

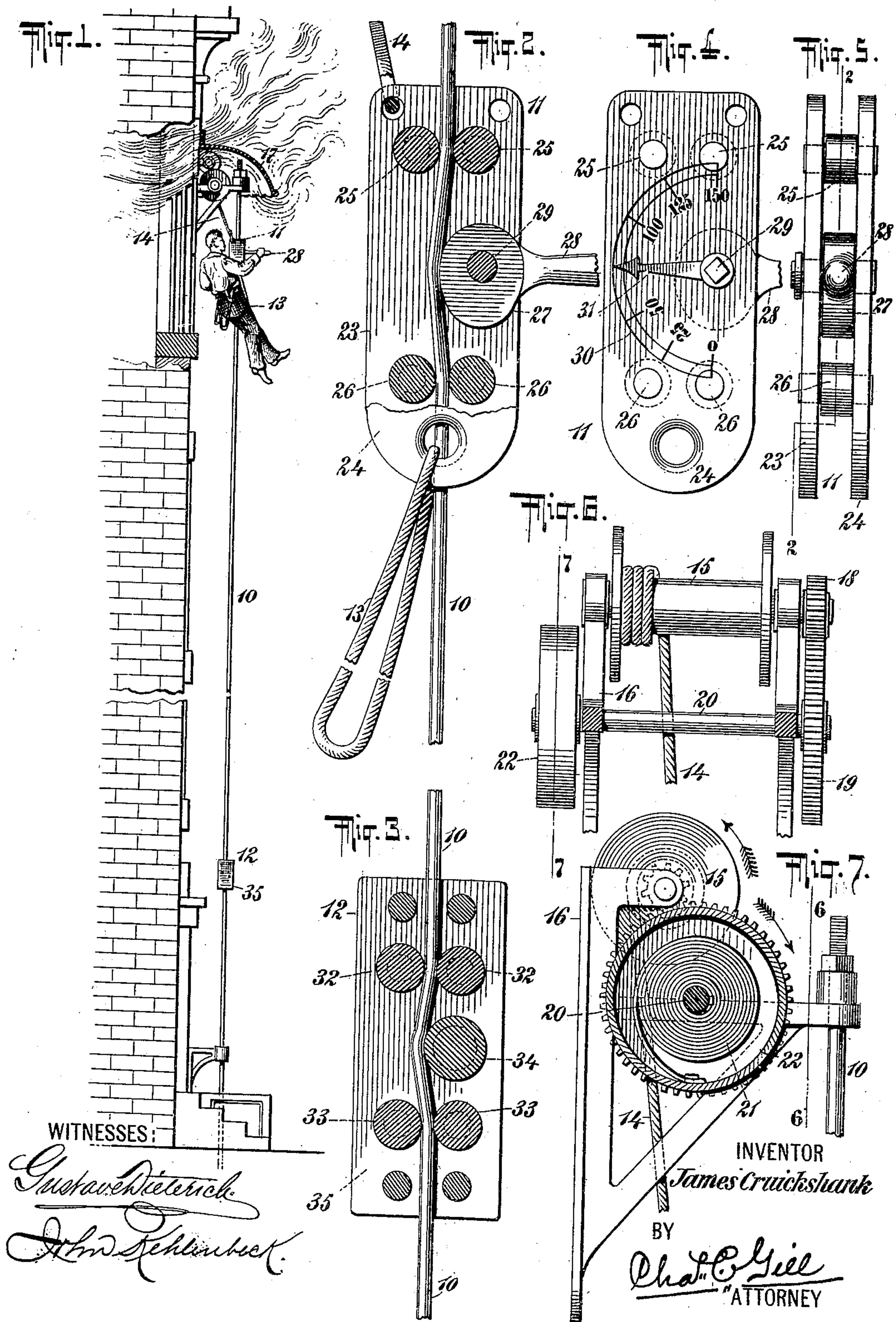
No. 835,180.

PATENTED NOV. 6, 1906.

J. CRUICKSHANK.

FIRE ESCAPE.

APPLICATION FILED JULY 20, 1901



UNITED STATES PATENT OFFICE.

JAMES CRUICKSHANK, OF NEW YORK, N. Y.

FIRE-ESCAPE.

No. 835,180.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed July 20, 1901. Serial No. 69,056.

