R. GLASSER.

EXTENSIBLE LADDER FOR FIRE ESCAPES.

APPLICATION FILED APR. 27, 1921.

1,423,104.

Patented July 18, 1922.

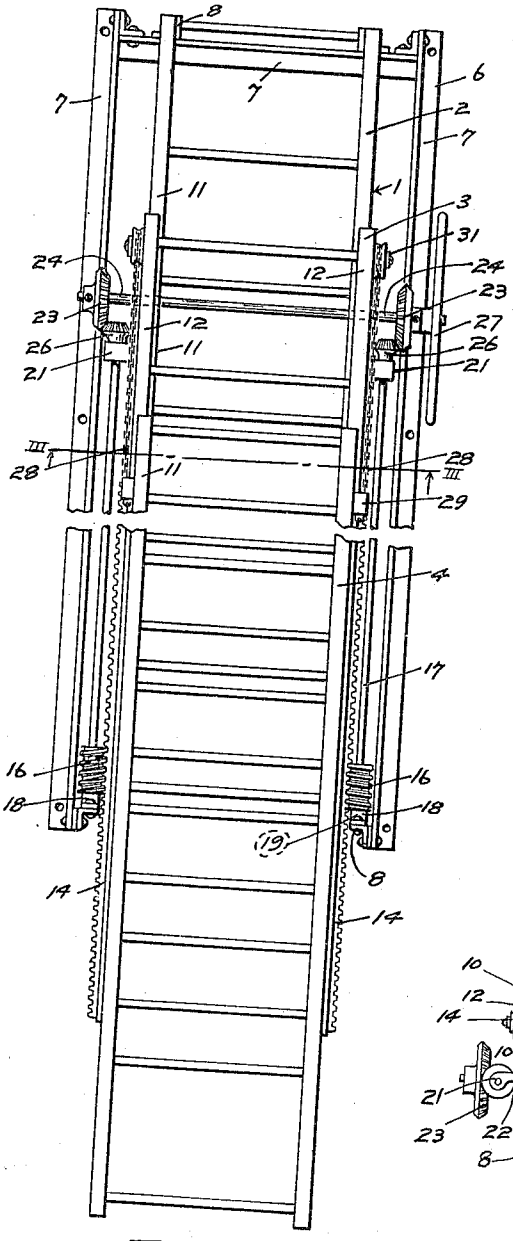


Fig. 1.

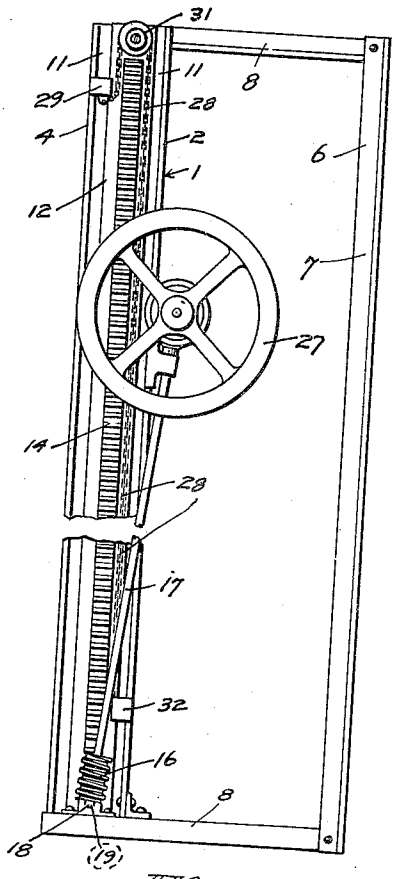


Fig. 2.

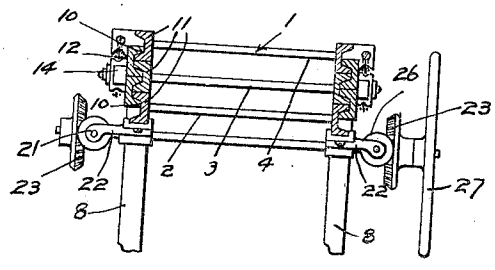


Fig. 3.

INVENTOR.
RICHARD GLASSER

BY

ATTORNEYS.

UNITED STATES PATENT OFFICE.

RICHARD GLASSER, OF SAN FRANCISCO, CALIFORNIA.

EXTENSIBLE LADDER FOR FIRE ESCAPES.

1,423,104. Specification of Letters Patent. Patented July 18, 1922.

Application filed April 27, 1921. Serial No. 464,852.

To all whom it may concern:

Be it known that I, RICHARD GLASSER, a citizen of the United States, and resident of San Francisco, county of San Francisco, and State of California, have invented a new and useful Extensible Ladder for Fire Escapes, of which the following is a specification.

The present invention relates to improvements in fire escapes and its particular object is to provide a drop ladder to reach from the first balcony to the ground. The stationary ladders constituting the fire escape and extending from balcony to balcony usually do not reach to the ground, for obvious reasons, but stop at the first balcony, so that in using the fire escape a person having reached the first balcony has to rely on some other means to get to the ground. To facilitate this last step I have invented my drop ladder which may be fixed to the first balcony permanently and is so constructed that it may be conveniently let down to the ground or to a place near the ground by any person having to use it, it being easy to handle, requiring no particular skill or strength nor any large degree of presence of mind, so that any person, even if frightened and excited and almost overcome by smoke and heat could easily use the same.

