

Aug. 28, 1923.

1,466,448

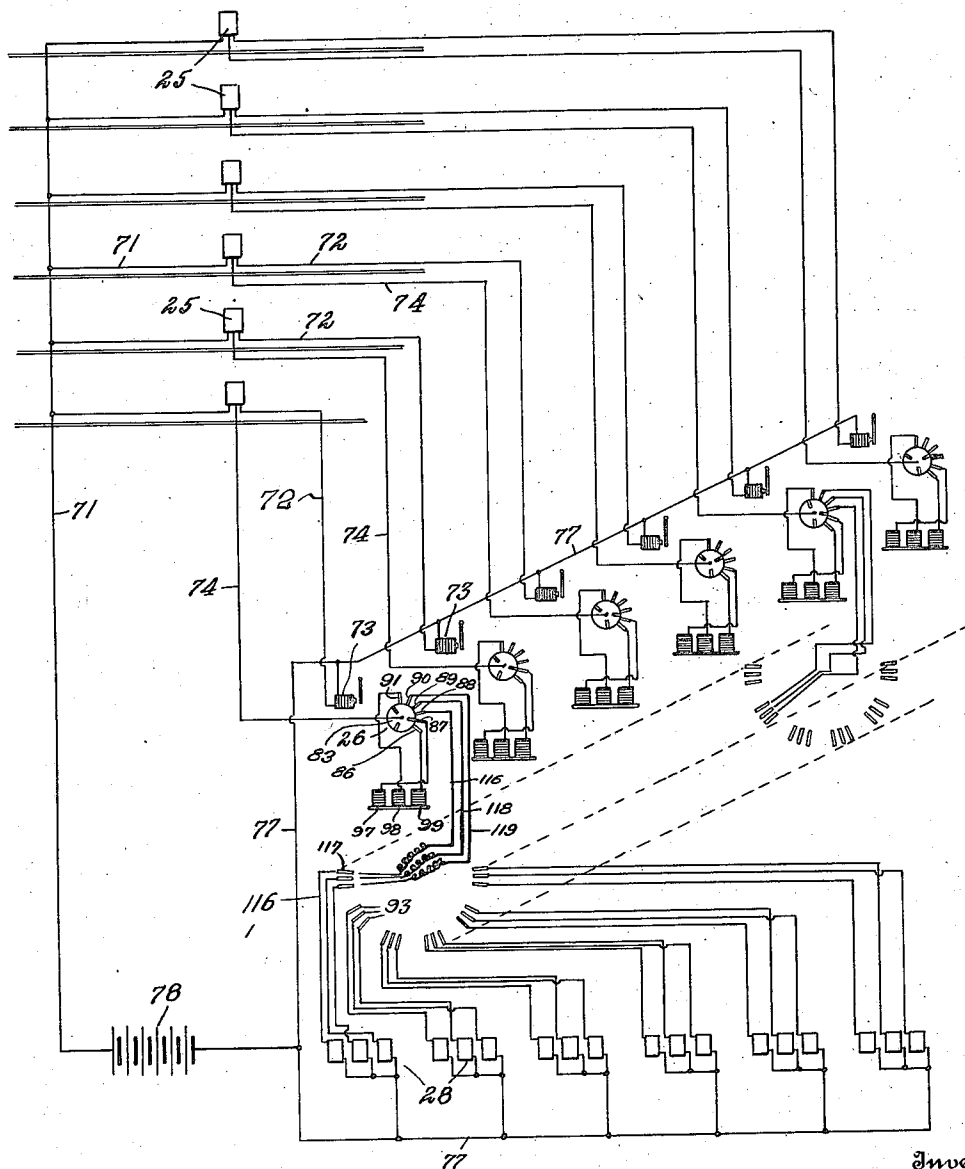
S. KATZ

ANNUNCIATOR OR INDICATOR SYSTEM

Filed July 22, 1921

4 Sheets-Sheet 1

Fig 1



Inventor

Samuel Katz

By

C. F. Goepfel,

Attorney

Aug. 28, 1923.

