

(No Model.)

3 Sheets—Sheet 1.

W. E. ANDERSON.  
FIRE ESCAPE.

No. 603,781.

Patented May 10, 1898.

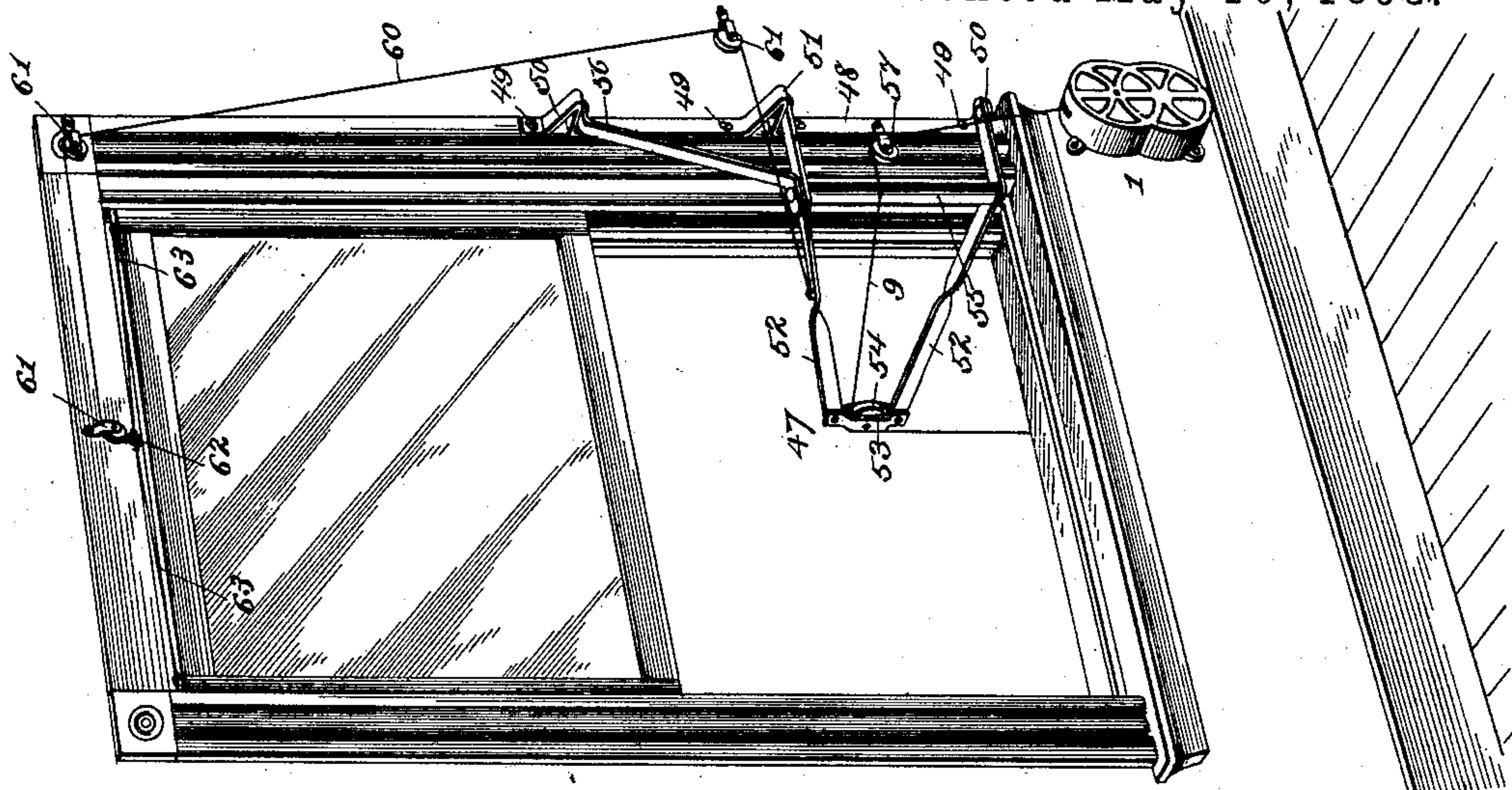


Fig. 2.

