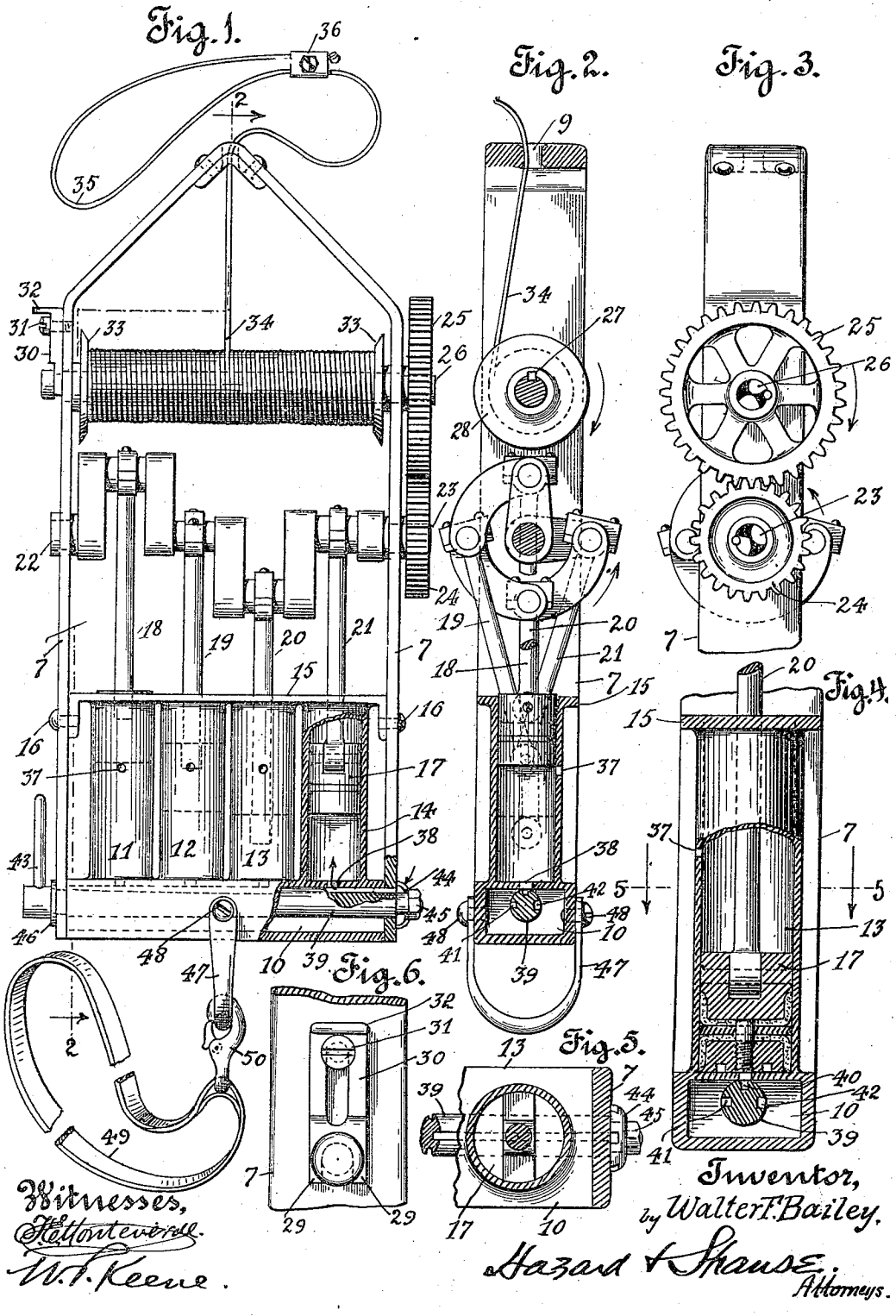
W. F. BAILEY.

PORTABLE FIRE ESCAPE.

APPLICATION FILED JAN. 21, 1913.

1,122,566. Patented Dec. 29, 1914.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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PORTABLE FIRE-ESCAPE.

1,122,566. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed January 21, 1913. Serial No. 743,302.

To all whom it may concern:

Be it known that I, WALTER F. BAILEY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Portable Fire-Escapes, of which the following is a specification.

This invention relates to fire escapes, and especially to a portable type of fire escape, and the principal object is to provide an efficient device of small size capable of being carried by travelers and used by them to escape from hotels or houses where they may be domiciled, in case of fire.

