March 29, 1949. A. SCALIA 2,465,935

SIGNALING AND REMOTE CONTROL SYSTEM FOR MAILBOXES

Filed March 12, 1947 2 Sheets-Sheet 1

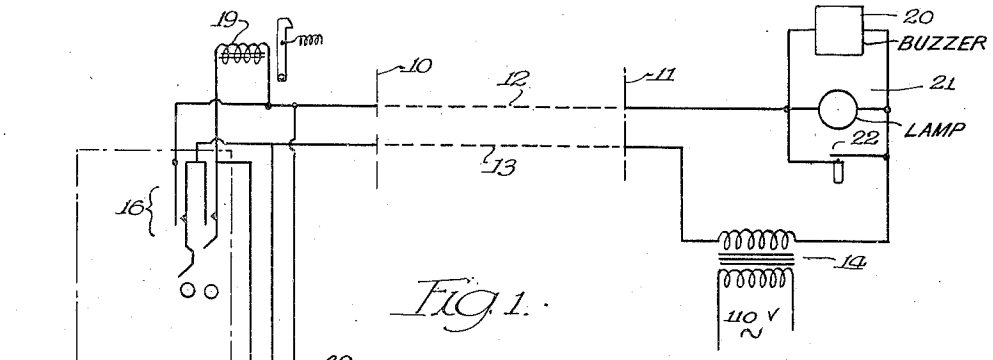


Fig. 1.

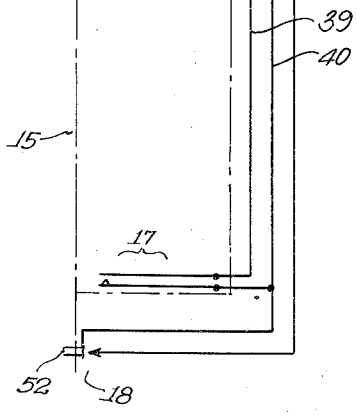
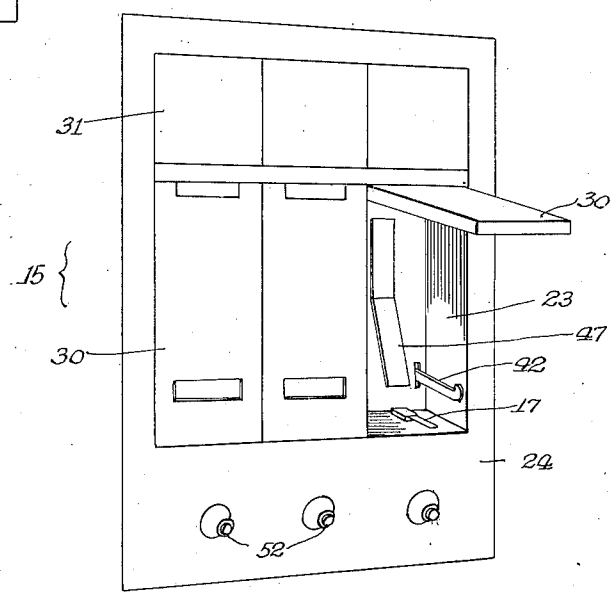


Fig 2.



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Filed March 12, 1947 2 Sheets-Sheet 2

