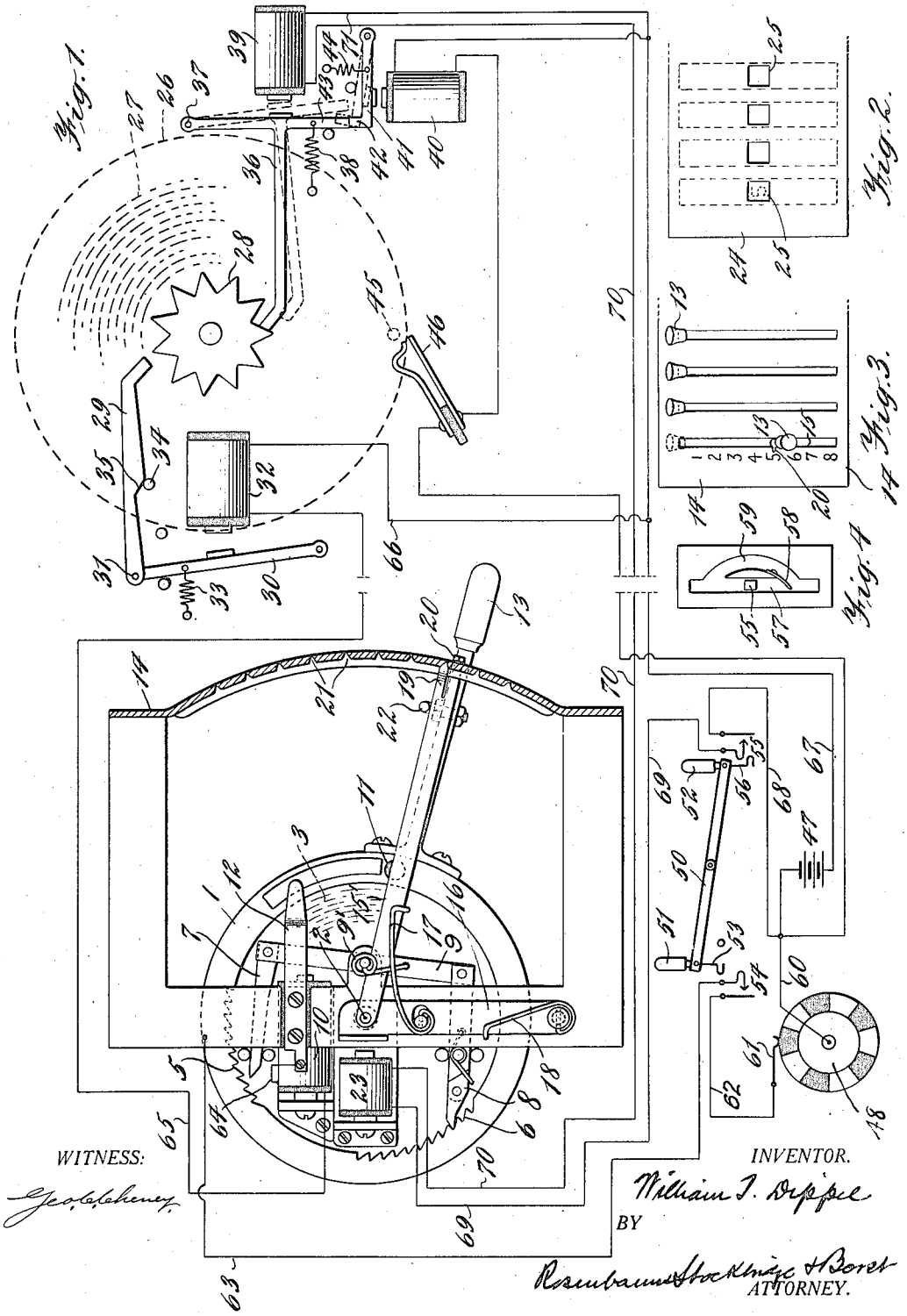
W. T. DIPPEL.