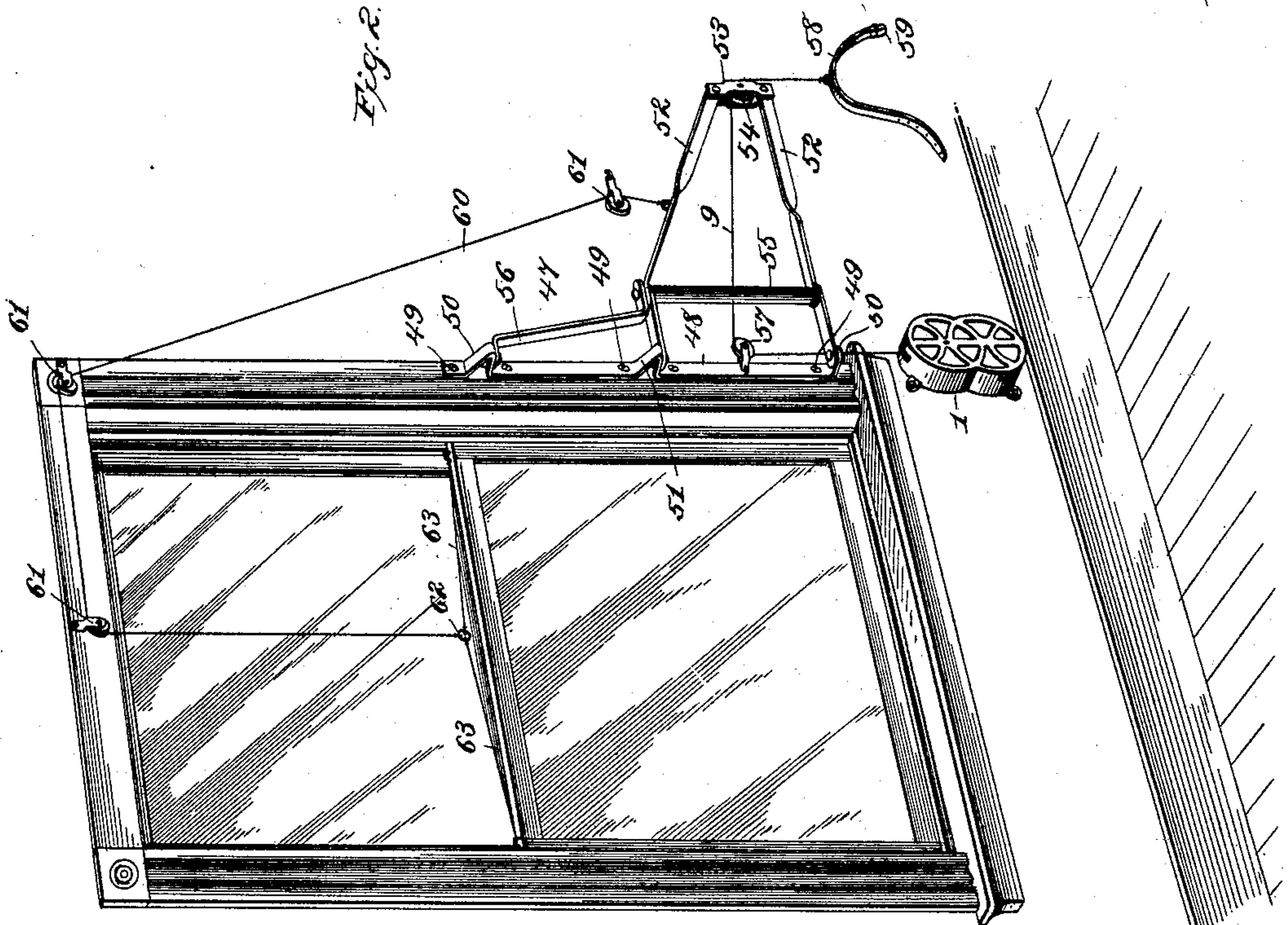


Fig. 1.

