J. McFELL.

ELECTRIC SIGNALING SYSTEM.

APPLICATION FILED MAY 10, 1913.

1,197,045. Patented Sept. 5, 1916.

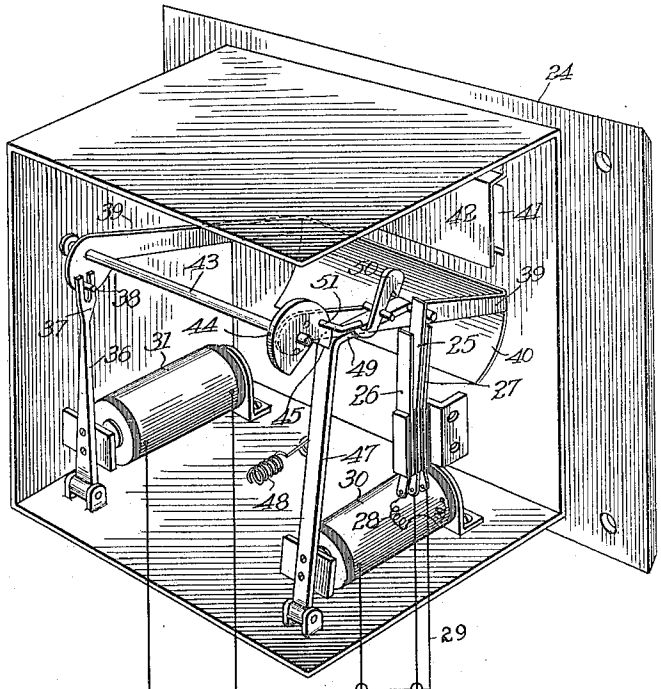


Fig. 1.

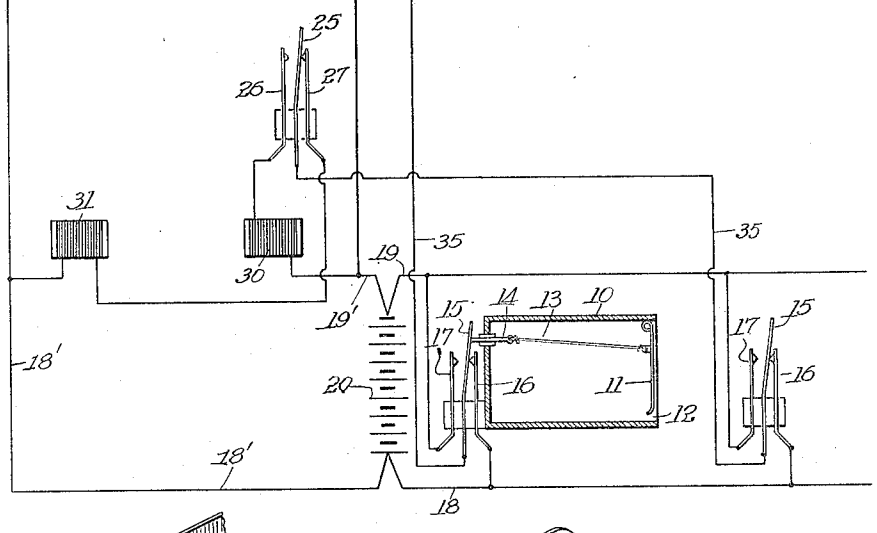
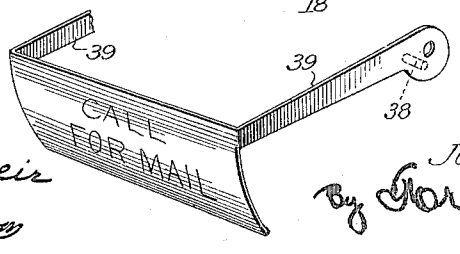


Fig. 2.



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ELECTRIC SIGNALING SYSTEM.

