

No. 862,209.

PATENTED AUG. 6, 1907.

A. L. SOHM.  
ELECTRIC SIGNAL SYSTEM.  
APPLICATION FILED SEPT. 22, 1906.

4 SHEETS—SHEET 1.

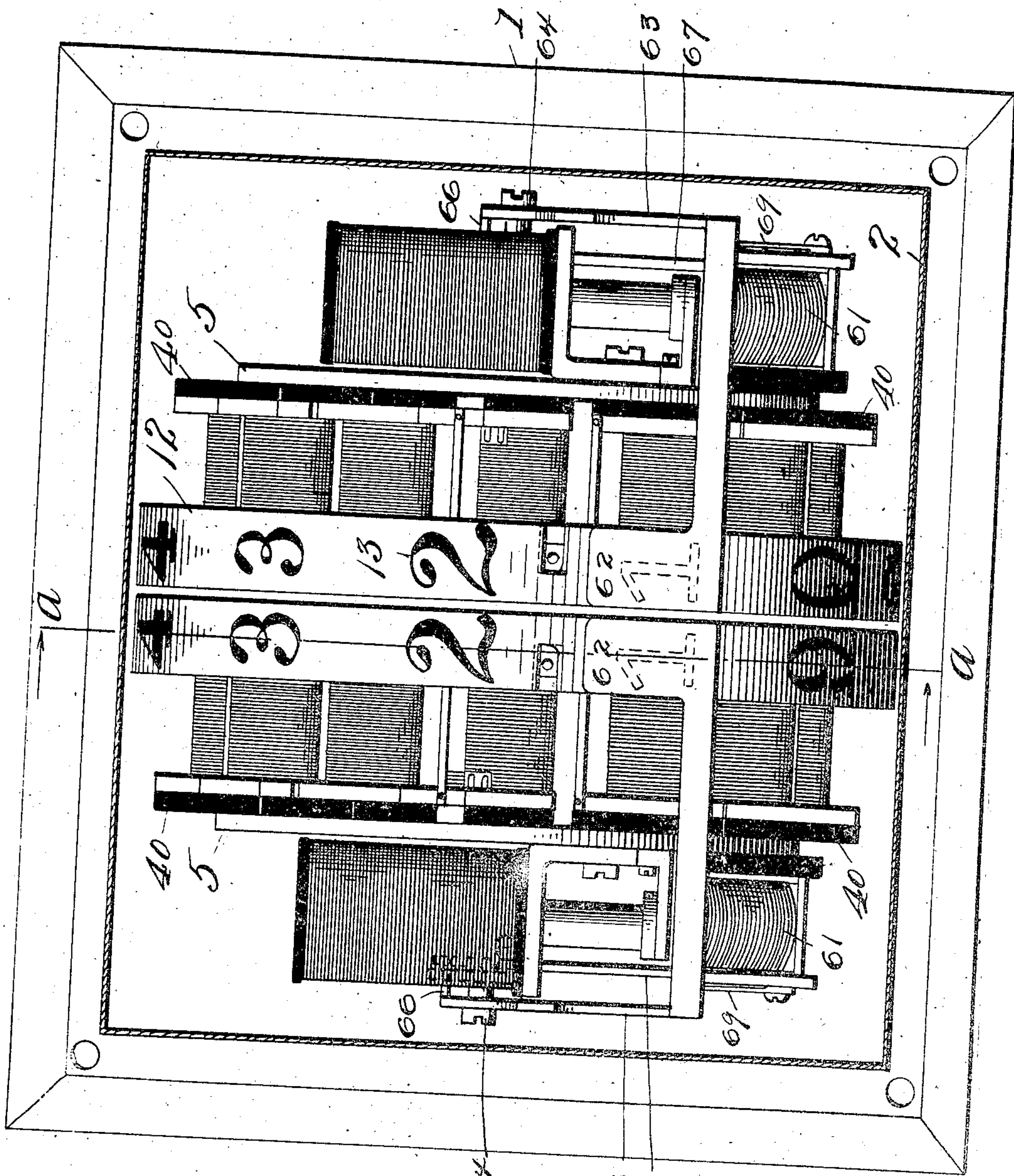


Fig. 1.

