

(No Model.)

2 Sheets—Sheet 1.

A. J. REAMS.
PROGRAMME CLOCK.

No. 367,662.

Patented Aug. 2, 1887.

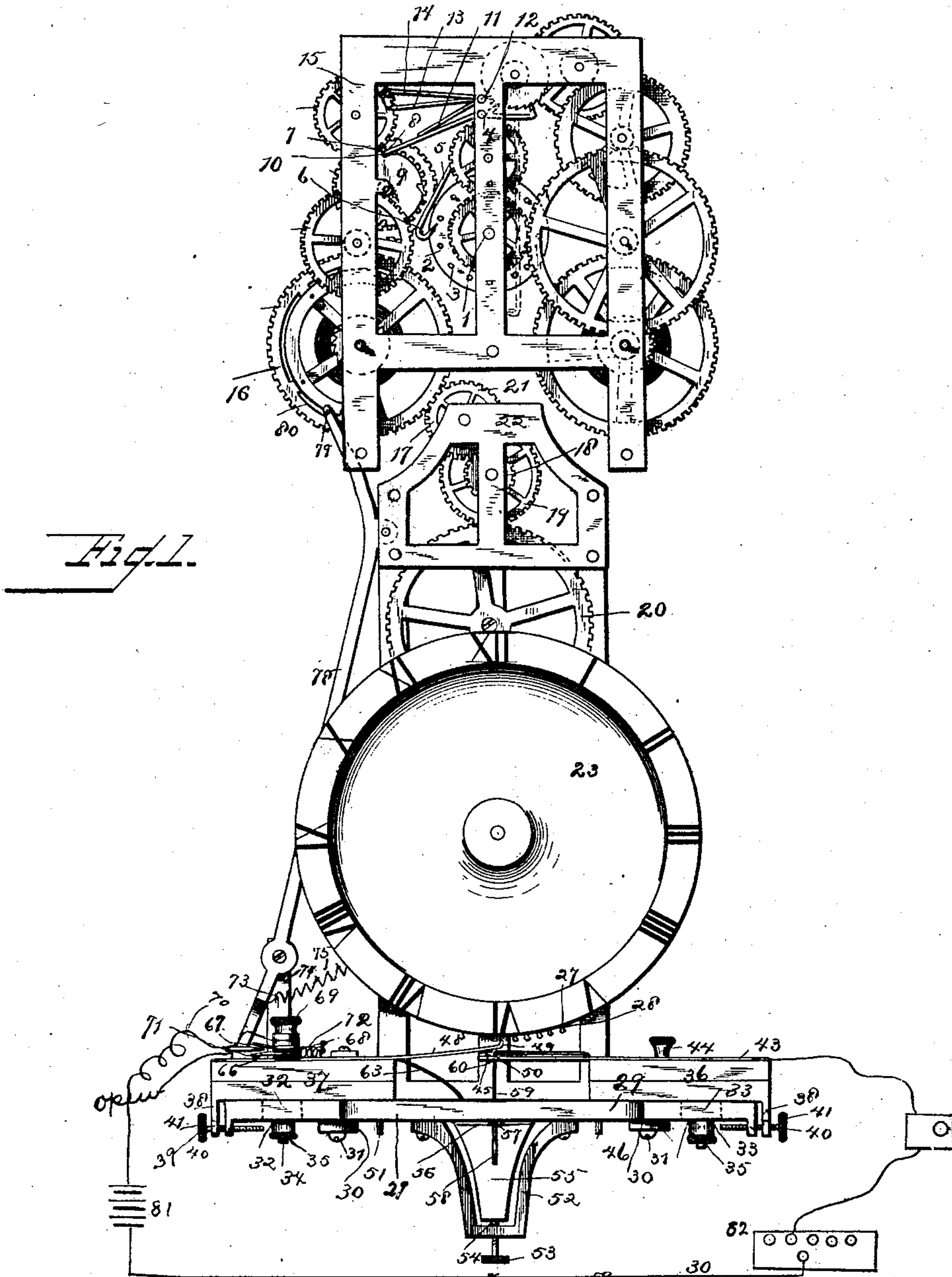


Fig. 4

Witnesses
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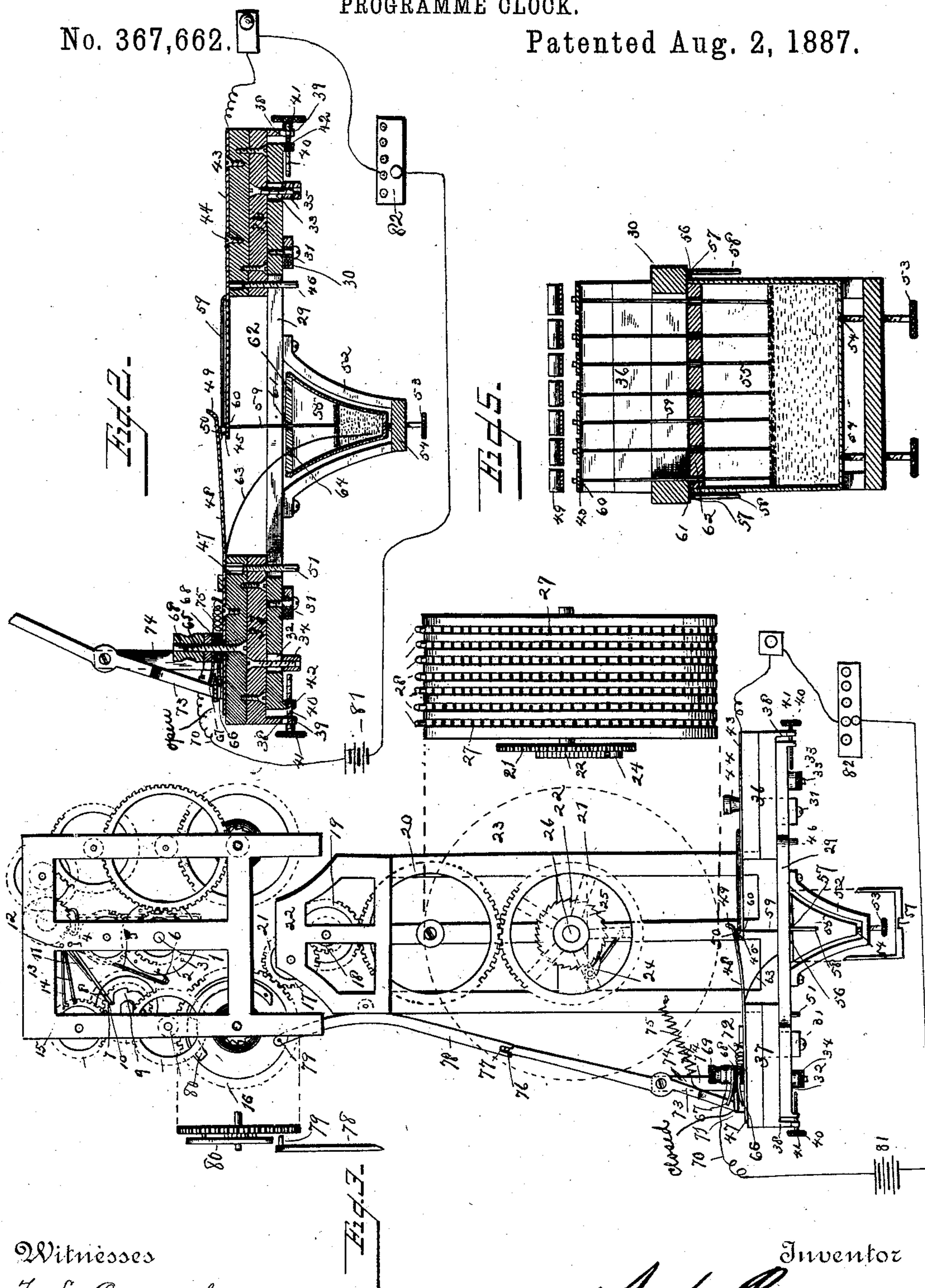
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F. L. Ouraud
A. L. Morsell

Inventor
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UNITED STATES PATENT OFFICE.

ANDREW J. REAMS, OF AUGUSTA, KANSAS.

PROGRAMME-CLOCK.

