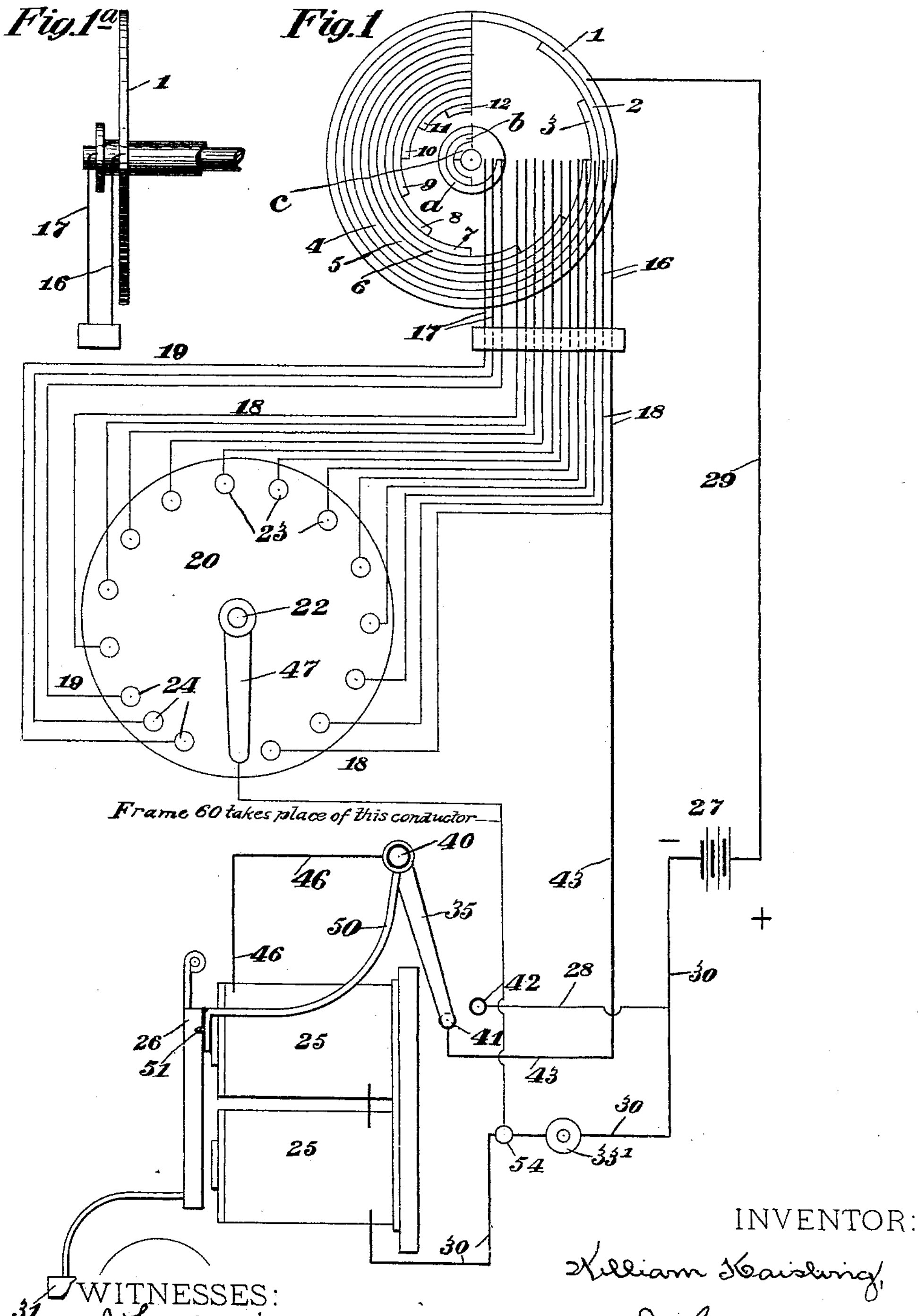
(No Model.) 2 Sheets—Sheet 1.

W. KAISLING.

ELECTRIC CLOCK STRIKING MECHANISM.

