

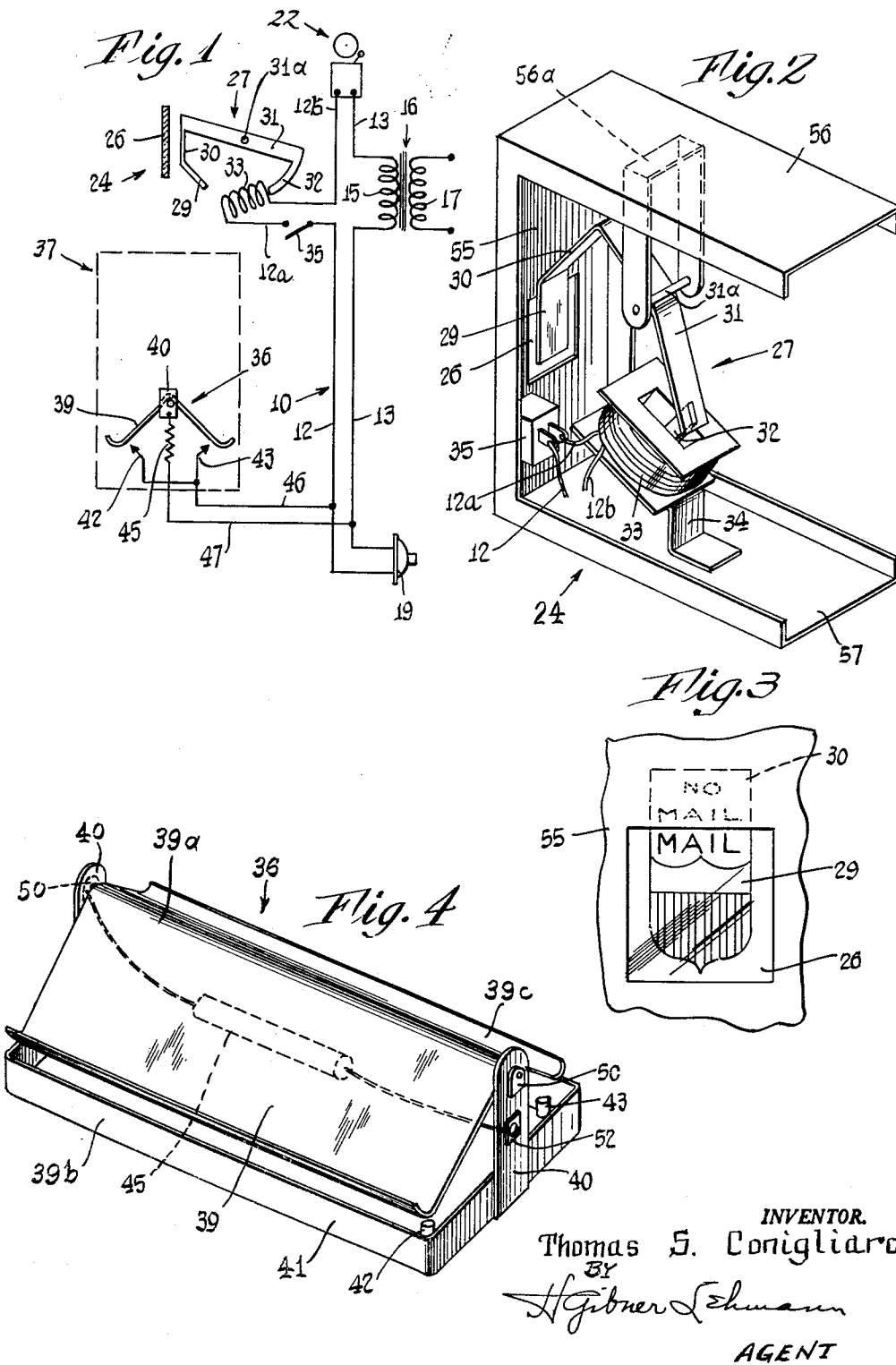
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COMBINED DOOR SIGNAL AND MAIL INDICATOR DEVICE

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COMBINED DOOR SIGNAL AND MAIL INDICATOR DEVICE

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This invention relates to mail indicator and signal devices for use within buildings having mail boxes, and more particularly to combined electrical indicators and signals wherein there are mail actuated switches, by which an indication as to the presence of mail may be had at a remote point, as well as an indication or signal which may be given by a caller.

An object of the invention is to provide a novel and improved electrical mail indicator of the type having a mail actuated switch, which indicator constitutes a non-energizing accessory in conjunction with existing energized signal lines intended for other purposes, thereby to enable an indication to be had at a remote point of the presence of mail in a mail box by utilizing an already existing energy supply and signal lines.

