

1,128,126.

Patented Feb. 9, 1915.

3 SHEETS—SHEET 1.

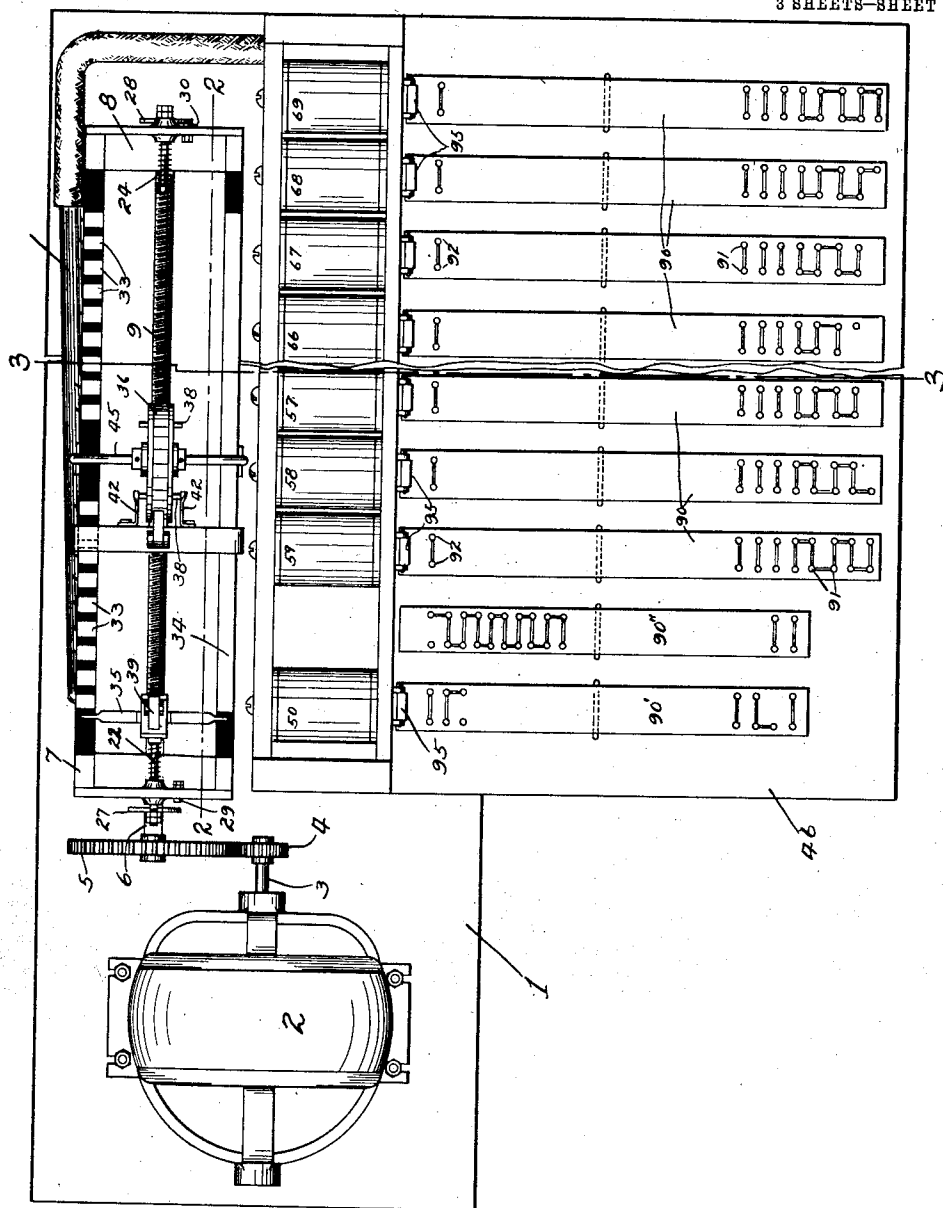


FIG. 1.