Witnesses  
Chas. T. Davies,  
John Bowles

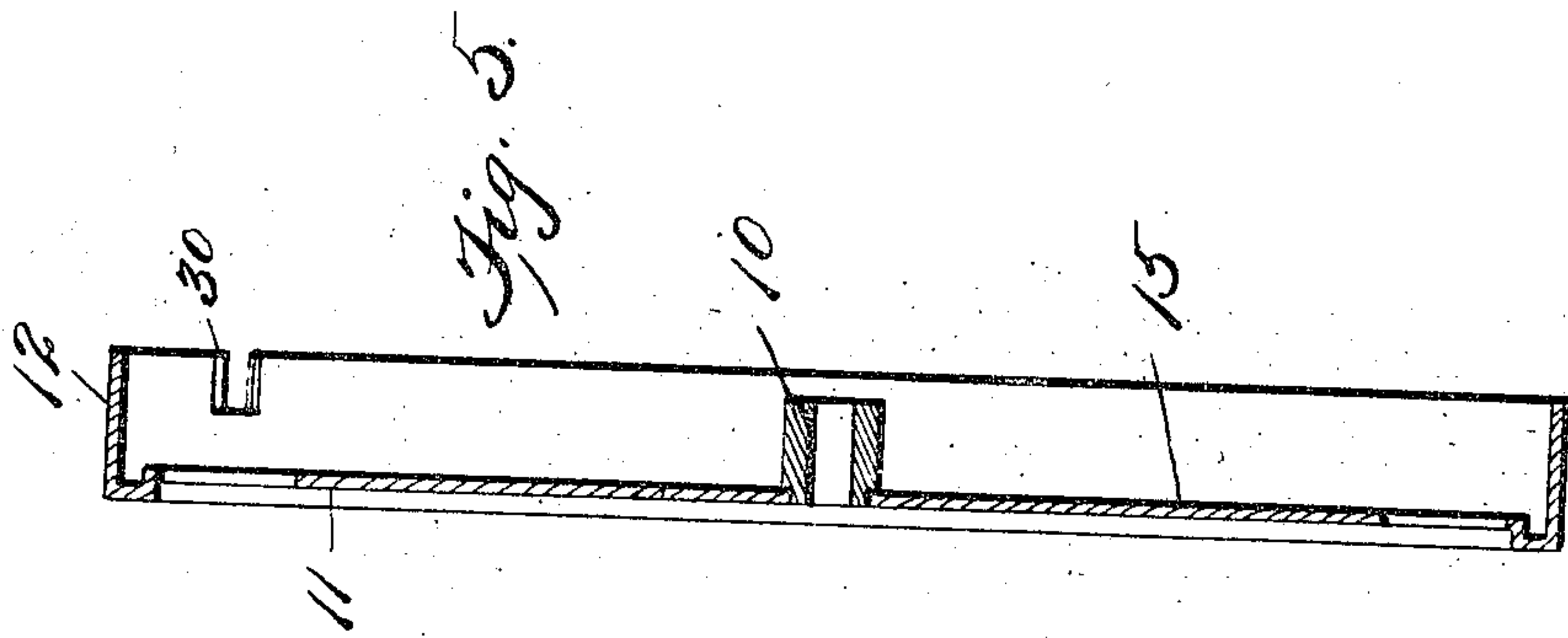
Inventor  
A. L. Sohm  
Shepherd Parker  
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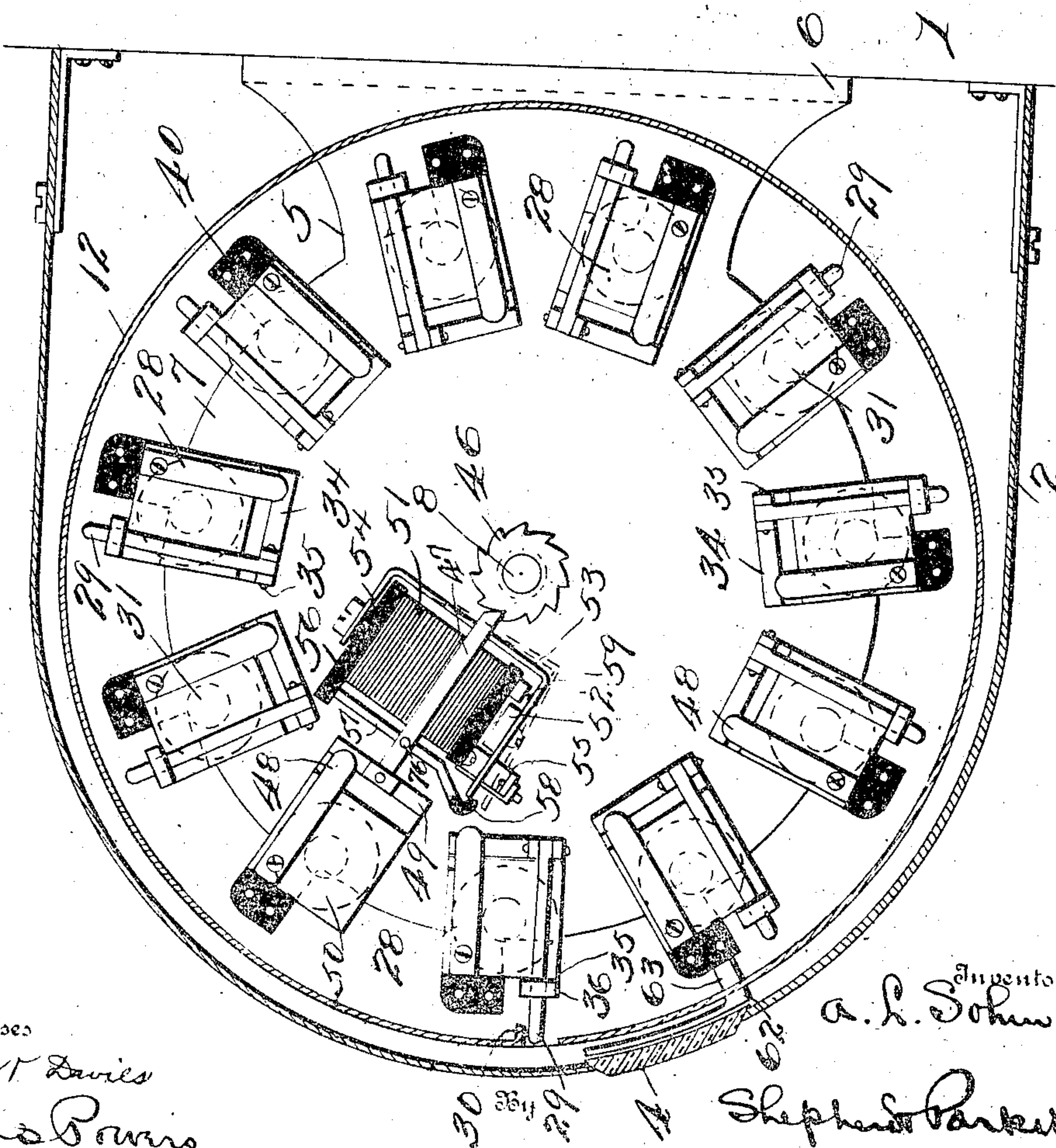
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4 SHEETS—SHEET 2.