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To all whom it may concern:

Be it known that I, JUDSON McFELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Signaling Systems, of which the following is a specification.

My invention relates to improvements in electric signaling systems and has for its general object to provide a simple and efficient apparatus whereby the condition of one or more primary appliances may respectively be indicated at distant signaling receiving points through the provision of electrical appliances and connections.

More specifically an object of my invention is to provide an electric signaling system for association with the letter boxes of hotels, apartment houses, and the like, whereby the condition of the box, whether containing mail or not, may be visually indicated in the individual room or suite to which the box is appurtenant.

A further object of my invention is to provide means of the character described simple in construction, certain in operation, and requiring a minimum expenditure of electrical energy for the setting, maintenance, and restoration of the signal.

While my invention is applicable to many situations, one of its advantageous embodiments, as above suggested, is for indicating in the rooms of hotel guests the presence or absence of mail in their respective office boxes, and I have therefore shown an embodiment of my invention particularly adapted for this use, for purposes of full disclosure, but without intent to limit my invention thereto.

In the drawings, Figure 1 shows in perspective, with casing parts broken away, a signal receiving apparatus associated through electrical means with the office mail boxes; Fig. 2 is a detail of the signal drop or shutter shown in perspective.

In the specific construction shown, the office mail box 10 has its front opening guarded by a pivoted shield 11 which, when in normal or pendant position, closes all of the orifice of said box except the space 12 which is left open for the reception of the hotel key. This shield 11 has connection by a rod 13 with a plunger 14 working through the back of the box against a switch tongue 15 normally contacting with a contact spring 16, and capable of being moved out of contact with said spring 16 and into connection with a back contact spring 17 when the shutter 11 is pivotally moved as by the insertion of mail matter in the box. The shield-actuated plunger therefore acts as a signal initiator, operable alternatively to close either switch, but never both at once.

The springs 15—17 form a switch for a signal-setting circuit; switch 15—16 is appurtenant to a signal-releasing circuit. Thus the springs 16 for the several boxes are connected in multiple to a wire-main 18 which is connected to one terminal of a battery 20 or other source of electrical supply, and the respective contacts 17 are likewise connected in common to a wire-main 19 connected to the other terminal of said battery. From these two batteries lead respectively the wire-mains 18′ and 19′ which are carried throughout the building adjacent to the several rooms in order that the signal receiving mechanism of each room may be readily connected therewith. Each signal cabinet 24 for an individual room is provided with a double switch consisting of a central movable contact 25, a contact 26 normally separated from the contact 25 and a contact 27 with which the spring 25 normally connects. Spring 26 has wire connections 28 with a release magnet 30 and contact 27 has wire connections 29 with a setting magnet 31. The remaining terminals of magnets 30 for all of the cabinets are connected to wire 19′ and magnets 31 are connected to wire 18′. The center contact 15 for each individual switch at the mail box has direct and individual connection by an appropriate wire 35, with the center contact 25 of the receiving cabinet in the corresponding room. Thus for each box and its signal receiving cabinet, constituting portions of a unit of the multiple-unit system I provide two circuits, viz., a setting circuit and a release circuit, with wire 35 common to both circuits, the switches of the mail box and the receiving cabinet being movable each for alternative inclusion in either circuit, but the switches standing normally to connect the release circuit wires at the box and the setting circuit wires at the original receiving cabinet; or in other

words, specifically, to close a loop connected with one side only of the battery, and therefore deënergized, so that manifestly the setting circuit is normally open at the box and the release circuit is normally open at the cabinet.

