United States Patent [19]

Arwood

[11] **3,889,874**

[45] **June 17, 1975**

[54] **MAILBOX SIGNAL APPARATUS**

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[22] Filed: **Mar. 22, 1974**

[21] Appl. No.: **453,944**

[52] **U.S. Cl.** **232/35**

[51] **Int. Cl.²** **A47G 29/12**

[58] **Field of Search** 232/35

[56] **References Cited**

UNITED STATES PATENTS

768,100	8/1904	Walsh	232/35
965,426	7/1910	Welch	232/35
1,021,026	3/1912	Welch	232/35
1,292,050	1/1919	Raney	232/35
2,356,020	8/1944	Westerfield	232/35
2,807,410	9/1957	Ward	232/35
2,834,539	5/1958	Carey	232/35
3,291,386	12/1966	Van Fleet	232/35
3,498,255	3/1970	Haeberle	232/35 X
3,606,141	9/1971	Taylor	232/35

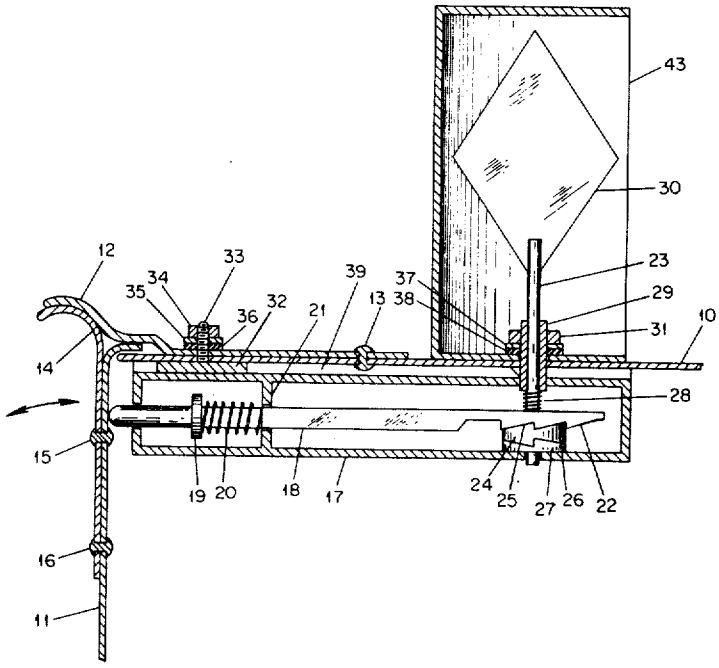
Primary Examiner—Francis K. Zugel

Attorney, Agent, or Firm—Martin J. Skinner

[57] **ABSTRACT**

A signaling device for a front-closing mailbox is described which will visibly indicate whether a mailman has opened the box to either pickup or deposit mail. The primary mechanism of the device is mounted within the mailbox for protection from the weather, and the device is automatically reset by the next operation of the mailbox door.

