No. 617,739. Patented Jan. 17, 1899.

C. R. HARRIS.

FIRE ESCAPE.

(Application filed Feb. 26, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 4.

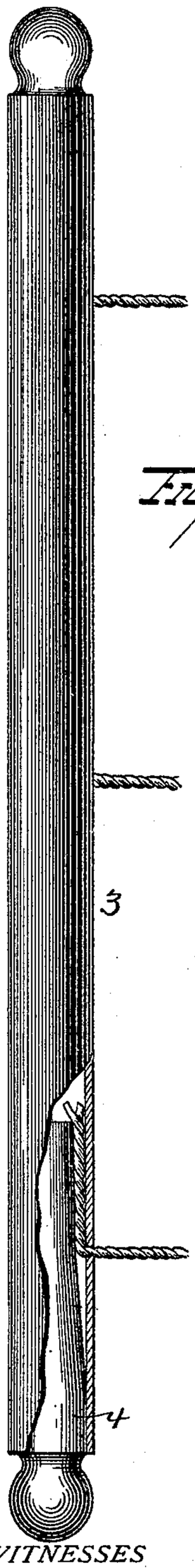
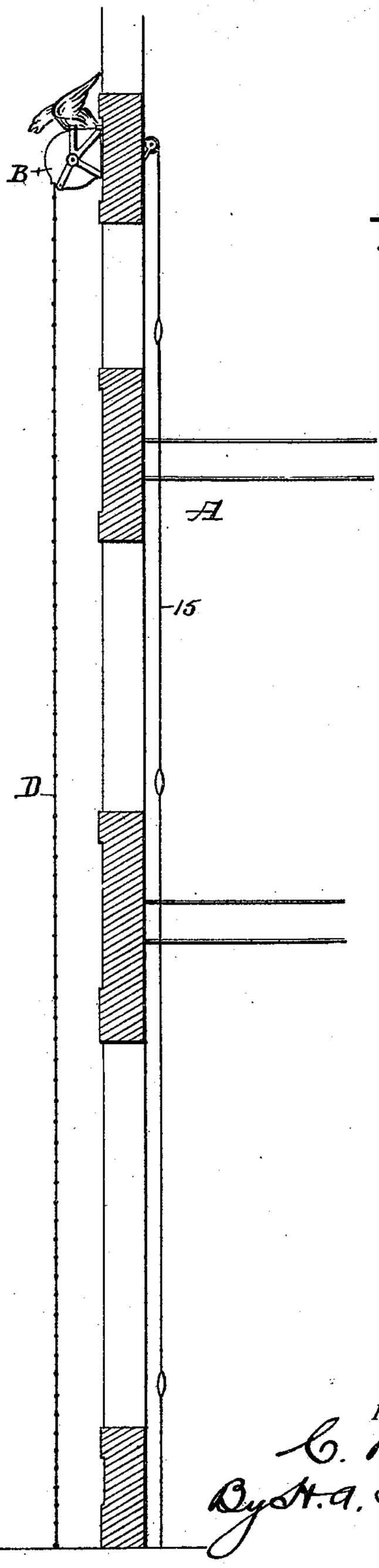


Fig. 1.



WITNESSES

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G. F. Downing

INVENTOR

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Fig. 2.