1,466,448

S. KATZ

ANNUNCIATOR OR INDICATOR SYSTEM

Filed July 22, 1921

4 Sheets-Sheet 2

Fig 3

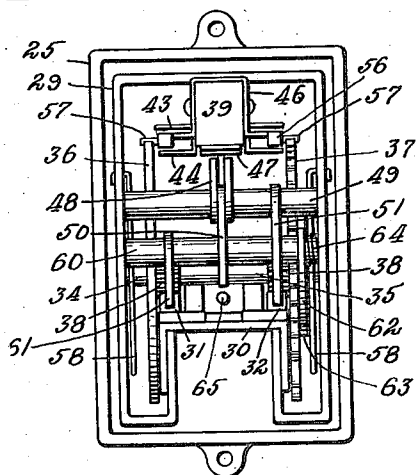


Fig 4

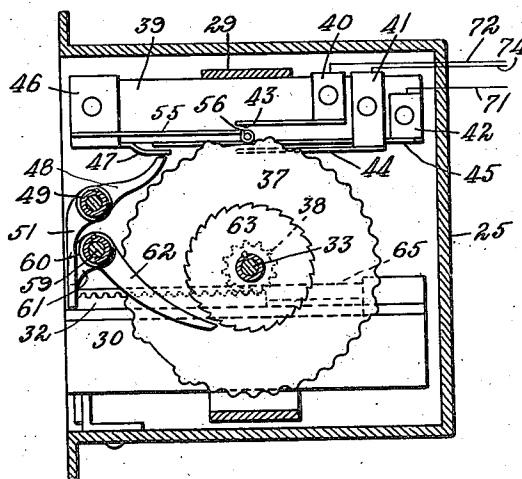


Fig 6

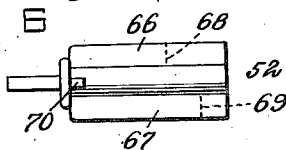


Fig 2

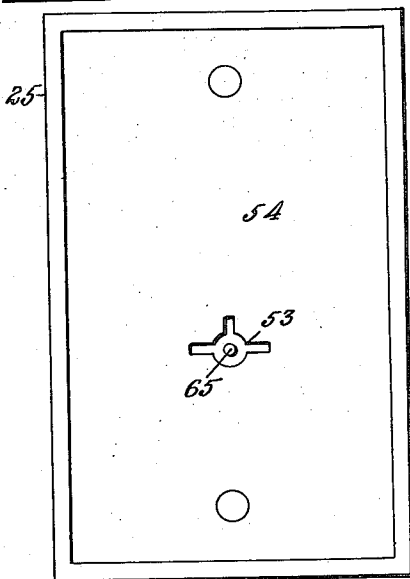
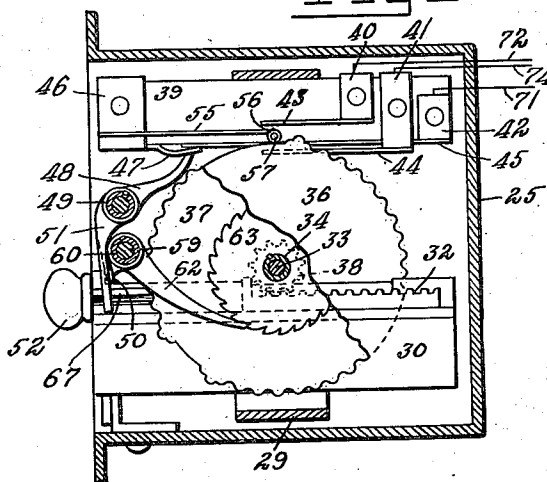


Fig 5



Inventor

Samuel Katz

By

C. P. Goepel

Attorney

Aug. 28, 1923.

1,466,448

S. KATZ

ANNUNCIATOR OR INDICATOR SYSTEM

Filed July 22 1921

4 Sheets-Sheet 3

Fig 7

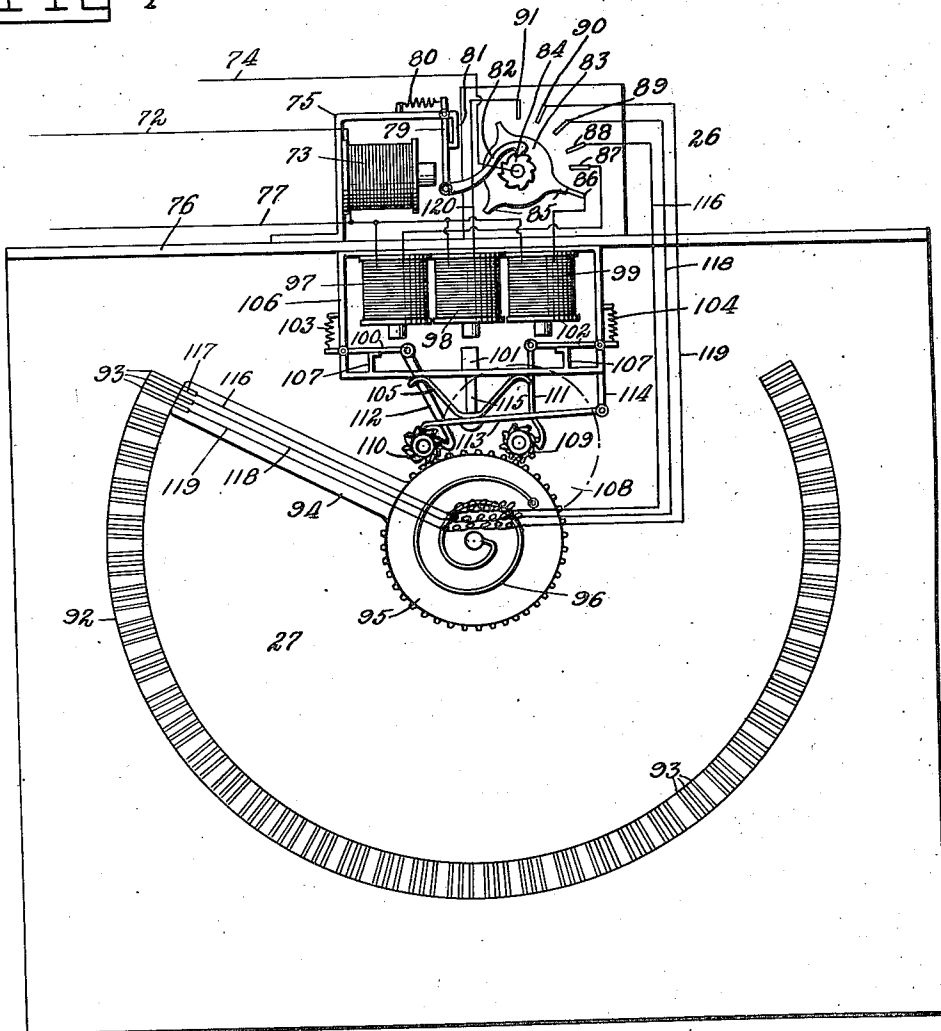
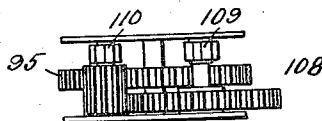