No. 493,777. Patented Mar. 21, 1893



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2

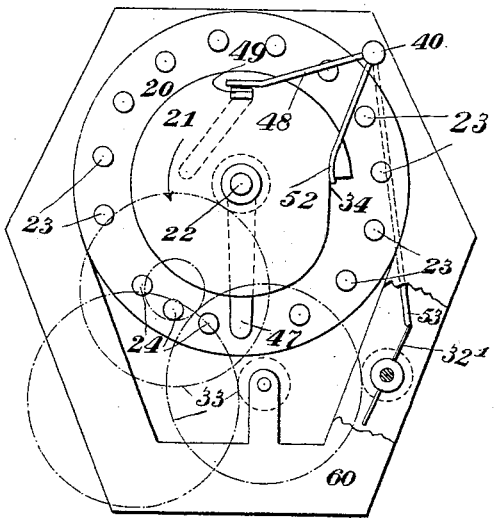


Fig. 3

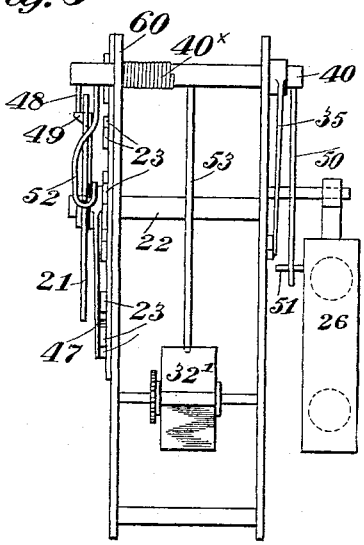
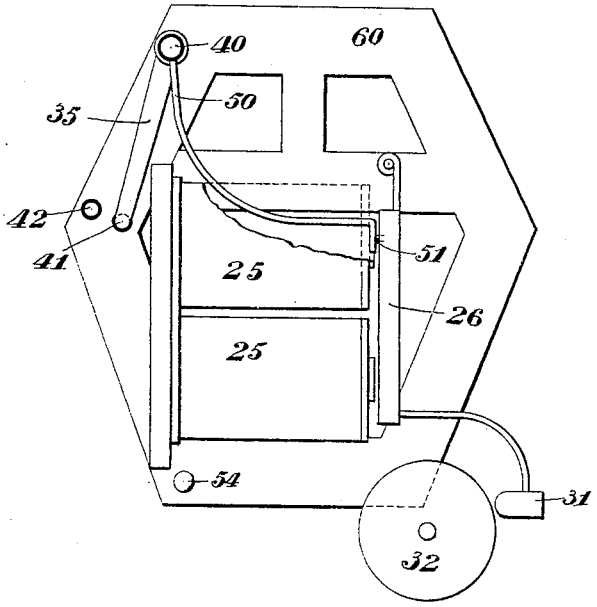


Fig. 4



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ELECTRIC CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 493,777, dated March 21, 1893.

Application filed April 4, 1892. Serial No. 427,723. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KAISLING, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electric Time-Annunciators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved electric annunciator for clocks, and consists in certain details of construction, and combination of parts as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a diagraphic view showing the several electric circuits and portions of the mechanical devices which form the subject of the present invention and Fig. 1ª is a fragmentary detail to be referred to hereinafter. Fig. 2 is a face view of the mechanism for closing the several bell ringing circuits and Fig. 3 is a side view of the same. Fig. 4 is a rear elevation of the same showing the mechanism seen at the right in Fig. 3.

The object of my invention is to provide an electric apparatus which when connected with an ordinary time clock will indicate the hours, and quarters; by successive taps on a bell, thus providing a device by the use of which the time of the day may be indicated at a number of different points or places, with but one clock or time piece.

To construct an apparatus in accordance with my invention I provide a contact disk and attach the same to the sleeve ordinarily carrying the hour hand or pointer. This disk consists of a flat piece of metal having a series of contacts, 1—2—3—, &c., which extends in concentric semi-circles about the face of the disk, and of varying lengths—from a complete circle 1, to one twelfth of a circle 12, at the inside, thus leaving an irregular spiral shaped space about the center of the disk. Fixed to the shaft of the clock ordinarily carrying the minute hand is a second smaller disk A, bearing three integral contacts *a*, *b*, *c*, equal to three quarters, one half, and one quarter of a circle respectively. This disk A is of a less radius than the radius of the inner semi-circular contact 12 of the series of contacts on disk 1 and is concentric with said disk 1. These contacts *a*—*b*—*c*, are for the purpose of indicating the quarter hours, while those 1–12, inclusive, are for the hours. Placed within reach of the above described contacts is a double comb 16—17, each arm of which is connected by a wire to a disk 20. This disk 20, is provided with fifteen contacts 23, three of which marked 24, are connected to the comb 17, by independent wires 19, and the other contacts 23, by independent wires 18, to the comb 16. This disk 20, is held stationary, and is provided with a revolving contact arm 47, which is operated by a barrel spring (not shown) and train of gearing 33, of the character usually employed in clocks for the purpose of giving the said moving contact arm 47, a slow rotary movement. Attached to a suitable point near the disk 20, is a magnet 25, and armature 26, which is connected to the battery 27, in a manner hereinafter described. Attached to the armature 26, is a tapper 31, which is within reach of a bell 32, and is adapted to strike the same when the said armature has been attracted by the magnets.

