Sept. 22, 1964 T. S. CONIGLIARO 3,150,361

MAIL INDICATOR AND DOOR SIGNAL

Filed July 17, 1962 2 Sheets-Sheet 1

Fig. 1

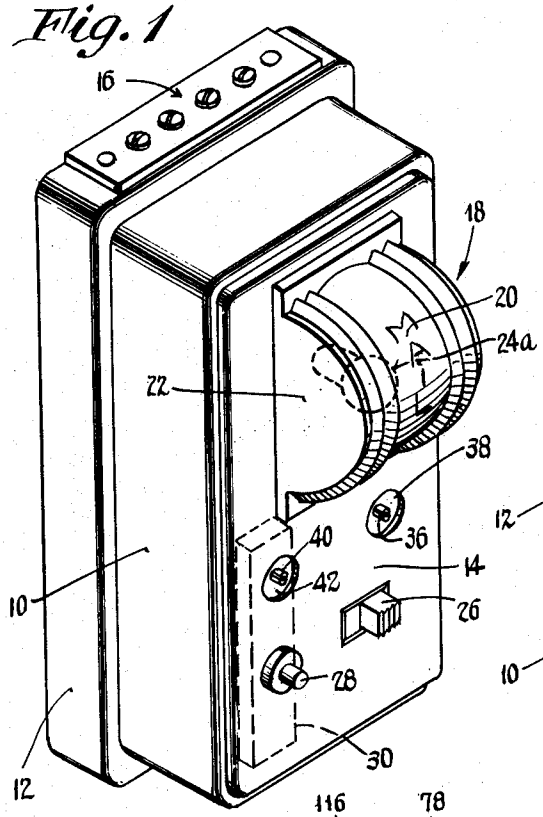


Fig. 2

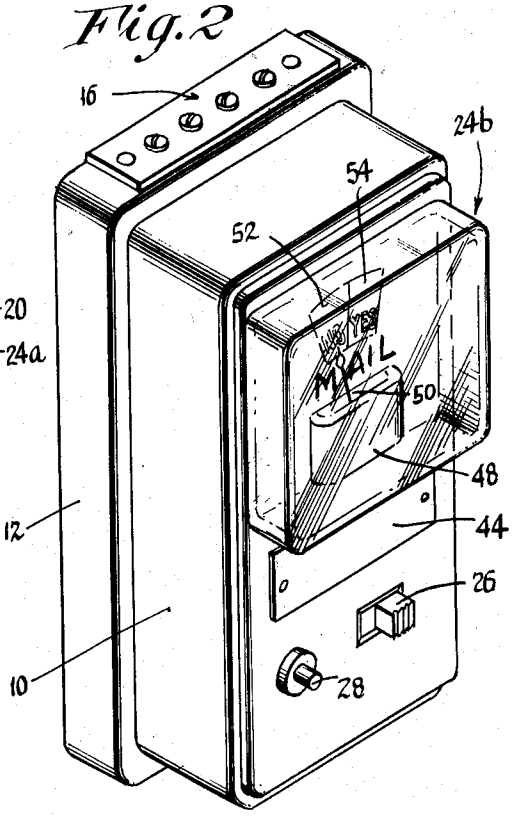
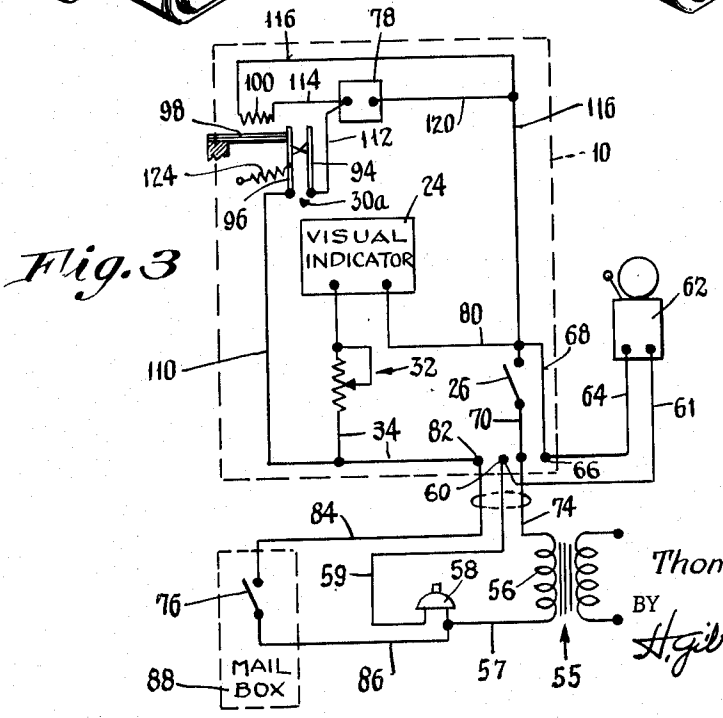