I attain this object by means of the mechanism illustrated in the accompanying drawing in which Figure 1 represents a front view of my drop ladder, Figure 2 a side view of the same and Figure 3 a sectional view of the same along line 3—3 of Figure 1.

Referring to the drawing in detail, my ladder 1, consisting of three component sections 2, 3 and 4, is shown as being supported in the frame 6. The latter forms no particular part of my invention and may be of any construction suited to the conditions to be met as long as it is adapted to hold the section 2 of the ladder vertically over the opening usually found in the floor of the lowermost balcony of a fire escape arrangement. The frame is shown in the drawing as consisting of a vertical rectangular structure of four angle irons (7) adapted to be secured to a support, as the wall of the house for instance, and having four angle irons 8 extending horizontally therefrom, which constitute the arms holding the section (2) of the ladder. It is understood, of course, that the length and shape of these arms can be adapted to the needs of the situation and can be arranged so that section 2 of the ladder is held vertically over the opening through which it is desired to descend.

The section (2) is stationary and fastened to said arms in a permanent manner. The three sections are of equal width and their sides are made of outwardly toeing channels (11) which just fit on each other. To hold them in sliding engagement I provide a third inverted channel (12) made up of two channel-shaped members, the overlying flanges of which extend into the channel of the middle member (11) and are rigidly secured thereto, while its exterior flanges (10) extend around the inner flanges of the two outer channels (11) and hold the same in sliding engagement with the central channel. It will be seen that in this manner the three channels constituting the sides of their respective sections are held together firmly with freedom of vertical motion relative to each other. It will be understood that I do not wish to confine myself to the exact construction of the channels as here outlined, the substance of the arrangement being a central section adapted to slidably engage the two outer sections.

The two channels (12) carry on their webs racks (14) extending through practically their whole length, which are adapted to be engaged by the worms (16). The latter are mounted on slightly slanting, vertical shafts (17), supported in bearings (18) resting on the lower pair of arms (8), as shown at (19), and in bearings (21) provided in brackets (22) secured to the stationary section (2) of the ladder at a convenient height above the floor of the balcony. These shafts are adapted to be rotated by means of bevel gears (23) mounted on a horizontal shaft (24) secured in the same brackets (22) and engaging bevel gears (26) secured to the shafts (17). A hand wheel (27) is secured to the horizontal shaft, by means of which the shaft may be rotated. The hand wheel is of sufficient size that it is easy to operate the apparatus, and the respective bevel and worm gears are so constructed that they work in conjunction, that is, if the two vertical shafts work in opposite direction, as they do in the illustration, the worms are of opposite thread direction.

It will be seen that in this manner the section (3) of the ladder can be raised and lowered at will by turning the hand wheel. The third section (4) is supported on either side by means of a chain or cable (28) secured to a block (29) fastened to the said section near its upper end and led over a pulley (31) secured to the upper end of section (3) to a block (32) secured to the lower end of the stationary section 2. It will thus readily be seen that when section (3) is lowered, section (4) is lowered at the same time and that section (4), being secured to a movable pulley will travel at twice the speed of the pulley, so that the two movable sections will arrive at their destination at the same time.

I claim:

1. A drop ladder comprising a stationary and a plurality of movable vertical sections, one movable section being slidably secured to the stationary section and the next movable section to the first one, means secured to the stationary section adapted to engage and impart vertical motion to the first movable section, a pulley secured to the upper part of the latter, and a flexible connection between the bottom of the stationary section and the top of the second movable section being led over said pulley adapted to transmit the vertical motion of the first movable section to the second movable section at twice the velocity of the first movable section.

2. A drop ladder comprising a stationary and a plurality of movable vertical sections, one movable section being slidably secured to the stationary section and having a vertical rack thereon, a worm adapted to operatively engage said rack, means for supporting said worm, means supported in said stationary section adapted to rotate said worm so as to impart vertical motion to said movable section, a second movable section slidably secured to the first movable section, a pulley secured to the upper part of the latter, and a flexible connection between the bottom of the stationary section and the top of the second movable section being led over said pulley adapted to transmit the vertical motion of the first movable section to the second movable section at twice the velocity of the first movable section.

3. A drop ladder comprising a stationary and a plurality of movable vertical sections, the first movable section being slidably secured to the stationary section and having a vertical rack thereon, an upright shaft, means for supporting said shaft, a worm on said shaft adapted to operatively engage said rack, a horizontal shaft supported in said stationary section adapted to operatively engage said upright shaft, means for manually operating said horizontal shaft, a second movable section slidably secured to the first movable section, a pulley secured to the upper part of the latter, and a flexible connection between the bottom of the stationary section and the top of the second movable section being led over said pulley adapted to transmit the vertical motion of the first movable section to the second movable section at twice the velocity of the first movable section.

4. A drop ladder comprising a stationary and a plurality of movable vertical sections, the first movable section being slidably secured to the stationary section and having a vertical rack thereon, an upright shaft, means for supporting said shaft, a worm on said shaft adapted to operatively engage said rack, a horizontal shaft supported in said stationary section having a bevel gear thereon, a second bevel gear on said upright shaft adapted to be engaged by said first bevel gear, means for manually operating said horizontal shaft, a second movable section slidably secured to the first movable section, a pulley secured to the upper part of the latter, and a flexible connection between the bottom of the stationary section and the top of the second movable section being led over said pulley adapted to transmit the vertical motion of the first movable section to the second movable section at twice the velocity of the first movable section.

RICHARD GLASSER.