Mounted in the frame 60, carrying the revolving contact arm 47, is a shaft 40, to which is secured a contact arm 35, which is insulated from the said shaft 40, and capable of a limited movement to make separate electric connections with two stationary contacts 41—42. One of these contacts, 41, is connected by a wire 43, to the wire 18, connecting the first contact 1, of the hour disk. The other contact 42, is connected by a wire 28 with the negative pole of the battery 27, and the said arm 35 with the magnets 25, and the magnets to the binding post 54 on the frame 60. Secured in this same frame 60, on another shaft is a disk or wheel 21, having a notch 34, formed in its periphery, in which a bent wire 52, connected to the shaft 40, rests, which bent wire serves to slightly revolve the shaft 40, and thereby move the arm 35, from the contact 41, to the contact 42. Connected to this same shaft 40 is a short arm 48, which bears at its outer end upon the upper surface of a spring catch 49, mounted on disk 21, and from the underside of said shaft 40 projects

a second arm 50, the extremity of which is bent downward so as to lie in the path of a projecting finger 51, on the armature 26, as clearly seen in Fig. 3 of the drawings. The operating spring, and its connected train of gearing 33, are held in check by an arm 53, bearing against one of the speed fans or regulators, 32′ and the said arm 53, released from the fan 32′, by another lever 50 engaging with a pin, 51 projecting from one side of the armature 26. Thus it will be seen that when the armature 26, is drawn toward the magnet 25, by the flow of a current of electricity therethrough, the shaft 40 is partially rotated, such rotation being only sufficient to disengage the arm 53 from the regulator 32′ and set the clock work driven by the spring above mentioned and the gearing 33 in motion, the spring catch 49, preventing, by its engagement with the arm 48, the further rotation of said shaft 40 whereby the arm 35, would be brought into contact with the contact piece 42. The clock work being thus set in motion, the disk 21 is rotated, whereby the catch 49 is moved from under the arm 48, on shaft 40 and said shaft 40 is still further rotated by the engagement of the arm 52 with the periphery of the disk 21, beyond the notch 34, the direction of rotation of the disk being indicated by the arrow in Fig. 2. A small spiral spring $40^{\times}$ mounted on shaft 40, one end of which is, secured to the shaft and the other end to the frame 60 serves to retract said shaft to its normal position (seen in Fig. 2) after the disk 21 has made a complete rotation and the arm 52 has again fallen into notch 34, lifting arm 48, up so that its extremity rests again above the catch 49, which wipes in to allow of the upward movement of said arm as will be readily understood.

A clock is provided and placed at a suitable position in one of the rooms, and one of the instruments for striking the bell 32, placed in another room some distance away, and electrically connected as described. A wire 29, connects the outside contact 1, of the large disk with the positive pole of the battery 27 and another wire 28, connects the negative pole of the battery with the contact 42 set in the frame 60. Another wire 30 connects said positive pole of the battery with the binding screw 54, set in frame 60, the circuit through said wire 30 being normally open by the provision of a circuit breaker or push button 33′ therein. The contacts 1–12, are so arranged on the hour sleeve as to bring the points of the comb 16, on the outside contact at one o'clock; the first and second at two o'clock the first, second and third at three o'clock, &c., and hold the said contacts the entire twelve hours. The inner contacts *a*—*b*—*c*, are arranged on the minute shaft, in a manner that after the first quarter hour, the first contact will be made with the contact 17, farthest from the center. At and after the half hour two contacts *a*—*b* will be made, and at and after the three quarters the three contacts *a*—*b*—*c* will be made, and at the full hour all three contacts broken, and then again made in the same order.

In operation; when it is desired to ascertain the time within hearing of the bell 32, the button 33′ is pressed which completes a circuit from the negative pole of the battery 27, through the wire 30, and push button 33′, to the binding post 54 on the frame 60, to the magnets 25, through said magnets and wire 46, through the contact arm 35, and contact 41, and wire 43, to the first wire 18, to the contact 1, and wire 29 back to the positive pole of the battery. When this circuit has been completed the armature 26, is attracted toward the magnets 25, moving the lever 50, slightly rotating the shaft 40, until stopped by the engagement of the arm 48 with the upper side of the spring catch 49 on the disk 21 and releasing the fan 32′, which puts the train of gearing 33 in motion. This movement rotates the contact arm 47, and stop disk 21, which are attached to the same shaft, the arm moving over the first contact on the disk 20, complete a circuit, as by this time the disk 21, has moved sufficiently to withdraw the lever 52, from the notch 34, and at the same movement of the disk and lever 52, the lever 50 is moved out of reach of the pin 51, projecting from the armature 26, and at the same time the contact arm 35, is moved over to the contact 42. When this last described contact is made a circuit is completed from the negative pole of the battery 27, through the wire 28, contact 42, arm 35, wire 46, through the magnets 25 to the frame 60, to moving contact arm 47, through the first contact on the disk 20, to wire 18, and comb 16, to contact 1, through said contact 1, and wire 29, to the positive pole of the battery. This circuit when completed attracts the armature to the magnets, and the tapper strikes the bell, 32 which will indicate the hour as one o'clock.

