

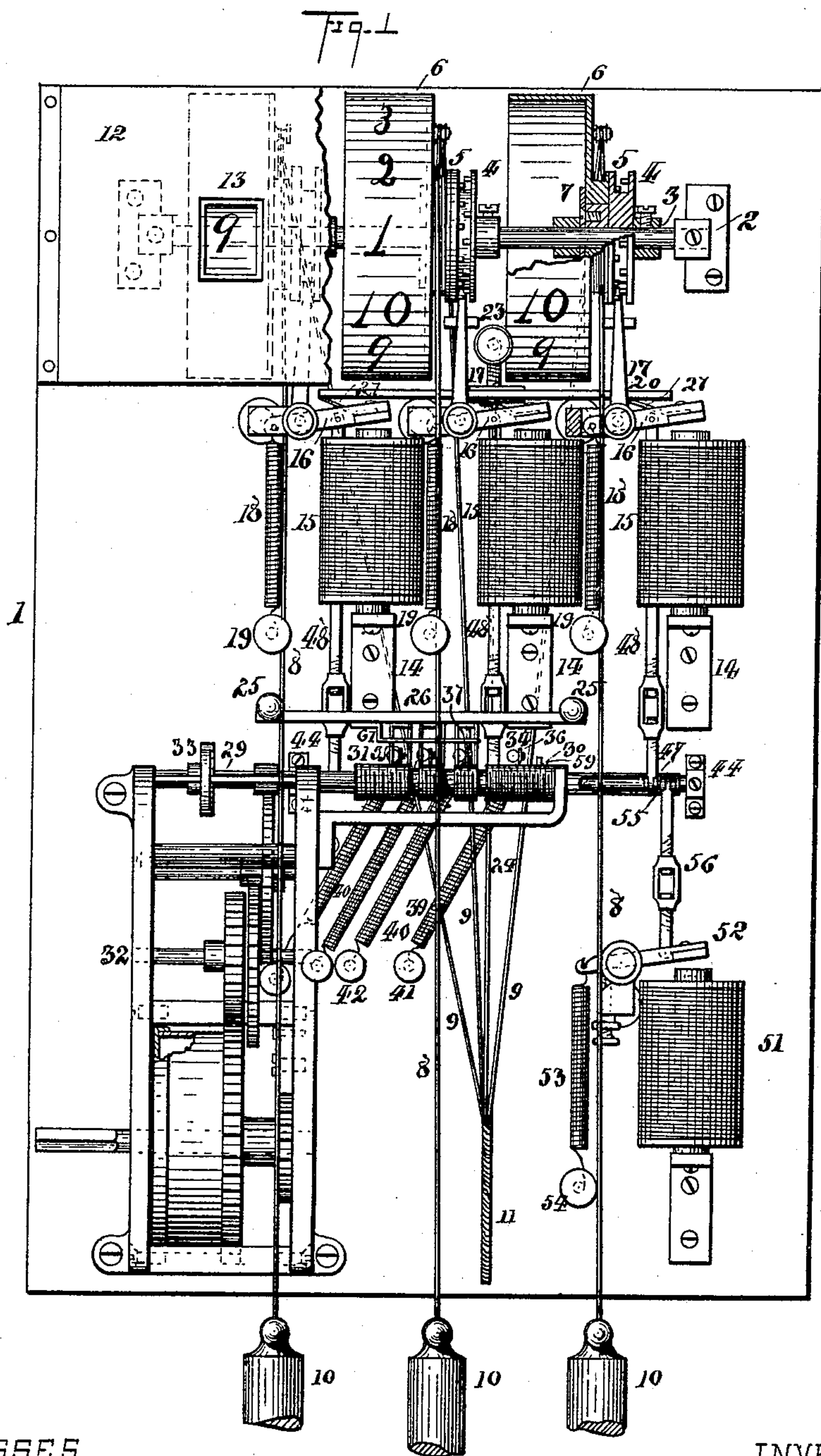
(No Model.)

3 Sheets—Sheet 1.

F. F. LOOMIS.
FIRE ALARM TELEGRAPH INDICATOR.

No. 479,950.

Patented Aug. 2, 1892.



WITNESSES.

BELLE S. LOWRIE.

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INVENTOR.