SPECIFICATION forming part of Letters Patent No. 367,662, dated August 2, 1887,

Application filed November 11, 1886. Serial No. 218,659. (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 Augusta, in the county of Butler and State of Kansas, have invented certain new and useful Improvements in Programme-Clocks; 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 5 which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a front view of my improved 15 programme-clock. Fig. 2 is a vertical sectional view of the shelf at the lower portion of the clock and of the parts appertaining to the same. Fig. 3 is a front view of the clock with the cylinder removed from its arbor and 20 shown in dotted lines, and showing the first wheel of the striking-train and the cylinder in a side projection. Fig. 4 is a top view of the shelf and its strips; and Fig. 5 is a vertical transverse section on line *x x*, Fig. 4.

Similar numerals of reference indicate corresponding parts in all the figures.

My invention has relation to that class of clocks in which electric bells or similar alarms are sounded at given intervals by suitable 30 means for breaking or making a current or currents connected to the works of a clock, and it contemplates certain improvements upon the clock for which Letters Patent No. 349,605 were granted to me on the 21st day of 35 September, 1886; and it consists to that end in the improved construction and combination of parts of such a clock, in which the electric current operating the alarm or alarms is broken during the time when the said alarm or alarms 40 are not wanted, and in which means are provided for the gradual making and breaking of the electric circuit or circuits, and for the improved operation of the striking-train operating the mechanism making or breaking the 45 circuit or circuits, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates the arbor of the minute hand of a clock, and this arbor is provided with a disk, 50 2, having forwardly-projecting pins 3 upon its face near the periphery, twelve in number,

and corresponding in position to the five-minutes divisions of time upon the face of the clock.

A rock-shaft, 4, is journaled in the clock- 55 frame above the minute-arbor, and has an arm, 5, formed with an inwardly-bent hook, 6, at its free end secured upon it, the hooked end of the arm bearing against and engaging the pins upon the disk. The rock-shaft is 60 provided with another arm, 7, the laterally-bent end 8 of which engages the periphery of a disk, 9, upon the arbor of the third wheel of the striking-train, having four equidistant notches, 10, in its periphery, and the bent end 65 of an arm, 11, rests upon this arm and projects from a rock-shaft, 12, journaled in the clock-frame above the first-mentioned rock-shaft. This upper rock-shaft is provided with two arms, 13 and 14, which engage a pin, 15, upon 70 the rim of the fourth cog-wheel in the striking-train of the clock in the usual manner. The arm 14 engages with the pin 15 until it is released by the upward movement of the arm 7, 75 which at the same time raises the end of the arm 13, so that when the pin is released from the arm 14 it moves forward a slight distance until it comes in contact with the arm 13, when it is stopped until the pin 3 upon the disk 2 permits the arm 5 to fall, which thus releases 80 the pin 15 from the arm 13, and the striking-train is operated until the pin is again stopped by coming in contact with the arm 14.

The first cog-wheel 16 of the striking-train meshes with a cog-wheel, 17, which again 85 meshes with a pinion, 18, upon the shaft of a cog-wheel, 19, which again meshes with a cog-wheel, 20, which meshes with a cog-wheel, 21, upon the tubular arbor 22 of the cylinder 23, which, similar to the cylinder in the above- 90 mentioned patent, is preferably constructed of hard rubber or of hard wood or similar non-conducting material, although it may be made of other material and may be insulated from its arbor. The cog-wheel of the cylinder is 95 provided with a spring-pawl, 24, which engages a ratchet-wheel, 25, rigidly secured to the cylinder arbor, which is journaled upon a short shaft, 26, upon the supporting-frame of the clock, revolving upon the same and hav- 100 ing the cylinder secured tightly upon it, so that when the cog-wheel is revolved from the

striking-train it will engage the pawl and re-
 volve the cylinder-arbor and the cylinder with
 it, while the cylinder may be revolved with
 its arbor upon the shaft without moving any
 5 of the wheels of the striking-train, the pawl
 slipping over the teeth of the ratchet-wheel
 as the latter is revolved under it. The cylin-
 der is provided in its periphery with a num-
 10 ber of parallel peripheral grooves having
 sockets 27, in which fit removable plugs 28,
 similar to the cylinder in the above-mentioned
 patent.

