No. 850,691. PATENTED APR. 16, 1907.

J. SUMMERS & J. J. BERRY.

ELECTRICAL INDICATOR.

APPLICATION FILED APR. 5, 1906.

4 SHEETS—SHEET 1.

Fig. 1.

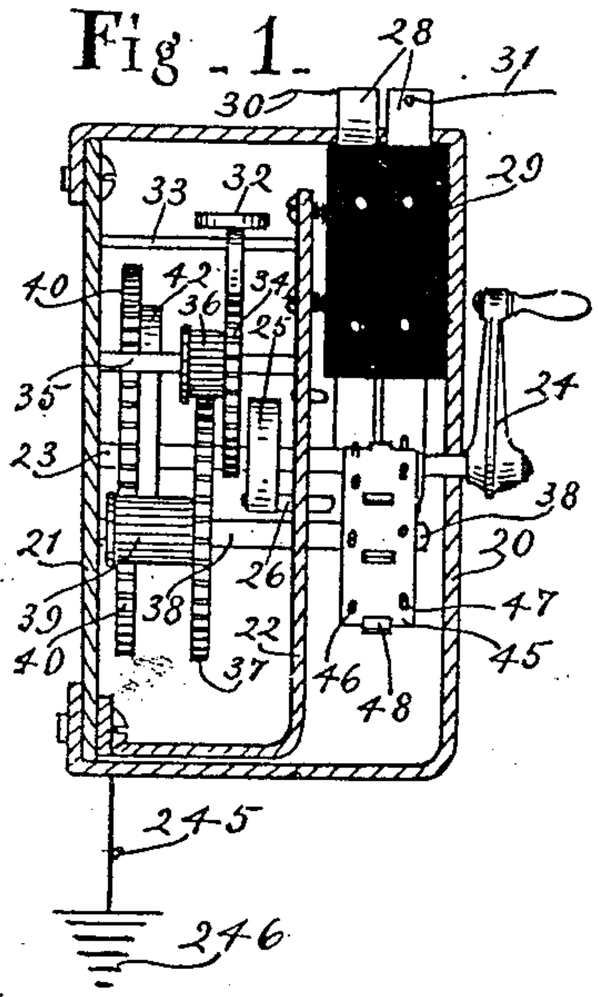


Fig. 2.

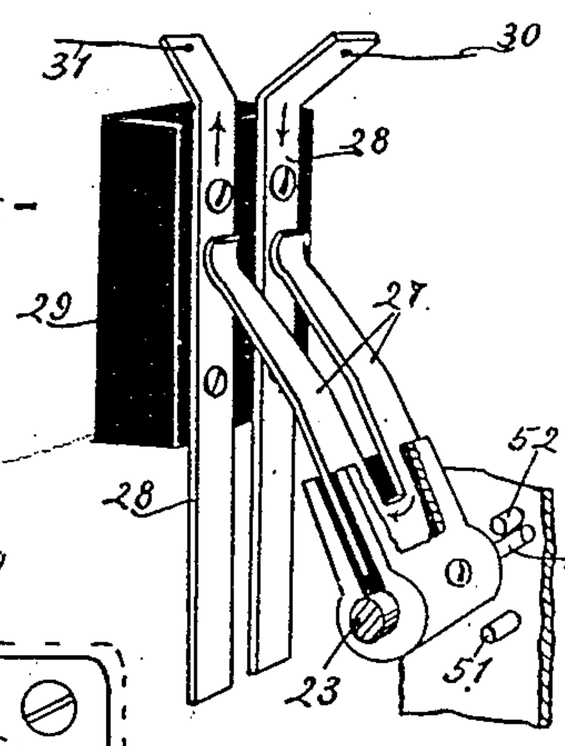


Fig. 3.

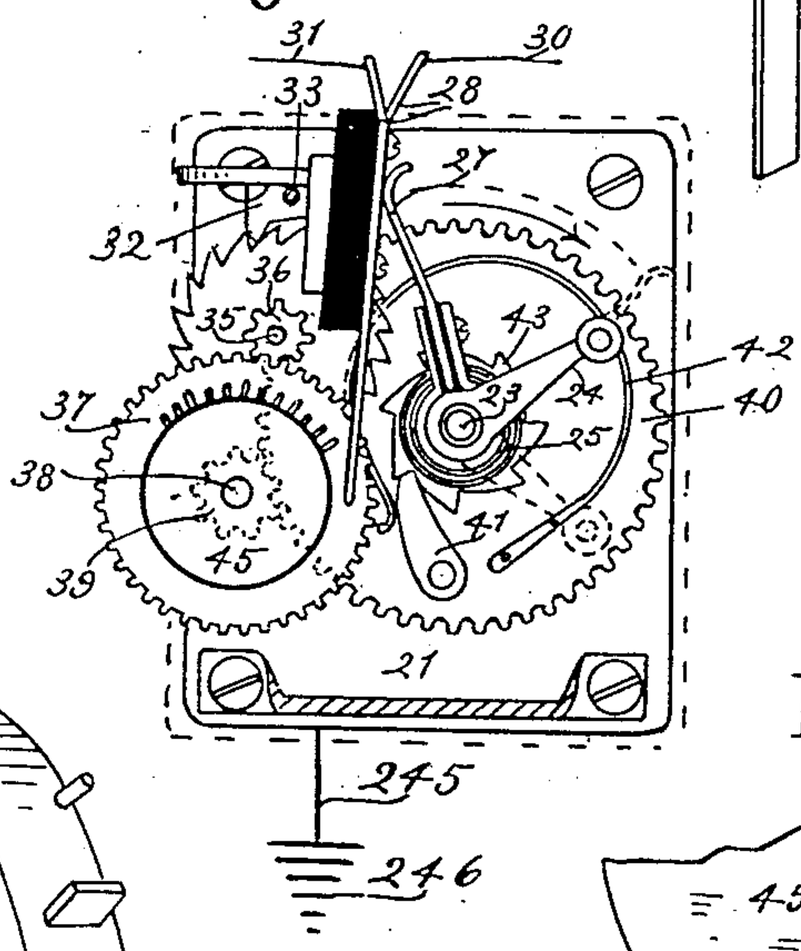


Fig. 4.