Fig 8



Inventor

Samuel Katz

By

C. F. Gaezel

Attorney

Aug. 28, 1923.

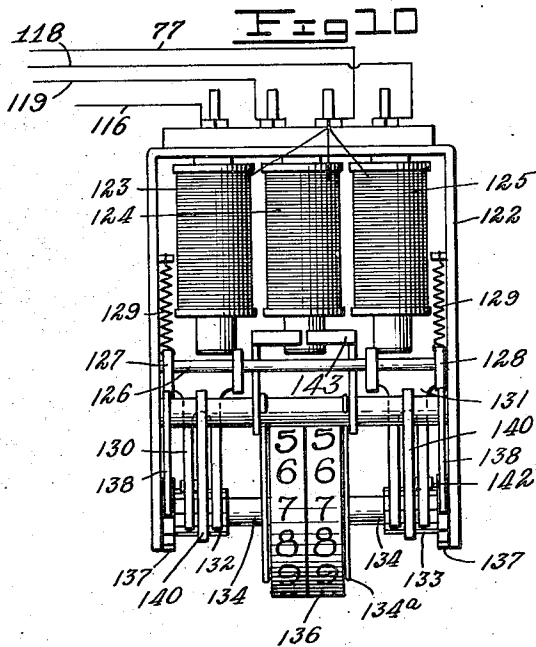
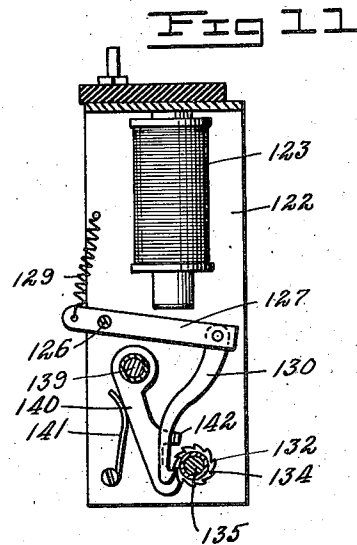
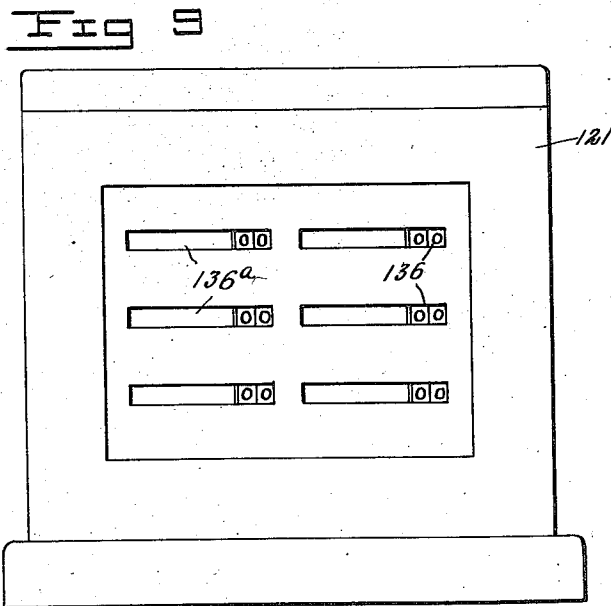
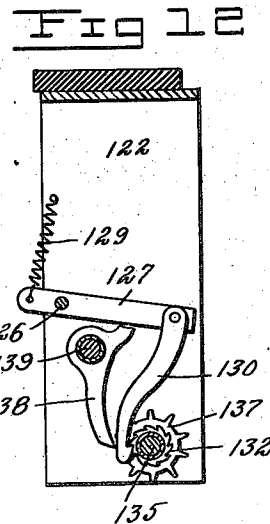
1,466,448

S. KATZ

ANNUNCIATOR OR INDICATOR SYSTEM

Filed July 22, 1921

4 Sheets-Sheet 4



Inventor

Samuel Katz

C. P. Goepel

Attorney

UNITED STATES PATENT OFFICE.

SAMUEL KATZ, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO LOUIS J. FRANK, OF NEW YORK, N. Y.

ANNUNCIATOR OR INDICATOR SYSTEM.

Application filed July 22, 1921. Serial No. 486,790.

To all whom it may concern:

Be it known that I, SAMUEL KATZ, a citizen of the United States, and resident of New York city, borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Annunciator or Indicator Systems, of which the following is a specification.