Whenever, by the insertion of an object in the box 10, shutter 11 is pivotally moved to close switch connections 15—17 the circuit for setting magnet 31 of the corresponding receiving cabinet is closed by path 20, 19, 17, 15, 35, 25, 27, 29, 31, 18′, 20. The magnet attracts its armature and the armature lever 36 through its forked end 37, works on a pin 38 carried eccentrically by the hub of a target yoke 39 so that the target 40 carrying a suitable legend (as shown in Fig. 2) is raised from position concealed within the box to pass between a sight opening 41 and a cover or shield 42 underlying the sight opening, and thus the target is displayed through the opening 41 to indicate to the occupant of the room that the mail box contains mail. As the target yoke is elevated its shaft 43 is turned, carrying with it a disk 44 until, when the target is fully raised, a notch 45 is brought opposite the end of armature lever 47, which normally rides on the arcuate surface of the disk under the tension of retractile spring 48. The armature lever, 47, dropping into the notch, locks the target in raised position, and at the same time a finger 49 of the lever 47 pulls over spring 25 of the switch-set away from connection with contact 27 and into connection with contact 26. This opens the circuit from the setting magnet 31, and establishes connection between the releasing magnet 30 and contact 15 of the mail box switch. Consequently the release magnet 30 of the affected cabinet is brought within the control of the switch 15—16 of the appropriate mail box, and by withdrawal of the mail matter, permitting the plate 11 to swing to pendant position closing the contact 15—16, a circuit for the release magnet 30 is established by the path, 20, 19′, 30, 28, 26, 25, 35, 15, 16, 18, 20, so energizing release magnet 30 and causing it to attract its armature 47. Attraction of the lever 47 withdraws it from latching engagement with notch 45 thereby to permit the dropping of the target 40. I have found in practice, however, that under some conditions and adjustments the breaking of connection between contacts 25 and 26 is apt to occur before the lever 47 escapes from notch 45, under which conditions the armature 47 may vibrate like a bell clapper, and to obviate the possibility of such occurrence I preferably provide means for latching the spring 25 in connection with contact 26 until the restoration of the target 40 is substantially completed or at least until the arcuate portion of disk 44 confronts the lever 47 to latch it in attracted position. To this end I pivot on the side wall of the casing a pawl 50 adapted to engage the contact spring 25 in said position. The tail of this pawl is acted upon by a pin 51 movable with the target, and to this end carried by the disk 44. When the target is raised pin 51 is removed from contact with the pawl 50 which accordingly drops behind the spring 26 to latch it in the position into which it is moved by the finger 49. This latching of the contact spring 25 is maintained, during the releasing operation, until the arcuate periphery of disk 44 has been brought behind the armature lever 47 in the descent of the target 40, and then the pin 51 releases the pawl 50 allowing spring 25 to snap back into connection with contact 27. When this occurs the armature lever 47 has been locked against vibration by the disk 44 so that "chattering" of the armature for the release magnet is mechanically prevented.

Manifestly, as illustrated in the drawings, the signal receiving cabinet and its appliances may be made of small size, with the working parts completely inclosed, the structure being suitable to be built into a wall like a wall switch, and while I have illustrated in some detail a construction which is manifestly simple, compact, and durable, it will be apparent that many changes in the specific construction might be made without departure from the teachings of my invention and within the scope of the appended claims.

In brief résumé it will be observed that the wiring for a system involving a number of units is minimized by the provision of two battery wires or mains common to all of the units, and a single wire 35, constituting the only individual connection between the signal initiating and signal receiving devices of the unit and forming a connection common to both the signal setting circuit and the signal releasing circuit which may be established between the mail box and the individual cabinet corresponding therewith. The automatic shifting of the switch spring 25 at the completion of the target setting operation to open the signal setting circuit and its automatic transference back into coöperation with contact 27 to open the releasing circuit as soon as the restoration of the target to normal position is completed, automatically minimizes the current expenditure from the battery 20. Thus under no condition does either setting or releasing battery remain in circuit longer than is necessary to complete the work that is to be effected by application of its energy. The mutual latching arrangement at the disk 44 and armature lever 47,—especially in connection with the pawl 50 preferably employed to control the movement of spring 25,—is effective in maintaining the proper mechanical position of the parts during the

intervals between electrical operation, and its mechanical arrangement in the signal receiving cabinet, as shown—with the target yoke working nearly horizontally, the armature levers vertically arranged, and the magnets disposed beneath the armature yoke,—makes for simple, cheap, and compact construction. Manifestly the arrangement permits of easy expansion or contraction of the system to suit changes in the number of grouping of the rooms to be served. It will also be apparent that while the signal initiating stations are described as grouped together and the receiving stations as separated from each other, this condition could be reversed, as in the use of my invention for call-annunciator systems or the like.

