

Nov. 6, 1934.

S. M. KENERSON

1,979,328

SIGNALING SYSTEM

Filed May 7, 1929

3 Sheets-Sheet 1

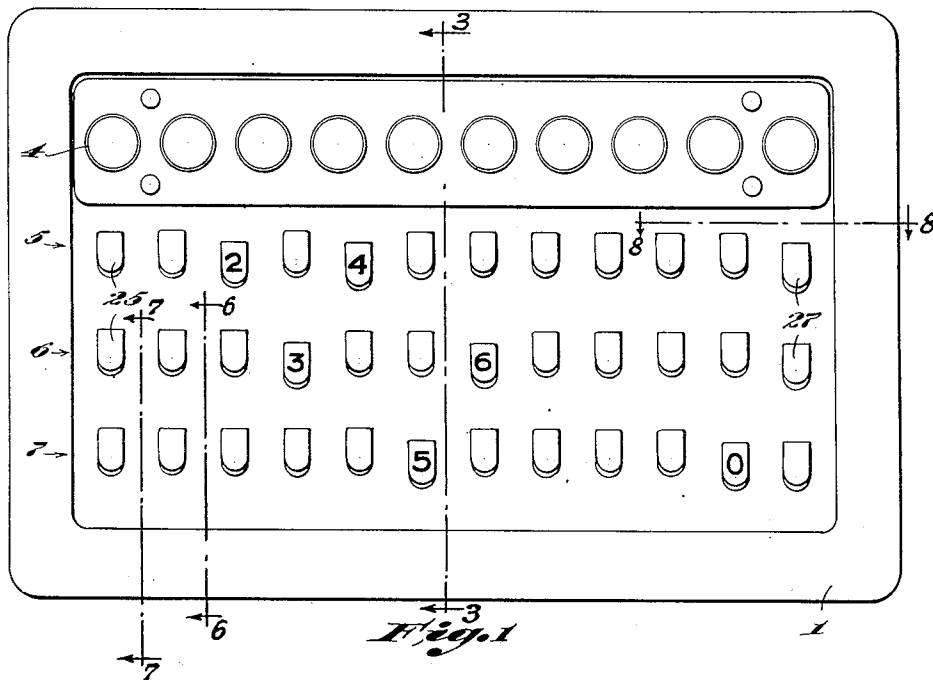
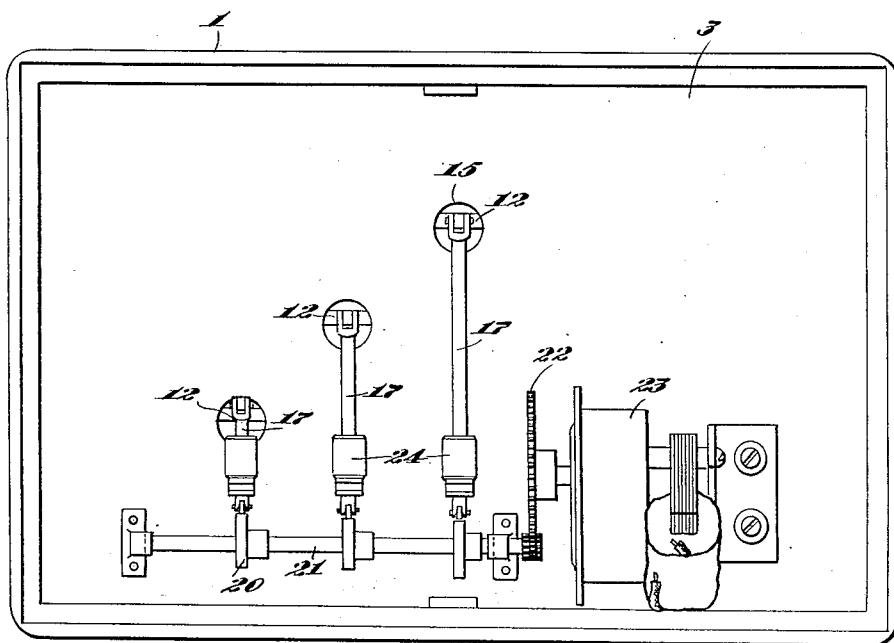


Fig. 2

Inventor
Stanley M. Kenerson
by Robert Cashman & Woodbury,
attys.

Nov. 6, 1934.