The present invention relates to annunciator or indicator systems, and more particularly to a device of this character which entails electro-mechanical mechanism.

An object of the present invention is to provide an indicator system of this character which is adapted for use under such conditions as exist in hospitals, factories, stores, ships and the like where it is necessary to locate certain individuals, such as doctors, officials, etc., wherever they may be by registering at a central office the local station near or at which the individual may be located.

Another object of the present invention is to provide a system or apparatus of this character which may be automatically actuated by use of selective keys carried individually by the persons whose whereabouts are to be indicated, and a system which requires no skill or manipulation other than inserting a key in the keyhole at a local station box and withdrawing the key therefrom, the system thus being adapted for use with a key which may be carried at all times by the person and which is not left in the key or switch box of the local station.

Another important feature of the present invention is in the provision of electro-mechanical devices which are selectively operated by keys of different characters to not only actuate certain indicating mechanism at the main station or office for registering the particular local station at which the key is used, but to also indicate at the main station or office the particular characteristic, number or letter, by which the individual key is known.

The invention further aims at the provision of an annunciator system of this character which embodies a peculiar combination of electro-mechanical contrivances reducing the various circuits to a minimum in

numbers and parts and which may be easily installed and easily maintained in working condition.

Briefly stated, the invention embodies a central station having a number of indicators, a selector connected to the indicators for selectively connecting the same in the main circuit for subsequent operation and for subsequently transmitting through the main circuit such electrical impulses as are required for the transmission of the various intelligences or indications desired with respect to the selected indicator, and a plurality of local stations or boxes adapted to interchangeably receive individually characterized keys for actuating the impulse imparting devices within the local stations or key boxes, whereby circuits are closed connecting the selected local station with its corresponding indicator in the main station and for subsequently closing the main circuit through such connected local and main stations.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Fig. 1 is a general plan view of the system constructed according to the present invention and illustrating the electrical circuits employed;

Fig. 2 is a front elevation of one of the local stations or key boxes;

Fig. 3 is a front view with the face plate removed;

Fig. 4 is a longitudinal section of the same, the adjacent side wall being removed;

Fig. 5 is a similar view, with parts broken away to show the interior construction of the device;

Fig. 6 is a side elevation of one form of key which may be used;

Fig. 7 is an end elevation of the selecting means, showing one of the selectors in section;

Fig. 8 is a plan view of a train of gearing which may be employed in the selecting means;

Fig. 9 is a front elevation of the main station showing a group of indicators mounted therein;

Fig. 10 is a front elevation of one of the indicators, the view being enlarged;

Fig. 11 is a vertical section taken through the indicator of Fig. 10; and

Fig. 12 is a similar view, certain parts being omitted.

Referring to Sheet 2 of the drawing, 25 designates local stations or key boxes which may be of any required number and are adapted to be placed in different locations, such as upon different floors of a building and in different wings or sections of the building for establishing local stations at known points throughout the building. Each local station 25, see Figure 1, is electrically connected to a selector 26 which is arranged at preferably some convenient portion of the building and may be located in the office of the telephone switchboard operator. These selectors 26 cooperate with a common selective contact ring 27, see Fig. 7, and the latter has electrical connection with indicators 28, see Fig. 1, which may be of any desired number and which have their fixed contacts in the ring 27.

Each local station or key box 25 comprises a body casing of suitable size and configuration adapted to be mounted in or upon a wall and which may be generally of the construction of the usual outlet box. Mounted within the box or body 25, see Fig. 3, is a frame 29 for supporting the mechanism and which preferably has an upwardly offset bottom portion 30 forming a guide for supporting a pair of rack bars 31 and 32 arranged in opposite sides of the casing adapted for independent movements. The casing carries a transverse shaft 33 upon which is mounted a pair of sleeves 34 and 35 provided with peripherally notched discs 36 and 37 respectively adapted to turn with the sleeves upon the shaft 33 and having pinions 38 on the sleeves meshing with the racks 31 and 32 for movement thereby.

Extending longitudinally in the upper part of the casing, as shown, is an insulating block or support 39 carrying contact straps 40, 41 and 42 which are bent U-shape, and the contacts 40 and 41 being fitted over the upper edge of the bar 39 with its side portions at opposite sides of the bar and terminating in different lengths from the top of the bar. The free ends of the strap 40 terminate in flexible contact strips 43 which are bent outwardly at right angles to the strap 40 and extend forwardly therefrom along the sides of the bar to a point substantially intermediate the ends thereof. The strap 41 has flexible contact strips 44 which are similarly bent out substantially at right angles to the strap 41 and which project forwardly therefrom in spaced relation

beneath the strips 43. The contact strip 42 is secured about the lower edge of the bar 39 at preferably its rear end portion and has a strip part 45 which lies against the lower edge of the bar 39 and extends to a point near the forward end of the same. This contact strip 42 is adapted to receive a main wire from a battery, an exciter or other suitable source of electric energy.

