

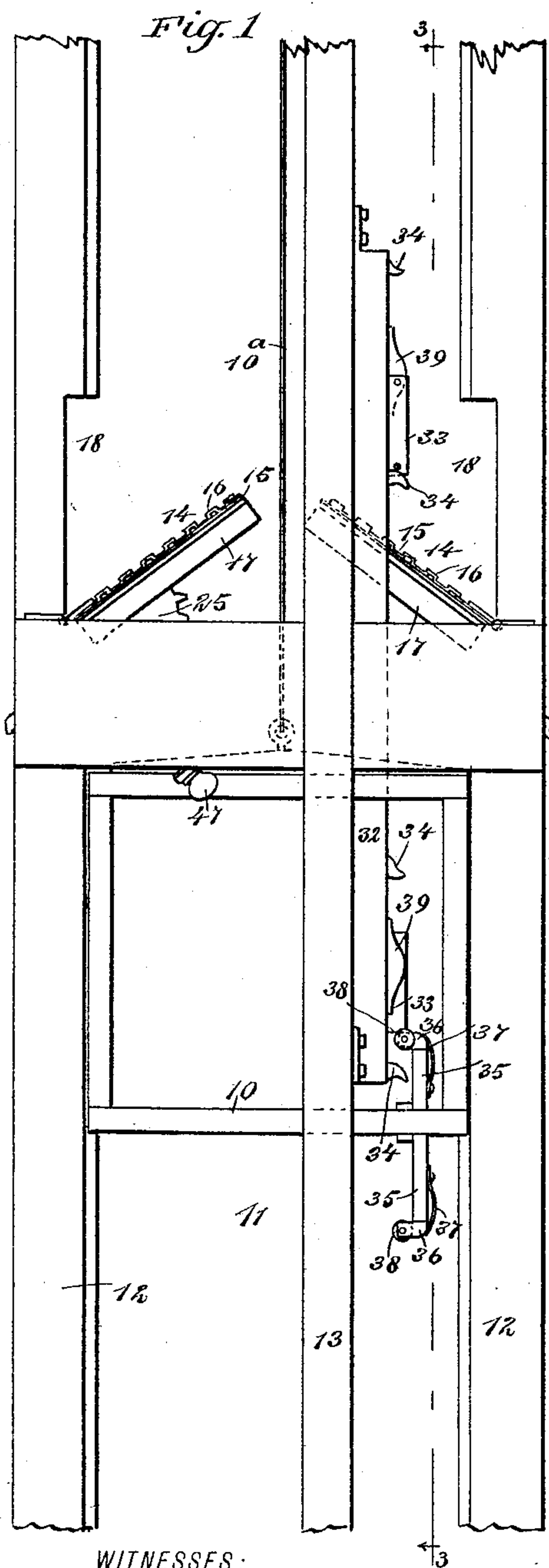
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W. N. ANDERSON.  
ELEVATOR.

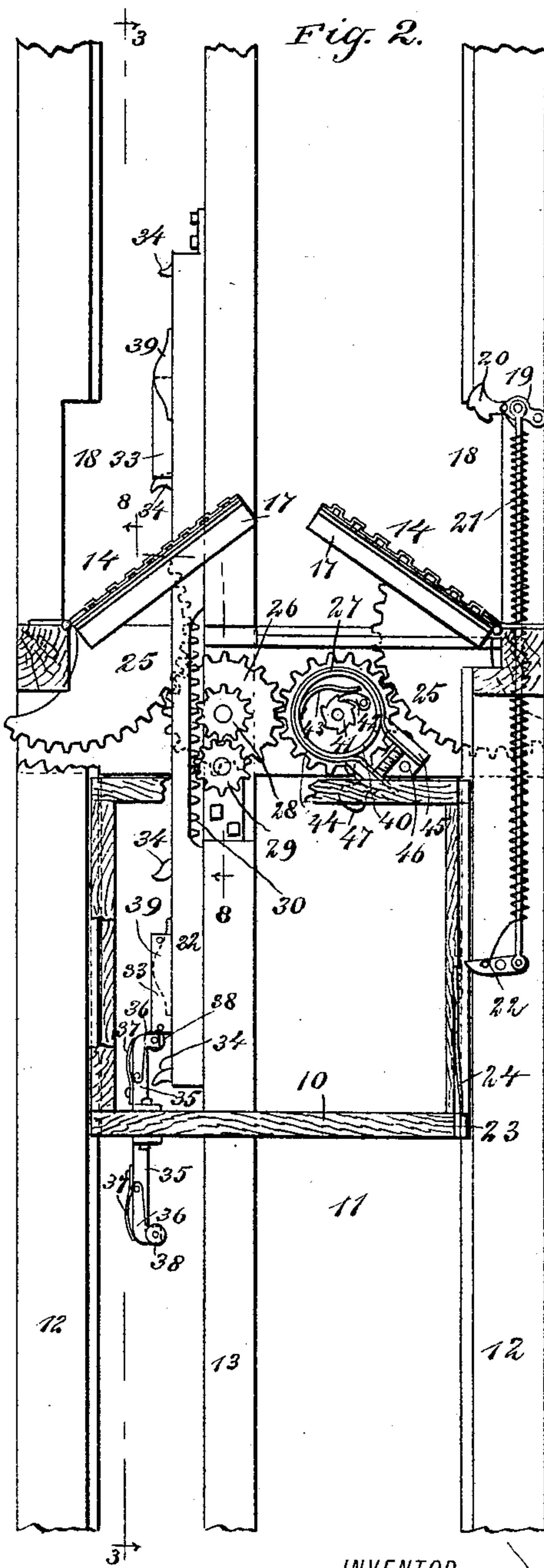
No. 480,542.

Patented Aug. 9, 1892.



WITNESSES:

