

May 13, 1958

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2,834,539

MAIL BOX SIGNAL DEVICE

Filed April 22, 1954

2 Sheets-Sheet 1

FIG. 1.

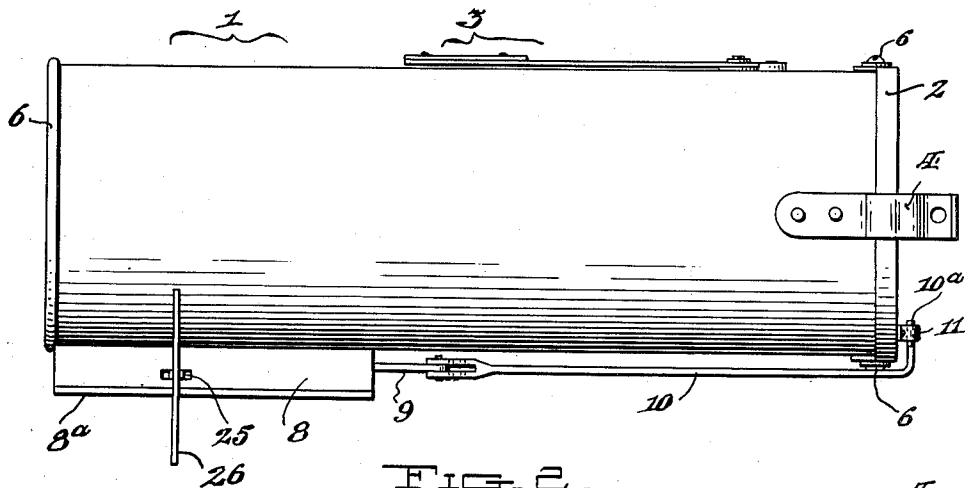


FIG. 2.

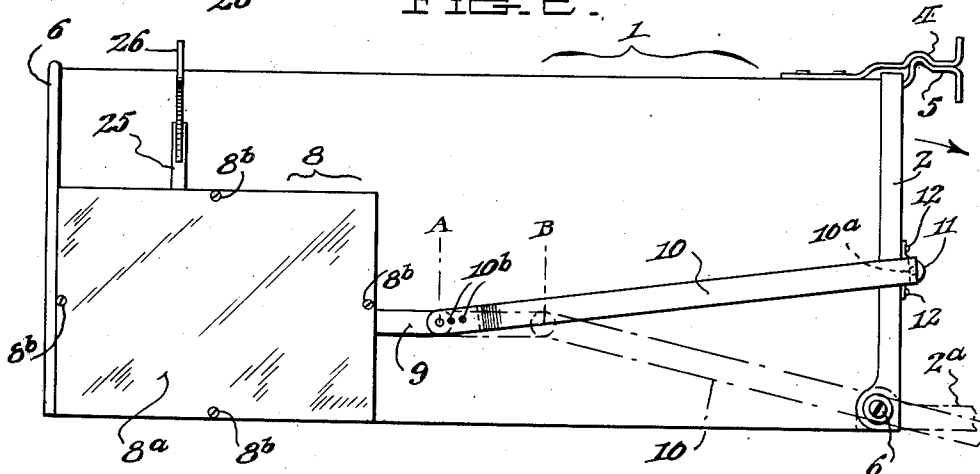
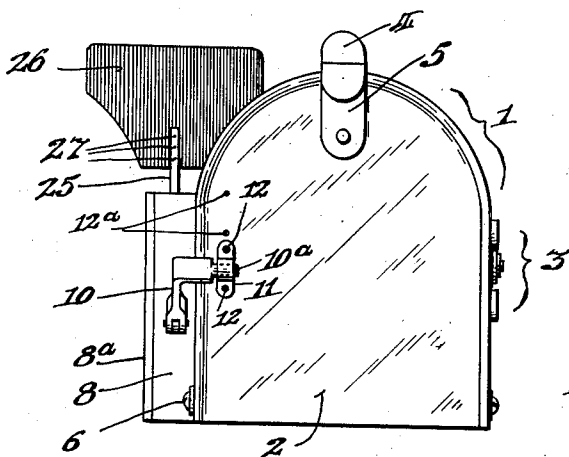


FIG. 3.



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FIG. 4.