The forward end of the bar 39 is provided with another contact strip 46 provided with a spring tongue 47 located beneath the block 39 and overlapping the forward end of the strip 45 and normally urged by its inherent tension out of contact therewith. The tongue 47 is adapted to be pressed and retained against the strip 45 for closing the circuit through the strip 45 and tongue 47 by an arm 48 mounted on a sleeve 49 and which has a depending finger 50 adapted to be thrust inwardly for raising the arm 48 and pressing the tongue 47 against the contact strip 45. The sleeve 49 also has a releasing finger 51 depending in the path of the rack 32 and adapted to be engaged thereby, as the latter moves forwardly in the casing toward its normal inactive position. The finger 50 is of sufficient length to project into the path of a key 52 which is adapted to be inserted in the key slot 53 formed in the cover or front wall 54 of the casing.

The contact strip 46 carries a pair of vibrating tongues 55, one at each side of the block 39 and each tongue 55 has upon its free end an enlarged or rolled over portion 56 forming a wiper presenting upper and lower contact faces adapted to vibrate between the upper contact strip 43 and the lower contact strip 44. The wiper 56 of each contact 55 is provided with a projection 57 in the form of a wiper bearing which extends laterally relatively to the block 39 and engages across the peripheral edge of the adjacent notched disc, 36 or 37. The strip 55 is thus vibrated between the strips 43 and 44 by the turning of the adjacent disc. The notches or serrations formed in the periphery of the disc correspond to the number and time intervals of the closing of the different circuits in which the strips 43 and 44 are included. Each disc 36 and 37 is independently urged into a position of rest by a spring 58, see Fig. 3, having one end secured to the frame 29 and its other end secured to the adjacent sleeve 34 and 35. The rack bars 31 and 32 are thus normally urged forward and rest against the outer end or face plate of the casing. The frame 29 is provided with another transverse shaft 59, see Fig. 4, upon which is mounted to turn a sleeve 60 having at one portion a depending projection 61 which lies in the path of the forward end of the rack 31 so that the rack, when returned to normal position

of rest, strikes the finger 61 and turns the sleeve 60 accordingly. The sleeve 60 has near its other end a depending and rearwardly projecting locking dog 62 adapted to cooperate with a ratchet disc 63 mounted upon the sleeve 35 and with the teeth of the disc 63 facing forwardly toward the nose of the dog 62. A light spring 64 normally urges the dog 62 against the ratchet 63 for locking the disc 37 from turning after the rack bar 32 has been moved inwardly by the key 52.

The face plate 54 of the casing is provided with the key slot 53 of desired configuration and which accommodates the barrel of the key and the latter is preferably centered between the rack bars 31 and 32 by a centering pin 65 projecting from the rear end of the frame 29. The key 52 has at opposite sides flanges 66 and 67 which may be varied in length according to the individuality of the key and which are adapted to engage at their outer ends the forward extremities of the racks 32 and 33 for retracting the racks to various extents according to the distances through which the notched discs 36 and 37 are to be turned. This variable formation of the flanges 66 and 67 is indicated in Fig. 6 by dotted lines as at 68 and 69 showing the flanges 66 and 67 of different lengths.

When the key 52 is inserted in the slot 53, the key being centered on the pin 65 is forced inwardly until the flanges 66 and 67 engage the forward ends of the rack bars 31 and 32. As soon as this condition arises the rack bars are carried backwardly with the key and the discs 36 and 37 are rotated until the key 52 reaches its innermost position. As the key 52 approaches its innermost position the detent or projection 70 on the inner side and at the top of the barrel of the key strikes the finger 50 and swings the sleeve 49 to raise the arm 48 against the spring tongue 47 and thus close a circuit through the contact 45, tongue 47 and vibrating strips 55. When the sleeve 49 is thus turned the releasing finger 51 is also swung with the sleeve inwardly into the path of the forward end of the rack 32, the rack having first been retracted by its key flange 67.

By a modified arrangement of the component parts the mechanisms could be operated by inserting and rotating the actuating key.

The key 52 is now withdrawn. The pawl 62 holds the disc 37 from turning but the spring 58 of the disc 36 is permitted to immediately actuate the disc to turn it toward its normal position of rest. The result is that the undulated peripheral edge of the disc 36 causes the vibration of the strip 55 between the contacts 43 and 44 and thus alternately closes the circuit through these

contacts and through the branch circuits which include such contacts. When the rack bar 31 approaches its normal position of rest, the rack bar strikes the projection 61 and swings the sleeve 60 to move the pawl 62 out of engagement with the ratchet disc 63, permitting the other spring 58 to operate its disc 37 toward a normal position of rest. The disc 37 causes the vibration of the other spring contact 55 between the spring contacts 43 and 44 at the other side of the block 39. Thus the circuit from the main contact 42, connected to wire 71, is alternately closed in the branch circuits of the contacts 43 and 44, connected respectively to wires 72 and 74. The rack bar 32, on approaching its normal position of rest, strikes the finger 51 and swings the sleeve 49 in a direction to move the arm 48 down and release the spring tongue 47 from the main contact strip 45, thus opening the main circuit. The parts are now in position of rest and ready for insertion of the same or another key having the flanges 66 and 67 of desired length. The lengths of the flanges 66 and 67 determine the distances through which the discs 36 and 37 are turned, and consequently the number of impulses or vibrations effected by the alternate closing of the main circuit through the branch circuits.