Fig 3

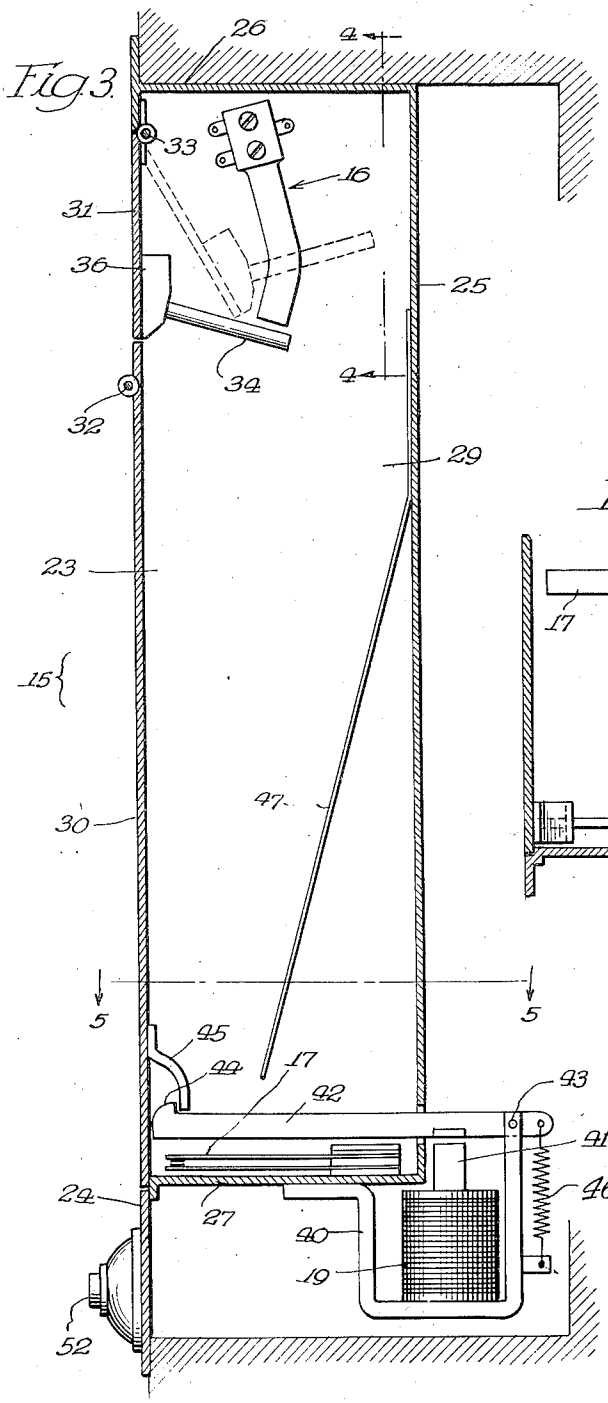


Fig 4

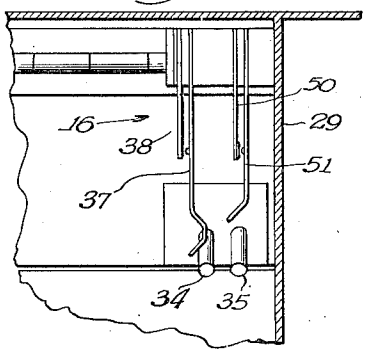
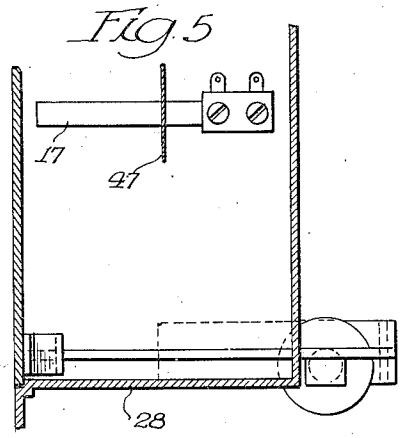


Fig 5



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SIGNALING AND REMOTE CONTROL SYSTEM FOR MAILBOXES

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7 Claims. (Cl. 177—311)

1

This invention relates broadly to electrical signaling and remote control systems and methods and has to do more specifically with a novel system which is operative to serve three distinct purposes, namely: (1) that of an electric door bell, buzzer or chime; (2) that of a mail box annunciator to signal the presence of mail in the box; and (3) that of a remote control circuit whereby a mail box can be unlocked from a remote point—thus making the use of a mail box key unnecessary.

The primary object of my invention is to devise a system which, preferably, can be superimposed upon a pre-existing two-wire door bell circuit—without the need for any additional interconnecting wires—and which will serve automatically to signal, at a remote point, the presence of mail in a mail box and as a remote control circuit for unlocking the mail box, in addition to its usual function as a door bell system.

A further object is to devise a system of the above-indicated character which will cause momentary operation of an audible signal at a remote point when mail is deposited in a mail box and which will thereafter provide a visual signal, which is inaudible, for continuously indicating the presence of mail in the box—the continuous visual signal persisting until the mail is removed from the box.

My invention is especially advantageous where it is desired to install such a system in an existing house or apartment building in which there are one or more previously installed two-wire door bell circuits, and where the cost of running one or more additional wires from the front entrance of the building to one or several remote points, as, for example, to a number of apartments in the building, would be substantial; but the utility of the invention is in no wise limited to situations of that character, since the invention is just as applicable to new-building installations—where the cost of additional wires would be insignificant—as it is to old-building installations where the cost of running additional wires might be prohibitive.

Additional objects and features of my invention will become apparent as the following detailed description progresses.

Referring to the drawings which accompany this specification:

Fig. 1 is a circuit diagram of my improved signaling system, according to the preferred embodiment of the invention;

Fig. 2 is a perspective view showing the front

2

of a multiple mail box unit—one of the boxes being shown open;

Fig. 3 is a vertical sectional view through a mail box in which certain components of the subject invention are shown installed;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3; and

Fig. 5 is a fragmentary sectional view taken at line 5—5 of Fig. 3.