At Fig. 1 on the drawings three of the contacts are made by the comb 16, while but one contact is made with the comb 17, which would give three taps of the bell, and after a short interval of time one tap of the bell. This interval is caused by the space between the last contact of the group of twelve, and the first of the group of three. The bell having been tapped three times in quick succession, and once after an interval of time, the time of day is a quarter past three.

All the circuits for tapping the bell are the same from the contacts on the disk 20, to the battery 27, as above described, and separate and independent wires are used from the said contacts to the two combs 16, and 17.

By means of an apparatus such as described, time may be ascertained at a number of different points by the use of one clock, and several of the instruments for operating the bell.

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

1. The combination with the center shaft of a clock carrying a series of contacts, of a stationary series of contacts adapted to contact electrically therewith during the revolution thereof, a second annular series of stationary contacts electrically connected to the last named series of stationary contacts, a contact arm arranged within said annular series and adapted to contact electrically therewith during its revolution, a normally open electric circuit, including a generator and signal, of which circuit each of the respective stationary and moving contacts and said contact arm form terminals, a spring connected with said contact arm and adapted to rotate the same, a detent for holding said contact arm against rotation, and means for disengaging said detent, whereby said circuit is closed and the signal operated, substantially as set forth.

2. The combination with the center shaft of a clock, carrying a series of contacts, of a stationary series of contacts adapted to contact electrically therewith at different points in the revolution thereof, a second annular series of stationary contacts electrically connected with the aforesaid series of stationary contacts, a contact arm arranged within said annular series of contacts and adapted to contact electrically therewith during its revolution, a spring connected to said contact arm and adapted to revolve the same, a pivoted detent for holding said contact arm against movement, a normally open electric circuit including a generator and signal of which each of the respective stationary and moving contacts and said contact arm form terminals, a normally open electric circuit including a generator and an electro-magnet, the armature of said magnet, said armature being arranged to engage said pivoted detent in its movement and release said spring, and means for closing said last named circuit whereby the contact arm is released and said first named circuit closed and the signal therein operated, substantially as set forth.

3. The combination with the center shaft of a clock carrying a series of contacts, of a stationary series of contacts adapted to contact electrically therewith during the revolution thereof, a second annular series of stationary contacts electrically connected to said last named series of stationary contacts, a contact arm arranged within said annular series of stationary contacts and adapted to contact electrically therewith in its revolution, a spring connected to said contact arm and adapted to revolve the same, a pivoted detent for holding said contact arm against movement, a normally open electric circuit including a generator and a signal of which circuit each of the respective stationary and moving contacts and said contact arm and said detent form terminals, a contact point in said circuit arranged in the path of said detent and forming a terminal of said circuit, a notched disk on the said contact arm and adapted to revolve therewith, a projection on said detent engaging said notch in the disk, a normally open electric circuit including a generator and an electro-magnet, the armature of said electro-magnet, said armature being arranged to engage said pivoted detent in its movement and disengage the same from said spring, and means for closing said last named circuit, whereby the signal is operated, substantially as set forth.

4. The combination with the center shaft of a clock, carrying a series of contacts, of a stationary series of contacts adapted to contact electrically therewith during the revolution thereof, a second annular series of stationary contacts electrically connected with said last named series of stationary contacts, a contact arm arranged within said annular series of stationary contacts and adapted to contact electrically therewith during its revolution, a spring connected to said contact arm and adapted to revolve the same, a shaft bearing a detent for holding said arm against movement, a normally open electric circuit including a generator and a signal of which circuit each of the respective stationary and moving contacts and said contact arm form terminals, a contact point in said circuit and forming a terminal thereof, an arm on said shaft playing over said contact point and forming the other terminal of said circuit, a notched disk borne by said contact arm, a projection on said shaft engaging the notch in said disk, a normally open electric circuit, including a generator and an electro-magnet, the armature of said electro-magnet, an arm on said shaft arranged in the path of said armature, a moving catch for preventing the full movement of said armature, and means for closing said last-named circuit whereby the signal is sounded.

In testimony that I claim the foregoing I hereunto affix my signature this 17th day of February, A. D. 1892.

WILLIAM KAISLING. [L. S.]

In presence of—
CHARLES LARGE,
M. E. HARRISON.