

No. 700,456.

Patented May 20, 1902.

A. TOMEK.
CLOCK STRIKING MECHANISM.
(Application filed Nov. 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 2.

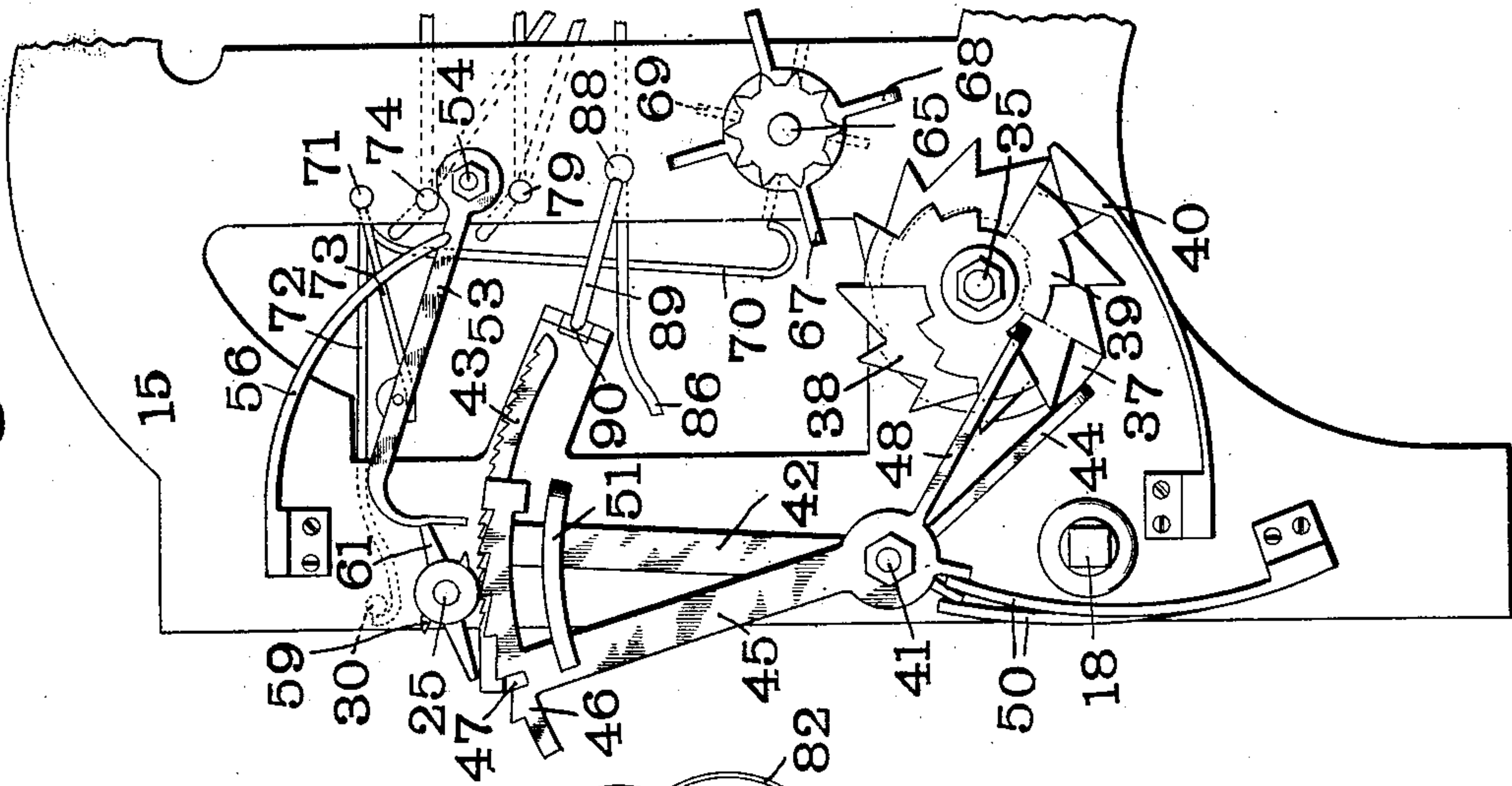
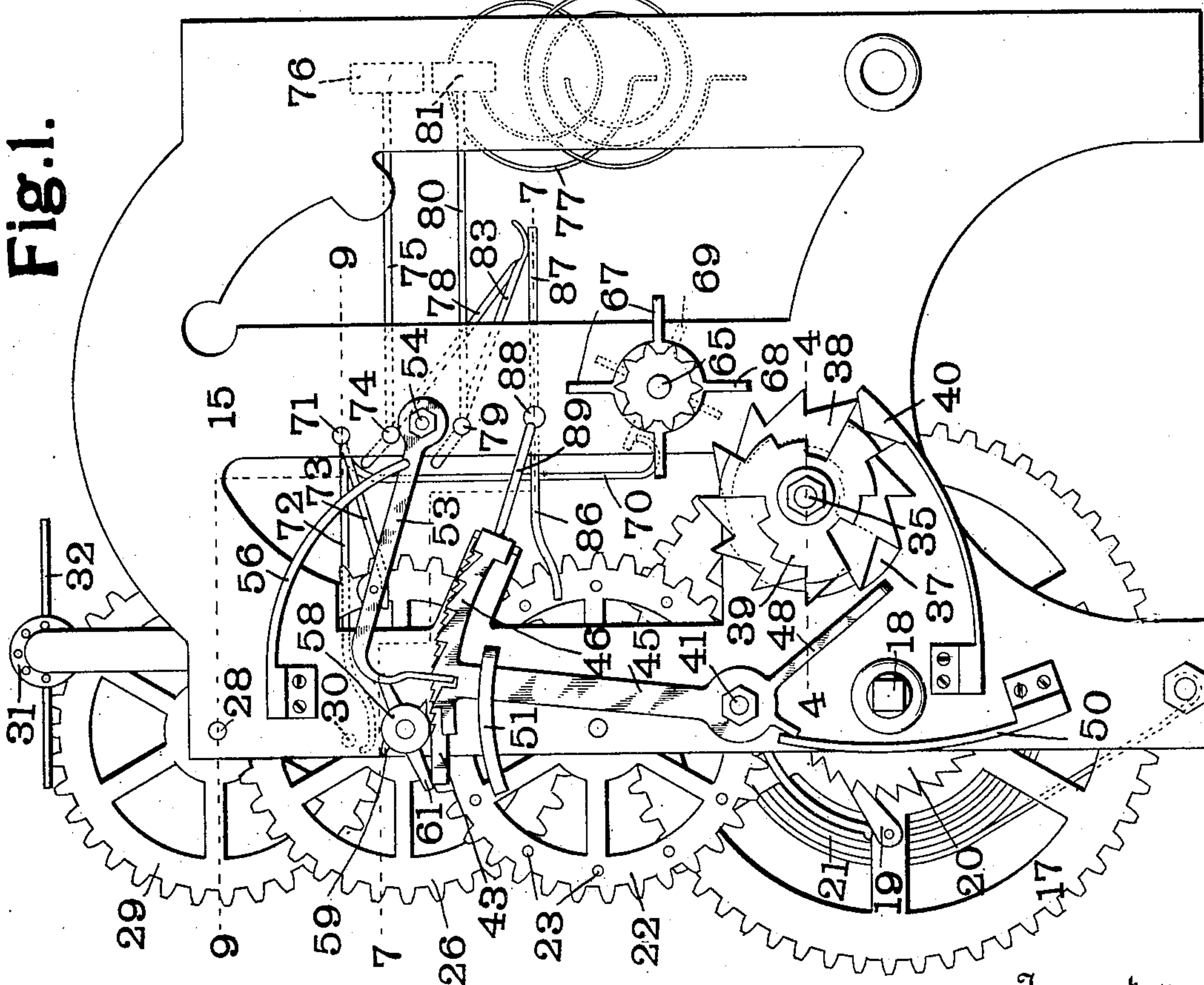