Referring to the diagram, Fig. 1, all that portion of the system shown to the left of the vertical dot-dash line 10 is either incorporated in or associated with an individual mail box which may, for example, be installed in the front entrance of an apartment building. The portion of the system shown to the right of vertical dot-dash line 11 is located at a point remote from the mail box, such as an apartment within the building, And the two aforementioned portions of the system are interconnected through a single pair of wires 12 and 13.

Alternating current is supplied to the system from the house mains through the medium of a transformer 14 which steps down the voltage to a suitable level such, for example, as 10–12 volts.

The mail box is identified as a whole by reference numeral 15, and the appurtenances added thereto and forming component elements of the subject signaling system comprise: a group of contact springs 16 mounted within the upper portion of the mail compartment; a pair of contact springs 17 located at the bottom of the mail compartment; a pair of pushbutton-operated contact springs; and an electromagnet 19 which serves both as an electrical reactance and as a means for unlatching the mail box door by remote control.

The components of the system which are located in the apartment comprise: an audible signal device 20, such as a door bell, buzzer or electric chime; an electric lamp bulb 21 or other visual signal device; a pair of pushbutton-operated contacts 22; and the transformer 14, which may be either in the apartment or the basement of the building.

Referring now more particularly to Figs. 2–5 inclusive, the mail box unit 15 may be generally of conventional design and, as shown in Fig. 2, comprises three mail holding compartments 23. The unit is made up of a front plate 24; a back plate 25; a top plate 26; a bottom plate 27; vertical end walls 28; vertical separating partitions 29, which divide the unit into individual mail compartments 23; front doors 30, one for each individual mail compartment, through which

mail is removed; and hinged closures 31, for the slot through which mail is admitted to the mail compartments. Doors 30 are hinged at 32 and their lower ends move outwardly and upwardly when the doors are opened. Suitable hinge springs, not shown, bias doors 30 toward open position so that when they are unlatched as hereinafter described, they will remain unlatched until they are intentionally closed. Closure 31 is hinged at 33.

So far, at least, as the present invention is concerned, the several mail compartments 23 are identical, and for purposes of further description it is convenient to assume that the unit 15 comprises only one mail holding compartment and one each of door 30 and closure 31.

The group of contact springs 16 is mounted within mail compartment 23 at the upper extremity thereof on the side wall 29 and is arranged to be operated, in response to opening movements of closure 31, by a pair of pins 34 and 35, each of which is secured at one end in a block of insulating material 36 which is attached to the back of closure 31. The positions of pins 34 and 35 when closure 31 is both closed and fully opened is indicated in Fig. 3—the open position being shown in dot-dash lines.

When closure 31 is opened to a slight extent, as would be necessary in order to insert a letter through the slot into compartment 23, pins 34 and 35 are moved upwardly to such an extent that pin 34 engages the sloping end of contact spring 37 and deflects that spring into engagement with contact spring 38. This closes a circuit via conductors 12 and 13 through the secondary winding of transformer 14 and through the audible signal device 20 and the lamp 21 in parallel. There is thus produced an audible signal and a visual signal. If the closure 31 is immediately released, the audible signal will be only momentary, but of sufficient duration to inform the occupants of the apartment that mail has been deposited in the box. The lamp 21 would also be extinguished upon restoration to normal of closure 31 save for the fact that the letter dropped into the box falls onto the upper one of contact springs 17, and this spring is so resilient that it deflects under the weight of the letter into engagement with the lower spring and thus closes a circuit through conductors 39 and 40, coil 19, conductors 12 and 13, and the secondary of transformer 14, which supplies enough voltage to light lamp 21 but not enough to actuate audible signal device 20. The reason for this is that the A. C. impedance of electromagnet coil 19 reduces the voltage impressed upon the audible signal device to such as extent that it will not respond; but the voltage is still sufficient to light lamp 21. At the same time, the parallel impedance of device 20 and lamp 21 is sufficient to limit the voltage across electromagnet coil 19 to a value which is not sufficient to enable the electromagnet to actuate its armature.

With contact springs 17 closed by the weight of a letter, a closure of pushbutton-operated contacts 22 will shunt out lamp 21 and device 20 and thus increase the voltage across electromagnet 19 to a value sufficient to enable it to actuate its armature.