To all whom it may concern:

Be it known that I, JAMES CRUICKSHANK, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

The invention relates to improvements in fire-escapes; and it consists in the novel features, combinations, and arrangements of parts hereinafter described, and particularly pointed out in the claims.

The fire-escape of my invention comprises in its preferred form a metal wire or rod extending downward along the exterior wall of a house, a grip device mounted on said rod and having suspended therefrom a sling to support the person who may desire to use the escape, a reel or windlass adjacent to the upper end of said rod and having thereon a rope whose outer end is fastened to said grip device and which rope unwinds from said reel to follow down said rod with said grip device when the latter is carried downward by the weight of a person sitting on said sling, a spring connected with said reel for automatically rewinding said rope thereon and returning said grip device to its initial position at the upper end of said rod preparatory to the repeated use of the escape, and a safety cushioning-stop on the lower portion of said rod to contact with said grip device and check the downward movement of the latter should for any reason the person using the escape lose, while descending, control of said device.

The more important features of the escape comprise the wire or rod, the grip device thereon to be operated by the person desiring to descend, and the safety cushioning-stop on the lower portion of said rod.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a view of a portion of a house equipped with a fire-escape constructed in accordance with and embodying the invention. Fig. 2 is an enlarged view, partly broken away and partly in section, of the grip device, sling, and wire or rod, the section through the grip device being on the dotted line 2 2 of Fig. 5. Fig. 3 is a central vertical section through the safety-stop, a portion of the wire or stop being illustrated therein.

Fig. 4 is a detached side elevation, partly broken away, of the grip device. Fig. 5 is an edge view of same. Fig. 6 is a front elevation, partly in section, of the reel and parts connected therewith; and Fig. 7 is an end view, partly in section, of same, the section being on the dotted line 7 7 of Fig. 6.

In the drawings, 10 designates the wire or rod, 11 the grip thereon, and 12 the safety-stop on said wire or rod.

The grip 11 supports the sling 13 and is connected with the rope 14, which is normally wound upon the reel 15, this reel being of usual or suitable construction and journaled in a frame 16 below a convenient protecting-hood 17. To one end of the reel 15 is secured a pinion 18, which is in mesh with a driving gear-wheel 19, the latter being mounted on a shaft 20, to which is connected the inner end of a volute spring 21, whose outer end is fastened to the wall of a stationary casing 22. The rope 14 when being unwound from the reel 15 will rotate said reel and through the pinion-wheel 18 and gear-wheel 19 effect the rotation of the shaft 20 and the winding up of the spring 21, the latter thus being placed under a tension which is utilized when the rope 14 is released to automatically rewind the same upon the reel 15.

The grip 11 is adapted to slide vertically, when force is applied, upon the rod or wire 10, and said grip comprises the two plates 23 24, the pairs of transverse rods 25 26 connecting said plates, and the eccentric 27, pivotally mounted between said plates 23 24 and having a handle 28, by which said eccentric may be manually operated. The eccentric 27 has its projecting portion extended downward, and said eccentric is secured upon the shaft 29, which is disposed on a horizontal plane about midway between the pairs of rods 25 26, as shown in Fig. 2. The rods 25 are in vertical alinement with the rods 26, and the wire or rod 10 passes between said rods 25 26, said rods 25, and likewise the rods 26, being separated from each other a convenient distance to receive the wire 10 between them with reasonable freedom.

The wire or rod 10 is securely held at its upper and lower ends, and except for the eccentric 27 the grip 11 would slide freely on said wire or rod. The purpose of the eccentric 27 is by being pressed against the wire rod 10 to create sufficient flexion in said rod to properly retard the downward passage of the grip 11 and the person occupying the