Fig. 1.



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Fig. 3.

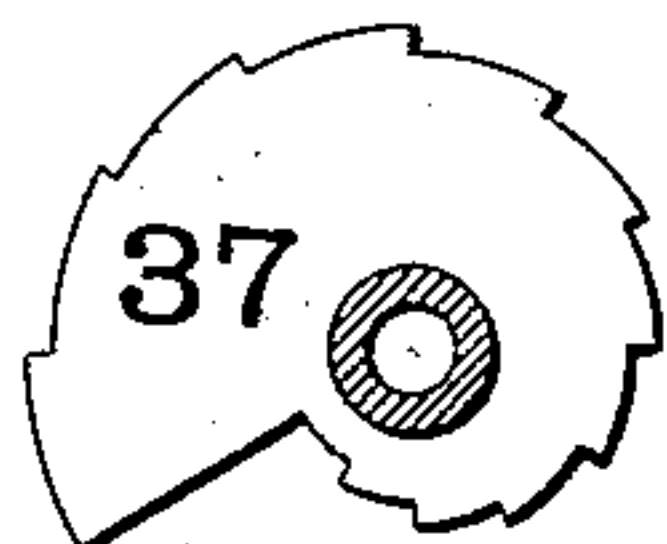


Fig. 4.

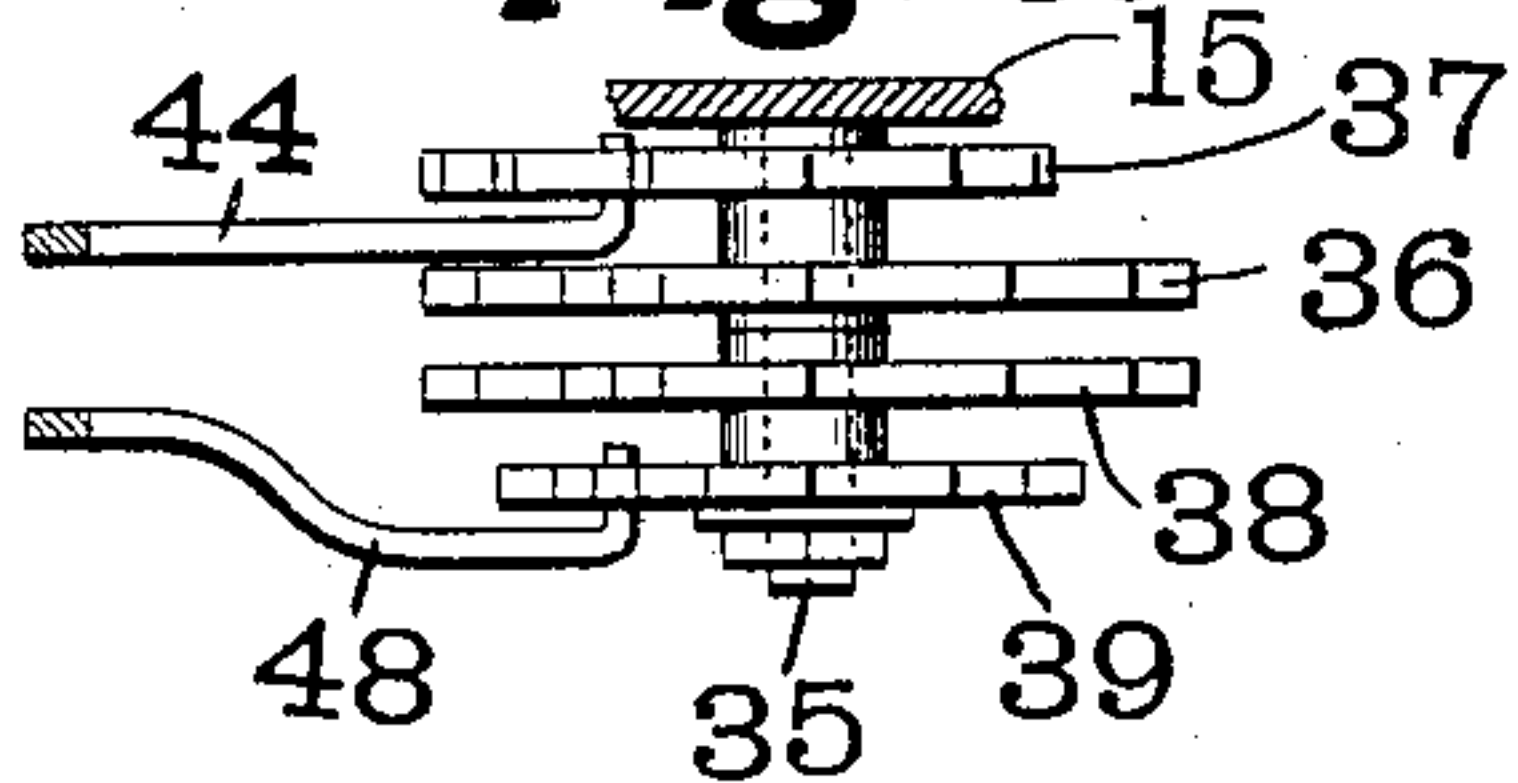


Fig. 5.

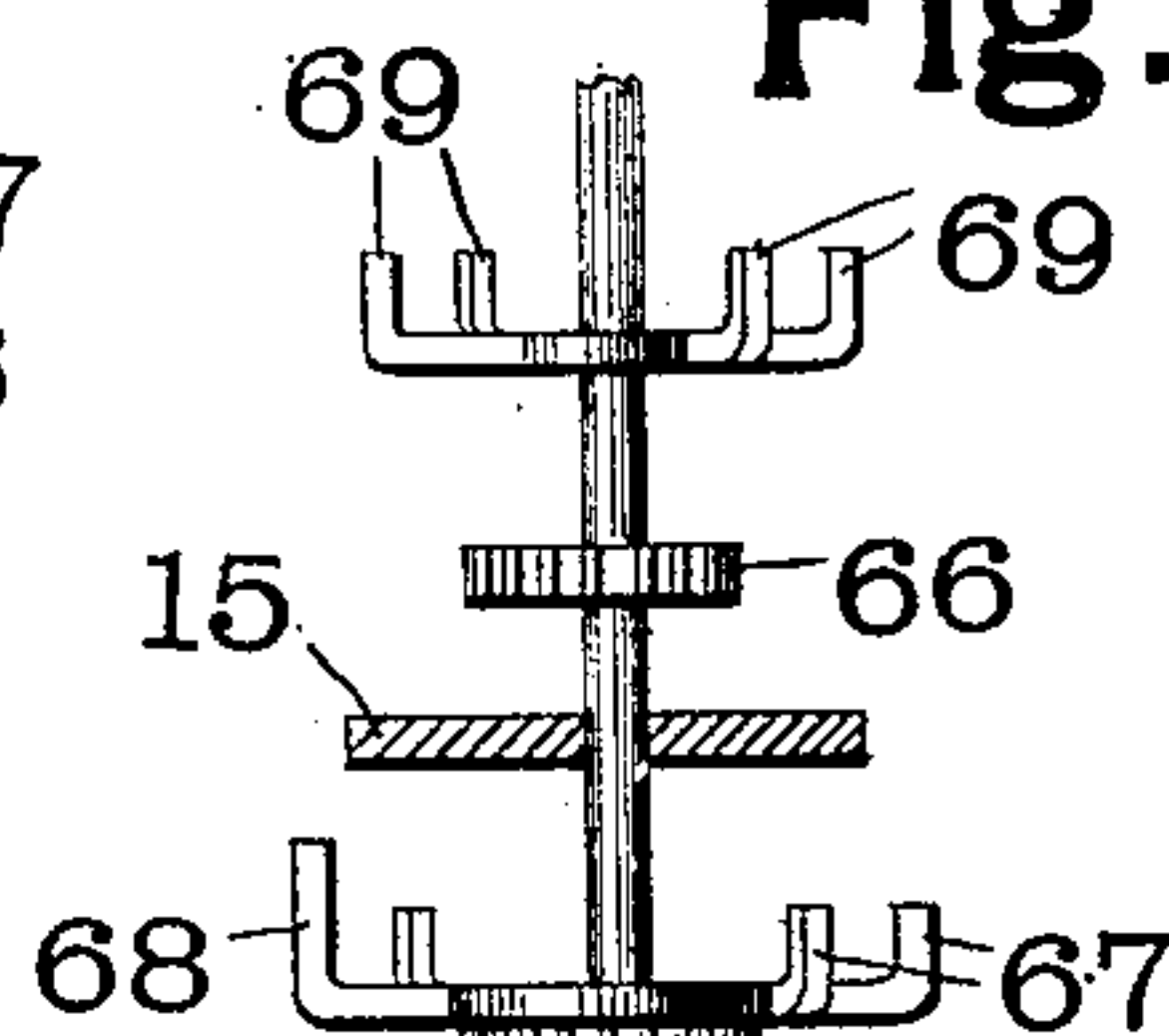


Fig. 6.

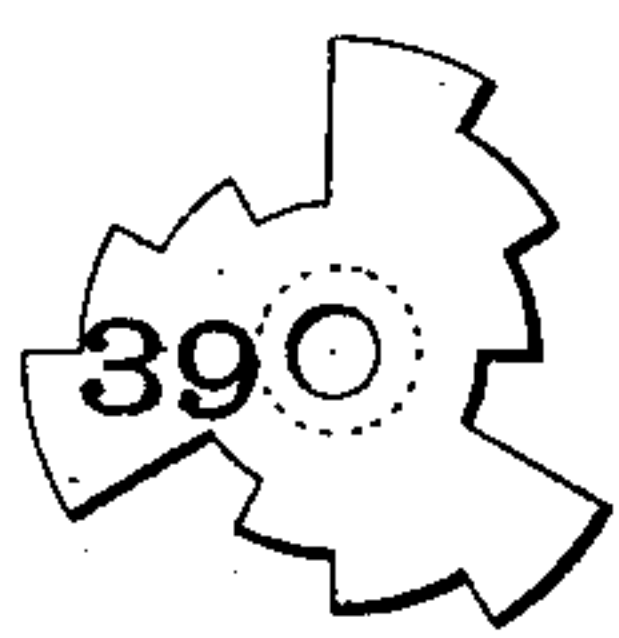


Fig. 7.