A shelf, 29, is secured at the lower end of the
 supporting-frame by means of two longitudi-
 15 nally-slotted brackets, 30, having screw-bolts 31
 projecting upward through their slots into the
 underside of the shelf; and this shelf is formed
 with two longitudinal slots, 32 and 33, near
 its ends, through which slots two nutted screws,
 20 34 and 35, project from two blocks, 36 and 37,
 which slide upon the upper side of the ends
 of the shelf with the screws sliding in the slots.
 The outer ends of these blocks are provided
 with two downwardly-projecting lips, 38, hav-
 25 ing slots or notches 39 in them, and the shoul-
 dered portions of two screws, 40, fit between
 the sides of the slots in the lips and are pro-
 vided with heads 41 for turning them, and
 have their threaded inner ends fitting in screw-
 30 threaded perforations 42 in the ends of the
 shelf. It will thus be seen that by screwing the
 two screws in or out the blocks may be drawn
 in or out, and that by forcing the nuts upon
 the screws in the slots in the shelf against the
 35 underside of the shelf the blocks may be se-
 cured in the positions in which they have been
 adjusted by the screws in the ends of the shelf.
 The shelf and blocks are preferably made from
 hard rubber or hard wood or similar insulat-
 40 ing material, or the shelf may be made of
 other material and the sliding blocks only
 made of insulating material.

One of the blocks, 36, has a number of longi-
 tudinal strips, 43, secured upon its upper side,
 45 each of the said strips being provided with a
 binding-screw, 44, and the inner ends of these
 strips are provided with upwardly-projecting
 contact-points 45, the said inner ends project-
 ing beyond the inner end of the block, and in-
 50 dividual adjusting-screws 46 pass up through
 the block, bearing with their upper ends
 against insulating-plugs which bear against
 the under sides of the strips near their free
 ends, and projecting with their lower headed
 55 ends through the open central portion of the
 shelf. The other block, 37, has one plate, 47,
 secured upon its upper side, and the inner
 portion of this plate projects beyond the in-
 ner end of the block and is formed into a
 60 number of strips, 48, corresponding in num-
 ber with the separate strips and registering
 with their inner ends with them, and the in-
 ner ends of the strips of the plate are bent up-
 ward to form tongues 49, to be engaged by the
 65 plugs of the cylinder, and are provided upon
 their under sides with contact-points 50, regis-

tering with the contact-points of the lower
 strips. A number of adjusting-screws, 51,
 pass through the inner portion of the block
 and bear with their upper ends against insu- 70
 lating-blocks which bear against the under
 sides of the strips of the plate, and have their
 lower headed ends projecting down through
 the open central portion of the shelf.

Brackets 52 project downward from the un- 75
 der side of the central portion of the shelf and
 have upwardly-pointing screws 53 in their
 lower ends, which screws fit with their upper
 ends in recesses or sockets 54 in the bottom of
 a vessel, 55, of glass or similar material, hav- 80
 ing diverging sides, and having flanges 56
 at the upper edges of the end pieces formed
 with notches 57 at their middles, with which
 the vessel is guided between two vertically-
 85 pending rods, 58, upon the frame, which rods
 serve as guides for the vessel or receptacle,
 which may be raised or lowered upon the
 screws. This receptacle is partly filled with
 mercury, and has a thin layer of glycerine or
 other non-conducting fluid, which will not mix 90
 with or be affected by the mercury, floating
 upon the mercury, and the separate strips are
 provided with wires 59, secured to the strips
 with their ends and bent downward at right
 angles to project through perforations 60 in 95
 the ends of the strips, the lower ends of the
 wires passing through perforations 61 in the
 non-conducting top 62 of the receptacle, and
 projecting into the glycerine with their lower
 ends when in their normal position without 100
 coming in contact with the mercury. A wire,
 63, is secured to the plate upon the other
 block and passes through a perforation, 64, in
 the cover of the receptacle and projects into
 the mercury in the receptacle. A screw, 65, 105
 projects upward from the block having the
 slitted plate, and is insulated from the said
 plate, and a strip, 66, of metal, and having its
 outer end curved slightly downward, is se-
 cured upon the said screw, insulated from the 110
 same, and in contact with the slitted plate. A
 similar strip, 67, is secured upon the screw,
 separated from the lower strip by means of an
 insulating-washer, 68, and the upper end of the
 screw is provided with a nut, 69, which may 115
 secure a wire, 70, to the screw or post. An
 arm, 71, is pivoted upon the top of the plate,
 insulated from the same, and has a wedge-
 shaped free end, which may be inserted be-
 120 tween the flaring ends of the metallic strips,
 a spring, 72, serving to draw the said arm be-
 tween the strips.

