Nov. 1, 1960 R. M. EVERSOLE 2,958,858

DELIVERY BOX SIGNAL

Filed Feb. 24, 1958 2 Sheets-Sheet 1

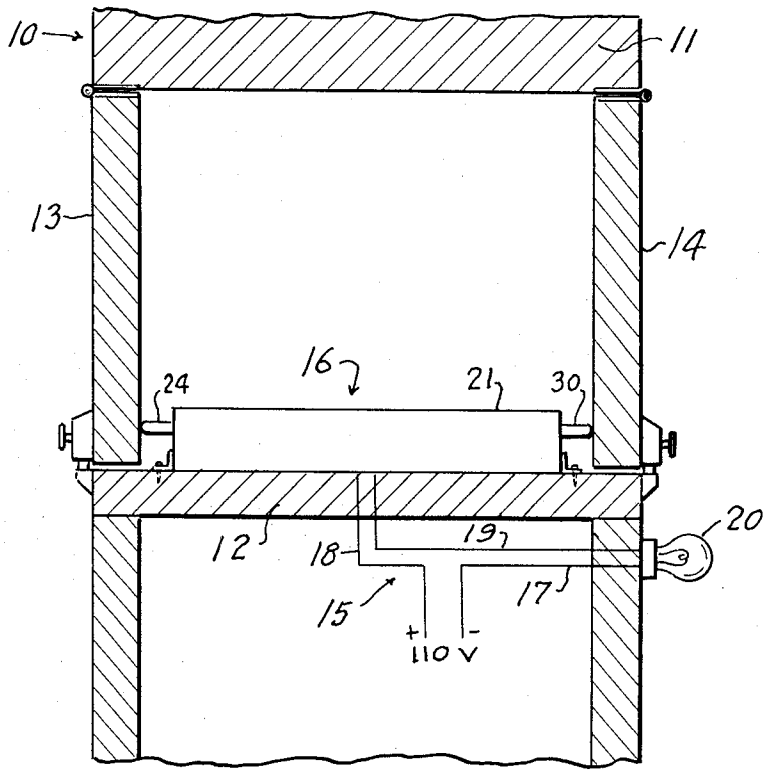


FIG. 1.

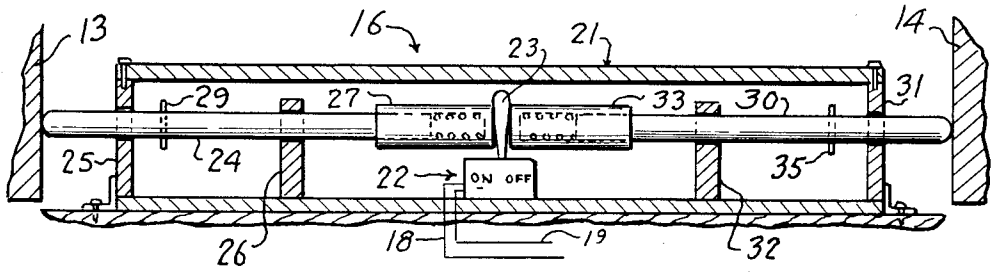


FIG. 2.

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Filed Feb. 24, 1958 2 Sheets-Sheet 2