*Fig. 1.*



Witnesses  
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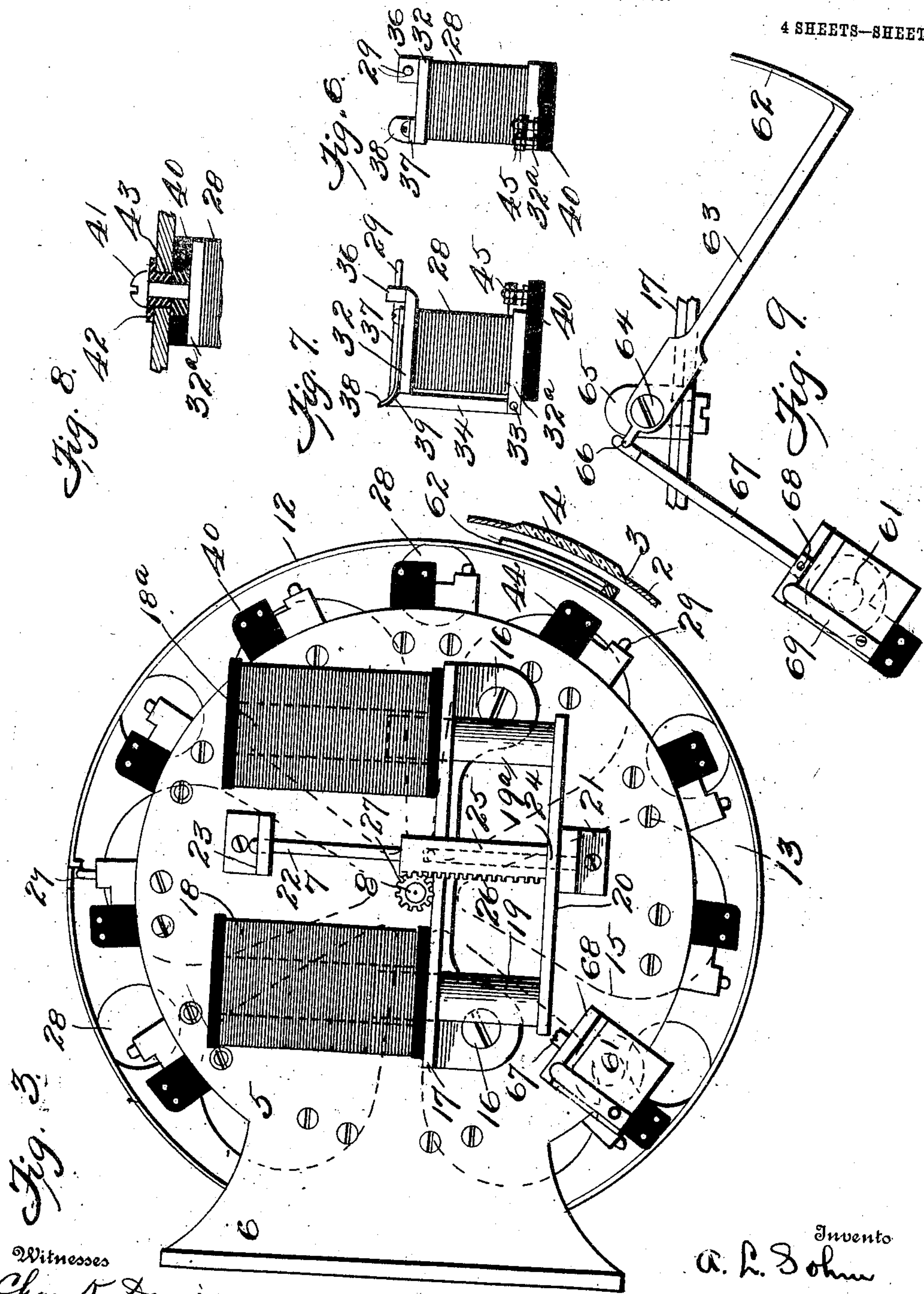


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4 SHEETS—SHEET 3.



Witnesses  
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4 SHEETS—SHEET 4.

