April 15, 1924. 1,490,524

J. C. WOOD

FIRE ESCAPE

Filed Nov. 10, 1922 2 Sheets-Sheet 1

Fig. 1.

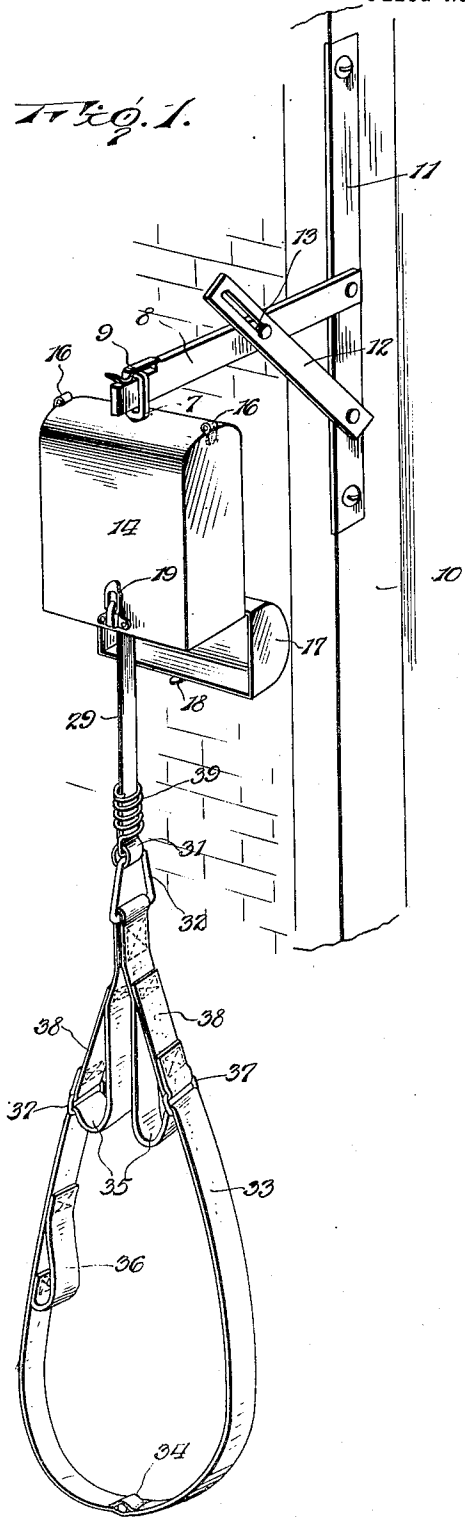

Fig. 2.