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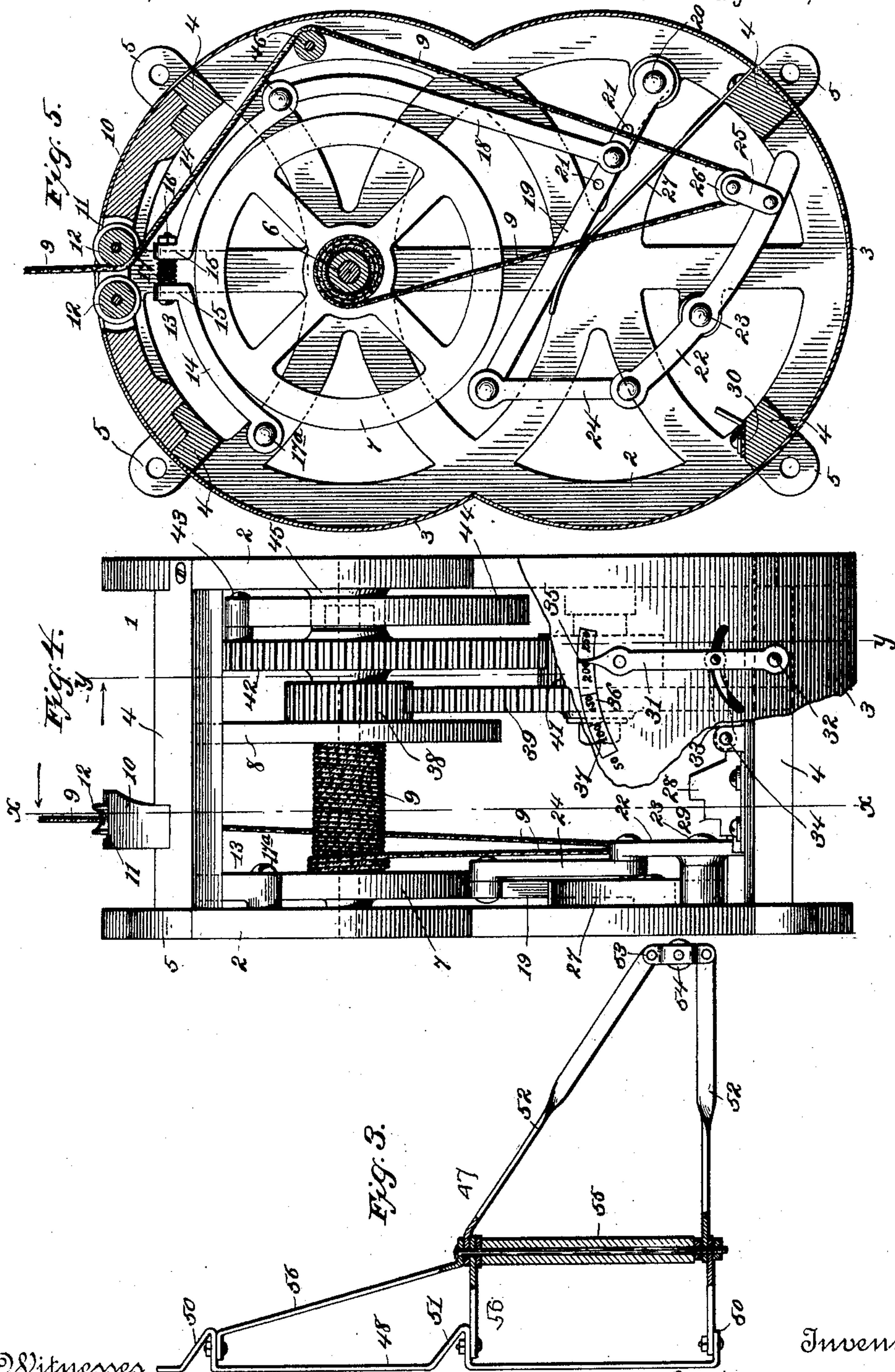