It is also an object to provide a fire escape carrying a reel on which is wound a fire-proof cable, with simple means to control the operation of the cable.

It is a further object to provide a metallic structure in which the reel is secured, and pneumatically operated means by which the speed of the unwinding of said reel is accomplished, controlled by a suitable valve together with a suspension strap by which the person is secured to the device.

In the drawings accompanying this specification and forming therewith the application for Letters Patent Figure 1 is a front elevation of the device, a portion of one of the cylinders and the valve casing being broken away to clearly show the control mechanism. Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1, viewed in the direction indicated by the arrows. Fig. 3 is a detail elevation of the meshing gears. Fig. 4 is a central section through one of the cylinders to show the inlet and exit ports therefrom. Fig. 5 is a cross section on the line 5—5 of Fig. 4, viewed in the direction indicated by the arrows. Fig. 6 is a detail in elevation of the locking latch to secure the reel shaft in operative position.

In the drawings numerals are used to indicate the same parts in the different views, 7 designating the frame of the apparatus composed of lateral sides with a V shaped top formed by bending the vertical side bars of the frame, the apex being provided with the bore 9 through which the cable is adapted to pass. The base of the structure is formed preferably of the hollow casting 10 on which are secured or cast the cylinders 11, 12, 13 and 14, these cylinders being provided with an upper flange or web 15 which extends laterally to include the upper end of each of the cylinders, and is secured to the frame 7 by means of suitable fastenings 16.

Mounted in each of the cylinders is the plunger piston 17 provided with means for expanding the leather cups included in the piston in the well known manner, each piston being pivotally connected by a connecting rod 18, 19, 20 and 21 to each respective piston, these piston rods in turn being pivoted on the crank shaft 22 which is provided with four cranks to accommodate the four piston rods, placed preferably at quadrants in the circle of movement of the crank shaft. This crank shaft is provided with suitable bearings in the frame 7, the outer end 23 of the shaft having the gear wheel 24 securely keyed thereon, this gear meshing with the somewhat larger gear 25 mounted on the wheel shaft 26, which is also provided with suitable bearings in the side bars of the frame, and is preferably in parallel relation with the crank shaft. This reel shaft is provided with a groove in which the feather 27 is secured to the internal bore of the reel 28 adapted to engage so that the reel will be positively revolved with the shaft, the oppositely disposed end from the gear being provided with the annular flange located outside of the adjacent frame in which the legs 29 of the sliding pawl 30 engage so that the shaft can not be slipped from engagement with the reel. The pawl 30 is slotted longitudinally, preferably in the same vertical plane with the axes of the two shafts, this slot accommodating the screw 31 so that the slide can be freely reciprocated on this headed screw and held in proper position, the screw being threaded in the frame, so as to provide sufficient friction to firmly hold the pawl in engagement, and the pawl is provided with an operating finger 32.

The reel 28 is of ordinary construction, preferably of metal with the flanged ends 33 on which is wound the cable 34 preferably a wire cable of small cross section, and of such strength as to be capable of sustaining a load of 500 or more pounds. The upper end of the cable after being passed through the opening 9, being preferably looped at 35, and the free end secured by the clamp 36, this loop being of such size as to readily slip

over a bed post, a door knob or other suitable and convenient projections to form an anchorage for the apparatus when it is desired to use the same. The clamp 35 acts as a stop to prevent the free end of the cable from pulling through the bore 9.

In the walls of each of the pistons an inlet port 37 is provided, and in the lower end the port 38, this latter port opening into the valve chamber formed in the base of the casting 10 in which is mounted the controlling valve 39, preferably a cylindrical member provided with a plurality of grooves 40, 41 and 42 extending longitudinally on the periphery of the cylindrical member, the valve being so mounted that the ports 38 can be closed by revolving the face of the cylinder, in contact therewith, or a certain amount of air will be permitted to enter and exhaust through the respective grooves. These grooves 40, 41 and 42 extend throughout the length of the valve member 39 and are of equal sectional area throughout their length; the grooves, however, being of different sizes in relation to each other so as to vary the extent of opening of the ports 38 to the atmosphere according to which groove 40, 41, or 42 is in register with the ports 38.