J. A. Griswell.  
C. Sedgwick



INVENTOR

W. N. Anderson  
BY  
Munn & Co  
ATTORNEYS

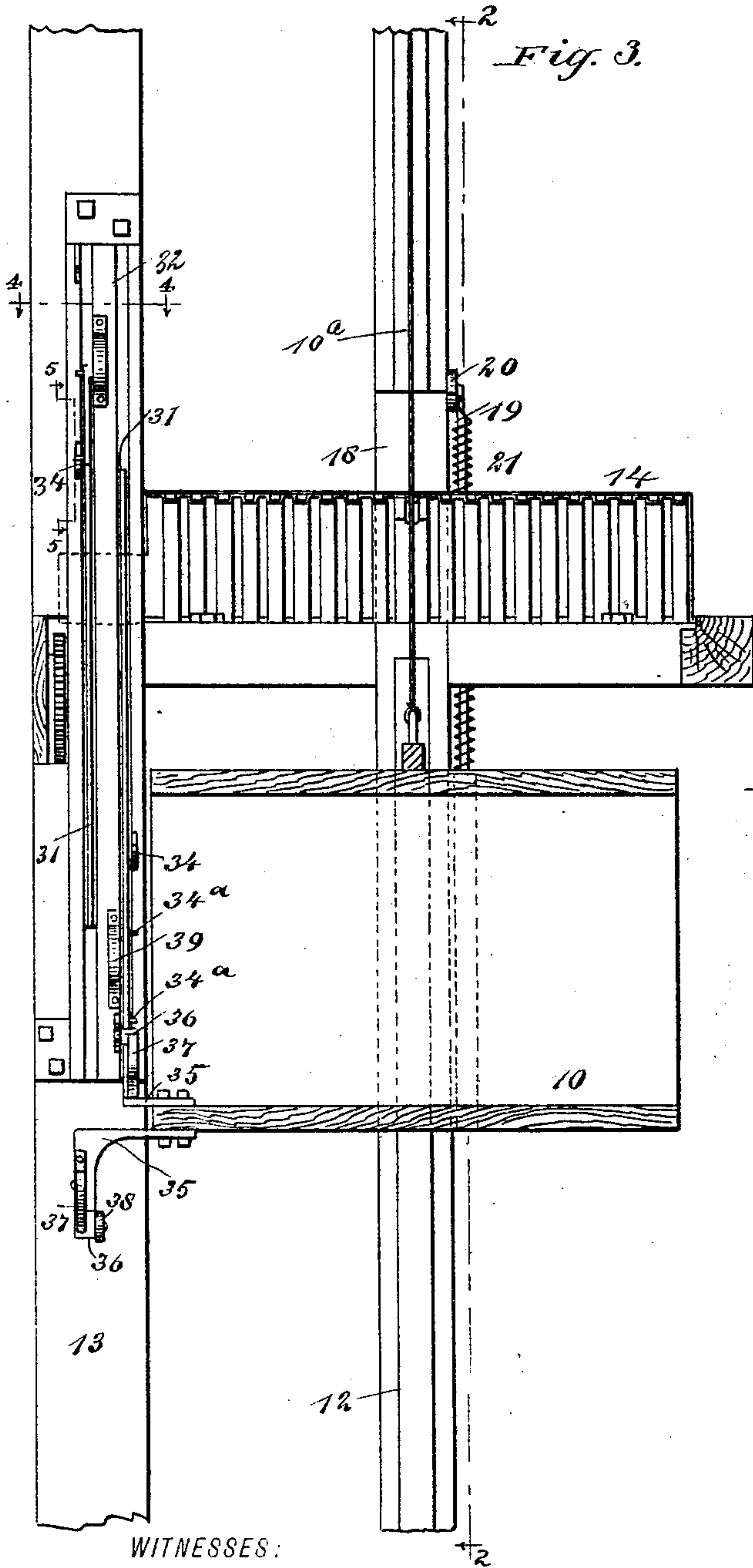
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Fig. 4.

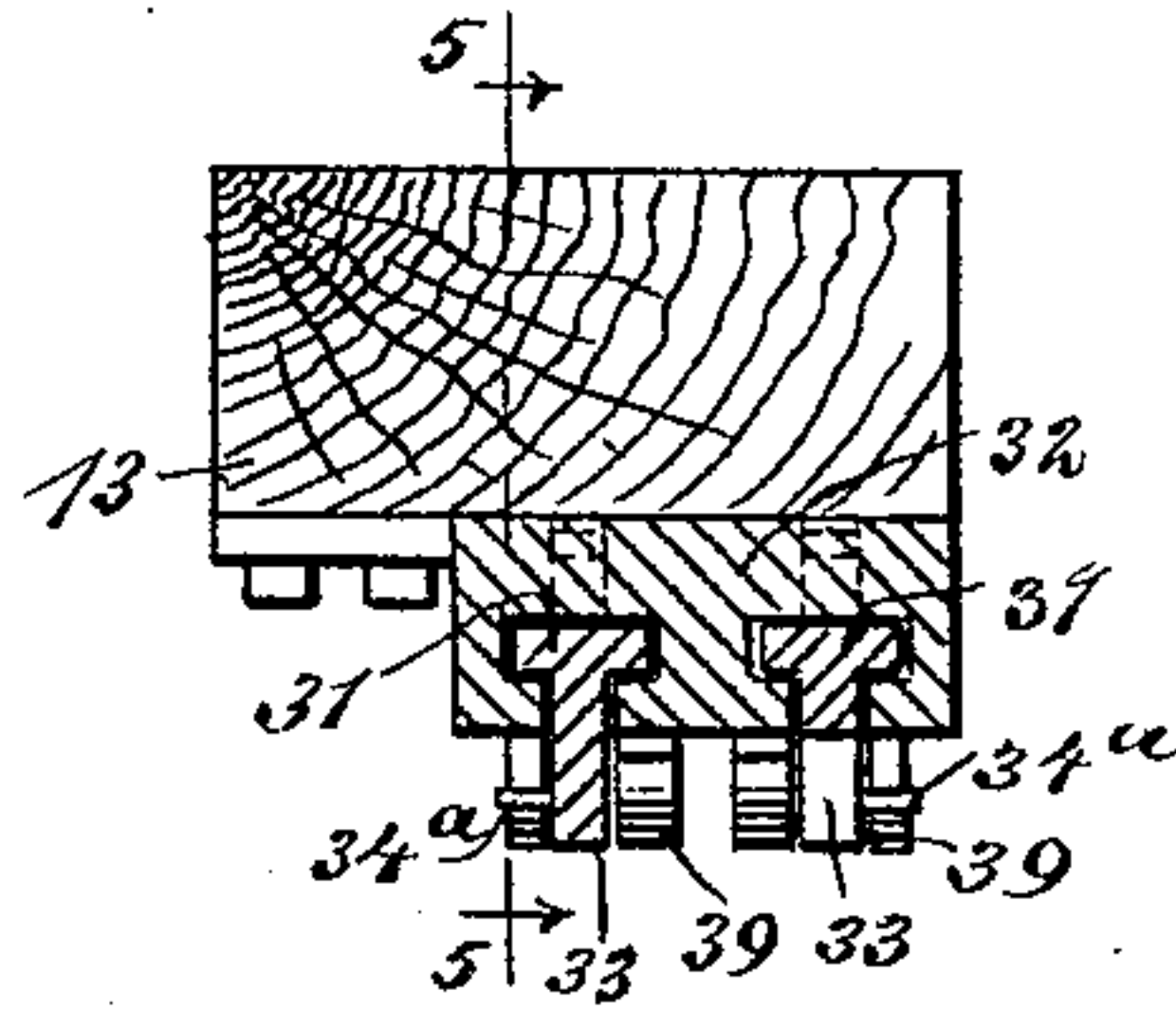


Fig. 5.