ANNUNCIATOR.

APPLICATION FILED MAY 27, 1919.

1,416,340. Patented May 16, 1922.



UNITED STATES PATENT OFFICE.

WILLIAM T. DIPPEL, OF NEW YORK, N. Y.

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To all whom it may concern:

Be it known that I, WILLIAM T. DIPPEL, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Annunciators, of which the following is a full, clear, and exact description.

This invention relates to annunciators, the object being to provide a system whereby calls can be promptly sent from one location to another by means of simple apparatus and devices, conveniently manipulated and easy to install.

The invention comprises generally a "sending" mechanism and a signal display or receiving mechanism connected in a circuit supplied with intermittent currents, the sending device being adapted to be set at a selected position and movable under the current impulses to a normal position while the signal display device is adapted to be moved from a normal to the selected position simultaneously by the same current impulses. The invention also comprises certain structures and circuits utilized for carrying out the broad idea, all of which will be fully described hereinafter and pointed out in the claims.

In the accompanying drawings:

Figure 1 is a diagram of the circuits and a conventional representation of the apparatus comprised in the complete system;

Figure 2 is a front elevation of the casing of the signal display mechanism;

Figure 3 is a front elevation of the casing of the signal sending mechanism; and

Figure 4 is a detail of a controlling switch.

The annunciator system herein described has been designed especially for use on the floor of a stock exchange or in any other place where persons congregate who are subject to be called temporarily from their immediate business and when it is desired that such calls shall be promptly given or displayed. The apparatus comprises an annunciator proper consisting of a box or frame having windows or spaces in which figures, letters, names or symbols intended for the interested persons are displayed, the box being located in some prominent position where it may be easily observed by any persons in its vicinity. The annunciator is connected by suitable circuits with a sending apparatus located at a telephone station, trading post or other suitable central point.

The sending apparatus comprises a disk or drum 1 mounted to rotate upon a stationary shaft 2 and having a spiral spring 3 connected at one end to the shaft and at the other end to the disk and having a constant tendency to turn the disk in one direction. On an internal annular shoulder of this disk are formed two ratchet segments 5 and 6 which are engaged by pawls 7 and 8 respectively, carried by an oscillating bar 9 pivoted to the frame, these devices constituting an ordinary escapement, the oscillation of which permits the disk to rotate step by step under the impetus of the spring 3. The oscillating bar 9 is provided with or constitutes an armature for an electro-magnet 10 adapted to actuate the bar in one direction, a spring 9′ moving it in the other direction. On the face of the disk there is provided an insulating segment or tooth 11 which is normally engaged by a stationary contact brush 12 in order to insulate the brush from the disk. The disk is provided with a handle 13 by which it may be rotated by hand and thereby store power in the spring to be subsequently used to return the disk to its normal position under the control of the escapement. The disk is mounted in a casing or frame 14 provided with a slot 15 through which the handle 13 projects, the normal position of the handle being preferably at the uper end of the slot and having a stroke through the entire length thereof. Alongside the slot is placed a series of figures, letters, names or other symbols corresponding to the signals to be displayed by the apparatus. The handle is movable to any signal position by hand and is there held by the engagement of the escapement with the ratchet teeth until the oscillation of the escapement permits the handle to return. Associated with the handle 13 is an indicating arm 15′ which is pivoted to the upper end of an armature lever 16, the latter being pivoted to the frame and mounted so that the pivotal point of the arm 15′ will be substantially co-axial with the disk 1. Arm 15′ is impelled upward by a spring 17 while the armature lever 16 is impelled towards the front of the casing by a spring 18. The forward end of the arm 15′ is split to form two fingers 19 and 20, the former being pointed and adapted to engage with anyone of a series of notches 21 formed in the back of the face plate of the casing adjacent to the slot through which the handle 13 plays, this engagement serving to