Another object of the invention is to provide an improved electrical mail indicator in accordance with the foregoing, which may utilize existing front or rear door bell lines together with the existing bell transformer or equivalent supply to effect the desired indication whenever mail or other matter is deposited in the mail box.

A still further object of the invention is to provide a novel mail indicator device as above characterized, which is of the utmost simplicity and involves a minimum number of parts or components.

A feature of the invention resides in the provision of an improved and simplified mail indicator device as above set forth, which is extremely sensitive in its response, and requires but a fractional or small amount of current to effect its operation.

Another feature of the invention resides in the provision of an improved remote-indicating mail signal system utilizing the existing door bell lines and source of energy, wherein an extremely small loading of the source of energy, as for example the bell transformer, is required for the operation of the indicator, thereby avoiding any danger or likelihood of the transformer becoming overloaded or overheated, and preventing any interference with or malfunctioning of the existing door bell.

Another object of the invention is to provide an improved and simplified electrical mail indicator as above set forth, which is devoid of any electrical relay or switching magnetic circuit control components and involves mainly a simple switching device at the mail box to effect its operation, thereby providing for the utmost in reliability and obviating the need for servicing.

Other objects of the invention include the provision of an improved and simplified mail indicator device as characterized, which involves a minimum number of movable parts and a minimum number of components, all of which are simple to construct, thereby providing for low cost and economy of fabrication.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference have been used to designate like components throughout the several views, in which:

FIGURE 1 is a diagrammatic representation of the present improved mail indicator device in conjunction with an electric door signal system.

FIG. 2 is a rear perspective view of the indicator portion of the mail indicator device.

FIG. 3 is a fragmentary front elevational view of the indicator of FIG. 2, showing the viewing window and indicia or signal means of the device.

FIG. 4 is a perspective view of the mail box switch unit of the device.

Referring first to FIG. 1, a two-wire energized door signal line is indicated by the numeral 10. The signal line comprises conductors 12 and 13, the conductor 13 having included in its circuit the secondary coil 15 of a bell transformer 16 or equivalent source of electrical energy, the said transformer being shown as having a primary winding 17 for connection to the house lines. The door signal line 10 is connected with a usual type of signal, indicated herein as a door bell 22 to one terminal of which the conductor 13 is connected.

The conductors 12 and 13 of the signal line 10 are connected to a push button 19 which is normally located at the front door or other entrance to the building. The transformer 16 may be located at any convenient point, preferably where access is had to an electrical outlet, as for example, in the basement of the building.

By the present invention a novel and simplified electrical indicator device 24 is provided, arranged to be connected in series in the door signal line circuit whereby the door signal line may be made to carry out not only the function of energizing the door bell 22 when the push button 19 is depressed, but also the additional function of indicating the presence of mail in the mail box of the building.

In accordance with the invention, the door signal line 10 is broken or disconnected at a convenient point, and the indicator device 24 as provided by the invention is interposed in the broken line, that is, connected to the two ends which are formed by cutting or disconnecting of the line. In FIG. 1 the indicator device 24 is illustrated diagrammatically, whereas FIG. 2 shows a rear perspective view of the device. As seen in these figures, the indicator device 24 has a window 26 behind which there is exposed a movable armature 27, said armature carrying a pair of indicator panels 29 and 30 which are angularly disposed with respect to each other. The panels 29, 30 are carried by a lever arm 31 of the indicator device, as by securing the panel 30 to one end of the arm. The arm 31 is carried by a pivot or spindle 31a as shown. The other end of the lever arm has a magnetic armature member 32 which is arranged to extend into the hollow core of a sensitive magnet coil or solenoid 33 the two terminals of which are connected with the ends formed when the signal line is broken. As seen in FIGS. 1 and 2 the coil 33 is connected to leads 12a and 12b, the lead 12b being connected to the doorbell 22 whereas the lead 12a is connected to an on-off switch 35 which is in turn connected with the conductor 12.

Referring to FIG. 1 it will be seen that when the armature piece 32 is disposed out of the magnet coil 33, the indicator panel 30 is presented behind the window 26. As seen in FIG. 3 the panel 30 may carry the words "no mail," thereby indicating the absence of mail in the mail box when the coil 33 is unenergized. Upon the coil 33 being electrically energized it will attract the armature piece 32, swinging the lever 31 clockwise as seen in FIG. 1 and bringing the indicator panel 29 directly behind the window 26. The panel 29 may carry the word "mail," and may also have any suitable emblem, as for example a shield, as seen in FIG. 3. Accordingly, a continually energized condition of the coil 33 generally corresponds to the presence of mail in the mail box, and an indication of such presence will be given through the window 26.