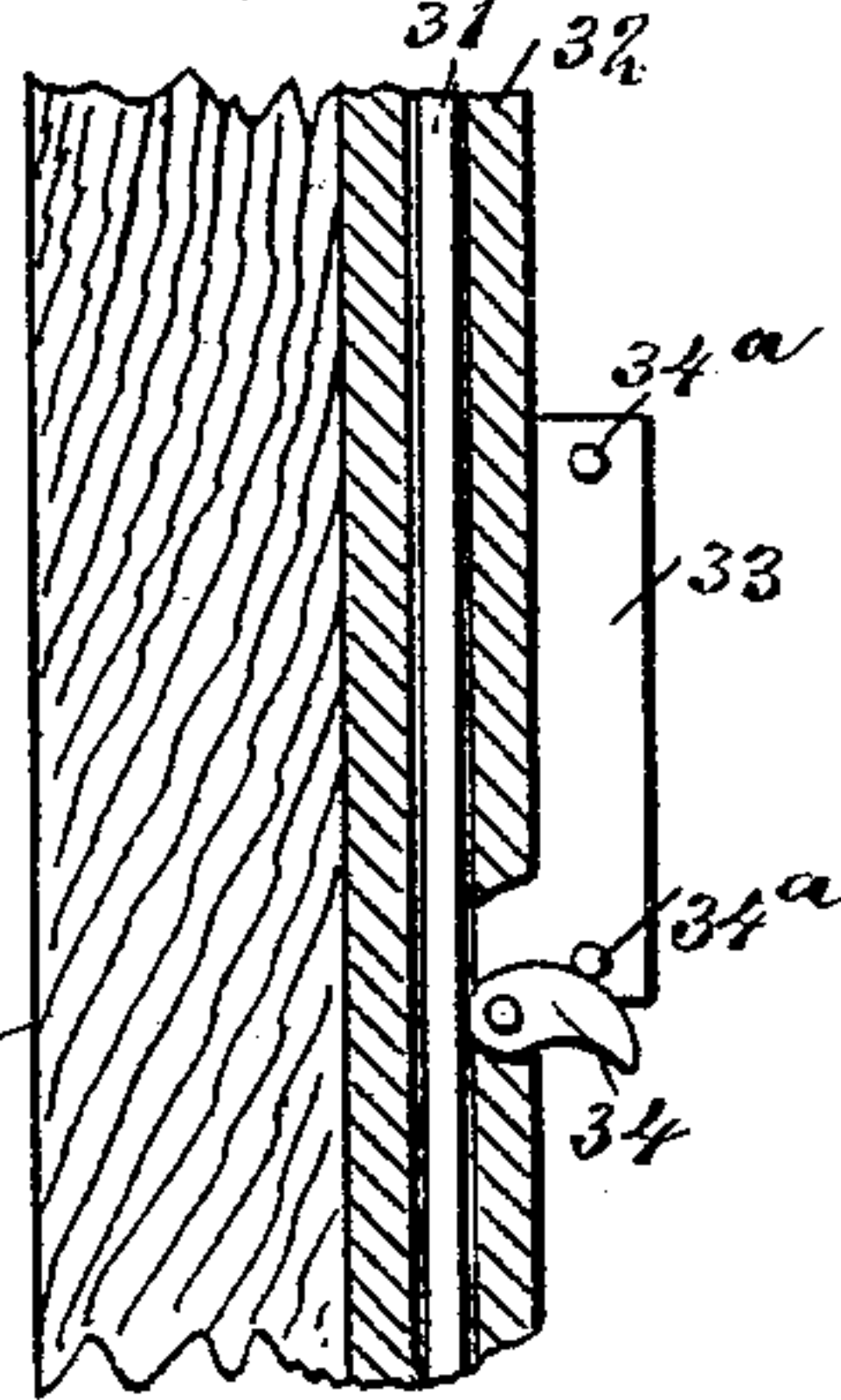


Fig. 6.

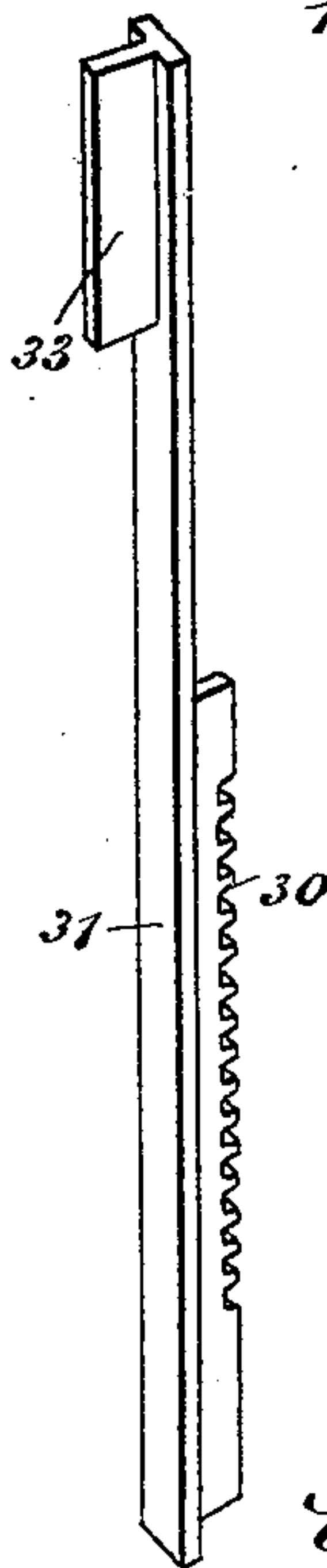
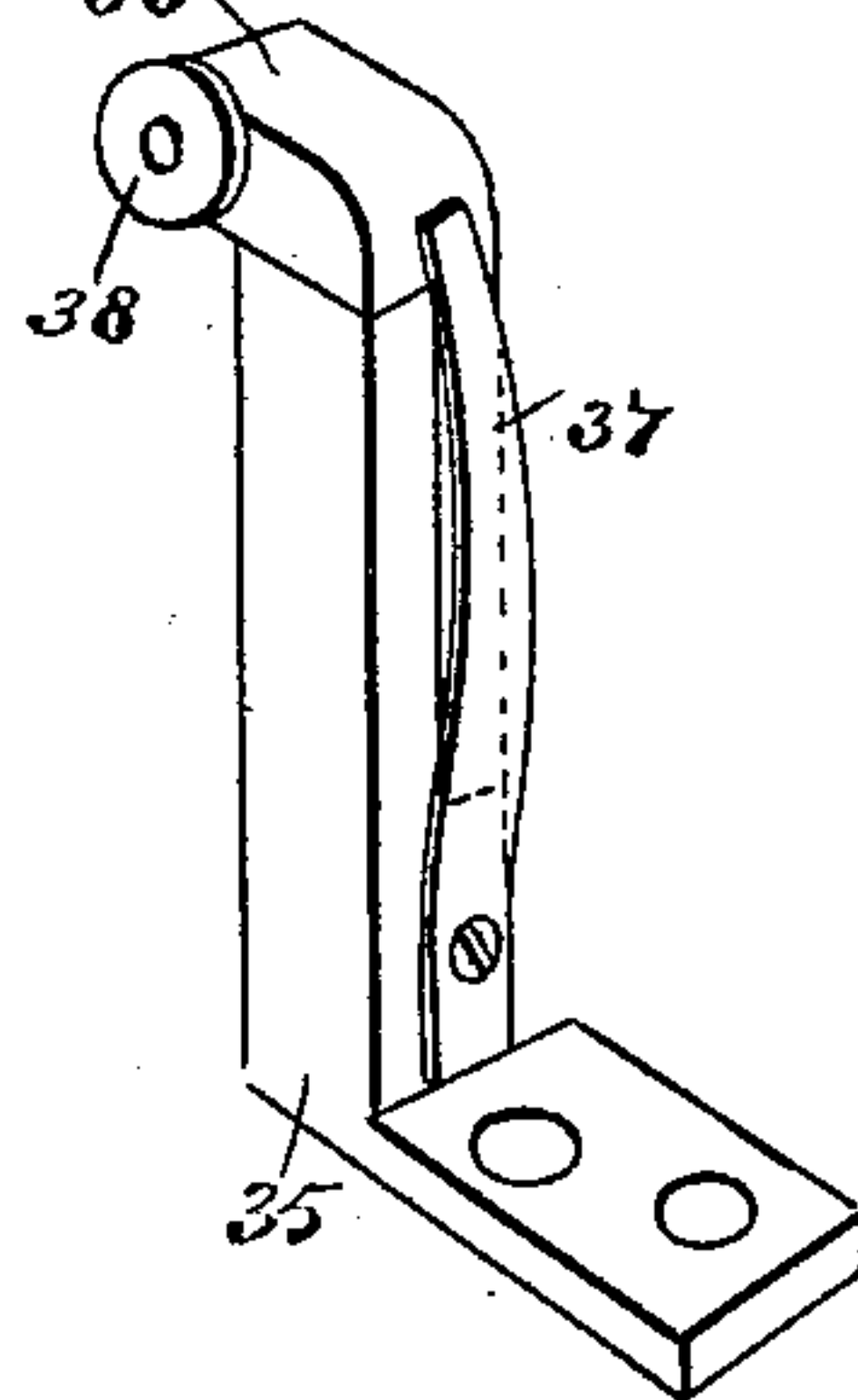