hold the arm stationary against the action of its spring 17. The other finger 20 of the arm projects through the same slot as the handle 13 and is bent laterally and formed with an index which points to the numerals or other signal insignia adjacent to the slot. The handle 13 carries a bent finger 22 which extends across the top of the arm 15′ and acts as a hook to carry the arm downward through the slot in company with the handle 13. When the handle returns to its normal position, the arm 15′ remains in the position previously occupied by the handle, being held at that position by the engagement of the finger 19 with a notch 21. 23 is an electro-magnet mounted in a position to attract the armature lever 16 and pull it rearward. This serves to release the finger 19 from its notch 21 whereupon spring 17 returns the arm 15′ quickly to its normal position at the upper end of the slot, where it then stands in close association with the handle 13 ready to accompany the latter on another excursion downward. To increase the capacity of the system, the apparatus so far described may be duplicated any number of times each one being placed behind its respective slot in the front plate of the casing. For simplicity of illustration, the signals are indicated on the drawing as numbers extending from 1 to 8 on the first slot, which may be continued from 9 upward on the successive slots.

The signal displaying apparatus is only conventionally shown, and comprises a casing 24 having in its front wall one or more windows 25 depending upon the capacity of the instrument and behind each window is mounted upon a horizontal axis a drum 26 within which is a spring 27 secured to the drum and to its shaft. Upon the shaft of the drum is a toothed wheel 28 adapted to be engaged by a pawl 29 which is reciprocated by an armature lever 30 to which it is pivoted at 31. The armature lever is under the influence of an electro-magnet 32 and a spring 33 and is adapted to play under these influences between two limiting stops, as shown. The pawl normally rests upon the pin 34 which holds it out of engagement with the teeth of the wheel 28. On a forward movement of the pawl an inclined surface 35 permits it to fall and engage a tooth of the wheel to force the latter around the space of one tooth. On the opposite side of the wheel a second pawl 36 is mounted, being pivoted at 37 and with its point normally held in engagement with the wheel 28 by a spring 38. This pawl prevents the return of the wheel 28 after it has been moved forward by the pawl 29. Pawl 36 is under the influence of an electro-magnet 39, the function of which is to swing the pawl out of engagement with wheel 28 as indicated in dotted lines. 40 is another electro-magnet whose armature 41 has a hooked end 42 which normally rests against the end of an arm 43 projecting from the pawl 36, being impelled against said arm by a spring 44. When the pawl 36 assumes the position shown in dotted lines, the hook 42 drops in front of the arm 43 as also indicated in dotted lines, and prevents the return of pawl 36 to its normal engagement with the wheel 28. However, upon magnet 40 being thereafter energized, the hook 42 is withdrawn, allowing spring 38 to return pawl 36 to its normal working position. The drum 26 carries a pin 45 and a pair of stationary contacts 46 are so located with respect to the pin that when the drum is about to complete its return movement to normal position, the pin will engage the contacts and momentarily close the circuit controlled thereby.

47 indicates a battery or other source of current, and 48 indicates a commutator or other continuously moving circuit controller upon which bears a contact brush 61. 50 is a switch lever pivoted at the center and being adapted to be oscillated by either of two plungers 51, 52. When the plunger 51 is forced downward to the limit of its stroke, finger 53 closes the contacts 54 and holds them closed until the position of the lever is changed. When the plunger 52 is forced downward, the contacts 55 are momentarily closed by the movement of the arm 56 past them and at the same time the contacts 54 are opened. When plunger 52 rises, arm 56 does not actuate the contacts 55, because of a mechanical arrangement provided to prevent it. Any suitable device may be used for this purpose, but as shown in Figure 4, the arm 56 is supposed to travel downward through the groove 57 and on the way engaging one of the contacts 55. In the downward movement, the arm passes beyond a spring tongue 58 which, on the upward movement, deflects the arm through the shunting groove 59.