A lever, 73, is pivoted at its middle to the
 top of an upright post, 74, secured upon and
 insulated from the sliding block having the 125
 slitted plate, and the lower beveled end of this
 lever may engage and tilt the arm having the
 wedge-shaped end, either tilting it out from
 engagement between the flaring ends of the
 metallic strips or allowing it to be drawn by 130
 its spring in between the strips, the lower arm
 of the lever having a spring, 75, secured to it

and to the main frame, which spring serves to draw the lower arm of the lever inward. The upper end of the lever is provided with an inwardly-projecting pin, 76, with which it engages a slot, 77, in the lower end of a lever, 78, pivoted at its middle upon the frame, and the upper end of this lever is provided with an inwardly-projecting pin, 79, which may be engaged by a semicircular bar, 80, secured upon the face of the first cog-wheel of the striking-train and projecting from it, the said bar tilting the upper end of the lever outward as it engages the same.

It will now be seen that when the clock is going the disk upon the minute-arbor, having the twelve pins upon its face, will tilt the hooked arm once every five minutes, releasing the striking-train, which will be allowed to revolve for a short period.

The wheels of the striking-train and the intermediate cog-wheels and pinions are constructed with such a number of teeth that the cylinder will be moved once around in the course of twelve hours, moving a space forward every five minutes equal to the space between the sockets for holding the plugs. It will therefore be seen that when during the revolution of the cylinder one of the plugs comes in contact with the upwardly-bent end of one of the strips of the slitted plate the beveled end of the said plug will depress the strip, causing its contact-point to come in contact with the contact-point of the strip below it, closing a circuit passing from the binding-post of the slitted plate to a battery, 81, to a suitable switch-board, 82, and from this to an individual bell in the room for which the special alarm is intended, and thereupon to the binding-post of the separate strip, which is depressed. Before, however, the contact-points come in contact, the end of the upper strip 48 has come in contact with the bend of the wire 59, secured to the strip 43 and passing through the end of the same, and this wire 59 on being depressed will enter the mercury, having had its end projecting above the glycerine before it was depressed, so that the circuit is closed before the contact-points touch, the slitted plate 47 having connection to the mercury in the cup by means of the single wire passing from it. By having these wires secured to the strips the circuit is gradually closed and gradually opened, giving the alarm or signal a longer space of time to ring than where no wires are used, and the electric current, which will pass between the contact-points when no wires are used, will now pass through the glycerine from the end of the wire to the mercury, preventing any oxidation of the contact-points by the spark caused when the circuit is made or broken.

The flaring shape of the sides of the cup will admit of the mercury expanding and contracting by the effect of the temperature without affecting the level of the mercury perceptibly, and the screws passing up through the