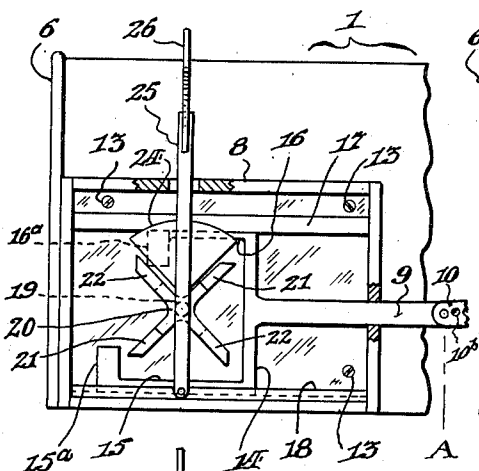


FIG. 5.

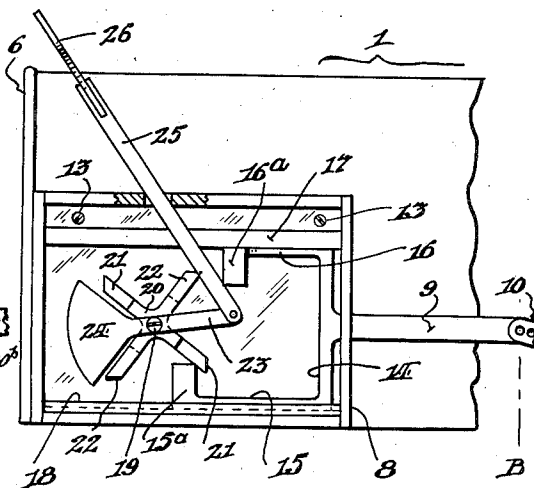


FIG. 6.

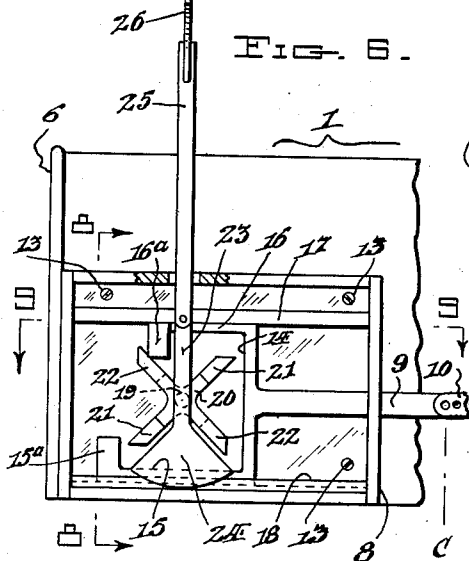


FIG. 7.

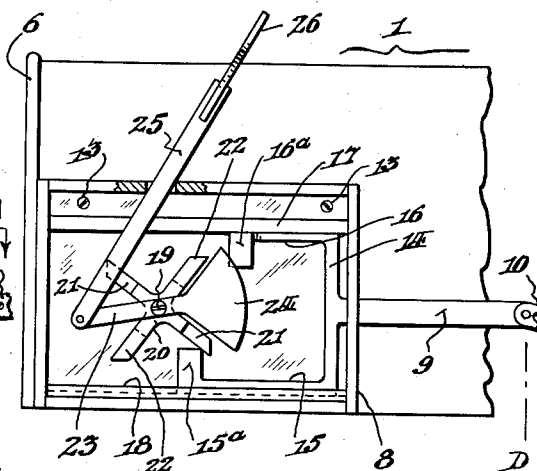


FIG. 8.

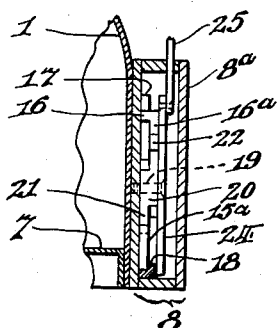
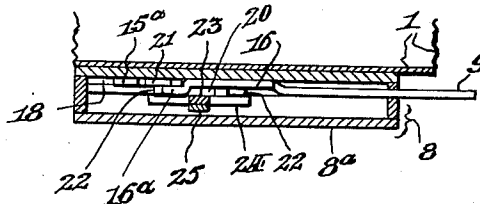


FIG. 9.



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MAIL BOX SIGNAL DEVICE

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3 Claims. (Cl. 232—35)

This invention relates to mail boxes of the type provided for rural mail delivery, and more particularly concerns a unique completely automatic signal device, or structure, which is adapted to be combined with such a mail box and automatically operated when the mail box door is opened and closed.

One object of my invention is to provide a novel automatic signal device of the type indicated, which can be readily applied to a conventional mail box of the type provided for rural mail delivery and having a swingable door at one end thereof, which automatic signal device may be utilized in conjunction with, or without, the usual hand operated signal device commonly located at one side of such a mail box.