One end of the cylinder is provided with a bore outside of the bearings in the frame in which is inserted the handle 43 by which the valve is turned, the opposite end being threaded external of its bearing in the frame, and preferably reduced to accommodate the mutilated washer 44 placed over the bearings, and the nut 45 applied to secure the cylindrical valve in position, the opposite end being provided with a flange 46 to limit the lateral movement of the valve member. The slots 40, 41 and 42 are carried clear to the shoulders, formed by the reduced threaded end so that they communicate to the outside air through the openings in the mutilated washer 44 and permit the passage of air in and out as before stated. Preferably fastened to the casing 10 is the yoke 47 secured by the screws 48 to which the body strap 49 can be secured by means of the snap hook 50.

In the operation of the device, the structure being adapted to be built of such small size as to be readily carried by travelers, and not to occupy very much room in the building in which it is supplied, the loop 35 is secured to any projection, as before stated, the person secures the body strap 49 under the arms in the usual well known manner, and by placing a tension on the cable until a window or opening is reached from which they wish to descend. Here they climb out of the window with the valve 39 placed so that the grooves 40, 41 and 42 are positioned out of register with the ports 38, and by lowering themselves carefully over the window ledge, the weight is thrown upon the supporting cable 34. The device being positioned within convenient reach of the person using same, the valve 39 may be operated by means of the hand lever 43 to move one of the grooves 40, 41 or 42 into register with the ports 38 to open communication between the interiors of the cylinders 11, 12 and 14 to the atmosphere and thereby permit reciprocation of the pistons 17; the pistons 17 being prevented from reciprocating when the ports 38 are closed. On opening the ports the strain exerted on the cable 34 will operate to rotate the reel 28 and the shaft 26 on which it is mounted through the key 27; the rotation of the shaft 26 being transmitted to the crank shaft 23 through the gears 25 and 24.

The rotation of the crank shaft 23 will operate to reciprocate the pistons 17 in their cylinders, thus moving on the up-stroke drawing air into the cylinders through the inlet ports 38 and thus moving downward in the cylinders discharging air through the ports 38.

It is manifest that the speed of rotation of the reel 28 and consequent unwinding of the cable 34 is proportionate to the velocity of the air drawn into the cylinders and discharged therefrom and that this velocity is proportionate to the extent of the open communication of the ports 38 to the atmosphere. It follows that by closing the ports 38 rotation of the reel will be inhibited so as to stop the unwinding of the cable and prevent the downward movement of the person suspended from the strap 49, and that by turning the valve so that the smaller groove 40 will register with the ports 38 a slow rotation of the drum and unwinding of the cable 34 therefrom will be permitted and a consequent slow downward movement of the person suspended from the strap 49 will be effected. The person, however, may increase the descent as desired by operating the valve 39 to move either the groove 41 or the groove 42 into register with the ports 38 according to the speed at which it is desired to unwind the cable 34 from the reel.

Instead of a control valve in which the speed may be regulated, it may be found preferable to have the valve fixed and so gaged as not to exceed a certain speed in lowering, but in practice applicant has found that the valve is efficient, and the downfall can be completely stopped by closing the ports 38 without shock or danger to the device and its supporting cable. When the cable has entirely unwound, and the occupant of the strap has safely reached the ground, the unwound reel can be readily removed by lifting the pawl 30, sliding the shaft out of the frame, removing the unwound reel and inserting a new reel with a cable, and the device thrown or carried to others to be again used without waiting to

rewind, the cable, which as before stated, has been made fast to some object in the room lately vacated, and remains fixed.

What I claim is:

1. A portable fire escape, comprising a plurality of alined cylinders having alined ports in their lower ends, pistons reciprocally mounted in said cylinders, a crank shaft connected to said pistons, a reel geared to said crank shaft, a cable wound on said reel, a rotary cylindrical valve member extending adjacent the lower ends of the cylinders having a series of longitudinally extending grooves therein of different sectional areas communicating with the atmosphere, and means for rotating the valve to move said grooves in and out of register with the ports, whereby variations of speed of unwinding of the cable from the reel may be effected.

2. In a fire escape, a plurality of alined cylinders formed with ports in their ends, pistons in said cylinders, a crank shaft connected to said pistons, a cable carrying reel geared to said crank shaft, a portable frame supporting the cylinders, crank shaft and reel, and a valve for controlling the passage of air to and from the cylinders through the ports, whereby the speed of rotation of the reel may be varied or its movement inhibited, comprising a cylindrical valve member formed with a plurality of longitudinally extending grooves of various cross-sectional areas adapted to be moved in and out of register with the ports on the rotation of the valve.

In witness that I claim the foregoing I have hereunto subscribed my name this 9th day of January, 1913.

WALTER F. BAILEY.

Witnesses:
W. P. KEENE,
B. A. DYKHUIZEN.

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