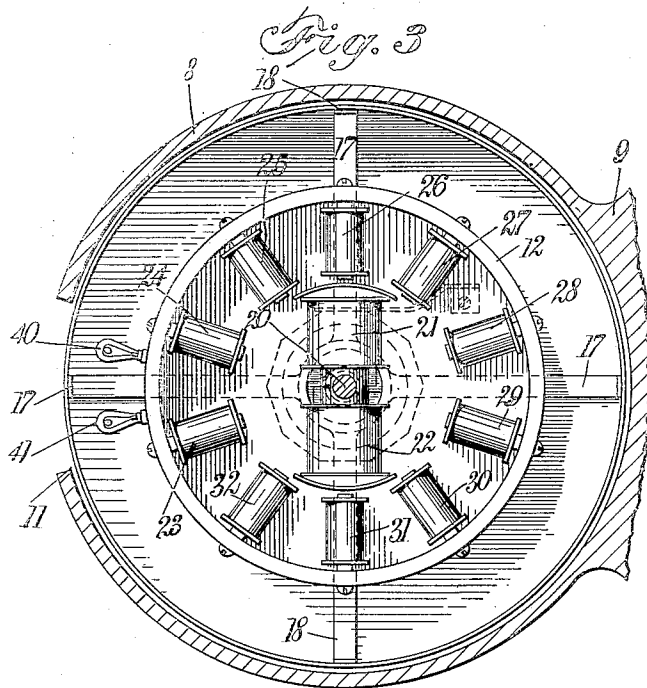
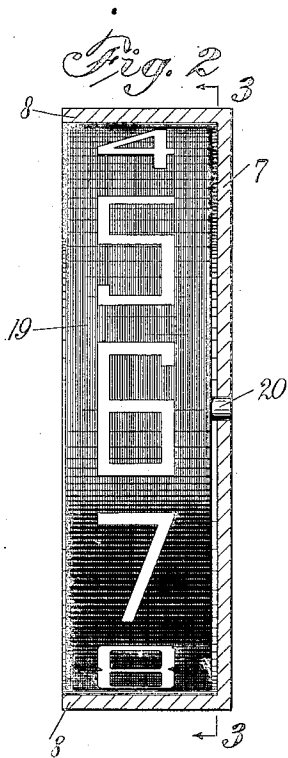
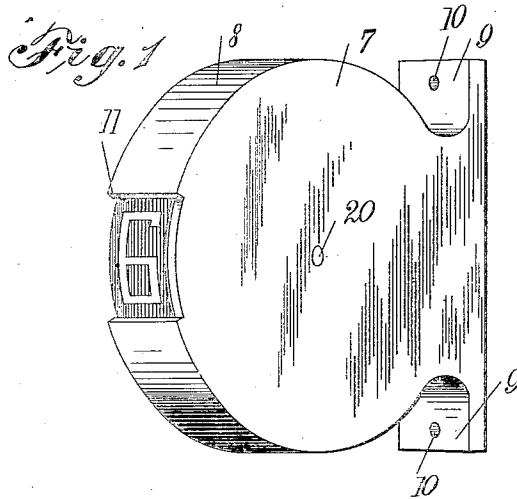


H. CALDWELL.
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APPLICATION FILED DEC. 5, 1911.

1,058,545.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 1.