Fig. 7.



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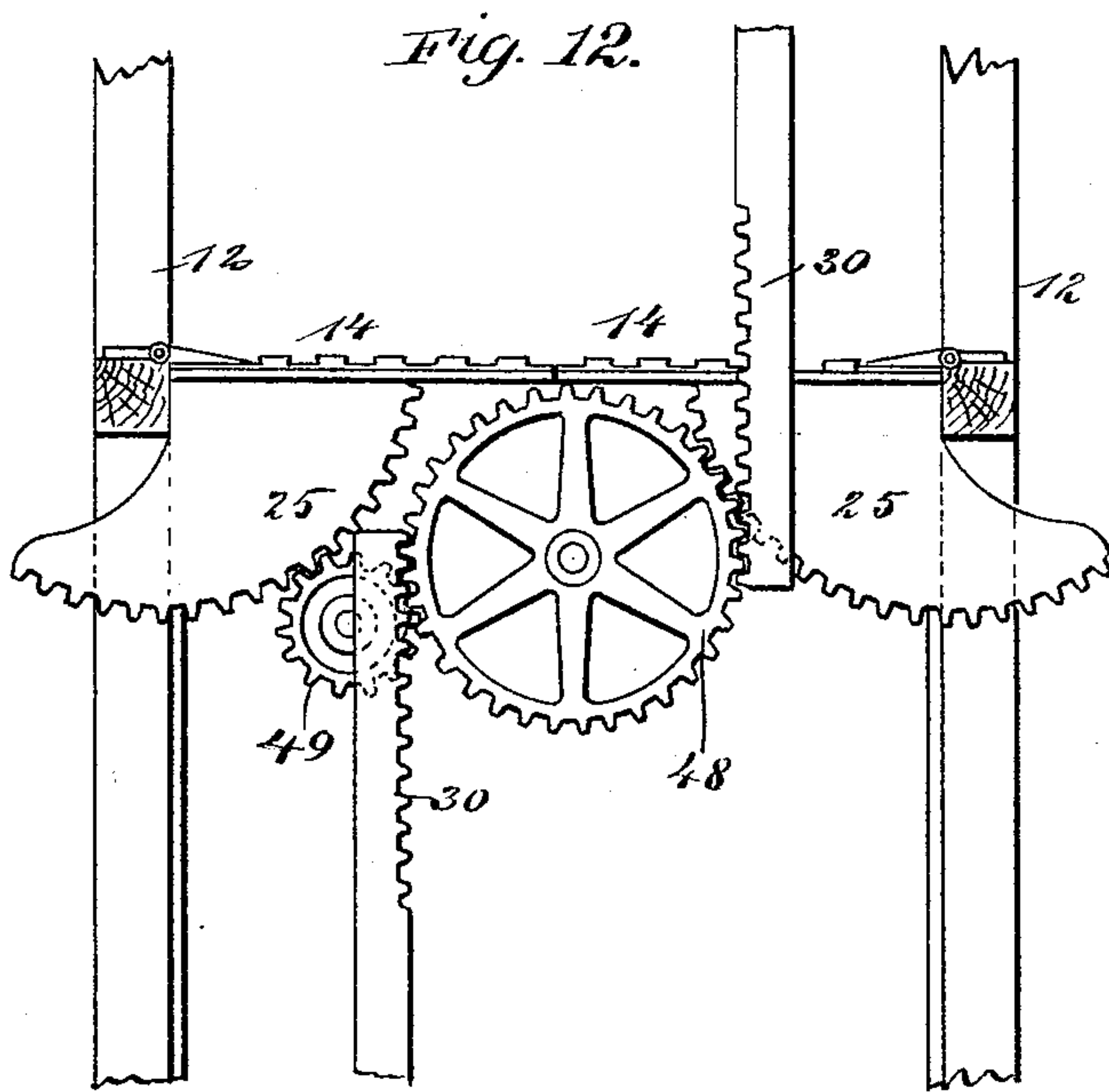
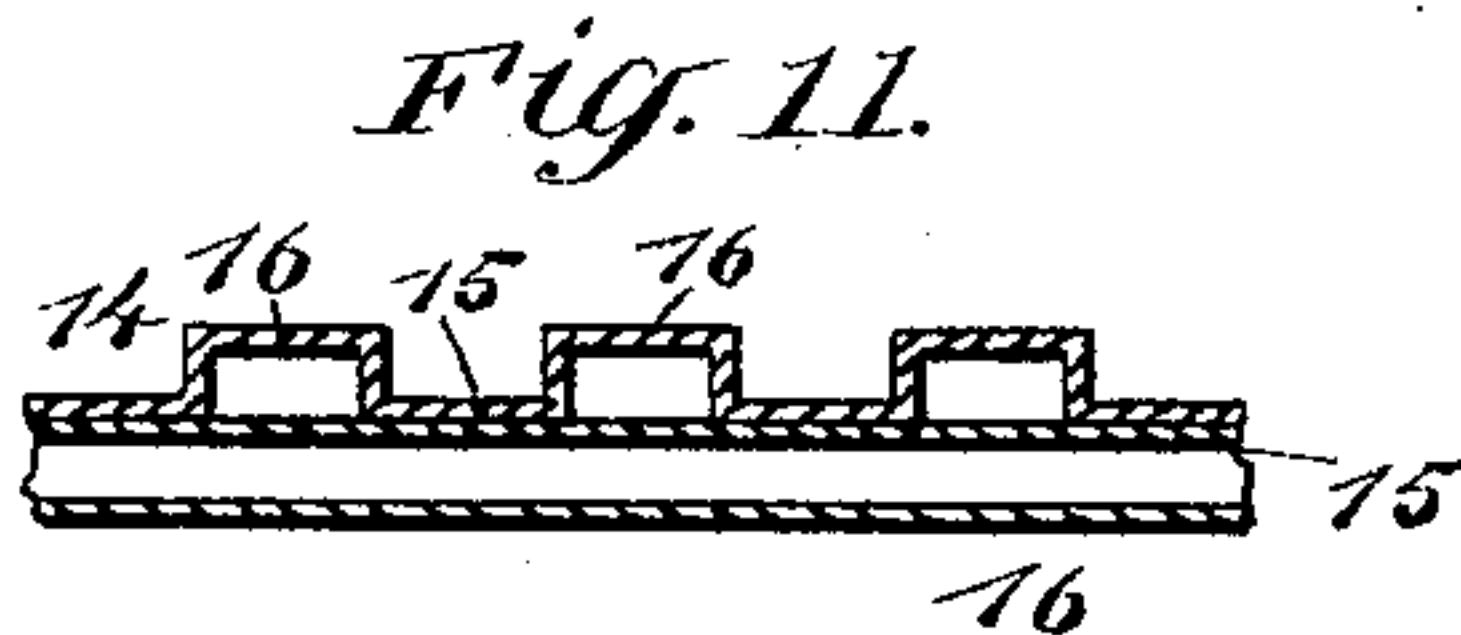