Another object is to provide such an automatic signal device having a signal element that is moved to "on" position by opening and closing of the mail box door in conjunction with the insertion of mail into the box, and that is moved to "off" position by opening and closing of the mail box door in conjunction with the withdrawal of the mail from the box.

A further object is to provide such an automatic signal device having an operating cycle one-half of which is completely effected by the swinging movement of the mail box door from closed to open and then to closed position, and the second half of which operating cycle is completely effected by the directly following swinging movement of the mail box door from closed to open and then to closed position.

An additional object is to provide such an automatic signal device on a conventional mail box of the type indicated having a usual hand operated signal device at one side thereof, which latter, if desired, may be used as heretofore, in conjunction with my automatic signal device in a cooperative or supplemental manner.

Another object is to provide such an automatic signal device which embodies a novel mechanical signal raising and lowering unit comprising a rotatably mounted member that is actuated by reciprocating means connected with the mail box door and in such manner as to revolve said member in one direction only and in step-by-step order.

Another object is to provide such an automatic signal device in which the said reciprocating means is adapted to be adjustably connected in intermediate relation between the mail box door and said signal raising and lowering unit.

Another feature of the invention resides in the provision of such an automatic signal device in which the said signal raising and lowering unit includes a novel counterweight arrangement adapted to maintain a substantially balanced weight relationship between certain parts of said unit.

Another object is to provide such an automatic signal device in which the said rotatably mounted member has special radially extending elements arranged for circular movement in two different planes for successive engagement thereof by reciprocable slide means adapted to effect such engagement first in one plane then the other, there-

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by to revolve said member in step-by-step order in one direction only.

With these and other objects in view, which will become apparent from the following detailed description of the practical and illustrative embodiment of my improvements depicted in the accompanying drawings, the invention comprises the novel automatic signal device, elements, features of construction and arrangement of parts in cooperative relationship, as more particularly indicated and defined by the hereto appended claims.

Referring to the drawings, in which similar reference characters designate corresponding parts:

Figure 1 is a top plan view of a conventional mail box of the type provided for rural mail delivery, and shows one form of my invention combined therewith.

Fig. 2 is a side elevational view of the combination shown in Fig. 1.

Fig. 3 is an end elevational view of the combination, as seen by looking at Fig. 2 from the right.

Figs. 4, 5, 6 and 7 are similar side elevational views of the rear mail box portion and the automatic signal raising and lowering unit of my invention, with the lid of the unit removed and the parts thereof in the successive positions which they occupy during cyclic operation of the device.

Fig. 8 is an elevational sectional detail view, taken substantially as indicated by the arrows 8—8 on Fig. 6, and

Fig. 9 is a plan sectional detail view, taken substantially as indicated by the arrows 9—9 on Fig. 6.

A mail box of the type with which my invention is combined, is more particularly shown in Figs. 1, 2 and 3. Such a mail box is of the conventional modern type approved by the U. S. Post Office and used for rural mail delivery. The said mail box is generally indicated by the numeral 1 and comprises a usual type front door 2, a usual type hand operated signal device 3 having a flag-like signal element mounted so that it can be set in raised and lowered position by hand, door latching means including a resilient latch member 4, the rear portion of which is fixed to the top of the mail box and a resilient latch member 5, the lower portion of which is fixed to the mail box door 2.

The mail box 1 is permanently closed at its rear end by a wall member 6 and the bottom of the box is permanently closed by a flat flanged metal plate member, indicated at 7 in Fig. 8.

The mail box door 2 is hingedly connected at its lower end with the opposite sides of the mail box 1, by screws 6, so that the door 2 can be swung downwardly to a substantially horizontal open position, as partly indicated by the dot-and-dash lines 2* in Fig. 2. When the door 2 is swung to its vertical or closed position, as shown in full lines in Fig. 2, the latch members 4 and 5 are inter-engaged with each other and yieldingly maintain the door in such closed position.

The automatic signal device of my invention is mounted along the side of the mail box 1 which is opposite to the side along which the usual hand operated flag signal device 3 is located.

My said automatic signal device generally comprises a housing 8, which is adapted to conveniently and protectively contain the main mechanism of the device, which mechanism is adapted to be operated by an actuating member 9 that extends through an opening in the forward wall of the housing 8 and has its free end pivotally connected with the rear bifurcated end of a flat metallic link forming rod or bar 10, the front end of which is bent to a right-angular formation and provided with a rounded tip section 10* journaled for pivotal connection in a bearing element 11 fixedly secured to the mail box door by two screws 12.