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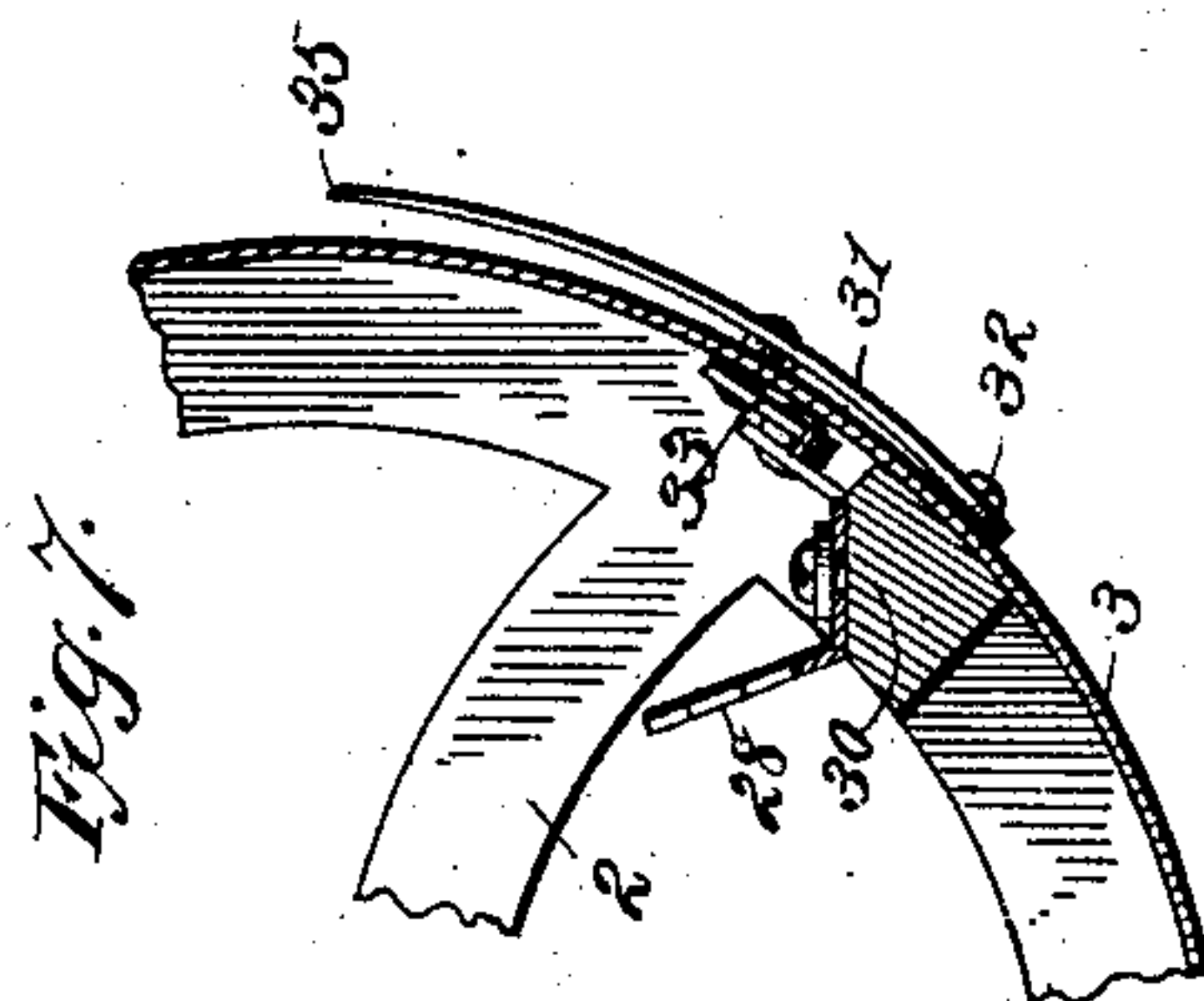
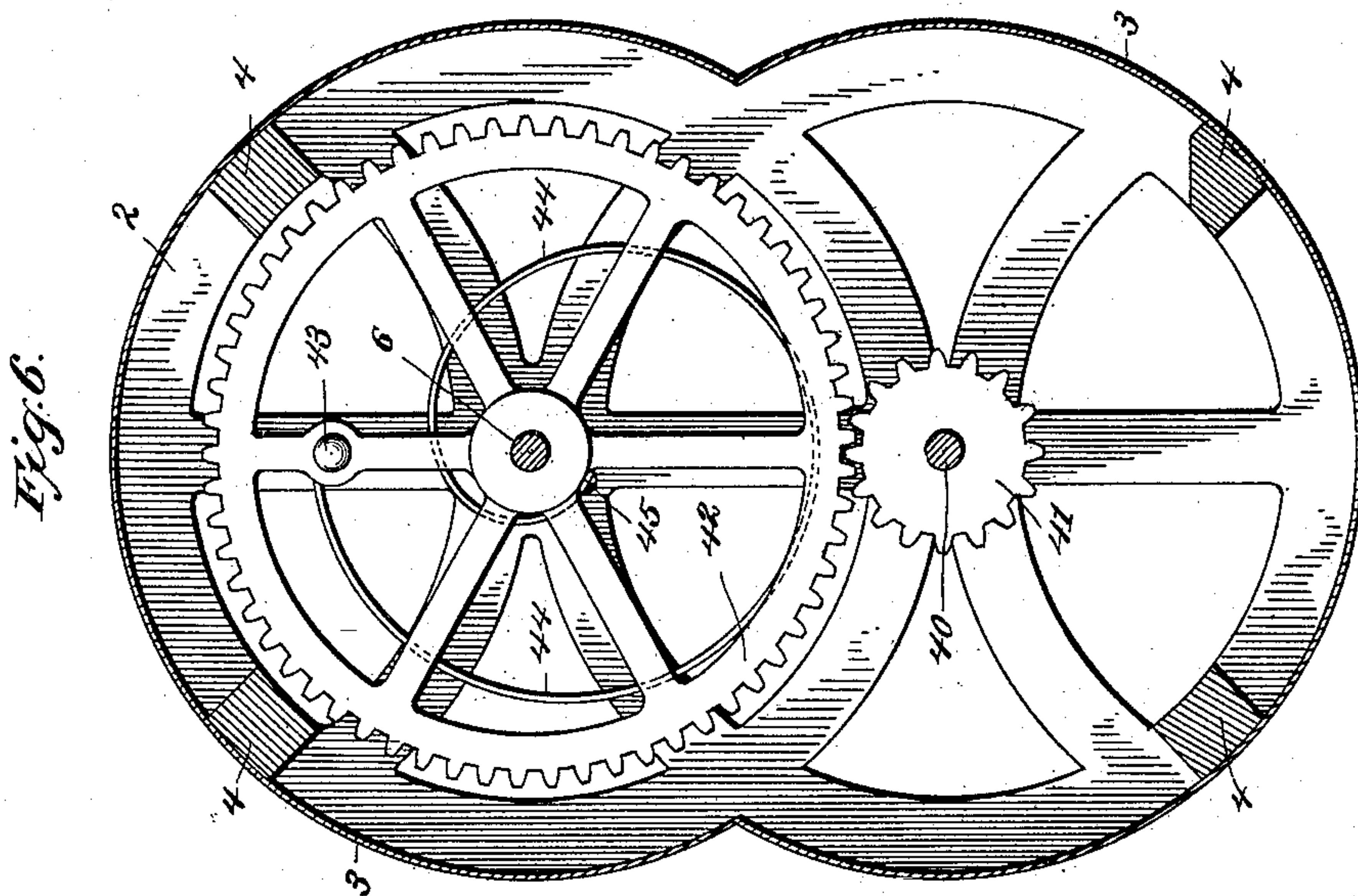
