

(No Model.)

3 Sheets—Sheet 1.

L. J. MESNER.  
FIRE ESCAPE.

No. 377,766.

Patented Feb. 14, 1888.

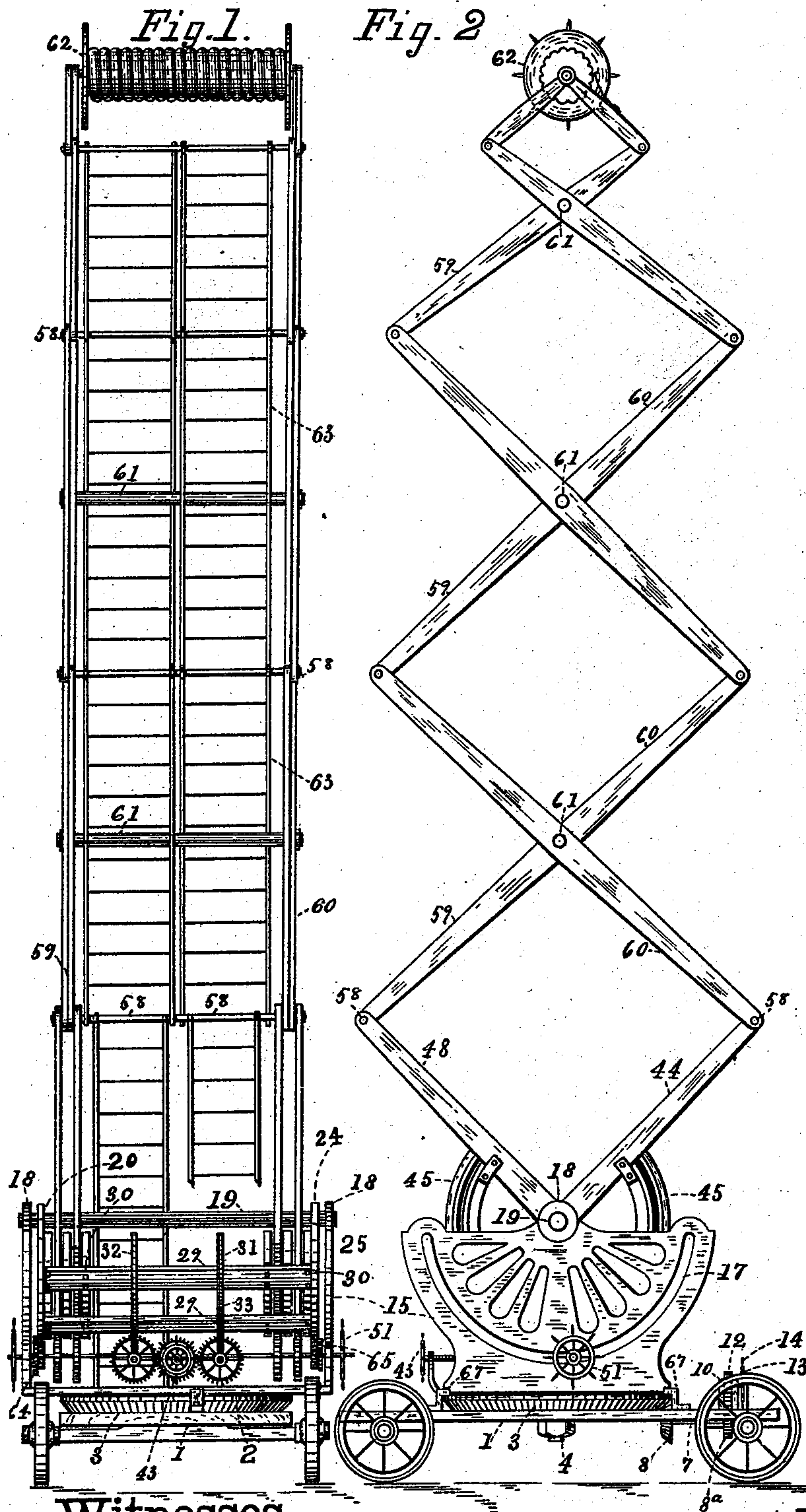
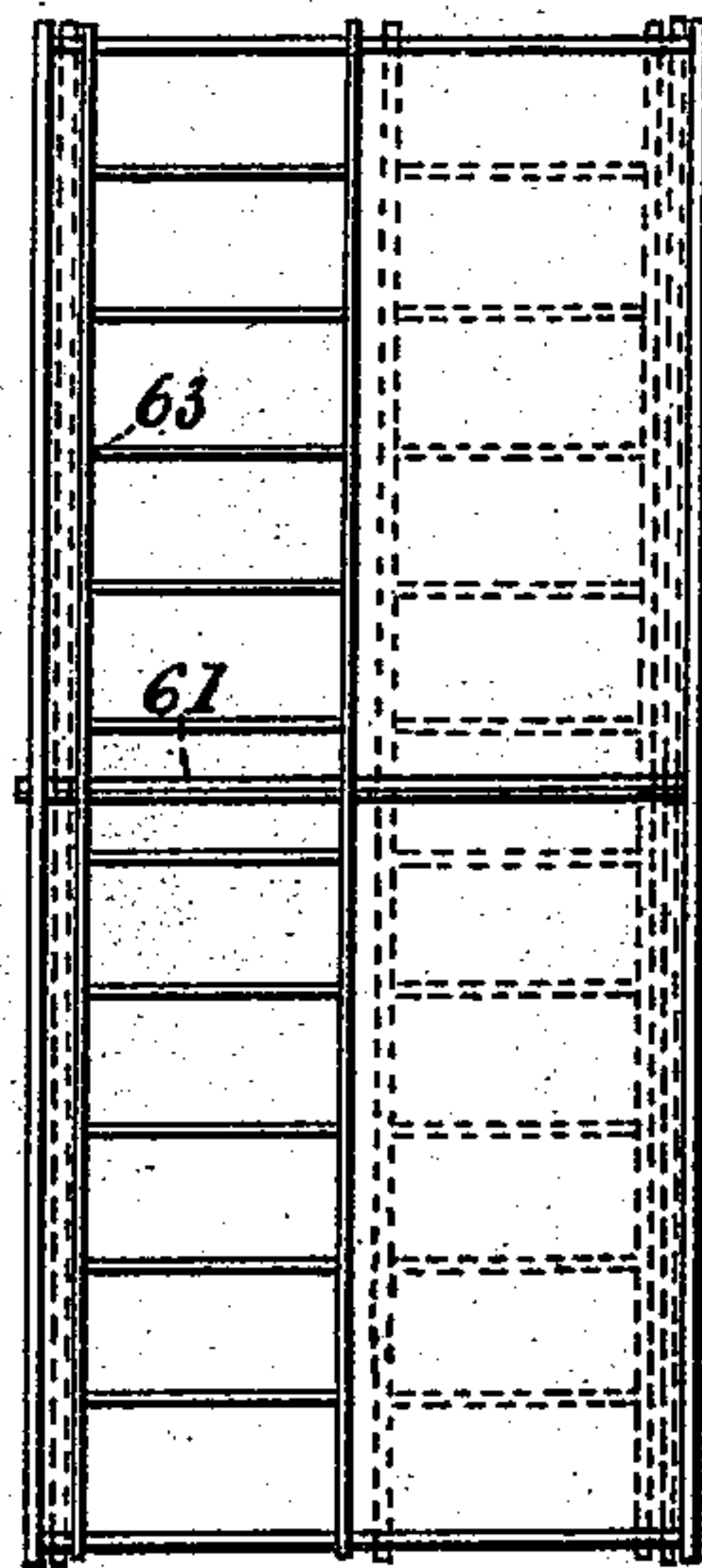