What I claim is:

1. Electric signaling means comprising, in combination, two line wires extending from signal initiating stations to signal receiving stations; a source of current supply for said two wires; and a plurality of signaling units each comprising a signal-setting magnet connected with one said wire; a signal-releasing magnet connected with the other wire; a signal associated with said magnets to be set and released by the setting and releasing magnets respectively; a common wire connectible to close either the signal setting circuit or the signal releasing circuit; a switch at each signal initiating station alternatively operable to connect said common wire in the signal-setting circuit or the signal-releasing circuit; a switch at each signal-receiving station responsive only to the particular initiation-station switch of that unit movable to connect said common wire alternatively in either circuit; and means controlled by the setting and releasing magnets for automatically shifting the last said switch in response to energization of either magnet to open the circuit for said magnet and close the circuit connections for the other magnet.

2. Electric-signaling means comprising in combination a signal arranged to drop when released; means, including a setting magnet, for raising said signal to set it, means mechanically to latch said signal in set position; means, including a releasing magnet, for moving said latching means to releasing position; two switches alternatively closed, one when the signal is set and the other when the signal is released, the switch closed by the setting of the signal connected with the releasing magnet, and the other switch connected with the setting magnet, two line wires connected with the two magnets respectively, a battery bridged between said wires, two signal initiating switches alternatively closable and connected with the respective line wires and a common wire connecting an element of both of the last said switches with both of the first said switches.

3. In an electric signaling system, the combination of a movable visual signal, means to move the same to set position including a setting magnet; means mechanically to latch the same in set position; means for moving said latching means to releasing position including a releasing magnet; two switches alternatively closable, one in response to the setting of the signal and the other in response to the releasing of the signal, the switch closed by the setting of the signal being connected with the releasing magnet and the switch closed by the releasing of the signal being connected with the setting magnet; signal initiating means comprising two manually operable switches alternatively closable; a single signal-initiating actuator for said switches; and two normally open circuits one including the setting magnet, the switch connected therewith, and one of the switches at the signal initiating station, and the other including the releasing magnet, the switch connected therewith, and the remaining switch at the signal initiating station.

4. In a system of the character described, the combination of a movable signal, means for moving the same to set position including a setting magnet, means for latching the same in set position, means for releasing said latching means including a releasing magnet, suitable circuit connection from said setting and releasing magnets to a signal initiating station, means at said signal initiating station for closing the circuit of the setting magnet or the releasing magnet, and means associated with the signal receiving means for automatically breaking the circuit for either magnet subsequently to its energization.

5. In a system of the character described, the combination of a movable signal, means for setting said signal including a setting magnet, means for latching said signal in set position including a latch and a part movable with the signal, coöperating, when the signal is released, to lock the latch in released position, a releasing magnet for moving said latching means to released position, a double switch controlled by said latching means one switch being closed only when the latching means is in released position and the other only when the latching means is in latching position, the first said switch connected with the setting magnet and the last said switch connected with the releasing magnet; signal initiating means comprising two switches alternatively closable, and two normally open circuits, one including the setting magnet its connected switch and one of the switches of the signal initiating station, the other including the releasing magnet, its connected switch and

the remaining switch of the signal initiating station.

