O. SCHNITZLER & B. J. WELAGE.

FIRE ESCAPE.

APPLICATION FILED MAY 12, 1913.

1,106,588.

Patented Aug. 11, 1914.

2 SHEETS—SHEET 1.

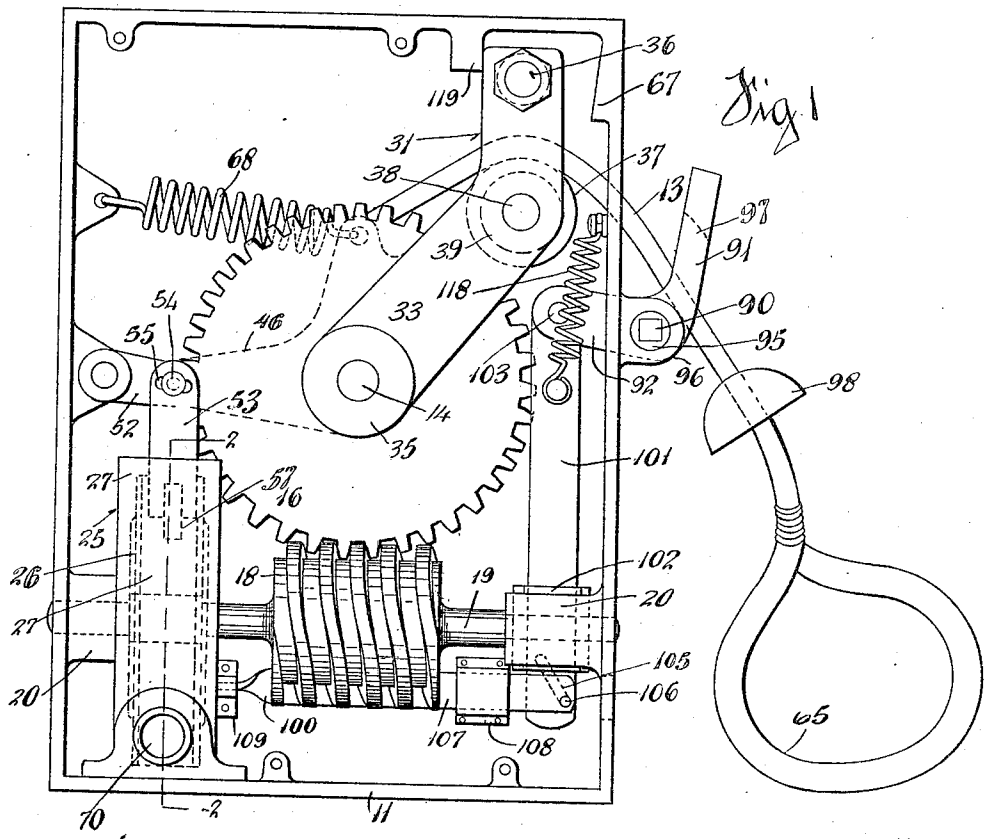


Fig. 1

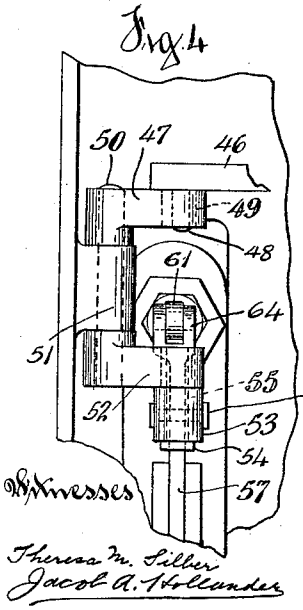


Fig. 4

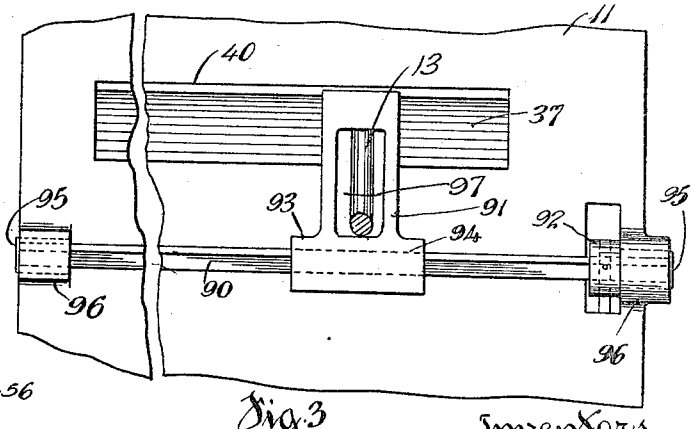


Fig. 3

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

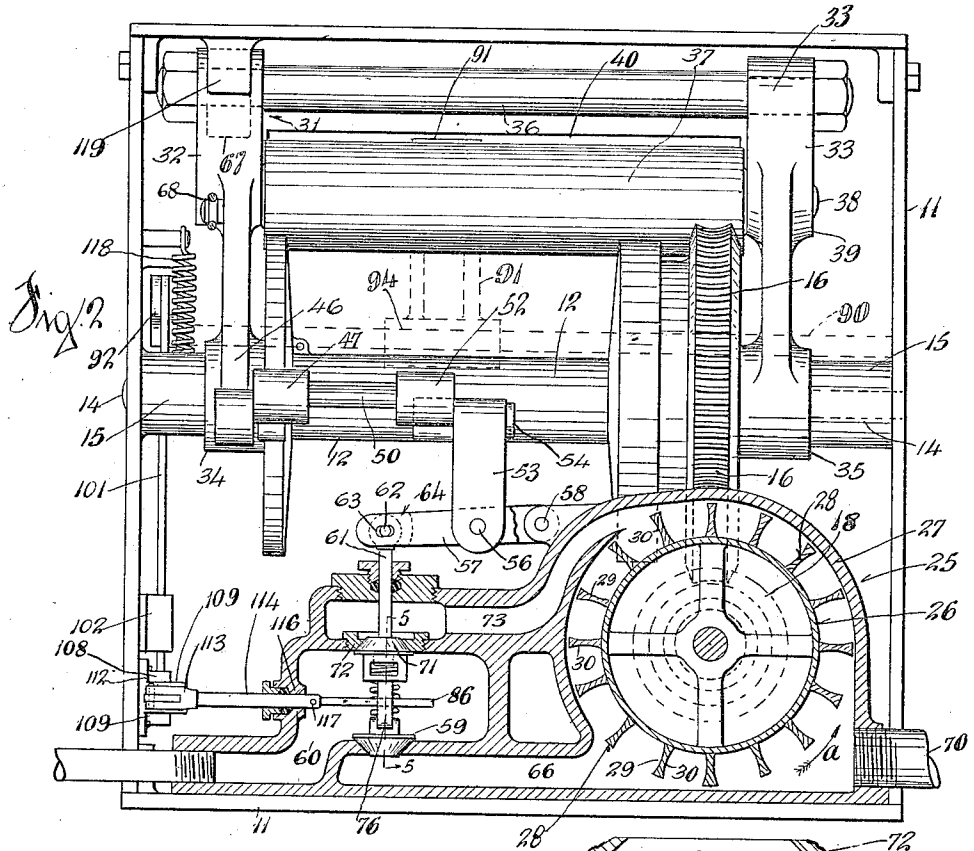


Fig. 6

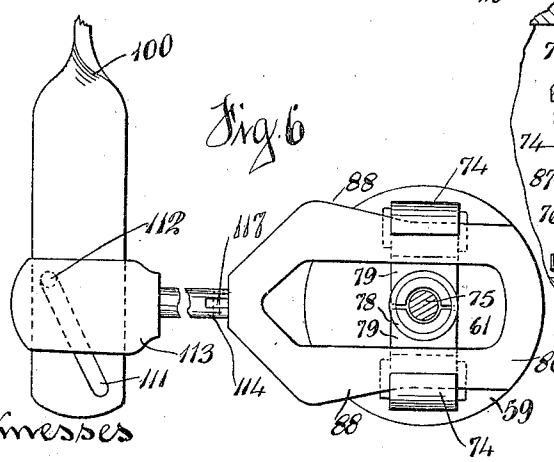
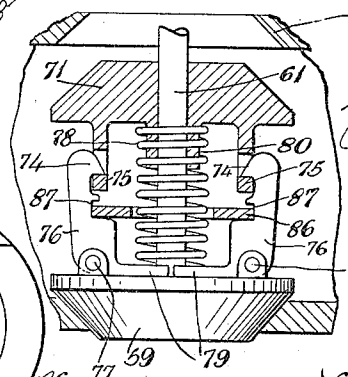


Fig. 5



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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

1,106,588. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed May 12, 1913. Serial No. 767,208.

To all whom it may concern:

Be it known that we, OSCAR SCHNITZLER and BERNARD J. WELAGE, citizens of the United States, residing, respectively, at Remington and at Norwood, in the county of Hamilton and State of Ohio, have jointly invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

Our invention relates to fire escapes, and has for its object the provision of new and useful improvements whereby the escaping movement in the fire escape is initiated by the weight of the person using the same; further in improved means