Fig. 3.



Witnesses.

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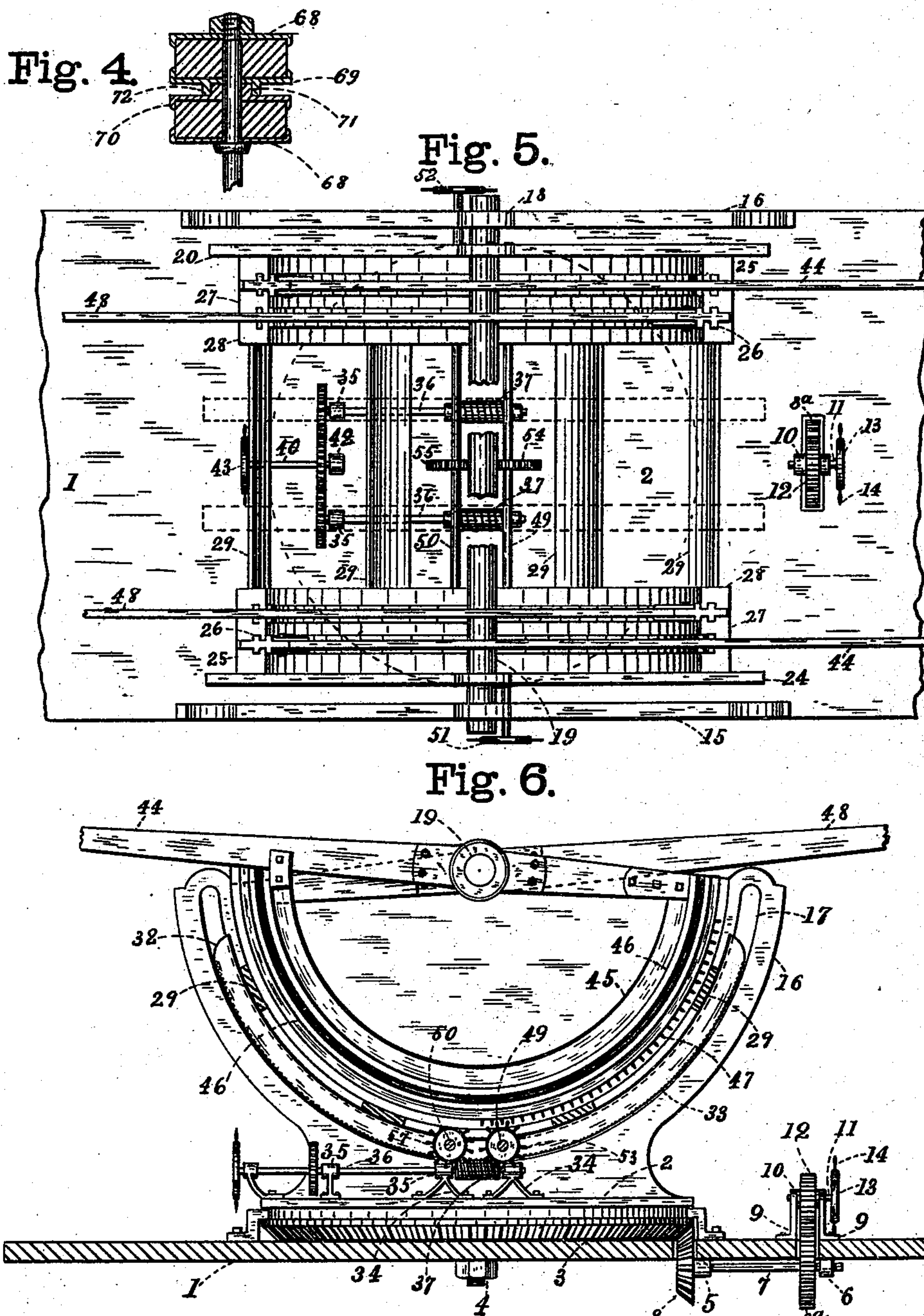
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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Fig. 7.