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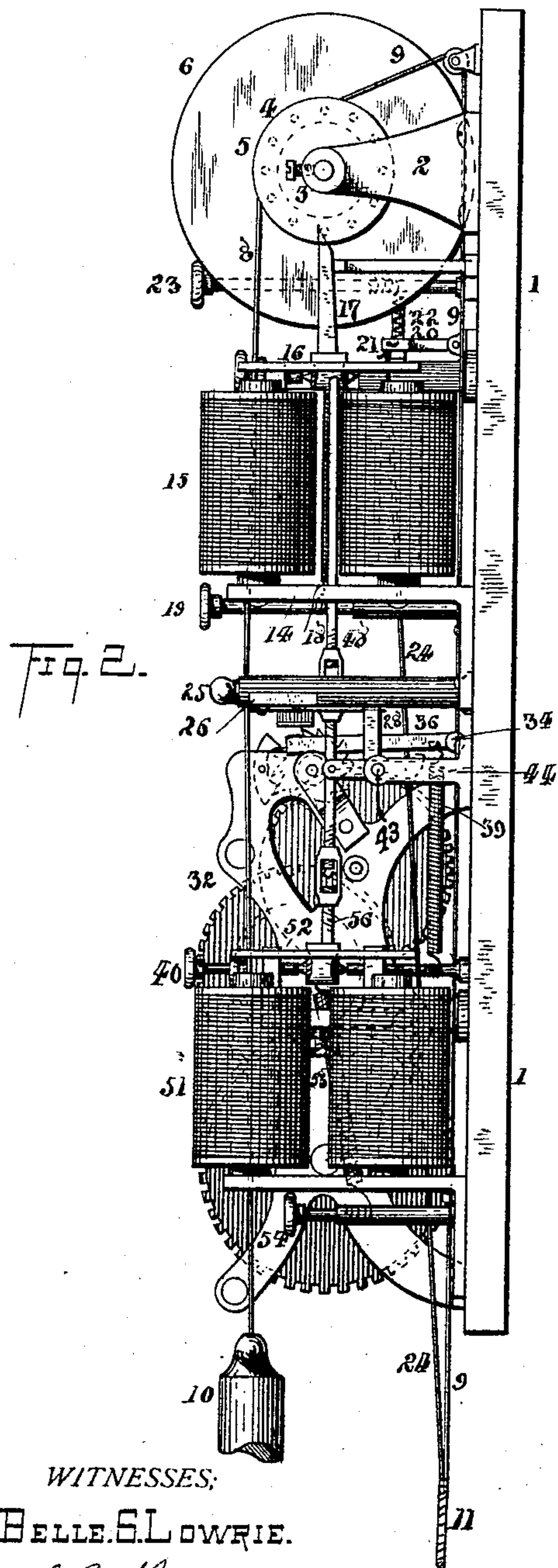