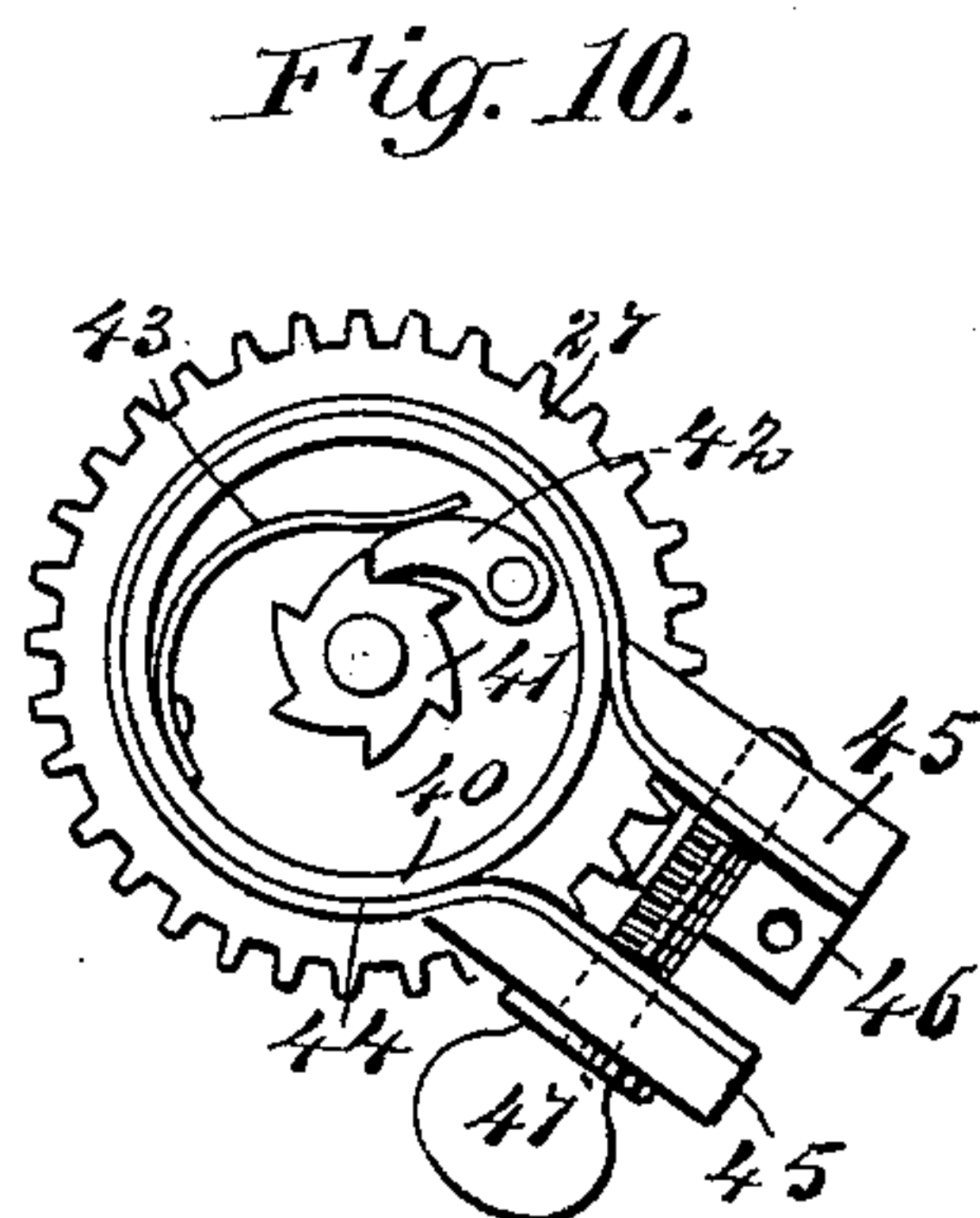
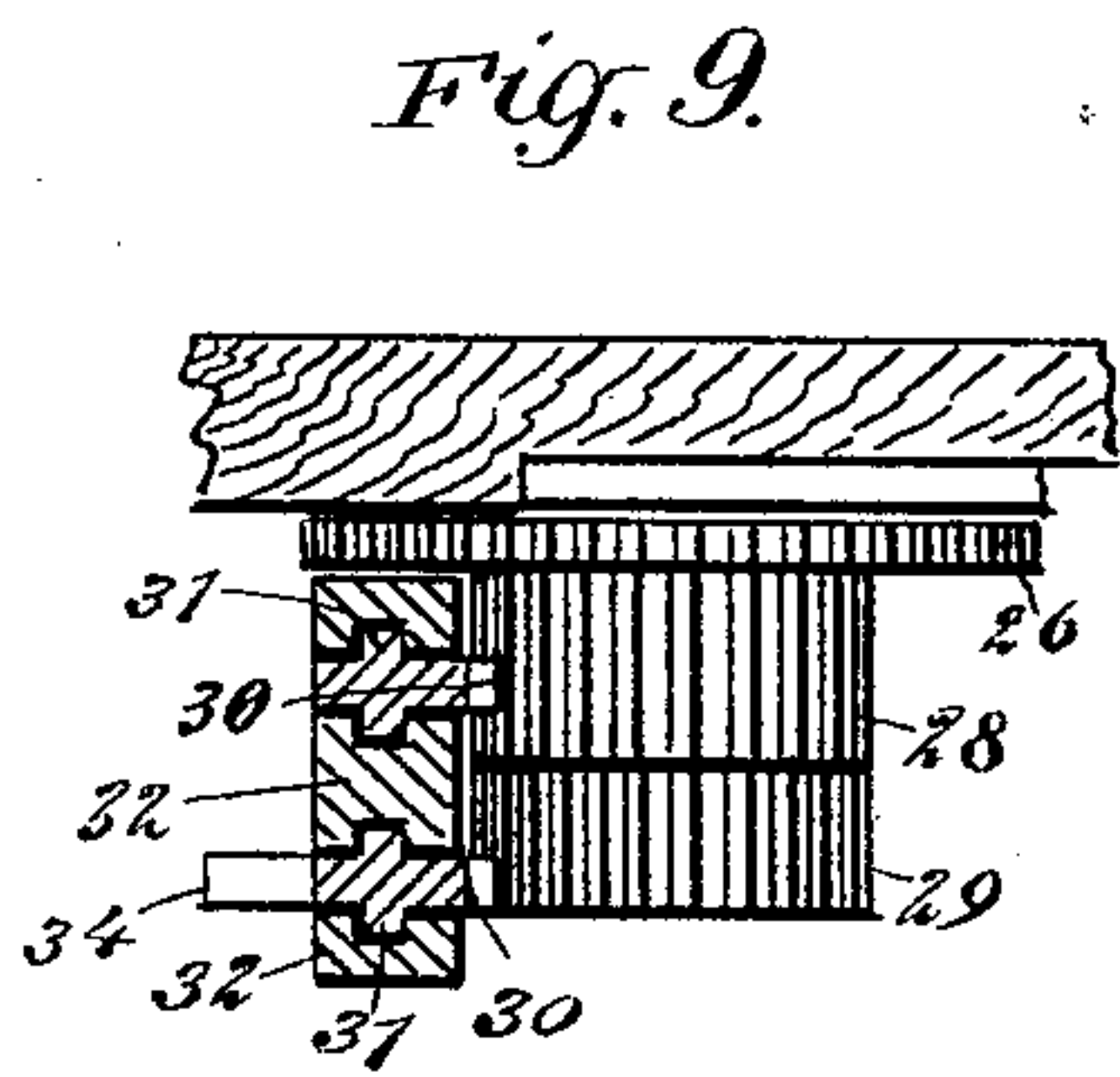
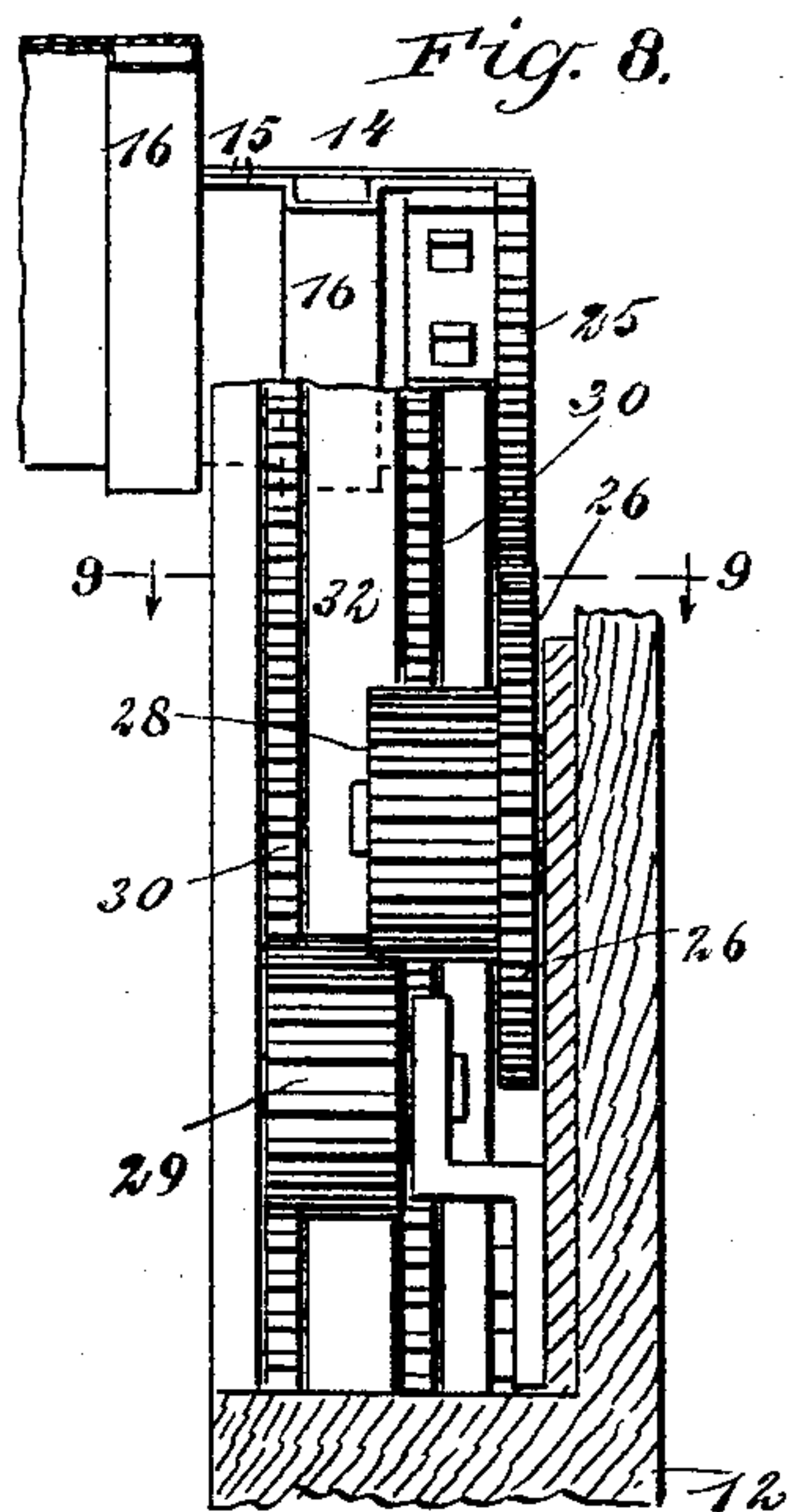