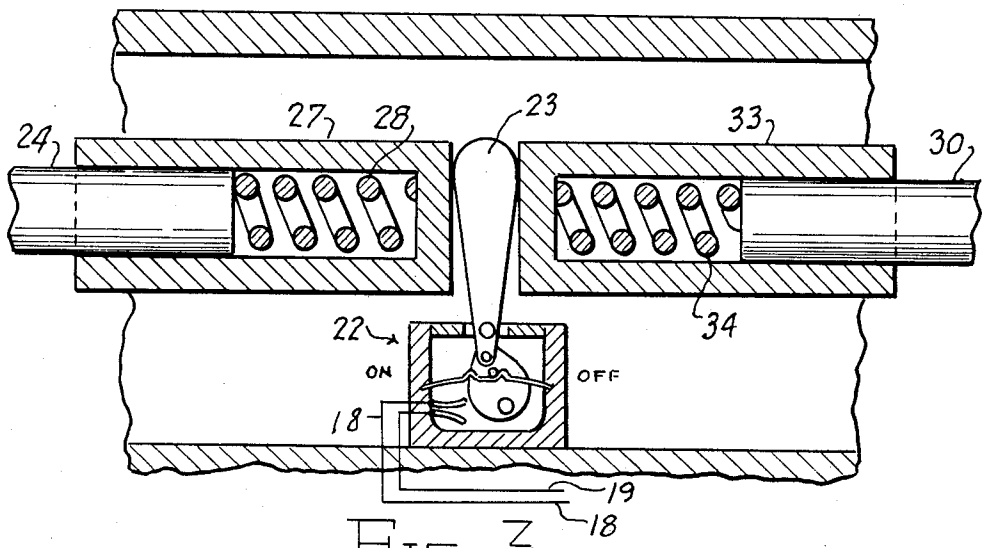


FIG. 3.

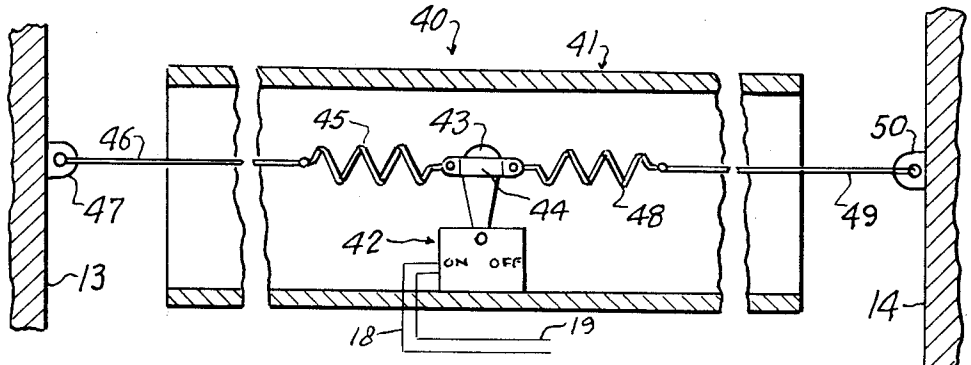


FIG. 4.

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DELIVERY BOX SIGNAL

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3 Claims. (Cl. 340—280)

This invention pertains to a signaling device for delivery boxes or the like and more particularly to a simple, reliable signaling device that is actuated by the opening of a delivery box door and is unaffected by subsequent openings of the same door when the other door has not been opened in the interim.

Various controls and circuits have been devised for operating signals when a door of a chamber is opened or mail is delivered to a mail box, for example. Such controls have been unduly complex, involving various combinations of cams, levers, springs, relays etc. that make the cost of such controls excessively high, particularly for domestic applications. Such controls have also been difficult to install, particularly in existing facilities, since the cams, levers, etc. must be placed in more or less precise relationship to assure their proper functioning.

The present invention proposes a signaling device that includes a reliable signal control, particularly for delivery boxes, that is less complex and less expensive than previously known signal controls. Further, a signal control designed according to the teachings of the invention can be packaged for sale in a single unit which can be easily installed with a few screws, rather than requiring various components of the control to be positioned in proper relationship. The control of the invention also turns a signal on or off when a given door is opened and does not affect the signal when the same door is subsequently opened, without the other door being opened in the interim. Thus, if a package is placed in a delivery box through an outer door, and the signal is actuated, it remains so regardless of how many other packages are subsequently delivered. Likewise, when an inner door of the delivery box is opened, the signal ceases and remains so regardless of how many additional times the iner door is opened.

The signaling device is particularly useful for domestic use. A housewife need not make continuous trips to a delivery box to check for deliveries because once the inner door has been opened and any packages have been removed, the signal will be turned off and remain unactuated until the outer door is opened and new deliveries are made. Hence, a mere glance at the signal, in the case a lamp is used, will indicate whether deliveries have been made, without the necessity of opening the inner door to ascertain this.