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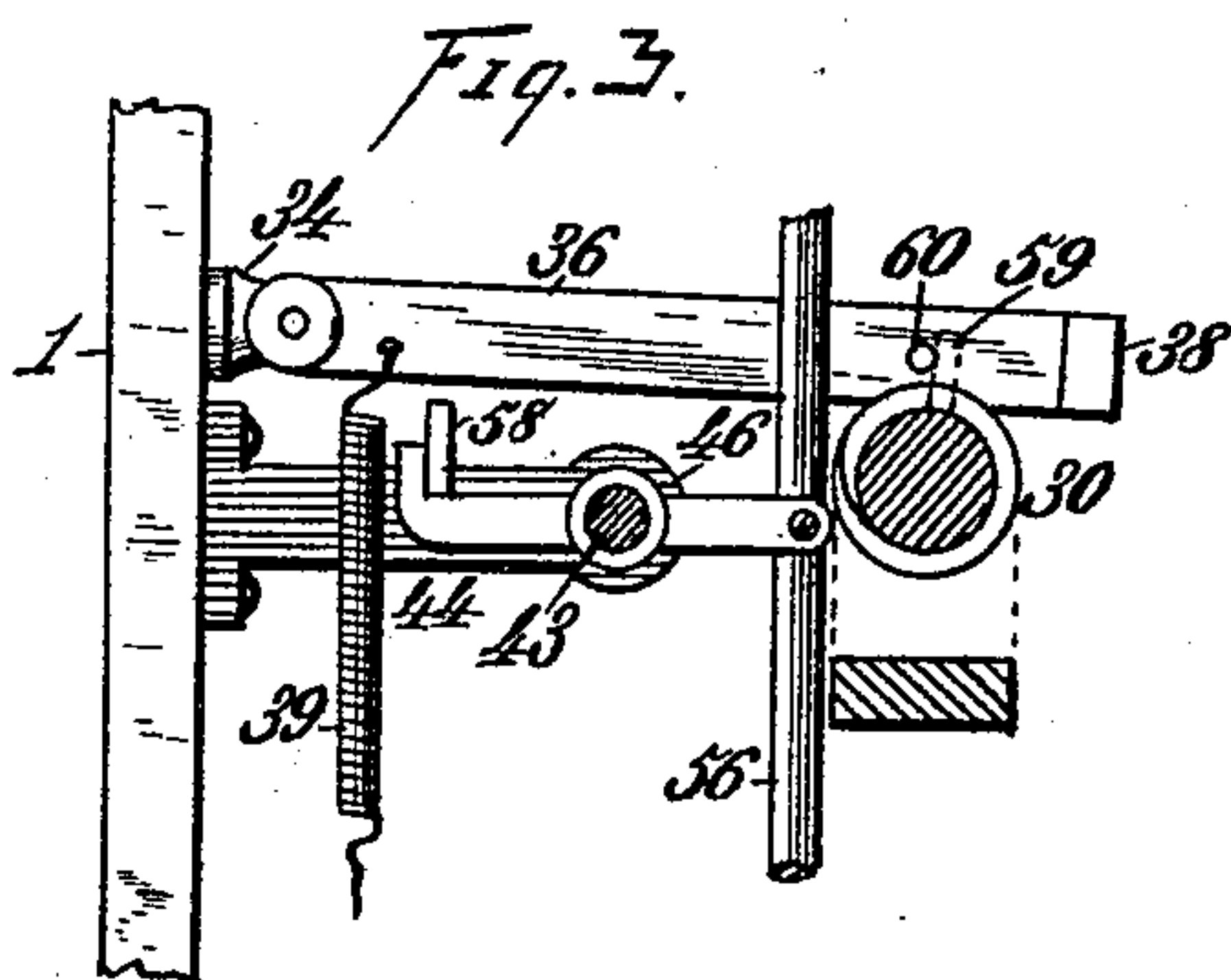
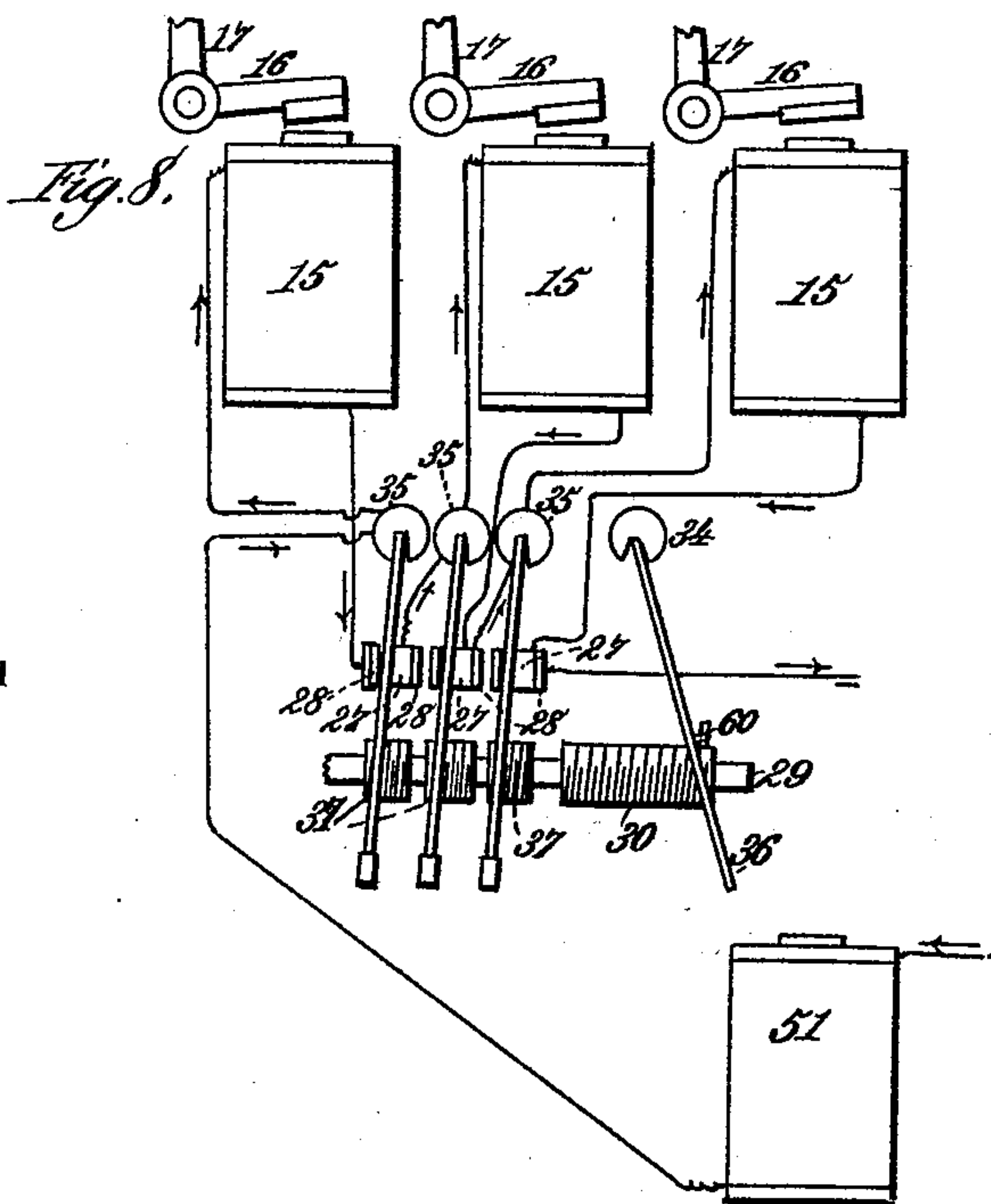