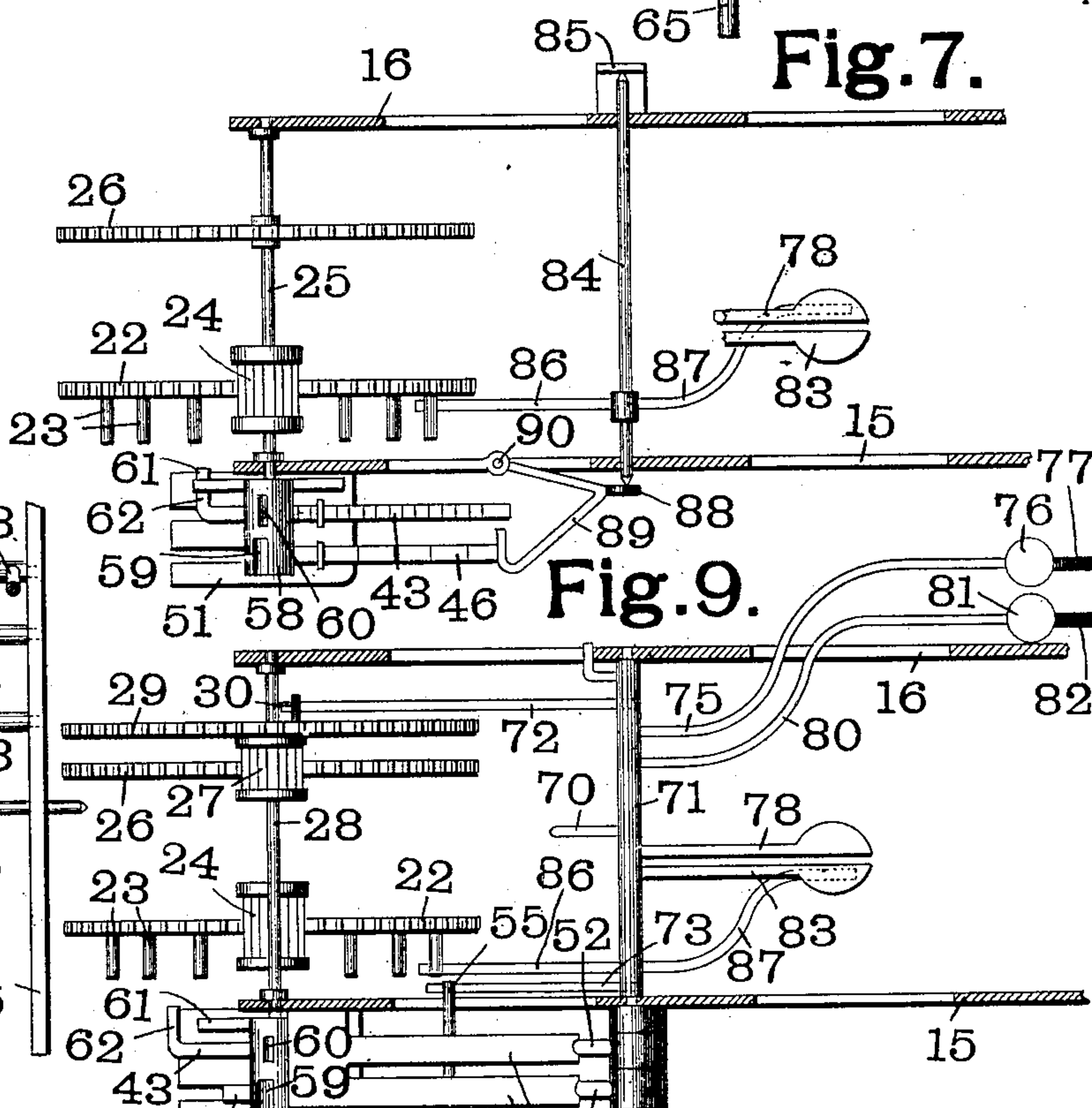


Fig. 8.

