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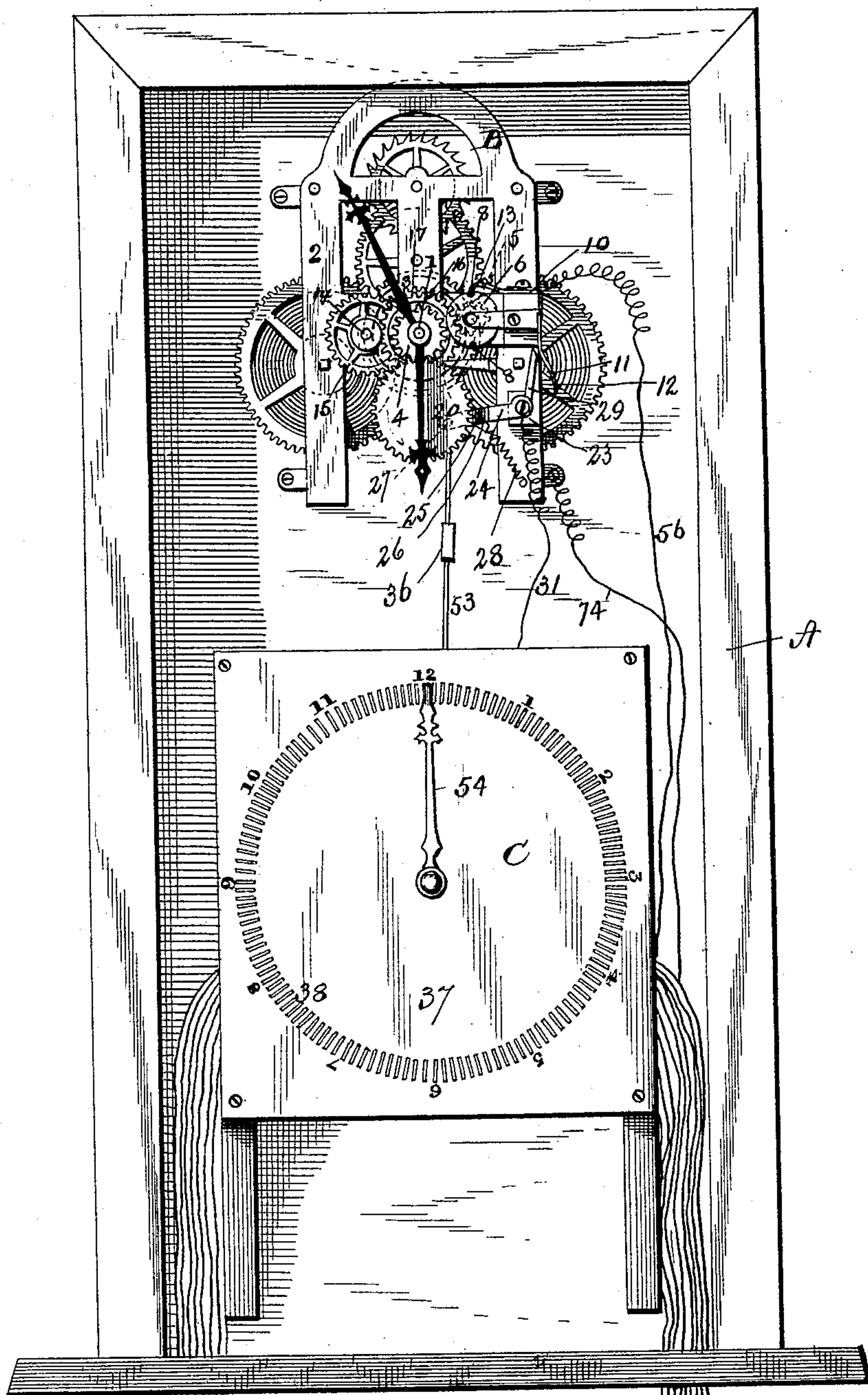
6 Sheets—Sheet 1.

A. J. REAMS.  
SIGNAL OR ALARM TRANSMITTER AND TIME INDICATOR.

No. 406,769.

Patented July 9, 1889.

Fig. 1



WITNESSES

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Robert M. Elliott

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(No Model.)