Fig. 3



INVENTOR.
Thomas S. Conigliaro
BY
H. Gilbert Lehmann
AGENT

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Fig. 4

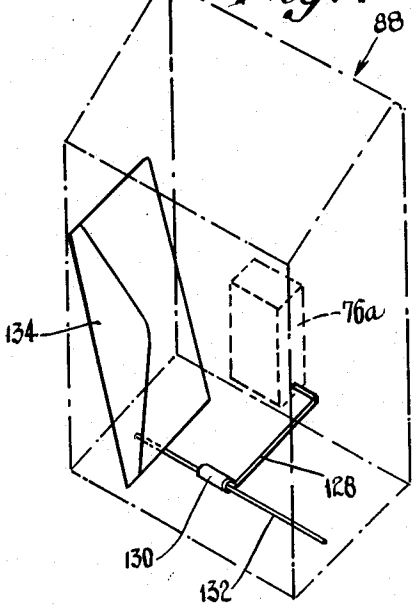


Fig. 5

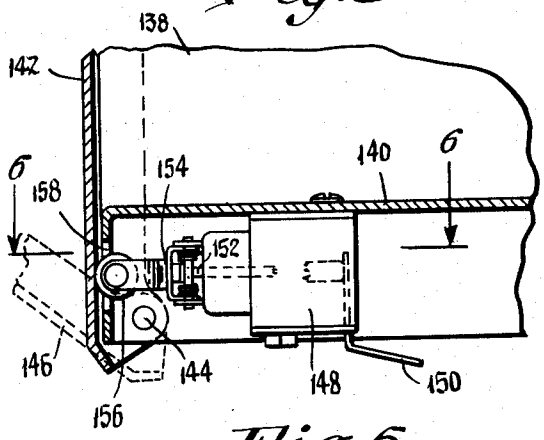


Fig. 6

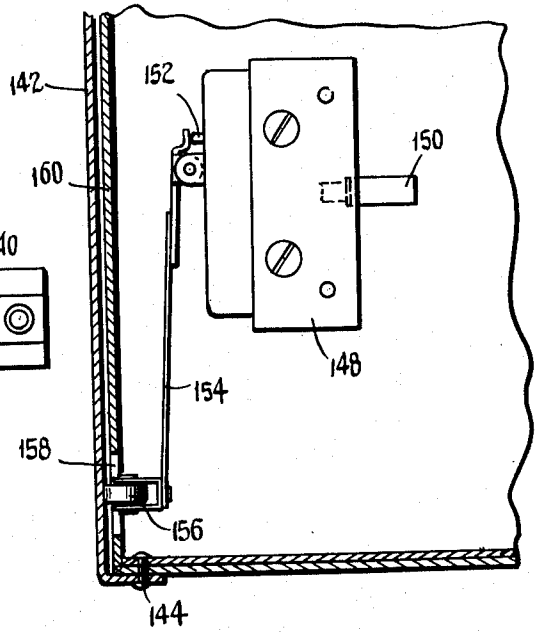


Fig. 7

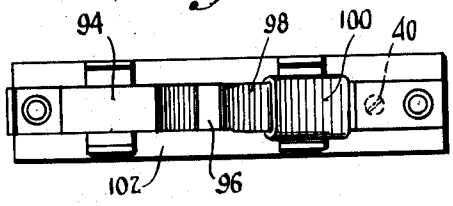
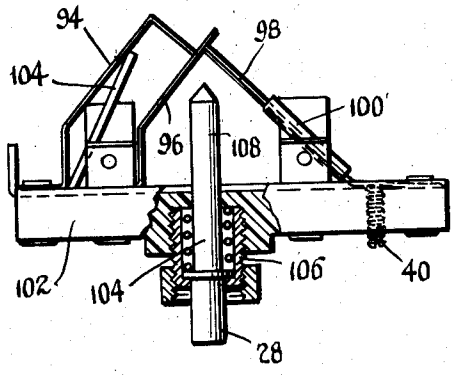


Fig. 8



INVENTOR.
Thomas S. Conigliaro
BY
H. Gibner Lehmann
AGENT

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3,150,361

MAIL INDICATOR AND DOOR SIGNAL

Thomas S. Conigliaro, 3690 Main St., Bridgeport, Conn., assignor of one-half to Nicholas Conigliaro, Carbondale, Pa.