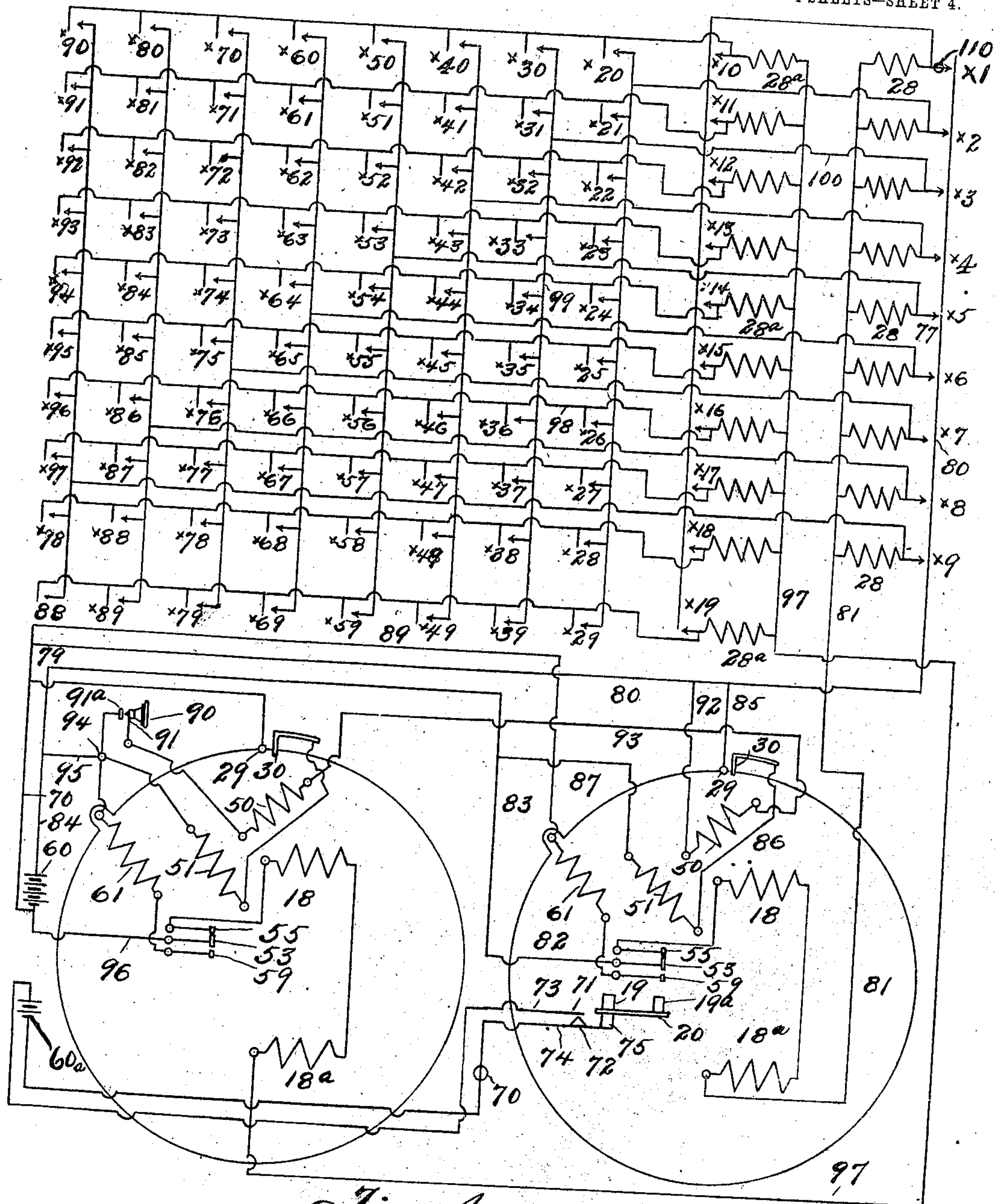


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

ALFRED L. SOHM, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO NATIONAL ELECTRIC WORKS,  
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## ELECTRIC-SIGNAL SYSTEM.

No. 862,209.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed September 22, 1906. Serial No. 335,831.

To all whom it may concern:

Be it known that I, ALFRED L. SOHM, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have  
5 invented certain new and useful Improvements in Electric-Signal Systems, of which the following is a specification.

This invention relates to electric signals and signal indicating mechanism and has particular reference to  
10 an improved receiving station or annunciator and system of wiring for use in connection therewith.

One of the principal objects of the invention is to provide a signal or call system in which signals or calls from any number of stations may be indicated by the  
15 employment of a number of electro magnets or solenoids controlling the exhibition of the indicating figures, corresponding to the number of digits required to produce the various numbers by which the stations are designated.

Another object of my invention is to produce an improved signal or call system in which signals or calls from individual stations are designated by figures arranged upon one or more rotatably mounted dial members, the number or numbers corresponding to the  
20 station from which a call is sent being exhibited through a suitably arranged sight opening.

Another object of the invention is to provide in a signal or call system, one or more rotatable number-bearing dial members adapted to be automatically  
30 retained by an electrically controlled stop or brake, in any position in which it is moved to designate the station from which a signal is received, until moved from such position by the action of an attendant.

A further object of my invention is to provide in a  
35 signaling system means to automatically open the circuit between all of the calling stations and the receiving station and utilize an electric current carried by a local circuit to operate the signal after a call is given, until the first named circuit is closed by an attendant.

A still further object of my invention is to provide means for apprising a person sending a call from a calling station as to whether or not his call is received and indicated at the receiving station.

Further objects of my invention are to provide a  
45 signal system whose cost of manufacture and maintenance is low, which requires only a small amount of current for its operation, which is rapid and reliable in its action, is perfectly adapted for use in connection with call bells, telephones, and burglar alarms, and  
50 whose receiving station or signal indicating mechanism occupies but a small part of the space required by devices at present in use for the same purpose.

With these and other objects in view the present invention consists in the combination and details of  
55 construction and arrangement set forth in the following

description and particularly pointed out in the appended claims.

In the drawings: Figure 1 is a front view of an annunciator embodying the principle of the present invention, having two dial wheels and adapted to record  
60 calls from not to exceed 99 stations, the cover or casing of the device being shown in section for clearness of illustration. Fig. 2 is a sectional view taking on line A—A of Fig. 1 looking toward the left. Fig. 3 is an end elevation of the annunciator looking at its left  
65 side with certain features omitted for clearness of illustration. Fig. 4 is a diagrammatic view of the windings of the receiving station and outlying circuits, the windings of the electro magnets which control the exhibition of the indicating figures being shown outside  
70 of the area of the receiving station for clearness of illustration. Fig. 5 is a central cross sectional view of one of the dial wheels upon which the indicating figures are located. Figs. 6 and 7 are respectively side and top detail views of one of the coils used to stop the dial  
75 at the right point in its rotation to display a number corresponding to the station from which a signal is sent. Fig. 8 shows in section the manner of securing the said coils to their support, and Fig. 9 is a detail view showing in elevation the shutter and mechanism  
80 for operating the same.

For purposes of illustration I have shown my invention as embodied in a call bell signal system and an annunciator. I will now proceed to describe such system and annunciator constructed and arranged in  
85 accordance with my invention.