Referring now to Figs. 1 and 4, particularly, it will be noted that the local station or key box has the main contact, 42 and 45, connected to a main wire 71, while the upper branch contact 40 is connected to wire 72 which leads to the actuator 73 of the selector 26 and the lower branch contact 41 is connected to a wire 74 which leads directly to the selector 26.

Each time the circuit is closed through the contact 43 and wire 72, the actuator 73 is operated to adjust the selector 26. As shown in Fig. 7, particularly, the actuator comprises a magnet mounted in a suitable frame 75 carried on the top of an insulating board or casing 76. The magnet 73 is grounded in a wire 77 which leads to a battery 78 constituting the source of electric energy for operating the various devices of the system. The magnet 73 has an armature 79 normally urged by a spring 80 away from the extremity of the core of the magnet and against a suitable stop 81 determining the outer position of the armature. The armature carries a pawl 82 pivoted to the free end of the armature and adapted to actuate the selector.

The selector comprises a rotary contact member 83 mounted upon the board 76 in proximity to the pawl 82 and provided with a ratchet wheel 84 with which the pawl 82 engages for intermittently advancing the rotary contact member. The member 83 is provided preferably with three equidistantly spaced apart contact fingers 85 ar-

3 ranged to traverse a series of contacts 86, 87, 88, 89, 90 and 91 which may be seated in commutator fashion in an insulating segment over which the contact arms 85 may traverse.

5 The board 76 is provided with an arcuate insulating section 92 in which are embedded groups of three each of contacts 93 which correspond in number to that of the
10 keys 52 and which compose the substantial or body portion of the selected contact ring 27. These groups 93 of contacts also correspond in number to the number of indicators 28 employed at the central or main
15 station, and arranged coaxially and concentrically within the ring 92 is a pivoted arm 94 provided with a gear wheel 95 by means of which the arm 94 may be turned to traverse the groups of contacts 93, and a
20 spring 96 is connected at one end to the arm 94 and at its other end to the board 76 for normally urging the arm 94 into a position of rest. The means for operating the arm 94 comprise three magnets 97, 98 and 99
25 having respectively the armatures 100, 101 and 102 normally urged into a position of rest in spaced relation from the cores of the magnets by their respective springs 103, 104 and 105. The armatures and springs
30 are mounted upon a frame 106 supported upon the upper portion of the board 76 and provided near its opposite lower corners with upstanding rests or stops 107 upon which the end armatures 100 and 102 normally
35 rest. The gear wheel 95 is connected to a suitable train of gearing 108 comprising any suitable number of correctly proportioned gears and pinions and including ratchet wheels 109 and 110 arranged to be
40 engaged by pawls 111 and 112 respectively, the pawl 111 having connection with armature 102, while the pawl 112 is connected to armature 100. The ratchet 110 also serves
45 as a means for locking the train of gearing 108 from retrograde movement after adjustment of the arm 94. This is effected by means of a locking dog 113 pivoted at one end to an extension 114 of the frame 106
50 and having a projecting end portion adapted to engage the ratchet 110 to hold it from turning when either the pawls 111 or 112 are advanced by their respective springs 103 and 104 to obtain a new grip upon their respective ratchets.

55 The armature 101 has a stem 115 which is connected at its lower end to the locking dog 113 so that upon energization of magnet 98 its armature 101 is elevated to lift the locking dog 113 out of engagement with its ratchet 110 to release the train of gears 108. The spring 105 is compressed by such
60 action and the spring is of U-shape with its ends overturned and engaging the pawls 111 and 112 for the purpose of swinging said pawls in opposite directions and out-

wardly away from their respective ratchet wheels to clear the same. Under such conditions the spring 96 is permitted to operate for returning the arm 94 to its normal position of rest and turning the intermeshing train of gears 108 therewith.

70 The rotary contact member 83 is connected to the wire 74, and by its rotation is adapted to selectively include the contacts 86 to 91 in circuit with the wire 74. The
75 first contact 86 is connected to the magnet 99 for actuating the pawl 102. The second contact 87 is connected to the magnet 97 for actuating the armature 100. The third contact 88 is connected to a wire 116 which
80 leads to the arm 94 and terminates in a contact piece 117 seated in the outer end of the arm. The arm 94 has three contact pieces 117 adapted to wipe against the inner face of the ring 92 and to traverse the groups of
85 contacts 93. The fourth contact 89 is connected by wire 118 to the middle contact piece 117 of the arm 94, while the fifth contact 90 is connected by wire 119 to the remaining contact 117 of arm 94 for transmitting the current from the selected wires 116, 118 or 119 to the corresponding contacts in the groups 93 for purposes which
90 will hereinafter appear.

95 The sixth contact 91 is connected by a wire 120 to the central magnet 98 which is closed in the circuit by operation of the magnet 73 when the impulse imparting disc 36 begins to move after being released by the key 52. The first impulse therefore
100 which is transmitted to the selector energizes the magnet 98 and restores the arm 94 to initial position so as to primarily reset the indicators and the selectors into their zero positions before making a new call.