5 Claims, 7 Drawing Figures



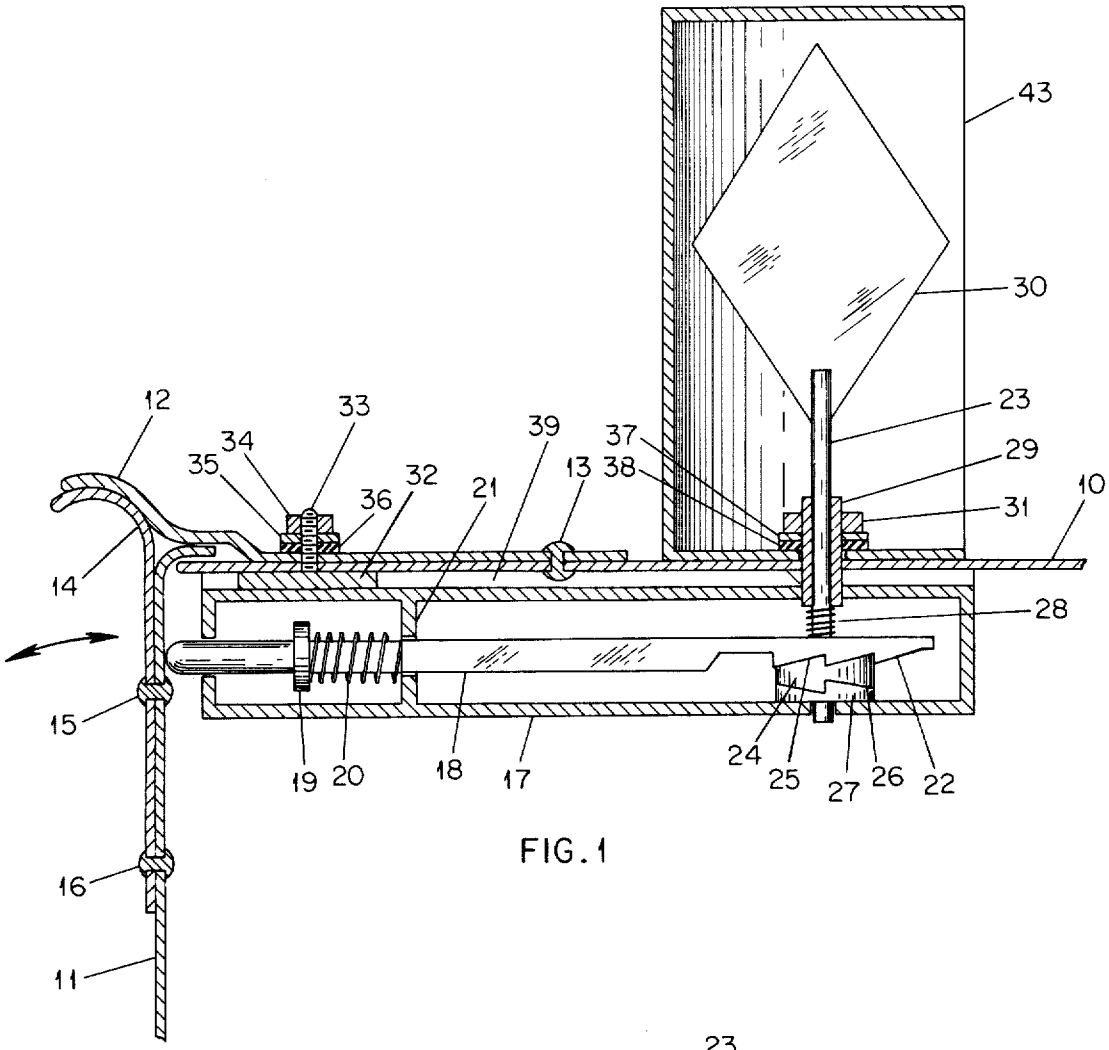


FIG. 1

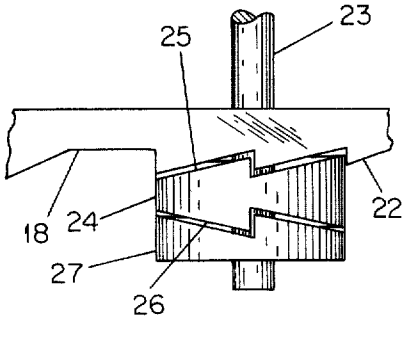


FIG. 2

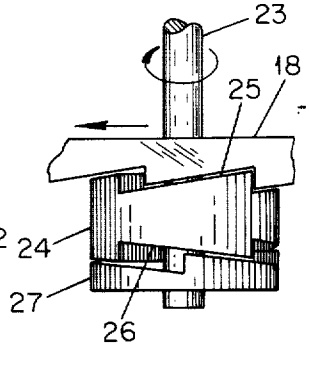


FIG. 3

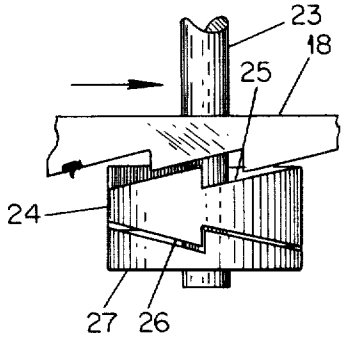


FIG. 4

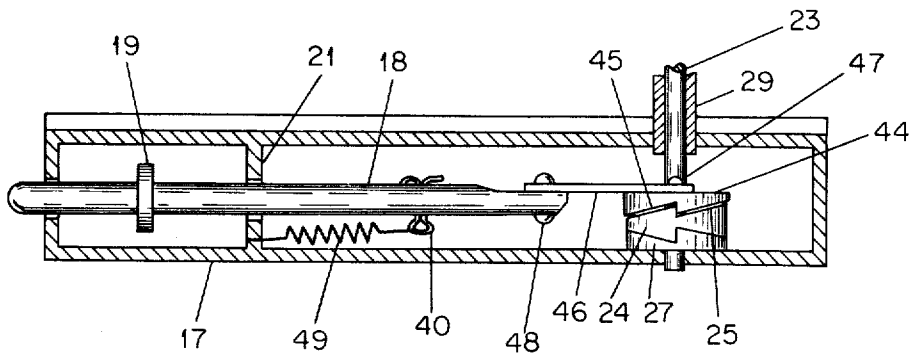


FIG. 5

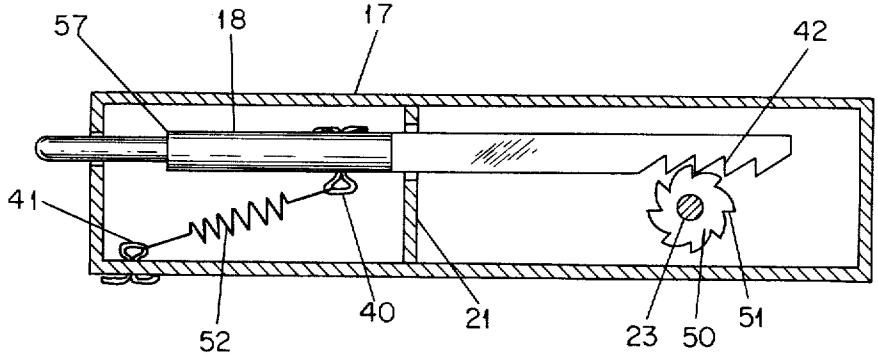


FIG. 6

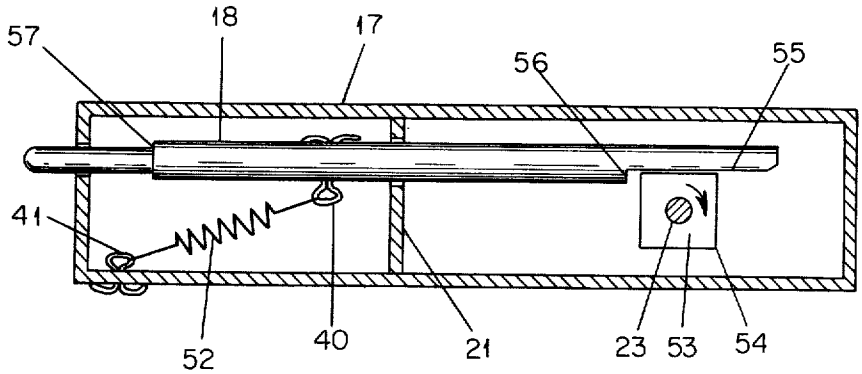


FIG. 7

MAILBOX SIGNAL APPARATUS

BACKGROUND OF THE INVENTION

The present development relates generally to signal flags for mailboxes, and more particularly to an automatically resetting signal flag to indicate the operation of the mailbox door.

In rural communities, in particular, it is often difficult for a home owner to determine whether a mailman has deposited or picked up mail at a mailbox located at the road. Too often, because of its orientation, the position of a normal mailbox "flag" is not clearly discernible. It would be desirable to have an automatic signal whereby a person in the house, in a car, etc., may ascertain the delivery or pickup without actually checking the contents of the box. In order to be most useful, such a signal should automatically reset for subsequent use.

Although a large number of door-operating signal devices for mailboxes have been developed, only two are known which provide for the rotation of an upstanding signal flag into different angular positions to indicate door operation. For example, in U.S. Pat. No. 2,567,459 to M. J. Yoder, a vertical shaft with a flag attached at the top has an encompassing coil spring that causes rotation of the shaft when a catch is released as the door is opened. The signal is reset by physically rotating the flag and closing the mailbox door to engage the catch. This would necessitate an additional operation by the mailman.

In the U.S. Pat. No. 2,356,020, to J. A. Westerfield, a rathcet wheel with an engaging arm is attached to the mailbox whereby a signal flag is moved 90° when the door is opened. This is an "automatic" device and does not require some other act to reset the signal. In this device, as well as that of Yoder, the mechanism is attached to the exterior of the mailbox and is subjected to the effects of weather as well as enticing vandalism. In Westerfield, in order for attachment to any mailbox, considerable placement problems are encountered for mounting the components.