In the drawings in which like numerals of reference represent corresponding parts throughout the several views 1 is a support upon which is removably secured a suitably formed casing 2 provided with an aperture  
90 or sight opening 3 which may be closed with a glass or other transparent medium 4. Secured to the support 1 within the casing 2 is a bracket 5 preferably of brass or other non-magnetic metal comprising a base or support 6 and a preferably circular disk 7 in the center of which  
95 is provided a suitable bearing for a shaft 8 to the inner end of which is rigidly secured the hub 10 of a dial wheel 11 provided with a flat peripheral flange 12. The dial wheel 11 is preferably formed of aluminium and for the purpose of lessening its weight portions thereof  
100 are cut out as shown in Fig. 3, the part remaining preferably comprising an outside ring 13 joined to a central ring 14 by the arms or spokes 15.

Mounted upon the outer side of the bracket 5 by any suitable means, as screws 16, is a horizontal bracket 17  
105 upon which is rigidly mounted dial actuating solenoids 18 and 18<sup>a</sup>. Within these solenoids are disposed movable cores 19 and 19<sup>a</sup> adapted to be drawn up into the solenoids upon their being energized. Cores 19 and 19<sup>a</sup> are rigidly secured to a plate 20 which normally rests  
110



upon the small bracket or stop 21 from which a guide, rod 22 extends upward to a similar bracket 23. The rod 22 extends through an opening 24 in the plate 20 as shown. Rigidly secured to the plate 20 and extending centrally upward therefrom is a tube or sleeve 25 adapted for reciprocatory movement upon the guide rod 22 which passes through the opening therein.

Mounted upon one side of the tube or sleeve 25 is a rack 26 which engages a pinion 27 rigidly secured upon the shaft 8, the parts being so disposed that when the solenoids 18 and 18<sup>a</sup> are energized by the closing of any push button in the outlying wiring the cores 19 and 19<sup>a</sup>, together with plate 20 and rack 26 will be drawn upward and by means of the engagement of the said rack with pinion 27 the shaft 8 carrying the dial wheel 11 will be rotated, and unless the rotation of the latter is checked or impeded it will rotate until the members carried upon its periphery will have all successively passed the sight opening 3. It is to be understood therefore that when any push button or any outlying line of the system is pressed the current which is thereby permitted to flow will pass through and energizing of solenoids 18 and 18<sup>a</sup> and thereby effect a rotating of the dial wheel 11 sufficient to cause each of the members carried thereby to successively pass the sight opening 3 unless the said rotation is checked before it completes such movement.

I will now explain the means which I employ to check the rotation of the dial wheel at a point in its above described movement such that a figure, or in the case of the use of a plurality of dial wheels, a plurality of figures indicating the number of the push button pressed will appear opposite the sight opening. Secured upon the inner side of the bracket 5 are a series of electro magnets corresponding to the number of figures arranged upon the peripheral surface of the dial wheel, such numbers comprising the digits from 1 to 9 in the case of small systems when only one dial wheel is required. Where two or more dials are required the second dial which I term the tens dial and is arranged to the left of the other, displays members from one to nine, while the right hand dial, or what I term the units dial displays a cipher in addition to the digits displayed by the tens dial. Where more than one dial is employed, numbers from 1 to 9 are exhibited on the left hand dial. In case three or more dials are required, all but the left hand dial will display the zero in addition to the nine digits displayed upon the right hand dial. In the case of a dial arranged to indicate from stations from one to nine, nine of the electro magnets 28, which I will hereinafter refer to as stop coils, will be used and each of them be in circuit with a corresponding push button through the coils of the dial actuating solenoids 18 and 18<sup>a</sup>. Each of the stop coils is adapted, when energized to move a pin 29 outward into the path of a lug or offset 30 stamped or otherwise produced upon the periphery of the dial wheel 11. The effect therefore of energizing any of the stops coils 28 is to check the rotation of the dial wheel 11 by the engagement of the offset 30 with the pin 29. The stop coils connected in circuit with stations or push buttons from one to nine inclusive are arranged consecutively around the edge of the bracket 5 so that when the stop coil, connected with any numbered station, is energized the rotation of the dial will be checked at the point in its

movement when the corresponding number on the dial is opposite the sight opening 3. In this way a signal from any station is indicated and the station identified by the number exhibited through the sight opening.

In the production of my stop coils and associated mechanism I wind the coils about a soft iron core 31 and provide ends 32 and 32<sup>a</sup> therefor, said ends comprising rectangular plates of soft iron arranged with reference to the coil as shown in Figs. 6 and 7. Pivoted to one of the end plates as 32<sup>a</sup>, by means of the pivot pin 33 is an armature 34 which extends lengthwise of the coil as shown.

The armature is secured to the plate 32<sup>a</sup> in such a relation that the armature is prevented from moving out of the range of influence of the soft iron plate 32 by the engagement of the outer portion of said armature with the inner surface of the plate 32<sup>a</sup> when the armature is moved outward more than a small fraction of an inch. Pivotaly secured to the free end of the armature 34 by means of the pivot pin 35 is a stop pin 29 adapted to be moved outward into the path of the lug or offset 30 when the stop coil is energized. The pin 29 moves through an opening 35 in the guide member 36 which is rigidly secured to the end plate 32.

The armature 34 is normally held away from the soft iron plate 32 by means of the spring 37 having a curved outer end 38 engaging an inclined surface 39 on the free end of said armature. When the coil is energized and the armature attracted by the magnetism of the plate 32 the spring 37 is pressed outward by the movement of said armature. When the coil is deenergized the spring presses the armature away from the plate 32.