105 When the rotary contact member 83, see Fig. 7, is moved to place one of its arms or fingers 85 upon the contact 86, and an impulse is transmitted through wire 74, the magnet 99 is energized with the result that
110 the armature 102 is raised to turn the ratchet 109, operate the train of gears 108, and consequently swing the arm 94 a corresponding distance. Should a number of successive impulses be transmitted through the contact
115 86, the armature 102 will be correspondingly vibrated to thus intermittently step the arm 94 forwardly. When the rotary contact member is advanced by the actuator 73 to bring the arm 85 upon the contact 87, the
120 continued operation of the train of gears 108 and the selector arm 94 is effected but through the energizing of the magnet 97 and the vibration of its armature 100. After
125 the arm 94 has been brought opposite the desired group 93 of contacts to place the respective indicator 28 in communication with the local station or box, the rotary contact member 83 is advanced, first to rest upon
130 contact 88 when the position of the indicator

is normal, then stepped to contact 89 to transmit impulses through wire 118, for operating the tens on the indicator, is then moved to contact 90 to transmit impulses through wire 119 for operating the units on the indicator 28. The rotary contact member is then advanced to the final contact 91 whereby further impulse energizes the releasing magnet 98 and returns all of the parts of the selector to normal position, re-setting the arm.

At the main station, such as indicated in Fig. 9 at 121, there may be a cabinet or casing containing a plurality of indicators 28. Each indicator is of the type specifically shown in Figs. 10, 11 and 12. Each indicator has a main frame 122 in the upper part of which are mounted magnets 123, 124, and 125. The magnets are grounded at one side in the wire 77, while the magnets are respectively connected to the wires 116, 119 and 118. The frame 122 carries a transverse rod 126 upon the opposite end portions of which are pivoted armatures 127 and 128 which project across the forward ends of the cores of magnets 123 and 125 respectively and are normally urged away from the pole pieces of these magnets by springs 129.

The free ends of the armatures 127 and 128 have pivotally connected thereto forked pawls 130 and 131 which project away from the magnets and normally engage ratchets 132 and 133 respectively. The ratchets 132 and 133 are mounted on a pair of sleeves 134 which are arranged to turn upon a transverse shaft 135 secured in the frame 122 and the sleeves 134 have upon their adjacent inner ends each a number or indicating wheel 136 operating adjacent a space 136^a in the face of the station box containing the number or name of the particular individual being located. Each sleeve 134 carries upon its outer end portion a toothed wheel 137 adapted to be engaged by a locking dog 138 arranged to hold the sleeves 134 in advanced position subsequent to each operation of the adjacent pawl 130 or 131. A transverse shaft 139 is arranged in the frame 122 and carries a pair of locking pawls 140 which project between the forked arms of the pawls 130 and 131 and engage the ratchets 132 and 133 and which are normally urged against the ratchets 132 and 133 by springs 141, and which, upon turning of the shaft 139, may be lifted out of engagement with the ratchets 133.

The pawls 140 have projections 142 which engage beneath the forked pawls 130 and 131 to lift the same out of engagement with the ratchets 133 upon the turning of the shaft 139. The shaft 139 carries armatures 143 which are arranged in proximity to the core of the magnet 124 so that when the lat-

ter is energized the opposite ends of the tubular shaft 139 are rotated sufficiently to lift the pawls 140 and the parts connected thereto for releasing both of the sleeves 134.

The pawls 138 are arranged to hold the sleeves 134 from racing forward under impulses of the pawls 130 and 131 and are raised and lowered by the rocking of the sleeves 139 when raised by travel of the pawls 140 over their respective ratchets 132 and 133.

In operation and use of this annunciator or indicating system, the same may be installed in a building, ship or manufacturing plant of considerable size with the local stations or key boxes 25 arranged on different floors and also in different wings or sections of the building. Doctors, nurses, or attendants may each be provided with an individual key 52, the keys being built on some system, such as that illustrated, where they are distinguished one from the other in the lengths of the flanges 66 and 67. Each key box has one of its discs, such as the disc 36, provided for the most part with a smooth peripheral edge but having a corrugated or undulating section adapted to transmit impulses to one of the indicators 28 after the selected indicator has been coupled with the local station or key box being operated upon.

When a person desires to announce at the central station his whereabouts in the building, it is only necessary that the person insert his individual key 52 into the nearest local station or key box, push the key into the box to the full extent, and then withdraw the key therefrom, no further operation being required on the part of the person.

When the key is inserted in the box the flanges 66 and 67 engage the rack bars 31 and 32 in proper sequence and slide the same inwardly to the various degrees required and dependent upon the lengths of the flanges 66 and 67. This action, as before described, turns the discs 36 and 37 and places the same in position for subsequent operation before the main circuit through the wire 71 is closed through the switch box. As the key approaches its innermost position the projection or lug 70 of the key strikes the finger 50 and closes the main circuit through the switch box. As the key is withdrawn the disc 36 is first set in operation to cause the intermittent closing of the circuit through the wires 72 and 74 for operating the selector so as to connect one of the indicators with the operated local station, and such operation depends upon the individual formation of the key so that by observing the selected indicator the person having the key 52 will be determined. As soon as the disc 36 has completed its operation, the disc 37 is then permitted to operate

under tension of its spring 58 so as to transmit impulses to the selected indicator, such operation of the indicator showing the specific local station which is set in operation.

5 In the selector 27 the arms 94 may be arranged in closely spaced apart relation as there is an arm 94 for each actuator 73 and the latter correspond in number to that of the local stations 25.