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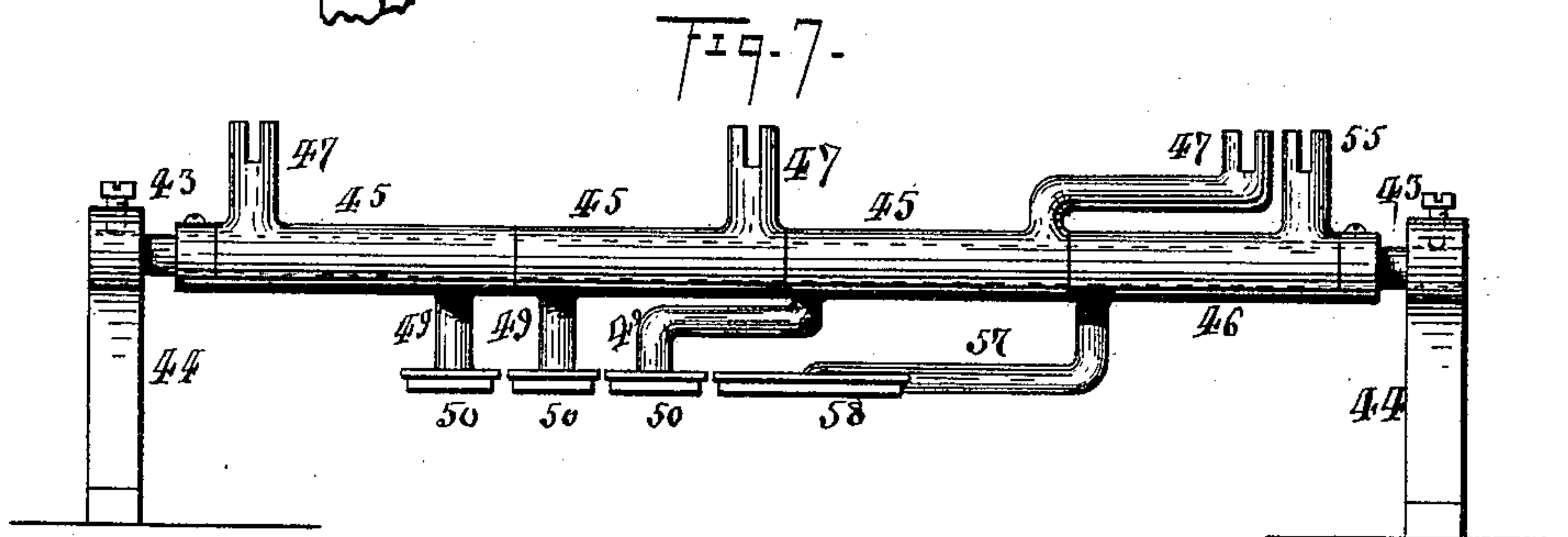
