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B. L. BOBROFF

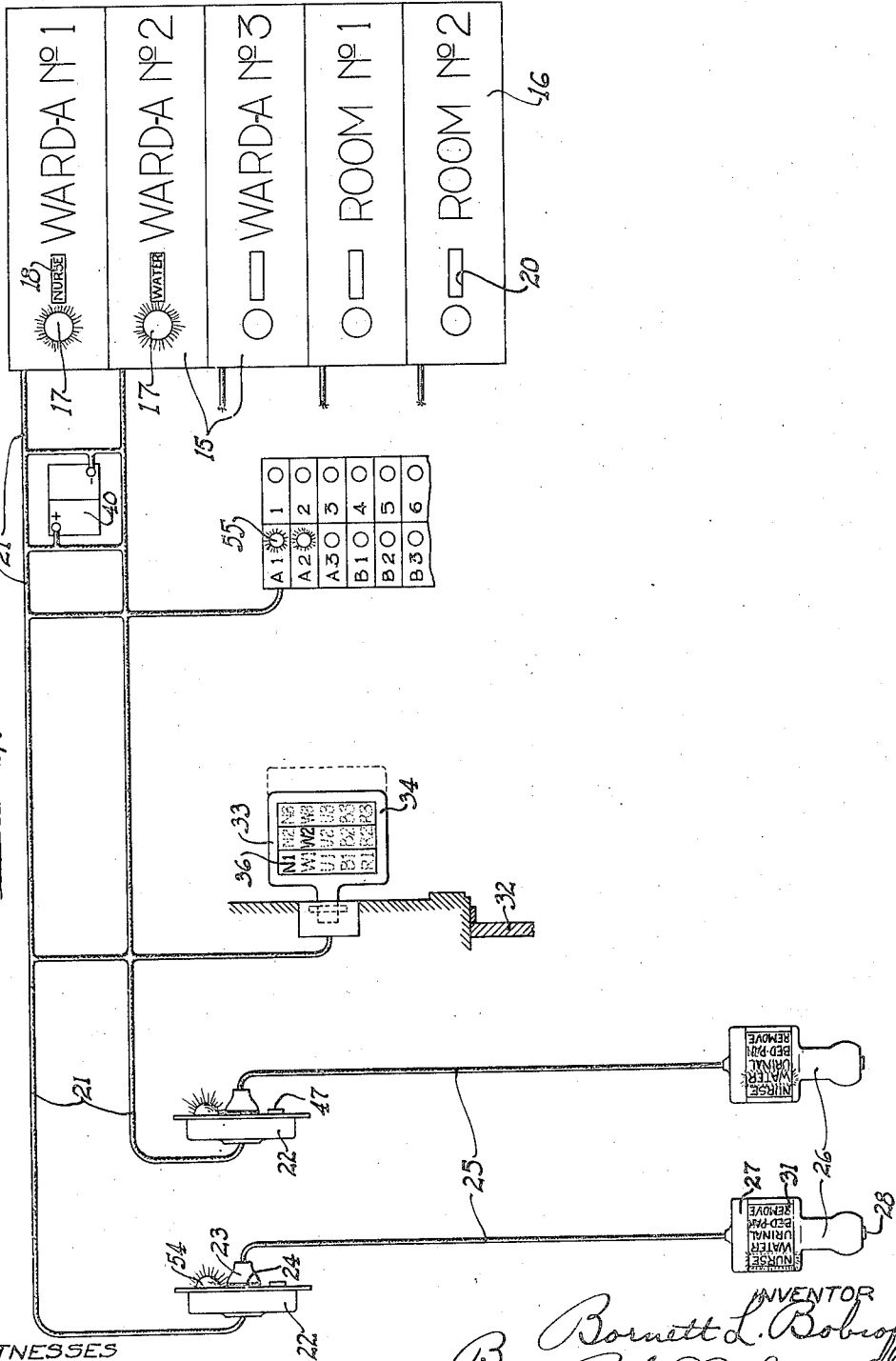
1,867,134

HOSPITAL SIGNALING SYSTEM

Filed April 4, 1928

2 Sheets-Sheet 1

FIG. 1



WITNESSES
 Irving J. Rose
 -m. E. Downey

INVENTOR
 By *Bornett L. Bobroff*
R. S. Caldwell
 ATTORNEY

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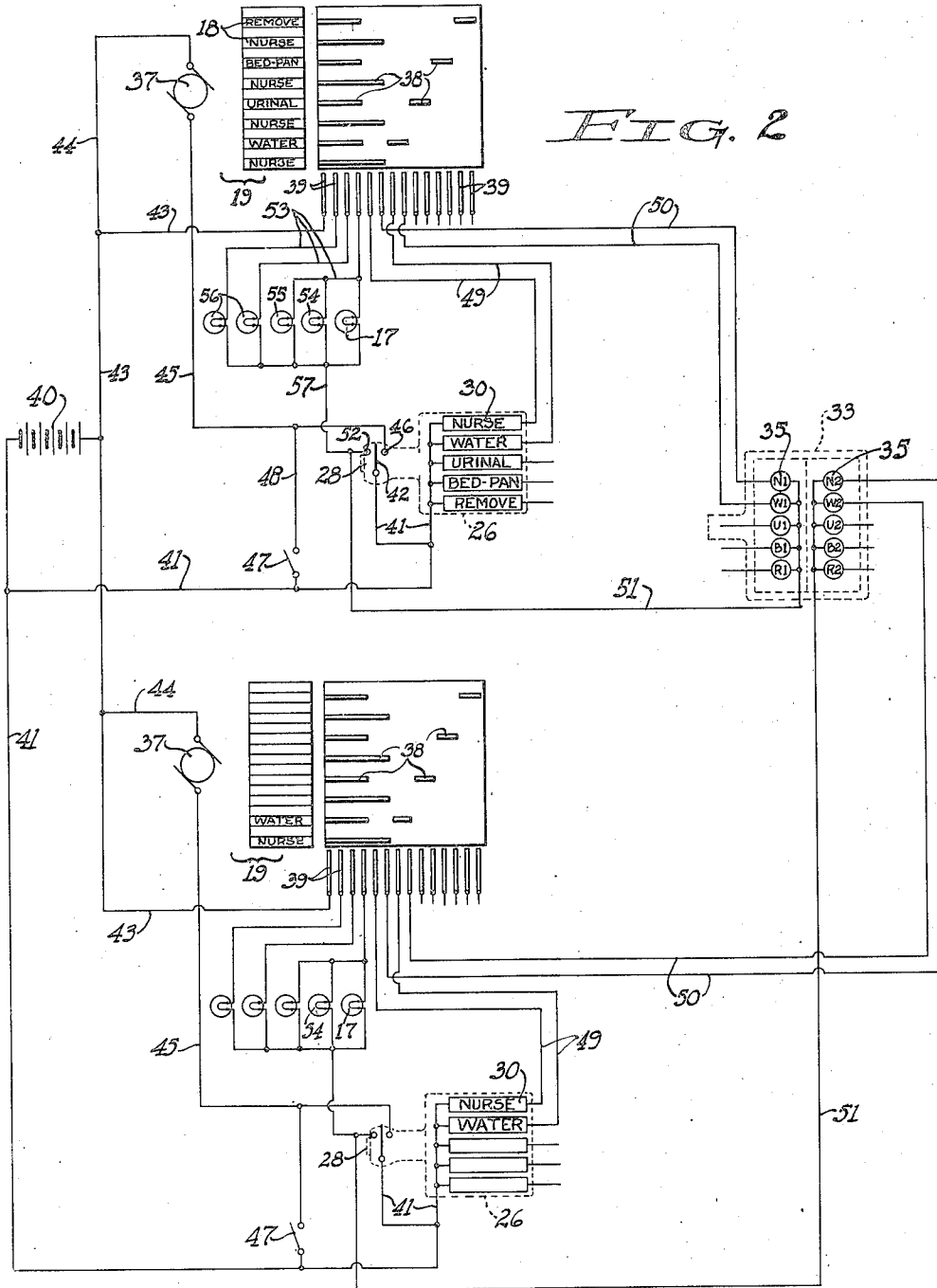


FIG. 2

WITNESSES

Irving J. Rose

M. E. Downey

INVENTOR

By *Bornett L. Bobroff*
R. S. Caldwell
ATTORNEY

UNITED STATES PATENT OFFICE

BORNETT L. BOBROFF, OF MILWAUKEE, WISCONSIN

HOSPITAL SIGNALING SYSTEM

Application filed April 4, 1928. Serial No. 267,455.

The invention relates to signaling systems for use in hospitals, sanitariums, and other institutions.

An object of the invention is to provide a hospital signaling system including an annunciator of the answer-back type and a plurality of responsive means controlled by the annunciator to display the same confirmation signal at different locations, and a more specific object is to constitute one of said responsive means an indicator, preferably an overdoor device, placed at the exterior of each room from which the signal is transmitted, whereby the needs of the patient of the room may be communicated to nurses or attendants on duty, thus affording an opportunity for prompt service to the patient and minimizing trips to the main annunciator board.