WITNESSES:

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R. M. Oyarzo

INVENTOR

George Furrer

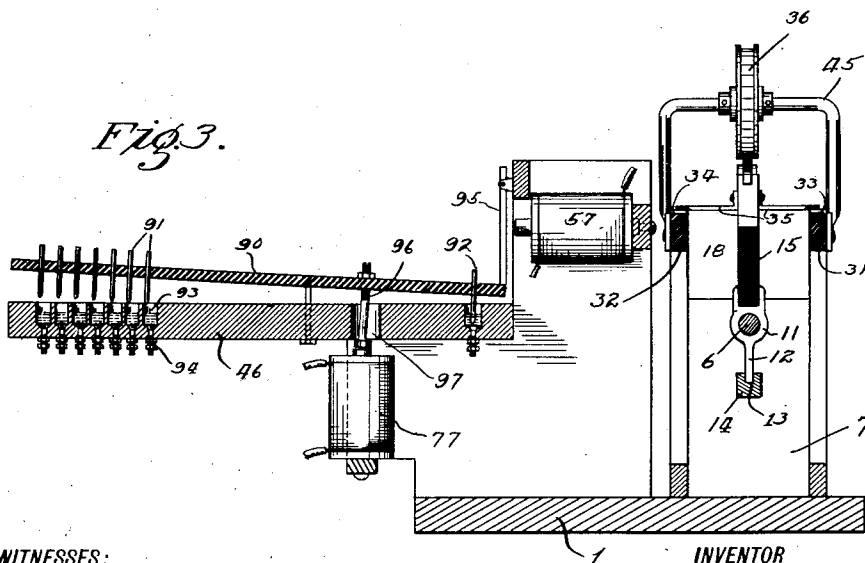
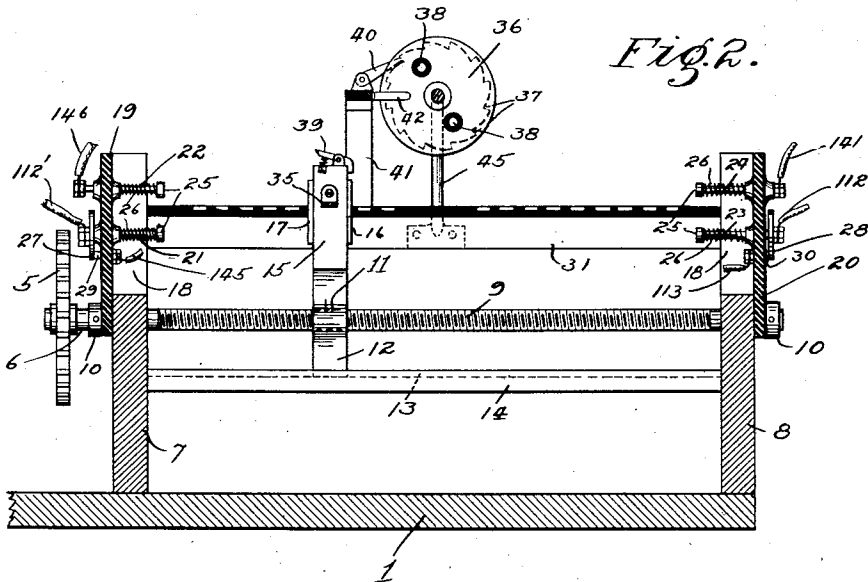
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3 SHEETS-SHEET 2.



WITNESSES:

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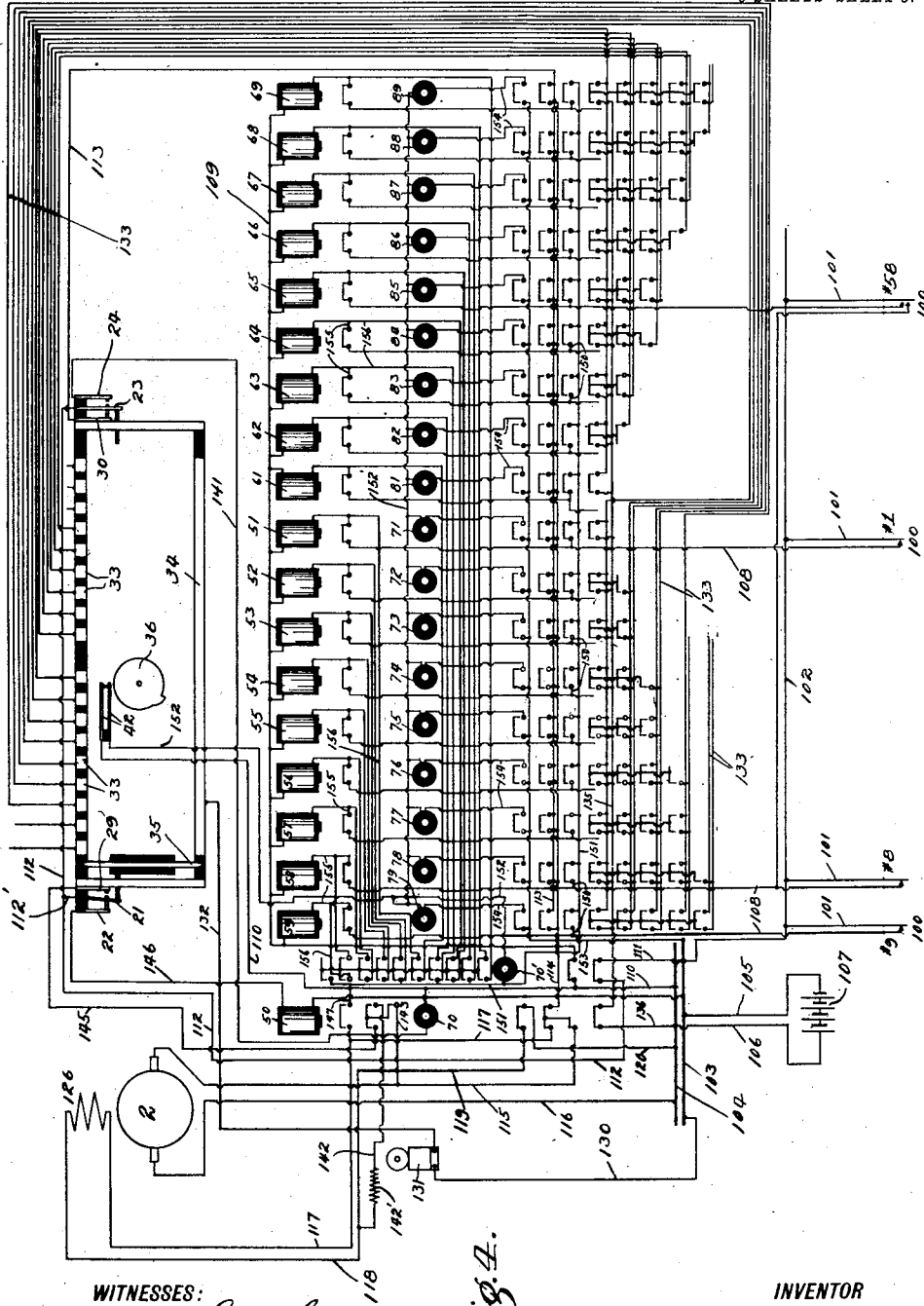
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Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE FURRER, OF OAKLAND, CALIFORNIA.

SIGNAL SYSTEM.

1,128,126.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed April 21, 1914. Serial No. 833,379.

To all whom it may concern:

Be it known that I, GEORGE FURRER, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Signal Systems, of which the following is a specification.

This invention relates to improvements in signaling systems and more particularly to audible signaling systems used in connection with burglar alarms, fire alarms and other devices having a number of stations at which contact is adapted to be made.

The object of my invention is to provide a mechanism by which a number is automatically sounded a given number of times at one or more points. The number thus sounded corresponding to the number of the stations from which the signal was initiated thus indicating the window or door opened or the location of a fire.

Another object of my invention is to provide mechanism for sounding signals from 1 to 99 with as few electromagnets as possible, and still another object is to provide means for stopping the sounding mechanism after the code has been repeated a given number of times, restoring all parts to normal.