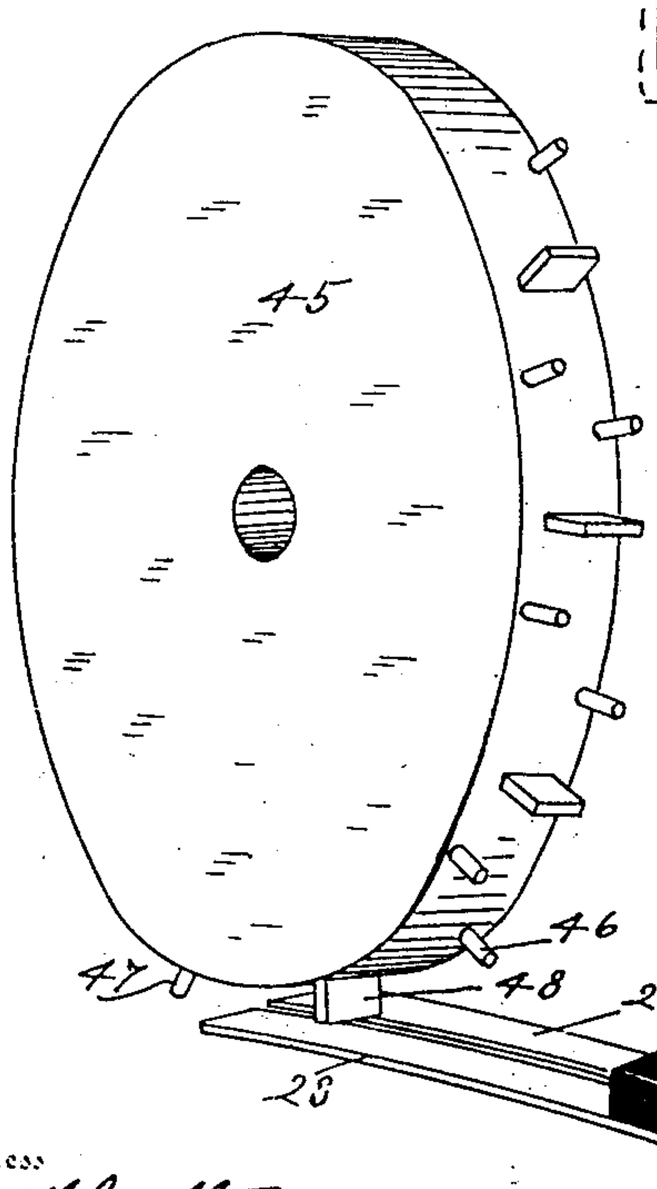


Fig. 5.

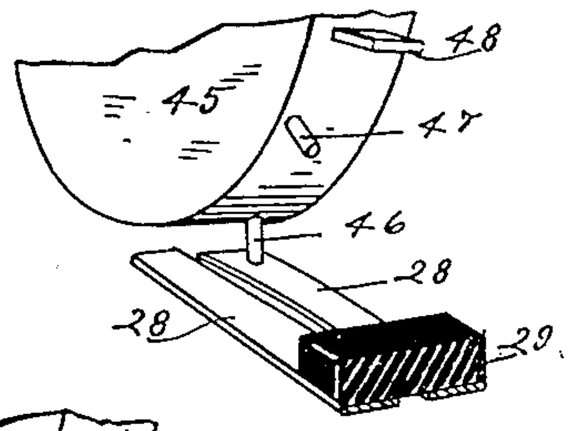
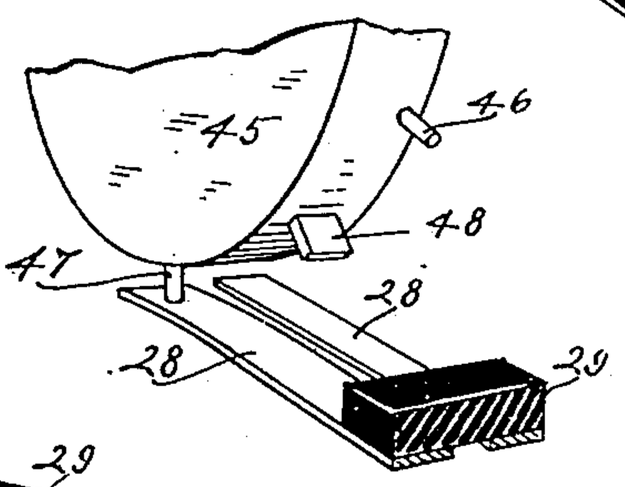


Fig. 6.



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4 SHEETS—SHEET 2.

Fig. 7.

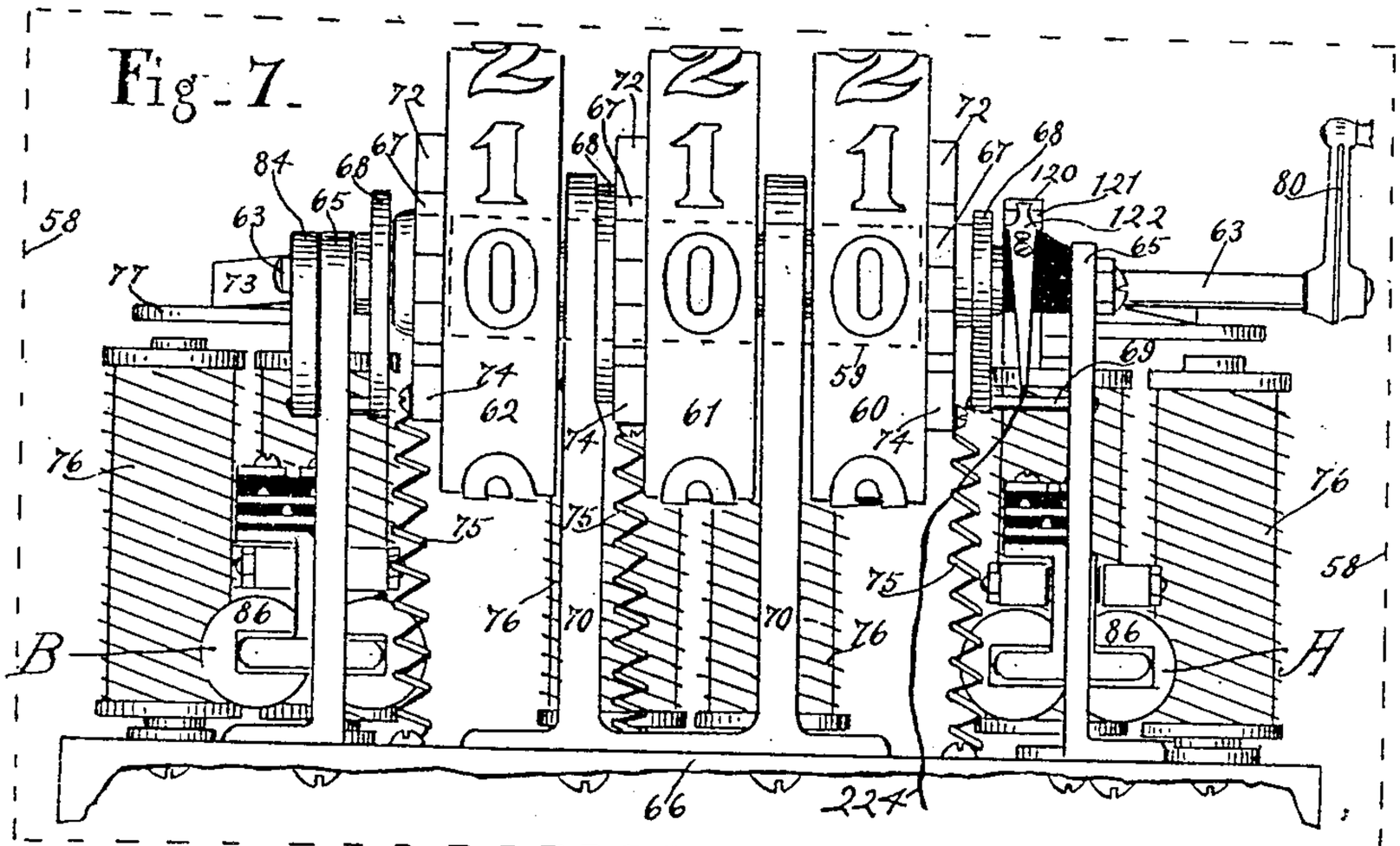


Fig. 14.