S. M. KENERSON

1,979,328

SIGNALING SYSTEM

Filed May 7, 1929

3 Sheets-Sheet 2

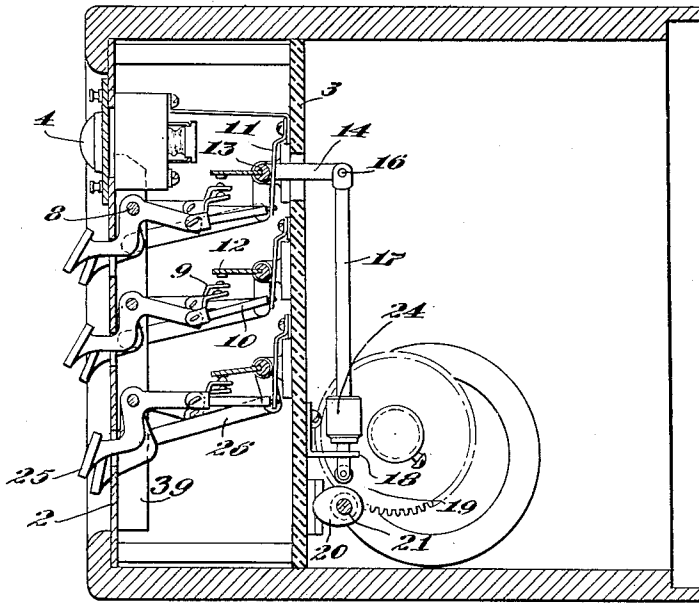


Fig. 3

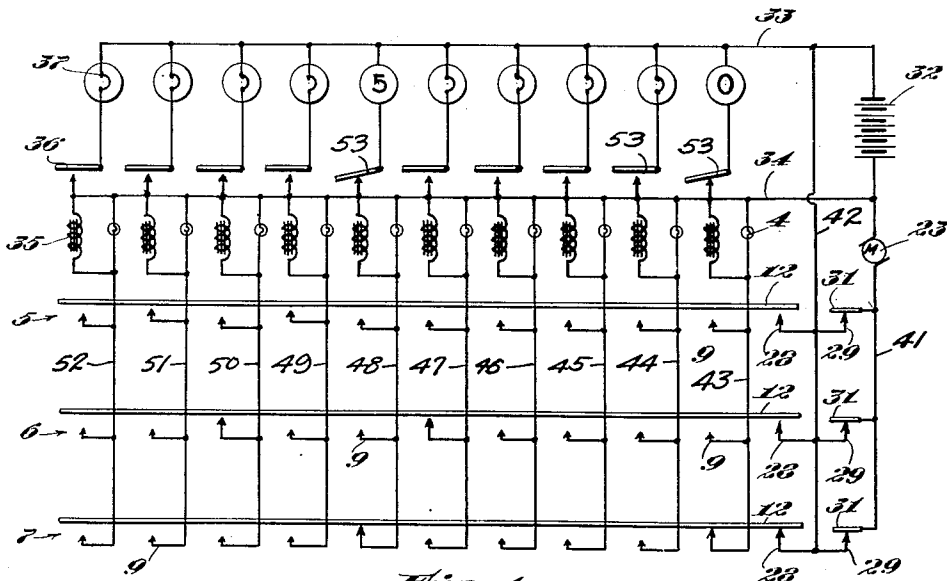


Fig. 4

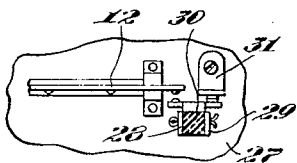


Fig. 5

Inventor
Stanley M. Kenerson
by Robert Cushman Woodberry,
Attys.

Nov. 6, 1934.