With these and other objects in view my invention consists in the novel construction and combination of parts as herein described and more specifically pointed out in the annexed claims.

Reference should be had to the accompanying drawings forming a part of this specification wherein: Figure 1 is a view in plan of the improved mechanism for sounding the audible signal. Fig. 2 is a view in section on the line 2—2 Fig. 1. Fig. 3 is a view in section on the line 3—3 Fig. 1. Fig. 4 is a diagrammatical view of the circuit used in connection with my system.

Referring to the corresponding parts by the same numerals of reference, 1 denotes a base on which is mounted a driving motor 2, to the shaft 3 of which is attached the pinion 4 meshing with a gear 5 keyed to shaft 6. This shaft is journaled in end plates 7 and 8 and between these plates is screw threaded as shown at 9, suitable collars 10 being provided to prevent end move-

ment. In threaded engagement with the threaded portion of the shaft 6, is a member 11 having depending end 12 which engages a groove 13 in the bar 14, by this means holding member 11 in an upright position. A groove is formed on the upper side of this member 11 wherein is attached an insulating block 15, on the sides of which are attached conducting plates 16 and 17. The end brackets 7 and 8 are cut out at the center thereof as shown at 18, and attached adjacent this cut out portion are insulating plates 19 and 20 wherein are slidingly mounted contact members 21—22 and 23—24 respectively. Each of these members is provided with an enlarged head 25, which is adapted to contact with one of the plates 16 or 17 and surrounding each stem is a coil spring 26 holding the head 25 extended from the supporting plate. Members 21 and 23 are provided with enlarged disks 27 and 28 respectively, which make contact with 29 and 30 respectively.

Between the end plates 7 and 8 are the longitudinal strips 31 and 32, the former having mounted thereon a plurality of conduction plates 33 the latter having a conducting strip 34. Blocks 33 are in this case arranged in two groups of nine each, a uniform space being provided between each member of the groups and a longer space between the two groups. It will be understood that if my device is to be used where only nine signals are required, one of these groups will be omitted and, correspondingly, where signals above 99 are required, a third group must be added.

Extending laterally from the block 15 are two conductively connected arms 35, one of which is adapted to rest on the blocks 33 while the other rests on strip 34 thus forming conducting path between these members. It will be evident that when the shaft 6 is rotated in one direction, member 11 and associated parts will move to the right and when rotated in the opposite direction the same will move to the left. At the end of its travel to the right, electrical contact will be made between members 23 and 24, at the same time breaking contact between 28 and 30; likewise at the extreme left contact is made between 21 and 22 and broken between 22 and 29.

Pivotally mounted on a support 45 centrally above the path of member 15 is a wheel 36 having the ratchet teeth 37 and the axially conducting blocks 38. On the upper end of block 15 is mounted a spring urged pawl 39 adapted to make contact with the ratchet teeth each time this block moves to the left, and as herein shown rotate the wheel 36 one-twelfth of a revolution. Pawl 40 pivotally mounted on the support 41, preventing backward movement of this wheel. Extending from this support are spring conducting arms 42 adapted to contact with the blocks 38. Adjacent this mechanism is a framework wherein is mounted an electromagnet numbered 50 and two groups numbered 51 to 59 inclusive, and 61 to 69 inclusive, and forming part of this frame is a plate 46 below which are mounted electromagnets 70 and 70', and two groups numbered 71 to 79, inclusive, and 81 to 89 inclusive, and pivotally mounted centrally above each of these electromagnets is an oscillating insulating bar 90, having in one end a plurality of contact pins 91 and in the other end a pair of contact pins 92, the various pins being connected by jumpers as shown in Fig. 1.