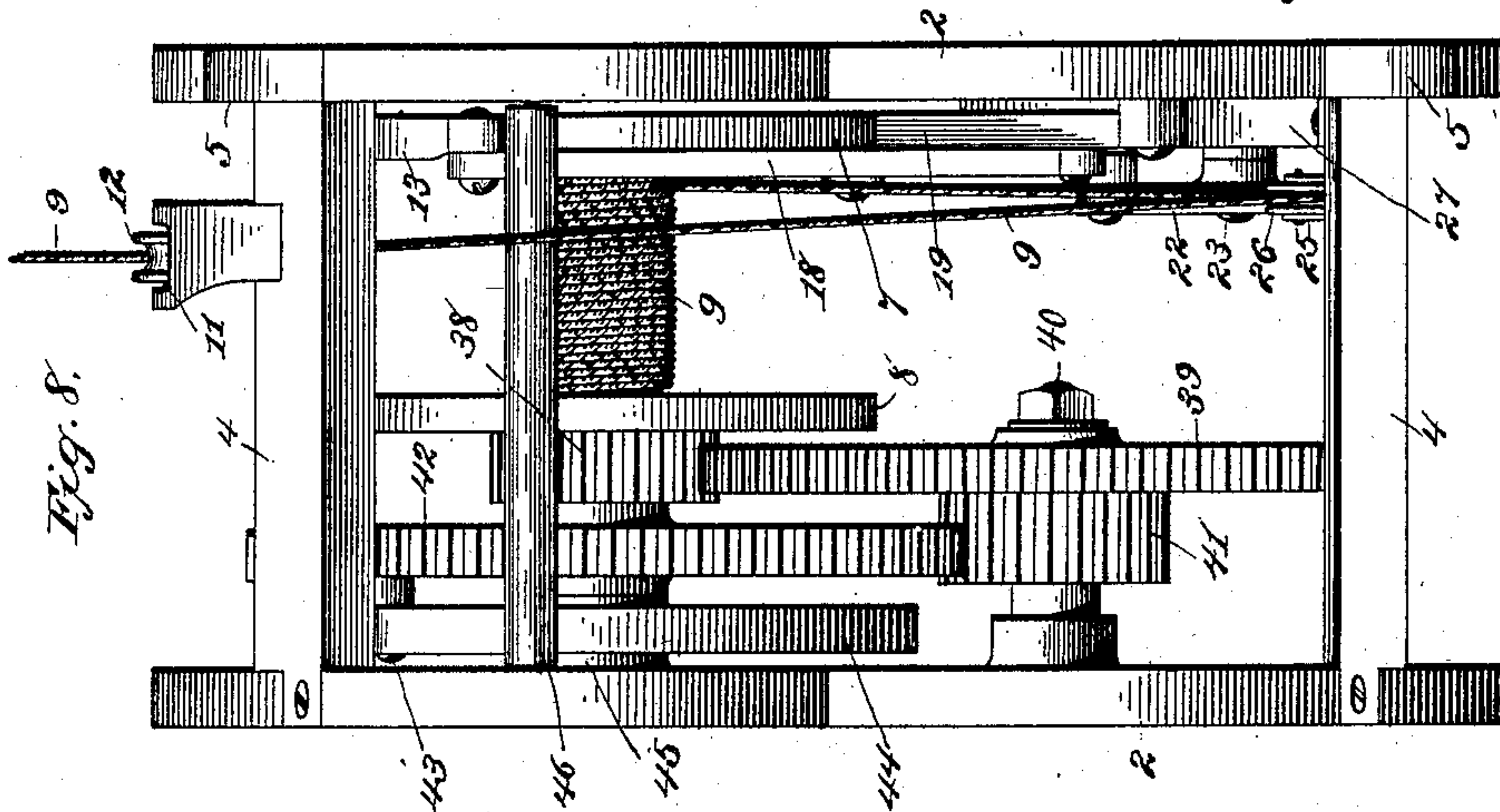
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# UNITED STATES PATENT OFFICE.