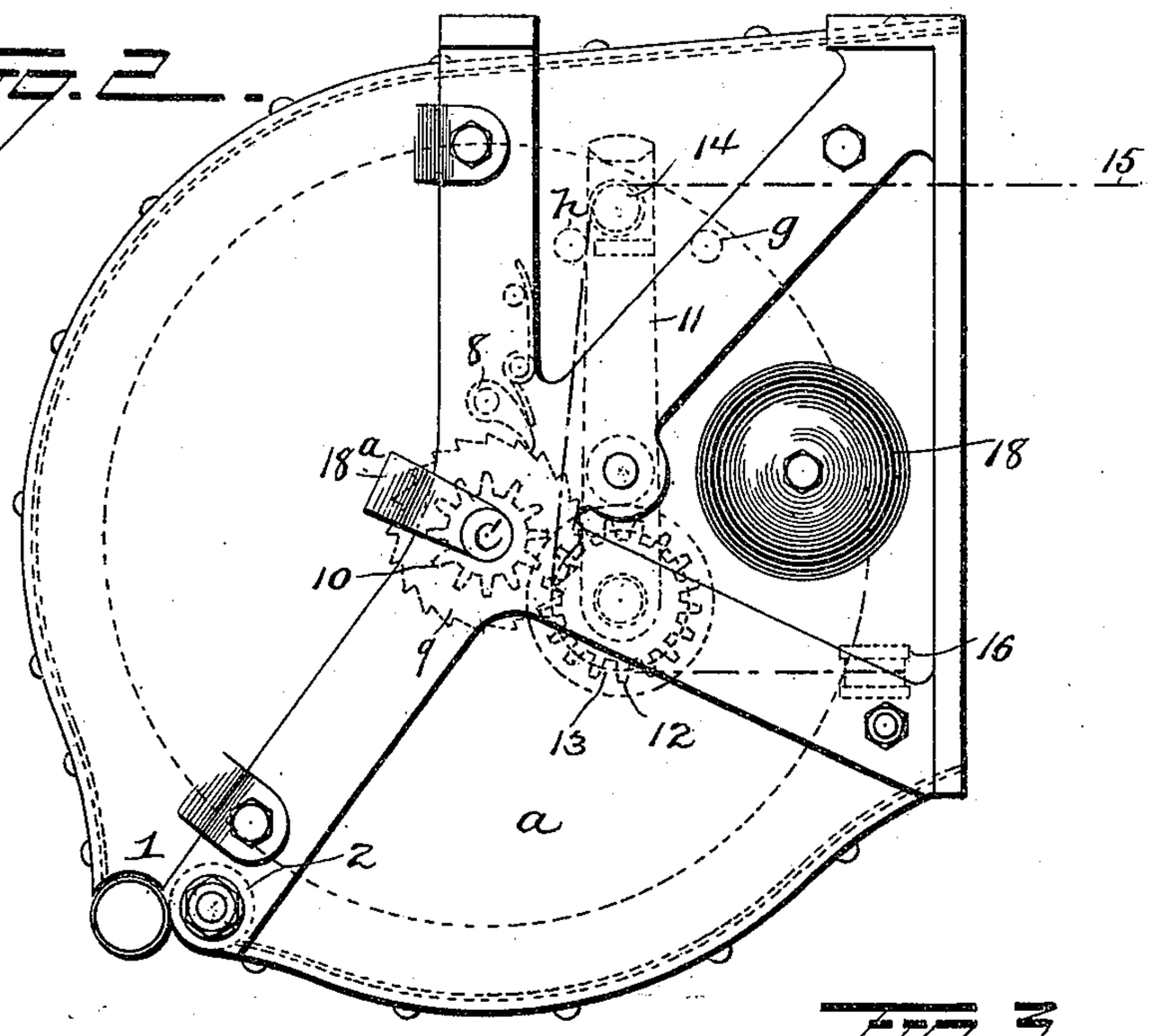

Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES R. HARRIS, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNOR TO THE HARRIS SAFETY COMPANY, OF NEW JERSEY.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 617,739, dated January 17, 1899.

Application filed February 26, 1898. Serial No. 671,838. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. HARRIS, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Fire-Escapes; and I do hereby 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.

My invention relates to an improvement in fire-escapes, and more particularly to such as employ flexible ladders, one object of the invention being to construct a fire-escape in such manner that it can be wound in compact form and readily released from any floor of the building to which it may be applied.

A further object is to so construct a fire-escape employing a flexible ladder that said ladder can be compactly wound within an ornamental casing secured at the top of a building and be released and started from its normal position by means of devices adapted to be operated from any floor of a building.

A further object is to provide simple and efficient means for controlling the operation of a flexible ladder.