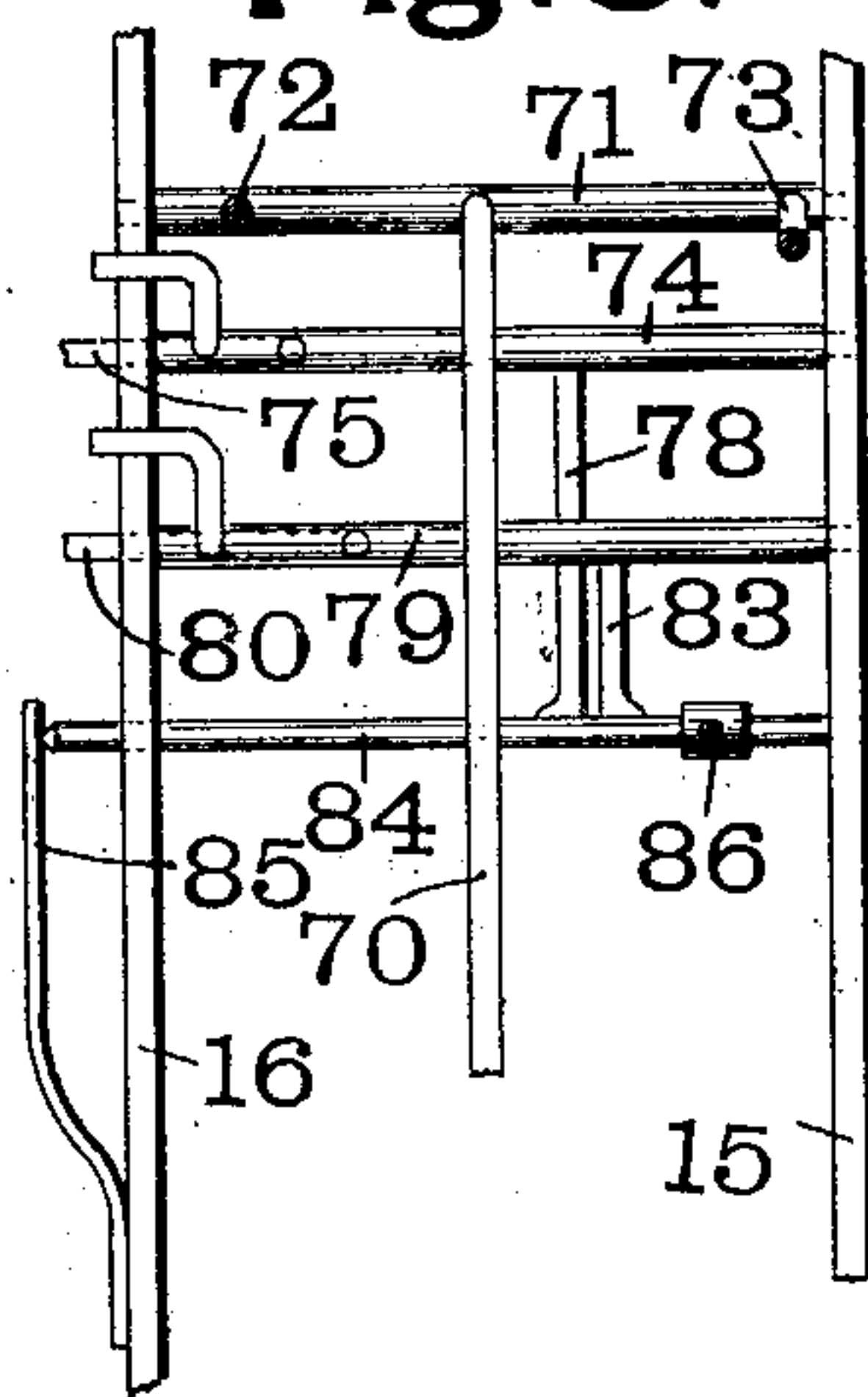


Fig. 9.

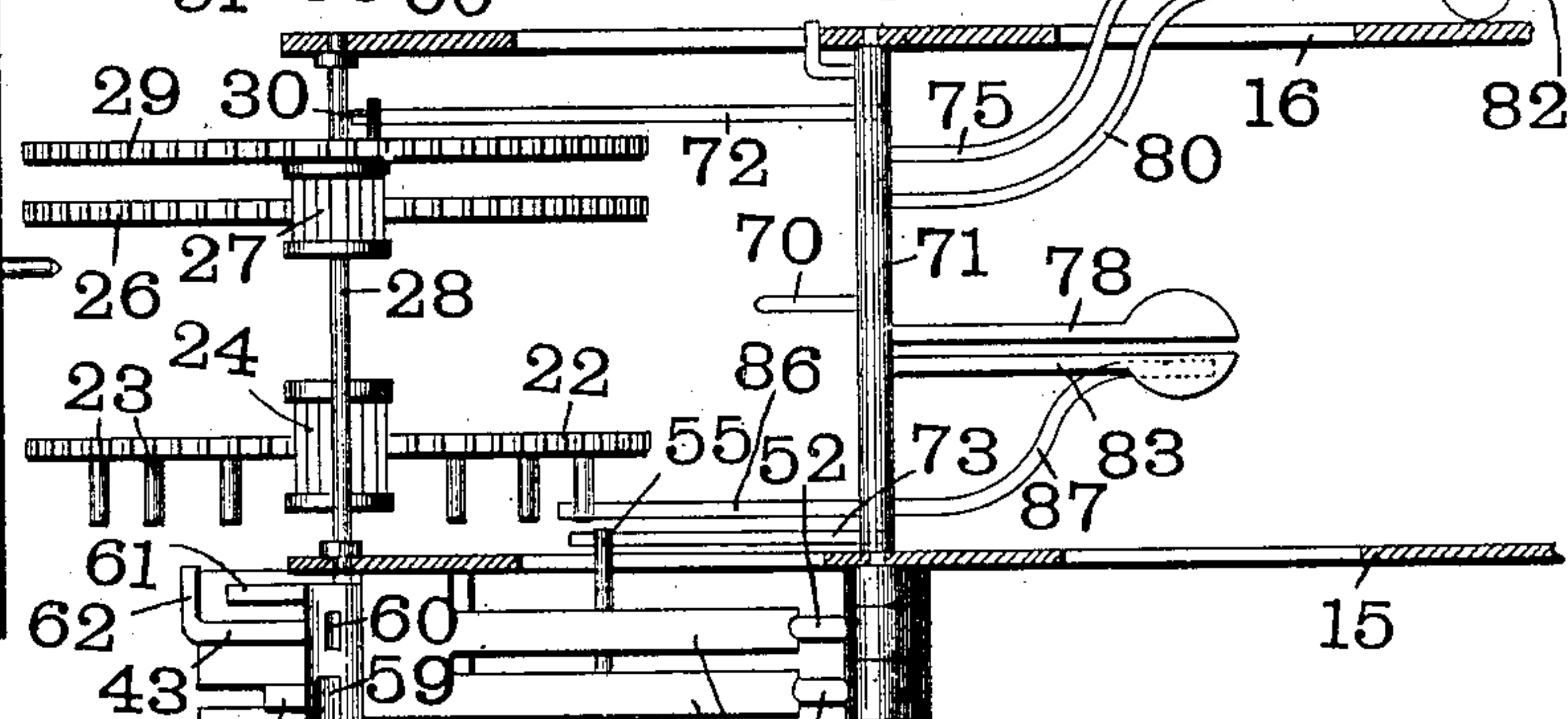
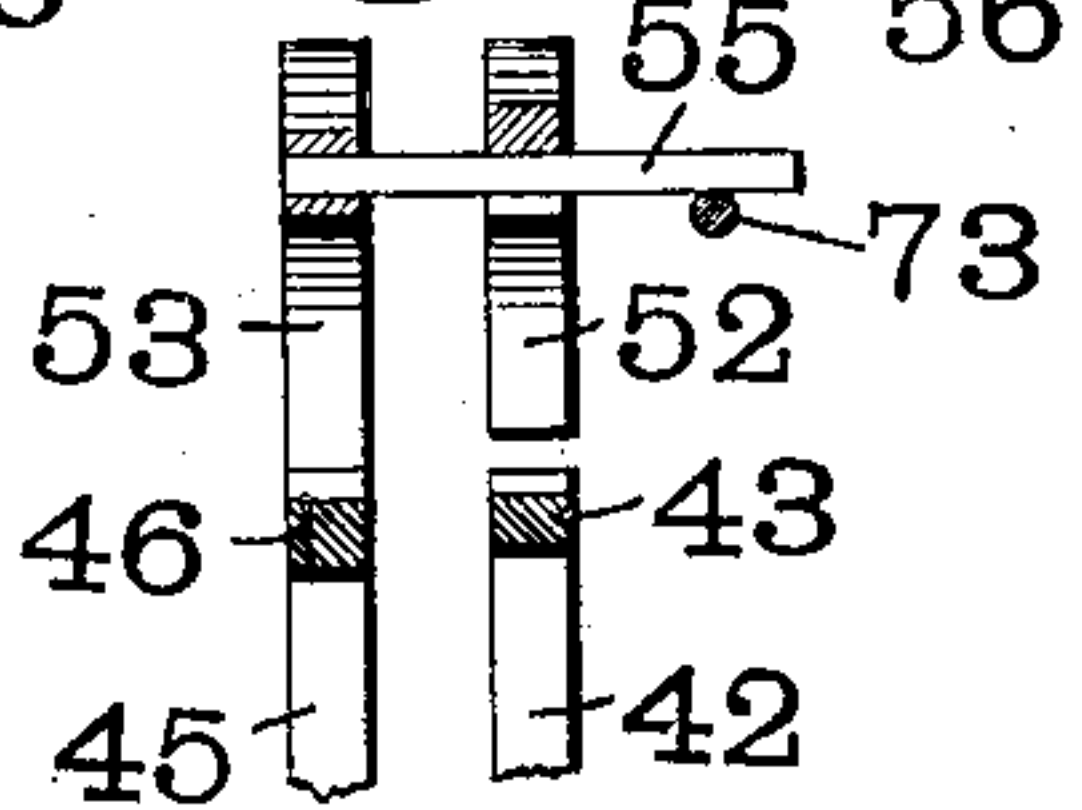