for returning the mechanism to initial position upon release of the user, and the invention will be further readily understood from the following description and claims, and from the drawings, in which latter:

Figure 1 is an end view of our improved device, with the end wall of the case removed. Fig. 2 is a rear elevation of the same, showing the rear wall of the case removed, and the fluid motor and its valves in section on the line 2—2 of Fig. 1. Fig. 3 is a detail in front elevation, showing the mechanism at the opening for the rope. Fig. 4 is a plan detail of the valve-operating means. Fig. 5 is a vertical section of the valves on the line 5—5 of Fig. 2, showing the valves in connected relation; and, Fig. 6 is a plan detail of the same.

11 represents the case of our improved device, which may be of suitable construction and is adapted to house the mechanism.

12 is a drum on which the cable 13 is arranged to be wound. The drum rotates on a shaft 14, supported in bearings 15 in the case.

A worm-wheel 16 is arranged to rotate with the drum, and is secured thereto in suitable manner. A worm 18 coöperates with the worm-wheel. It is rigid on a shaft 19 journaled in bearings 20 of the case. A fluid-motor 25 is arranged to operate the worm, the rotor 26 thereof being fast on the shaft 19. The rotor 26 rotates in a suitable casing 27, which has suitable inlet and discharge openings. We have shown the rotor as arranged to operate in both directions and provided with blades 28 having impact faces 29, 30, the impact faces 29 being impacted when the rotor rotates in the direction of the arrow *a* and the impact faces 30 being impacted when the rotor rotates in the opposite direction.

The fluid-motor is arranged to control the rotation of the winding drum, preventing a too rapid descent of the person using the fire escape and also causing a positive feed of the cable in the escaping operation. We have provided automatic means for initiating the rotation of the drum through the medium of the fluid-motor. Thus 31 is a rocker frame which comprises the end-pieces 32, 33, respectively having bearings 34, 35, about the shaft 14, and connected by a tie-rod 36. An idler roll 37 has its trunnions 38 mounted in bearings 39 of said end-pieces, this idler roll receiving the rope thereabout and directing it to an opening 40 in the frame extending lengthwise of the drum. The rope is fed through this opening from the drum.