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6 Claims. (Cl. 340—281)

This invention relates to signal and indicator systems, and more particularly to systems of this type which incorporate door or entrance signals and mail box indicators.

The invention concerns improvements in the signal and indicator systems of my copending application Serial No. 137,766 filed September 13, 1961, and entitled Combined Door Signal and Mail Indicator System, and of my Patent No. 3,008,132 issued November 7, 1961 and entitled Mail Indicator Device, and Patent No. 3,008,133 issued November 7, 1961 and entitled Combined Door Signal and Mail Indicator Device.

An object of the invention is to provide a novel and improved door signal and mail indicator system which effects both visual and temporary audible indications as to the presence of mail in the mail box, utilizing the fewest possible components and also utilizing a simplified circuit whereby the manufacturing cost is held to a minimum.

Another object of the invention is to provide an improved signal and indicator system as above, which is reliable in operation and not likely to get out of order, thereby requiring a minimum amount of servicing and maintenance.

A further object of the invention is to provide an improved and simplified mail-actuated switch means for use with existing mail boxes, to effect a circuit control of the mail indicator system.

An additional object of the invention is to provide a simple and improved automatic electric cut-out for use with an indicator system as above characterized, to enable a momentary audible signal to be had when mail is deposited in the mail box.

Another object of the invention is to provide a novel unitary mail indicator instrument and door signal accessory which is small and compact, attractive and easily operated, with the necessary manual controls and visual signal conveniently disposed at the casing front where it is readily accessible for viewing and adjustment.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, wherein:

FIG. 1 is a front perspective view of a unitary mail indicator instrument illustrating one embodiment of the invention.

FIG. 2 is a front perspective view of another unitary mail indicator instrument made in accordance with the invention, illustrating another embodiment thereof.

FIG. 3 is a schematic circuit diagram of the improved door signal and mail indicator device.

FIG. 4 is a diagrammatic representation of a mail box having incorporated in it a simplified mail-actuated switch mechanism as provided by the invention.

FIG. 5 is a fragmentary vertical sectional view of another type of mail box, that commonly used for rural delivery, having incorporated therein a simplified mail-actuated switch means as provided by the invention.

FIG. 6 is a fragmentary horizontal section taken on the line 6—6 of FIG. 5.

FIG. 7 is a top plan view of a novel electric circuit cut-out device for effecting a temporary operation of the audible signal of the indicator means, as provided by the invention.

FIG. 8 is a view partly in side elevation and partly in section, of the electric cut-out device of FIG. 7.

Considering first FIG. 1, the unitary mail indicating instrument and door signal accessory shown therein comprises a generally rectangular open-backed casing member 10 having a mounting or base edge portion 12, and having a front wall or panel 14. Terminals 16 are disposed at the top of the base portion 12 for connection with the door signal, signal lines, a source of supply and a mail-operated switch, all to be described. Referring to FIG. 3, the casing 10 is indicated diagrammatically by the broken rectangular outline which has been given the same number.

Disposed on the front panel 14 is a visual indicator device comprising a curved globe or lens 18 having a convex front face 20 and flat sides 22. Within the lens 18 is an incandescent electric lamp 24*a* of small voltage and power rating, such lamp being designated diagrammatically by a broken outline. In FIG. 3, the lamp 24*a* may be considered as constituting the visual indicator shown by the box 24.

The front panel 14 also mounts an on-off switch 26, and additionally a reset button 28 which constitutes a portion of an electric cut-out device indicated generally by the broken outline 30 in FIG. 1. In FIG. 3 the electric cut-out device is shown diagrammatically, and the diagrammatic showing is given the numeral 30*a*.

In series with the visual indicator 24 (see FIG. 1) is a rheostat 32, such rheostat being inserted in a lead wire 34 connected with the indictor. The rheostat 32 has a shaft 36 which is accessible through an opening 38 in the front panel 14. Similarly, the electric cut-out device 30*a* has an adjusting screw 40 which is accessible through an opening 42 in the front panel 14.