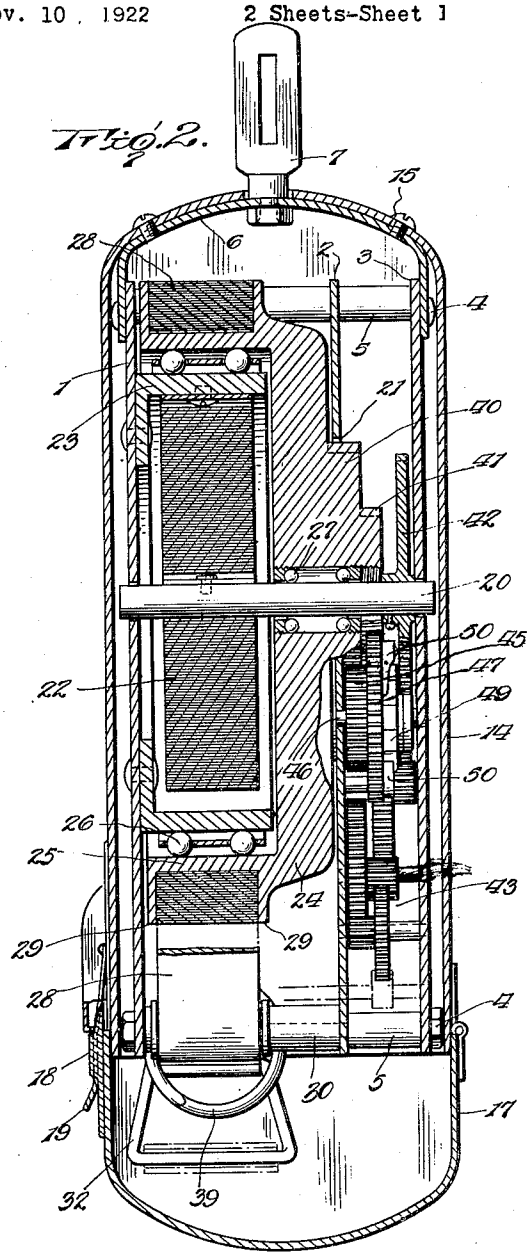

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Fig. 3.

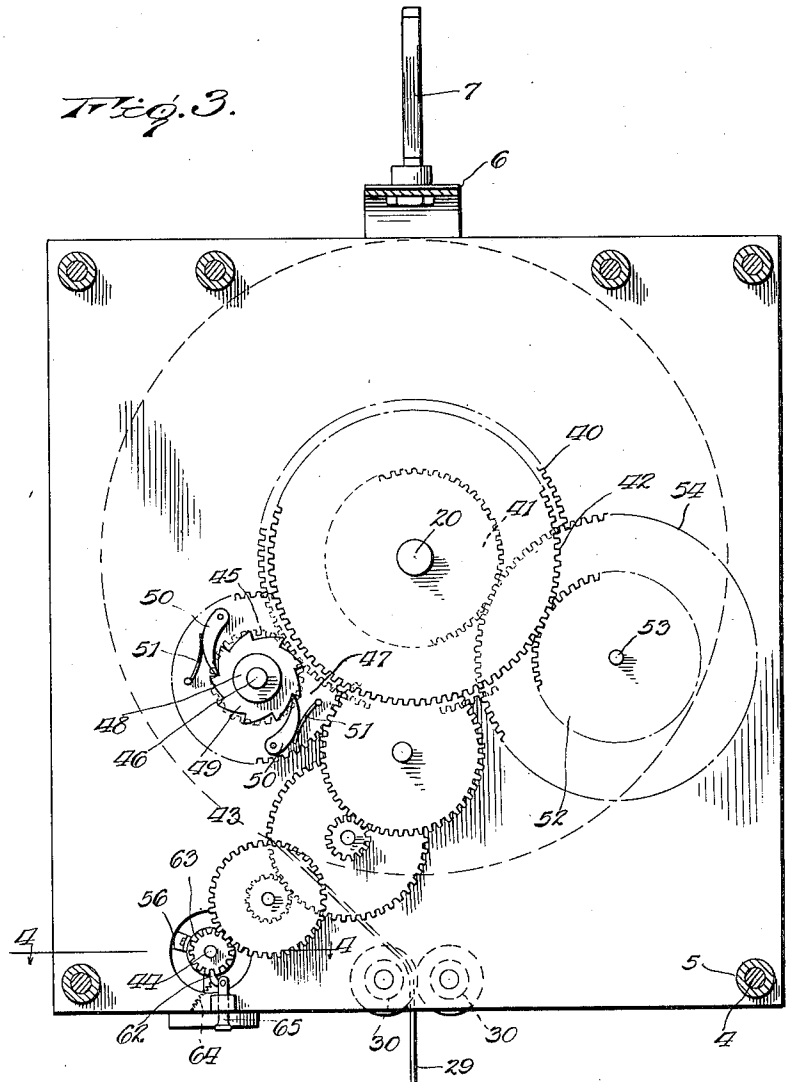
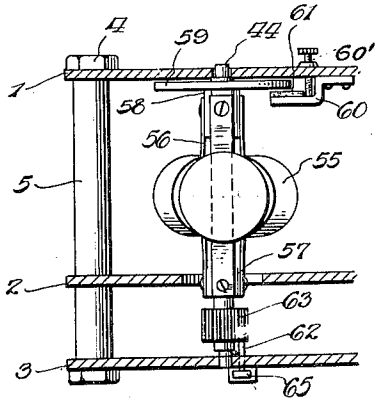


Fig. 4.