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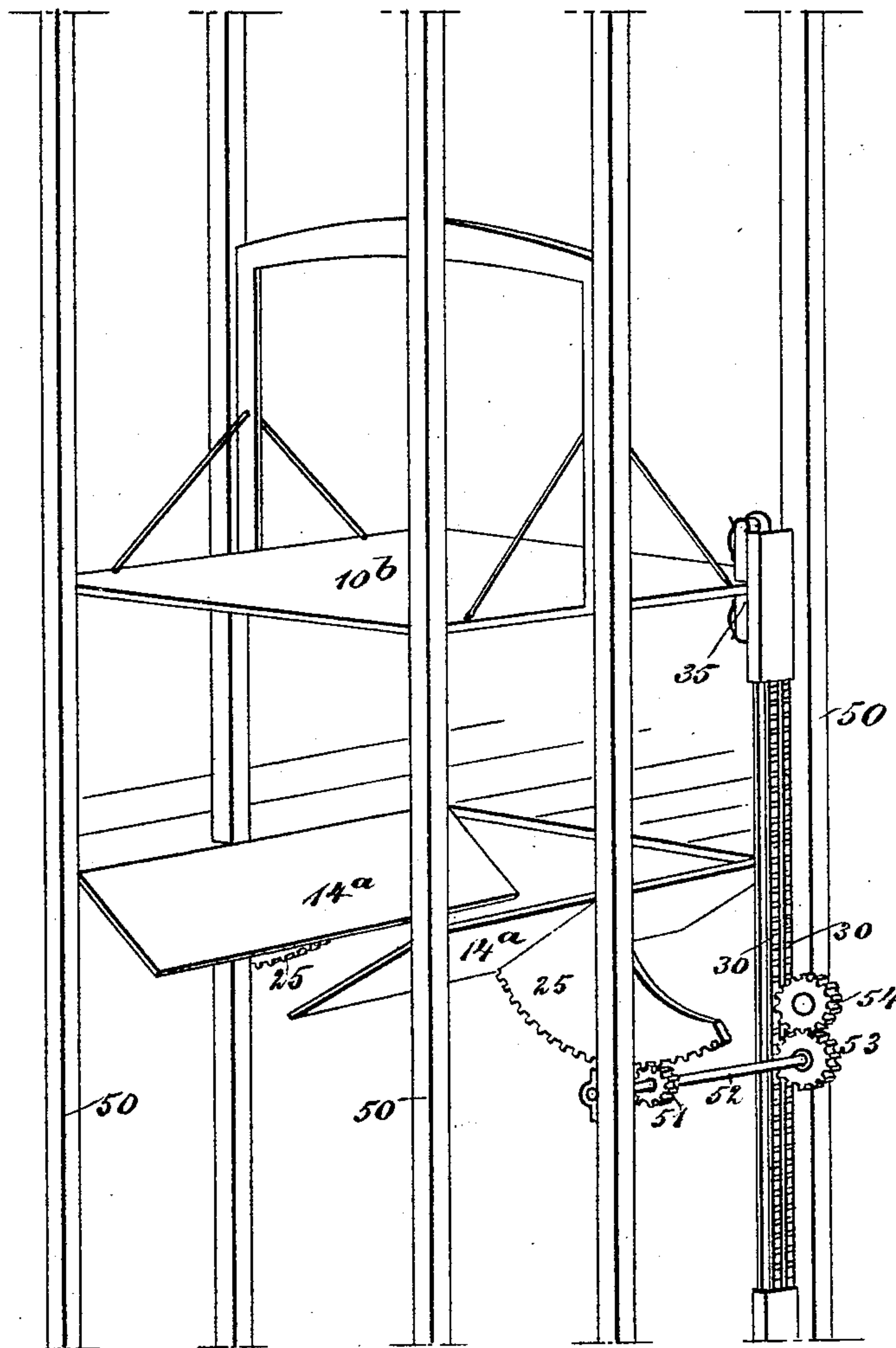
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*Fig. 13*