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## FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 603,781, dated May 10, 1898.

Application filed June 17, 1897. Serial No. 641,200. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. ANDERSON, of Frewsburg, in the county of Chautauqua and State of New York, 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.

This invention relates to fire-escapes and is of the type embodying reels, the same being adapted to enable a person to lower himself from a burning building to the ground at any desired speed.

The object of the present invention is to provide a simple and reliable fire-escape of the nature referred to in which an automatic brake is employed and in which the brake action may be increased or diminished and set at any desired point, so that persons of different weights may readily adjust the brake mechanism to suit themselves, the force of the brake being determined by an indicating device arranged within plain sight of the operator.

The invention also contemplates the use, in connection with the lowering device, of an improved bracket or support which is extensible and capable of being projected out of and beyond a window, so as to enable the person descending to avoid coming in contact with the walls of the building or projections thereon.

The detailed objects and advantages of the invention will be pointed out in the course of the ensuing description.

The invention consists in an improved fire-escape embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims hereto appended.

In the accompanying drawings, Figure 1 is a perspective view taken from the interior of a room and showing a window with the improved fire-escape apparatus arranged contiguous thereto, the apparatus being thrown out of position for use. Fig. 2 is a similar view showing the apparatus adjusted to its operative position. Fig. 3 is an enlarged side elevation of the bracket or support, the same

being partly in section. Fig. 4 is an edge view of the reel and its mechanism with the casing omitted. Fig. 5 is a longitudinal section through the reel, taken on the line  $x x$  and showing the brake mechanism. Fig. 6 is a similar section taken on the line  $y y$ . Fig. 7 is a detail cross-section showing the sliding stop or gage for limiting the movement of the brake mechanism. Fig. 8 is an edge view of the reel, taken from the opposite side from Fig. 4.

Similar numerals of reference designate corresponding parts in the several views.

Referring to the drawings, 1 designates the frame of the reel, which is preferably composed of the two skeleton side portions 2, connected by a sheet-metal casing 3, secured to the edges of the sides 2 and inclosing the operative parts of the reel and brake mechanism. The side frames 2 are further connected and braced by means of cross-bars 4, the ends of which are reduced and fitted in recesses in the sides and held therein by means of screws, bolts, or other fasteners. At its inner side the casing is provided with a plurality of ears or lugs 5, having openings to receive fasteners, by means of which the casing may be attached to the wall within a room and adjacent to any window.

The reel-shaft 6 is journaled in bearings in the frames 2 and has mounted fast thereon a pair of wheels 7 and 8, the wheel 7 being arranged at or near one side of the casing and constituting a friction-wheel upon which the brake acts for retarding the motion of said wheel. Extending around and wound upon the shaft 6 is the hoisting and lowering rope or cable 9, said rope or cable passing upward through a curved arm or bar 10, bolted or otherwise secured to adjacent cross-bars 4 and provided with an opening 11, in which are arranged two grooved pulleys 12, between which the rope or cable 9 passes, said pulleys serving to prevent the too-rapid wearing of the rope or cable.

Located above the friction-wheel 7 is a brake-shoe 13, comprising two independently-movable sections 14, each formed in the arc of a circle corresponding to the periphery of the friction-wheel, said sections being provided at their adjacent ends with offsets or ears 15, through which passes a bolt 16,



around which is disposed a coiled spring 17, interposed between the ears 15 and serving to press the same apart. One of the sections 14 is pivotally connected to one of the side frames 2 at its extremity 17<sup>a</sup>, while the end of the other section 14 has pivotally connected thereto a bar or link 18, which extends downward and connects to a pivoted arm 19, fulcrumed at 20 on the frame and provided with a longitudinal series of openings 21, providing for the adjustment of the pivotal connection between the link 18 and arm 19 for correspondingly varying the force with which the brake-shoes may be applied to the friction-wheel 7.

Arranged under the arm 19 is a lever 22, which is fulcrumed at 23 intermediate its ends. One end of the lever 22 is connected to the free end of the arm 19 by means of an interposed pivotal link 24. Connected to the opposite end of the lever 22 is a pivoted yoke 25, carrying a grooved pulley 26, around which the hoisting and lowering rope or cable passes. As the rope or cable 9 is drawn upon, the effect is to raise the yoke 25 and the corresponding end of the lever 22, thereby depressing the opposite end of the lever 22 and moving the free end of the pivoted arm 19 downward, thus drawing downward on the loop 18 and forcing the brake-shoe sections into contact with the fly-wheel 7. When this weight is relieved, the pivoted arm 19 is lifted by means of a leaf-spring 27, secured at one end of the frame of the reel and bearing at its free end beneath said pivoted arm, and by the return movement of said arm the brake-shoe is thrown out of engagement with the fly-wheel 7. It will thus be seen that the brake is automatic and is thrown into action by reason of the weight of a person being placed upon the rope or cable.

The movement of the lever 22, and consequently the force of the application of the brake-shoe, is regulated and limited by means of a sliding stop or gage 28. This gage is stepped, as indicated at 29, or provided with rests disposed at different elevations, and the gage is slidingly mounted to slide transversely of the reel-frame, so that any one of said rests or steps may be moved into the path of the lever 22. The base of the gage 28 is longitudinally slotted, as indicated at 30, and bolts or other suitable fasteners pass through said slots and also through the adjacent cross-bar 4 of the frame, so as to hold the gage in place, while permitting the same to slide transversely of the frame. The gage is reciprocated by means of a lever 31, which is pivotally connected to the frame at one end, as shown at 32, and which is connected with the sliding gage by means of a link or rod 33, which connects pivotally with the lever 31 at a point intermediate the ends of the latter and which connects pivotally at its opposite end with an ear 34 on the sliding gage. The lever 31 at its swinging end is pointed to form an indicator 35, and this indicator moves in front of a graduated arc 36, secured to the

outside of the casing in plain view of the operator. This arc has represented upon its exposed side numerals representing different weights, as shown at 37, thus enabling a person before descending from a burning building to adjust the indicator 35 to a point opposite the numerals representing his weight. This moves the corresponding step or rest 29 into the path of the lever 22, thus limiting the application of the brake-shoe to the fly-wheel 7. In this manner the lowering mechanism and the brake may be regulated to a child weighing fifty pounds or to a heavy person weighing two hundred and fifty pounds or more, and the brake will automatically apply its force to the fly-wheel 7 in proportion to the weight of the person descending.

