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SIGNAL SYSTEMS

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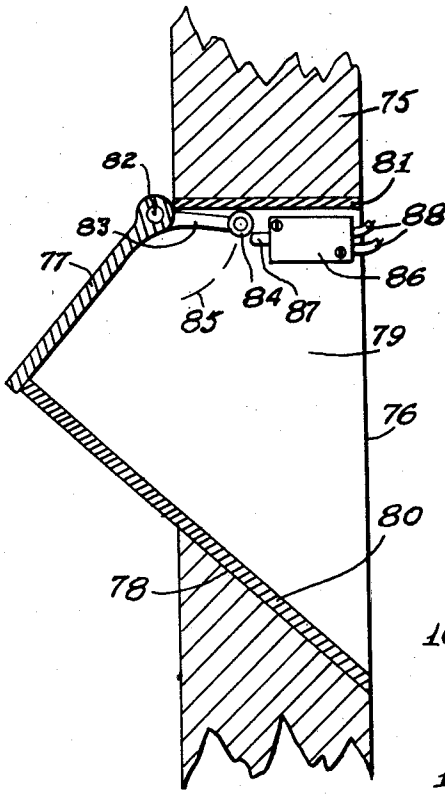

Fig. 1.

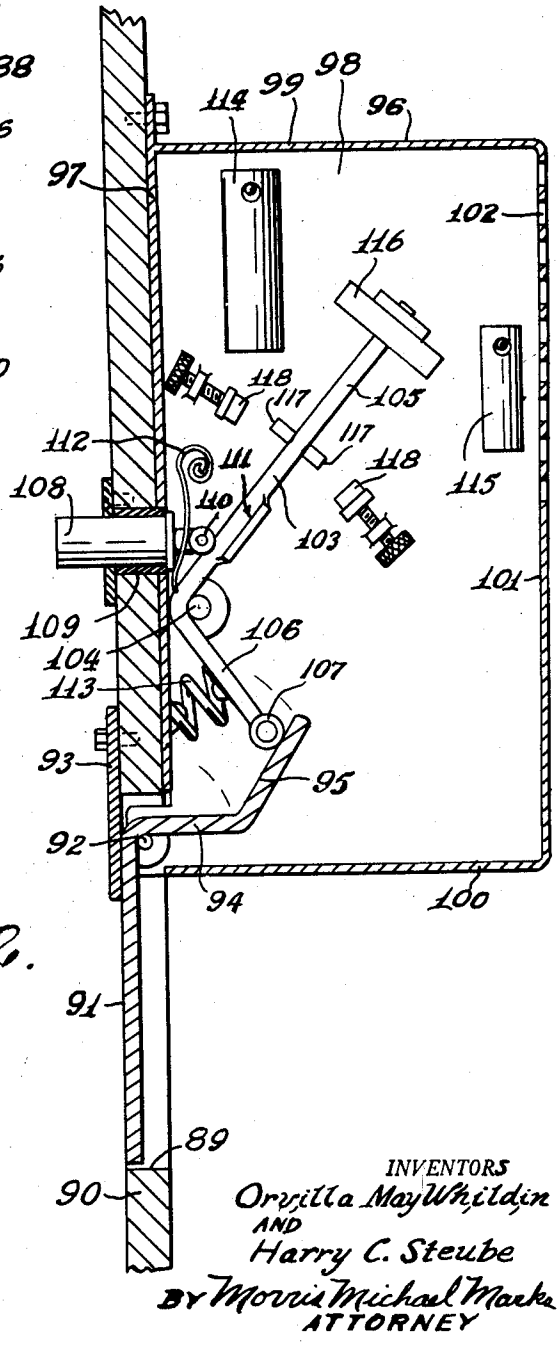

Fig. 2.

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SIGNAL SYSTEMS

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6 Claims. (Cl. 232—36)

Our invention relates to signal systems, and it relates more particularly to signals which are set off by the opening and closing of mail slots during the insertion or removal of mail therefrom, and which may be in combination with means for manually actuating a signal, as for instance by a visitor announcing his presence at the door.

In our original Letters Patent No. 2,759,057, of which this is a further modification, we have shown such a system as applied for instance to mail boxes which as a general rule are disposed outside the locked front door of the household. Thus, not only could unauthorized persons seek to obtain access to the mail box, but the householder prior to our invention had no way of knowing when mail was placed therein by the mail man. Hence, there was considerable uncertainty as to the actual time of arrival of the mail, resulting in the householder being required to make frequent trips to the mail box, opening and closing the front door in the process, in order to determine whether the mail had yet arrived.