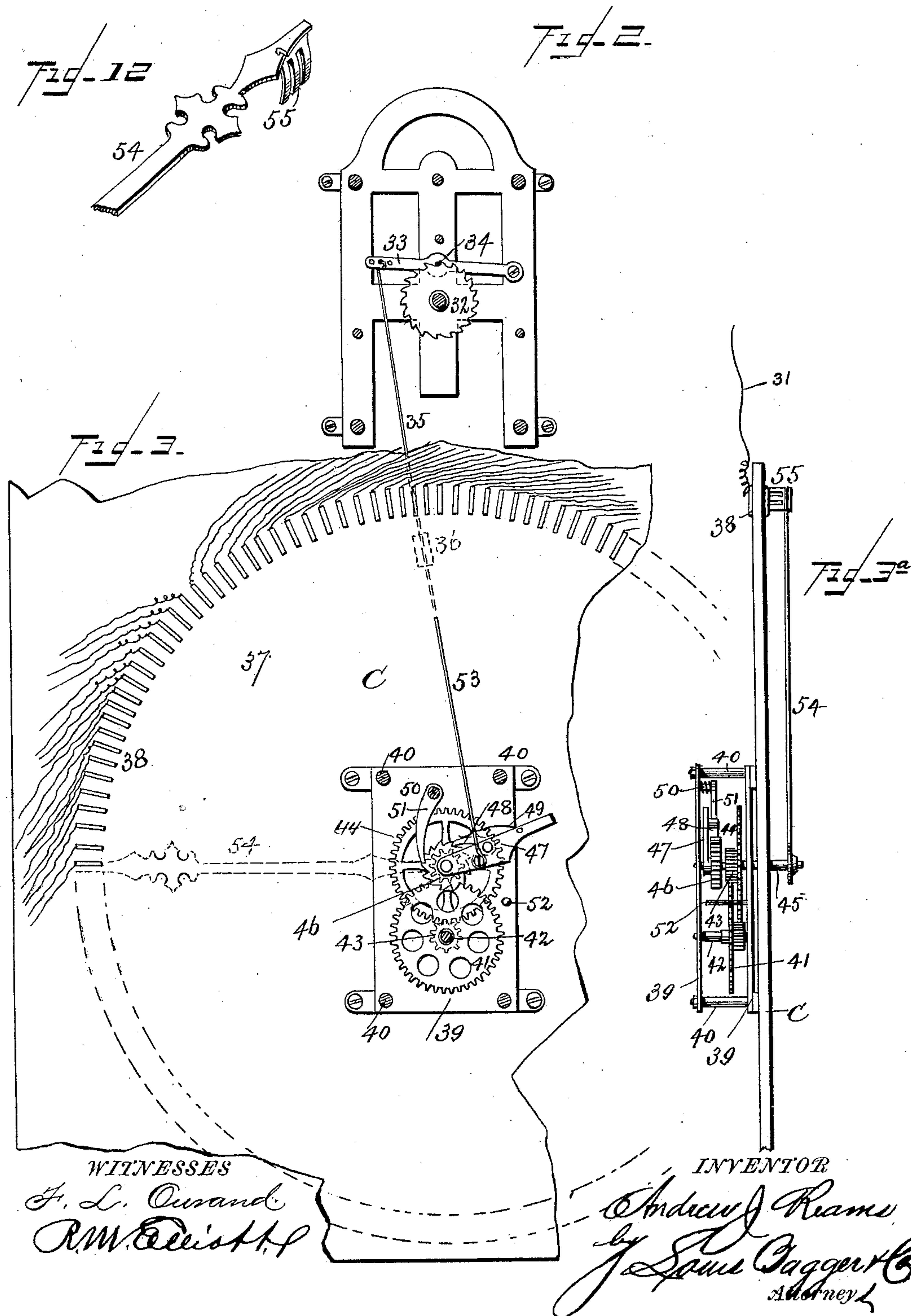
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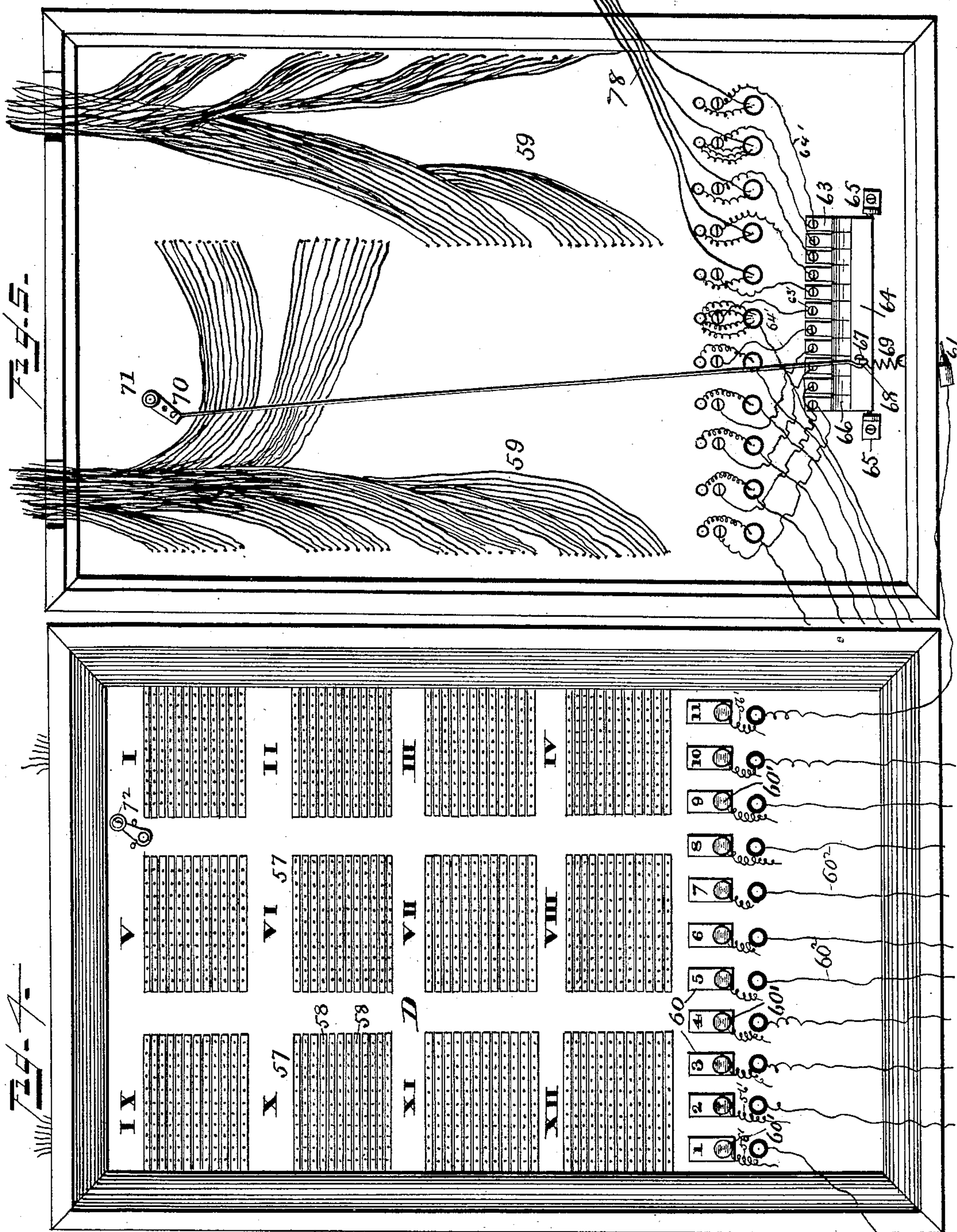
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Patented July 9, 1889.



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(No Model.)