The stop coils 28 are rigidly secured about the edge of the disk portion 7 of the bracket 5 in the positions indicated in Fig. 2 of the drawing. Interposed between the coils and the said disk is a plate 40 of fiber or other suitable insulating material serving to insulate the stop coils 28 from the metal disk. In securing the coils to the disk I preferably employ a screw 41 adapted to be received within the core 31, the said screw being insulated by a socket 42 received within an opening 43 in the disk 7. The fiber plates 40 are provided with an extension 44 in which are provided a plurality of openings adapted to receive wire engaging sockets or binding posts 45. The ends of the wire on the coil 28 are secured within the inner ends of the sockets or binding posts 45, the outside winding to be connected with said coil being connected with the outer ends of said sockets or binding posts.

It will be understood from the foregoing description that where there are nine or less stations numbered to correspond with corresponding figures on the dial 11 that push buttons or other signal producing means will each be in circuit with the dial actuating solenoids 18 and 18<sup>a</sup> and with one of the stop coils 28 arranged to check the movement of the dial at a point in its movement to display a number corresponding to the number of the station.

The weight of the cores 19 and attached parts is sufficient to return the dial to its normal position in which no number is displayed through the sight opening. As no means is provided for retaining the stop pins 29 in contact with the lug or offset 30 after the current energizing the stop coil has ceased to flow it is obvious



that the dial would only indicate the number of the station from which a signal is sent for a brief period unless some means is provided for preventing return of the dial to its normal position.

5 To hold or lock the dial in a position to indicate the number of a station from which a signal has been sent I provide a ratchet 46 upon a shaft 8 to which the dial is rigidly secured. Cooperating with the teeth of said ratchet is a pawl or dog 47 which is pressed against the  
10 ratchet by the spring 48. The outer end of the pawl or dog 47 is secured to the armature 49 of a release coil 50 which corresponds in general construction and arrangement with the stop coils 38, but as shown, has no stop pin secured to the armature. When the release  
15 coil 50 is energized the armature 49 will be drawn toward it against the influence of the spring 48 and will release the pawl or dog 47 from engagement with the ratchet 46 thereby permitting the dial wheels to rotate to their normal positions.

20 Arranged between the release coil 50 and the shaft 8 and in proximity to the pawl or dog 47 is a relay coil 51 provided with an armature 52 disposed in juxtaposition to one end of the core of the said coil and which normally occupies the position shown in dotted lines in  
25 Fig. 2. The armature is mounted upon a spring 53 of phosphor bronze or other non-magnetic spring metal, said spring being insulated from the relay coil 51 by suitable insulation 54. Disposed in proximity to the free end of spring 53 and normally in contact therewith is a contact point 55, said spring and contact point  
30 forming a part of the signal circuit in which the signal sending means, solenoids 18 and 18<sup>a</sup> and stop coils 28 are located. It will be evident therefore that it is essential that the outer end of the spring 52 shall be in  
35 contact with contact point 55 in order that a signal from a signal station shall be received and indicated at the signal indicating means or annunciator.

Pivoted at 56 to one end plate of the relay coil 51 is a rod or arm 57 having a hooked end 58 preferably formed  
40 or covered with suitable insulation and adapted to engage the free end of the spring 53 and hold the same in the position shown in full lines in Fig. 2 after the armature has been drawn toward the core of the relay coil. The attraction of the relay coil upon the armature 52  
45 serves to bring the spring 53 into contact with contact point 59 and thereby close a local circuit designed to accomplish certain purposes to be hereinafter more fully described. By reference to Fig. 4 of the drawing it will be seen that the local circuit above mentioned  
50 includes a battery 60, the spring 53, contact point 59 and a coil 61 whose purpose will be hereinafter explained. One end of the described circuit is connected to the frame work of the stop coils 28, the frame work of all of said coils being electrically connected  
55 together. The other end of the described circuit is connected to the operating mechanism of the device at any convenient point as by a connection with the bracket 6 which is in electrical contact through the shaft 8 with the dial wheels 11. When, therefore, any  
60 part of the metallic portion of the stop coils 28 or attached mechanism contacts with any part of the dial wheel 11, the local circuit above described will be completed and current from the battery 60 will pass through coil 61, contact point 59, and spring 53 as  
65 hereinbefore described. In the operation of my de-

vice this circuit is closed by the contact of any one of the stop pins 29 with the lug or offset 30. The coils 61 in the above described local circuit is arranged to operate a shutter 62 designed to normally conceal the portion of the dial adjacent the side opening 3. The shutter is  
70 carried at the end of the arm 63 pivoted at point 64 to a bracket 65 carried by and extending above the solenoid supporting bracket 17. To the end of the short arm 66 is pivotally connected a link 67 which is in turn pivotally secured to the armature 68 of the shut-  
75 ter operating electro magnet 61. For clearness of illustration, portions of the shutter operating mechanism are omitted from Fig. 3, such parts being clearly illustrated in Fig. 9. The construction of the electro mag-  
80 net 61 is similar to that of the stop coils except that no stop pin is employed in connection therewith.

The armature 68 is normally held away from the adjacent end of the coil by the spring 69 which operates in this connection in the manner heretofore described in connection with the spring 37. It will thus be seen  
85 from the foregoing that the immediate result of any of the stop pins 29 contacting with the lug or offset 30 is to energize relay coil 51 thereby opening the circuit between the stop coils and the various outlying stations and permitting a local current to pass through the  
90 shutter operating coil 61 thereby raising the shutter to display the number adjacent the aperture or sight opening. The shutter is always closed until a number is in position to be exhibited through the sight opening 3 so that no movement of the dial is ever to be observed  
95 through said opening.