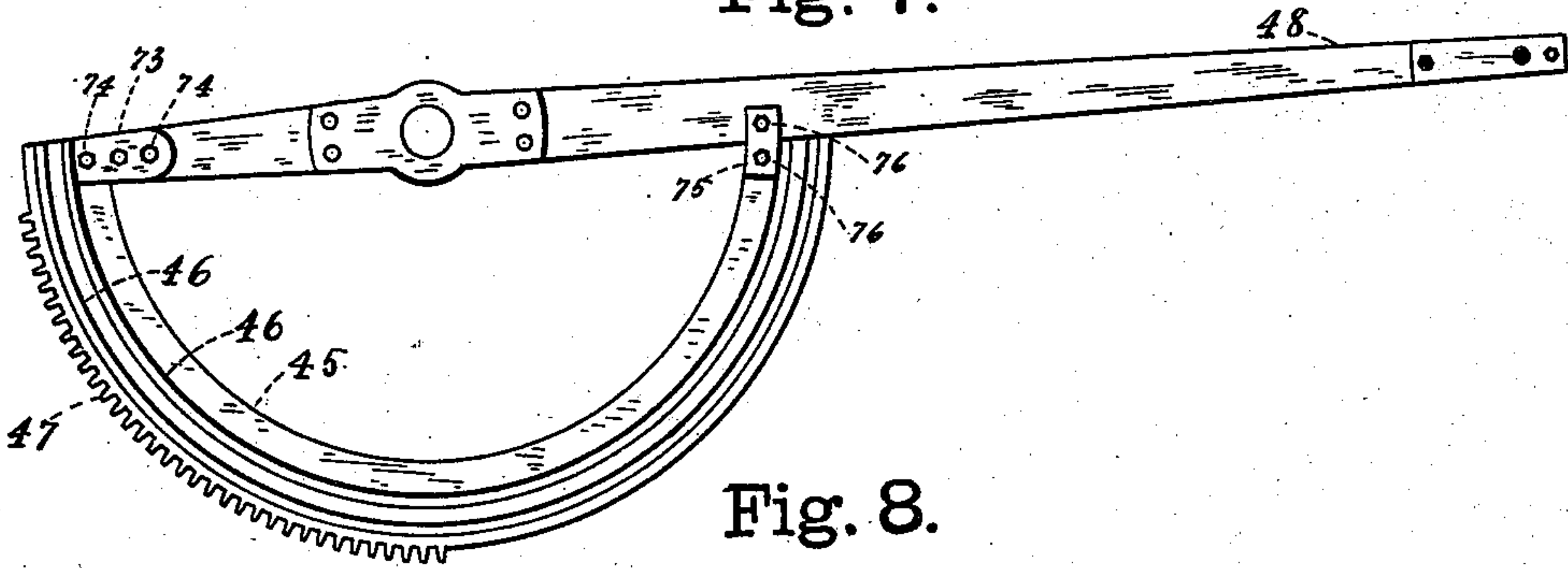


Fig. 8.

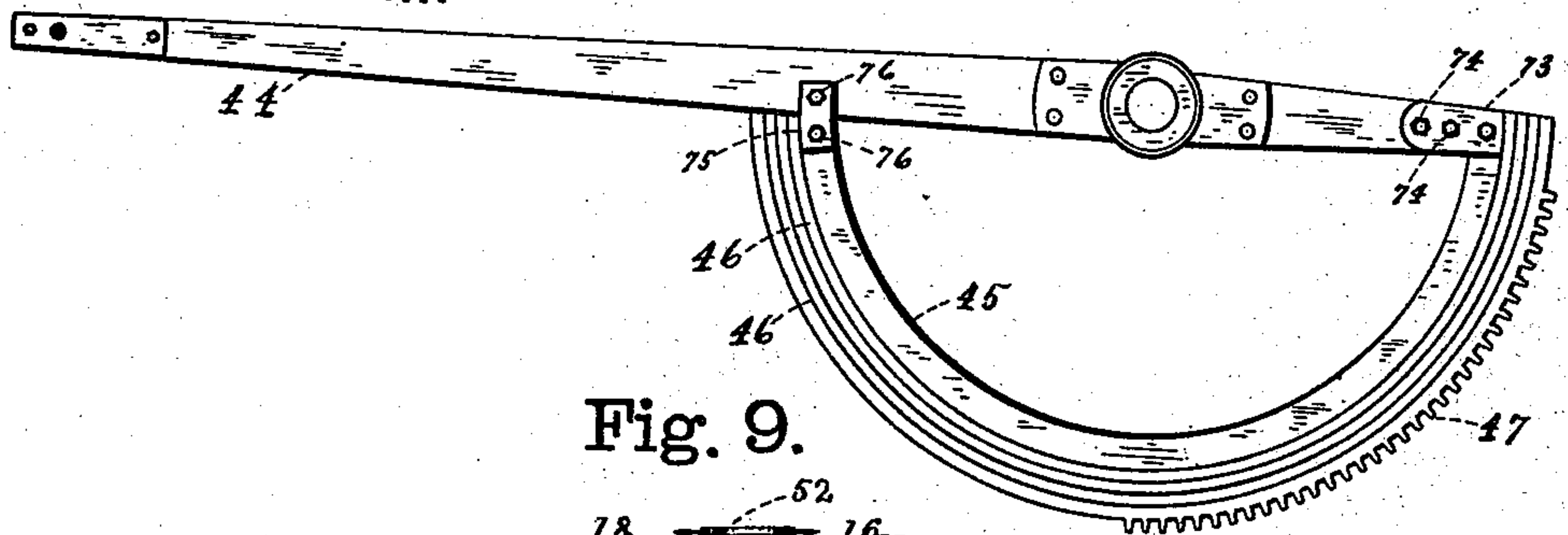


Fig. 9.