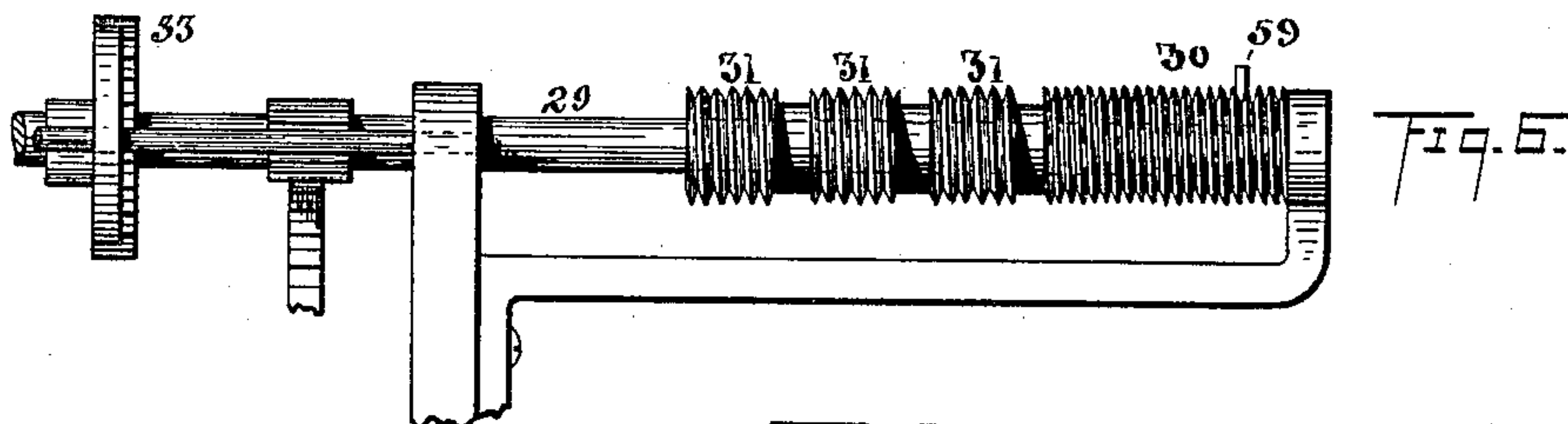
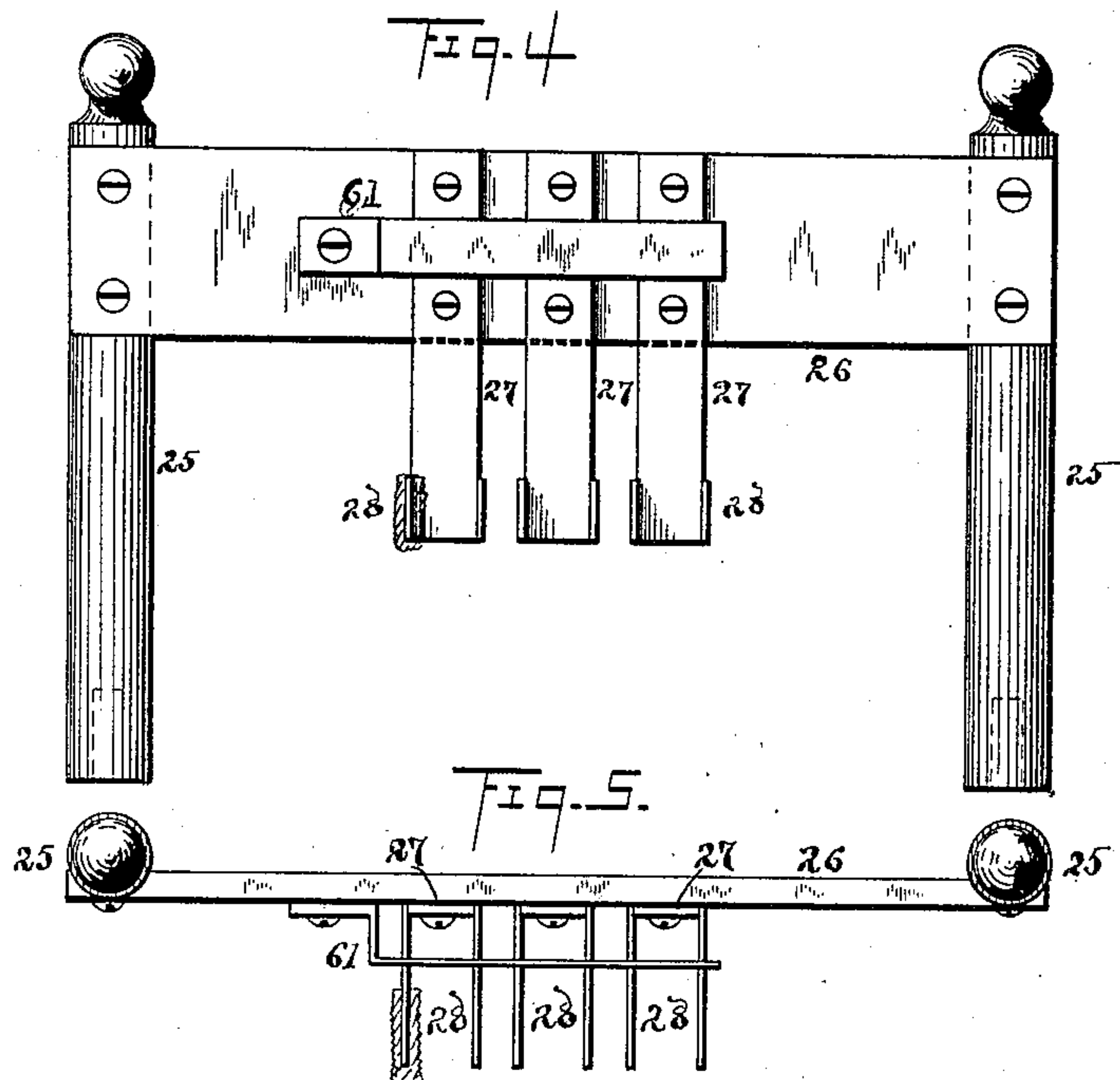
(No Model.)