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# UNITED STATES PATENT OFFICE.

WILLIAM N. ANDERSON, OF SAN RAFAEL, CALIFORNIA.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 480,542, dated August 9, 1892.

Application filed September 15, 1891. Serial No. 405,773. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. ANDERSON, of San Rafael, in the county of Marin and State of California, have invented new and Improved Elevator Attachments, of which the following is a full, clear, and exact description.

My invention relates to improvements in elevator attachments and especially to attachments adapted to be used in connection with elevators the wells of which are closed by vertically-swinging doors; and the object of my invention is to produce a light, durable, and non-combustible door for closing the well, and also to produce a simple mechanism, which by the movements of the elevator-cage will automatically open and close the doors.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of the elevator and attachments embodying my invention. Fig. 2 is a vertical section, partly in elevation, of the same on the line 2 2 in Fig. 3. Fig. 3 is a vertical cross-section on the line 3 3 in Figs. 1 and 2. Fig. 4 is a sectional plan of the sliding racks and raceway on the line 4 4 in Fig. 3. Fig. 5 is a broken detail sectional view on the line 5 5 in Fig. 4. Fig. 6 is a detail perspective view of one of the sliding racks. Fig. 7 is a detail perspective view of one of the arms and spring-latches which are secured to the elevator-cage. Fig. 8 is an enlarged detail elevation of the rack and gear mechanism for operating the doors, partly in section, on the line 8 8 in Fig. 2. Fig. 9 is a sectional plan on the line 9 9 in Fig. 8. Fig. 10 is a detail side elevation of the friction attachment for preventing the doors from slamming. Fig. 11 is a broken detail cross-section through one of the doors. Fig. 12 is a modified form of gearing for actuating the doors, and Fig. 13 is a perspective view of a modified form of the invention in which the doors open downward instead of upward.

The elevator-cage 10 is operated by a cable 10<sup>a</sup> in connection with any suitable hoisting mechanism and is adapted to move vertically in the well 11, which is formed between the side posts 12 and 13. At each floor the elevator-well is closed by swinging doors 14, each door being formed of united sheet-metal plates 15, having corrugations 16 therein, and the plates are united so that the corrugations of one plate will intersect those on the other at right angles. The doors are strengthened by suitable cross-braces 17, and when raised into a vertical position they rest in recesses 18 in the side posts 12. On one of the side posts is a vertical rod 19, to the upper end of which is pivoted a catch 20, adapted to engage a door and hold it open, and as the doors are connected by gearing, as hereinafter described, when one is held open the other will be held open also. The catch 20 is normally pressed downward by a spring 21, which spring has one end secured to the catch and is coiled around the rod 19, the lower end of the spring being secured to a latch 22, which projects inward to a point slightly beyond the front side of the post 12 and into the path of a block 23, which is pressed outward from the cage 10 by a spring 24. It will thus be seen that when moving downward the block will engage the latch 22 and tilt the latch, and the movement of the latch will raise the spring 21, so as to release the catch 20 and allow the doors to drop.

Each door 14 has secured to it near one end a depending segmental rack 25, one of which racks engages a gear-wheel 26, pivoted on the wall of the well adjacent to the doors, and the other of which engages a segmental gear-wheel 27, the two gear-wheels being meshed together, so that the doors will move in unison. The gear-wheel 26 has secured to it a pinion 28, which pinion meshes with a pinion 29 beneath it, and the latter pinion projects inward into the well, so that a portion of its face will not align with the pinion 28 above it. These pinions 28 and 29 are engaged by sliding racks 30, which are secured to sliding bars 31, moving vertically in a raceway 32, which raceway is secured to one of the side posts 13 of the elevator-well.