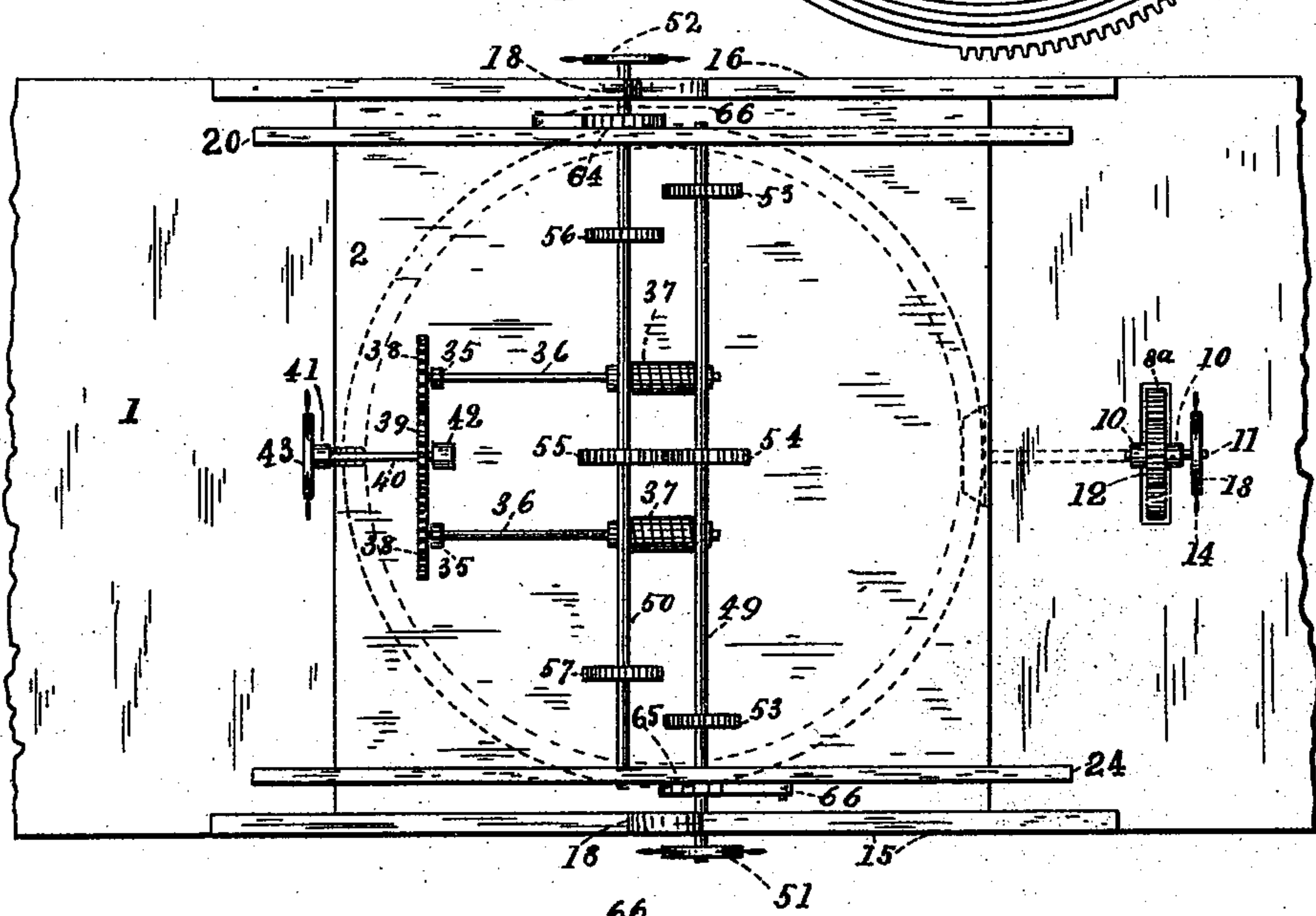
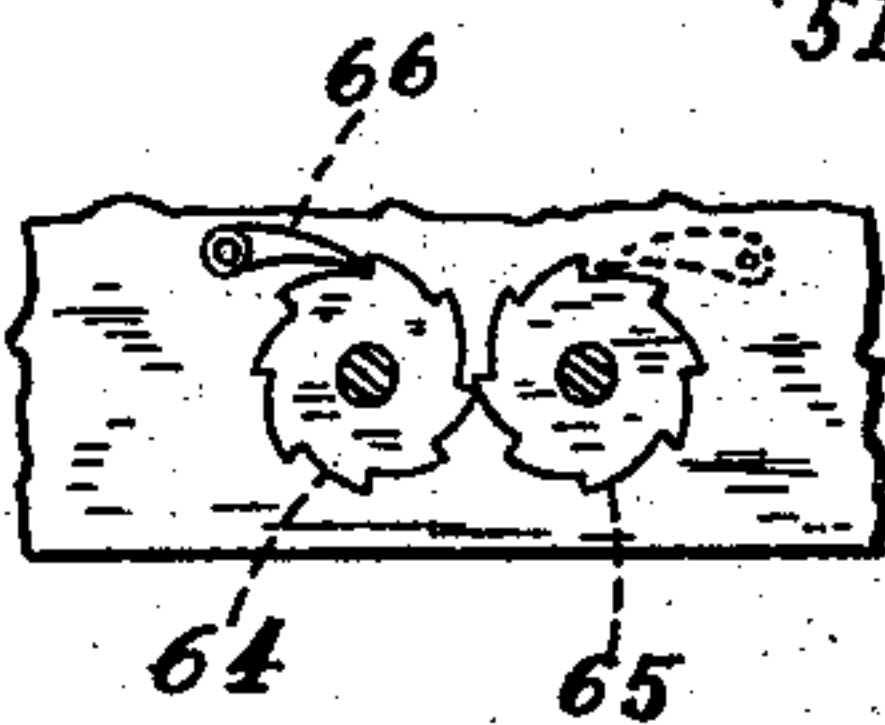