sling 13 and operating the handle 28 of said eccentric. The wire or rod 10 will preferably be a stout steel wire, and the bending or flexing of this wire by means of the eccentric 27 will be governed as to degree by the action of the person employing the escape and should be governed by the weight of such person. As a guide for the operation of the eccentric 27 I provide a weight-index 30 on the outer face of the grip 11, and on the shaft 29 of the eccentric 27 is secured a hand 31 for coöperation with said index, the numerals on said index denoting the respective positions the hand 31 should reach when the eccentric 27 is properly turned in accordance with the weight of the persons who may use the escape. For example, if the person using the escape should weigh one hundred and twenty-five pounds, he should turn the handle 28 until the hand 31 points to "125" on the index 30 and there hold it during the descent. The person intending to use the escape may before suspending himself in the sling turn the handle 28 until the hand 31 points to a number on the index 30 in excess of his weight, so as not to descend until he is fully prepared to do so, and then only at such speed as he may desire, this speed then being governed by the degree he may move the handle 28 in a reverse direction to relieve the flexion of the rod or wire 10. In Figs. 2 and 4 the eccentric 27 is shown as having been turned to a proper position for flexing or bending the wire or rod 10 to a sufficient extent to insure a safe descent of seventy-five pounds of weight. The extent to which the eccentric 27 will be turned by the operator will necessarily be governed by special conditions. During the descent of the grip 11 the rope 14 will unwind from the drum 15 and follow down with said grip, as herein-after explained, the object of the rope 14 being to afford a means for effecting the ascent of the grip 11 to its initial position for further or repeated use.

Upon the lower portion of the wire or rod 10 is located the stop 12, which comprises the pairs of rods 32 33 (corresponding with the aforesaid rods 25 26) and an intermediate rod 34, the latter being permanently partly in the path of the rod or wire 10, extending between the rods 32 33, and initially bending the said wire or rod 10 so as to hold the stop 12 stationary at all times except when, due to accident or other cause, the grip 11 shall descend with undue speed and strike against it, under which condition the stop will slowly descend and check and cushion the latter portion of the descent of the grip 11 and person suspended therefrom. The pairs of rods 32 33 and rod 34 are supported in plain flat plates 35.

Under the normal condition of the apparatus the rod or wire 10 will be firmly held at its ends, the rope 14 will be wound upon

the reel 15, and the grip 11 will be held by said rope upon the upper portion of the rod or wire 10 adjacent to the window or other exit from the building. In the event of a conflagration the person desiring to escape from the building will bind the eccentric 27 firmly against the wire or rod 10, and after seating himself in the sling 13 will relax the pressure of the eccentric 27 from the rod or wire 10 to a sufficient extent to permit of his safe descent with the grip 11. During the descent of the grip 11 the rope 14 unwinds from the reel 15 and the spring 21 winds within the casing 22, and after the grip 11 has made its descent and been released the spring 21 will act as a motor to rewind the rope 14 upon the reel 15 and effect the return of the grip 11 to its initial position at the upper end of the rod or wire 10, where it will be ready for repeated use. In the event of accident during the descent of the grip 11, such as the person losing control of the eccentric 27 and descending with undue rapidity, the grip 11 will strike the safety-stop 12 and be gradually arrested thereby.

In the employment of the escape it is the flexion or bending of the wire or rod 10 at a point intermediate the pairs of rods between which it is confined that is depended on to control or, if desired, prevent the descent of the grip with the person seated in the sling 13. The rods 25 26 guide the grip 11 upon the rod or wire 10, and it is immaterial to the success of the escape whether said rods rotate or are rigidly secured at their ends to prevent rotation.

The invention is not limited to the employment in every instance of the rope 14 and motor 21, since said parts need only be used when it is desired to utilize their purposes; nor is the invention limited to any special form or construction of the pairs of rods 25 26 and 32 33, since these rods merely constitute points of resistance and afford a guide or path for the rod or wire 10, which is an individual untwisted plain taut stout wire rod capable of limited flexion by means of the grip device. I recommend the employment of a wire 10 of about one-eighth or three-sixteenths of an inch in diameter, since such rod secured vertically will be sufficiently strong to sustain the proper weight and may be given the necessary bend or flexion by the eccentric 27 to afford the desired resistance. The grip 11 and stop 12 have a corresponding principle of operation in respect to their action on the wire 10 in that each of said devices forms and maintains a bend in the wire 10 and while descending under a positive force causes said rod to be bent outward and then inward along successive portions, or, in other words, causes said bend to travel downwardly, the energy absorbed in thus bending and straightening the rod of wire and in the con-

sequent wire-drawing of the rod constituting a resistance to the downward passage of said grip and stop. I do not limit myself to the wire 10 being one-eighth or three-sixteenths of an inch in diameter; but a wire of that diameter is abundantly stout for all usual conditions. A very stiff or heavy rod or bar would not properly receive or cooperate with the retarding-stop 12, and a person desiring to use the escape would not be able to create and maintain the bend in it by means of the grip device. The essential features of the grip 11 in respect of the bending and straightening of the wire 10 are the eccentric 27, the upper left-hand rod 25, (looking at Fig. 2,) and the lower left-hand rod 26, and these features correspond with the rod 34 and left-hand upper and lower rods 32 35 of the stop 12, with the exception that the rod 34 is not movable, but in connection with said rods 32 35 constitutes a fixed resistance instead of the variable resistance afforded by the grip device.