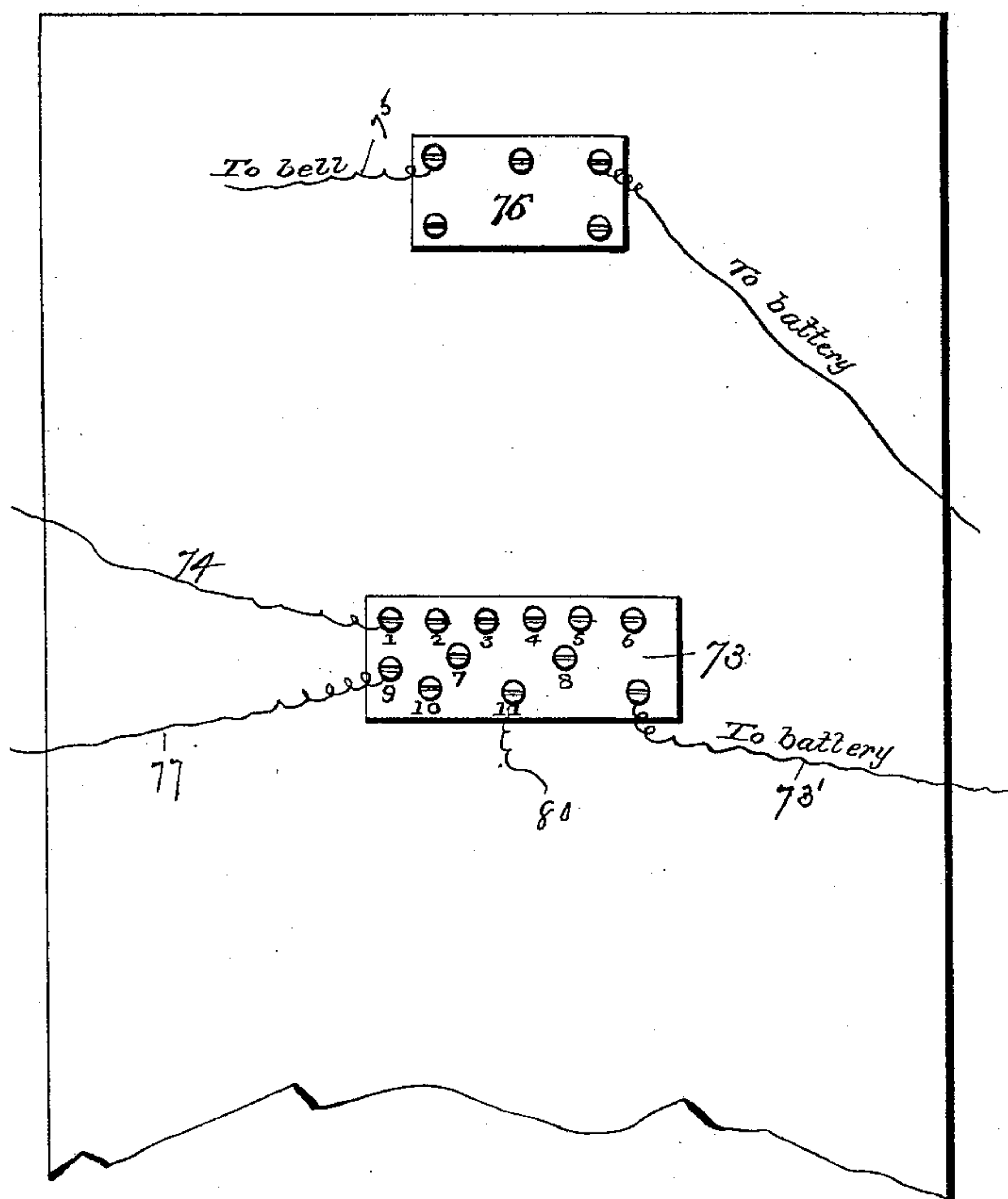
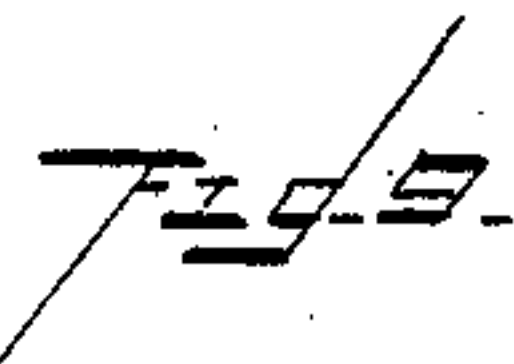
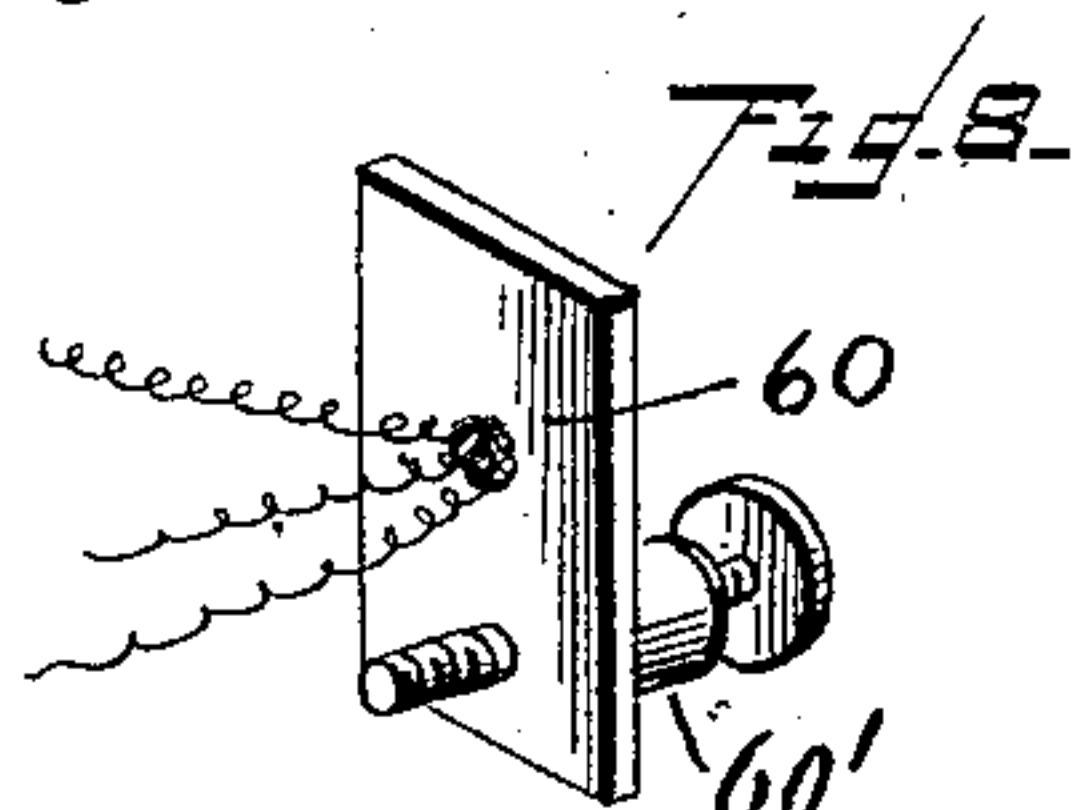