The movable indicator system 27 comprising the pivoted arm 31, indicator panels 29, 30 and armature piece

32 is preferably made light in weight so as to have a sensitive response. Also, it is given a balance which normally maintains the indicator panel 30 disposed directly behind the window 26, as illustrated in FIG. 1, under the action of gravity.

From the circuit of FIG. 1 it will be observed that the magnet coil 33 is also energized each time that the door bell 22 is rung by virtue of the push button 19 being depressed. However, such energization is of a momentary nature, and the momentary indication of mail which is given by the panel 29 being presented behind the window 26 will not be taken as a true indication by the user, since it is accompanied by the sound of the door bell, announcing the presence of a person at the entrance of the dwelling. By the present invention a much smaller but continuous energization of the magnet coil 33 is effected when mail is deposited in the mail box. This is accomplished by use of a current attenuating device in the signal line, which is made to provide a reduced line current when mail is in the mail box, as will be shortly explained. This lesser but continuous energization of the coil 33 is sufficient to attract the armature member 32 and swing the lever 31 clockwise, thereby to present the "mail" panel 29 behind the window 26, indicating the presence of mail. However, such lesser energization is insufficient to energize and operate the door bell 22.

There is provided by the invention a novel mail box switch and current attenuator indicated generally by the numeral 36 (FIGS. 1 and 4), the said switch and attenuator being arranged for disposition within a mail box 37 at the bottom of the same. The switch 36 includes in series in its circuit the current attenuating device, and is arranged to be normally open when no mail is in the mail box 37, and to close and to remain closed whenever any mail, papers or other material are inserted in the mail box.

As seen in FIGS. 1 and 4, this novel, mail-actuated switch 36 is constituted as a single pole double throw switch having a light-weight rocker member 39 pivotally carried by upstanding bearing arms 40 secured to the opposite ends of a rectangular, low base member 41 of a size enabling it to fit into the mail box 37 and rest on the bottom wall of the said box. The rocker member 39 has a peaked shape, that is, it is of angular cross section with a ridge 39a extending between its opposite ends and located approximately centrally of the rocker. The rocker member 39 is cooperable and engageable with stationary contacts 42, 43 carried by the base 41, the latter being preferably of insulating material such as plastic composition. Normally, as seen in FIGS. 1 and 2, the switch rocker 39 is out of engagement with the stationary contacts 42 and 43. However, if the rocker member 39 should be tilted about its pivotal axis either to one side or the other, it will engage a contact 42, 43. The contacts 42, 43 are connected together as shown in FIG. 1. The current attenuating device, shown in FIG. 1 as a resistor 45, is connected with the rocker member 39, and leads 46, 47 connect the contacts 42, 43 and the resistor 45 respectively to the wires 12, 13 of the door bell line 10.

As seen in FIG. 4, the remaining lead from the resistor 45 may be brought out to a suitable terminal 52, for connection to the wire 47. One end of the resistor 45 is connected to a metal bearing piece 50 carried by the insulating bearing strips 40 of the mail box switch.

With such organization, actuation of the switch rocker member 39, effecting engagement of the same with one of the contacts 42, 43 will have the effect of connecting the resistor 45 between the wires 12, 13 of the door line. That is, as seen in FIG. 1 the mail box switch and series resistor 45 are, in effect shunted across the door bell button 19. Accordingly, whenever the mail box switch 36 is closed, as by mail being deposited in the mail box 37, the resistor 45 will be connected between the wires 12, 13 causing an energization of the coil 33. The

value of the resistor 45 is sufficiently high to limit the current in the signal line to a low value which is insufficient to operate the door bell 22. However, due to the sensitive magnet 33 having a large number of turns of relatively fine wire, sufficient magnetism will be created to attract the magnetic armature 32 and swing the lever arm 31 clockwise so as to provide the "mail" indication, as given by the panel 29 being presented in the window 26. Moreover, the ohmic resistance and reactance of the magnet coil 33, although appreciable, is not enough to prevent adequate energization and operation of the door bell 22 whenever the button 19 is depressed. As an example, with a 10-volt transformer secondary, the coil 33 and bell 22 may have ohmic resistances of 6 ohms and 5 ohms respectively, and the resistor 45 may have a value of 30 ohms.

As seen in FIG. 2, the indicator device 24 may further comprise a framework made, for example, from sheet metal, having a front wall 55 wherein the window 26 is disposed, a top wall 56 mounting a bracket 56a which carries the spindle 31a, and a bottom wall 57 constituting a base and having a bracket 34 on which the magnet coil 33 is mounted.