bracket supporting the mercury cup and having their ends projecting into the sockets or recesses in the bottom of the cup will serve to adjust the cup so as to bring the mercury and glycerine at the proper level with reference to the ends of the wires. The segmental or semicircular bar upon the face of the first wheel in the striking-train will tilt the upper end of the upper lever outward, and will tilt the upper end of the lower lever inward, causing the lower end of the said lever to be tilted outward, drawing the arm having the wedge-shaped end outward out of contact with the flaring ends of the strips, breaking all connection between the slitted plate and the wire of the circuit, and consequently breaking the circuit, while the bar bears against the upper end of the upper lever. As soon as the bar releases the said end of the lever the spring at the lower arm of the lower lever and the spring of the arm with the wedge-shaped end will serve to bring the levers and the arm back in their normal position, and consequently to close the contact between the line-wire and the slitted plate. The bar is so secured upon the wheel of the striking-train that it will engage the lever during the time when the alarms are not desired to be sounded—during the night, for example—so that when the plugs upon the cylinder depress the strips and close the circuits the circuit will be broken at the slitted plate, so that there will be no circuits closed and the batteries will have rest, the mechanism effecting a saving in battery materials on account of the rest afforded the batteries. It follows that the space of time during which the circuit is broken may be regulated by the length of the curved bar, the bar, however, being in most cases semicircular and closing the circuit twelve hours of the twenty-four. If desired, the cylinder may be connected to the time-train of a clock instead of to the striking-train.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a programme-clock having a revolving cylinder provided with insertible plugs, the combination of a slitted plate having the ends of the strips bent upward and having contact-points upon the under sides of the ends and having one end of an electric circuit attached to it, separate strips having their inner ends provided with upwardly-projecting contact-points and having circuit-wires attached to them, and having perforations in their inner ends, a cup containing mercury with a thin layer of glycerine above it supported under the ends of the strips, bent wires secured to the upper sides of the separate strips and having their ends inserted down through the perforations in the said strips and pending above the glycerine in the cup, and a wire attached to the slitted plate and immersed in the mercury in the cup, as and for the purpose shown and set forth.

2. In a programme-clock, the combination of a revolving cylinder having insertible plugs in its periphery, a longitudinally-slitted plate having the ends of the strips bent upward to be engaged by the plugs and having contact-points upon the under sides of the ends of the strips, separate longitudinal strips having contact-points upon the ends, a screw having a binding-nut upon its upper end and secured to and insulated from the slitted plate, a strip upon the lower end of the screw in contact with the plate and insulated from the screw, and having a downwardly-curved outer end, a strip secured upon the screw, insulated from the other strip, and having its end curved upward, an electric wire secured to the screw and strip by the nut, and having its other end passing through a battery and attached to a switch, electric wires secured to the separate strips and upon them and secured to the switch, an arm pivoted upon the slitted plate and insulated from the same, and having a wedge-shaped end for engaging the flaring ends of the strips and a spring for drawing it between the same, a lever pivoted upon an insulated post and having its lower end engaging the arm and having a spring drawing the lower arm inward and formed with an inwardly-projecting pin upon its upper end, a lever pivoted near its middle and having a slot at its lower end and an inwardly-projecting pin at its upper end and having the slot engaged by the pin of the lower lever, and the first wheel of the striking-train of the clock, provided with a segmental bar secured upon the face, and engaging the pin of the upper lever, as and for the purpose shown and set forth.

3. In a programme-clock, the combination of brackets having vertical perforations, a cup containing mercury and having means for guiding it vertically, and having sockets or recesses in its bottom, screws passing through the perforations in the brackets and fitting with their upper ends in the recesses in the bottom of the cup, and a wire at the end of a circuit immersed in the mercury in the cup,

and vertically-sliding wires having their ends projecting down toward the mercury, as and for the purpose shown and set forth.

4. In a programme-clock having a revolving cylinder provided with insertible plugs in its periphery, the combination of a horizontal shelf having longitudinal slots near its ends, and having horizontal screw-threaded perforations in its ends, blocks having downwardly-projecting nutted screws sliding in the slots and having downwardly-projecting vertically-slotted lips at their ends, screws fitting in the perforations in the ends of the shelf and having shoulders at the sides of the lips and having suitable heads, a longitudinally-slitted plate secured upon one block and having an electric wire attached to it and having the ends of its strips bent upward and provided upon the under sides with contact-points, and separated strips secured upon the other block and having electric wires attached to them and having contact-points upon the upper sides of their ends, as and for the purpose shown and set forth.

5. In a programme-clock, the combination of a disk upon the minute-arbor of the clock, having twelve pins upon its face near the periphery, a rock-shaft having an arm formed with a curved end bearing against the pins and having an arm with a laterally-bent end, a disk upon the arbor of a wheel in the striking-train having four notches in its periphery engaged by the bent end of the arm, a wheel of the striking-train having a pin in its rim, and a rock-shaft having an arm resting with its bent end upon the arm engaging the notched disk and having two arms engaging the pin of the wheel of the striking-train, as and for the purpose shown and set forth.

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:

C. W. HAWES,
H. G. MYERS.