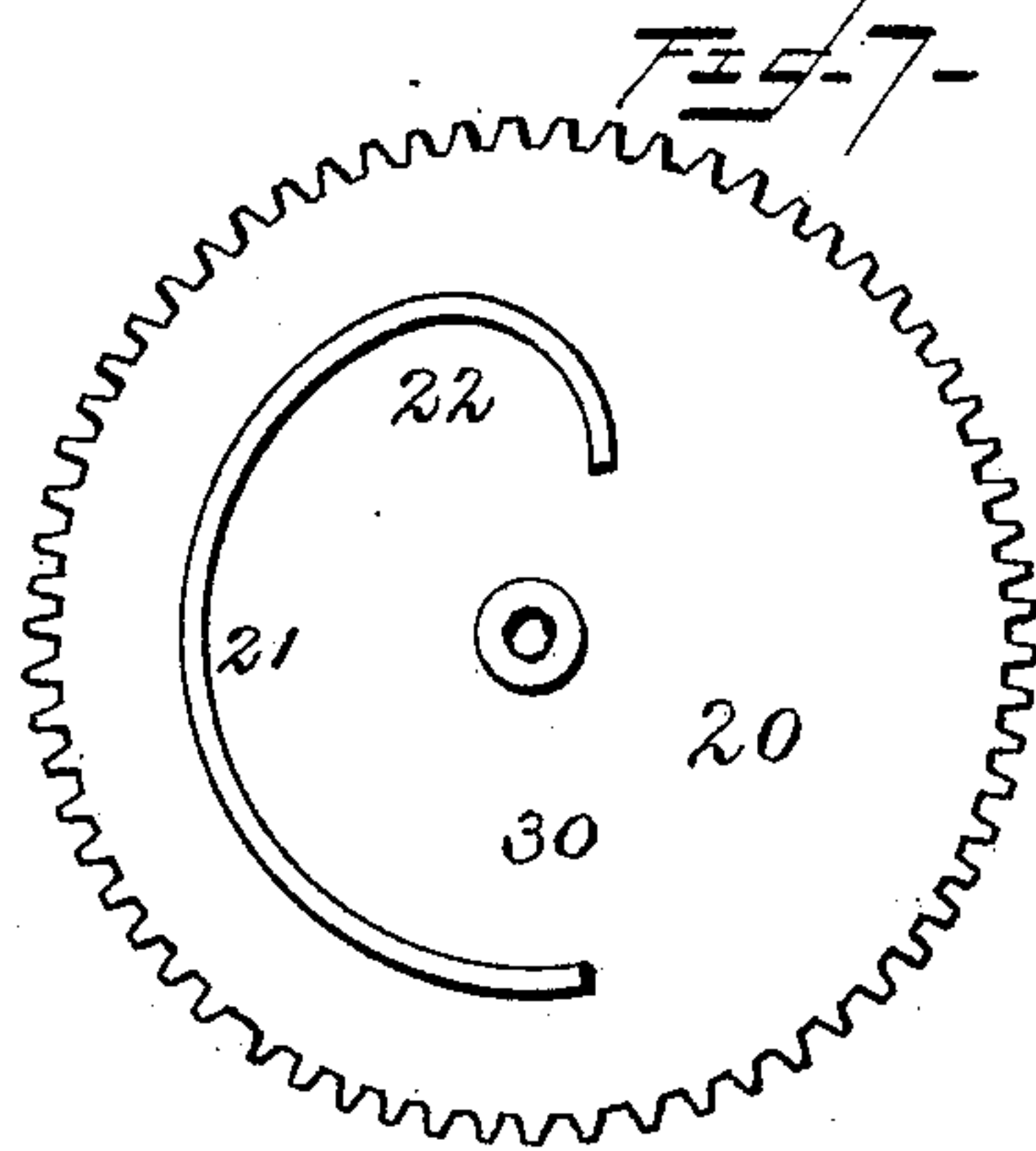
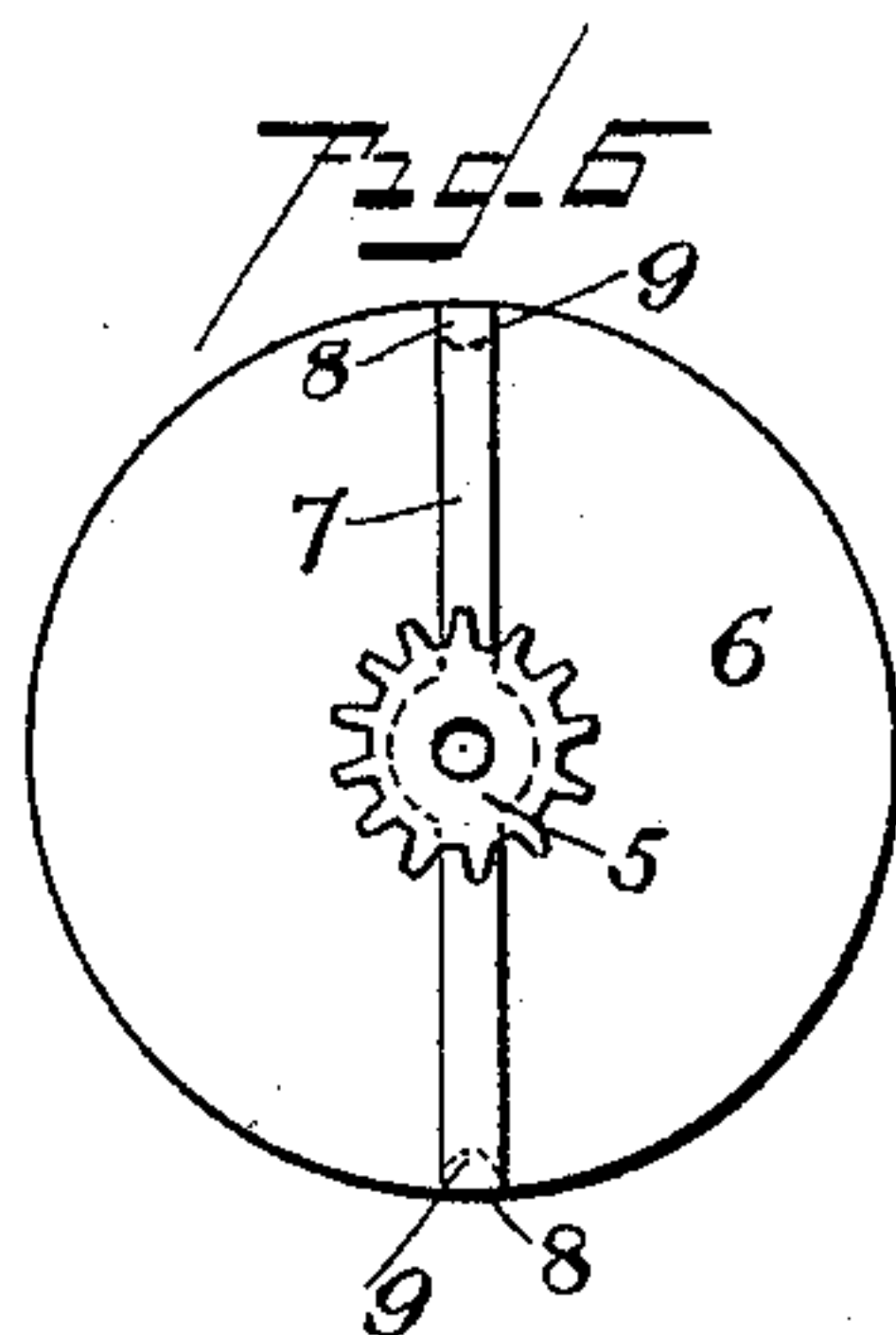
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Patented July 9, 1889.