Another object of the invention is to provide a signaling system of this character including patient-controlled switching means for the production of successive signals and means whereby the overdoor indicator is rendered ineffective until the desired signal is reached, thereby avoiding unnecessary flashing of lamps in the overdoor indicator in cases where lamps are used as the responsive elements in such indicator.

A further object is to provide such signaling system including a patient-operated circuit-closer which controls the operation of the signal-producing means and simultaneously disables the overdoor indicator until the circuit-closer is released upon the arrival of the desired signal.

A further object is to provide a signaling system including switching means movable to successive signaling positions to co-operate with indicating means and means for rendering the indicating means ineffective until the switching means reaches a selected signaling position.

The invention further consists in the several features hereinafter set forth and more particularly defined by the annexed claims.

This application constitutes a continuation in part of my co-pending application for signaling systems, Serial No. 204,892, filed July 11, 1927.

In the accompanying drawings, Fig. 1 is

a diagrammatic illustration of a hospital system embodying the invention; and

Fig. 2 is a schematic diagram of the circuit connections for the system.

In these drawings, the numeral 15 designates each of a row or tier of annunciator units adapted to hospital use, there being one for each room, or one for each bed in the case of a ward or other room having several beds. These annunciator units are placed in one or more tiers at a nurse's station and each includes a front plate 16 which is designated with a room number or with a bed number, as the case may be. If desired, the front plates of several annunciator units may be integrally formed of a single piece of material. A signal lamp 17 is visible through the front plate of each annunciator unit, and name plates 18 carried on an intermittently rotatable motor-driven annunciator drum 19, as hereinafter described, (shown diagrammatically in Fig. 2) are successively visible through an opening 20 in the front plate to signal the various needs of the patient.

Each annunciator unit is connected by a wiring cable 21 with an outlet box 22 in the wall of the room or ward designated on the annunciator front plate, or close to the bed so designated. An attachment plug 23 is adapted to fit into a suitable receptacle 24 provided for it in the outlet box 22 to establish connections between the various conductors of the wiring cable 21 and several corresponding conductors in a flexible extension cable 25 connected to the terminals of the attachment plug.

A push-button holder 26, preferably having a pear-shaped end portion and an enlarged flat indicating portion 27, as shown, is attached to the free end of the extension cable 25 and carries a push-button or circuit-closer 28 in its pear-shaped end portion. The push-button 28, as illustrated in Fig. 2, is in the nature of a single-pole double-throw switch, this switch being normally urged to one circuit-closing position but capable of momentary manipulation to the other circuit-closing position. The push-button holder may be of the general type shown in United States Patent No. 1,367,583, issued to

me February 8, 1921, and includes a number of indicating lamps 30 therein, the lamps being covered on opposite sides by translucent plates 31 having the various needs of the patient thereon in register with the lamps for selective illumination by the lamps.

Preferably the needs designated on the push-button holder are not visible until selectively illuminated by the lamps 30.

In the embodiment of the invention illustrated in the drawings, two push-button holders 26 are provided for serving two beds in the same room or ward. Above the door 32 of the room or ward is placed an overdoor indicator 33 visible along the corridor on which the room opens, the indicator being of a type disclosed generally in my copending application for signaling systems, Serial No. 204,892, filed July 11, 1927, and more specifically in my application for hospital indicators, Serial No. 285,695, filed June 15, 1928. The overdoor indicator includes a casing 34 in which are disposed a number of indicating lamps 35 illuminating suitable designations 36 placed on opposite sides of the casing and corresponding to the designations on the push-button holder 26. In the present instance, the lamps 35 are arranged in tiers, there being a tier of lamps corresponding to those in each push-button holder and the designations illuminated by lamps in any one tier also identifying the bed served by the corresponding push-button holder.

The annunciator units 15 are generally of the type shown in United States Patent No. 1,367,583, issued to me February 8, 1921, and more specifically of the type disclosed in my application for signaling systems, Serial No. 204,892, filed July 11, 1927, and each annunciator unit includes an electric motor 37 which drives the rotary annunciator drum 19, a development of which is shown in Fig. 2. In addition to the name plates 18, the annunciator is provided with electrically connected contact ribs 38 which engage with contactors 39 during the rotation of the drum to establish indicating circuits hereinafter described.