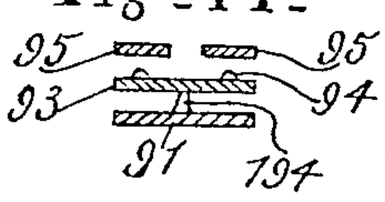


Fig. 15.

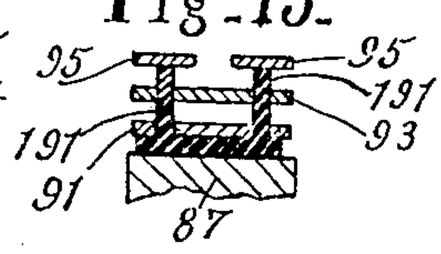


Fig. 16.

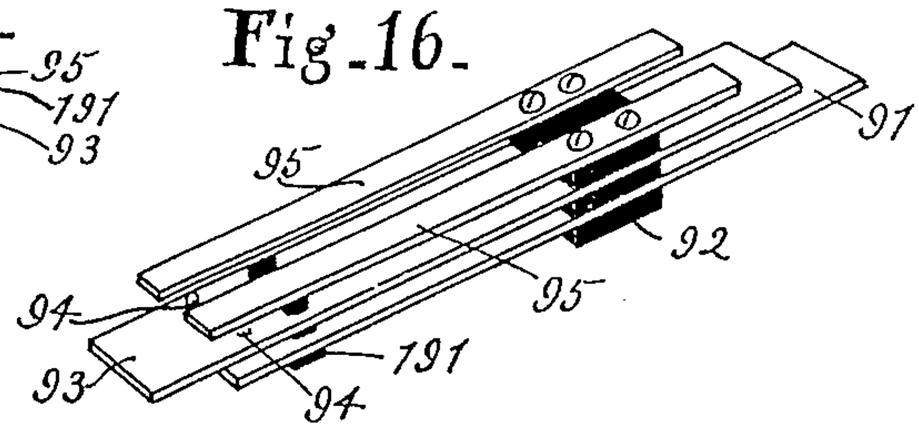
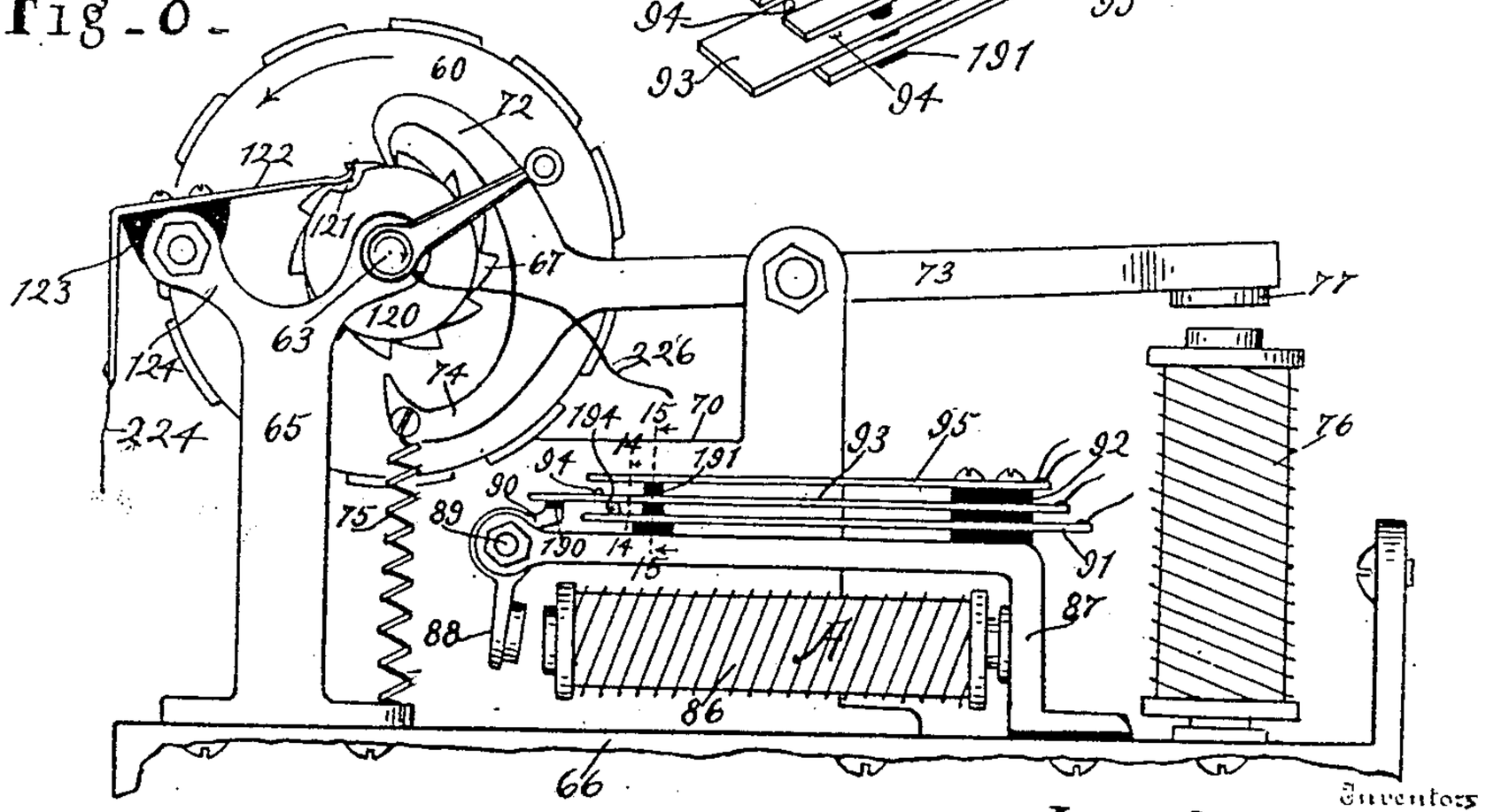


Fig. 8.



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4 SHEETS—SHEET 3.

Fig. 9.