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(No Model.)

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A. J. REAMS.

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Fig. 10.

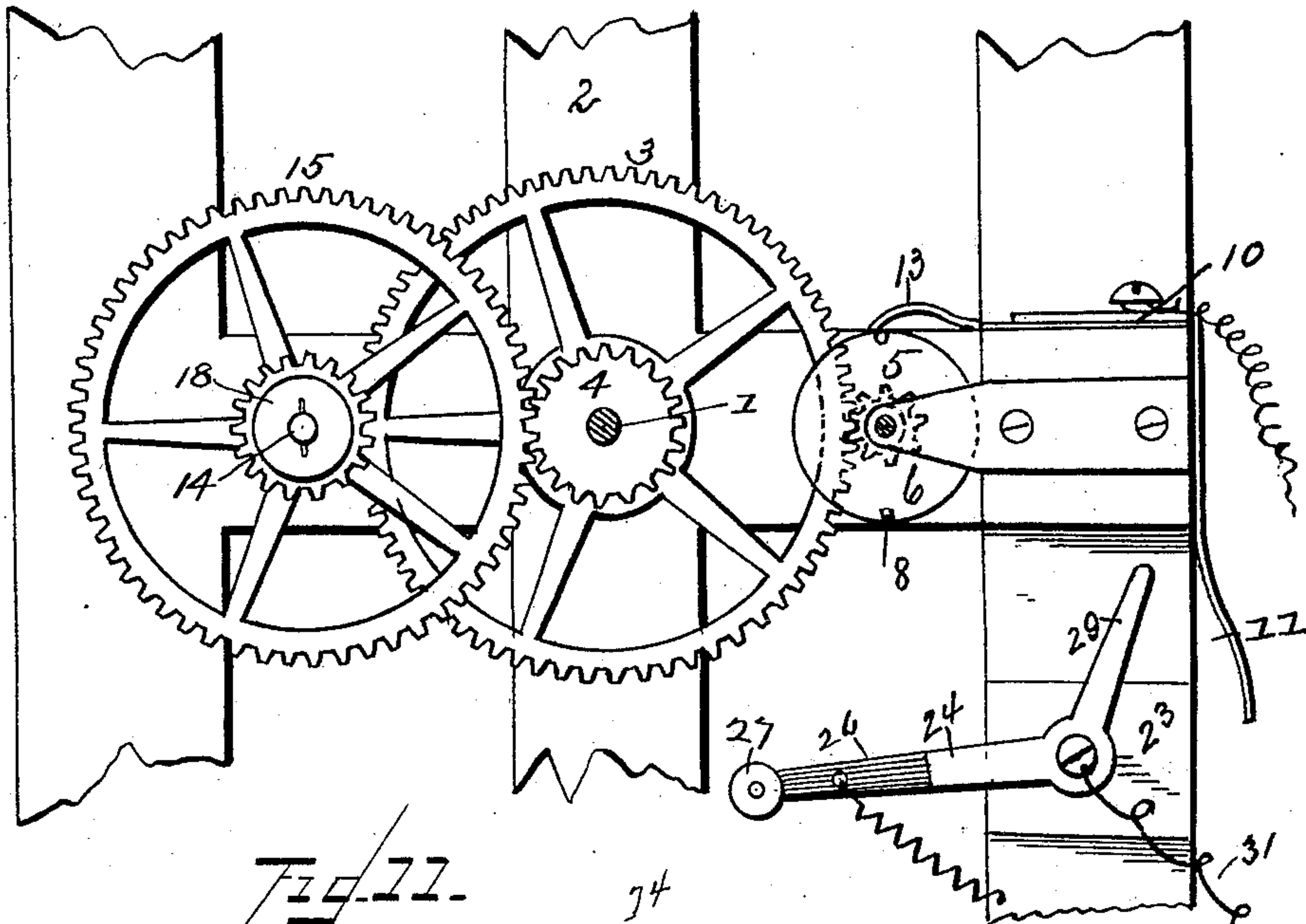
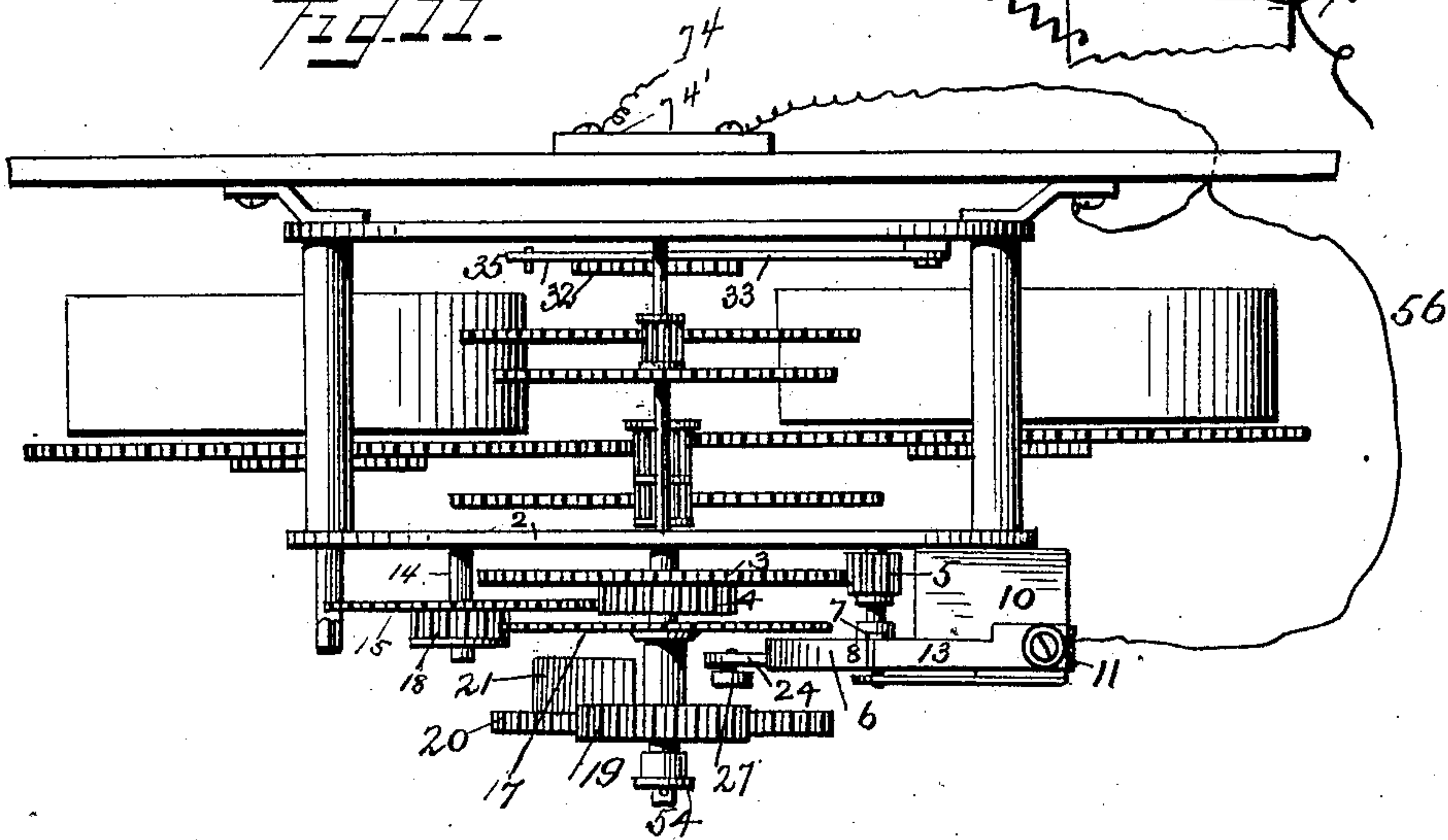


Fig. 11.