In the schematic wiring diagram of Fig. 2, a battery 40 or other source of current has one terminal connected by a conductor 41 leading to each push-button holder 26, where it has a common connection with all of the lamps 30 and with the movable element 42 of the double-throw push-button circuit-closer 28. The other terminal of the battery is connected by a conductor 43 which leads to one of the contactors 39 of the drum switch and by another conductor 44 leading to one terminal of the motor 37, the other terminal of the motor being connected by a conductor 45 leading to that terminal 46 of the push-button circuit-closer 28 against which the movable element 42 of the circuit-closer is manually depressed. Another push-

button circuit-closer 47 carried by the wall box 22 has one terminal connected to the conductor 41 and the other terminal connected by a conductor 48 joining the conductor 45, thus placing the circuit-closer 47 in parallel with the motor-controlling circuit-closer 28.

Several of the contactors 39 are connected by conductors 49 individually leading to the terminals of the lamps 30 in the push-button holder 26, and other conductors 50 connected to other contactors 39 lead individually to terminals of the lamps 35 in the overdoor signal 33. Each pair of conductors 49 and 50 leading to corresponding lamps in the push-button holder and overdoor indicator are connected to adjacent contactors 39 engageable with the same contact rib 38 on the switch drum. The other terminals of the lamps 35 are connected by a common wire 51 leading to that terminal 52 of the push-button circuit-closer 28 which is normally engaged by the movable element 42 of the circuit-closer.

Other contactors 39 are connected by conductors 53 leading to terminals of lamps 17, 54, 55 and 56 and these lamps have a common connection with a conductor 57 joined to the push-button switch contact 52. The lamp 54 is placed in the wall box 22 and the lamp 55 is placed with others in the superintendent's office for purposes of supervision. The lamps 56 are placed in the supply room or wherever else it is desired to display a signal.

In order to insure attention when a patient is so weak that he is only able to momentarily depress the push-button in the push-button holder, those contact ribs 38 which control the "Nurse" indication are interposed between the other contact ribs in order to establish a circuit, as hereinafter described, for effecting a "Nurse" indication alternately with each of the other signals. The blank spaces between the contact ribs are relatively short and several "Nurse" indications may be obtained during a single revolution of the annunciator drum, thus avoiding the necessity for completely rotating the drum to effect such indication.

When the patient desires attention he presses the push-button 28 in the push-button holder 26, which serves to establish a motor circuit including the battery 40, conductors 43 and 44, annunciator motor 37, conductor 45, push-button contacts 46 and 42 and conductor 41 back to the battery. The motor 37 is thereupon started in operation serving to effect the slow intermittent rotation of the annunciator drum 19 to bring the name plates 18 successively in position for display through the opening 20 in the annunciator front plate 16. At the same time the rotation of the drum effects the engagement of the contact ribs 38 with the contactors 39, which thereupon establishes a circuit including the battery 40, conductor 43, one contactor 39,

contact ribs 38, another contactor 39 and the connected conductor 49, a lamp 30 in the push-button holder, and thence through the common return wire 41 back to the battery, thus illuminating that lamp 30 in the push-button holder which corresponds to the same signal displayed on the annunciator board. As long as the push-button is held depressed all other possible lamp circuits, including those for the overdoor indicator, are broken at the push-button contact 52.

The lighted indicating lamp 30 in the push-button holder indicates to the patient the signal which he has caused to be displayed on the annunciator 15, and if that is not the signal desired to be given he merely holds the push-button 28 depressed to light successive lamps in the push-button holder until the desired signal is indicated. He then removes his finger from the push-button, which opens the motor circuit and permits the annunciator drum to remain in the selected switching and indicating position. At the same time, the release of the push-button 28 effects the engagement of the contact element 42 with the back contact 52, which connects the conductor 51 with the conductor 41 leading to the battery 40, thus establishing a circuit through one of the indicating lamps 35 in the overdoor indicator by way of one of the conductors 50. The lamp 35 is then connected in parallel with the corresponding lighted lamp 30 in the push-button holder.

It will be seen that by reason of the above-described circuit arrangement, the signal lamp 35 in the overdoor indicator and the lamps 17, 54, 55, 56 will not become illuminated until the push-button 28 is released upon the arrival of the desired signal, thus avoiding unnecessary and undesirable flashing of lights in the corridor, on the annunciator board, and elsewhere.