The end-piece 32 has an arm 46 extending therefrom. This arm has articulation with an arm 47, the articulation being shown as comprising a pin 48 on the arm 46 received in a slot 49 in the arm 47. The arm is rigid on a rock-shaft 50 journaled in a bearing 51 in the frame. An arm 52 is rigid on the rock-shaft. The arm 52 has articulation with a link 53, shown accomplished by a pin 54 on the arm 52 received in a slot 55 in the link. The link 53 has articulation, shown at 56, with a link 57 pivoted at 58 to the motor casing. The link 57 operates a valve 59 in a fluid inlet passage 60 communicating with the motor, shown accomplished by a stem 61 on the valve, the stem having articulation, shown as a pin 62, on the stem received in slots 63 in the fork-end 64 of the link 57.

The cable is provided with a suitable suspending device for the user, shown as a loop 65. When the weight of the user is received by the loop, there will be a rocking of the rocker-frame 31, caused on account of the weight being applied to the idler roll 37, causing said rocker-frame to rock on the shaft 14, and raising the arm 46, which, through the medium of the connections described, operates the valve 59, whereby fluid, such as water or other suitable fluid, is received from the fluid inlet passage 60 into the inlet-port 66 of the motor, whereby the motor is operated and the drum caused to revolve, little power however being required

to revolve the drum by reason of the tendency of the weight of the user to unwind the cable by the presence of his weight, the motor and worm and worm-wheel mechanism however, preventing any undue speed of descent of the user and controlling the descent by the speed of the motor. The movement of the rocker-frame is limited, as by a stop 67 against which the rocker-frame is arranged to strike.

If desired, the mechanism may be provided with means for automatically returning the cable to the drum so that the device may be used over and over again for subsequent escapes. For accomplishing this we provide means whereby the rotor of the fluid-motor has rotation in opposite direction imparted thereto and provide the valve mechanism with a valve control for feeding the fluid to the motor in directions to accomplish its opposite rotation, the valve mechanism being controlled in part by the rocker-frame.

The rocker-frame is normally retracted by a spring 68 for normally closing the valve 59. A valve 71 acts in opposition to the valve 59 and coöperates with the valve-seat 72 in the inlet passage 60, for forming communication with the inlet-port 73 of the motor, the inlet-port 73 being located for causing the fluid passing therethrough to impact the faces 36 of the rotor blades for turning said rotor in opposite direction. The fluid is discharged through an outlet-passage 70. The valves 59 and 71 are normally in separated relation, but means are provided for bringing them into connected relation upon operation of the rocker-frame in the escapement movement. Thus catches 74 on one of the valves cooperate with keepers 75 on the other of the valves for releasably connecting said valves. The catches are shown on levers 76 pivoted at 77 to the valve 59, the keepers being shown on lugs extending from the valve 71. A spring 78 normally causes separation of said valves and is shown received about the valve-stem and as resting on the heels 79 of said levers. The valve 71 has a bearing 80 about the valve-stem and is movable lengthwise thereof.

The valves 59 and 71 are normally in separated relation for closing their respective valve-seats. When the rocker-frame is operated for opening the valve 59, this valve is raised toward the valve 71, and the catches 74 are caused to make connection with the keepers 75 for the purpose of opening the valve 71 when the valve 59 is again seated. The seating of the valve 59 is caused by the retraction of the rocker-frame due to the spring 68, when the weight is released from the cable, the tension of the spring being such that it will retract the rocker-frame irrespective of the weight of the rope or cable itself. When the valve 59 is closed, whereby the valve 71 is opened, communication is effected between the inlet-passage 60 and the inlet-port 73 for reversing rotation of the rotor of the fluid-motor and thereby causing rotation of the drum in the opposite direction and rewinding the cable thereon.

When the cable is rewound, both valves are caused to close, shown accomplished by a cam-plate 86 loosely reciprocating in recesses 87 in the levers 76, the cam-plate being provided with cams 88 for separating the levers and thereby releasing the catches from their keepers, the spring 78 causing instant seating of the valve 71.