In the past, attempts had been made to provide means whereby the householder would learn when the mail receptacle was opened or closed. However, in the main such means relied on the use of electrical systems which were open to tampering, or corrosion due to the weather.

Other attempts had been made to avoid the pilferage susceptibility of mail boxes by utilizing a mail slot in an outside door of the house. Such attempts have not been wholly satisfactory however, for they neither rule out the possibility of reaching thru the mail slot with a suitable instrument to obtain access to the mail on the floor, nor do they in any way protect the bulky mail which is permitted by the mailman to stick in the slot while protruding part way outside of the door.

One object of our invention therefore is to provide a signal system which will be actuated by the opening or closing of a mail slot, whether in a mail box, door, or otherwise, in such a manner as to notify the householder that the mail has arrived, or that someone is manipulating the mail receptacle, as the case may be.

Another object of our invention is to provide a signal system which is substantially incapable of being adversely affected by the weather, fool-proof and tamper-proof in operation, and easy to install and operate.

A further object of our invention is to provide a mail receptacle signal system which will operate without the necessity of electrifying any part of the mail receptacle structure itself.

Another object of our invention is to provide a signal system which may include means for notifying the householder of the opening, closing or manipulating of a mail receptacle, and of the presence of a visitor who manually operates the signal system, said means being capable of operation with or without the use of electricity, as desired.

A further object of our invention is to provide a signal system which is easily assembled, requires a minimum

of changes to standard construction, is inexpensive and reliable in operation and construction.

Other objects will appear from the description of our invention which appears more fully hereinafter.

For the purpose of illustrating our invention, we have shown in the accompanying drawings forms thereof which are at present preferred by us, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized and that our invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Referring to the drawings in which like reference characters indicate like parts:

Figure 1 represents a vertical sectional view of a mail receptacle of modified construction and comprising a door having a mail slot, and embodying our invention.

Figure 2 represents a vertical sectional view of a mail receptacle of modified construction, and comprising a door having a mail slot and mechanically operated signal system, and embodying our invention.

In accordance with our invention, our signal system may be applied to any mail receptacle, as for instance a mail box, a front door having a mail slot, or a storm door having a mail slot and spaced from the front door in a manner to permit mail to be dropped therebetween.

In Figure 1 is illustrated one form of signal system embodying our invention, wherein said signal system is applied to a door **75** having a mail slot **76** formed therethrough and covered by a suitable closure member **77**. In the mail slot shown in Figure 1, the lower edge **78** is illustrated as being downwardly and rearwardly inclined so as to facilitate the passage of mail therethrough; but it is to be understood that the shape of the slot **76** is not limited thereto but may be of any suitable configuration. In like manner, the closure member **77** is illustrated as being of the outward lift type; but it is to be understood that it may be of the inward depressible type without departing from the spirit or essential attributes of our invention. As illustrated in Figure 1, the mail slot **76** may be lined with a side wall **79** on each of its two sides, a rearwardly and downwardly inclined chute member **80** and a top portion **81**. The closure member **77** may be pivotally secured to the upper region of the mail slot lining, as by the hinge member **82**. A cam device **83** projects rearwardly from the closure member **77** and comprises a cam follower **84**. The cam **83** and follower **84** are adapted to traverse an arc **85** whose center is disposed along the longitudinal axis of the hinge member **82**. A suitable switch member, such for instance as a microswitch device **86** operated by a plunger **87** extending therefrom, may be suitably mounted on the lining of the mail slot **76**, with the outer tip of its plunger **87** intercepting the path of movement of the cam follower **84** about said arc **85**. The switch **86** is connected by suitable means such as the electric wires **88** to a signal circuit which may be similar to that illustrated in Patent No. 2,759,057.

In operation, when the closure member **77** is lifted, the cam **83** swings downwardly and its follower **84** intercepts the plunger **87** operable momentarily to depress the plunger **87**, and during the time of said depression to actuate the signal **66**. As the follower **84** continues along the arc **85** during the opening process of the closure member **77**, it uncovers the plunger **87** thereby permitting it to move outwardly and thus release the signal **66** from actuation. When the closure member **77** is itself released and thereby permitted to return to its closing relation to the mail slot **76** the follower **84** is returned along the arc **85** and again intercepts the plunger **87** in a man-

ner to actuate the signal **66**, and again releases said plunger **87** when the closure member **77** is completing its closure movement.