Inventor

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By

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Patented Apr. 15, 1924. 1,490,524

UNITED STATES PATENT OFFICE.

JOSEPH C. WOOD, OF JACKSON, TENNESSEE, ASSIGNOR OF ONE-EIGHTH TO WILLIAM B. BARGER, OF JACKSON, TENNESSEE.

FIRE ESCAPE.

Application filed November 10, 1922. Serial No. 600,089.

To all whom it may concern:

Be it known that I, JOSEPH C. WOOD, a citizen of the United States, residing at Jackson, in the county of Madison and State of Tennessee, have invented certain new and useful Improvements in Fire Escapes, of which the following is a specification.

My invention relates to portable fire escapes and has for its object the provision of a compact, light and inexpensive device which may be readily carried about and easily arranged for use. The invention seeks to provide a novel construction whereby the mechanism may be arranged within a very small compass and will operate easily and efficiently whenever desired. The invention is illustrated in the accompanying drawings and will be hereinafter fully set forth.

In the drawings:—

Figure 1 is a perspective view of my improved fire escape in operative position;

Fig. 2 is an enlarged section taken longitudinally of the main shaft;

Fig. 3 is a view, partly in section and partly in side elevation, more particularly showing the train of gearing, and

Fig. 4 is an enlarged detail horizontal section on the line 4—4 of Fig. 3.

In carrying out my invention, I provide a frame consisting of plates 1, 2 and 3 which are secured together in fixed spaced relation by bolts or screws 4 passing through spacers 5 or in any other desired manner, as many of the fastening devices being used as may be deemed desirable. The outer plates 1 and 3 are connected centrally at their upper ends by a bracing strap 6, and to the center of this strap 6 I swivel a suspending eye 7 which is adapted to be fitted over the end of a supporting arm 8 when the device is to be used. The supporting arm 8 may be of any preferred or convenient form and is illustrated as a flat bar having a notch in its upper edge to receive and hold the upper extremity of the eye 7, a leaf spring 9 being secured upon the bar to pass over the eye and resist releasing movement of the same. The supporting bar 8 may be secured directly to a window frame, indicated at 10, but will preferably be attached to a base bar 11 which may be, in turn, readily secured to the window frame, a brace 12 being attached to the base bar below the point of attachment of the supporting bar and having a pin and slot engagement with the supporting bar, as shown at 13. This construction provides a support which may be easily folded into a small compass when the device is not in use, and it may be very quickly and easily secured in place when the emergency arises requiring the use of the device. The particular manner of suspending the device for use, however, may be varied within wide limits, and the support may be mounted to swing so that, when not in use, it will be disposed against the wall of a room and will be inconspicuous so that it will not detract from the sightliness of the room. It will also be understood that if the described supporting frame should not be desired, a ring may be fitted in the eye 7 and a strap or other supporting member may be inserted through the ring and secured to a bed or other substantial article of furniture or some fixed object in the room. The main frame, consisting of the plates 1, 2 and 3 and the connections between the same, together with the operating mechanism mounted in said frame, is enclosed within a case 14 of proper form and dimensions to fit closely about the mechanism, as shown most clearly in Fig. 2, and the upper end of this case is rigidly secured to the bracing strap 6, as shown at 15. At the sides of the case are provided eyes or loops 16 of any convenient form through which may be passed and secured a hand strap so that the device may be easily carried by the owner thereof. The lower end of the case is provided with a cover 17 hinged to one side of the case and provided at its opposite side with a lug or projection 18 to be engaged by a fastening loop or latch 19 mounted upon the front side of the case at the lower end thereof, as shown and as will be readily understood.