The racks 30 are adapted to move simulta-



neously in opposite directions, so that it will be seen that they will not interfere with each other, and either rack will serve to open or close the doors, according to the direction in which the cage is moved. Each bar 31, which carries the rack 30, is provided on its back side with a projecting block 33, and pivoted in the raceway adjacent to the bars are cam-shaped hooks 34, the eccentric or rounded surfaces of which are adapted to engage pins 34<sup>a</sup> on the blocks 33.

It will be noticed by reference to Fig. 5 that the hooks 34 can only turn into a horizontal position in one direction, but that they may be turned up into a vertical position in the opposite direction. The hooks are arranged in this manner for one of the bars 31 and are reversed for the opposite bar, so as to close downward instead of upward. The hooks are adapted to engage the latches on the elevator-cage, as hereinafter described, and they will thus by pressing against the pins 34<sup>a</sup> start the blocks 33 and the racks connected therewith with an easy movement, so as not to strain any parts of the mechanism, and when the blocks are moved in the opposite direction the hooks will serve to limit their movement.

The elevator-cage is provided with bent arms 35, which are secured thereto so that their vertical portions will align with the bars 31 and racks 30, and the arms are oppositely arranged so that the catch on one will engage the block on one of the bars 30, and the catch on the other will engage the block on the opposite bar.

The latch 36, which is pivoted to the free end of the arm 35, is normally pressed forward, so as to engage a block 33 by a spring 37, one end of which presses against the latch and the opposite end of which is secured to the arm 35, and the latch carries on one side a roller 38, which is adapted to engage rounded steps 39 on the raceway 32, and the resulting pressure will release the latches from the blocks 33, so that the cage may move on without straining the mechanism. These steps 39 are located on the raceway at a point opposite the blocks when the doors are in either a wide-open or closed position.

The gear-wheel 27, which is connected with one of the door-racks, as described, has a drum 40 mounted loosely thereon, and within this drum is a ratchet-wheel 41, carried by the gear-wheel, and which is engaged by a pawl 42, said pawl being pressed by a spring 43, secured to the drum. This drum is encircled by a strap 44, the ends of which are secured to clamping-pieces 45, one piece being supported on a bracket 46, which is secured to the wall of the elevator-well, and the clamping-pieces are connected by a thumb-screw 47, by adjusting which the requisite pressure on the drum may be maintained.

When the doors are opened, the pawl 42 will slide loosely over the ratchet-wheel; but when the doors are closed the pawl will en-

gage the ratchet-wheel and the drum will turn, and the pressure on the drum will prevent the doors from slamming.

In Fig. 12 I have shown a modified form of gearing adapted for use where the elevator-well is located against the wall of a building, and in this case a large gear-wheel 48 engages one of the racks 25 and connects by means of an idler 49 with the opposite rack. This gear-wheel projects into the path of the racks 30, operated by the elevator-cage, as described, and the movement of the rack turns the gear-wheel and opens or closes the doors.

The operation of the device is as follows: When the elevator-cage ascends, one of the latches 36 on an arm 35 engages a hook 34 and block 33, thus pushing up one of the racks 30, which rack by means of the gear mechanism described above opens the doors 14, and when the doors are opened the catch 20 engages one of them and holds them open until the upward movement of the cage causes the spring-pressed block 23 to strike the catch 20 and release the catch. By this time the cage will have passed above the doors, and the opposite catch 36 will engage the opposite block 33, thus moving the rack 30, which has not yet been moved, and this rack by means of the gear mechanism described closes the doors and moves the other rack back to its normal position. When the elevator descends, this movement is reversed and the catch 20 is released by the block 23 striking the latch 22.

In some cases it is desirable that the doors swing downward in the well, and the construction shown in Fig. 13 is well adapted to do this. As shown in the above figure, the cage 10<sup>b</sup> moves between the side posts and between the corner-posts 50, on which the racks 30 are held to move, as already described. The doors 14<sup>a</sup> swing downward and they may be of any approved construction. The segmental racks 25 are secured to the under side of the doors near the middle, and each rack meshes with a pinion 51 on a transverse shaft 52, on which is a pinion 53, which engages one of the racks 30 and which also engages another pinion 54 above, the latter being adapted to engage the other rack 30. The pinion 53 is wider than the pinion 54, so that one of the racks 30 may engage it without touching the pinion 54. The above construction provides for opening the doors when the elevator-cage is going in either direction. The sliding racks and their actuating mechanism are not shown in detail in Fig. 13, as they are not like the same parts shown in the main figures and described above.

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

1. The combination, with a vertically-swinging door adapted to swing across an elevator-well and having a segmental rack, of vertically-sliding rack-bars extending above and below the door at its hinged edge and both geared to its segmental rack, a block project-



ing from one rack-bar above the door, a block projecting from the other rack below the door, and a latch for each rack-block, both mounted at the same side of the elevator-cage, whereby one rack will open the door when the cage ascends and the other open it as the cage descends, substantially as set forth.

2. The combination, with a vertically-swinging door adapted to swing across an elevator-shaft and having a segmental rack, of vertically-sliding rack-bars extending in the raceway above and below the hinged edge of the door and both geared to its segmental rack, blocks projecting, respectively, from the upper end of one rack and from the lower end of the other rack, a latch for each rack-bar, both mounted on the same side of the cage, and rounded steps on the raceway to release the latches from the blocks, substantially as set forth.

3. An apparatus of the character described, comprising vertically-swinging doors adapted to close the elevator-well and having segmental racks on the under side, sliding racks held to move in a vertical raceway in the elevator-well and connected by a gear mechanism with the door-racks, said sliding racks having projecting blocks, as described, bent arms secured to the elevator-cage and provided with spring-pressed latches arranged in the path of the blocks on the sliding racks,

said latches having rollers on one side, and rounded steps secured to the raceway in the path of the rollers, substantially as described.

4. The combination, with the sliding racks connected with the doors, as described, and provided with projecting blocks, of cam-hooks pivoted adjacent to the blocks and adapted to engage pins thereon, and latches secured to the elevator-cage and arranged in the path of the hooks, substantially as described.

5. The combination, with the swinging doors and the vertically-moving cage having a spring-pressed block thereon, of a spring-pressed catch pivoted on the side of the well and adapted to engage an open door, and a latch having a spring connection with the catch and arranged to project into the path of the spring-pressed block on the cage, substantially as described.

6. The combination, with the swinging doors having segmental racks thereon and the gear-wheels connecting the racks, of a drum loosely mounted on one of the gear-wheels, a pawl-and-ratchet-wheel connection between the drum and the gear-wheel, and an adjustable friction-strap mounted on the drum, substantially as described.

WILLIAM N. ANDERSON.

Witnesses:

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JEROME PORTER.