WITNESSES

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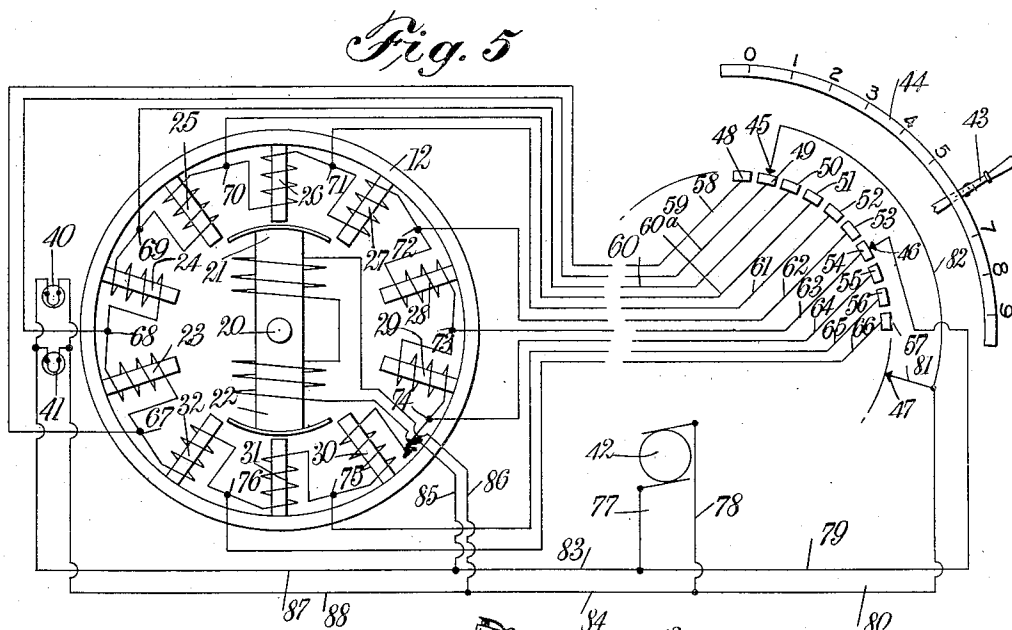
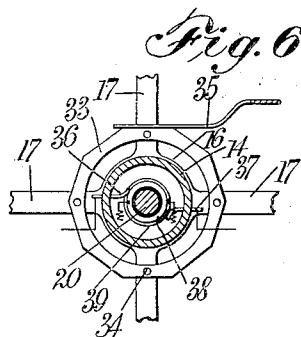
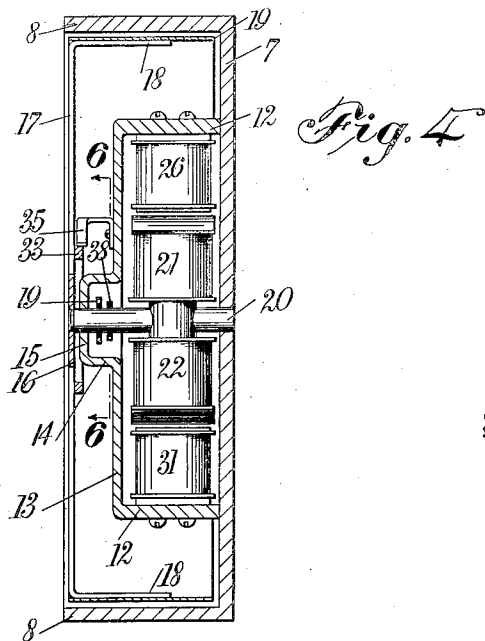
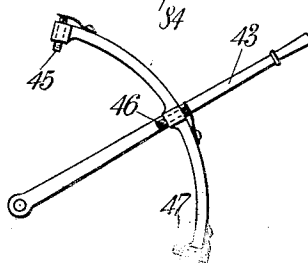


Fig. 7



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UNITED STATES PATENT OFFICE.

HENRY CALDWELL, OF FORT MICHIE, NEW YORK.

ANNUNCIATOR SYSTEM.

1,058,545.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed December 5, 1911. Serial No. 664,011.

To all whom it may concern:

Be it known that I, HENRY CALDWELL, a citizen of the United States, and a resident of Fort Michie, in the State of New York, have invented a new and Improved Annunciator System, of which the following is a full, clear, and exact description.

My invention relates to annunciator systems, my more particular purpose being to provide an electrically operated annunciator having a movable drum provided with characters which may be seen from a distance, said drum being so arranged that it may be quickly turned to any desired extent at the will of a distant operator.

Reference is to be had to the accompanying drawings forming a part of this specification in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a perspective view showing the annunciator casing provided with a window and with a movable character wheel which may be seen fragmentarily through said window; Fig. 2 is a substantially central vertical section through the annunciator casing; Fig. 3 is a section through the annunciator casing and is taken on the line 3—3 of Fig. 2, looking in the direction of the arrow; Fig. 4 is a substantially central section through the annunciator mechanism; Fig. 5 is a diagram of the wiring; Fig. 6 is a detail showing the means whereby the character wheel may be stopped positively in a number of definite positions; and Fig. 7 is a detail showing the hand operated switch mechanism, and particularly the hand lever and brushes which it carries.