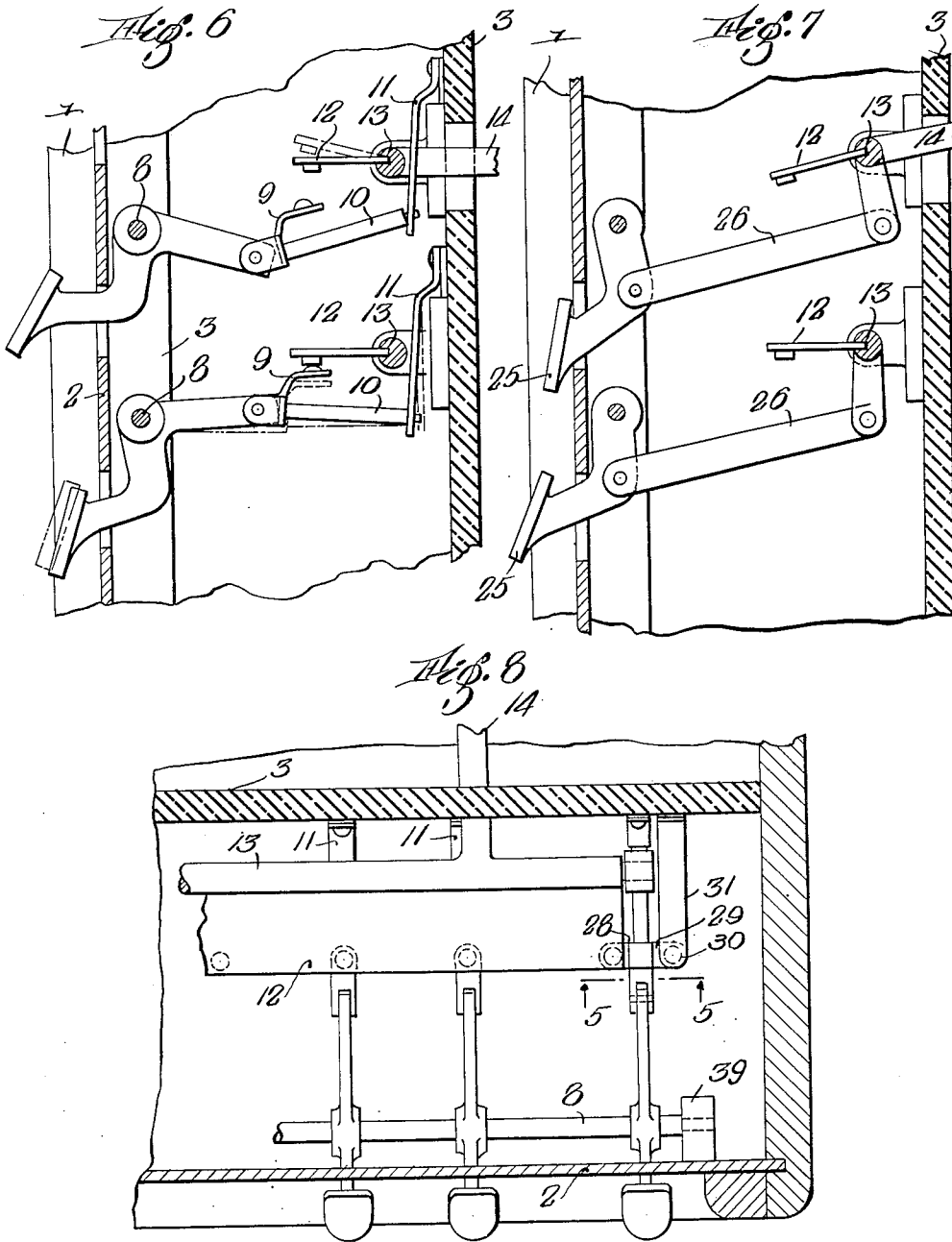
S. M. KENERSON

1,979,328

SIGNALING SYSTEM

Filed May 7, 1929

3 Sheets-Sheet 3



Inventor
Stanley M. Kenerson
By Robert Cushman & Woodbury
attys.

UNITED STATES PATENT OFFICE

1,979,328

SIGNALING SYSTEM

Stanley M. Kenerson, Springfield, Mass., assignor
to The Standard Electric Time Company,
Springfield, Mass., a corporation of Connecticut

Application May 7, 1929, Serial No. 361,081

8 Claims. (Cl. 177—380)

This invention relates to a signaling system and more particularly to a system for concomitantly sending a plurality of sets of signals. A typical use of the invention is for calling physicians in a hospital by means of signal boards distributed throughout the hospital and controlled from a central station, as for example the telephone operator's station. According to the preferred method of using the invention each physician is assigned a number and, when the physician is called, his number is flashed on the signal boards throughout the hospital; and in concomitantly calling a number of physicians their numbers are flashed in sequence.

The principal objects of the invention are to provide a system which is simple in construction and economical in use, which may be operated with facility and without likelihood of error, which uses a minimum amount of current, which does not give false signals, and which is generally superior both in construction and use to prior systems for the purpose.

For the purpose of illustrating the genus of the invention a typical embodiment is shown in the accompanying drawings in which

Fig. 1 is a front elevation of the control apparatus;

Fig. 2 is a rear elevation of the same apparatus with the cover removed;

Fig. 3 is a central vertical section of the apparatus from front to rear on the line 3—3 of Fig. 1;

Fig. 4 is a circuit diagram;

Fig. 5 is a section, on line 5—5 of Fig. 8, of the motor and source switch hereinafter referred to, and

Figs. 6, 7 and 8 are sections on the correspondingly numbered lines of Fig. 1.