The main shaft 20 is journaled at its ends in the outer plates 1 and 3 of the main frame and the intermediate plate 2 is provided with a large opening 21 to accommodate the said shaft and a part of the gearing. It will be noted that the intermediate plate is nearer the plate 3 than the plate 1 so that the frame, in effect, consists of a gearing chamber and a drum or reel chamber. A motor spring 22 is coiled about one end of the main shaft 20

and has one end secured to said shaft, while its opposite end is secured to a circular flange 23 rigidly secured to the adjacent plate 1. A reel or drum 24 is fitted concentrically about the shaft 20 and has its rim portion 25 off-set so that it fits about the flange 23 in spaced relation thereto, anti-friction devices 26 being disposed between the outer periphery of the flange 23 and the inner periphery of the rim 25 so that the reel may rotate easily about the flange, as will be readily understood. Anti-friction devices 27 are also provided within the hub of the reel about the shaft 20, as clearly shown in Fig. 2. A suspending strap or tape 28 is wound about the reel between annular flanges or arms 29 thereon, and this strap or tape is preferably of spring-tempered steel. One end of the tape is, of course, secured to the rim 25 of the reel, while the free end thereof is trained about rollers 30 mounted at the lower end of the frame whereby the tape will be guided into and out of the frame in the operation of the device. The tape is formed into an eye 31 at its free extremity and a loop 32 is engaged in said eye. A sling 33 of any suitable material is secured in the eye 32 and suspended therefrom and is equipped at its lower end with a small weight 34 so that it will hang vertically below the suspending loop and may be easily fitted about the body of the person who is compelled to use the device. At its upper end, the sling is so disposed as to form loops or hand holes 35 through which the arms of the user may be passed and upon one side below the said loops 35 is an additional loop 36. By referring to Fig. 1, it will be readily noted that the loops are formed by passing the web of the sling through rings or loops 37 which are carried by straps 38 fixed to the web above the said rings. When a person has fitted the main portion of the sling about his body and inserted his arms through the loops 35, the weight imposed upon the sling will cause the hand loops to fit closely around the arms and prevent the user withdrawing his arms under the excitement of the moment. Safety in descending is thereby assured. Means are provided to permit a slow descent of the sling and a rapid return or ascent thereof, and to prevent damage and possible breakage of the connections between the tape and the sling upon the return movement, I provide a buffer consisting of a spring 39 coiled around the tape immediately above and adjacent the eye 31 which, upon the return movement, will be brought into contact with the guide rollers 30 and absorb the shock so that no breakage of any of the parts will occur. The tape is obviously flexible and the sling will generally be of stout textile fabric so that the sling and the free end of the tape may be folded within the cover 17 when the device is not in use.

Fixed to the side of the reel in any desired manner are gear wheels 40 and 41 and fixed to the adjacent end of the main shaft 20 is a gear wheel 42, these gears being disposed within the space or chamber between the plates 2 and 3. The gear 40 actuates a train of gearing, indicated at 43, whereby to rotate a governor shaft 44 disposed at the lower end of the frame and extending through the three plates 1, 2 and 3. The train of gearing includes a gear 45 fixed upon a shaft 46 which is carried by the plates 2 and 3 and a gear 47 loosely mounted upon the hub 48 of the gear 45, Upon the outer end of the hub 48 is secured a ratchet 49, and upon the side of the gear 47 are pawls 50 which are adapted to engage the said ratchet and are held to the same by springs 51 in an obvious manner. When the tape is unwinding to permit a descent, the ratchet 49 will transmit motion to the gear 47 through its engagement with the pawls 50 thereon so that the governor shaft will be actuated, but upon return movement the ratchet will simply ride under the ends of the pawls without transmitting any motion to the gear 47 and, consequently, the governor will remain at rest so that a very quick return movement of the tape will be permitted. The gear 42 on the main shaft meshes with a gear 52 carried by a shaft 53 mounted in the plates 2 and 3 at the rear of the main shaft and upon the same shaft 53 is a gear 54 which meshes with the gear 41 on the reel, this arrangement causing the reel and the main shaft to always rotate simultaneously and in the same direction so that, upon unwinding of the tape, the spring 22 will be wound and upon release of the tape the spring will immediately start to unwind and, by its unwinding, will effect winding of the tape and return movement of the same.