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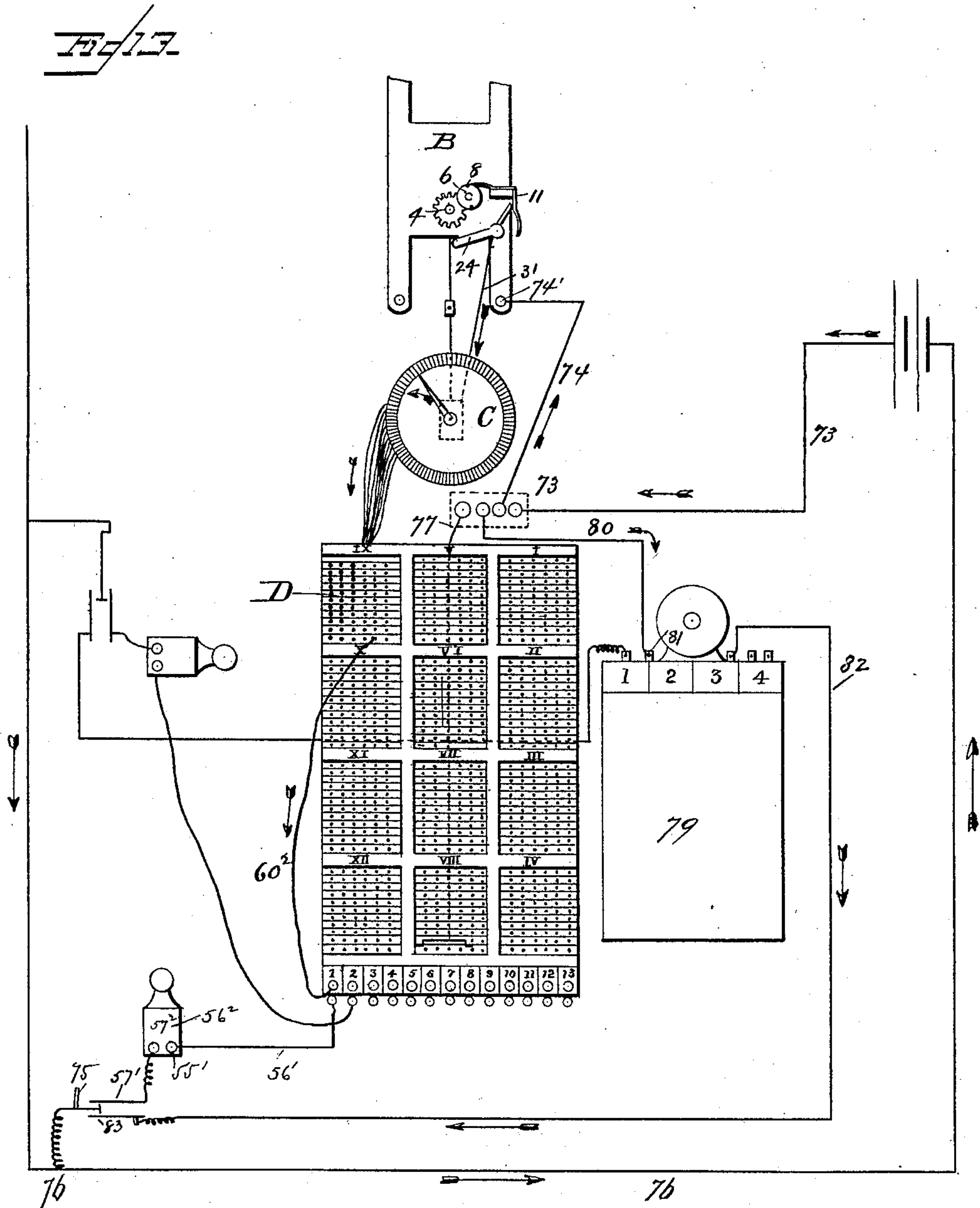
(No Model.)

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A. J. REAMS.  
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No. 406,769.

Patented July 9, 1889.



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# UNITED STATES PATENT OFFICE.

ANDREW J. REAMS, OF EL DORADO, KANSAS.

## SIGNAL OR ALARM TRANSMITTER AND TIME-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 406,769, dated July 9, 1889.

Application filed August 3, 1888. Serial No. 281,916. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. REAMS, a citizen of the United States, and a resident of El Dorado, in the county of Butler and State of Kansas, have invented certain new and useful Improvements in a Combined Signal or Alarm Transmitter and Time-Indicator; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a combined signal or alarm transmitter and time-indicator.

The object is to produce an apparatus which will automatically transmit electric signals or alarms, and also the time to any number of electric dials in a building, and from the same clock.

With these objects in view the invention consists in the improved construction and combination of parts of a combined signal or alarm transmitter and time-indicator, as will be hereinafter fully described in the specification, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, forming part of this specification, and in which like letters of reference indicate corresponding parts, I have illustrated one form of device embodying the essential features of my invention, although the same may be carried into effect in other ways without departing from the spirit thereof, and in these drawings—

Figure 1 is an elevation showing the clock mechanism and the automatic circuit-closer. Fig. 2 is a view of the back plate of the clock mechanism, showing a ratchet-wheel secured to the minute arbor and an arm for engaging the said ratchet-wheel. Fig. 3 is a rear elevation, partly in section, of the automatic circuit-closer and mechanism for operating the hand or pointer. Fig. 3<sup>a</sup> is a side elevation of the circuit closed. Fig. 4 is a front elevation of the switch-board. Fig. 5 is a rear elevation of the same. Fig. 6 is a detail view of a disk for closing the circuit of the clock mechanism to cause it to transmit an alarm or signal at a certain time. Fig. 7 is a detail view of a wheel, showing a cam secured to one side. Fig. 8 is a detail view of one of the

metallic plates of the switch-board, showing a number of wires secured thereto. Fig. 9 is an elevation of the back of the casing, showing plates secured thereto on its inner side for connecting the device with the battery. Fig. 10 is a detail view of a portion of the clock mechanism. Fig. 11 is a plan view of the clock mechanism. Fig. 12 is a detail view of the hand or pointer, and Fig. 13 is a diagram showing the complete circuit.

Referring to the drawings, A designates the casing of the clock mechanism and the automatic circuit-closer, which may be made of any suitable material and ornamented in any manner to produce a neat and finished casing. Within this casing is secured the clock mechanism B, the motive power of which may be either a spring or a weight, and may be made to wind electrically in the manner set forth in Letters Patent granted to me June 12, 1888, and numbered 384,472.

On the minute-arbor 1 of the clock and in front of the frame-plate 2 is secured a wheel 3, (seen more clearly in Fig. 10,) having a pinion 4 secured thereto, the said wheel meshing with a pinion 5, carrying on its arbor a disk 6, (see Fig. 6,) made of any suitable material—such, for example, as hard rubber or compressed paper. On the inner face of the disk and secured to the arbor extending through the same is a strip of metal 7, the ends of which are bent up and form arms 8, which rest in grooves 9 in the periphery of the disk, and at diametrically-opposite points. These arms are to be dressed down, so as to be flush with the face of the periphery of the said disk.

To the clock-frame and directly opposite the disk is secured a block 10, of a suitable insulating material, having secured to its outer side a metallic spring 11, one end of which projects downward and terminates in an arm 12, which is slightly curved outward. To the upper end of the block is secured a thin spring 13, terminating directly over and resting upon the periphery of the disk. The mechanism for operating this disk is so adjusted that it is caused to revolve once in every ten minutes, and by means of the arms 8 on the periphery will close the circuit every five minutes; but the disk may be constructed



with ten arms or be caused to revolve oftener, thus closing the circuit at shorter intervals, as desired, and by making the arms wider the duration of the signal or alarm may be increased. Thus, while the spring is resting upon the insulating material between the arms, the current will be cut off until another arm is brought in contact with the spring.

Directly opposite the disk and secured to the frame-plate of the clock is a stud 14, carrying an intermediate wheel and pinion 15 secured together, the wheel meshing with the pinion 4 on the minute-arbor of the clock. An hour-wheel 17 is secured to a sleeve journaled on the minute-arbor and meshes with the intermediate pinion 18. On the sleeve of the hour-wheel, and in front of it, is secured a wheel 19, which meshes with a wheel 20, having double the number of teeth, the said wheel revolving on a stud secured to the plate-frame of the clock. This wheel 20 has secured on its inner side a cam 21, which is to be made of metal. One end of this cam is slightly curved inward, as shown at 22. The wheel carrying this cam is designed to revolve but once in every twenty-four hours. Opposite to this wheel and secured to the plate-frame of the clock is a block of insulating material 23, upon which is pivoted a lever 24. This lever is bent nearly at right angles and has secured at the end 25 a strip of non-conducting material 26, having a roller 27 pivoted thereto. This roller is designed to be engaged by the inner face of the cam on the wheel 20. The object for which this operates will be described farther on. To the insulated portion of the lever is attached a coiled spring 28, the opposite end of the same being secured to the clock-frame to hold the lever 24 in its normal position. The opposite end 29 of the lever is designed to be brought in contact with the arm 12 of the spring on the insulated block, the thin spring 13 being in constant contact with the disk. As the wheels revolve, the cam engages the end of the lever carrying the roller and forces it up, thus closing the circuit for twelve hours. As the wheel 20 revolves and the roller comes opposite the open portion 30 between the two points of the cam, the spring draws the lever back, breaking the current for twelve hours, and thus saving the batteries. During this time no alarms can be sounded without changing the programme after it has been once set. A wire 31 is connected to the screw which holds the lever in place on the block, and extends down and connects with the automatic circuit-closer C, which will be described farther on.