The particular embodiment of the invention chosen for the purpose of illustration comprises a casing 1, a front panel 2 mounted in an opening in the front of the casing, a partition 3 mounted within the casing parallel to the front panel 2, a row of pilot lights 4 to indicate to the operator the signals which are being set out, and three rows of keys 5, 6 and 7 for sending three sets of signals in sequence. Each row of keys comprises a stopping or resetting key 25 at the left, a starting key 27 at the right and ten intermediate selector keys representing the ten digits. The intermediate selector keys are pivoted about horizontal axes on pins 8 mounted in flanges 39 on the back of the front panel 2, the keys having finger pieces extending forwardly through openings in the panel 2. Pivotaly connected to the

rear end of each key is a switch contact 9 and a part 10 whose rearward end is reduced and extends through an opening in a spring 11. The spring 11 presses forwardly on the part 10 normally to hold the key in upper position, with the contact 9 in lower position. However when the key is depressed a pivotal connection between the key and the part 10 passes beyond the dead-center line like a toggle and the spring then serves to hold the switch contact 9 in raised position, hereinafter referred to as advanced position (see lower switch in Fig. 6). Upward movement of the key may be limited in any suitable manner as by interengaging surfaces on the key and part 10 (see lower switch in Fig. 6). To prevent short circuiting of the key-operated contacts through the keys and casing the keys are formed of insulation material.

Mounted above each of the three horizontal rows of keys is a plate 12 carrying a switch contact in line with each of the contacts 9 of the row and connecting with a rod or shaft 13 pivoted at the ends to swing about a horizontal axis. Each rod 13 is provided with a crank arm 14 which extends through an opening 15 in the partition 3 and pivotally connects at 16 with a rod 17 which slides vertically in a guide 18 and is provided on its lower end with a cam follower 19 engageable with one of the cams 20 mounted on shaft 21 which is driven through gearing 22 by electric motor 23 which, as shown, is of the slow-speed electric-clock type. The cams 20 are shaped and positioned successively to move the plates 12 downwardly into contact with the manually controlled switches 9 which have been raised to advanced position, the cams operating in sequence so that each plate 12 is raised before the next plate is depressed. Any suitable means may be employed to restore each plate 12 to normal position after the rise in the cam has passed the cam follower, weight 24 being shown for this purpose.

The stop key 25 at the left-hand end of each row of keys is for the purpose of conjointly restoring all of the other keys of the row to normal position when the stop key is depressed. As shown in Figs. 3 and 7 each of these stop keys is connected to one of the rods 13 by means of a link 26 so that when the stop key is depressed, the associated plate 12 is swung downwardly to a greater degree than it is moved by its cam and to a degree sufficient to move all of the other keys of the row beyond their dead-center positions so that the spring 11 may snap them into their normal positions.

The aforesaid starting key 27 at the right-hand end of each row of selector keys controls a starting switch (Fig. 5) which is identical with the selector switches except in that it is a double switch comprising two parts 28 and 29 mounted on opposite sides of insulation 30 (Figs. 5 and 8). The part 28 cooperates with a contact on the end of the associated bar 12 while the part 29 engages a stationary contact 31 which is connected to the motor circuit as shown in Fig. 4. The contact 31 is somewhat lower than the normal position of the plate 12 so that when a starting key is depressed past dead-center position to circuit closing position the contact 29 engages contact 31 but the contact 28 stops short of the normal position of the plate 12 as above described in connection with the selector switches.

As shown in Fig. 4 the preferred circuit arrangement comprises any suitable source of current 32 connected to two distributing conductors 33 and 34. Each pilot light 4 is connected on one side to the conductor 34 and on the other side it is connected in parallel to the manually controlled contacts 9 of selector switches in the three rows of keys so that circuit may be closed through any one of the three selector switches associated with each pilot light.

Connected in parallel with the pilot lights 4 are relay magnets 35 which control switches 36 controlling the signals 37. While only one set of signals 37 is shown in Fig. 4 it will of course be understood that ordinarily a plurality of sets of signals would be connected in parallel to the switches 36 so that the signals are flashed in a number of locations simultaneously.

The lines 33 and 34 connect the lamps 37 and the switches 53 in parallel with the source or battery 32. The motor 23 is connected with the source 32 by the lines 41, 42 and 33, the switches 29, 31 being connected in parallel between the lines 41 and 42. The switches 28 when advanced engage the bars 12 in timed relation to transmit electrical energy through the bars 12 to the switches 9 which are advanced to engage these bars to thereby complete the circuit through the connections 43 to 52, associated with the advanced switches, to the line 34 and to the source 32. It will be observed that a relay 35 is connected in parallel between each of the lines 43 to 52 and the line 34, and hence on completion of the circuit through any of the lines 43 to 52, the relay associated therewith is energized to close the switch 53 and to complete the circuit through the lamp 37 associated with the relay.