The rear flat wall of the housing 8 is fixedly secured against the side surface of the mail box 1 by screws 13.

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The housing has a separable lid or cover 8^a secured to the front thereof by screws 8^b which are anchored in the side walls of the housing 8. By referring to Figs. 4 to 7 inclusive and Fig. 9, it will be noted that the actuating member 9 forms part of a frame-like slide piece that may be integrally formed of flat sheet metal or other rigid type sheet material and comprises a cross member 14, two parallel superimposed members 15 and 16 that are provided at their free ends with opposed projections 15^a and 16^a arranged to extend toward each other and adapted to perform a certain function as hereinafter explained. The integral frame-like piece comprising the members 9, 14, 15, 16, 15^a and 16^a, is arranged to operate as a reciprocable slide unit between an upper flat guide plate or member 17 and a lower grooved guide track member 18, both of which members 17 and 18 are secured against the inner surface of the flat back wall of the housing 8 and adapted to guidingly cooperate with the outer edge portions of the parallel members 15 and 16.

Mounted for free rotary movement on a screw stud 19 which is anchored in the rear flat wall of the housing 8, as indicated in Fig. 8, is a member that generally comprises a hub section 20 through which the screw stud 19 extends. The said hub section 20 has radially projecting therefrom two diametrically opposed pairs of elements 21—21 and 22—22 arranged in laterally offset or displaced relation with respect to each other when viewed from the side as shown in Fig. 8, so that each pair of said elements is adapted to have a circular or rotational movement in a different plane. Also secured to the hub section 20 is a metallic arm 23 having a segmentally-shaped weight member 24 at one end thereof which is adapted to counterbalance a signal rod 25 pivotally connected to the other end of the arm 23. The signal rod 25 is provided with a slot in its upper end in which is secured a signal plate 26 by means of screws or rivets indicated at 27 in Fig. 3. The signal plate 26 may be painted red or some other color as considered appropriate.

The flat rear surface of the hub member 20 is contactingly arranged against the front surface of the rear wall of the housing 8, as shown in Fig. 8, and the frictional contact thus established in conjunction with the counterweight 24, maintains the various parts that unitedly revolve about the screw stud 19 in weight balanced relationship at all times, frictionally stopped and held in the various positions to which they are unitedly moved during operation of the signal device.

From Fig. 8 it will be noted that the projection 16^a is forwardly offset in relation to the member 16 so as to bring the projection 16^a in the same plane as the pair of diametrically opposed radially extending elements 22—22 with which said projection cooperates. Likewise, that the projection 15^a is arranged in the same plane as the pair of diametrically opposed radially extending elements 21—21 with which said projection 15^a cooperates.

From Figs. 1 and 2 it will be apparent that as the mail box door 2 is swung downwardly to its open position, indicated at 2^a, the integral slide frame comprising the members 9, 14, 15, 16 and projections 15^a and 16^a, will be unitedly pulled forward by the link element 10, so that the point of connection between the link element 10 and the member 9, will be moved from the position indicated by the letter A in Fig. 2, to the position indicated by the letter B. Also, that when the mail box door 2 is swung upwardly to its closed position the said slide frame will be moved from position B to position A. By keeping this in mind and referring to Figs. 4 to 7 inclusive, it will be seen that my signal device carries out a completely automatic cycle of operation in connection with the opening and closing action of the mail box door, as follows:

When the signal plate 26 is in its lowermost position, as shown in Figs. 1, 2, 3 and 4, and the mail box door is closed, then the various parts of the mechanism within the housing 8 are positioned as shown in Fig. 4.

Assuming that the mail box door 2 is now swung down-

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wardly to its position 2^a, then the point of connection between the members 9 and 10 will move in a straight horizontal line from position A to position B, thereby causing the forward or right vertical edge of projection 15^a to engage the lower one of the pair of elements 21—21 and move it to the position shown in Fig. 5. This will simultaneously reposition all the other parts of the mechanism within the housing 8, as shown in Fig. 5, and move the signal rod 25 to a position of inclination to the left, as indicated in said figure.

Assuming that the mail box door 2 is now swung upwardly to its closed position, then the point of connection between the members 9 and 10 will move in a straight horizontal line from position B (Fig. 5) to position C (Fig. 6), thereby causing the rear or left vertical edge of the projection 16^a to engage the upper one of the pair of elements 22—22 and move it to the position shown in Fig. 6. This will simultaneously reposition all the other parts of the mechanism within the housing 8 as shown in Fig. 6 and move the signal rod 25 to its uppermost or raised signalling position shown in said figure.