Fig. 10.



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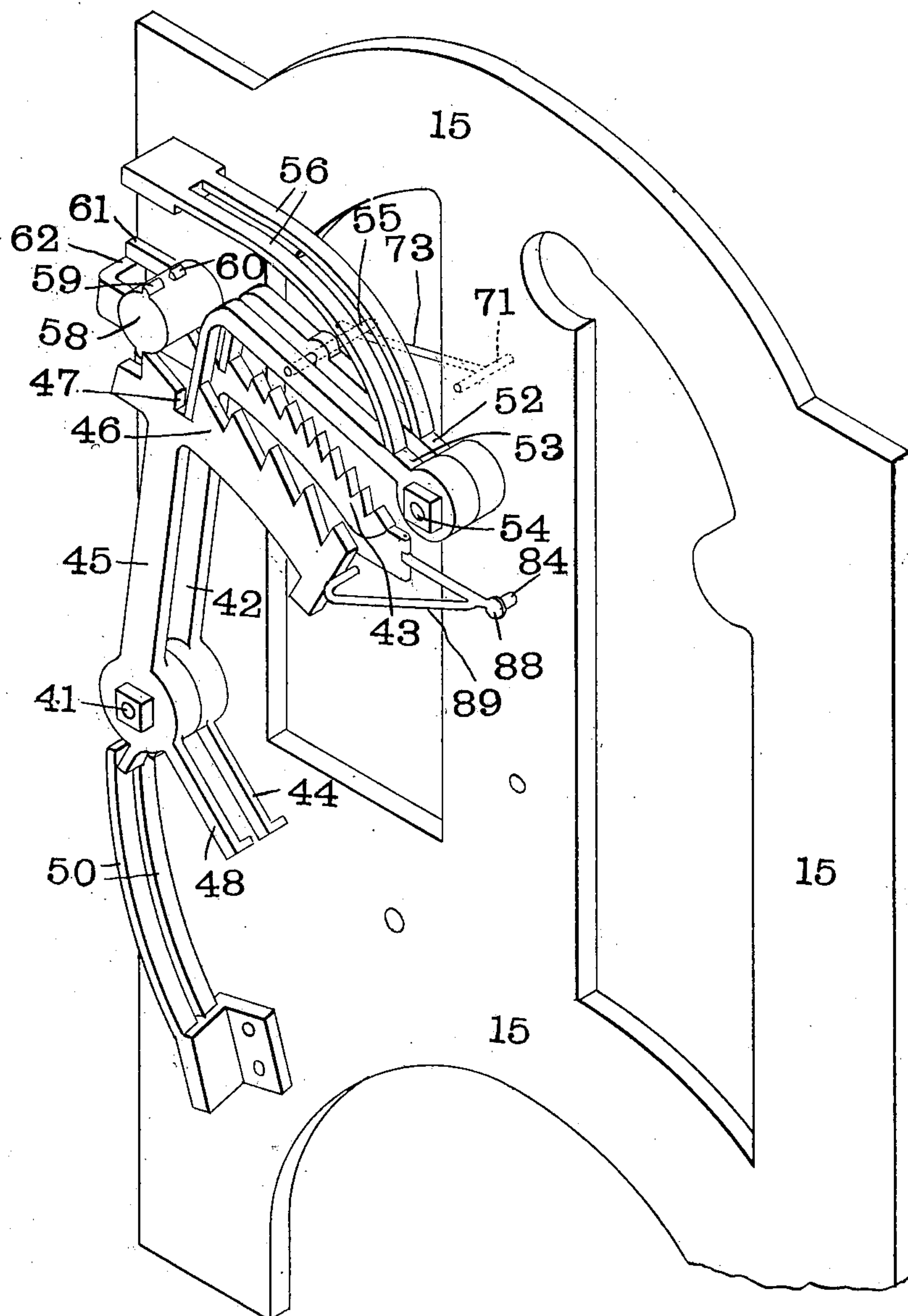
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3 Sheets—Sheet 3.