The bars controlled by electromagnets 70 and 70' are numbered 90' and 90'' respectively, and are provided with a plurality of contact pins on each end which contact with mercury wells as shown in the core of bars 90. Below each of the contact pins is a small cavity 93, from the bottom of which extends a binding post and conducting screw 94 and each of these cavities is partially filled with mercury or other liquid conducting material. The bars are so weighted that the end containing pins 91, which will be hereinafter termed the front end, will be normally pulled down by gravity and these pins being brought into the conducting liquid. Each of the electromagnets 50 to 59, 61 to 69 inclusive, is provided with a pivotally mounted armature 95, which extends over the rear end of bar 90 and when the latter is depressed so that pins 92 contact with their mercury wells, prevents its return to the normal position. To depress this end of the bars, there are provided electromagnets 71 to 79 and 81 to 89 inclusive, having armatures 96 attached to the bar back of the pivotal point and extending through a suitable opening 97 in the base 70.

Referring now the circuit: 100 denotes the contact devices at which the signals are initiated #1 denoting that this device which sounds the alarm once, #8 that which sounds eight times and #58 that which sounds it five times with a pause and then eight times. Each of these devices is connected from one side by conductors 101 with a conductor 102 which in turn is connected

to a busbar 103. The other busbar is denoted by 104 and these are connected by conductors 105 and 106 with a source of current 107.

The contact devices 100 which sound members 1 to 9 are provided with a conductor 108 from the other side, which is connected through the contacts 92 of bar 90 to the corresponding electromagnet of group 51 to 59. The other terminal of all these magnets are connected to conductor 109 which passes through a pair of contact pins on the front end of 90'' and thence through conductor 110 to busbar 104. Thus when any device 100 makes contact the circuit is closed over the corresponding electromagnet drawing its armature 95 from the path of bar 90, allowing the front end of the latter to drop, opening the circuit through the coil by the lifting of contact 92 and placing contacts 91 in the front end in their mercury wells.

Bars 90' and 90'' are normally down at their front ends, consequently, when the front end of a bar 90 drops a circuit is established from busbar 103 over conductors 111 through a pair of contact pins on the front end of bar 90'' conductor 112, contacts 23 and 30 conductor 113 through the contact pair of that bar 90, which is down on the front end conductor 114 the connected contact pins on front end of bar 90', conductor 115 the motor armature conductor 116 to the other busbar. At the same time the field coils 126 receive current through conductor 117 attached to one of the said connected pins in bar 90' return over conductor 118 a pair of contact pins on the front end of bar 90' conductor 120 to busbar 104. This starts the motor and turns the screw so as to move 11 to the right arms 35 making conductive connections between 33 and 34. Strip 34 is connected to one side of battery through conductor 130 bell 131 and conductor 132, while from each block 33 a conductor 133 leads to the mercury wells at the front of bars 90 and the pins which contact therewith are strapped together and one of the wells connected by conductor 135 contacts on front of bar 90' and conductor 136 to the other side of battery. The bar 90 actuated by #9 contact device has nine wells connected to nine blocks 33 while that bar controlled by #1 has but one well so connected, thus 11 moves the arm 35 across each block 33 and a circuit is established from busbar 103 over 130, bell 131, conductor 132, arms 35, block 35 one of the conductors 133 to the corresponding mercury well, conductors 135 and 136 to the other busbar. The first group of nine contact blocks 33 represent the tens hence if the device 100 corresponds to a number below ten they will all be dead, but if one such as #58 is sprung, then five of

this group next to the units group will be alive, and eight of the units group adjoining the tens group, thus always giving the same interval between tens and units of the number.