The governor shaft carries a centrifugal speed governor consisting of weights 55 carried by spring arms 56 of a well-known type, the said springs being secured at one end to a collar 57 fixed to the governor shaft and at their opposite ends to a collar 58 loose upon the shaft and carrying a brake disk 59. Secured rigidly to the plate 1 is a bracket 60 which overlaps the brake disk 59, as shown clearly in Fig. 4, and upon the said bracket is secured a pad or brake shoe 61 which is adapted to be engaged by the opposed face of the brake disk in the event of excessive speed so that the rotation of the parts will be retarded and an unsafe rapidity of descent will be prevented. A set screw 60′ may be mounted in the casing and connected with the brake shoe so

that the maximum speed of descent may be regulated in an obvious manner. In order that the device may be held against operation while the sling is being adjusted about the body of the user, I provide a detent 62 which may be of any preferred form and is mounted upon the plate 3 of the frame adjacent the pinion 63 upon the governor shaft. The detent is normally held out of engagement with the pinion by a spring 64 and is equipped with a handle 65 of any convenient or desired form whereby it may be pushed into engagement with the detent so as to prevent rotation of the same and thereby lock all the operating mechanism.

From the foregoing description, it will be seen that I have provided a very simple and compact device which may be readily used by any person and which will operate readily and is not apt to get out of order. While the device is intended more particularly and primarily for use as a fire escape, it may be employed in other fields and can be used advantageously in wrecking buildings inasmuch as a bucket or similar receptacle may be substituted for the sling and débris consequently lowered readily to the ground automatically, while the emptied receptacle may be rapidly returned to the point of use. Of course, the strength of the motor spring must be adjusted to the use for which the device is to be put and the dimensions of the other parts may be varied accordingly at will. While I have illustrated one embodiment of the invention, it is to be understood that the minor details of construction may be varied within the limits of the appended claims without involving any departure from the spirit or scope of the invention.

Having thus described the invention, what is claimed as new is:

1. A fire escape comprising a supporting frame, a main shaft mounted transversely in the frame, a stationary circular flange on one side of the frame arranged within the same concentric with the main shaft, a motor spring wound about the shaft within the said flange and having its opposite ends secured respectively to the shaft and the flange, a reel mounted loosely upon the shaft at one side of the said flange and having its rim laterally off-set with the off-set portion fitting concentrically about the said flange, the spring being housed by the wheel, the flange and the frame, a flexible tape secured to and wound upon the rim of the reel, a body-suspending member carried by the free end of the tape, gearing connecting the reel and the shaft, a governor, and gearing connecting the reel and the governor, said last-mentioned gearing being operative during unwinding of the tape and inoperative during winding of the tape.

2. A fire escape comprising a supporting frame, a main shaft mounted transversely in the frame, a circular flange on one side of the frame and arranged within the same concentric with the main shaft, a motor spring wound about the shaft within the said flange and having its opposite ends secured respectively to the shaft and the flange, a reel mounted rotatably upon the shaft at one side of the said flange so as to house the spring and having its rim off-set to fit concentrically about the said flange, a flexible tape secured to and wound upon the rim of the reel, a body-suspending member carried by the free end of the tape, gearing connecting the reel and the shaft, a governor, gearing connecting the reel and the governor, said last-mentioned gearing being operative upon unwinding of the tape and inoperative during winding of the tape, and means for locking the gearing against movement.

In testimony whereof I affix my signature.

JOSEPH C. WOOD. [L. S.]