It is, therefore, a principal object of the invention to provide a more simple and reliable signaling device than those presently available or known.

Another object of the invention is to provide a signaling device having a control that is easy to install.

A further object of the invention is to provide a signaling device having a control that is actuated by response to an opening of a delivery box door and which is unaffected by subsequent opening of the same door without the other door being opened in the interim.

Other objects of the invention will be apparent from the following detailed description of a preferred embodiment and variation thereof, reference being made to the accompanying drawing, in which:

Fig. 1 is a view in cross section of a delivery box embodying a signaling device according to the invention,

Fig. 2 is an enlarged, detailed view partially in cross section of a signal control of the signaling device shown in Fig. 1,

Fig. 3 is a greatly enlarged, detailed view of a portion of the control shown in Figs. 1 and 2, and

Fig. 4 is a view partially in cross section of an alternative signal control embodying the invention.

Fig. 1 shows the present invention in conjunction with a delivery box indicated at **10** having side walls **11** and **12**, an outer door **13**, and an inner door **14**. A signaling device according to the invention includes a circuit generally indicated at **15** and a preferred signal control generally indicated at **16**. The circuit **15** comprises lead wires **17** and **18** and a connecting wire **19**. The wire **17** connects a suitable source of power, as a 110 volt source, to a signal, such as a lamp **20**, and the wire **18** connects the source of power to the control **16**. The wire **19** connects the control **16** to the lamp **20**. When the control **16** is open, the lamp **20** is off; when the control **16** is closed, the lamp is on.

The control **16** is more fully illustrated in Figs. 2 and 3 and comprises a housing **21** that contains all necessary parts of the signaling device except for the wiring **15** and the lamp **20**. The control **16** has a switch **22** which is preferably of the over-center type, such as a toggle switch, having an operating lever **23**. A rod **24** is located at one side of the lever **23** and can be slidably supported by an end wall **25** of the housing **21** and also by a tab **26** suitably provided therein. A sleeve **27** with a closed end is placed over the inner end of the rod **24** and a suitable spring **28** is located within the sleeve **27** which tends to urge the sleeve **27** and the rod **24** apart. The two are kept together, however, because the sleeve **27** contacts the lever **23** and the rod **24** has a pin **29** which abuts the end wall **25** when the rod **24** is in its outer position. The lever **23** and the pin **29** thus prevent the sleeve **27** and the rod **24** from being separated. On the other side of the lever **23** is a rod **30** supported by an end wall **31** of the housing **21** and also by a tab **32**. A sleeve **33** with a closed end is place over the inner end of the rod **30**. A suitable spring **34** is located within the sleeve **33** and tends to urge the sleeve **33** and the rod **30** apart. The two are kept together, however, because the sleeve **33** engages the lever **23** and the rod **30** has a pin **35** which abuts the end wall **31** of the housing **21**. The lever **23** and the pin **35** thus prevent the sleeve **33** and the rod **30** from being separated.

In operation, with both of the doors **13** and **14** closed, the springs **28** and **34** urge the lever **23** toward a center position, as shown in Fig. 2, but the switch **22** is not changed from its previous "off" or "on" position when the lever **23** was in a position closer to one door or the other. With the switch **22** in the open or "off" position, when the outer door **13** is opened the rod **24** is pushed outwardly by the spring **28** until the pin **29** abuts the end wall **25** of the housing **21**, if the door **13** is opened sufficiently. In any instance, the inner end of the rod **24** is moved away from the lever **23** and partly out of the sleeve **27**, thus allowing the spring **28** to expand. The spring **28** and the sleeve **27** thus do not exert as large a force on the lever **23** as previously. The spring **34**, however, still retains the same potential energy and pushes on the lever **23** with the same force as previously. Since the force of the spring **28** is decreased, the pressure differential of the springs **28** and **34** is increased, with the force of the spring **34** being greater, which causes the lever **23** to be moved toward the outer door **13**, to the closed or "on" position for the switch **22**. A