A further object is to provide a fire-escape which shall be simple in construction, cheap to manufacture, ornamental in appearance, sure in operation, easy to manipulate, and which shall be effective in all respects in the performance of its functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view illustrating a section of a building and showing the application of my improvements thereto. Fig. 2 is an end view of my improvements. Fig. 3 is a face view, partly broken away and partly in section. Fig. 4 is a detail view illustrating the bottom rung of the ladder.

A represents a portion of a building, and B the casing of my improved fire-escape, said casing being made ornamental in appearance and secured to the front of the building at or near the top thereof, so as to form a part of the cornice of the building or take the place of metal or other ornamentations usually employed as a finish to the architectural appearance of a building. The casing B comprises two end frames *a a* and an outer wall or covering of sheet metal *b*, secured at its respective ends to said end frames *a a*. A reel or shaft C is mounted in the ends *a* of the casing, preferably at or near points located centrally in said ends, for the reception of a flexible ladder D, which is adapted to be wound thereon and has one end secured thereto. The casing B is provided with an elongated opening 1 below and outwardly removed from the reel C for the passage of the ladder D, and at one edge of this opening a fixed bar 2 is disposed and secured at its ends to the end frames of the casing. Over this fixed bar the ladder is adapted to pass and on account of its frictional contact therewith be retarded somewhat in its descent. It will be observed that when the entire ladder is wound within the casing B the roll will be of such diameter as to extend outwardly to a point in line with or approximately in line with the elongated opening in the casing, and that consequently when the ladder first commences to unwind the frictional contact of said ladder with said fixed bar will be very slight and that little or no resistance will be offered to the descent of the ladder; but as the ladder descends and the angle between the rolled ladder and the elongated opening increases the frictional resistance offered by the fixed bar will also increase, and thus tend to prevent the ladder from descending too rapidly as the preponderance of the weight thereof accumulates below the casing. In this way the descent of the ladder will be not only gradual, but practically uniform.

The lower rung 3 of the ladder (which is tubular) is made larger than the others and is secured to the cables of the ladder by means of keys 4, the ends of the cables being inserted through suitable holes in the rung and held in place by being wedged between the inner face of the rung and said key.

When the ladder is wound within the casing B, the lower rung 3 will serve to close the elongated opening in the casing, and thus exclude all dust.

The shaft or reel C is provided near its respective ends with heads or disks 5 6, and one of the journals of said shaft or drum is extended beyond its bearing and has secured thereto a sprocket-wheel 7, over which a sprocket-chain 7ª may be made to pass for the purpose of winding the ladder. The chain 7ª may be conveniently placed over the sprocket-wheel, when it is necessary to wind the ladder, by means of a pole from an upper window of the building. A pawl 8 is pivotally attached to the head or disk 5 and adapted to engage a ratchet-wheel 9, mounted loosely on the shaft C. A pinion 10 is secured to the ratchet-wheel 9, and at a point in proximity to said wheels 9 and 10 a lever 11 is pivotally supported between its ends within the casing B and adapted to be limited in its movements by means of stops *g h*. A pinion 12 and a drum 13 are mounted in the lower end of the lever 11 and adapted to rotate together, the lever 11 being so disposed normally that the pinion 12 will be in proximity to but out of mesh with the pinion 10. A pulley 14 is mounted in the upper end of the lever 11, and over this pulley a cord 15 passes. The cord 15 extends down through the rooms on the various floors of the building in proximity to the window-casing or at other places where it can be conveniently reached by the occupants of the rooms, and the upper end of said cord after passing over the pulley 14 on the lever 11 is passed (preferably two or more times) around the drum 13, which revolves with the pinion 12. After passing about the drum 13 the cord is passed over a pulley 16 in the casing and then extended to the opposite end of the casing, where it is attached to a spring 17. It will be observed that the spring 17 acts to normally retain the lever in such position as to maintain the pinion 12 out of mesh with the pinion 10.