In this manner, the signal **66** is sounded at the beginning of the opening of the closure member **77** and at the end of the closing of said member. Thus, when mail is passed through the door **75** by means of the mail slot **76**, the signal **66** will sound twice, but when bulky mail sticks in the slot **76** and extends outwardly therethrough, the door **77** will be prevented from closing and the signal will ring but once. Since such mail is capable of being easily pilfered, the householder is put on notice by having heard but one signal, that he should come at once to the door to remove the bulky mail which is sticking out of the mail slot. Also, should an unauthorized person seek to reach through the mail slot to the interior of the house, he must do so by lifting the door **77** and keeping it in lifted position. By so doing he will have actuated the signal but once, and thus have warned the householder that he is to come to the door. The unauthorized person will then be immediately discovered and the signal will have achieved its purpose.

In Figure 2 is illustrated a modified construction embodying our invention, wherein the signal is operated by mechanical means instead of electrical. In this construction, a mail slot **89** is formed through a door **90**. A suitable closure member **91** may be pivotally secured, by means of a suitable hinge member **92**, to a base plate **93** which is mounted on the door **90**. A bell crank arm **94** may extend rearwardly from the hinged portion of the closure member **91**, and comprise a cam portion **95** which may be upwardly and rearwardly inclined. A suitable housing **96** may be provided, comprising a base plate portion **97**, side wall **98**, top wall **99**, bottom wall **100**, and a rear wall **101** which is preferably formed into an open grille work **102**. The base plate **97** is secured to the rear of the door **90** by any suitable means. A suitable opening may be provided in the lower forward portion of the housing **96** to permit free passage therethrough of the bell crank arm **94** and cam **95**.

A second bell crank **103** may be mounted on a pivot **104** within the housing **96**, and may comprise a shank or lever mechanism portion **105** on one side of the pivot **104** and a cam follower portion **106** extending from another side thereof. The bell crank portion **106** preferably terminates in a cam follower member **107** adapted to ride upon and bear against the cam **95**.

A manual device such as a push button or other plunger **108** may be slidably mounted within a suitable sleeve **109** extending through the door **90**, preferably above the bell crank portion **103**, and terminates in a suitable bearing or follower member **110** adapted to bear against and ride upon a bearing surface **111** on the bell crank arm **103**. A suitable spring device **112** may be mounted in the housing **96** in a manner to bear against the plunger **108** to urge it outwardly through the door and away from said bearing surface **111**.

A yieldable retaining means such as the spring device **113** may be mounted within the housing **96** in a manner to urge the cam follower bell crank arm **106** upwardly and toward the cam **107**.

Suitable sound devices such for instance as the chime members **114** and **115** may be mounted in the interior of the housing **96**, and may if desired be of different tones. A sound-actuating element, which may be a weighted striker **116**, is mounted on the bell crank arm **103** in a manner to actuate the chime **114** when the bell crank arm **103** is at its upper limit of thrust, and to actuate the chime **115** when said arm is at its lower limit of thrust. The striker **116** is preferably spaced from the pivot **104** a distance substantially greater than that between the pivot **104** and the outer edge of the cam follower **107**, and also substantially greater than the distance between said pivot **104** and any portion of the bearing surface **111**.

If desired, a suitable striker retracting device may be provided. Thus, for instance, projections **117** may extend from both sides of the bell crank arm **103**, and substantially parallel to the striker **116**. Resilient members **118** may be adjustably mounted on the housing **96** in a manner to be disposed within the path of the projections **117**, operably to intercept the same just before the striker **116** would strike the sound devices **114**, **115** during the thrust of the bell crank arm **103**. Thus, the weighted arm **116** will continue its movement against the yielding resistance of the resilient member **118**, but when the striking motion is completed, the resilient member **118** will retract the striker **116** from contact with the sound device **114**, **115** and thus prevent it from dampening the vibration of the sound device.

In operation when the closure member **91** is pushed inwardly to permit passage of mail through the slot **89**, the bell crank cam **95** is rotated toward the rear of the door **90** operably to swing the cam follower **107** downwardly, carrying with it the bell crank arm **106** against the resistance of the compression spring **113**. In so doing, the bell crank arm **103** is swung downwardly, carrying with it the striker **116**, ultimating in the striker **116** striking the sound device **115**. The mechanical advantage is such that but slight movement of the cam **95** is required to swing the weighted striker **116** a considerable distance, and the momentum of the striker is such as to strike the chime **115** with substantial force.