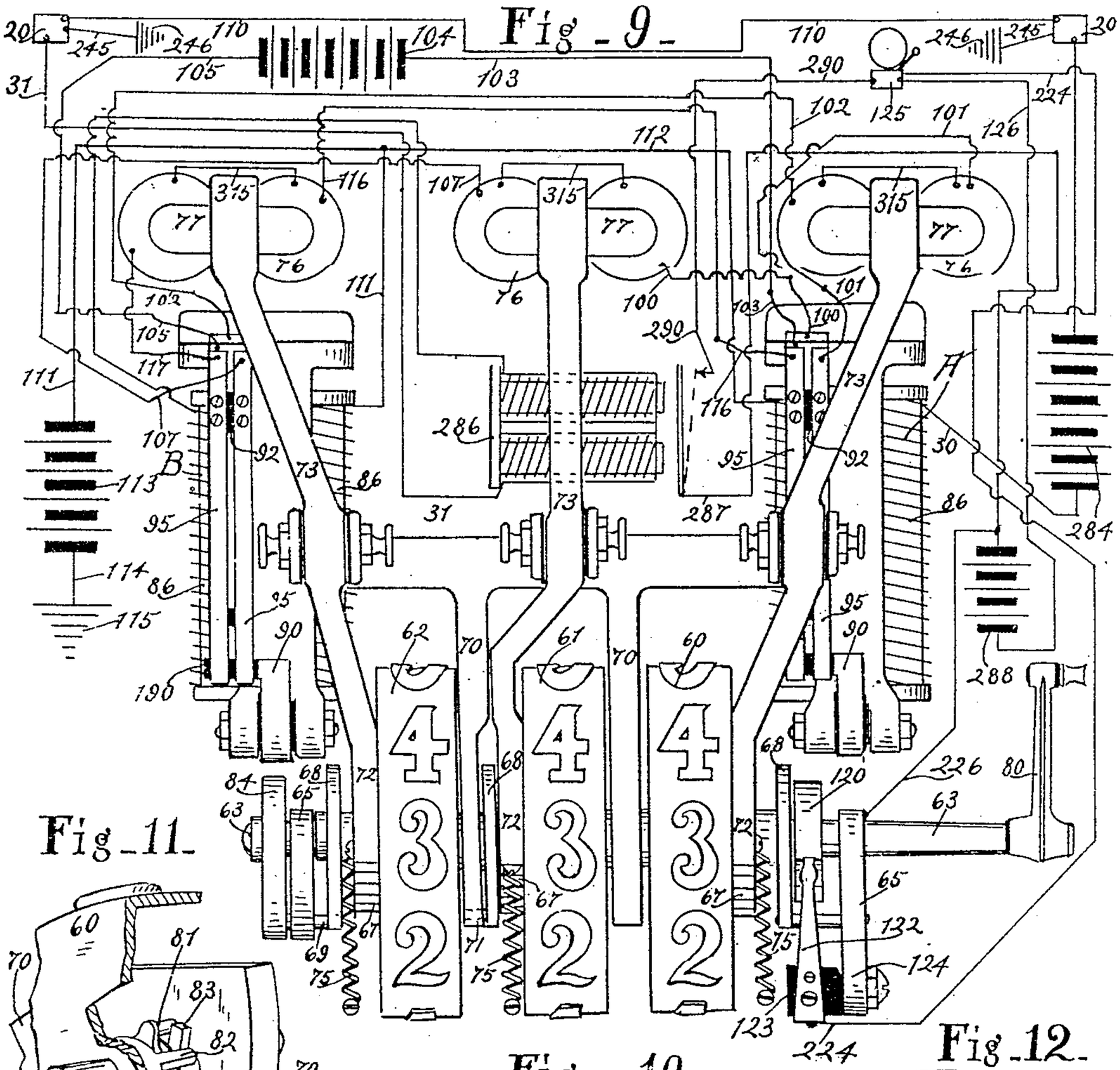


Fig. 11.

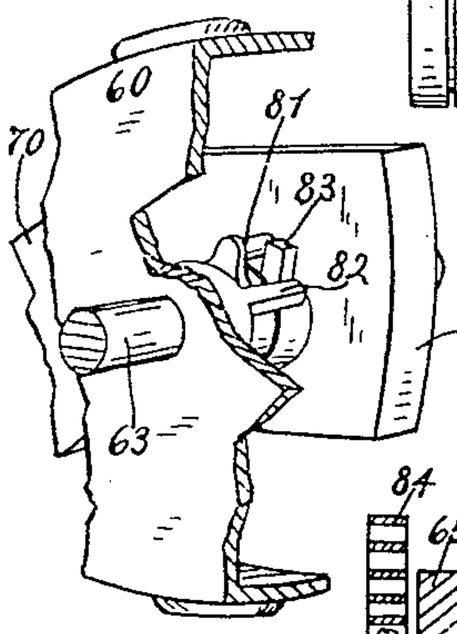


Fig. 10.

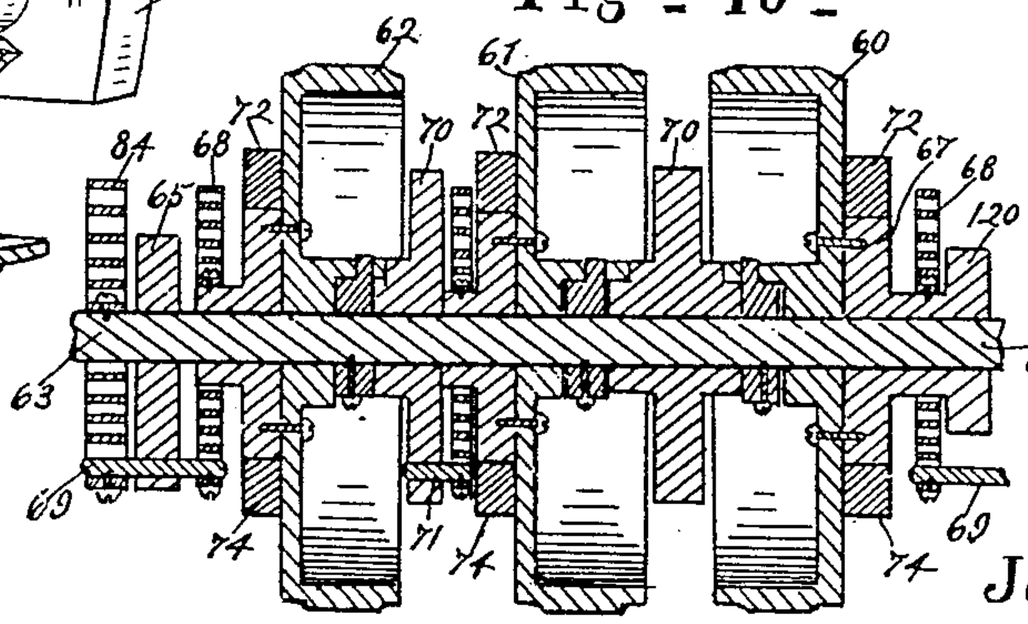
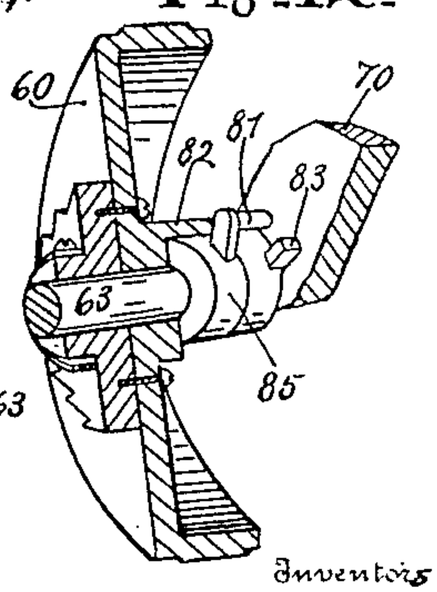


Fig. 12.