A name plate 44 may be affixed to the front panel 14 to cover the openings 38 and 42 and the adjustment screws 36 and 40, this being shown by way of example in the instrument illustrated in FIG. 2. The instrument of this figure is generally similar to that of FIG. 1 with the exception that the visual indicator designated 24*b*, is in the form of an electric meter having a deflecting coil 48 and a pointer 50, the latter being movable over a scale having two colored zones 52 and 54 labelled respectively "NO" and "YES." The instrument movement 24*b* thus is an alternative for the incandescent lamp 24*a* and the lens 18. Both the incandescent lamp 24*a* and the instrument movement 24*b* constitute visual indicators to reveal the presence of mail as effected by the indictor system, as will be shortly described.

Referring now to the circuit diagram of FIG. 3, the indicator system is shown as operating from a source of current such as a conventional door bell or door chime transformer 48 having a secondary coil 50 connected by a lead 52 to the conventional front door push button 54. The push button 54 is connected by a lead 56 to a terminal 58 of the unit instrument, which terminal is in turn connected by a lead 60 to the door bell 62 (or chimes) of the dwelling or building. The bell 62 is connected by a wire 64 to a terminal 66 of the instrument, from which a wire 68 goes to the on-off switch 26, the latter being also connected by a wire 70 to a terminal 72. From the terminal 72 a wire 74 connects to the remaining terminal of the transformer secondary coil 50. By such organization, the door bell 62 will operate when the button 54 is depressed in the usual manner.

In accordance with the present invention, in conjunction with the current source and door bell system above set forth there is provided a novel mail indicator device involving the visual indicator 24, a mail box switch 76, the electric cut-out 30*a*, and an audible signal device such as a buzzer 78.

As shown in FIG. 3, the visual indicator 24 is con-

nected by a wire 80 to the on-off switch 26, and the wire 34 of the visual indicator is connected to a terminal 82 of the unit. From the terminal 82 a wire 84 leads to the mail-box switch 76, and from such switch a wire 86 connects with the wire 52 of the transformer secondary 50.

The mail-box switch 76 may comprise a miniature snap switch of a type well known in the electrical art. Such a switch is indicated by the broken outline 76a shown in FIG. 4, where it is mounted on the rear wall of an upright type mail box, the latter being diagrammatically illustrated by a simple outline, designated 88.

Considering again FIG. 3, the electric cut-out 30a is of the thermal-responsive type, comprising a pair of biased-apart switch blades 94 and 96 (see also FIGS. 7 and 8) which are normally held in engagement with each other by bimetallic arm 98, said arm being influenced by a heater coil 100.

The switch blades 94 and 96 are disposed in parallel relation with each other, and are carried by an elongate rectangular insulating base 102, being secured thereto by suitable rivets as shown. Interposed between the switch arms 94 and 96 is a rigid stop arm 104 arranged to engage the switch arm 94 and constitute a stop therefor, which prevents the arm 94 from following the cooperable arm 96 when the latter is released. The bimetallic arm 98 is also carried at one end by the base 102, and at its other or free end abuts the switch blade 96 as seen in FIG. 8. Upon the heater 100 becoming energized and being heated, it will impart heat to the bimetallic arm 98, flexing the latter in a clockwise direction as viewed in FIG. 8 to cause it to disengage the switch blade 96. Upon this occurring, the switch blade 96 will also shift clockwise, separating from the switch blade 94 and opening the circuit.

A reset plunger 104 is reciprocable in a mounting bushing 106 carried by the base 102, said plunger having the button 28 and also comprising an inner end 108 which is engageable with the switch blade 96 to manually restore the latter to engagement with the switch blade 94. When such resetting is effected by actuation of the plunger 104, the bimetallic arm 98 will again return to the FIG. 8 position, presuming that it has become sufficiently cool to do this.

Considering again FIG. 3, the switch blade 96 is connected by a wire 110 to the wire 34, and the blade 94 is connected by a wire 112 to one terminal of the audible signal 78. The said signal terminal is also connected by a wire 114 to the heater 100, which is in turn connected by a wire 116 to the on-off switch 26. The remaining terminal of the audible signal 78 is connected by a wire 120 to the wire 116. In FIG. 3 the bias normally experienced by the resilient switch blade 96 is illustrated diagrammatically by means of a coil spring 124.