Fast on the shaft 6 is a spur-pinion 38, which meshes with a spur gear-wheel 39, journaled on a stud or counter-shaft 40, connected to the machine-frame. The wheel 39 has connected rigidly thereto a spur-pinion 41, which in turn meshes with a large spur gear-wheel 42, mounted loosely on the shaft 6. The wheel 42 is provided at one side with a laterally-projecting pin or stud 43, and engaging said stud is the outer hooked free end of a helical spring 44, which is coiled around the shaft 6 and has its inner end secured to a stationary hub 45, fast upon the inner side of the frame. Thus as the rope or cable 9 is drawn off the reel the spring 44 is wound up, and after the person descending has reached the ground by releasing the rope or cable the spring 44 acts to wind the reel and wrap the rope or cable thereon, thus placing the mechanism in condition to admit of the descent of a second person, and so on. 46 designates a roller around which the rope or cable 9 passes for preventing too great friction thereon and for bringing the action of the rope in proper direction relatively to the lever 22. By means of the gearing above described the wheel 42, which winds up the spring 44, rotates at a very low rate of speed compared with the reel, thus enabling a comparatively small spring to be employed.

Arranged over the reel 1 and secured for convenience to the casing of the window-frame is a swinging bracket or support 47. This bracket comprises a stationary portion 48, which is for convenience formed of a strip or bar of metal having openings to receive fasteners 49, by means of which it is secured in place, and provided at its top and bottom with projecting ears 50, to which the swinging portions of the bracket are pivotally connected. The part 48 is also provided intermediate the ears 50 with a third ear 51, to which an intermediate swinging brace is connected pivotally. The swinging part of the bracket comprises outwardly-converging arms 52, which are connected at their outer ends by plates or yokes 53, between which is mounted a grooved pulley 54, over which the rope or cable 9 passes. The inner divergent ends of the arms 52 are loosely mounted upon



a vertically-revoluble shaft or roller 55, which is carried in the outer ends of a pair of swinging horizontal links or arms 56, pivotally connected at their inner ends to the ears 50 and 51 above referred to. The upper link or arm 56 extends obliquely and forms a brace for more effectively supporting the outer swinging portion of the bracket. Secured to the strap or bar 48 is a grooved pulley 57, which, being arranged near the window-casing, guides the rope or cable 9 around the edge of the window-casing and prevents the rope from rubbing against the same and becoming worn. The cable or rope 9 extends from the reel-casing 1 upward around the pulley 57 and thence on one side of the roller 55 and over the pulley 54. The cord or cable 9 has attached to its outer end a flexible belt 58, provided with a buckle 59 at one end for enabling the same to be fastened around a person's waist preparatory to making a descent. The swinging bracket may be further supported by means of a rope or cable 60, running over suitable pulleys 61, secured to the window-casing, and connected to a ring 62, having auxiliary ropes or cables 63, connecting the same to the lower sash of the window, as shown in Figs. 1 and 2, the rope 60 being secured at its other end to the upper arm or bar 52 of the swinging bracket in the manner illustrated. By virtue of this arrangement the lower sash is automatically raised whenever the bracket is swung away from the wall around toward the window, thereby expediting the adjustment of the apparatus in use and reducing the number of manipulations for effecting such adjustment.

By means of the construction above described it will be seen that the swinging bracket is located wholly within a room and above the reel. When it is desired to use the fire-escape, the swinging bracket may be readily moved so as to be projected out of the window, the hoisting or lowering rope or cable 9 being at the same time carried outward by the bracket. The operator may now adjust the indicator 35 to the desired point for regulating the brake mechanism to his own weight, and after fastening the belt 58 securely around his waist he may climb out of the window, grasping the swinging bracket or support. When his weight comes upon the rope or cable 9, he will immediately begin to descend, and the brake mechanism above described will check the reel-shaft and prevent his too rapid descent, thus making the fire-escape reliable and safe in operation.

An independent fire-escape constructed in accordance with this invention may be applied in each and every room in a hotel or dwelling and will not detract from the external appearance of the building, as it is normally located wholly within the window.

The exact form of the supporting-bracket above described need not be adhered to, and the reel and brake mechanisms are also susceptible of various changes in the form, pro-

portion, and minor details of construction, which may accordingly be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a fire-escape, the combination of the lowering rope or cable and a reel therefor located to the inside of the window, a swinging bracket mounted to the inside of the window and swinging on a vertical axis, said bracket being provided with a vertically-arranged hinge-joint and adapted to fold upon itself, whereby the bracket may be swung around the window-casing so as to project outwardly beyond the same, a guide mounted on the end of said bracket and over which said rope or cable is passed, and a vertically-arranged antifriction-roller having its axis coincident with the axis of said hinge-joint of the bracket, substantially as and for the purpose set forth.