To direct the attention of an attendant to a call sent in, I employ a bell, buzzer, electric light or other signal designated in the drawing by the reference numeral  
100 70. This signal or alarm is located in a special local circuit which includes the battery 60<sup>a</sup> and terminates in contact points 71 and 72 which are carried by any suitable spring arms 73 and 74 respectively. An extension 75 on spring arm 74 is normally engaged by  
105 the plate 20 carrying the cores 19 and 19<sup>a</sup> as shown in Fig. 4. The engagement of the plate 20 when in its lower or normal position with the extension 75 of the spring 74, serves to press contact point 72 away from contact point 71. When, however, the solenoids 18 and 18<sup>a</sup> are energized and the plate 20 is raised in con-  
110 sequence thereof the contact points 71 and 72 come together and the signal or alarm is operated until the plate 20 returns to its normal position.

After a signal has been given and the station indicated on the dial, the device may be reset to receive  
115 other calls by energizing the release coil 50 which has been hereinbefore described. Upon energizing electro magnet 50 the drawing up of the armature 49 not only disengages the pawl or dog 47 from the ratchet 46, but also causes the spring arm 57 to release the spring 53,  
120 thereby permitting the latter to contact with contact point 55 by which the apparatus is again placed in connection with the outline circuits. The above described movement of the arm 57 is due to its pivotal connection with the pawl or dog 47 at point 76 shown in Fig. 2.  
125

For purposes of illustration of my invention I have shown the electrical connection of ninety nine stations with the central or receiving station or annunciator and have illustrated such station or annunciator as provided with two indicating dials which are suffi-  
130



cient to indicate or identify calls from any station in the system shown. It is to be understood that additional dials may be employed for systems having a larger number of stations, one dial being sufficient to indicate calls from any one of nine stations, two dials being sufficient to indicate calls from any one of ninety nine stations, three dials being sufficient to indicate calls from any one of nine hundred and ninety nine stations and so on.

For convenience of illustration I have shown stop coils 28 which in a two dial annunciator are associated with the left hand dial, outside of the limits of the receiving station or annunciator. When a signal is sent in from any station, as for instance, from station  $X^5$  as by pressing the push button 77 at that station, the current will pass from the battery 60, through line 78, point 79, from thence along line 80, to push button 77, from thence through stop coil 28 designed to stop the rotation of the dial to exhibit the numeral 5 through the sight opening, from thence along line 81 to the disk actuating solenoids 18 and 18<sup>a</sup>, from there to contact point 55 through spring 53 and back to the battery 60 by way of lines designated as 82, 83 and 84. It is to be understood that the number 5 exhibited as above described is carried on the left hand or tens dial shown on the left hand of Fig. 1 of the drawing and in upper portion of Fig. 4.

When the dial comes to a position to indicate the number of the station in which the signal is given, stop pin 29 will be in contact with the lug or offset 30 thereby closing the local circuit from the battery along lines designated as 78, 79 and 80, to point 85, from thence through pin 29, and offset 30, along line 86 through the relay coil 51, from thence along line 87 to line 83 and back to the battery 60.

As hereinbefore described the energizing of the relay coil 51 will break the contact between the spring 53 and contact point 55 and will establish contact between said spring and contact point 59 thereby closing a local current from the battery 60 along line 78 to a point 88 and thence along line 89 through the shutter actuating coil, to and through contact point 59 and back to the battery, by way of lines 82, 83, and 84.

When the dial is to be reset pressure upon the release key 90 will close the circuit between contact points 91 and 91<sup>a</sup>, thereby permitting the current to pass from battery 60, along lines 78, 80 and 92 to and through the pawl release coil 50 of the units dial, from thence by way of line 93 to and through the pawl release coil 50 of the tens dial, from thence through release key 90 to point 94 and back to the battery by way of lines 95 and 84.

When a signal is to be sent to any station whose designated number is above nine, the closing of the circuit as by pressing a push button will establish a circuit through the units coil corresponding to its units digit and through the tens coil corresponding to its tens digit. I have designated the units coils in the two dial annunciator illustrated in Fig. 4 as 28<sup>a</sup>. Consider for example that a call is sent from station  $X^{36}$  by closing a circuit at that point, the current from battery 60 will pass by way of line 96 to the spring 53, thence to contact point 55 through the tens dial-actuating solenoids 18 and 18<sup>a</sup>, thence by way of lines 97 to and through units coil number 8, from thence by way of line 98,

to and through the push button at station  $X^{36}$  from thence along lines 99 and 100, to and through tens coil number 3 and from thence by way of line 81 to and through the units solenoid 18 and 18<sup>a</sup>, through contact point 55 and spring 53 and from thence to the battery 60 by way of lines 82, 83 and 84.

At each station in the system is preferably located a single stroke electric bell 110 shown in connection with station No.  $X^1$  in Fig. 4. This bell will sound whenever the push button at station 1 is closed, if the circuit between said push button and the annunciator is closed. If however the circuit is open the bell will not sound so that a person operating the signal will know that his signal is not indicated on the annunciator.

From the foregoing description it will be understood that I have provided an improved signal system and signal indicating means accomplishing the objects hereinbefore stated.

It is to be understood that I have only shown and described one embodiment or illustration of my invention and that such invention is not to be considered as limited thereto except as specified in the appended claims.

Having fully described my invention what I claim is:

1. In an electric signal system, a signal indicating device comprising a dial, means to bring a number on said dial corresponding to the number of a station from which a signal is sent into a position to be observed, means adapted to close a local circuit when the dial comes to rest in the said position, and a relay coil in said circuit adapted when energized to open the circuit between the signal indicating means and the outlying stations.