3 Sheets—Sheet 3.

F. F. LOOMIS.
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Patented Aug. 2, 1892.



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UNITED STATES PATENT OFFICE.

FRANK FOWLER LOOMIS, OF AKRON, OHIO.

FIRE-ALARM-TELEGRAPH INDICATOR.

SPECIFICATION forming part of Letters Patent No. 479,950, dated August 2, 1892.

Application filed December 1, 1891, Serial No. 413,651. (No model.)

To all whom it may concern:

Be it known that I, FRANK FOWLER LOOMIS, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Fire-Alarm-Telegraph Indicators, of which the following is a specification.

The object of my invention is to produce an apparatus to be connected with an electric fire-alarm circuit provided with boxes which severally give a determined number and which shall automatically indicate by appropriate figures the number of the box from which the alarm is given.

To the aforesaid purpose my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described, and then specifically pointed out in the claims, reference being had to the accompanying drawings, which constitute a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a front elevation of my apparatus; Fig. 2, a side or edge elevation of the same, looking from the right of Fig. 1; Figs. 3, 4, 5, 6, and 7, details of parts of the mechanism embodied in said apparatus and hereinafter fully described and explained, and Fig. 9 a diagram of the wire connections.

Upon a suitable slab or base, as 1, which is preferably of non-conducting material, as marble, hard rubber, or glass, are attached brackets 2, in and between which is fastened a small shaft 3, on which is loosely mounted a series of escapement-wheels 4 of a peculiar construction, hereinafter described, the number of which corresponds with the number of numerals to be employed in the system. Loosely mounted on the same shaft at one side of and contiguous to each escapement-wheel 4 are a pulley 5 and a drum 6, united together and arranged by a pawl and ratchet 7 to move with and drive the escapement-wheels as they revolve with the front from the top downward and to be released and returned when desired, as hereinafter explained.

About each pulley are two cords 8 9, wound in opposite directions, the first 8 passing over the front of the pulley 5 and provided with

weights 10, which constantly tend to revolve the drums and pulleys in one direction—that is, the front—from the top downward and the second cords 9 to revolve them in the opposite direction when drawn, the latter cords being united near the bottom of the plate 1 in a single large cord 11 to afford a hand-grasp and to enable them to be simultaneously drawn to restore the drums 6 to their normal position after they shall have given the proper signal.

On the faces of the drums 6 are numerals in successive order and ordinarily from “1” to “10,” and in front of and covering and concealing the drums is a case 12, (partially broken away in Fig. 1 to enable the mechanism behind it to be seen,) having openings or windows 13 opposite each drum and preferably glazed, through which a single number on the face of each drum may be seen. Beneath the drums 6 are mounted on the base 1 by means of brackets 14 a like number of electro-magnets 15, electrically connected, as hereinafter described, and pivotally suspended above the upper poles of which are rocking armatures 16, each of which has a lever 17, arranged to engage the pins of the escapement-wheels 4. Each of these escapement-wheels consists of two oppositely-disposed disks mounted on or integral with a single hub and each having on its inner face a series of projecting pins, which extend to or across the center line between them, the pins of each disk alternating with the pins of the opposite disk. The levers 17 are of such size and so arranged as to extend between the disks of the escapement-wheels and the pins on either side, and hence when rocked by the armatures 16 they vibrate from one disk to the other, allowing one pin to pass at each vibration and arrest the passage of the next pin until rocked in the opposite direction. All of the armatures 16 are normally raised from the magnets 15 by coiled springs 18, the tension of which is regulated by cords on thumb-posts 19 and arranged to be simultaneously rocked down by a horizontal rocking bar 20, provided with a series of springs 21 on its under side, equal in number with those located above, and which severally lightly rest on the bars of said armatures when the bar is raised, but sufficiently rigid to depress them when it is rocked down,

the object of which will be hereinafter explained. The horizontal rocking bar 20 is constantly raised by a spring 22, the tension of which is regulated by a thumb-post 23, and is drawn down by a cord 24, united near the bottom of the base 1 with the cords 9 in the larger cord 11. The relative lengths of these cords is such that when the drums 6 are turned back to their original position the cords 9 will be slack and the cord 24 tight, and hence the latter can be drawn to draw down the rocking bar 20 without turning the drums.

Below the magnets 15 and mounted on posts 25, extending from the base 1, is a non-conducting bar of hard rubber or other suitable material, on which are attached three metallic plates 27, having from each side of their inner ends depending contact-plates 28. (See enlarged views of Figs. 4 and 5, which represent, respectively, an inverted plane and a front elevation.) These plates have not been numbered in Fig. 1, as, on account of the scale of the drawings, they would tend to obscure the figures and confuse the lines; but they have, in so far as possible, been represented in Figs. 1 and 2, where they will be recognized by the enlarged drawing and the numbers of adjacent parts. In front of the contact-plates 28 is a shaft 29, journaled in suitable bearings, having one portion enlarged, on which is a sleeve of hard rubber or other non-conducting material, having four sets of screw-threads, one of low and the other three of high pitch, hereinafter described, and for a purpose to be stated. This shaft is driven by clock-train 32, the motion of which is regulated by an escapement 33. Directly back of the top of the rubber sleeve on the shaft 29 there are mounted in the base 1 four metallic studs, one whereof 34 is opposite the screw-thread 30 and the others 35 back of the screw-threads 31, respectively. (See enlarged elevation in Fig. 3, in which the base is toward the bottom of the sheet.) These studs are in electrical connection with other parts of the apparatus, as hereinafter described. Loosely pivoted to the stud 34 is a small metallic blade 36, and to each of the other studs similar blades 37, each of which extends over the top of the screw-threads in a rubber sleeve on the shaft 29 and has its under edge adapted to fit and run in said threads and has its end covered with a soft-rubber cap 38 to insulate it from electrical connection with the next when the ends come in contact, as hereinafter described. The pivotal connection of these blades 36 and 37 with their respective studs is such as to permit their outer ends to swing vertically and horizontally for a short distance, and they are all drawn toward the left of Fig. 1 by coiled springs 39 and 40, respectively, the tension of which is regulated by thumb-posts 41 42. The blades 37 are severally located between the contact-plates 28 of the oppositely-disposed plates 27 and when normally held by the springs 40 rest against and form electrical