A casing 7 is provided with an outer peripheral wall 8 and is further provided with a pedestal 9 having holes 10 through it, this pedestal being secured directly upon a support. The casing 7 is provided with an opening 11 which serves the purpose of a window, and is hereinafter referred to as such. Mounted within the casing 7 and concentric thereto is a circular magnet support 12. This magnet support is provided with a disk-like face 13 having an annular neck 14, this neck terminating in a disk-like wall 15 serving as a bearing. A spider 16 is provided with radially extending arms 17 (see Fig. 6), these arms being provided with bent portions 18 which engage the inside of a circular drum 19, as will be understood from Fig. 4. The drum 19 is made of suit-

able material, such as celluloid, and is, for the most part, both dark in color and opaque to light. It is provided, however, with a number of legends or intelligible characters (see Fig. 2) which, in this instance, are numerals. These characters are transparent, or at least translucent, and are rendered visible through the window 11 (see Fig. 1) when the interior of the drum is illuminated at night. The characters are also, because of their white color, visible in the day time, there being then no illumination within the drum. The spider 16 is mounted rigidly upon a revoluble shaft 20. An electro-magnet having ends 21, 22 is also mounted rigidly upon this shaft, the ends of this magnet being of opposite polarity.

The magnet support 12 encircles the shaft 20 and, as above explained, is stationary. A number of electro-magnets 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, are mounted upon the magnet support 12, and extend radially inward from it, as will be understood from Fig. 5.

The spider 16 carries a facet ring 33 (see Fig. 6), which is secured upon the arms 17 by aid of pins 34. A spring 35 engages the facet ring and is mounted directly upon the portion 13 of the magnet support. Brushes 36, 37 extend through the neck 14 and are insulated therefrom. These brushes engage collector rings 38, 39 which are also insulated from the neck 14 and from each other. The brushes 36, 37 are electrically connected with the magnets 21, 22, these magnets together thus constituting an armature, and the brushes 36, 37 and collector rings 38, 39 having a relation to the armature analogous to that found in a dynamo or motor, for the purpose of establishing electrical communication between the ends 21, 22 and other parts aside from the casing, as hereinafter described.

I provide lamps 40, 41 for the purpose of illuminating the interior of the drum. A dynamo 42 is furnished for the purpose of supplying current to all parts of the apparatus. A hand lever 43 is mounted to swing adjacent to the graduated scale 44, the latter having for this purpose a general arcuate form and being provided with numerals, as will be understood from Fig. 5. The lever 43 carries three brushes 45, 46, 47 insulated from other parts and analogous to the brushes used upon a motor or dynamo. The construction of the lever 43 and parts car-

ried by it can be best understood by reference to Fig. 7.

Adjacent to the path of travel of the brushes 45, 46, 47 are a number of stationary contact sectors 48, 49, 50, 51, 52, 53, 54, 55, 56, 57. Connected with these sectors are a number of wires 58, 59, 60, 60^a, 61, 62, 63, 64, 65, 66, these wires leading respectively to junctions 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, and by aid of these junctions the wires in question are connected with the various magnets carried by the magnet support. Connected with the dynamo 42 are wires 77, 78, and connected with these wires are two other wires 79, 80. The wire 79 leads to the brush 46, and the wire 80 is, by aid of wires 81, 82, in constant communication with the brushes 47, 45.

Wires 83, 84 are connected with the wires 77, 78 and also with the wires 79, 80. Connected with the wires 83, 84 are two wires 85, 86, which are also connected, through the medium of the brushes 36, 37 and collector rings 38, 39, with the ends 21, 22. For the sake of simplicity, the brushes and collector rings are omitted from the diagram (Fig. 5), but are shown in detail in Fig. 6. Connected with the wires 83, 84, and also with the wires 85, 86, are two other wires 87, 88 which lead to the lamps 40, 41.

The parts are so arranged and proportioned that no matter in what position the hand lever 43 may be stopped, the drum 19 will take up some definite position, and in such position some one of the numerals carried by the drum 19 will be completely exposed to view, as indicated in Fig. 1. The action of the spring 35 (see Fig. 6) upon the facet wheel 33 insures that all of a single numeral will be displayed through the window 11, there being as many of these numerals as there are facets upon the facet wheel 33, and the several facets of the facet wheel, as well as the several numerals carried by the drum, correspond to the number of effective positions of the hand lever 43.

Of the ten magnets 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, when energized, five are always of one polarity and the other five of a different polarity. The five magnets of the one polarity always form a semi-circle and the five magnets of the other polarity likewise form a semi-circle, the two semi-circles being disposed in opposite relation to each other. The two ends 21, 22 are also of opposite polarity.