As shown in Figs. 1 and 4 the selector keys are set to send out the three numbers 24, 36 and 50 in sequence as the cams depress the upper intermediate and lower plates 12 successively. After the selector keys of one row are set to send the desired signal the starting key of that row is then depressed to raise the contact 28 to a position corresponding to that of the raised selector switches 9 and to close the motor switch 29—31. Inasmuch as the switch contacts on each of the bars 12 are normally disconnected from any source of current and are only connected to the source when the switch 28 is elevated and the motor is started, false signals are prevented. If switch 28 were not provided false signals might result in setting up a second or third row of numbers since the motor would then be running and part of the numbers of the new row might be flashed before all the keys of the new row are depressed. Obviously the system may be used for only one or two sets of signals by setting up the

keys of only one or two rows; conversely more than three sets may be sent in sequence by providing more than three rows of keys and a corresponding number of motor driven contacts 12.

I claim:

1. A signal system comprising a plurality of circuits, selector switches for closing the circuits, the switches having manually movable parts which may be individually advanced in any group combination and motor driven parts which engage said advanced parts, a motor for actuating the latter parts, a switch for starting said motor, and a circuit including a switch controlled by the motor for connecting a source of current to said selector switches when the motor switch is operated, the latter switch having a part which is manually advanced by the operation of the motor switch and another part which is advanced by the operation of the motor to engage the first part.

2. A signal system comprising a plurality of circuits, selector switches for closing the circuits, the switches having manually movable parts which may be selectively advanced and motor driven parts which engage said advanced parts, a motor for actuating the latter parts, a switch for starting said motor, a circuit for supplying current to said circuits, and a switch having a part which is manually advanced into position completely to close said last circuit by the motor, the latter switch having another part which is advanced by the operation of the motor to engage the first part.

3. A signal system comprising a plurality of circuits, selector switches for closing the circuits, the switches having manually movable parts which may be selectively advanced and motor driven parts which engage said advanced parts, a motor for actuating the latter parts, a motor switch for starting said motor, a source switch having a part which is manually advanced and a part which is advanced by the motor, and means for conjointly advancing said last part of the source switch and closing the motor switch.

4. A signal system comprising a plurality of circuits, a plurality of selector switches connected in parallel to each circuit so that any switch may close the circuit, the switches having manually movable parts which may be selectively advanced and motor driven parts which engage said advanced parts, the latter being common to different groups of said circuits respectively, motor means for operating the latter parts in sequence, and a source switch associated with each of said sets for connecting a source of current to said selector switches, each source switch having a part which is manually advanced into position completely to close circuit only when the associated selector switches close circuit.

5. A signal system comprising a plurality of circuits, and a plurality of selector switches connected in parallel to each circuit so that any switch may close the circuit, the switches having manually movable parts which may be selectively advanced and motor driven parts which engage said advanced parts, the latter being common to different groups of said circuits respectively, means including a motor for actuating the latter parts in sequence, a source switch associated with each of said sets for connecting a source of current to said selector switches, each source switch having a part which is manually advanced into position completely to close circuit only when the associated selector switches close circuit, a motor switch associated with each of said sets,

and means for conjointly advancing the source switch to said position when the corresponding motor switch is closed.

6. A signal system comprising a row of circuit-
5 controlling members, a contactor extending lengthwise of said row, means for individually advancing any members in the row toward said contactor, means for holding each advanced member in advanced position, automatic means
10 for oscillating said contactor back and forth through a limited range into and out of contact with each advanced member simultaneously, and manual means for oscillating said contactor through a greater range to restore advanced members to retracted position.
15

7. A signal system comprising a plurality of signal control circuits, a bank of selector switches for closing the circuits respectively, each switch
20 having an individual part movable from retracted to advanced position and a manual key for causing said movement, holding means for yieldably retaining said parts in either of said positions, means including an actuator extending along said bank in juxtaposition to each of said selector
25

switches for simultaneously closing those switches of which said movable parts are in advanced position and manually controlled means for simultaneously moving each advanced part to retracted position through the medium of said actuator.
80

8. A signal system comprising a plurality of signal control circuits, a bank of selector switches for closing the circuits respectively, each switch
85 having an individual part movable from retracted to advanced position and a manual key for causing said movement, holding means for yieldably retaining said parts in either of said positions, circuit-closing means common to the switches of said bank, automatic means for intermittently
90 actuating said circuit-closing means to a limited extent sufficient to operate the switches of which the movable parts are in advanced position, and manually controlled means for actuating said
95 circuit-closing means to a greater extent sufficient to move the movable parts from advanced to retracted position.

STANLEY M. KENERSON.

25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150