When the member 11 reaches the extreme right the motor armature and field circuits are broken by the opening of 23 and 30, but the momentum of the motor is sufficient to move 23 into contact with 24 thus completing a circuit from 103 over conductors 111, 112, contacts 23 and 24, conductor 141, electromagnet 70 conductor 110 to the other busbar. This energizes electromagnet 70 pulling down the corresponding bar 90' opening the front contacts and closing the rear ones. This operation completes a circuit to the motor armature over conductors 111 and 112 contacts 21 and 29, conductors 145 strapped contact pins on the rear of bar 90', conductors 143, 115 the armature and conductor 116 to busbar 104. This also completes a circuit to the field from conductor 145 the strapped contact pins at the rear of 90' conductor 142 through a resistance 142' conductor 118 field 126 conductors 117, 147 and 110 to busbar 104. It will be observed that the circuit to the field in this case is in the reverse direction to that established before, consequently the motor will reverse and cause member 11 to travel to the left and the resistance in the field will cause it to travel faster in this direction. It will also be noted that the ringing circuit is broken by the opening of the contact pins to which conductors 135 and 136 are attached thus on the backward movement of the member 11 the bell 131 will not be sounded. When the member 11 reaches the extreme right contact is made between 21 and 22 which completes a circuit from conductor 112 through these contacts, conductor 147 electromagnet 50 conductor 121 to the other side of battery. This withdraws the armature 95 holding the bar 90' allowing the front contact to be immersed in the mercury wells and raising the rearward ones, establishing the circuit as first described causing the motor to move to the right. Each time the member 11 moves to the left pawl 39 contacts with the teeth of the ratchet wheel 36 moving the same a predetermined distance and after a given number of such movements one of the contacts 38 makes connection between the arms 42 thus closing a circuit from conductor 108 of the contact device 100, which operates over conductor 150 through the third pair from the rear of contact points 91, conductor 151 electromagnet 70' conductor 152, contact arms 42, conductor 110 to busbar 104. The energizing of electromagnet 70' pulls down the rear end of bar 90'' causing the plurality of points on this end to make contacts in their respective mercury

wells. At the same time circuit is established from busbar 103 over conductor 153, the rearmost contacts 91, conductor 154 the corresponding electromagnet of the group which pulls down bar 90 thence over conductor 152 to contacts 42 and then as previously described. This circuit causes the rear end of the bar 90 to be pulled down and the corresponding armature 95 to latch the same. The movement of 90 momentarily opens the circuit through 70' but it is again energized through another circuit and is retained with the rear end depressed until the device 100 is restored to its normal condition. The last mentioned circuit is from conductor 108 over conductors 155 and 156 through contacts out the rear of 90'' conductor 151, electromagnet 70', conductor 152, contacts 42 and conductor 110 to busbar 104. The raising of the front end of bar 90 will open the motor circuit as between conductors 113 and 114 and the bar 90'' will open the circuit as between conductors 111 and 112, and the device 11 stops just after passing the ratchet wheel 36. The parts remain in this condition until all the devices 100 are restored to their open or normal position. When this takes place electromagnet 70' is deenergized as current is cut off from conductor 108, the front end of bar 90'' drops closing the motor circuit through conductor 111—112, contacts 21 and 29, conductors 145, 143, 115, the motor armature and conductor 116 to the other busbar, thus causing the device 11 to continue traveling to the left. When it reaches its extreme movement to the left the motor circuit as between contacts 21—29 is opened and electromagnet 50 will be energized by the closing of contacts 21 and 22 allowing the front end of bar 90' to drop. The closing of the motor circuit through the front of this bar does not start the motor again on account of the circuit being open as between conductors 113 and 114 and all parts are thus in normal position ready for action on the closing of the next contact device 100.

While I have shown the described and preferred embodiment of my invention it will be understood that minor changes in form of construction may be resorted to without sacrificing the advantages or spirit of my invention.

I claim:—

1. In a signal system comprising a contactor, a plurality of contacts thereon, a movable switch blade adapted to make connection between said contacts and a conducting strip conductively connected to a source of electrical energy, a motor driving said switch blade, means operated by said switch blade for causing the reversal of said motor when said switch blade reaches the end of its travel in either direction, and

means for stopping said motor after said switch blade has traversed its course a given number of times.

2. In a signal system comprising a contactor having a plurality of contacts, a movable switch blade adapted to make contact between said contacts and a strip conductively connected to a source of electrical energy, an electrical motor driving said switch blade, means operated by said switch blade for causing the reversal of said motor when said switch blade has reached the limits of its movement, a plurality of circuit closing devices, a plurality of electromagnetically operated switches, each of said circuit closing devices controlling one or more of said electromagnetically operated switches, each of said switches provided with a plurality of contact points a given number of which are electrically connected with the same number of contacts on said contactor, other contacts on said switch adapted to close the circuit to said motor and a signal in the circuit through said contactor and said plurality of contact points.