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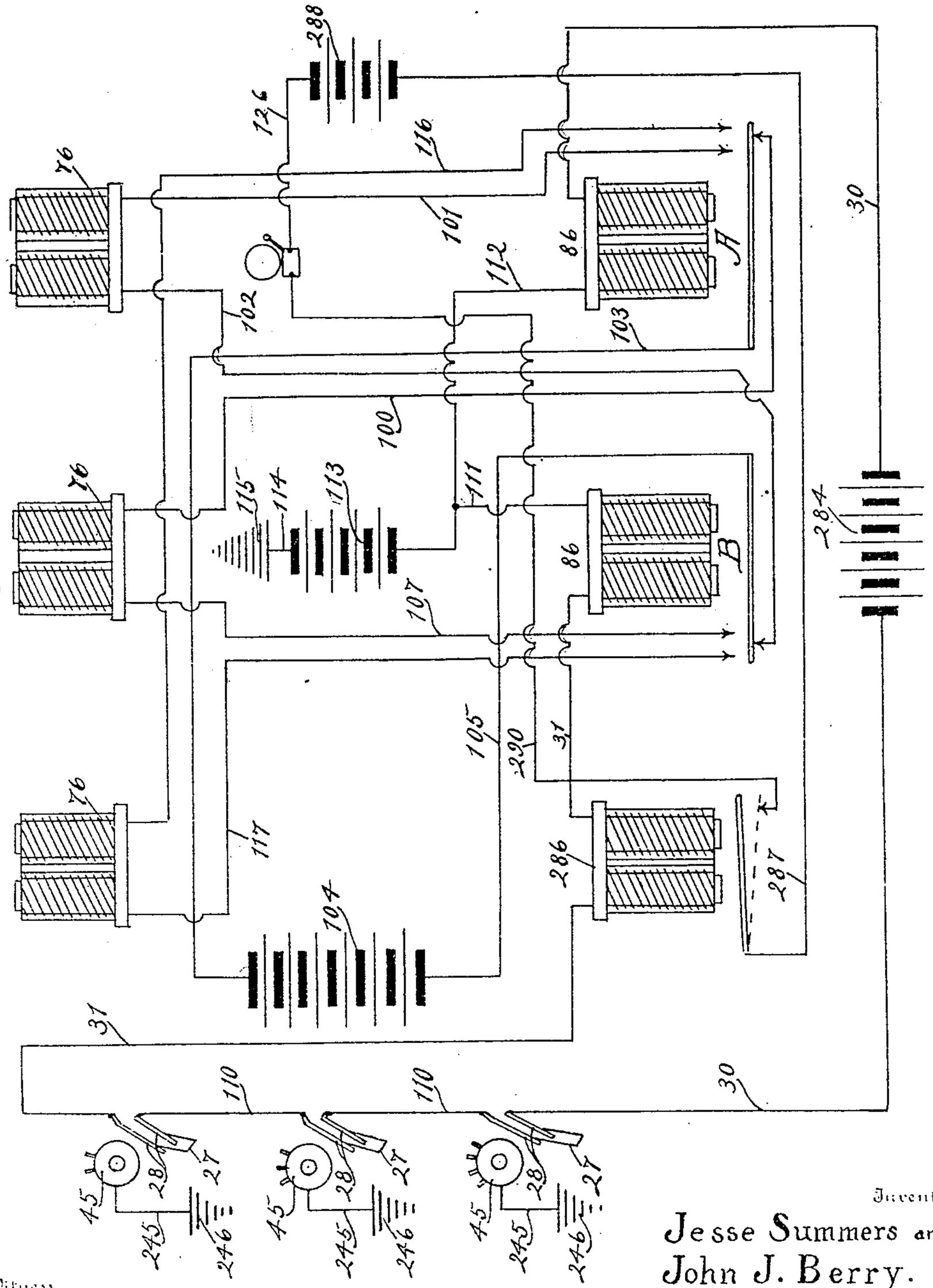
4 SHEETS—SHEET 4.

Fig - 13 -



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ELECTRICAL INDICATOR.

No. 850,691. Specification of Letters Patent. Patented April 16, 1907.

Application filed April 5, 1906. Serial No. 310,065.

To all whom it may concern:

Be it known that we, JESSE SUMMERS and JOHN J. BERRY, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Electrical Indicator; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The object of this invention is to provide an electrical signal or indicating mechanism that may be used for fire-alarm and kindred purposes and which discloses certain numerals or other visible indicia, so as to make it a visible indicator in contradistinction to a bell or annunciator. This makes a reliable indicator, because with merely a bell in a fire-alarm system one is liable to miscount the strokes, whereas with a visible indicator one can see positively the number or other indicia. For illustration, in fire-alarm apparatus, such as shown herein, the number of the street-box that is rung will be indicated at headquarters, so that the operator there can read the number, and therefore make no error.

One feature of the invention consists in operating a one, two, or three wheel numeral-indicator electrically through the intervention of merely a pair of wires. There is shown herein, the most difficult of these forms—namely, the arrangement for operating three numeral-wheels with one pair of wires; but the device may in a simpler manner operate one or two numeral-wheels. This mechanism is here shown also with the ordinary bell or annunciator.

The nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is an elevation of the left-hand side of the calling mechanism in the street-box or calling-station in its normal or unoperated position, the box being shown in section. Fig. 2 is a perspective view of the terminals or contact-plates and the calling-stations, parts being omitted and parts being broken away. Fig. 3 is a front elevation of the mechanism in the street-box or calling-station with the upper part of the middle supporting-plate removed and the lower part in section. Fig. 4 is a perspective view of the circuit-closing wheel and contact-plates, the same being shown on an enlarged scale, said part being in the position when the hundreds-wheel at the receiving-station is being actuated. Fig. 5 is the lower part of Fig. 4, showing the position of the parts when the units-wheel at the receiving-station is being operated. Fig. 6 is the same as Fig. 5, excepting the parts are in the position when the tens-wheel at the receiving-station is being operated. Fig. 7 is a front elevation of the mechanism at the receiving-station, the numeral-wheels being at "0" and unoperated. Fig. 8 is an elevation of the right-hand side of what is shown in Fig. 7. Fig. 9 is a plan view of the mechanism at the receiving-station, the numeral-wheels being at zero and a diagram of the wiring at the receiving-station. Fig. 10 is a central vertical section through the numeral-wheels and associated parts. Fig. 11 is a perspective view of the inside of a part of the numeral-wheel and associated parts, parts being broken away. Fig. 12 is a perspective view of part of one of the indicating-wheels and some associated parts, said wheel being viewed from a point different from the point of view as shown in Fig. 11. Fig. 13 is a diagram of the electrical connections at and between the calling and receiving stations. Fig. 14 is a section on the line 14 14 of Fig. 8. Fig. 15 is a section on the line 15 15 of Fig. 8. Fig. 16 is a perspective view of part of the relay shown in Fig. 8.

In order to explain this mechanism, we will proceed to describe first the calling box or station; second, the receiving box or station; third, the wiring or electrical circuits, and, fourth, the mode of operation. It is understood that there may be several sending-stations for one receiving-station.