The audible signal 78 is thus seen to be bridged by the heater 100, both of these receiving energy through the switch blades 94, 96.

In accordance with the invention, by making the audible signal 78 in the form of a well-known make-and-break device such as a buzzer, a more effective heating and energization of the heater 100 is obtained for several reasons. For one thing, when the circuit through the coils of the buzzer 78 is being repeatedly broken, the heater 100 will receive virtually full energy from the transformer 48. For another thing, upon the buzzer armature breaking the circuit, an induced voltage will occur in the coils of the buzzer, and such voltage, through the arc occurring at the armature contacts of the buzzer, will also tend to energize the heater 100 with voltage spikes during certain like-polarized portions of the cycle of the energizing current. These voltage spikes and the spark discharge produce, as is well known, radio interference signals in the air, and the parallel-connected heater effects a damping of the spark and signals, to reduce radio and television picture interference. Also, any open-circuit failure of the parallel connected heater 100 will not interfere with operation of the audible signal 78.

The buzzer 78 may be mounted in any convenient place, within the casing 10, as for example on the bottom wall thereof.

The foregoing completes the connections of the present improved signal and indicator system.

Operation is as follows: As already mentioned, when the push button 54 is depressed, it will result in the door bell 62 becoming energized in the usual manner.

When mail is deposited in the mail box 88 it will effect a closing of the mail operated switch 76, and this will cause energization of the visual indicator 24, which may be either the incandescent lamp 24a, see FIG. 1, or the electrical meter type movement 24b, see FIG. 2. Thus a visual indication is given of the presence of the mail in the box 88. Also at the same time an audible indication is given of the presence of mail by virtue of the buzzer 78 being energized through the switch contacts 94, 96. Simultaneously the heater 100 will be energized, and this will heat and flex the bimetallic arm 98. Upon the bimetallic arm being sufficiently flexed, it will separate from the switch blade 96 enabling the latter to shift away from the blade 94, thereby opening the circuit through the audible signal 78. Upon the user removing the mail from the box 88, the switch 76 will again open. Thereafter, the heat responsive switch 94, 96 is manually reset by actuation of the plunger 104 in the manner already described above. The system is then in readiness for the next mail delivery.

The time interval during which the buzzer 78 sounds may be varied by adjusting or turning the adjusing screw 40 in the base 102, see FIG. 8, which alters the cold position of the bimetallic arm 98.

Considering now the details of the mail-operated switch means as provided by the invention and referring to FIG. 4, there is illustrated a switch actuator arm 128 in the form of a slender wire having its free end bent at right angles and carrying a light metal sleeve 130 through which a slender cross piece or cross arm 132 passes. The sleeve 130 secures the cross arm 132 rigidly to the actuator arm 128, and when mail (such as the envelope 134 shown in FIG. 4) is deposited in the mail box 88 the weight of the mail will push downward the arms 132 and 128, closing the switch 76.

By the use of suitable switch units and actuator arms, a weight of as little as one ounce or less will be sufficient to actuate the switch and close the circuit, for the purpose of effecting an indication of the presence of mail.

Another embodiment of the invention, comprising a novel and improved switch mechanism for a rural-type mail box, is illustrated in FIGS. 5 and 6. In these figures, the body of the mail box is indicated at 138. The mail box has a bottom wall 140 and a hingedly-mounted front door 142 carried by pivot rivets 144. In FIG. 5 the door 142 is shown in the closed position, the open position being indicated by the dotted outline 146. Mounted on the underside of the bottom wall 140 of the mail box is a miniature type non-biased electric snap switch 148 having a reset lever 150 by which it may be shifted to the open position after being once closed. The switch 148 has a plunger operator 152 which is actuated by a slender lever 154, the latter carrying a roller 156 disposed in an opening 158 of a depending flange 160 constituted as an integral part of the bottom wall 140 of the mail box. Normally, as shown in FIGS. 5 and 6, the front door 142 of the mail box holds the lever 154 in a retracted position wherein the switch 148 is open-circuited. However, when the front door 142 is operated to open the mail box for the purpose of placing mail therein, the lever 154 will swing clockwise as viewed in FIG. 6, closing the circuit through the switch 148. Even when the door 142 is again closed the switch 148 will remain in closed-circuit condition until such time as the

user manually resets it to the open-circuit position by actuation of the reset lever **150**.