3. In a signal system comprising a contactor having a plurality of contacts in two groups, one representing units the other tens, a conducting strip parallel to said contacts, a movable switchblade adapted to make contact between said conducting strip and said contacts, an electric motor driving said switchblade, an electromagnetic switch adapted to be operated by the movable switchblade at each end of its travel to reverse the direction of current in the field of said motor and means for stopping the said motor after said switchblade has traveled its course a given number of times.

4. In a signal system comprising a contactor having a plurality of contacts; one group representing tens, the other group representing units, a conducting strip parallel to said contacts, a movable switchblade adapted to make contact between said contacts and said strip, said strip being connected to a source of electrical current through an audible signal, conductors connecting said contacts to one or more electromagnetically operated switches, contact points on said switches adapted to connect one or more of said conductors with the other terminal of the source of electrical energy and circuit closing devices for causing the operation of said electromagnetically operated switches.

5. In a signal system comprising a contactor having a plurality of contacts; one group representing tens the other group representing units, a movable switchblade adapted to make contact between said contacts and a source of electrical energy, an electrical motor driving said switchblade, a plurality of electromagnetically controlled switches, including two groups, one repre-

senting tens and the other representing units, circuit closing devices adapted to close said switches, conductors connecting said contacts with one or more of said switches, the contacts of the tens group being connected to the tens group of switches and the contacts of the unit groups being connected to the unit group of switches, and other contacts on said switch adapted to start said electrical motor, means coacting with said movable switchblade for reversing said motor when said switchblade reaches its limit of travel in either direction, and other means associated therewith for stopping said motor after traversing its course a predetermined number of times.

6. In a signal system comprising a contactor having a plurality of contacts, a movable switchblade adapted to connect said contacts with a source of electrical energy, said switchblade being mounted upon a screw threaded rod for the purpose of imparting a rectilinear movement thereto, an electric motor driving said screw threaded rod, a pivotally mounted electromagnetically controlled switch adapted to reverse the field current of said motor, contacts adjacent the end of the path of movement of said switchblade for the purpose of operating said switch, a resistance adapted to be inserted in series with the motor field by said switch on the backward movement of said switchblade and a contact device driven by said movable switchblade adapted to stop the said motor after said switchblade has traversed its path a given number of times.

7. In a signal system comprising a contactor having a plurality of contacts, a movable switchblade adapted to connect said contacts with a source of electrical energy, said switchblade being mounted upon a screw threaded rod for the purpose of imparting a rectilinear movement thereto, an electric motor driving said screw threaded rod, a pivotally mounted electromagnetically controlled switch adapted to reverse the field current of said motor, contacts adjacent the end of the path of movement of said switchblade for the purpose of operating said switch, a resistance adapted to be inserted in series with the motor field by said switch on the backward movement of said switchblade, a wheel intermittently moved by said switchblade on its backward movement, contacts on said wheel, an electromagnet switch adapted to open the circuit to said motor, the contacts on said wheel operating the last mentioned switch.

8. In a signal system comprising a plurality of electromagnetically controlled switches in groups representing units and tens, each consisting of a pivotally mounted bar of insulating material, a plurality of contact pins through the ends thereof, mercury wells into which said pins are adapted

to contact, circuit closing devices adapted to
operate one of said switches either alone
or in combination with one in the other
group, a motor driven contactor adapted to
complete a circuit from a source of current
to said electrical switches, said switches be-
ing adapted to permit the passage of a num-
ber of impulses corresponding to the num-
ber of the circuit closing devices and an
10 audible signal in the circuit through said

contactor and said switch, which sounds a
number of times corresponding to the num-
ber of the circuit closing devices which op-
erate the said electromagnetic switch.

In testimony whereof I affix my signature 15
in presence of two witnesses.

GEORGE FURRER.

Witnesses:

HARRY M. FROSTHOHN,
JOHN FURRER, Jr.