Fig. 10.



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# UNITED STATES PATENT OFFICE.

LEONARD J. MESNER, OF BUFFALO, NEW YORK.

## FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 377,766, dated February 14, 1888.

Application filed May 10, 1887. Serial No. 237,675. (No model.)

*To all whom it may concern:*

Be it known that I, LEONARD J. MESNER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

My invention relates to certain improvements in that class of fire-escapes in which the elevating apparatus consists in a system of levers put together on the principle of the "lazy-tongs;" and the invention consists in certain improvements in the mechanism for elevating the ladders, the hose, for turning the same around into any position desired for giving the ladders and hose-reel any inclination that may be required, and to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

In Sheet 1, Figure 1 is a front elevation of the complete apparatus, a portion of the lower ladders being broken away so as to show more clearly the mechanism below it. Fig. 2 is a side elevation of the same, and Fig. 3 is a detached front elevation of one of the sections, showing a similar view of the ladders connected thereto. In Sheet 2, Fig. 4 is a cross-section through a pair of the arms or levers, showing the way in which the joints are secured. Fig. 5 is a plan or top view of the apparatus, the upper portions of the ladder being left off and portions of the main shaft being broken away so as to show the mechanism below it, showing also a portion of the vehicle-platform upon which the apparatus is carried; and Fig. 6 is a side elevation of the same with one side of the frame and the first semicircular grooved guideway left off, so as to show the other portions of the mechanism more clearly. In Sheet 3, Fig. 7 represents a side elevation of one of a pair of the lower levers and the semicircular sliding piece and gearing, showing the construction of the several parts; and Fig. 8 is a similar view of the opposite arm or lever with its curved sliding piece and gearing adapted to work on the same shaft side by side with the arm shown in Fig. 7. Fig. 9 is a plan view of the mechanism below the levers, the main shaft, and curved guideways; and Fig. 10 is a side elevation of

a portion of one of the curved side pieces, showing two ratchet-wheels and pawls for the purpose of more clearly illustrating their position on the machine.