It will now be understood from the foregoing that I have provided a novel and improved, greatly simplified yet effective and reliable combination door signal and mail indicator device which has a number of desirable features. It provides both a visual and an audible indication as to the presence of mail, and the audible indication is automatically discontinued after a small predetermined elapse of time, starting with the closing of the mail actuator switch. The indicator system involves relatively few components, and is of flexible design whereby it may be utilized with existing mail boxes and door signal systems. Adjustment of the energization of the visual signal, and adjustment of the time interval of the audible signal, as well as resetting of the thermal cut-out may be easily effected from the front of the unit. The unit may also be rendered inoperative at will, by opening the on-off switch mounted on the front panel. The unit is small and compact, and constitutes an attractive adjunct for the home or office building.

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

I claim:

1. A mail indicator system comprising, in combination:
(*a*) a source of current,
(*b*) a visual electric signal connected to said source,
(*c*) a mail box switch connected with said source and visual signal to actuate the latter when the switch is closed,
(*d*) an audible make-and-break electric mail signal connected with the source and with said mail box switch to be actuated simultaneously with the visual signal, said signal having make-and-break contacts,
(*e*) automatic means for rendering the audible mail signal inoperative at a predetermined time after closing of the said mail box switch,
(*f*) the automatic means comprising an electric cut-out connected in circuit with the audible mail signal for disconnecting the latter after said predetermined time,
(*g*) the cut-out comprising a bimetallic switch and a heater juxtaposed thereto,
(*h*) said heater being connected in parallel with the audible mail signal,
(*i*) the audible mail signal having the make-and-break being such that the circuit therethrough is intermittent when the device operates,
(*j*) the audible mail signal producing a high induced voltage which is applied to and damped by the heater when the circuit through the signal is broken,
(*k*) said parallel connection being such that any open-circuit failure of said heater will not result in interference in the operation of the audible signal.

2. An indicator system as in claim 1, wherein:
(*a*) the bimetallic switch comprises biased-apart switch blades and a bimetallic arm holding said switch blades together, and engaged, and
(*b*) the heater comprises a coil encircling the bimetal arm.

3. An indicator system as in claim 2, wherein:
(*a*) the switch blades are substantially parallel to each other, and
(*b*) the bimetallic arm extends substantially perpendicular to the switch blades, and at its end abuts one of said blades.

4. An indicator system as in claim 3, wherein:
(*a*) there is a manual reset plunger engageable with one of the switch blades to reestablish engagement therebetween.

5. A mail indicator system comprising, in combination:
(*a*) a source of current,
(*b*) a visual electric signal connected to said source,
(*c*) a mail box switch connected with said source and visual signal to actuate the latter when the switch is closed,
(*d*) an audible make-and-break electric mail signal connected with the source and with said mail box switch to be actuated simultaneously with the visual signal, said signal having make-and-break contacts,
(*e*) automatic means for rendering the audible mail signal inoperative at a predetermined time after closing of the said mail box switch,
(*f*) the automatic means comprising an electric cut-out connected in circuit with the audible mail signal for disconnecting the latter after said predetermined time,
(*g*) the cut-out comprising a bimetallic switch and a heater juxtaposed thereto,
(*h*) said heater being connected in parallel with the audible mail signal,
(*i*) the audible mail signal having the make-and-break being such that the circuit therethrough is intermittent when the device operates.
(*j*) the intermittent circuit through the audible mail signal enabling an intermittent increased energization of the heater to be effected from the source of current, to produce an increased heating effect.

6. A mail indicator system comprising, in combination:
(*a*) a source of current,
(*b*) a visual electric signal connected to said source,
(*c*) a mail box switch connected with said source and visual signal to actuate the latter when the switch is closed,
(*d*) an audible make-and-break electric mail signal connected with the source and with said mail box switch to be actuated simultaneously with the visual signal, said signal having make-and-break contacts,
(*e*) said make-and-break signal producing a spark discharge which causes radio interference signals in the air,
(*f*) the automatic means comprising an electric cut-out connected in circuit with the audible mail signal for disconnecting the latter after said predetermined time,
(*g*) the cut-out comprising a bimetallic switch and a heater juxtaposed thereto,
(*h*) said heater being connected in parallel with the audible mail signal,
(*i*) said parallel connection of the coil effecting a damping of the spark discharge, thereby reducing said radio interference signals and pitting of the make-and-break contacts.

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