Preferably, as seen in FIG. 1, the rocker member 39 is connected to its pivotal shaft at a point slightly removed from the ridge 39a of the member. That is, the ridge is slightly off center, with respect to the axis of the member, and the member is balanced for such disposition of the pivot. By this arrangement, any object of significant weight which comes to rest on the ridge 39a will cause the light rocker member to tilt and close the switch circuit in the mail box.

To strengthen or reinforce the rocker member 39 the opposite longitudinal edges thereof may be upturned to constitute a pair of flanges 39b and 39c, as seen in FIGS. 1 and 4, on which flanges letters, papers and the like may rest.

It will now be understood from the foregoing that I have provided an extremely simple yet effective and reliable mail indicator device which makes use of the existing door signal lines of a dwelling. Adjacent the door-bell push button, connections may be effected to the signal line and brought to the mail box switch 36. At a point adjoining the door bell 22 and remote from the mail box 37 and push button 19, the indicator device 24 may be located and interposed in one of the signal line wires. The indicator device is seen to be devoid of relays or any other magnetic-type circuit control components. Instead, it is merely constituted of the on-off switch 35 and the single coil magnet 33 together with the armature assemblage including the indicator panels. At the mail box the electrical switch which is responsive to the presence of mail is simple in construction and sensitive in its response to the weight of objects which may be placed on it. The entire mail indicator device is characterized by extreme simplicity, relatively few movable parts, and has been found to be effective and reliable in its operation.

Variations and modifications may be made within the scope of the claims, and portions of the improvements may be used without others.

I claim:

1. A combined door signal and mail indicator system comprising a two-wire energized door signal line including an electrical energizing means and a push button series connected in the line; a mail-box controlled circuit comprising a mail box switch and current modifying device series-connected thereto, said circuit being connected to directly parallel the push button, said switch being responsive to mail being placed in the mail box; an audible electric door signal connected in series in the door signal line; and a sensitive magnet connected in series with the signal line and having a biased armature and an indicator controlled by the armature, said armature being normally held in its biased position wherein the indicator shows the

absence of mail in the mail box, and being actuated in response to closing of either the said push button or the mail box switch to provide an indication to the effect that mail is present in the mail box, the said current-modifying device reducing the current in the signal line to a value insufficient to operate the door signal when only the mail box switch is actuated, and the presence of the sensitive magnet in the signal line providing an attenuation of the current in the line when the push button is closed, which is insufficient to render the door signal inoperative.

2. The invention as defined in claim 1 in which the armature and indicator constitute a rigid assemblage which is movable as a unit, and in which there are means for pivotally mounting the said armature and indicator unit, said pivotal mounting means being off-center whereby the force of gravity biases the unit to a predetermined rotative position with the indicator showing the absence of mail.

3. The invention as defined in claim 1 in which the current-modifying device comprises a resistor adapted to appreciably attenuate the current passing through the mail box switch as compared with the normal door signal current.

4. The invention as defined in claim 1 in which the mail box switch comprises a single pole double throw electric switch having a movable operator for the switch blade, said operator being arranged for engagement by mail placed in the mail box.

5. The invention as defined in claim 4, in which the switch operator comprises a rocker, and in which there are means for pivotally mounting the said rocker, said rocker being normally held by the force of gravity in a position wherein the switch contacts are maintained opened.

6. The invention as defined in claim 5 in which the rocker has a ridge at its uppermost portion, said ridge being located out of a vertical plane passing through the pivotal mounting means for the rocker.

7. The invention as defined in claim 5 in which the rocker comprises a peaked member of angular cross section, and in which the pivotal mounting means provides a

pivotal axis which extends closely adjacent the peak of the rocker.

8. The invention as defined in claim 1 in which the sensitive magnet comprises a solenoid constituted as a multi-layer coil having an ohmic resistance close to the ohmic resistance of the door signal.

9. The invention as defined in claim 1 in which the indicator comprises a pair of panels connected with each other and disposed angularly with respect to each other, one of said panels providing a "no mail" indication and the other panel providing a "mail" indication.

10. The invention as defined in claim 9 in which the armature comprises a magnetic member and a pivoted arm carrying at one end the said magnetic member, the other end of the pivoted arm carrying the said two angularly disposed panels.

11. An electrical switch device adapted to be mounted in and at the bottom of a mail box, the said switch device comprising a rocker plate extending horizontally, means pivotally mounting the rocker plate for turning movement about an axis located adjacent the center of the plate, and a pair of stationary switch contacts arranged to be engaged by the plate when the latter is tilted respectively in one direction or an opposite direction, said rocker plate having a peaked shape, and being of angular cross section, the peaked portion of the plate being off center and constituting the uppermost portion of the plate.

12. The invention as defined in claim 11 in which the rocker plate has oppositely disposed, lowermost edge portions which are turned upward to provide flanges thereon.

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