contact with the left lip, excepting the left blade, where the lip is covered with rubber (see Figs. 4 and 5) to prevent electrical contact for a reason to be stated. Back of the shafts 29 and below the studs 34 35 is a shaft 43, fastened in brackets 44, on which are loosely mounted three sleeves 45 and one sleeve 46. Each of the sleeves 45 has a crank-arm 47, projecting toward the front, each connected by a rod 48, rendered adjustable by means of a turnbuckle, with the armature 16 of the respective one of the magnets 15 situated above it. From the opposite or inward side of these sleeves 45 extend arms 49, divided at their outer ends with non-conducting pallets or blades 50, each arranged when rocked upward to engage the under side of its respective blade 37 and raise it out of the screw-thread in which it rests in the rubber sleeve on the shaft 29.

From the description thus far given it will be apparent that when the magnets 15 are out of circuit their respective armatures 16 are by means of the springs 18 raised, and the blades 37 rest against the respective left lips 28 of the plates 27, the blade at the left resting in the screw-thread opposite it and the other two in the spaces or grooves at the left of their respective screw-threads, and hence when the shaft 29 is put in motion the left blade will at once proceed to travel along its screw-thread until its magnet shall be in circuit, when by drawing down its armature the blade will by its respective rod 48, arm 47, sleeve 45, and arm 49 raise the blade, which will be at once drawn back to the left by its spring 40 to recommence its travel, and will thus vibrate until the interval between the electrical connections is sufficient to permit it to reach the right lip 28 of its plate 27, with which it makes electrical connection and creates a short circuit, thereby cutting out its magnet, and falls into the groove at the right of its screw and simultaneously pushes the next blade from the contact with the left lip 28 of its plate, which brings that magnet into circuit, as hereinafter explained. Below the sleeve 46 is a magnet 51, above which is a rocking armature 52, normally held upward by a spring 53, the tension of which is regulated by a thumb-post 54. This armature 52 is connected with a crank-arm 55, extending outwardly from the sleeve 46, by a rod 56, arranged to be adjusted by a turnbuckle. From the opposite side of this sleeve 46 is a crank-arm 57, which bears a non-conducting plate or pallet 58, arranged to engage and raise the blade 36 from the finer screw-thread 30 when the armature 52 is drawn down. On the screw-thread 30 is a pin 59, arranged to be engaged by a corresponding pin 60 on the blade 36 when the latter has traveled to the right of the screw-thread 30.

The electric connection, of which no diagrams are shown nor wires attempted to be placed on the drawings, is as follows: The

circuit-line passes primarily through the magnet 51, thence to the left stud of the series 35, thence to the left magnet of the series 15, thence to the left plate of series 27, thence to the second stud of the series 35, thence to the second magnet of the series 15, thence to the second plate of the series 27, thence to the third stud of the series 35, thence to the third magnet of the series 15, thence to the third plate of the series 27, and thence to the return-line of the circuit. It will from this description be seen that if the blades 37 rest against the lips 28 of the plates 27 the current will take the short circuit through the studs 35, blades 37, and plates 27, and thence to the return-wire and the magnets 15 will not be energized.

In operation the blades 37 rest against the left lip 28 of the plates 27 and make electrical connection therewith, excepting the left blades, which by reason of the insulation on the left lip 28 forms no contact therewith, and hence the left magnet 15 is in electrical connection with the magnet 51 to be energized by the circuit when closed. At the same time the blade 36 is swung to the right of the screw-threads 30, with its pin 60 engaging pin 59 and arresting the action of the clock-train. When an alarm is turned in from any box, the circuit is closed at each contact in the box and the magnet 51 is energized, which by means of appliances hereinbefore described raises the blade 36, which is immediately withdrawn, to the left, and by which action the train 32 is released and permitted to revolve the shaft 29, carrying the sleeve having the screw-threads 30 and 31. Simultaneously the armature 16 of the left magnet 15 is rocked down, permitting by means of the escapement hereinbefore described the left drum to make a partial rotation, sufficient to present the first figure or symbol after that normally at the front behind the glazed opening 13, and the left blade, which commences to travel toward the right with the movement of the screw, is raised by the mechanism hereinbefore described and swings back to the left. This operation is repeated at each closing of the circuit by the signal-box until its first number has been given, when in the interval between that and its next number, during which time the left blade travels across its screw, encounters and makes electrical connection with the right lip 28 of its plate 27, and with its insulated end pushes the next blade away from contact with the left lip 28 of its plate 27 and falls into the groove between its screw-thread and the next until released, as hereinbefore described. The electrical result is that a short circuit is established through the left stud 35, the left blade 37, and left plate 27 to the second magnet 15, thereby cutting out the left magnet 15 and placing the next in the circuit. The operation of this second magnet and its attachments is similar to that of the first just described, and after it has presented its proper number its blade travels to