My invention involves certain principles of operation which are entirely novel in this and all analogous arts, and in the first place I may mention that the rod 10 is not a heavy bar nor a cable, but a metallic rod upon which the grip device is normally capable of a free sliding motion and which is of a character adapting it when gripped to be wire-drawn under the weight of the passenger supported in the carrier connected with the grip. The grip when in use will bend the wire to a degree at or beyond the elastic limit of the rod, and the descent of the passenger or equivalent weight while the grip is in operative position will result in the rod being wire-drawn, so that should, for illustration, the rod be successively used a number of times it will become drawn or longer in consequence thereof and will also become stronger, although its diameter will become reduced. The bend made in the wire by the grip device and maintained therein in successive portions of the wire during the descent of the passenger in the carrier effects a change in the structure of the wire rod, the latter under such operation becoming wire-drawn.

I am aware of no apparatus in this or any other art which combines a wire rod properly held and maintained so as to be capable of limited flexion when in use, a grip device thereon normally affording a free path for the rod or capable normally of sliding freely thereon, and which when placed in operative relation to the wire rod may create a bend in said rod and have the power to wire-draw it, and a carrier for a passenger connected with said grip device, said carrier being prevented from attaining undue speed due to the action of the grip device in wire-drawing said rod, and in this connection I may say that my invention is not limited to any special form of

wire in cross-section, since wire rods may vary materially in their cross-sectional form—as round, oval, square, or oblong, or in the form of a ribbon—but is limited to a wire material or a material which may be wire-drawn, as distinguished from a cable or heavy bar, both of which are known to the prior art in operations not at all analogous to those which characterize and render valuable my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an apparatus provided for the descent of persons from an upper portion of buildings to the ground, the wire rod 10 of small diameter and bendable and secured at the upper portion of a building and thence extending downwardly, and a grip device normally free on said rod, combined with a passenger-carrier connected with said grip device and movable therewith, said grip normally affording a free path for said wire rod and comprising operative means to be brought into action at the proper time by a positive force applied thereto by the operator for bending outwardly and inwardly continuously successive portions of said wire rod during the descent of said grip device and carrier, said rod 10 being adapted to resist this bending and straightening out of the same and by such resistance to control the said descent of said grip device and carrier; substantially as set forth.

2. In an apparatus provided for the descent of persons from an upper portion of buildings to the ground, the wire rod 10 of small diameter and bendable and secured at the upper portion of a building and thence extending downwardly, and a grip device normally free thereon, combined with a passenger-carrier, connected with said grip device and movable therewith, said grip device normally affording a free path for said wire rod and comprising the eccentric and its handle and a rod 25 above and a rod 26 below said eccentric for enabling said eccentric when a positive force is applied to said handle by the operator to effect the bending outwardly and inwardly of continuously successive portions of said wire rod during the descent of said grip device and carrier, said rod 10 being adapted to resist this bending and straightening out of the same and by such resistance to control the said descent of said grip device and carrier; substantially as set forth.

3. In an apparatus provided for the descent of persons from an upper portion of buildings to the ground, the wire rod 10 of small diameter and bendable and secured at the upper portion of a building and thence extending downwardly, and a passenger-carrier in cooperative relation to said rod and normally affording a free path for said wire rod and comprising operative means to be

brought into action at the proper time by the operator for acting against said rod to control the descent of said carrier thereon, combined with the retarding-stop normally stationary
5 on said rod and comprising an upper and a lower and an intermediate rod against which said wire is gripped and which maintain a bend in the same; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 18th day 10 of July, A. D. 1901.

JAMES CRUICKSHANK.

Witnesses:

CHAS. C. GILL,
GUNDER GUNDERSON.