For operating the cam-plate we provide a lever which, as shown, comprises a rod 90, and arms 91 and 92. The rod is shown polygonal in cross-section. The arm 91 has a bearing 93 about said rod. This bearing has a bore 94 similar in cross-section with said rod for rocking said rod. It is arranged to slide lengthwise on said rod. The arm 92 is secured to said rod. The rod is journaled in thimbles 95 rocking in bearings 96 on the case. The arm 91 has an eye 97 through which the cable 13 passes. The rope adjacent to its outer end is provided with a knob 98 too large to pass through the eye and thereby arranged to contact the arm 91, which operates the rocker-rod 90, owing to the polygonal form of its bearing thereabout, and thereby operates the lever. The arm 91 is arranged to slide lengthwise of the rod 90 and the opening 40 to accommodate the rope to its windings on the drum.

A link 101 reciprocates in a bearing 102 in the case and has articulation 103 with the arm 92. The link 101 has a cam-slot 105 therein which coöperates with a pin 106 on a link 107 reciprocating in bearings 108, 109, in the case. The link 107 is a quarter-twist link, as note the twist 100 therein. The link 107 has a cam-slot 111 therein in which a pin 112 in a fork 113 is received, the fork having connection with a stem 114 which reciprocates in a bearing 116. The stem 114 has articulation 117 with the cam-plate 86 for reciprocating the same, and thereby releasing the catches between the valves when the knob 98 strikes the arm 91. The articulation 117 permits the cam-plate to readily follow the movement of the valve 59. A spring 118 retracts the valve releasing mechanism, so that the catches are returned to operative position upon withdrawal of the contact between the knob and arm. The retraction of the rocker-frame is limited by a stop 119.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a fire escape, the combination of a drum, a cable about said drum, a fluid-motor having operative connection with said drum

for rotating the same, a fluid-passage communicating with said fluid-motor, a valve in said passage, and a part actuated by said cable upon weight being applied thereto, said part having connection with said valve for operating the same.

2. In a fire escape, the combination of a drum, a cable about said drum, a reversible fluid-motor having operative connection with said drum for rotating the same in opposite directions, fluid-passages communicating with said fluid-motor for opposite rotations of said fluid-motor, a valve in each of said passages, a part actuated by said flexible escapement-suspender upon weight being applied thereto, said part having connection with one of said valves for opening the same, and connecting means between said valves for causing combined movement of said valves upon reseating of said opened valve, for the purpose described.

3. In a fire escape, the combination of a drum, a cable about said drum, a reversible fluid-motor having operative connection with said drum for rotating the same in opposite directions, fluid-passages communicating with said fluid-motor for opposite rotations of said fluid-motor, a valve in each of said passages, a part actuated by said cable upon weight being applied thereto, said part having connection with one of said valves for opening the same, connecting means between said valves for causing combined movement of said valves upon reseating of said opened valve, and releasing means for releasing said connecting means, said escapement-suspender having an actuating part thereon for said releasing means.

4. In a fire escape, the combination of a drum, a cable thereabout, a shaft which supports said drum, a rocker-frame pivoted about said shaft, a worm-wheel rotating with said drum, a worm meshing therewith, a fluid-motor operating said worm, and a valve for said fluid-motor, said rocker-frame having operative connection with said valve, and said rocker-frame receiving said cable thereover and rocked by the weight of a person suspended by said cable.

5. In a fire escape, the combination of a drum, a cable thereabout, a shaft which supports said drum, a rocker-frame pivoted about said shaft, a worm-wheel rotating said drum, a worm meshing therewith, a reversible fluid-motor operating said drum, valves for said fluid-motor, said rocker-frame having operative connection with one of said valves, releasable connecting means between said valves for causing combined movements of said valves, releasing means for said connecting means, and a part on said cable operating said releasing means, for the purpose described.

In testimony whereof, we have hereunto signed our names in the presence of two subscribing witnesses.

OSCAR SCHNITZLER.
BERNARD J. WELAGE.

Witnesses:
CHAS. E. WEBER,
THERESA M. SILBER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."