Fig. 11.



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UNITED STATES PATENT OFFICE.

ANTON TOMER, OF ST. LOUIS, MISSOURI.

CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 700,456, dated May 20, 1902.

Application filed November 5, 1900. Serial No. 35,445. (No model.)

To all whom it may concern:

Be it known that I, ANTON TOMER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Striking Mechanism for Clocks, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to striking mechanism for that class of clocks known as "repeating clocks," in which the hour is repeated at certain intervals, usually fifteen minutes, and the fractional parts of the hours are indicated upon another gong having a different tone.

The object of my invention is to simplify the construction of striking mechanism for the class of clocks above referred to, and particularly to so construct the mechanism that both the hours and the fractions of hours are struck by the use of but one motor.

My invention consists, in part, in the combination, with a plurality of gongs, of a motor, connections actuated by said motor for operating said gongs, and means for automatically shifting said connections from one gong to another.

My invention also consists in various other novel features and details of construction, all of which are described in the following specification, and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate one form of mechanism made in accordance with my invention, Figure 1 is a front plan view. Fig. 2 is a similar view showing the parts in a different position, part of the frame being broken away and the striking-train being omitted. Fig. 3 is a detailed view of one of the snail-wheels. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a detailed view showing the parts for actuating the ratchet-wheels shown in Fig. 4. Fig. 6 is a detailed view of one of the snail-wheels. Fig. 7 is a section on the line 7 7 of Fig. 1. Fig. 8 is a view showing a detail of construction. Fig. 9 is a section on the line 9 9 of Fig. 1. Fig. 10 is enlarged detailed view partly in section; and Fig. 11 is an isometric projec-

tion, on an enlarged scale, showing the front plate and some of the parts carried thereby.

Like marks of reference refer to similar parts in the several views of the drawings.

15 and 16 are two plates which are arranged parallel some distance apart and which form the framing of the device. Between the plates 15 and 16 at one side is arranged the striking-train, as shown in the drawings, and at the other side is arranged the clock-train, which, however, has been omitted, as it forms no part of my invention.

17 is a spur-wheel which is loosely mounted on the winding-stem 18. The wheel 17 is connected by means of a pawl 19 with a ratchet-wheel 20, rigidly mounted on the stem 18. Secured to the stem 18 is one end of a spring 21, the other end of which is secured to the frame and which serves to drive the spur-wheel 17. The spur-wheel 17 drives a spur-wheel 22, which is provided with pins 23 for actuating the hammers for striking the gongs. The spur-wheel 22 meshes with a lantern-wheel 24 on a shaft 25. Secured to the shaft 25 is a spur-wheel 26, which in turn meshes with a lantern-wheel 27 on a shaft 28. The shaft 28 has rigidly mounted on it a spur-wheel 29, carrying a pin 30. The spur-wheel 29 meshes with a lantern-wheel 31, which actuates a blade 32, which serves to regulate the speed of the striking-train. The parts hereinbefore described are substantially the same as those used for the striking-train of an ordinary clock.

Loosely mounted on a stud 35, carried by the plate 15, is a ratchet-wheel 36, to which is rigidly mounted a snail-wheel 37. The stud 35 also has loosely mounted upon it a ratchet-wheel 38, to which is rigidly secured a quarter-hour snail 39. The snail-wheel 37 controls the striking of the hours and the compound snail-wheel 39 the striking of the fractions of hours, as will be hereinafter described. The ratchet-wheels 36 and 38 are prevented from accidental rotation by means of detents 40.

Pivoted on a stud 41 is a rack-bar 42, carrying on its upper end a toothed rack 43. The bar 42 is provided with an arm 44, adapted to come in contact with the snail-wheel 37.

45 is a bar similar to the bar 42 and also loosely mounted on the stud 41. The bar 45

is provided at its upper end with a toothed rack 46, having formed therein a notch 47. The bar 45 is also provided with an arm 48, adapted to come in contact with the quarter-hour snail-wheel 39. The bars 42 and 45 are acted on by springs 50, which tend to throw the arms 44 and 48 in contact with the snail-wheels 37 and 39, respectively. The upper ends of the bars 42 and 45 move in a guide 51, so as to prevent lateral movement.

52 and 53 are pawls which engage with the racks 43 and 46, respectively. These pawls 52 and 53 are pivoted on a stud 54, carried by the plate 15. The end of the pawl 53 is somewhat longer than the pawl 52, (shown in Fig. 10,) and the said pawl carries a pin 55, projecting beneath a pawl 52. The pawls 52 and 53 are forced down into contact with the racks by means of springs 56.

Carried by the shaft 25 is a gathering-pawl 58, provided with teeth 59, adapted to engage with the teeth of the rack 46, and teeth 60, adapted to engage with the teeth of the rack 43. The cylinder 58 is also provided with arms 61, adapted to come in contact with a laterally-projecting portion 62, carried by the rack 43.