The circuits will be described in connection with the description of the operation. Let it be assumed that it is desired to display the Figure 5 on the annunciator, it being understood that the figure is merely representative of a person's name of other signal to be displayed. A person in charge of the transmitter will pull the handle 13 downward until it arrives opposite the Figure 5. In this movement the indicator 15′ accompanies the handle and is held stationary at 5 by the engagement of finger 19 with the notch 21 at that point, the handle 13 and disk 1 being meanwhile held by the escapement. Next, the operator pushes the plunger 51 downward, thus closing the contacts 54. This establishes a circuit from the battery by wire 60, commutator 48, brush 61, wire 62, contacts 54, wire 63 to the frame of the instrument, thence by brush 12 which is

now bearing upon the metallic portion of the disk, by wire 64, magnet 10, wire 65, magnet 32 of the signal displaying device, wire 66 and wire 67 to battery. So long as this circuit remains closed, an intermittent current will flow through the magnet 10 of the transmitter and the magnet 32 of the signal displaying device. Each impulse of current will actuate the escapement lever 9 and the pawl 29, causing the disk 1 and the drum 26 to simultaneously move step by step, the disk moving towards its normal position and the drum moving towards a signal position. Both magnets will receive impulses at the same time and when the handle 13 has reached its normal position, the drum 26 will have been forced forward a corresponding distance and will display in the window in the front of the annunciator casing the figure 5. When the handle 13 reaches its normal position, the brush 12 rides upon the insulating segment 11 and opens the circuit. Pawl 29 of the annunciator ceases to act and the drum 26 is held stationary by the pawl 36. This condition may remain as long as necessary, or until the object of the signal has been achieved, the indicator 15 in the meantime showing that the call has been set in and that the signal is displayed. Response having been made to the signal the plunger 52 is forced downward, thus creating a second break in the circuit previously established, at the points 54, and momentarily closing the contacts 55 establishing a new circuit as follows: from battery by wire 68, contacts 55, wire 69, magnet 23, wire 70, magnet 39, wire 71 and wire 67 to battery. The energizing of magnet 23 causes the return of the indicator 15′ to normal position, as before explained, and the energizing of magnet 39 removes the pawl 36 from engagement with wheel 28 and allows the spring 27 to return the signal displaying drum 26 to its normal position. The pawl 36 must be held out of engagement with the wheel 28 long enough to permit the drum to complete its return movement, which at one time may be a longer travel than at another. Consequently the momentary operation of magnet 39 permits the hook 42 to lock 36 out of engagement with the toothed wheel until the drum has fully completed its return movement except for a very short distance, at which point the pin 45 momentarily closes the contacts 46 and establishes a circuit through the magnet 40, as can be easily traced, to remove the hook and allow the pawl 36 to resume its operative position in connection with the wheel 28 for the next operation of the signal.

It should have been stated before that numbers or other signals corresponding to those on the front plate of the transmitter are placed upon the periphery of the drum 26 to be displayed through the windows in the front of the annunciator which are of a proper size to display one signal at a time.

I claim:

1. An annunciator system comprising in combination a signal displaying member movable step by step from a normal position to any one of a plurality of signal positions, a manually operable signal selecting member movable step by step from any one of a plurality of selected positions to which it has been manually moved to a normal position, electro-magnetic devices responsive to intermittent current for effecting the simultaneous movement of said members, a circuit controller for causing an intermittent current and operable independently of the movement of the selecting and display members, a source of current, a circuit including the said devices, circuit controller and source of current, a circuit controlling device included in said circuit and effective to close the circuit automatically by the movement of the selecting member away from normal position and open the circuit when the selecting member is in its normal position, and a manually operated switch also in said circuit for directly connecting the circuit controller to said electromagnetic devices.

2. An annunciator system comprising in combination a signal displaying member, a signal selecting member movable from any one of a plurality of selected positions to a normal position, an indicator movable with the selecting member to a corresponding selected position, and means for returning said indicator to normal position simultaneously with the return of the signal displaying member to normal position.