Now referring to Figs. 3 and 5, it will be seen that electromagnet 19 is secured to an iron frame 40 which is attached at one end to the bottom plate 27, by which it is supported; and said electromagnet has a core 41 which is disposed in spaced relation to an armature 42 which is pivoted at 43 on frame 40 and provided with a detent 44 which serves to latchingly engage a latchplate 45 secured to door 30. A coil spring 46 normally holds armature 42 in latching engagement with latchplate 45 and is strong enough to prevent actuation of said armature by electromagnet 19 when the voltage thereacross is reduced by inclusion in circuit of device 20 and lamp 21, but not strong enough to prevent actuation of the armature when the voltage across the electromagnet is increased by closing contact 22 and thus shunting out elements 20 and 21.

In order to ensure that a letter dropped into the box will fall on contact springs 17 at a point sufficiently forward to effect a closure of those contacts, there is attached to the back wall 25 a light leaf spring 47 which is of sufficient stiffness to divert a downwardly moving letter toward the front of the box, but sufficiently yieldable so as not to interfere with insertion of whatever mail is to be deposited.

It often happens that pieces of mail which are too large to pass completely through the intake slot are left in the slot by the letter carrier and that the closure 31 is thus held in its fully open position. For that reason, spring 37 is so formed that when closure 31 is fully opened, pin 34 will pass the laterally offset end portion of spring 37 (see Fig. 3), thus allowing contact springs 37, 38 to reopen. As a result, the operating circuit of audible signal device 20 is closed but momentarily, and said device is, accordingly, not kept in operation to the annoyance of the occupants of the apartment. But unless some other piece of mail has been dropped into the box the contacts 17 will not be closed, and for that reason there is provided, as a part of spring group 16, a pair of contact springs 50 and 51—the latter of which is bent angularly at its free end for engagement by pin 35. When closure 31 is fully opened, pin 35 engages contact spring 51 and deflects the same into contact with spring 50. These contacts are in parallel with contacts 17 and are effective to close a circuit through electromagnet 19 and lamp 21 which causes said lamp to light. The audible device 20 is not actuated because of the A. C. impedance of electromagnet 19.

Contacts 18 are manually operable by the pushbutton 52 to close a circuit through conductors 53 and 54 and conductors 12 and 13 to energize both the audible signal device 20 and the lamp 21.

It will be seen that I have provided a system requiring only two interconnecting wires which functions as a door bell circuit and, in addition, as a circuit for operating an audible signal momentarily when mail is either deposited in the mail box or left in the mail intake slot and which maintains a visual signal until the mail is removed from the box; and which further provides for unlocking the mail box by remote control.

It will be self-evident that there are numerous possible modifications and alternative arrangements within the purview of my inventive concept and, accordingly, I do not wish to be limited except as indicated by the terms of the appended claims.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A signalling system comprising: a first station and a second station remote from said first station and connected therewith through a pair of conductors, a mail box at said first station, a first pair of normally open contacts associated

with said mail box and operative, in response to a partial opening of the slot closure of the mail box, to close a circuit including said conductors, said circuit including an audible signal device and a visual signal device located at said second station, a source of alternating current in series with said contacts, said contacts being operative in response to further opening of said closure to open said circuit, a second pair of normally open contacts, an inductance, said second pair of contacts being located within said mail box and adapted to be closed by the weight of a letter superimposed thereon, said second contacts being included in series with said inductance and said source of current and said signal devices in a circuit including said pair of conductors.

2. A signaling system comprising: a first station and a second station remote from said first station, said stations being interconnected by a pair of conductors, a mail box at said first station, a first pair of normally open contacts associated with said mail box and operative in response to a partial opening of the slot closure of the mail box to close a circuit including said conductors, said circuit including an audible signal device and a visual signal device located at said second station, a source of alternating current in series with said contacts, said contacts being operative in response to further opening of said closure to open said circuit, a second pair of normally open contacts, an electromagnet operative when fully energized to unlock the door of the mail box, said second pair of contacts being located within said mail box and adapted to be closed by the weight of a letter superimposed thereon, said second contacts being included in series with the winding of said electromagnet and said source of current and said signal devices in a circuit including said pair of conductors, said audible signal device being inoperative on the voltage applied thereto when included in series circuit with the winding of said electromagnet, a pair of manually operable normally open contacts at said second station operative, when closed, to shunt at least one of said signal devices, said electromagnet being inoperative to unlock said door on the voltage impressed thereon when said last-mentioned contacts are open, but operative in response to a closure of said last-mentioned contacts, provided said second contacts are also closed.