10 From Figures 4 and 5 it will be noted that the discs 36 and 37 of the local station have certain lobes higher than others. These higher lobes elevate the contact pins 57 sufficiently to close the upper contacts 43 and 56 and send an impulse through the wire 72 and magnet 73. This latter magnet 73 is actuated only when it is desired to shift the wheel 83 of the selector to control the movements of the arms 94 and the number 20 wheels of the indicators. The intermediate lobes or projections of the discs 36 and 37 merely provide recesses between the lobes to admit the dropping of the pins 57 to close the contacts 44 in circuit with the wire 74 and actuate the number wheels in the indicators 28.

When an indicator has been properly connected by the selector with a local station or key box 25, the current is transmitted 30 over the wire 116 to magnet 123 which actuates one of the number wheels 136, this number wheel being used for tens numbers. The disc 37 of the key box has its peripheral edge so formed as to step the selector to the 35 next contact after the desired number of tens has been indicated on the tens wheel 136 for closing the circuit through wire 118. Further impulse energizes magnet 125 and causes the unit wheel 136 to be advanced as desired. As soon as a desired number is 40 reached the further automatic operation of the key box actuates the selector to close the circuit through wire 119 of the magnet 124, thus actuating the armatures 143 and releasing the number wheels 136. The number 45 wheels are then returned to normal position under tension of their springs 134^a.

I have illustrated and described a preferred and satisfactory embodiment of my 50 invention, but it is obvious that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

What is claimed is:

55 1. In an annunciator system, a plurality of local stations, each including means for producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations, impulse responsive means for setting 60 each indicator for various indications, means interconnecting said stations and said indicators including impulse responsive selecting means for connecting an operated station 65 with a corresponding selected indica-

tor in response to the first group of impulses to permit the indicator to respond to the second group.

2. In an annunciator system, a plurality 70 of local stations, each including manually operable means for automatically producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations, impulse 75 responsive means for setting each indicator for various indications, means interconnecting said stations and said indicators including impulse responsive selecting means for connecting an operated station with a corresponding selected indicator in response to 80 the first group of impulses to permit the indicator to respond to the second group.

3. In an annunciator system, a plurality 85 of local stations, each including means for producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations, impulse responsive means including a plurality 90 of electro responsive devices for setting each indicator for various indications, means interconnecting said stations and said indicators including impulse responsive selecting means for connecting an operated 95 station with a corresponding selector and impulse responsive means operated by the first group of impulses to operate the selector to connect the selected indicator, and to thereupon cut the selector out of operation 100 and also responsive to the second group of impulses to successively connect the electro-responsive devices of the selected indicator for operation by the second group of impulses.

4. In an annunciator system, a plurality 105 of local stations, each including manually operable means for automatically producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations, impulse 110 responsive means including a plurality of electro responsive devices for setting each indicator for various indications, means interconnecting said stations and said indicators including impulse responsive selecting 115 means for connecting an operated station with a corresponding selector and impulse responsive means operated by the first group of impulses to operate the selector to connect the selected indicator, and to thereupon 120 cut the selector out of operation and also responsive to the second group of impulses to successively connect the electro-responsive devices of the selected indicator for operation by the second group of impulses.

5. In an annunciator system, a plurality 125 of local stations, each including means for producing successive groups of electrical impulses, a plurality of step-by-step indicators corresponding in number to the number 130 of stations and biased to non-indicating po-

sition, impulse responsive means for stepping said indicators to indicating positions, means for holding said indicators in indicating positions means interconnecting said stations and said indicators including impulse responsive selecting means for connecting an operated station with a corresponding indicator and impulse responsive means operated by the first group of impulses to operate the selector to connect the selected indicator, and to thereupon cut the selector out of operation and also responsive to the second group of impulses to successively connect the impulse responsive means and the holding means of the indicator for operation by the second group of impulses.

6. In an annunciator system, a plurality of local stations, each including manually operable means for automatically producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations, impulse responsive means including a plurality of electro-responsive devices for setting each indicator for various indications, means interconnecting said stations and said indicators including impulse responsive selecting means for connecting an operated station with a corresponding selector for single and multiple step advancement of the latter and impulse responsive means operated by the first group of impulses to operate the selector by single and multiple stepping to connect the selected indicator, and to thereupon

cut the selector out of operation and also responsive to the second group of impulses to successively connect the electro-responsive devices of the selected indicator for operation by the second group of impulses.

7. In an annunciator system, a plurality of local stations, each including means for producing successive groups of electrical impulses, a plurality of indicators corresponding in number to the number of stations and each having a plurality of number wheels, impulse responsive means for each indicator including an electro responsive device for each number wheel for setting each indicator for various indications, means interconnecting said stations and said indicators for including impulse responsive single and multiple step-by-step advancing selecting means for connecting an operated station with the corresponding indicator and impulse responsive distributing means operated by the first group of impulses to commit the selector for operation by single and multiple steps to connect the selected indicator and to thereupon cut the selector out of operation and also responsive to the second group of impulses to successively connect the electro responsive devices of the separate number wheels of the selected indicator for operation by the second group of impulses.

In testimony that I claim the foregoing as my invention, I have signed my name hereunder.

SAMUEL KATZ.