2. In an electric signal system, a signal indicating means comprising a dial, means to bring the said dial into a position to display a number corresponding to the number of the station from which a signal is sent, a shutter normally preventing the display of said dial, means adapted to close a local circuit when the dial comes to the said position, a relay coil in said circuit, means associated with said relay coil to open the circuit between the signal indicating means and the outlying stations and to close a local circuit, and a shutter actuating coil adapted to move the said shutter out of its normal position to permit the observation of a number in a position to be displayed.

3. In an electric signal system, a signal indicating means, a dial associated therewith, electrically actuated means to display a number on said dial corresponding to that of a station from which a signal is sent, means to automatically hold the said dial in a position to display said number, automatic means to open the circuit between the signal indicating means and the outlying stations when the dial is moved into position to display a number corresponding to that of a station from which a signal is sent, and electrically actuated means adapted to release the dial to permit it to regain its normal position and close the circuit between the signal indicating means and the outlying station.

4. In an electric signal system, a signal indicating means comprising a dial, a shutter normally concealing a portion of the same, means to open the circuit between the said signal indicating means and the outlying stations when a signal is received and indicated and close a local circuit, a shutter operating coil therein adapted to move the said shutter and means to simultaneously close the circuit between the coil indicating means and open the said local circuit.

5. In a signal system, a signal indicating means comprising a rotary dial, an electrically controlled stop or brake adapted to hold the same in any position in which it is placed, a relay coil adapted to be energized when a signal is received and indicated, means actuated by said coil to open the circuit between said signal indicating means and outlying stations, means to maintain the circuit open, and electrically operated means adapted to release the dial to permit it to return to its normal position,



said means operating to simultaneously close the circuit between the signal indicating means and the outlying station.

6. In a signal system, a plurality of signal stations and a signal indicating means comprising a dial, a plurality of figures carried thereon, means to cause said dial to rotate when a signal is received from any signal station stop coils severally in circuit, with each of the said stations and each of said coils adapted to stop the said dial in position to indicate the number of the station in series therewith, and means to break the circuit in which said coils and stations are located.

7. In an electric signal system, a signal indicating means comprising a rotary dial carrying numbers to be displayed, means to rotate said dial to bring the numbers carried thereby successively into a position to be observed, a series of electrically actuated means severally in circuit with the individual stations in the system, said means being arranged in proximity to said dial and each of said means adapted when a signal is set from any station to advance a stop or brake element into the path of movement of a portion of said dial, the parts being so arranged that when the dial is stopped a number will be in position to be observed which will correspond with the number of the station from which the signal is sent, means to automatically hold the dial in said position and electrically operated means adapted to effect the release of said dial, said dial being adapted upon such release to return to its normal position.

8. In an electric signal system, a signal indicating means comprising a rotary dial adapted to exhibit figures carried thereon through a sight opening, a series of electrically controlled instrumentalities corresponding in number to the number of figures on the dial, said instrumentalities being severally in circuit with individual stations in the system and adapted when a signal is sent from any station to stop the movement of said dial to exhibit a number corresponding to the number of the station from which the signal is sent, means for resetting said dial, the said indicating means being adapted to automatically open the circuit between itself and each signal station upon receiving a signal from such station and to maintain said circuit open until the means for resetting the dial has been actuated.

9. In an electric signal system, a signal indicating device comprising a dial, means for rotating said dial to successively bring the numbers thereon into a position to be observed when a signal is sent from any station in the system, a series of electrically controlled means corresponding in number to the number of figures on the dial, each of said means being in circuit with individual stations in the system and each being adapted when a signal is sent from any station to engage a portion of said dial to check its movement at a point to display a number corresponding to the number of the station from which said signal is sent, means to hold the dial in any position in which it is placed and electrically actuated means to re-

lease the said dial, said dial being adapted upon such release to return to its normal position.

10. In an electric signal system, a signal indicating device adapted to indicate a station from which a signal is sent, means actuated by said signal indicating device adapted when a signal is received to close a local circuit in which is located a shutter operating coil adapted to display a figure on said signal indicating device when said shutter operating coil is energized.

11. In an electric signal system a signal indicating device adapted to indicate the number of a station in the system from which a signal is sent, automatic means adapted to open the circuit in which each of said signal stations is located when a signal is sent therefrom and means at each station in the system adapted to indicate whether the circuit in which said station is located is open or closed.

12. In a signal system, a plurality of signal stations, a signal indicating means comprising a plurality of dials, the right hand dial carrying a plurality of digits, coils adapted to control the indication or display of each of said digits, each of said coils being in electrical communication with all signal stations the units figure of whose number corresponds with the digit, the display of which is controlled by said coil, the dial to the left of the first named dial carrying a series of digits, coils adapted to control the indication or display of each of said digits, each of said coils being in electrical communication with all signal stations the tens figure of whose number corresponds with the number the indication or display of which is controlled by said coil, and one of the number-indicating coils of the tens dial being in circuit with one of the number-indicating coils of the units dial when a signal is sent from any station in the system.

13. In a signal system, a plurality of signal stations, a signal indicating means comprising a plurality of adjacent dials, the right hand dial carrying the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9, a like number of coils adapted to control the indication or display of the said digits, each of said coils being in circuit with all stations, the units figure of whose number corresponds with the number the display of which is controlled by the said coil, the dial to the left of the first named dial bearing a series of consecutive digits, a like number of coils adapted to control the indication or display of said digits, each of said coils being in circuit with all of the stations, the tens figure of whose number corresponds with the number the indication or display of which is controlled by the said coil, and also in circuit with one of the coils controlling the indication or display of the digits on the units dial, when a signal is sent from any station.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED L. SOHM.

Witnesses:

S. C. HILL,

JOHN S. POWERS.