3. A signaling system comprising: a first station and a second station remote from said first station and interconnected therewith by a pair of conductors, a mail box at said first station, a first pair of normally open contacts situated within said mail box and adapted to be closed by the weight of a letter resting thereon, an electromagnet operative, when fully energized, to unlock said mail box, a signal device at said second station and a second pair of normally open contacts at said second station in shunt to said device, a source of current, and a circuit including said conductors, said source of current and said first and second pairs of contacts connected in series in said circuit, the voltage across the winding of said electromagnet being so reduced by the impedance of said device, when said contacts are open, that said electromagnet is ineffective to unlock said mail box, the voltage across said winding, when said device is shunted by closure of said second contacts, being sufficient to fully energize said electromagnet, provided said first contacts are closed.

4. A signaling system comprising: a first station and a second station remote from said first station, a mail box at said first station having a compartment for the reception of mail, a slot for insertion of mail, a hinged closure for said slot and a door providing access to said compartment for removal of mail, a first pair of normally open contact springs adapted to be closed momentarily in response to an opening of said closure, an audible signal device and a visual signal device located at said second station and connected in parallel, a second pair of normally open contact springs adapted to be closed in response to a full opening of said closure and to be held closed as long as said closure remains fully open, a latch normally holding said door closed, and an electromagnet operative, when fully energized, to unlatch said door, a first circuit including a pair of conductors interconnecting said stations, said circuit including said signal devices and said first contacts in series with a source of alternating current, but not including the winding of said electromagnet, a second circuit including said pair of conductors and said signal devices and said source of current, said second circuit also including said second contacts in series with the winding of said electromagnet, and a third pair of normally open contacts located at said second station and connected in shunt to said signal devices, said electromagnet being insufficiently energized to unlatch said door when said second pair of contacts are closed and said third pair of contacts are open, but sufficiently energized to unlatch the door when both said second and third pairs of contacts are closed.

5. A signaling system comprising: a first station and a second station remote from said first station, a mail box at said first station having a compartment for the reception of mail together with a slot for insertion of mail and a door for removal of mail, a first pair of normally open contact springs located in the bottom of said compartment and adapted to be closed by the weight of a letter resting thereon, a latch normally locking said door, an electromagnet operative, when energized, to unlatch the door, an electrically operated visual signal device at said second station, a second pair of normally open contacts located at said second station and connected in shunt to said signal device, and a circuit including a source of current and a pair of conductors interconnecting said stations, said circuit including both said pairs of contacts and the winding of said electromagnet in series with said source of current, said signal device being operative in response to a closure of said first pair of contacts, said electromagnet being insufficiently energized to unlatch said door when said first pair of contacts only is closed, but sufficiently energized to unlatch the door when both said pairs of contacts are closed.

6. A signaling device comprising: a first station and a second station remote from said first station, a mail box at said first station having a compartment for the reception of mail and a slot for the insertion of mail, together with a hinged closure for said slot, a first pair of normally open contacts adapted to be closed momentarily in response to an opening of said closure, a second pair of normally open contacts located within and at the bottom of said compartment and adapted to be closed by the weight of a letter resting thereon, an electrically operated audible signal device located at said second station, a visual signal device located at said second station, a first circuit including a pair of conductors inter-

connecting said stations, a source of current included in said circuit in series with said first contacts and said signal devices, both of said devices being actuable momentarily in response to a closure of said first contacts, and a second circuit including said pair of conductors and said source of current and said signal devices, said second circuit also including said second pair of contacts and an impedance element in series, the magnitude of said impedance being sufficient to prevent operation of said audible signal device when said second contacts are closed and said first contacts are open, but insufficient to prevent operation of said visual signal device under the same conditions.

7. A signaling system comprising: a first station and a second station remote from said first station, a mail box at said first station having a compartment for the reception of mail and a slot for insertion of mail, together with a hinged closure for said slot, a first pair of normally open contacts adapted to be closed momentarily in response to an opening of said closure, a second pair of normally open contacts located within and at the bottom of said compartment and adapted to be closed by the weight of a letter resting thereon, an electrically operated audible signal device located at said second station, a visual signal device located at said second station, a first circuit including a pair of conductors inter-connecting said stations, a source of alternating current included in said circuit in series with said first contacts and said signal devices, both of said devices being actuable momentarily in response

to a closure of said first contacts, and a second circuit including said pair of conductors and said source of current and said signal devices, said second circuit also including said second pair of contacts and the winding of an electromagnet in series, the impedance of said winding being sufficient to prevent operation of said audible signal device when said second contacts are closed and said first contacts are open, but insufficient to prevent operation of said visual signal device under the same conditions, a third pair of contacts located at said second station and in shunt to said signal devices, a door providing access to said compartment, a latch normally locking said door, and means operable by said electromagnet in response to closure of said third pair of contacts for unlatching said door.

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