6. In a system of the character described, the combination of signal receiving apparatus comprising a casing having a sight opening, a target pivoted for movement for display through said sight opening or concealment within the casing; means to move said signal to set position including a setting magnet, means for latching said signal in set position including a latch and a coöperating part movable with the signal, to be latched by the latch or to lock the latch in unlatched position, means for moving said latch to unlatched position including a releasing magnet, a double switch controlled by said latching means comprising a switch closed only when the latch is in unlatched position and connected with the setting magnet, and a switch closed only when the latch is in latching position and connected with the releasing magnet, means for latching the last named switch in closed position, means for releasing the last said latching means when the signal returns to concealed position, suitable circuits including the setting and releasing magnets and their respectively connected switches, and suitable switch means at a signal initiating station controlling said circuits.

7. In a system of the character described, the combination of means of current supply; two wiring mains extending therefrom to a plurality of signal initiating stations on the one hand, and a plurality of signal receiving stations on the other hand; an individual wire connection between each signal initiating station and a corresponding signal receiving station; at each signal initiating station switch means for connecting said individual wire with either wiring main; at each signal receiving station two electromagnets and switch means for connecting said individual wire through the respective magnets with either of said mains; signaling means for each signal receiving station responsive to said magnets respectively for setting and releasing the signal; and automatic means whereby the setting of a signal operates the associated switch means to open the circuit for the setting magnet and to close the switch connections for the releasing magnet, and the releasing of the signal operates said switch means to open the circuit for the releasing magnet and close the switch connections for the signal-setting magnet.

8. In a system of the character described, the combination of a battery supply; wiring mains between which said battery is bridged extending therefrom to signal-receiving and signal-initiating stations; at the several signal receiving stations respectively, a signal, a signal-setting magnet connected with one wiring main, a signal-releasing magnet connected with the other wiring main, a switch member connectible alternatively to either magnet; and at the signal transmitting station a plurality of signal initiating switches for respectively controlling the magnets at the several signal receiving stations, each said signal initiating switch comprising a pair of contacts connected with the opposite mains and a switch member movable alternatively into connection with either of said contacts; and a single individual wire connection from said switch member of the signal initiating switches to the stated switch member of the appropriate signal receiving station.

9. In a system of the character described, the combination of a plurality of signal displaying devices, each comprising a signal proper, a setting magnet therefor, a releasing magnet therefor, and a switch having a member movable for alternative connections with either said magnets, and means operable in response to energization of either said magnets to move said switch means into connection with the other of said magnets; a like plurality of signal initiating devices each comprising a double throw switch, an individual connection from the movable member of each said double throw switch to the stated switch member of the corresponding signaling device, a source of current supply, and wiring mains extending from said source of supply, one said main connected to like terminals of all of said double throw switches and to one magnet of each signaling device and the other main connected with the remaining terminals of the signal initiating switches and the remaining magnets of the signal receiving devices.

10. In a system of the character described, the combination of a movable signal, means for setting said signal including a setting magnet, means for releasing said signal including a releasing magnet, circuit connections for said magnets including means operable in response to energization of either magnet to establish circuit connections for the other magnet and including also a suitable source of electrical power and signal initiating switch means; and means to delay the operation of said responsive means until the corresponding movement of the signal proper is substantially completed, whereby each magnet substantially completes its respective operation upon the signal before affecting the circuit connections for the other magnet.

11. In a system of the character described, the combination of an oscillatable signal, a shaft therefor, means including a setting magnet for moving said signal to set position, latch means for said signal including a latch member and coöperating means on the signal, to be latched by the latch or to lock the latch in unlatched position, means

for moving said latch to unlatching position including a releasing magnet, circuit connections for inclusion of said setting and releasing magnets alternatively, including a double throw switch associated with said signal latch, for movement thereby to close the circuit connections for one magnet and for spring return to close the connections for the other magnet, and a latch for said switch controlled by the signal latch.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

JUDSON McFELL.

In the presence of—
GEO. T. MAY, Jr.,
MARY F. ALLEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."