The lighting of the lamp 35 in the overdoor indicator apprizes the nurse on duty of the want of the patient, and when the nurse arrives at the patient's bedside she presses the resetting push-button 47 on the wall box 22 to momentarily start the motor 37 and thus move the annunciator drum to the succeeding blank position where no indicating lamp circuits are closed. The blank position is indicated to the nurse as soon as the lamp 54 in the wall box becomes extinguished.

The light 55 in the superintendent's office and the instrument or annunciator light 17 which all relate to one transmitting device may have their conductor wires connected to the same contactor or contact finger 39. The supply room lights 56 require connection to separate contact fingers, since they are preferably connected in common with all the instruments on the floor.

By means of this invention, the patient is enabled to signal at once his desires without

necessitating the delay incident to requiring the nurse to visit the bedside of the patient in order to learn what is wanted. Furthermore, the signal as given remains until the signaling system is reset by the nurse at the bedside upon responding to the signal. The patient knows just what signal he has given because of the illumination of the indicating lamp in the push-button holder and it is not necessary for him to learn a code of signals. If he desires to cancel a signal or to change it after it has been given, it is only necessary for him to press the push-button 28 again and so start the motor-driven annunciator drum in operation until the succeeding blank position is reached or the desired signal is indicated. A patient in weakened condition may signal for a nurse by depressing the push-button for a comparatively short length of time, since such indication may be effected intermittently between each pair of the other signals.

With the provision of the overdoor indicators 33 visible along the corridor the indicating function of the annunciator drum becomes of secondary importance except for purposes of supervision, since the nurses on duty need only observe the lights in the overdoor indicators outside of the respective rooms or wards to learn the needs of the patients. This feature makes it unnecessary to visit the main annunciator board at the nurse's station, thus saving many steps and affording an opportunity for prompt service to the patient.

While the signaling system of this invention is more particularly intended for use in hospitals and the like it is also adaptable to other applications when needs or wants are to be signaled.

What I claim as new and desire to secure by Letters Patent is:

1. In a signaling system, the combination of a plurality of indicating lamps, switching means movable to successive switching positions and having electric circuit connections with said lamps to selectively light said lamps, a motor for driving said switching means, means for operating said motor including an electric circuit, a circuit-closer in said circuit and in said circuit connections movable to either of two positions and in one position closing said motor circuit and in the other position closing the circuit connections for said indicating lamps, and signal lamps having circuit connections with said switching means and disposed at the place of said circuit-closer for apprizing the operator of the switching position of said switching means, said circuit-closer when moved to one position closing the motor circuit to operate said switching means and signal lamps and simultaneously opening the circuit connections through said indicating lamps to prevent lighting thereof, and said circuit-closer

- when moved to its other position opening the motor circuit to stop the operation of said switching means in a selected switching position and simultaneously closing the circuit connections through the corresponding indicating lamp to light said lamp. 70
- 5 2. In a signaling system, the combination of indicating means including a plurality of responsive elements, switching means movable to successive switching positions and having circuit connections with said responsive elements for producing any one of a plurality of signals, a motor for driving said switching means to its successive switching positions, means for operating said motor including an electric circuit, a circuit-closer movable to different circuit-closing positions and having circuit connections with said motor and with said responsive elements, and 75
- 10 20 signal elements at the place of said circuit-closer for apprizing the operator of the switching position of said switching means, said circuit-closer when placed in one position closing the motor circuit to operate said switching means and signal elements and simultaneously opening the circuit connections through said responsive elements to prevent operation thereof, and said circuit-closer when placed in its other position opening the motor circuit to stop the operation of said switching means in a selected switching position and simultaneously closing the circuit connections through the corresponding responsive element. 85
- 25 3. In a signaling system, the combination of switching means movable to successive switching positions, a motor for driving said switching means, means for operating said motor including an electric circuit, indicating means including a plurality of responsive elements having circuit connections with said switching means for producing any one of a plurality of signals, a circuit-closer having circuit connections with said motor and with said responsive elements and movable to alternative positions for effecting the operation of either said motor or said responsive elements, and means for apprizing the operator of the switching position of said motor driven switching means, said circuit-closer when moved to one position closing the motor circuit to operate said switching means to its successive switching positions and simultaneously opening the circuit connections through said responsive elements to prevent operation thereof, and said circuit-closer when moved to its other position opening the motor circuit to stop the operation of said switching means in a selected switching position and simultaneously closing the circuit connections through the corresponding responsive element. 90
- 30 95
- 35 100
- 40 105
- 45 110
- 50 115
- 55 120
- 60 125
- 65 130
- In testimony whereof, I affix my signature. 90
BORNETT L. BOBROFF.