 27 to transmit motion in the right direction

to the gear wheel 30 and it will be seen that if either one of the gear wheels 25 or either of the gear wheels 26 or 27 should be broken, the connection with the winding drum at the opposite side of the machine would still permit the device to work successfully. As a result it will be seen that the danger of accident is reduced to a minimum.

The vertical shaft 35 has near its lower end an annular flange or collar 38 which is secured by means of bolts 39 to a horizontally revoluble brake pulley 40 and the latter has a central bore 41 large enough to receive the ratchet wheel 32 and the upper end of its hub. This brake pulley is held to turn within an annular vertical flange 42 which is formed integral with the partition 29 and on the upper side of the same.

The pulley 40 has radial recesses 44 opening from its inner bore 41 and in these are held pawls 45 which are normally pressed inward by springs 46, so as to engage the teeth of the ratchet wheel 32, and the pawls have flat under sides 47 which rest upon the partition 29 and serve as guides to enable the pawls to run smoothly to place.

In the circumference of the brake pulley 40 are vertical recesses 47^a in which are held brake shoes 48 which have on their outer faces, ribs 49 of triangular cross section which fit into corresponding grooves 50 in the inner side of the flange 42. The ribs thus serve as guides to hold the brake shoes in place and they also give an increased surface for friction. The brake shoes 48 are held in the recesses, as described and they are also connected with the brake pulley by pins 51 which extend through the outer portion of the pulley and into the shoes, as shown clearly in Fig. 4.

A series of nearly vertical arms 52 are held in vertical recesses 53 in the brake pulley 40 and are adapted to swing into slots 54 in the collar 38 of the shaft 35, these rods terminating at their upper ends in forks 55 which are held in keepers 56 on the weights 57 and the forks also span the bolts 58 which are screwed into the shaft 35 and radiate therefrom, and which form suitable supports for the weights. The weights 57 are placed circumferentially around the shaft 35 and are held to slide loosely on the bolts 58, the weights being normally pressed inward by spiral springs 59 which are held between the outer faces of the weights and washers 60 on the outer ends of the bolts. The weights will thus be held normally inward but when the shaft 35 gets to running at too great speed, the weights are thrown outward by centrifugal force and they carry with them the arms 52 which are arranged directly opposite the pins 51 and which by striking on the pins force the brake shoes 48 against the flange 42, thus decreasing the speed of the machine.

The entire top mechanism of the machine, that is the parts which are held above the partition 29, are covered by a case 61 which protects them from the weather. The upper end

of the vertical shaft 35 is journaled in a thickened cap-like portion 62 of a cross piece 63 which is secured to the top of the frame 10.

The operation of the device is as follows: When the fire escape is to be used it is suspended at some convenient point and the person or weight to be lowered is fastened by any suitable means to the hook 17 on the cable 16 and if it is a weight it is dropped, or if it is a person who is to be lowered, the person steps boldly out of the window or from the building top, as the case may be. The weight on the cable 16 will cause it to unwind and to revolve the drum 15 which acting on the shaft 20 by means of the connecting gear mechanism will tighten the spring 21, as already described. The movement of the drum will also, through the gear wheels 25, 26, 27, 36 and 30, transmit motion to the ratchet wheel 32 and the latter by means of the pawls 47 will turn the brake pulley 40 and the shaft 35. If, during the descent the speed becomes too great, the centrifugal force will carry out the weights 57 as previously described and throw the brake shoes 48 against the flange 42, thus slackening the speed of the machine. When the person or weight has reached the ground and the hook 17 is detached, the reaction of the spring 21 will wind up the cable, as already described, and during this backward movement the pawls 47 will slide freely over the ratchet wheel 32 so that the brake pulley 40 and the mechanism above will not turn and there will be no excessive friction to prevent the easy winding up of the drum.

It will be noticed that the movable weights 57 and their connected arms 52 act as a governor which controls the brakes and in the claims I shall allude to the said parts as a governor.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a fire escape, the combination with a winding drum, and a governor, of a brake pulley connected with the governor, brake shoes carried by the brake pulley and operated by the governor, and means for operating the governor and brake pulley from the winding drum, substantially as described.

2. In a fire escape, the combination with a winding drum, and a governor, of a brake pulley connected with the governor, brake shoes carried by the brake pulley, means for operating the brake shoes from the governor, and a gear and ratchet connection between the winding drum and the brake pulley, substantially as described.

3. In a fire escape, the combination with a vertical shaft carrying a governor, and a winding drum, of a brake pulley connected with the brake shaft, brake shoes carried by the brake pulley and provided with projecting pins, arms engaging the governor weights and the pins of the brake shoes, and a gear and ratchet connection between the winding

drum and the brake pulley, substantially as described.

4. In a fire escape, the combination with a vertical shaft, and sliding and spring pressed weights carried by the shaft, of a brake pulley connected to the shaft and provided with vertical recesses, brake shoes carried by the said pulley and provided with pins projecting into the recesses of the brake pulley, arms projecting into the recesses of the brake pulley and having their upper ends engaging the said weights, and means for operating the brake pulley, substantially as described.

5. A fire escape comprising a frame having a winding drum journaled therein, a cable carried by the drum, a vertical shaft journaled adjacent to the drum, a ratchet wheel journaled loosely on the vertical shaft and connected by a gear mechanism with the drum, a brake pulley held to encircle the ratchet wheel and connected with the vertical shaft, pawls carried by the brake pulley and held to engage the ratchet wheel, brake shoes carried by the brake pulley and adapted

to move outward against a fixed support, outwardly moving weights carried by the vertical shaft, and an operative connection between the weights and the brake shoes, whereby the latter will be actuated by the movement of the weights, substantially as described.

6. In a fire escape, the combination of the frame, the winding mechanism, the vertical shaft having a ratchet connection with the winding mechanism, the brake pulley carried by the shaft, the outwardly-moving brake shoes carried by the brake pulley and held to abut with a fixed support, radially-extending pins extending through a portion of the brake pulley and connected with the brake-shoes, radially moving weights carried by the vertical shaft, and arms connected with the weights and adapted to strike the brake shoe pins, substantially as described.

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Witnesses:

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EDWARD M. CLARK.