Referring in the first place to the first six figures, a suitable box 20 is located like a fire-alarm box at any desired place to contain the calling mechanism hereafter described. A frame is mounted within said box, consisting of a back plate 21 and an intermediate plate 22 parallel, said intermediate plate being connected with the back plate by bending the lower end of the intermediate plate horizontally and securing to it the back plate. In said plates 21 and 22 a shaft 23 is mounted, with a crank 24 thereon

outside the box for winding said shaft in the direction indicated by the arrow. A coil-spring 25 is mounted on said shaft, the inner end of which is secured to the shaft and the outer to the post 26. The function of the spring is to actuate the shaft 23 in the opposite direction from the movements indicated by the arrow. Upon said shaft 23 outside the plate 22 there is secured a pair of spring contact-pieces 27, adapted to engage a pair of contact-plates 28, secured on the insulation-block 29, which is fastened to the intermediate plate 22. Wires 30 and 31 lead from said contact-plates to the receiving-station. While the pieces 27 are in engagement with the contact-plates 28, the circuit through wires 30 and 31 of the receiving-station will be short-circuited, and when the contact-pieces 27 are moved back away from the contact-plates 28 by the crank 24 the circuits through the receiving-station may be opened and closed. An escapement 32 is mounted on a pin 33 and engages an escapement-wheel 34 on the arbor 35, which is actuated by a pinion 36 on said arbor. The pinion 36 meshes with a gear 37 on a shaft 38, which is actuated by a pinion 39 thereon. The pinion 39 meshes with a gear 40, that is mounted loosely on the shaft 23. It carries a pawl 41, held by a spring 42 in engagement with a ratchet-wheel 43, that is secured rigidly on said shaft, and in this way power is transmitted to the wheel 40 from the shaft 23. This mechanism therefore renders the action of the spring 25 slow in returning the shaft 23 after it has been actuated by the crank 24. On the shaft 38 a circuit-closing wheel 45 is mounted, so as to be actuated by the mechanism that has been described. It has upon it one row of contact-points 46 for the units-wheel of the receiving-station and adapted to engage only one of the contact-plates 28. On the other side of said wheel there is a row of pins 47 for the tens-wheel of the receiving-station and the other contact-plate 28. There is also a centrally-located row of widened contact-pins 48, adapted to engage both plates 28 and operate the hundreds-wheel in the receiving-station. Said wheel 45 is connected with the ground by a wire 245 and the frame of the box, so that the current from the receiving-station will pass through one of the plates 28 or both when the pins 48 are in contact therewith and the contact-pieces 27 are out of engagement with the plates 28. In each calling-box the wheel 45 is equipped with contact-pins 46, 47, and 48 in order to actuate the indicating-wheels at the receiving-station to different extents and bring to view a certain number representing said calling-station. Furthermore, these contact-pins 46, 47, and 48 are placed on said wheel in a staggered position, so that no two of them will engage the contact-plates 28 at the same time, but the engagement of said contact-points with said plates must be successive. If there be four contact-pins 46 on the wheel 45, one rotation of the wheel 45 will operate the units-wheel at the receiving-station to the numeral "4." If there be five contact-pins 47 on said wheel, it will move the tens-wheel in the receiving-station to the numeral "5." If there be four wide contact-pins 48 on said wheel, it will bring to view the numeral "4" on the hundreds-wheel at the receiving-station. Consequently said calling-box when operated will always bring to view the numerals "454" at the receiving-station.

It is immaterial how the contact-pins 46, 47, and 48 are placed upon the wheel 45 so long as they engage their respective plates 28 and are out of line with each other transversely. Thus the four pins 46 could precede all the pins 47 and they could precede all the pins 48 or be arranged in any other way, for, as will hereafter appear, the indicating-wheels at the receiving-station do not have to be successively operated.

The wheel 45 is rotated by the mechanism heretofore described in the calling-box, one complete revolution resulting from each operation of the handle 24. Consequently the extent of movement of said handle 24 must be limited, and this is done by the stop-pin 50 on the shaft 23, that is adapted to engage the forward stop-pin 51 and the rearward stop-pin 52, secured to the intermediate plate 22. The escapement-controlled mechanism therefore moves the wheel 45 one complete revolution, while the shaft 23 is rotated to the extent of movement permitted by said stops.

Considering now the receiving mechanism shown in Figs. 7 to 12, it is mounted in a box 58, (indicated by dotted lines in Fig. 7,) having a slot 59 in the front face thereof through which one numeral on each of the numeral or indicating wheels 60, 61, and 62 is visible. These wheels have large numerals from "0" to "9" and mounted loosely on a shaft 63, that has bearings in arms 64, extending from stands 65, mounted on a base 66.

As seen in Fig. 10, each indicating-wheel is a cylinder with one side face, and that side face has secured to it the ratchet-wheel 67, and said ratchet-wheel is actuated by a spring 68, coiled on the hub thereof. The outer end of said spring is fastened to the horizontal post 69, which extends from the stand 65. This is true of the outside wheels, while the spring for the middle wheel is at its outer end fastened at 71 to one of the supporting-plates 70, as seen in Figs. 9 and 10. Therefore each numeral-wheel has an independent means for actuating it from zero whenever permitted by the pawl 72 on the lever 73. This pawl at each operation of said lever 73 permits the spring for the corresponding indicating-wheel to actuate said

numeral-wheel only to the extent of one notch of the ratchet-wheel 67. Hence said ratchet-wheel 67 has one notch or tooth for each numeral on the wheel and one for the blank space between "9" and "0." Said lever 73 has also another pawl 74 on the under side of the ratchet 67 to engage the teeth of said ratchet when the pawl 72 is elevated in order to prevent the spring from moving the numeral-wheel more than one notch. A spring 75 extends from the pawl 74 to the base of the post 65, that tends to hold the pawl 72 in engagement with the ratchet, excepting when it is disengaged by the action of the magnet 76 on the armature 77. Therefore every time the magnet 76 is energized the pawl 72 will be momentarily released from the ratchet 67 and will permit the spring 68 to move the numeral-wheel one notch. There are three of the magnets 76, one for each indicating-wheel, and they are independently energized at different times by the current from the calling-box. After the indicating-wheels have been operated by the current from the calling-box they will remain in their actuated position, disclosing the number of the calling-box until they are reset by operating by hand the crank 80. This is outside of the box 58. This is done by the operator and moved in the direction indicated by the arrow on the end of shaft 63 in Fig. 8. On account of the inclination of the teeth on the ratchet-wheel 67 this movement is possible, which turns the numeral-wheels back to zero. The movement of the shaft 63 by the crank 80 causes the horizontally-extending arm 81, secured to the shaft, to engage a projection 82 from the indicating-wheel and return said wheel from the position shown in Fig. 12 toward zero until said projection 82 engages the stop 83 on the stationary plate 70. Then the wheels will all be at zero. Such rotation of the shaft 63 by the crank 80 tightens the spring 84, (seen at the left-hand end of Fig. 10,) so that when the wheels have reached zero and the crank 80 is released the spring 84 will return the shaft 63 to its normal position—that is, until the arm 81 engages the stop 83. This last position is illustrated in Fig. 11. The inner end of the spring 84 is secured to said shaft 63 and the outer end pin 69 in the left-hand standard 65. The arm 81 is on a collar 85, that is stationary on the shaft 63.