On the rear end of the minute-arbor is secured a ratchet-wheel 32, having twelve teeth. Directly above this wheel and pivoted to the back frame-plate of the clock is an arm 33, to which is secured a pin 34, projecting out laterally, so that it will engage the teeth on the ratchet-wheel. To the end opposite the pivotal point of this lever is attached a wire 35, which passes down and engages an opening in one end of a piece of insulating material

36, the opposite end of the said piece being engaged by a wire which connects with the mechanism of the automatic circuit-closer C. This circuit-closer consists of a plate 37, which may be made of any suitable insulating material, such as wood fiber, hard rubber, or any other suitable non-conducting material. In the outer portion of this plate are secured a number of pieces of metal 38, arranged radially in a circle and corresponding to every five minutes of time. There will, consequently, be one hundred and forty-four of these pieces in the circle, as that is the number of five-minute periods contained in twelve hours; but the division of it may be altered, as desired—as, for example, to have them arranged to ten minutes. These pieces are secured through openings formed in the plate, and have secured to each of them an electric wire, which passes down and connects with the programme switch-board D, situated below or to one side the clock mechanism. On the back of the plate on which the circle of metal pieces are secured is a frame, consisting of two plates 39, secured together by pillars 40. These plates form the bearing for the revolving parts of the mechanism for operating the hand or pointer on the automatic circuit-closer. This mechanism consists of a wheel 41, revolving on an arbor 42, the said wheel revolving a pinion 43, secured to it, meshing with the wheel 44, secured to a sleeve 45, which projects through the plates and through an opening in the plate to the front of the same. To the rear portion of the arbor carrying the sleeve is secured a ratchet-wheel 46, having twelve teeth, and on the same arbor is pivoted a lever 47, carrying a pawl 48, for engaging the ratchet-teeth, the said pawl 48 being kept in position by means of a spring 49. To the back plate is secured a stud 50, on which is pivoted a pawl 51, designed to engage the ratchet-wheel to prevent retrograde movement of the same when the pawl 48 is operated. The outer end of the lever is left long, so that it may descend by its own weight and rest upon a stop-pin 52, secured to the back plate.

To the lever 47 is secured at a suitable distance from the arbor carrying the sleeve a wire 53, which extends upward and connects with the insulating material 36, to which the wire from the clock is connected, the object of this insulating material being to prevent any current passing from the clock mechanism to the automatic circuit-closer. The contact hand or pointer 54 is made, preferably, of some good conducting material—such, for instance, as copper or brass—and has secured at its outer end a number of spring-hangers 55, which are directly over the circle of metal pieces and project toward the same, having their ends bent out slightly, so that they may form frictional contact with each of the metal pieces without any danger of hanging or catching upon the same. The manner in which the lever is adjusted in the mechanism for oper-



ating this hand or pointer is such as to cause it to revolve in the same direction as the hands of a clock; but it will be readily seen that by changing the relative positions of the  
 5 pawls the hand may be caused to revolve in the opposite direction.

The circuit-closer and the clock-works are electrically connected by a wire 31, one end being secured to the frame of the mechanism  
 10 on the back of the circuit-closer and the other end passing up and connecting with the lever 24 on the clock-frame. As the clock runs and the pin on the arm 33, secured to the clock-frame, is engaged by a tooth of the wheel 32  
 15 on the minute-arbor, the free end of the lever is raised and the wire 53, connecting the arm with the mechanism of the circuit-closer, is raised, thereby causing the pawl 48 to engage the ratchet-wheel. The arbor 42 is turned a  
 20 certain distance, and this movement is transmitted through the pinions and wheels to the pointer, which is thereby moved from one metal piece to another every five minutes. As the tooth passes under and by the pin, the  
 25 levers are free to drop to their normal position, and the pawl 48 engages another tooth, and so on, closing the circuit every five minutes.

If desired, I may place the automatic circuit-closer behind the dial of the clock and operate the contact-hand directly from the sleeve of the hour-wheel instead of below, as shown.

Below the clock-case and connected thereto, and forming a part of the same, is a programme  
 35 or alarm switch D, consisting of a number of metallic strips 57, having perforations or holes 58 formed therein, the said strips being arranged in a series of twelve, each strip corresponding to five minutes of time. Each of  
 40 these strips is numbered to correspond with the five-minute division of the time-dial, as 5, 10, 15, &c., the hours from 1 to 12, and may be arranged to read from right to left or from left to right, so as to prevent the  
 45 crossing of the wires 59 on the back of the board. The numerals may be printed on any suitable material, and secured to the board or printed directly on the board. Each strip is secured to the said board by screws or other  
 50 equivalent form of fastening device, and has one end connected by suitable binding-screws or otherwise with a conducting-wire from the corresponding metal piece 38 in the automatic circuit-closer above described. Below the  
 55 strips are a number of metal plates 60, corresponding with the number of rooms in the building or place where the clock is to be used, and each plate is provided with a binding-post 60', and to the back are secured any  
 60 number of insulated wires 60<sup>2</sup>, which pass through suitable openings in the board. The free ends of the conducting-wires are tipped with a suitable wire 61, and their ends are split, as shown at 62, so as to form springs to  
 65 insure perfect contact when inserted in the strips for which they are intended to be used. The points of the wire are protected by fer-

rules 61', of any suitable insulating material, and made in any desired shape, the object being also to prevent contact with the other  
 70 points when set close together.

To the binding-post of each plate 60 is connected one end of the conducting-wire 56', the other end being connected to one binding-post 55' of an electric bell 56<sup>2</sup>, as shown in  
 75 Fig. 13. Now, it will be seen that by inserting the metal tip of one of the insulated wires 60<sup>2</sup> in one of the holes in the strip a connection is made between that strip and the plate to which the said wire is attached. When the  
 80 contact hand or pointer arrives at the metal piece corresponding to the plate in which the insulated wire is inserted, the circuit is completed and the bell 56<sup>2</sup> will be sounded.