65 is the shaft or spindle upon which the minute-hand of the clock is rigidly secured. This shaft carries a spur-wheel 66, driven by the clock-train, which has not been shown. The shaft 65 is provided with three arms 67, having short lateral projections, and an arm 68, having a long lateral projection, as shown in Fig. 5. The arms 67 are adapted to engage with the ratchet-wheel 38 and move the same, while the arm 68 is adapted to engage with both the ratchet-wheel 38 and the ratchet-wheel 36. The shaft 65 also carries within the frame of the device four arms 69, which engage with the end of a lever 70. The lever 70 is secured to a rock-shaft 71. The rock-shaft 71 is provided with an arm 72, having an upturned end adapted to engage with the pin 30 on the wheel 29, as shown in Figs 1 and 9. The rock-shaft 71 is also provided with an arm 73, which projects below the pin 55, carried by the pawl 53, to raise the same.

74 is a rock-shaft carrying an arm 75, to which is secured a hammer 76, adapted to strike a spiral gong 77. The rock-shaft 74 is also provided with an arm 78 for a purpose hereinafter to be described.

79 is a rock-shaft similar to the rock-shaft 74 and provided with an arm 80, carrying a hammer 81, adapted to strike a spiral gong 82. The said shaft is also provided with an arm 83, similar to the arm 78.

84 is a rock-shaft which is mounted in the frames 15 and 16, so as to have a longitudinal movement. The said shaft 84 is forced toward the front of the device by means of a spring 85. The shaft 84 is provided with an arm 86, adapted to be actuated by the pins 23 on the spur-wheel 22. The said shaft is also provided with an arm 87, which projects be-

neath either the arm 78 or the arm 83 in accordance with the longitudinal movement of the shaft 84. The front end of the shaft 84 rests against a disk 88, carried by a triangular frame 89. The triangular frame 89 is pivoted at 90 to the frame of the device and is adapted to be struck by the end of the rack 46, and so force the shaft 84 to its rear position.

The operation of my device is as follows: As the shaft 65 is rotated by the clock-train one of the arms 69 comes in contact with the end of the lever 70 and forces the same outwardly. This rocks the rock-shaft 71, and so lifts the pawls 52 and 53 out of engagement with the racks 43 and 46. This allows the racks to be moved by the springs 50 until the arms 44 and 48 come in contact with the snail-wheels 37 and 39. This releases the striking-train owing to the movement of the projection 62 out of contact with the arm 61. At the same time, however, the upturned end of the arm 72 comes in contact with the pin 30 on the wheel 29 and prevents the train from being put in motion until the parts have had sufficient time to gain the proper positions. As soon as the shaft 65 has moved sufficiently to move the arm 69 out of contact with the lever 70 the same falls to its normal position, thus releasing the striking-train and at the same time dropping the pawl 53 into engagement with the rack 46. The pin 55, however, holds the rack 52 out of engagement with the rack 43. As the striking-train moves the shaft 25 will be rotated, thus causing the teeth 59 of the gathering-pawl 58 to feed the rack 46 back toward its normal position. While this is taking place, the rock-shaft 84 will be forced to its forward position, as shown in Fig. 9, by the spring 85, so that the arm 87 will act upon the arm 83, thus causing the hammer 81 to strike the gong 82. As soon as the rack 46 has reached the limit of its movement its contact with the triangular frame 89 will force the shaft 84 to its rear position, thus driving the arm 87 under the arm 78, so as to actuate the hammer 76 to strike the gong 77. At the same time the pawl 53 will fall into the notch 47 in the rack 46, thus allowing the pawl 52 to come into engagement with the rack 43. The rack 43 will now be fed toward its normal position by means of the teeth 60 on the cylinder 58. As soon as the rack 43 has reached its normal position the arm 61 will come in contact with its projecting portion 62, and thus lock the striking train. As the shaft 65 is rotated the arms 67 will feed only the snail-wheel 35 during three-fourths of a revolution, thus causing the same hour to be repeated, but changing the strokes for the fractional parts of the hour. When, however, a complete revolution has been made, the arm 68 will feed forward both the snail-wheels, thus changing the hour.

I wish it understood that where in the claims I refer to a gong I do not intend to limit my-

self to what is usually termed a "gong," but intend to cover also a bell or any other device suitable for giving an audible signal.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a striking mechanism for clocks, a gong for sounding the hours, a gong for sounding quarter-hours, a motor, operating connections between said motor and gongs, an hour-controlling mechanism, a separate and independently-movable quarter-hour-controlling mechanism, means for actuating both said controlling mechanisms during each quarter-hour, and means actuated by the movement of one of said controlling mechanisms for shifting said operating connections from one gong to the other.

2. In a striking mechanism for clocks, a gong for sounding the hours, a gong for sounding quarter-hours, a controlling device for each of said gongs, a quarter-hour snail-wheel for one of said controlling devices, an hour snail-wheel for the other of said controlling devices, said snail-wheels being independently pivoted on a common axis, and an actuating device provided with three arms for actuating said quarter-hour snail-wheel and one arm for actuating both snail-wheels.

3. In a striking mechanism for clocks, a gong for sounding the hours, a gong for sounding fractions of hours, a motor, operating connections between said motor and gongs, a pair of controlling-racks for said gongs, a pair of independently-movable detents for said racks, means for simultaneously disengaging said detents from said racks, means for independently returning said racks, and means for

automatically shifting said operating connection from one gong to the other after the return of the first rack.

4. In a striking mechanism for clocks, a gong for sounding the hours, a gong for sounding fractions of hours, a motor, operating connections between said motor and gongs, a pair of controlling-racks for said gongs, a pair of independently-movable detents for said racks, a pin carried by one of said detents and extending beneath the other, means for moving said pin and thereby simultaneously disengaging said detents from said racks, means for independently returning said racks, and means for automatically shifting said operating connections from one of said gongs to the other after the return of the first rack.

5. In a striking mechanism for clocks, a gong for sounding hours, a gong for sounding quarter-hours, a motor, operating connections between said motor and gongs, a pair of controlling-racks for said gongs, a pair of independently-movable detents for said racks, means for simultaneously disengaging said detents from said racks, means for independently returning said racks, and means actuated by the return of the first of said racks for shifting said operating connections from one of said gongs to the other.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

ANTON TOMEK. [L. S.]

Witnesses:

A. C. FOWLER,
JAMES H. BRYSON.