Upon the base 66 there are two relays A and B, one for the units-wheel and another for the tens-wheel of the device, each consisting of a magnet 86, a frame 87, carrying the magnet and insulated from but secured to the base, an armature 88, pivotally mounted at 89 to one end of the frame 87 and having on its opposite end a crank 90, that carries an insulating-block 190, normally in contact with the contact-strip 93, secured in the insulating-block 92, mounted upon said frame 87. Another contact-strip 91 is mounted in said block below the strip 93. The strip 93 carries one pin 194 extending below and two pins 94 above it, the lower pin being normally in contact with the strip 91 and the upper pins 94 being movable into contact with the contact-strips 95, carried on said block 92, when the armature 88 is actuated, as the crank 90 will elevate the strip 93 and the pins 94 and cause said pins to engage the strips 95 and contact with strip 91 will be broken. Insulating-posts 191 are mounted on the frame 87 and extend up loosely through the strips 91 and 93 and keep strip 95 normally out of touch with strip 93 when the armature 88 is not actuated. The strip 93, acting through the arm 90, holds the armature 88 normally away from the magnets.

The wire 30 from the station runs to the magnet 86 of the relay A on the units-wheel side. A wire 100 runs from the lower contact-strip 91 in the relay A to the magnet for the tens-wheel 76. Wires 101 and 116 lead from the strips 95 of the units-wheel relay A to the magnet 76 for the units-wheel and to the magnets 76 for the hundreds-wheel 116. A wire 102 runs from said magnet 76 for the units-wheel to the lower strip 91 of the relay B for the tens-wheel. A wire 103 runs from the middle strip 93 on the units side of the device to the battery 104 and a wire 105 from said battery to the corresponding strip 93 in the tens-wheel relay B. Wires 107 and 117 run from the top contact-strips 95 in the tens-wheel relay B, the wire 107 going to the said magnet 76 for the tens-wheel mechanism and wire 117 going to the magnet of the hundreds-wheel mechanism. A wire 31 connects the call-box to a magnet 86 for the relay B. A wire 111 runs from said magnet 86 to battery 113, and the wire 112 runs from the magnet 86 in relay A to the battery 113, from which a wire 114 runs to the ground at 115. Wires 315 connect the coils of the magnets 76.

The device operates as follows: Assuming that the crank 24 in the call-box is operated from the position shown in Fig. 3 in the direction of the arrow as far as the stops 50 and 51 (shown in Fig. 2) will permit, the contact-springs 27 will then be in the dotted-line position shown in Fig. 3. As soon as the crank 24 is released by the hand the spring 25 will begin to actuate the clock mechanism and through it the wheel 45, containing the various pins corresponding with the units, tens, and hundreds wheels at the receiving-station. Assuming the first pin of the wheel 45 that engages one of the springs 28 is the units-pin 46, it engages the corresponding contact-plate 28. As soon as that happens a circuit is established from the battery 113 over lines 112 through relay A for the units-wheel and over wire 30, including battery 284, through contact-plate

28, wheel 45, and wire 245, to ground at 246 and from ground at 115 over wire 114 to battery 113. This will energize the magnet 86 of relay A and move the armature 88 and the crank 90, connected with said armature, so as to bring the contact-pins 94 into engagement with the upper contact-strips 95. That establishes a new circuit. The circuit just described is the relay-circuit, and the second circuit just referred to may be called the "indicating-wheel-operating" circuit. For the units-wheel it may be traced as follows: It runs from the battery 104 through wire 103 to the middle contact-strip 93 in the relay A on the units-wheel side. When the magnet 86 is energized from the call-box or station, as has been explained, the armature 88 will move the middle contact-piece 93 upward, causing the pins 94 to close the circuit with the strips 95 and break contact with strip 91. The circuit then passes through said strip 95 and the wire 101, through the units-magnet 76, wire 102, and lower strip 91 of the relay B for the tens-wheel. Since said magnet 86 on that side has not been energized, the circuit will pass from the strip 91 through the pin 194, strip 93, and wire 105 to the battery 104. The current through this circuit will energize the magnet 76 for the units-wheel and actuate the lever 73 and permit the units-wheel to be rotated one notch or one number by the spring 68. The energization of the magnets 76 and 86 through the two circuits just described with reference to the units-wheel is very quick, only while the pin 46 on the wheel 45 is in contact with the contact-plate 28 during the movement of said wheel 45; but the operation is sufficiently long to effect the movement of the units-wheel one number. As soon as the connection is broken between said pin 46 on wheel 45 and the plate 28 the armatures 88 and 77 will be released and returned to their normal position.

Considering the circuits with reference to the operation of the tens-wheel, when the contact-pin 47 on the wheel 45 engages the left-hand plate 28 (shown in Fig. 1) the relay-circuit passes from battery 113 over wires 111 through relay B for the tens-wheel, wire 31, and magnet 286 to contact-plate 28, wheel 45, wire 245, to ground at 246 and from ground 115 over wire 114 to battery 113. This energizes said magnet 86 in relay B and actuates its armature, moves the middle strip 93 out of contact with the lower strip 91 and into contact with the upper strips 95.

The circuit for causing the actuation of the tens-wheel is as follows: The circuit passes from the battery 104 through the wire 105 to the middle contact-strip 93 in relay B for the tens-wheel, thence back through the strip 95, wire 107, magnet 76 for the tens-wheel, wire 100 to the lower contact-strip 91 in the relay A on the units-wheel side of the device. Since the magnet of that relay is dead, it will pass through pin 94, contact-strip 93, and wire 103 back to the battery 104. This energizes the magnet for the tens-wheel and causes its operation in the manner heretofore described as to the units-wheel.

The hundreds-wheel is operated as follows: When one of the contact-pins 48 on the wheel 45 engages the two contact-plates 28, there is a ground-circuit established over the portion of the two circuits described with reference to the units-wheel and tens-wheel for energizing the magnets 86 of both relays A and B—that is, current flows from battery 113 over wires 111 and 112 through both relays, over wires 30 and 31 through both plates 28 and wheel 45 to the ground. The effect is to energize both of said relays and move both of the middle contact-strips 93 away from the lower contact-strips 91 and into engagement with the upper contact-strips 95. Then the current for causing the actuation of the hundreds-wheel is as follows: Beginning with battery 104, the circuit passes through the wire 105 to the middle contact-strip 93 of relay B to the strip 95 and out through the wire 117 to the magnet 76 for the hundreds-wheel, and from said magnet through the wires 116 to strips 95 and 93 in the relay A and wire 103 back to the battery 104. This circuit is followed because the lower strips 91 in both relays are out of the circuit. Therefore from this description it is clear that as the contact-pins on the wheel 45 close the circuits the indicating-wheels are actuated one notch or number until the last of said pins is moved from the contact-plates 28. Then the indicating-wheels will remain in their actuated position, disclosing the number of the sending-box until the operator at headquarters returns the indicating-wheels for actuating the lever 80. Any number of sending-boxes may be employed in series with intermediate wires 110 between the boxes running from the left-hand contact-plate (shown in Fig. 1) of one box to the right-hand contact-plate 28 (shown in Fig. 2) of the next box. When only one call-box is used, the wires 30 and 31 are connected directly, as shown in Fig. 1.