In said drawings, 1 represents the platform of the vehicle upon which the apparatus is secured.

2 is the turn-table having the large bevel gear-wheel 3 arranged below and firmly secured to it and to the platform 1 by the bolt 4.

To the platform 1 is secured, by bolts or in any well-known way, two boxes or bearings, 5 and 6, carrying a shaft, 7, having a bevel pinion, 8, adapted to gear into the large gear-wheel 3, rigidly secured to it, and at the opposite end of said shaft 7 is a spur-wheel, 8<sup>a</sup>. At the top of the platform 1 are two vertical frame-pieces, 9, having boxes 10, in which is mounted a shaft, 11, having a pinion, 12, adapted to gear in with the spur-wheel 8<sup>a</sup>. At the other end of the shaft 11 is a hand-wheel, 13, by which it is operated by hand. It will be seen from this construction that the whole apparatus above the gear-wheel 3 may be turned in either direction by operating the hand-wheel 13 by means of the handles 14.

To the turn-table are rigidly secured two side frame-pieces, 15 and 16, each having a semicircular slot, 17. These side pieces, 15 and 16, are each provided with bearings 18, adapted to receive the main supporting-shaft 19. To the shaft 19 is keyed or otherwise rigidly secured two side frame-pieces, 20 and 24, so that they oscillate with the shaft 19, and to each inner side of these frame-pieces 20 and 24 (shown in Figs. 1, 5, and 9) is rigidly secured a grooved guide-piece, 25, (see Fig. 5,) each having longitudinally-curved grooves 26, and opposite the guide-pieces 25 is a similar curved guide-piece, 27, having corresponding grooves, 26, on each side of it, and opposite to the curved guide-pieces 27 is another curved guide-piece, 28, having the longitudinal curved grooves 26 on one side only. These guide-pieces are rigidly kept in position by cross-pieces 29 (shown in Figs. 1, 5, and 6) a sufficient distance apart to allow curved arms having ribs adapted to slide in the curved grooves to slide between them, as will be more clearly hereinafter shown. To these cross-pieces are secured by bolts 30 two curved pieces, 31 and 32, each having a screw-threaded groove, 33, (shown in Figs. 1 and 6,)



and to the turn-table 2 are secured by bolts in the ordinary way the supporting-frames 34; having bearings 35, in which are mounted the shafts 36. These shafts 36 are provided with a screw portion, 37, adapted to gear in and engage with the screw-threaded grooves 33 in the two curved pieces 31 32. At the opposite ends of each of the shafts 36 is a gear-wheel, 38, and between the wheels 38 is another spur-wheel, 39, adapted to gear in with the wheels 38 and mounted on a shaft, 40, set in bearings 41 42. (See Figs. 5, 6, 9.) To the outer end of the shaft 40 is a hand-wheel, 43. By this means the device may be made to incline either to one side or the other, the screw holding it firmly at any point to which it may be adjusted.

44 48 represent the first pairs of levers or jointed arms. They are fitted so as to turn loosely on the main shaft 19. There are four of these arms—two on each side—and each are provided with semicircular sliding bars 45, having curved guiding-ribs 46. These curved sliding bars have each a series of teeth, 47, which cover about one-half (more or less) of the periphery of the semicircular bars. (See Figs. 6, 7, and 8.) The curved sliding ribs 46 are made to correspond in size and shape to the grooves 26, so as to fit and slide freely in said grooves between the semicircular guide-pieces 25, 27, and 28.