circuit is thereby completed between the voltage source and the lamp 20, thus lighting the lamp. When the door 13 is closed, it pushes the rod 24 inwardly toward the lever 23 and tends to compress the spring 28 which thus exerts a greater force on the lever 23, through the sleeve 27, and urges it toward its center position. The switch 22 still remains in the "on" position, however, and the lamp 20 remains lighted because the force of the springs 28 and 34 are equal and the switch operating lever will not pass its center position. If the door 13 is again opened, the spring 34 forces the lever 23 toward the door 13, as before, and the lever 23 again is urged toward its center position when the door 13 is shut. In all instances, however, the switch 22 remains in the "on" position because the spring 34 has not yet been overpowered. The lamp 20 thus continues to indicate that the package box has been opened from the outside.

If the inner door 14 is now opened, the spring 34 pushes the rod 30 outwardly until the pin 35 abuts the end wall 31, if the door 14 is opened sufficiently. The innr end of the rod 30 is moved away from the lever 23 and partly out of the sleeve 33 thus enabling the spring 34 to expand and exert less force on the lever 23. The spring 28 exerts the same force through the sleeve 27 on the lever 23 as it did before, however, and the pressure differential of the springs 28 and 34 is increased, with the force of the spring 28 being greater. Consequently, the lever 23 is moved toward the inner door 14 and changes the switch 22 to the "off" position. The circuit between the voltage source and the lamp 20 is thereby disconnected and the lamp is extinguished. When the door 14 is closed, the spring 34 is again compressed and thus urges the lever 23 back toward the center position, but the switch will not pass the center position because the force of the opposing springs is balanced. If the door 14 is again opened, the lever 23 is moved again toward this door but the switch 22 remains in the "off" position. Thus the housewife can repeatedly open the inner door without turning the signal lamp on or off.

Wide latitude can be employed in choosing the springs 28 and 34 to be used in the control 16. The strength and modulus of elasticity need not be high enough to enable each spring to push the lever 23 back to the center position against the force of the opposing spring when a door is shut. It is only necessary that each spring be strong enough to move the switch operating lever 23 toward the opposite door, when opened, and the rod of the opposing spring is moved completely to its outer position, in order to change the position of the switch 22.

Fig. 4 shows another control, indicated at 40, embodying the principles of the invention. The control 40 includes a housing 41 with opened ends (as shown) or slotted end walls. A switch 42 is located in the center of the housing 41 and can be of th over-center type or of a simple, unbiased type. A lever 43 extends upwardly from the switch 42 and is provided with a collar 44. A spring 45 is engaged with the lever 43 through the collar 44 and is connected at its opposite end to a wire or rod 46. The wire 46 is pivotally attached to an ear 47 affixed to the outer door 13, preferably near the hinges. A second spring 48 is engaged with the lever 43 through the collar 44 and is connected at its opposite end to a wire or rod 49 pivotally attached to an ear 50 of the inner door 14, preferably near the hinges. The springs 45 and 48 are preferably under slight tension when the doors 13 and 14 are closed.

In operation, when the outer door 13 is opened a sufficient amount, the rod 46, which moves outwardly with the door 13, pulls the spring 45 outwardly, thereby increasing the potential energy in the spring 45 by placing it under tension. The opposed spring 48 remains under substantially the same tension as previously. Therefor, the increased tension in the spring 45 causes it to pull

the lever 43 toward the door 13 and turn the switch 42 to the "on" position, thus connecting the lamp 20 to the voltage source. When the door 13 is closed, the tension in the spring 45 decreases and the lever 43 remains in the same position, since the tension, if any, in the spring 48 is not sufficient to overcome the tension, if any, in the spring 45 and the frictional resistance of the lever 43. If the switch 42 is of the over-center type, the springs 45 and 48 can be made strong enough with sufficiently high moduli of elasticity to pull the lever 43 back to the center without affecting the position of the switch 42. In either case, further opening of the door 13 again increases tension in the spring 45 but the switch 42 is unaffected since the lever 43 has already moved the switch 42 to the "on" position.