To set the programme or alarm it is only nec-  
 85 essary to insert the tips in the conducting-wires in the strips on the programme switch-board corresponding to the time the signal is wanted, and each room may have any number of signals sounded at intervals of time, as  
 90 close together as five minutes between each of the signals. The number of rooms for which this switch-board may be fitted up will be regulated by the building in which it is placed; but for the sake of illustrating this  
 95 device I have only shown eleven in this instance, as it will be only necessary to make the strips longer and add more openings, and then add a corresponding number of room-plates and conducting-wires to accomplish this  
 100 result. Below the room-plates and on the back of the board are placed a number of similar metallic strips 63, of the same number as there are bells to be used, the same being secured by means of screws 63' to the  
 105 back of the board, and each one connected by a suitable wire 64', either with the binding-post screws or otherwise, on each room-plate. A heavy plate of metal 64, pivoted at each end to suitable shoulders 65, secured to the  
 110 back of the frame, is secured below these strips. On the outer edge of this heavy plate are secured thinner pieces of spring-tempered metal 66, which are designed to bear upon the strips 63, secured to the back  
 115 of the frame and directly above them. At a point upon the upper surface of this plate 64 is secured a shoulder 67, provided with the opening 68, in which is secured a spiral spring 69, which passes back and is secured to the  
 120 frame, the object of this spring being to hold the plate 64 up and out of contact with the strips below it. To the said shoulder and in the same opening in which the spiral spring is secured is attached a wire which extends  
 125 upward and is connected with an arm 70, secured to a stud 71, which passes through the board and has a crank 72 secured to its outer side, the object of this lever and wire being  
 130 that by turning it to one side, and thus drawing up the wire, the plate 64 will be drawn down, and thus connect all of the wires, so that an alarm may be sounded simultaneously in every part of the building by simply



turning the lever to one side, thus forcing the plate of metal down on the strips below them and close the circuit with all the bells. When it is desired to cause them to stop ringing, it is only necessary to turn the lever in the opposite direction, thus opening the circuit, when the bells will cease to ring.

The circuit is completed as follows: A wire 73' leads from one pole of the battery to the switch-plate 73, secured to the back of the clock-casing, (see Fig. 9,) which has a wire 74 passing through the back of the casing and connected to the frame of the clock at 74'. From the clock-frame the current passes through the works and arms 8 on the circuit-closing disk 6 to the spring 11 and to the arms 24 on the twelve-hour cut-out, from thence by the wire 31 to the works on the plate of the circuit-closing device below the clock, through the contact pointer or hand to the pieces of metal 38 in the circle, and by each wire to the corresponding strip on the alarm or programme switch-strips 58, from these strips by the conducting-wires carrying the tips 61 as they are inserted in the different strips to the room-plates 60, and through the wires connecting with the binding-post 60' to one binding-post of the bell 56<sup>2</sup>. A wire 57' leads from the other binding-post 57<sup>2</sup> to a three-point push-button 75, having the bell-circuit always closed, from the central point of the push-button to a wire 76, leading from the other pole of the battery, thus completing the circuit. One end of a wire 77 connects with the switch-plate 73 and passes down on the inside of the casing and connects with the plate 64, Fig. 5, pivoted directly over the metallic strips 63, which are connected by a wire 78 to each of the room-strips through their binding-posts to the different bells when the crank 72 is turned, thus closing the circuit, as before described. The annunciator 79 is placed in circuit by a wire 80 from switch-plate 73, Fig. 9, to the binding-post 81 of the annunciator-bell, and from the other binding-post a wire 82 leads to the lower or open circuit-spring 83 of the push-button 75 of the bell 56<sup>2</sup>. It will be seen as the button is pressed the bell-circuit to the clock is opened and the circuit to the annunciator closed by the other battery-wire being cut into circuit, thus sounding the bell and indicating the number of the room signaling.

It will be seen by adding insulating-cords provided with split tips that any bell may be sounded at short intervals throughout the day or night and repeat itself every twenty-four hours; but, if desired, the clock can be made to sound bells at longer or shorter intervals, as before described.

It will be seen that, although this device is comparatively simple of construction and requires no more care than an ordinary clock would, it has a much wider range for usefulness and is less liable to get out of order. The interior is easy of access for setting the pro-

gramme or alarm, which may be accomplished by simply inserting the tip of a wire connected with any room it is desired to alarm in the metal strip corresponding with the time the alarm or signal is wanted.

The operation of the clock is as follows: As the clock runs and the minute-arbor is revolved the pivoted lever on the back frame is raised by the ratchet-wheel, operating the pointer or hand on the circular switch below. As the contact hand or pointer is moved from one metal piece to another the ratchet-tooth passes under the pin on the pivoted arm, and the hand is allowed to rest on the metal piece for a short time. At this moment one of the arms in the disk 6 passes under the spring 13 and closes the circuit. When another tooth on the ratchet-wheel on the minute-arbor engages the pin on the pivoted arm, it raises it and advances the contact pointer or hand to another space or piece, and so on, making and breaking the current automatically every five minutes. The circuit in the programme-switch D being normally open, the bells are only sounded when the circuit is closed by the tips of the insulated cords being inserted in one of the holes of the strip of the programme switch or dial and the clock arrives at the time corresponding to the strip so placed. The programme or calls once set may be left for any length of time, and will be repeated from day to day, but may be instantly changed to any time desired—as, for example, in the present case the clock indicates 5.50 o'clock and the pointer on the circle is on the segment or space corresponding to 12 o'clock. Now, if the tip of one of the wires of a room numbered 1 be inserted in the first strip in section 2, then as the piece of metal in the small disk passes under the spring and in contact with it bell No. 1 will be sounded. If all the rooms had a tip inserted in that strip, then all the bells connected with them would ring.

The tips of the flexible conducting-wires may be inserted in holes in the frame or left hanging down when not in use, all the connecting-wires from the programme-dial being closed on the back of the same and protected from injury or accident.

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

1. The combination, with the clock-frame, of a block of insulating material secured thereto, an L-shaped lever pivoted upon the block having an arm of an insulating material and the other arm of a conducting material, a circuit-closing disk, and springs engaging the disk and conducting-arm of the lever, substantially as described.

2. The combination, with the sleeve of the hour-wheel, of a wheel secured thereto, a stud on the frame, a cam-wheel on the stud engaging the wheel on the sleeve of the hour-wheel, an L-shaped lever pivoted to a block of insulating material secured to the frame, a roller



on the lever engaging the cam-wheel, and a spring for engaging L-shaped lever, substantially as and for the purpose specified.

3. The combination, with the sleeve of the  
5 hour-wheel, of a wheel secured thereto, a stud secured to the frame and carrying a cam-wheel meshing with the said wheel, an L-shaped lever pivoted to the frame and carrying a roller engaging the cam-wheel, and a spring for  
10 drawing the lever out of contact with the cam-wheel, substantially as described.

4. The combination, with the clock mechanism, of an automatic circuit-closing device constructed of a plate of suitable insulating  
15 material, having a series of metal pieces arranged in a circle, a contact hand or pointer mounted above the said pieces, mechanism connecting with the hand or pointer, and an insulated wire connecting the clock mechanism and mechanism for operating the hand or  
20 pointer, whereby, when the clock is in operation, the hand or pointer will be operated at determined intervals, substantially as and for the purpose specified.

25 5. The combination, with the minute-arbor,

of a ratchet-wheel secured thereto, a lever pivoted above the same and having a pin engaging the ratchet-wheel, an automatic circuit-closer below the clock mechanism, a hand or pointer moving over the same, and an insulated rod connecting with the lever on the clock and operating the hand or pointer on the circuit-closer, substantially as and in the manner described.

6. The combination of an automatic circuit-  
35 closer, metallic pieces secured thereto, a switch-board, and conducting-wires connecting the metallic pieces and switch-board, a contact hand or pointer mounted above the metallic pieces, and mechanism for operating  
40 the hand or pointer, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

ANDREW J. REAMS.

Witnesses:

WM. H. ELLET,  
ALVA SHELDEN.