The mechanism herein shown is provided with three indicating-wheels. Where, however, two indicating-wheels will suffice—as, for example, where the number of call-boxes does not exceed ninety-nine—the construction and arrangement is the same as herein shown and described with the omission of the hundreds-wheel and the means for driving and controlling it, including the extra wiring for that circuit which has been described. In such case the wide contact-pins 48 on the wheel 45 in the call-box should be omitted.

A bell-signal or annunciator may be con-

nected with this apparatus as follows: A disk 120 is secured on the hub of the ratchet-wheel 67, as shown in Fig. 8, with the notch or recess 121 in the periphery thereof. A contact-spring 122 has a pin adapted to engage the periphery of said disk. It is mounted on the insulation-block 123, that is secured to the arm 124 on the post 65 at the right-hand side of the machine, as seen in Fig. 8. This spring-contact 122 is so mounted that it will not engage the disk 120 at the recess 121. Then, as seen in Fig. 9, the wire 224 leads from said spring-contact to the bell 125 and wire 126 to battery 288 and over wire 226 to the frame and supplies current for the bell. Therefore after the units-wheel has been started by a call the circuit between the disk 120 and spring-contact 122 will be closed, and the bell will ring until the numbering-wheel has been returned to zero, as shown in Fig. 8, when the bell-circuit will be open. The bell-signal therefore will continue until the operator has come to the device, seen the numbers on the wheels, and has returned them to zero. To the foregoing apparatus there may also be added means for indicating whether any of the lines or circuits are injured or broken. To accomplish that, we place the relay 286 in the line or wire from the call-box. Here it is in line 31, and a closed battery 284 is in line 30. The battery 284 is too weak to energize relays A and B through the resistance, so said relays are not energized except upon the operation of the box 20. The relay 286 is highly wound, so that it will be constantly energized when the circuit between the call and receiving stations is normal. Its armature then is normally held in contact with the magnet so as to maintain an additional bell-circuit normally open, as shown in diagram in Fig. 13. This additional bell-circuit consists of a wire 287 running to the open battery 288 and a wire 126 to the bell, wire 290 from the bell to a terminal that may be engaged by the armature of the relay 286 when the current ceases to pass through the magnet in said relay 286. This feature of the construction therefore operates as follows: When the circuit including the call or receiving stations is broken by accident to the wire or otherwise, there will be no current to energize the magnets 286, and then the additional bell-circuit will be closed and the bell will ring and indicate at the receiving-station that the line is out of order. When the line is in good order and the device is operating, as heretofore explained, this additional bell-circuit will be broken and the bell will not be rung by it.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In an electrical indicator, a grounded receiving-station with a plurality of indicators, a grounded call-station, a pair of lines connecting said stations and connected with each other at the receiving-station, means at the receiving-station connected with each line for controlling the operation of an indicator, and a single means at the call-station for grounding said lines that automatically ground them a predetermined number of times but grounds only one wire at a time.

2. In an electrical indicator, a grounded receiving-station with a plurality of indicators, a grounded call-station, a pair of lines connecting said station, means at the receiving-station connected with each line for controlling the operation of an indicator, means at the call-station for normally connecting said lines, manually-actuated means that temporarily disconnects said lines, and means at the call-station for grounding said lines during the operation of said disconnecting means that automatically grounds them a predetermined number of times but grounds only one wire at a time.

3. In an electrical indicator, a grounded receiving-station with a plurality of indicators, a grounded call-station, a pair of lines connecting said stations, means at the receiving-station connected with each line for controlling the operation of an indicator, means at the call-station for normally maintaining a connection between said lines, manually-actuated means for temporarily removing said connection from between said lines, means at the call-station for connecting said lines one at a time with the ground during the operation of said disconnecting means, and a spring for returning said connecting means to its normal position.

4. In an electrical indicator, a grounded receiving-station with a plurality of independent indicators, a grounded call-station, a pair of lines connecting said stations, means at the receiving-station connected with each line for controlling the operation of the indicator, two contact-plates in the call-station, one connected with each of said lines, a wheel with a series of pins thereon in position to engage the respective contact-plates and establish a connection between either of said contact-plates and the ground, said pins of the different series being out of line with each other transversely of the wheel, and means for operating said wheel.

5. In an electrical indicator, a grounded receiving-station with a plurality of indicators, a series of call-stations each of which is grounded, a pair of lines connecting said receiving and call stations in series and connected with each other at the receiving-station, means at the receiving-station connected with each line for controlling the operation of an indicator, means at each call-station for connecting said lines one at a time with the ground, and means at each call-station for normally maintaining a connection between said lines.

6. In an electrical indicator, a grounded

receiving-station with a plurality of independent indicators, a series of call-stations each of which is grounded, a pair of lines connecting said receiving and call stations in series, means at the receiving-station connected with each line for controlling the operation of an indicator, and means at the call-station for grounding said lines one or both at a time for a certain number of times and in a certain order.

7. In an electrical indicator, a grounded receiving-station with three indicators, a grounded call-station, a pair of lines connecting the two stations, means at the receiving-station connected with each line for controlling the operation of two indicators, a connection at the receiving-station with both lines for controlling the operation of the third indicator, and means at the call-station for grounding both lines simultaneously or one at a time as desired.

8. In an electrical indicator, a grounded receiving-station with three indicators, a grounded call-station, a pair of lines connecting the two stations, two relays at the receiving-station, one connected with each line for controlling the operation of an indicator, a connection between said relays so that both relays will be operated for controlling the operation of the third indicator, and means at the call-station for grounding said lines simultaneously or one at a time as desired.

9. In an electrical indicator, a grounded receiving-station with three indicators, a grounded call-station, a pair of lines connecting the two stations, means at the receiving-station connected with each line for controlling the operation of an indicator, a connection at the receiving-station with both lines for controlling the operation of a third indicator, two contact-plates in the call-station connected respectively with said lines, a wheel with three series of contact-pins, two series of pins adapted to engage respectively said contact-plates, and a third series adapted to engage both contact-plates, and means for actuating said wheel.

10. In an electrical indicator, a grounded receiving-station with three independent indicators, a grounded call-station, a pair of lines connecting said stations, means at the receiving-station connected with each line for controlling the operation of an indicator, a connection between the lines at the receiving-station with a battery in it for operating the third indicator, and a single means at the call-station for grounding said lines one at a time for actuating two indicators and connecting said lines for actuating the third indicator.

11. In an electrical indicator, a grounded receiving-station with three independent indicators, a grounded call-station, a pair of lines connecting said stations, means at the receiving-station connected with each line for controlling the operation of two indicators, a connection between the lines at the receiving-station with a battery in it for operating the third indicator, and means at the call-station for grounding said lines one at a time for actuating two indicators and connecting and grounding said lines for actuating the third indicator and predetermining the number of times and the order in which the lines are grounded and connected.

In witness whereof we have hereunto affixed our signatures in the presence of the witnesses herein named.

JESSE SUMMERS.
JOHN J. BERRY.

Witnesses:
HELEN B. MCCORD,
NELLIE ALLEMONG.