The operation of my device is as follows: I will suppose at the start that the hand lever 43 occupies the position indicated at the right of Fig. 5. The brush 45 now engages the sector 49, the brush 46 engages the sector 54, and the brush 47 does not engage any sector. The following circuit is now completed: dynamo 42, wires 77, 79, brush 46, sector 54, wire 63 and junction 73. The

current here divides and passes in opposite directions and in parallel through the various magnets carried by the magnet support to the junction 68; thence the currents unite as a single current which flows through the wire 59, sector 49, brush 45, wires 80, 82, 78, back to the dynamo 42. The magnets 24, 25, 26, 27 and 28 are thus all energized in a particular sense, and the magnets 23, 32, 31, 30 and 29 are all energized in the opposite sense. Such being the case, the armature is in equilibrium, being so attracted that any torque which may tend to develop, by a magnetic pull in one direction, is offset by a contrary torque tending to turn it in the opposite direction. The armature, therefore, takes up a neutral position, as indicated in Fig. 5, the drum assuming the position indicated in Figs. 1 and 2, so that a particular numeral (in this instance the numeral 6), is displayed through the window 11. In order that the numeral displayed may be seen from a distance, the lamps 40, 41 are illuminated. The circuit through these lamps is as follows: dynamo 42, wires 77, 83, 87, lamps 40, 41, wires 88, 78, back to dynamo 42.

The armature is constantly energized by the following circuit: dynamo 42, wires 77, 83, 85, (connection shown in Fig. 6), ends 22, 21, wires 86, 84, 78, back to the dynamo. Suppose, now, that the hand lever 43 be turned, say, in a counter-clockwise direction, according to Fig. 5, so that the various brushes 45, 46, 47 are moved in the same counter-clockwise direction by distances representing the consecutive distances between two of the sectors; that is to say, the brush 45 disengages the sector 49 and engages the sector 48. The brush 46 moves out of engagement with the sector 54 and into engagement with the sector 53. The brush 47 moves one step nearer the sector 57, but as yet does not engage it. It is evident that the wires 58 and 62 are now energized, and as these wires are connected with the junctions 67 and 72, the magnets now energized in one sense are those numbered 23, 24, 25, 26, 27, whereas those energized in the opposite sense are those numbered 28, 29, 30, 31, 32. A torque is now produced on the armature by the reason that the five magnets having one polarity will tend to move the armature into a virtually neutral position, and the tendency of the other five magnets of opposite polarity is to do the same thing, to wit, to move the armature into said neutral position. This means that the armature will turn in a counter-clockwise direction, according to Fig. 5 and for a distance representing the annular distance between two consecutive magnets. The further movement of the lever 43 in a counter-clockwise direction causes the armature to turn one step farther

in the same direction. A movement of the hand lever 43 in a clockwise direction, however, causes the armature to turn likewise in a clockwise direction, the angular distance of rotation being commensurate with the number of sectors passed over by the swinging movement of the hand lever, and this in turn being commensurate with the numerals of the arcuate scale passed over by the hand lever.

If it happens that the hand lever 43 is moved sufficiently in a counter-clockwise direction to disengage the brush 45 from the sector 48, and to bring the brush 47 into engagement with the sector 57, the same system is carried further, the line of division of the current being, in this instance, between the junctions 76 and 71, so that the armature 21 rotates correspondingly in a counter-clockwise direction and assumes a position relative to and controllable by the position of the hand lever 43. The aggregate result is that any swinging movement given to the hand lever 43 is practically duplicated by a similar movement of the armature and the movement in question is indicated by the appearance of the drum as seen through the window 11, the numeral here displayed corresponding to the particular numeral associated with the arcuate scale 44 and hidden by the outer portion of the hand lever 43.

If desired a number of the annunciator casings 7 with their contents may be arranged in a series so that the various nu-

merals displayed through the respective windows 11 may be formed into any number and style of denomination.

It will be understood, of course, that numerals are not in all instances employed, and that intelligible characters of any kind may be used instead of these numerals.

I do not limit myself to any particular use for the annunciator system above described, nor to the exact arrangement shown for the various parts, nor to any particular materials to be employed in construction, the scope of my invention being commensurate with my claim.

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

An annunciator system comprising a plurality of magnets arranged in the approximate form of a circle, electric mechanism controllable at will for selectively dividing said magnets into two groups of opposite polarity, an armature controllable by said magnets and adapted to turn into different positions depending upon the distribution of the magnets into groups, and indicating mechanism connected with said armature and controllable thereby.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY CALDWELL.

Witnesses:

JOHN WILLIAM WORRALL, Jr.,
JOHN T. McANIFF.