2. In a fire-escape, the combination of the lowering rope or cable, a swinging bracket provided with a guide over which said rope or cable is passed, said bracket being mounted upon a stationary support to the inside of the window and normally swung inwardly out of the way, a flexible connection attached by its respective ends to the lower window-sash and to the swinging bracket and one or more guides over which said connection passes between its points of attachment, whereby the said flexible connection serves as a stay for the swinging bracket when the latter is swung into position out of the window, substantially as and for the purpose set forth.

3. In a fire-escape, the combination of the lowering rope or cable and a reel therefor, a brake-shoe for said reel, a pivoted arm and a pivotal link connecting said arm and shoe, a lever connected with said pivotal arm and engaging with and actuated by said lowering-rope, and a spring for returning said parts to their normal positions after the brake-shoe has been applied, substantially as and for the purpose set forth.

4. In a fire-escape, the combination of the lowering rope or cable and a reel therefor, a brake-shoe for said reel, a pivoted arm and a pivotal link connecting said arm and shoe, the said arm and link being adjustably connected with each other to vary the leverage, a lever connected with said pivotal arm and engaging with and actuated by said lowering-rope, and a spring for returning said parts to their normal positions after the brake-shoe has been applied, substantially as and for the purpose set forth.

5. The combination of a wheel and a sectional brake-shoe provided with arc-shaped sections loosely attached to each other by a link and having an interposed spring, an operating-bar for the brake-shoe and a lowering-rope engaging with and actuating said bar, one of said brake-shoe sections being pivoted to a stationary point and the other being piv-



oted to the operating-bar, substantially as and for the purpose set forth.

6. In a fire-escape, the combination of the lowering rope or cable and a reel therefor, a  
5 brake-shoe comprising independent sections yieldingly connected together, a brake-lever engaging with and actuated by said rope and connections between said lever and one of the  
10 brake-shoe sections, the other of said brake-shoe sections being pivotally mounted on a stationary point, substantially as and for the purpose set forth.

7. In a fire-escape, the combination of a lowering rope or cable and a reel therefor, a  
15 brake-shoe for the reel actuated by the tension of the lowering-rope, a lever engaging with and actuated by said lowering-rope and connections between said lever and brake-shoe, and adjustable means for regulating the  
20 range of movement of the lever to regulate the power with which the brake-shoe is applied in accordance with the tension on the rope.

8. In a fire-escape, the combination of a lowering rope or cable and a reel therefor, a  
25 brake-shoe, a brake-lever actuated by said rope or cable, and connections between said brake shoe and lever, and a sliding gage having stepped rests adapted to be engaged by said brake-lever for varying the stroke of said  
30 lever and operating means for said gage, substantially as and for the purpose set forth.

9. In a fire-escape, the combination of a lowering rope or cable and a reel therefor, a  
35 brake-shoe for the reel actuated by the tension of the lowering-rope, a lever engaging with and actuated by said lowering-rope and connections between said lever and brake-shoe, adjustable means for regulating the range of  
40 movement of the lever to regulate the power with which the brake-shoe is applied in accordance with the tension on the rope, and a visual indicator connected with and controlling the movement of said adjustable means and provided with a scale of weights, whereby the  
45 setting of the indicator at a certain weight on the scale serves to regulate the range of movement of said lever so as to apply the brake-shoe with a force in accordance with said in-

dicated weight, substantially as and for the purpose set forth.

10. In a fire-escape, the combination of a window provided with a movable sash, a swinging fire-escape normally lying within the window and adapted to be swung out through the opening of the window, and con-  
55 nections between said window-sash and fire-escape, whereby upon swinging the latter around to adjust it out of the window, the sash is automatically opened, substantially  
60 as and for the purpose set forth.

11. In a fire-escape, the combination of a window provided with a movable sash, a fire-escape provided with a lowering-rope and having a swinging bracket carrying said rope, and  
65 connections between said sash and swinging bracket, whereby upon swinging the bracket out of the window to adjust the rope for lowering, said sash is automatically opened, substantially as and for the purpose set forth.

12. In a fire-escape, the combination of a  
70 lowering rope or cable and a reel therefor, a fast pinion 38 and loose gear 42 mounted upon the shaft of the reel, idle-gears 39 and 41 connecting said fast pinion and loose gear, whereby the rotation of the one actuates the other,  
75 and a spring 44 for rotating the reel backwardly to wind up the rope, said spring being connected with said shaft and loose gear respectively and wound by said loose gear, substantially as and for the purpose set forth.

13. In a fire-escape, the combination of a window provided with a movable sash, an adjustable fire-escape and connections between the same and said window-sash, whereby upon  
85 adjusting the fire-escape for use the sash is automatically opened by the adjusting movement, substantially as and for the purpose set forth.

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

WILLIAM E. ANDERSON.

Witnesses:

PETER LINDHOLM,  
JOHN VENMAN.