In the side frame-pieces, 20, are mounted, in suitable bearings, two shafts, 49 and 50, one shaft projecting through the semicircular slot 17 on one side and provided with a hand-wheel, 51, and the other shaft projecting through the curved slot 17 on the opposite side and provided with a hand-wheel, 52. (See Figs. 1, 2, 5, 6, and 9.) On the shaft 49 are two gear-wheels, 53, (see Fig. 9,) adapted to gear in and engage with the teeth 47 on the semicircular slide-bars connected to the outer set of arms, 44, and in or about the center of the shaft 49 is a gear-wheel, 54, adapted to gear in and engage with the gear-wheel 55 on the shaft 50. The shaft 50 is also provided with two gear-wheels, 56 57. These wheels 56 57 are adapted to gear into the teeth 47 on the semicircular slide-bars connected with the inner set of arms, 48. Now it will be seen from this construction that by moving either one or both of the hand-wheels 51 or 52 each set 44 and 48 may be made to turn on the main shaft, so that their outer ends will either swing up toward each other or down away from each other. To the lever-arms 44 and 48 are jointed by rods 58, secured in any well-known way, (see Figs. 1 and 4,) a series of pairs of arms, 59 and 60, each pair of arms being jointed at the center by shafts 61, so that the whole combined will be in the form of a lazy-tongs. Each series or set of arms are preferably made shorter or lighter as they go up, and at the top is mounted in suitable well-known journals a hose-reel, 62. On each set of arms or jointed levers 59 and 60 is secured a ladder, 63, Fig. 1—one series of ladders on one side and another series on the other side, so as to afford a ready

means of going up or down when the apparatus is extended.

In Figs. 1, 9, 10 I have shown two ratchet-wheels, 64 and 65. They are mounted on the shafts 49 and 50, near the side frame-pieces, 20 and 24, and are each provided with a detent-pawl, 66. Their object is to prevent the shafts 49 and 50 from turning backward, and thereby hold the apparatus at any point at which it may be elevated.

The whole apparatus is secured to the platform of the vehicle by means of the center bolt, 4, and suitable holding-pieces, 67. (Shown in Fig. 2.)

The running-gear of the vehicle is constructed in the well-known way adapted for such vehicles, and a further description is not required.

In Fig. 4 I have shown a suitable means for strengthening the joints of the lever-arms, which are preferably made of wood, and to strengthen the same I use the cast or malleable iron plates 68, 69, 70. On the plate 70 is a projecting piece, 71, adapted to pass into the circular rim 72, and the bolt or shaft passes through all, which materially adds to the strength of the joint.

The operation of the invention will be easily understood from the foregoing description and drawings. The apparatus, being adapted to be drawn by horses, may be readily taken from one place to another. It is elevated to any point that may be required by turning the hand-wheels 51 or 52, or both, and when elevated sufficiently it is rigidly held in position by the ratchet-wheels and their detent-pawls, as hereinbefore mentioned. If it is desired to incline the ladders to one side or the other, it may be done by turning the hand-wheel 43, thereby operating the screw above described, and if required the whole apparatus may be turned around so as to reach any required point by operating the hand-wheel 13 and its combined operative parts, as hereinbefore mentioned. The curved or semicircular sliding bars 45 are rigidly secured to the arms 44 48 by means of the plates 73 and bolts 74 on one end and by plates 75 and bolts 76 on the opposite end. (See Figs. 7, 8.)

I claim as my invention—

1. In a fire-escape consisting in part of a system of pivoted levers or arms in the form of a lazy-tongs, the lower pairs of pivoted arms pivoted to the main shaft in bearings in the supporting-frame, their curved or semicircular sliding bars, and curved holding-ribs and gear-teeth, in combination with correspondingly-grooved semicircular guideways, in which the curved holding-ribs move or slide, gear-wheels on the shafts 49 and 50, for gearing in with the teeth on the curved sliding bars, and a means consisting of hand-wheels on said shafts for operating them, whereby all the parts are securely held in place while free to be easily moved, substantially as described.

2. In a fire-escape consisting in part of a system of pivoted lever-arms in the form of a



lazy-tongs, the two lower pairs of arms piv-  
oted to the main shaft in bearings in the sup-  
porting-frame, in combination with their  
curved or semicircular sliding bars, curved  
5 holding-ribs, and gear-teeth, corresponding  
semicircular slideways for receiving and hold-  
ing the said sliding bars, and mechanism for  
gearing in with the teeth on the curved sliding  
bars, a means consisting of hand-wheels for  
10 operating them, and a means consisting of the  
ratchet-wheels and detent-pawls for holding  
the apparatus at any point it may be elevated,  
substantially as described.

3. In a fire-escape, the pairs of pivoted bars  
composing the extensible frame, in combina- 15  
tion with the strengthening and wearing plates  
68, 69, and 70, the plate 70 having the pro-  
jecting portion 71, and the plate 69 having  
the projecting rim 72, as and for the purpose  
described.

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