3. An annunciator system comprising in combination two rotary drums, a source of power tending to rotate each drum in one direction, an escapement permitting one drum to make a step by step movement, means for rotating the other drum against its source of power, electromagnetic devices for actuating said escapement and said means, and a circuit including a source of intermittent current and said electromagnetic devices.

4. An annunciator system comprising a signal displaying rotary member, a spring tending to rotate said member in one direction, means for rotating the member step by step to a signalling position against the power of said spring, a detent co-operating with the member for holding it at any position to which it may be moved, an electromagnet for removing the detent from operative engagement with the member and another electro-magnet for restoring the detent to operative position.

5. An annunciator system comprising a signal displaying rotory member, a spring tending to rotate said member in one direc-

tion, means for rotating the member step by step to a signalling position against the power of said spring, a detent cooperating with the member for holding it at any position to which it may be moved, an electro-magnet for removing the detent from operative engagement with the member, another electro-magnet for restoring the detent to operative position, and an electric circuit including said last named magnet and controlled by the movement of said member.

6. In an annunciator system the combination with a signal display device, of a signal sending device comprising a rotary disc, a spring tending to rotate the disc in one direction, means for adjusting the disc against the action of the spring to any one of a plurality of different positions, an escapement for permitting a step by step return movement of the disc, an indicating member shiftable with said disc to an indicating position when the disc is shifted against the action of its spring, means for pivotally supporting the indicating member and for latching it in indicating position when so placed by the operation of the disc, a spring normally tending to rotate said indicating member to initial position where it is ready to be shifted with the disc, a source of intermittent current, electromagnetic devices responsive to said current for operating said display device to display position and said escapement to allow the disc to return to normal position, and manually controlled means for simultaneously unlatching said indicating member, and causing a resetting of the display device.

7. In an annunciator system, the combination of a signal display device, means normally tending to return the device to non-display position, a signal determining device manually operable to selected positions, means normally tending to return said determining device to initial position when displaced therefrom, means for holding each of said devices in displaced positions, a source of intermittent current, electrical devices controlled by said intermittent current for permitting the return of the determining device to initial position and for simultaneously shifting said display device from the initial position to a display position corresponding to the adjusted position of the determining device, holding means for retaining the display device in said particular display position to which it has been shifted, a manually operated device adapted when in one position to connect said source of intermittent current to said electrical devices and when shifted to another position to release the display device from its holding means.

8. In an annunciator system, the combination with a signal determining device shiftable manually from an initial to selected positions in each of which selected positions it corresponds to a signal to be given, a signal display device located, at a distance from the determining device and adapted to be shifted from an initial to selected positions corresponding with those of the determining device, means tending to return both of said devices to initial position when displaced from that position, operating means when active for permitting return of the determining device to initial position from any adjusted position and simultaneously shifting said display device to a position corresponding with the said adjusted position, holding means for retaining the display device in display positions, operating means when active for releasing said holding means, and a manually controlled device for alternately determining the activity of both of the said operating means.

9. In an annunciator system, a source of intermittent current, a display device, a spring connected to said device to return the same to an initial position when released, means connected to said source of current for shifting said device away from its initial position against the action of its spring, means for controlling the number of current impulses, to advance the device to a plurality of adjusted positions, holding means for retaining the device in said adjusted positions, means for incapacitating said holding means, locking means for retaining said holding means in incapacitated condition, means for controlling said incapacitating means and means controlled by said display device for causing said locking means to release the display holding means when the display device has substantially resumed its initial position.

10. In an annunciator system the combination of a display device, a spring for returning the same to an initial position when free to act, means for retaining the device in adjusted positions, a signal determining device having a member adjustable to selective positions for determining the signal to be displayed, an indicating member shiftable by said adjustable member to the selected positions, means for retaining said indicating member in the positions to which it has been shifted, means including electromagnetic devices controlled by the determining device and operating said display device to adjusted position, manually controlled means for simultaneously releasing the indicating member and said display device, and a spring for returning the indicating member to initial position when released.

In witness whereof I subscribe my signature.

WILLIAM T. DIPPEL.