From the construction and arrangement of parts above described it will be seen that when an occupant of one of the rooms of a building pulls the cord 15 the first result will be to turn the lever 11 on its fulcrum and cause the pinion 12 to be moved into mesh with the pinion 10. As the pull upon the cord continues the drum 13 will be turned, and with it the pinion 12, and thus motion will be imparted to the pinion 10, and consequently to the shaft or reel C, (through the medium of the ratchet devices,) and cause the unwinding of the ladder to be started. After the ladder has been thus started to unwind its own weight will in most cases be sufficient to cause it to continue to descend until its lower end reaches the ground; but should the ladder not descend sufficiently rapid after a single pull on the cord the operator (after having released the cord) may again pull it and cause motion to be again imparted to the shaft or reel to further assist the unwinding of the ladder. It will be observed that each time the cord is released by the operator the lever 11 will be made to turn and move the pinion 12 away from the pinion 10 and the pinion 12 made to rotate backwardly by the action of the spring 17, so that the operator can by a succession of pulls on the cord cause the unwinding of the shaft or reel C until the ladder descends freely, or, if necessary, he may continue to operate the cord until the ladder is wholly unwound.

A gong 18 is secured to the casing C and adapted to be operated by means of an arm 18ª, secured to rotate with the pinion 10, so that as the ladder descends the alarm will be given, and the steel cables of the ladder will serve as transmitters of the vibrations of the gong to the rooms of the building.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set forth.

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

1. The combination with a casing and a reel mounted therein, of a flexible ladder adapted to be wound on said reel, a cord to pass through the building, and gearing connected with said cord and adapted to transmit motion intermittingly to said reel when a succession of pulls are given to the cord, substantially as set forth.

2. In a fire-escape, the combination with a reel and a flexible ladder to wind thereon, of gearing connected with the reel and means under the control of persons in the building on which the apparatus is located for throwing said gearing into mesh and simultaneously imparting motion positively thereto, substantially as set forth.

3. In a fire-escape the combination with a reel and a flexible ladder to wind thereon, of gearing for assisting the unwinding of the reel, a cord connected with said gearing for throwing the gearing into mesh and simultaneously rotating it, and means for disengaging said gearing when the cord shall have been released by the operator, substantially as set forth.

4. In a fire-escape the combination with a reel and a flexible ladder to wind thereon, of a pinion connected with said reel, a pivoted lever, a pinion and a drum carried by said lever, a pulley mounted on the lever, a spring and a cord adapted to extend through the building and pass over the pulley on the lever whereby to move the pinion on the lever into mesh with the pinion on the reel and rotate it, the end of the cord being attached to said spring, substantially as set forth.

5. In a fire-escape, the combination with a casing, a reel and a flexible ladder to be wound thereon, of a pinion connected with the reel, a lever pivotally supported between its ends, a pinion mounted at one end of said lever and a pulley at the other end, a drum secured to said pinion on the lever, a spring

secured in the casing, a pulley mounted in the casing and a cord passing over the pulley and drum on the lever, the pulley in the casing and attached to said spring, substantially as set forth.

6. In a fire-escape, the combination with rigid end frames and a covering secured at the ends to said end frames whereby to form a closed casing, said covering having an elongated slot in its lower portion, of a fixed bar forming the inner wall of said slot, a reel mounted in the casing and supported by said end frames, the axis of the reel being disposed inwardly from said fixed bar and the periphery of said reel adapted to extend to a point over said elongated slot in the casing, and a ladder adapted to wind on said reel and pass through said elongated slot, substantially as set forth.

7. In a fire-escape, the combination with a casing, of a reel mounted therein, a flexible ladder to wind on said reel, a sprocket-wheel secured to one journal of said reel at a point outside the casing, a ratchet-wheel mounted loosely on the reel, a pawl attached to the head of the reel and adapted to engage said ratchet-wheel, gearing connected with said ratchet-wheel, means for operating said gearing to unwind the ladder from the reel and a sprocket-chain to pass over the sprocket-wheel to wind the ladder on the reel, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHAS. R. HARRIS.

Witnesses:
S. G. NOTTINGHAM,
R. S. FERGUSON.