If the inner door 14 is now opened as when removing articles from a delivery box, tension in the spring 48 is increased and, when sufficient, pulls the lever 43 toward the door 14 since there is little opposing tension in the spring 45. The switch 42 is thereby moved to the "off" position and disconnects the lamp 20 from the voltage source, thus extinguishing the lamp. When the door 14 is closed, the lever 43 remains in the same position since the tension in the spring 45 is not sufficient to overcome the slightly lesser tension in the spring 48 and the frictional resistance of the lever 43. However, the springs 45 and 48 can be made stronger with higher moduli of elasticity so as to move the lever 43 to a central position, if desired, when an over-center type switch is employed.

The control 40 has an advantage over the control 16 in that the springs 45 and 48 also urge the doors 13 and 14 to closed position and thereby serve dual purposes of operating the switch 42 and shutting the doors. However, the wires 46 and 49 are more fully exposed since they are attached by the ears 47 and 50 to the doors 13 and 14 and move outwardly as the doors 13 and 14 are opened. Thus, the wires 46 and 49 are apt to be broken or bent, particularly by packages being placed in or removed from the delivery box. In contrast, the rods 24 and 30 or the control 16 extend only slightly outwardly when a door is opened, until the pins 29 and 35 abut the end walls 25 and 31. Further, the sensitivity of the control 40 tends to be less than that of the control 16. Thus, the switch 22 of the control 16 can be actuated when the door 13 or 14 is opened only slightly. However, for the control 40, if the springs 45 and 48 have higher moduli so as to move the lever 43 more quickly when a door is first opened, further opening of that door tends to stretch the respective spring. On the other hand, if the springs have low moduli, the lever 43 will not be moved until the door is opened correspondingly further.

It will be readily seen that the signaling device of the invention is simple, inexpensive, and dependable. The signal control of the device includes a switch with an operating lever movable in directions toward the doors of a delivery box or the like. On each side of the lever, between the lever and the doors, are resilient means engageable with both the lever and the doors, at least when closed, which means move the lever toward a door when opened and tend to urge the lever toward a central position when closed.

While the invention has been disclosed in conjunction with a wall-mounted delivery box, it is capable of application wherever a switch that is affected by opposite rectilinear movements is used.

Various modifications will be suggested from the above description. Such modifications can be employed without departing from the scope of the invention as determined by the appended claims.

What I claim is:

1. A signaling device to be located in a delivery box or the like having means forming a chamber with doors at opposite ends thereof, said device comprising a switch, an operating lever associated with said switch movable in di-

rections toward said doors, resilient means engageable with said switch operating lever and said doors, at least when closed, said resilient means moving said lever toward either door, when opened, a signal, and a circuit connecting said signal through said switch to a source of voltage, said switch acting to close said circuit when said lever is moved to a position closer to one door and said switch opening said circuit when said lever is moved to a position closer to the other door.

2. A signaling device to be located in a delivery box or the like having means forming a chamber with doors at opposite ends thereof, said device comprising a switch having a closed position and an open position, an operating lever associated with said switch movable in directions toward said doors, said switch being in its closed position when said lever is moved closer to one door and said switch being in its open position when said lever is moved closer to the other door, resilient means engageable with said lever and said doors, at least when closed, said resilient means moving said lever toward either door, when opened, a signal, and a circuit connecting said signal through said switch to a source of voltage.

3. A signaling device to be located in a delivery box having wall means forming a chamber with doors at opposite ends thereof, said device comprising a switch having a closed position and an open position, a lever associated with said switch movable in directions toward said doors, said switch being in its closed position when said lever is moved closer to one door and said switch being in its open position when said lever is moved closer to the other door, resilient means engageable with said lever and said doors, at least when closed, said resilient means moving said lever toward either door, when opened, and urging said lever to a central position when said doors are closed, a signal, and a circuit connecting said signal through said switch to a source of voltage.

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