Opening and closing of the mail box door 2 as just described, would be carried out by a mailman for the purpose of inserting mail into the mail box 1. In other words, when the mail box door 2 is manipulated as explained for the purpose of inserting mail into the mail box 1, the signal plate 26 is automatically moved from its lower to its upper signalling position shown in Fig. 6, thereby to notify the recipient of the mail that mail has been placed in the box.

The procedure described up to this point has resulted in automatic operation of my signal device through one-half of its operating cycle. The second half of the automatic cycle of operation takes place when the mail box door 2 is opened and closed in connection with the removal of the mail from the box. This operational phase of my automatic signal device takes place substantially as follows:

Assuming that the mail box door 2 is swung downwardly the second time to its position 2^a and in this instance for the purpose of removing the mail, then the point of connection between the members 9 and 10 will move in a straight horizontal line from position C (Fig. 6) to position D (Fig. 7), thereby causing the forward or right vertical edge of the projection 15^a to engage the lower (and second) one of the pair of elements 21—21 and move it to the position shown in Fig. 7. This will simultaneously reposition all the other parts of the mechanism within the housing 8, as shown in Fig. 7, and move the signal rod 25 to its position of inclination to the right.

After the mail has been removed from the box 1, the door 2 is again closed and this will cause the point of connection between the members 9 and 10 to move in a straight horizontal line from position D (Fig. 7) to position A (Fig. 4), thereby causing the rear or left edge of the projection 16^a to engage the upper (and second) one of the pair of elements 22—22 and move it to the position shown in Fig. 4. This will simultaneously reposition all the other parts of the mechanism within the housing 8, as shown in Fig. 4 and move the signal rod 25 back to its lowermost position. The entire automatic cycle of operation of my signal device has now been completed and the mechanism reset as originally.

As previously indicated, the conventional hand operated flag signal device 3 can be used, if desired, as usual, in conjunction with my automatic signal device. In other words, when it is desired to notify the mailman that mail has been placed in the box for collection, the hand operated signal device 3 can be placed in its raised or signalling position, as heretofore, etc.

Since the point of pivotal connection of the link element 10 with the mail box door 2, determines the extent of movement automatically imparted to the member 9 of the slide frame, and said pivotal connection swings

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through an arc the radial pivot of which is represented by the screws 6 connecting the door 2 with the box 1, it will be realized that said extent of movement imparted to the member 9 may be varied, or adjusted, by varying the vertical location of the pivotal connection of the link 10 in relation to the door 2. To this end, additional screw holes 12^a may be provided in the door 2, as shown for example in Fig. 3, so that the bearing element 11 may be located and secured at a higher point on the door 2, in vertical alignment to its location as shown. Since such adjustment of the front end of the link element 10 requires a length adjustment at the rear end of the link element 10, additional apertures 10^b are provided in centralized alignment for the pivotal connection established at this point, as shown in Fig. 2. Accordingly, with this arrangement, the stroke adjustment of the link element 10 is made possible, as desired, so as to vary the automatic operation of my signal device in relation to the swinging action of the mail box door 2.

Of course my automatic signal device can be changed and modified in various ways, without departing from the invention herein disclosed, the scope of which is more particularly defined by the hereto appended claims.

I claim:

1. In combination with a rural delivery mail box provided with a swingably mounted door; of a signal device comprising, a signaling member mounted for up and down movement, link means arranged to extend along a side wall of the mail box and having its front end pivotally connected with the door of the mail box in such manner that the link means will be reciprocated during swinging movement of the mail box door to its open and closed

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positions, a rotatably mounted member that is operatively connected with said signaling member, and reciprocable motion transmitting means interposed between the link means and the rotatably mounted member which reciprocable motion transmitting means is adapted to effect step-by-step rotary movement of said rotatably mounted member in one direction only and thereby effect upward movement of the signaling member to its uppermost position during one reciprocating movement of the link means and downward movement to its lowermost position during the next reciprocating movement of said link means.

2. The combination in accordance with claim 1, wherein said rotatably mounted member is provided with similar pairs of oppositely extending radial elements arranged in laterally offset relation with respect to each other so that each pair of elements has a circular movement in a different plane.

3. The combination in accordance with claim 1, wherein said rotatably mounted member is provided with similar pairs of oppositely extending radial elements arranged in laterally offset relation with respect to each other so that each pair of elements has a circular movement in a different plane and the reciprocable motion transmitting means is adapted to successively engage said elements in such manner as to effect the said step-by-step rotation of the rotatably mounted member in one direction only.

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