the right, pushes away the next blade from contact with its circuit-plate 27, and falls into the groove between its screw-thread and the next, and thereby cuts its magnet out and brings the third magnet in circuit. The third magnet and its mechanically and electrically connected parts operates in the same manner until the third drum shall have presented its appropriate figure, when the third blade from the left falls into the channel between the right screw-thread 31 and the screw-thread 30, thereby creating short circuits and cutting out the magnet 15. During the aforesaid movement of the other parts just described the magnet 51 is by the closing and opening of the circuit by the box from which the alarm comes simultaneously energized with the magnet 15, then in circuit, and the blade 36 is raised by the mechanism hereinbefore described, and thus repeatedly recommences its travel along the screw-thread 30 until the box from which the alarm comes runs down or ceases to send in its signals, when it continues to run along the screw-thread 30 until the pin 59 encounters the pin 60 and averts the motion of the train, the length and pitch of the screw 30 being such relatively to the screw 31 that the travel of the blade thereon will consume more time than the successive travel of all of the other blades along their respective screws. When the signal shall have been sent in, the drums 6 have been restored to their normal position by drawing the cords 9, and at the same time by rocking down the bar 20 by means of the cord 24 the blades 37 are by the intermediate mechanism hereinbefore described raised and by their respective spring 40 drawn back to the left lips 28 of the plates 27, thereby placing the apparatus in position to receive the next alarm.

The arm 61 under and parallel with its bar 26 is simply a stop to arrest the upward movement of the blades 37 and is not essential to my invention, as other devices may be employed to subserve the same purpose.

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

1. In a fire-alarm indicator to be operated by the opening and closing of the circuit from a fire-alarm box, the combination, with indicating-wheels normally forced to revolve to present successive numbers and to be successively operated and a like number of electromagnets having armatures arranged to operate escapement-wheels to permit a partial revolution of one of said indicating-wheels at each closing of the circuit, of a like number of studs electrically interposed one between one end of the main line and the first magnet and the others between the first and second and the second and third magnets, and a like number of contact-plates electrically interposed between the said magnets, the last connecting with the opposite end of the main line, and vibrating blades connected with said

studs and arranged to successively engage said contact-plates, substantially as shown, and for the purpose specified.

2. The combination, with the studs 35, contact-plates 28, and vibrating blades 37, of the insulated sleeve having screw-threads 31, and intermediate spaces and a motor for driving said sleeve, substantially as shown and described, and for the purpose specified.

3. The combination, with the studs 35, contact-plates 28, and vibrating blades 37, normally drawn in one direction by the spring 40, of the rocking arms 50, arranged to be operated by the armatures 16, and rods 48 to raise said blades from the screw-threads as the circuit is broken, substantially as shown and described.

4. The combination, with escapement-actuating magnets arranged to be successively placed in circuit, and vibrating blades, and contact-plates arranged to successively place them in circuit, and guide-screws, of the rocking bar arranged to simultaneously raise said vibrating blades from the guide-screws, substantially as shown and described, and for the purpose specified.

5. The combination, with the escapement-actuating magnets and their armatures, and the vibrating blades, and guide-screws, and the contact-plates, of the loosely-mounted sleeves severally united with said armatures by connecting-rods and provided with crank-arms to raise said blades to restore them to

their normal position, substantially as shown and described.

6. The combination, with the escapement actuating magnets and their armatures, and the vibrating blades, and guide-screws, and contact-plates, and a driving-train, of a separate electro-magnet provided with an armature to release the driving-train to operate said guide-screws when placed in circuit, substantially as shown and described.

7. In an apparatus for placing successively in circuit electro-magnets to operate escapement mechanism for indicating-wheels in a fire-alarm indicator, the combination, with a motor, of a series of vibrating blades and contact-plates to create short circuits about said magnets, and a separate electro-magnet to operate releasing mechanism, and a non-conducting sleeve arranged to be operated by said motor and provided with screw-threads and intermediate spaces for said vibrating blades and having a separate screw-thread and a vibrating blade arranged to run therein, the last-mentioned blade and screw-thread being provided with pins to engage and stop said mechanism when the alarm has been given.

In testimony that I claim the above I hereunto set my hand.

FRANK FOWLER LOOMIS.

In presence of—

C. E. HUMPHREY,

C. P. HUMPHREY.