When the closure member **91** is manually released, the yieldable retaining means **113** urges the bell crank arm **106** rearwardly away from the door **90**, thereby forcing the cam **95** downwardly, and swinging the closure member **91** to a "closed" position. Simultaneously, the rearward movement of the bell crank arm **106** swings the lever arm **103** upwardly in a manner to impart momentum to the weighted sound-actuating striker **116** operably to swing said striker into sound-actuating contact with the chime **114** with substantial force. The weight of the striker **116** then swings it downwardly to a position of equilibrium with respect to the opposite urge of the compression spring **113**, said position of equilibrium being intermediate the sound devices **114** and **115**.

When the push button **108** is manually pushed inwardly, the bearing **110** bears against the bearing surface **111** and cams the lever arm **103** downwardly against the pressure of the spring **113** and in a manner to swing the said striker **116** into sound-actuating contact with the chime **115**. When the push button **108** is released, the spring **113** urges the bell crank **106** rearwardly in a manner to cause the weighted striker **116** to strike the chime **114** as hereinabove described, and the weighted striker then returns to its point of equilibrium.

As a result, when mail is inserted through the mail slot **89** of the mail-receiving member which in this case is the door **90**, the closure member **91** is swung inwardly to permit insertion of the mail through the slot. By this action, the chime **115** is sounded. When the mail-inserting operation is completed, the closure member **91** swings back to a "closed" position and this operation results in the sounding of the chime **114**. Thus both sound devices are serially actuated and the householder is informed that the mail has arrived. If bulky mail has been stuffed into the slot **89** in a manner to protrude outwardly therefrom so that it could be withdrawn by an unauthorized person, the closure member **91** will remain in its depressed condition, and only the chime **115** will have sounded, thereby warning the householder to come to the door and withdraw his mail before it can be pilfered. In like manner, if an unauthorized person seeks to gain access to the interior of the house by opening the mail slot, the closure member **91** is depressed and sounds the single chime **115**, thereby warning the householder. When a visitor comes to the door he depresses the push button **108**, thereby sounding both the chimes **115** and **114**. Should the householder ignore this, a second pushing of the push button **108** will in-

form him, by the repetition of the double sounding of the chimes, that the signals were actuated not by the insertion of mail but by a visitor at the door.

It should be understood that while one form of sound-actuating device is illustrated, our invention is not limited thereto but includes as well any means, electrical or mechanical, of any description, for actuating sound.

We are aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and we therefore desire the present embodiments to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a primary and a secondary sound device; means for actuating said sound devices; said means comprising: a cam carried by said cover and traversing a path of movement during the opening and closing of said cover; a follower mechanism mounted on said mail-receiving member in motion-transferring relation to said cam; a yieldable retaining device adapted to urge said follower mechanism against said cam in a manner to urge said cover into "closed" position; a lever mechanism carried by said follower mechanism and comprising a bearing surface and a sound-actuating element; a manual device mounted on said mail-receiving member and comprising a bearing portion adapted to bear against said bearing surface; a device for yieldably urging said bearing portion away from said bearing surface; a retracting device disposed in the path of said lever mechanism and adapted to retract said sound element immediately following its sound-actuating thrust; the arrangement of parts being such that when said cover is manually moved to "open" position, said cam moves said follower mechanism against the opposition of said yieldable retaining device, said follower mechanism moves said lever mechanism until said element is in position to actuate said primary sound device whereupon its thrust is reversed by said retracting means, and when said cover is released said yieldable retaining device urges said follower along said cam operably to close said cover and simultaneously to thrust said element into position where it actuates said secondary sound device, and when said manual device is operated said bearing portion bears against said bearing surface operably to move said element against the opposition of said yieldable retaining device until said element is in sound-actuating condition with respect to said primary sound device whereupon it is retracted by said retracting means, and when said manual device is released, said yieldable retaining device urges said element toward sound-actuating relation to said secondary sound device.

2. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a sound device; means for actuating said sound device; said means comprising: a cam carried by said cover and traversing a path of movement during the opening and closing of said cover; a follower mechanism mounted on said mail-receiving member in motion-transferring relation to said cam; yieldable retaining means adapted to urge said follower mechanism against said cam in a manner to urge said cover into "closed" position; a lever mechanism carried by said follower mechanism and comprising a bearing surface and a sound-actuating element; a manual device mounted on said mail-receiving member and comprising a bearing portion adapted to bear against said bearing surface; a device for yieldably urging said bearing portion away from said bearing surface; a retracting device disposed in the path of said lever mechanism and

adapted to retract said sound element immediately following its sound-actuating thrust; the arrangement of parts being such that when said cover is manually moved to "open" position, said cam moves said follower mechanism against the opposition of said yieldable retaining means, said follower mechanism moves said lever mechanism until said element is in position to actuate said sound device whereupon its thrust is reversed by said retracting means, and when said cover is released said yieldable retaining means urges said follower along said cam operably to close said cover and simultaneously to move said element into position for renewed actuating of said sound device, and when said manual device is operated said bearing portion bears against said bearing surface operably to move said element against the opposition of said yieldable retaining device until said element is in sound-actuating condition whereupon it is retracted by said retracting means, and when said manual device is released, said yieldable retaining device urges said element toward position for renewed actuating of said sound device.

3. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a primary and a secondary sound device; means for actuating said sound devices; said means comprising: a cam carried by said cover and traversing a path of movement during the opening and closing of said cover; a follower mechanism mounted on said mail-receiving member in motion-transferring relation to said cam; yieldable retaining means adapted to urge said follower mechanism against said cam in a manner to urge said cover into "closed" position; a lever mechanism carried by said follower mechanism and comprising a sound-actuating element; a retracting device disposed in the path of said lever mechanism and adapted to retract said sound element immediately following its sound-actuating thrust; the arrangement of parts being such that when said cover is manually moved to "open" position, said cam moves said follower mechanism against the opposition of said yieldable retaining means, said follower mechanism moves said lever mechanism until said element is in position to actuate said primary sound device whereupon its thrust is reversed by said retracting means, and when said cover is released said yieldable retaining means urges said follower along said cam operably to close said cover and simultaneously to thrust said element into position where it actuates said secondary sound device.

4. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a primary and a secondary sound device; means for actuating said sound devices; said means comprising: a cam carried by said cover and traversing a path of movement during the opening and closing of said cover; a follower mechanism mounted on said mail-receiving member in motion-transferring relation to said cam; yieldable retaining means adapted to urge said follower mechanism against said cam in a manner to urge said cover into "closed" position; a lever mechanism carried by said follower mechanism and comprising a bearing surface and a sound-actuating element; a manual device mounted on said mail-receiving member and comprising a bearing portion adapted to bear against said bearing surface; a device for yieldably urging said bearing portion away from said bearing surface; the arrangement of parts being such that when said cover is manually moved to "open" position, said cam moves said follower mechanism against the opposition of said yieldable retaining means, said follower mechanism moves said lever mechanism until said element is in position to actuate said primary sound device, and when said cover is released said yieldable retaining means urges said follower along said cam operably to close said cover and simultaneously to thrust said element into position where

it actuates said secondary sound device, and when said manual device is operated said bearing portion bears against said bearing surface operably to move said element against the opposition of said yieldable retaining device until said element is in sound-actuating condition with respect to said primary sound device, and when said manual device is released, said yieldable retaining device urges said element toward sound-actuating relation to said secondary sound device.

5. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a primary and a secondary sound device; means for actuating said sound devices; said means comprising: a sound actuating element; motion-transferring mechanism carried by said mail-receiving member and disposed between said cover and said sound actuating element; yieldable retaining means adapted to urge said motion-transferring mechanism into a condition wherein said cover is in "closed" position and said sound-actuating element is in retracted position; the arrangement of parts being such that when said cover is manually moved to "open" position, said motion-transferring mechanism moves in opposition to said yieldable retaining means operably to actuate said primary sound device, and when said cover is released said yieldable retaining means urges said motion-transferring mechanism operably to close said cover and simultaneously to thrust said element into position where it actuates said secondary sound device.

6. A signal system comprising a mail-receiving member having a mail slot and a movable slot cover mounted on said mail-receiving member; a primary and a secondary sound device; means for actuating said sound devices; said means comprising: a sound actuating element; motion-transferring mechanism carried by said mail-receiving member and disposed between said cover and said

sound-actuating element; yieldable retaining means adapted to urge said motion-transferring mechanism into a condition wherein said cover is in "closed" position and said sound-actuating element is in retracted position; a manual device mounted on said mail-receiving member and disposed in motion-transferring relation to said motion transferring mechanism; the arrangement of parts being such that when said cover is manually moved to "open" position, said motion transferring mechanism moves in opposition to said yieldable retaining means operably to actuate said primary sound device, and when said cover is released said yieldable retaining means urges said motion-transferring mechanism operably to close said cover and simultaneously to thrust said element into position where it actuates said secondary sound device, and when said manual device is operated its motion is transferred to said motion-transferring mechanism operably to move said element against the opposition of said yieldable retaining means until said element is in sound-actuating condition with respect to said primary sound device, and when said manual device is released, said yieldable retaining means urges said element toward sound-actuating relation to said secondary sound device.

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