Accordingly, it is the principal object of the subject development to provide a pre-assembled mechanism whereby a visible signal flag is rotated a predetermined angular amount each time the door is opened.

It is another object to provide for mounting the mechanism primarily within the mailbox.

It is still another object to provide a signaling device which may be easily installed in any approved standard rural-type front-opening mailbox by a home owner.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a cross sectional view of one embodiment of my signaling device showing it in a typical position within a front-opening mailbox of a standard type;

FIG. **2** is an enlarged view of the axially-moving rod and rotatable wheel of the device of FIG. **1** when the mailbox door is fully closed;

FIG. **3** is a view of the components of FIG. **2** when the mailbox door is just opening;

FIG. **4** is a view of the components of FIG. **2** when the door of the mailbox is being closed and the door is moving the rod rearward; and

FIGS. **5–7** are drawings illustrating other rotating means for a signal flag as other embodiments of my invention.

SUMMARY OF THE INVENTION

My invention is an improved visible signal-operating device for a mailbox wherein all but the signal flag and a portion of its support shaft are enclosed in the mailbox. The device, pre-assembled except for the signal flag, is typically mounted onto the underside of the top of the box by a bolt extending through one of the holes normally containing a rivet and by a shaft bushing through a separate hole in the top of the mailbox. The signal flag is rotated 90° (or 180° if desired) each time the mailbox door is opened through the cooperative action of an axially-moving rod unit engaging a surface of a gear, ratchet wheel or other rotatable member. This rotatable member turns the signal flag shaft as the rod moves in one direction; it is restrained from rotation by suitable means during movement of the rod in the opposite direction. A shield may be provided to prevent viewing of the signal flag except from a direction seen only by the home owner.

DETAILED DESCRIPTION

My invention will be most clearly understood by first referring to the cross sectional view of FIG. **1** wherein is illustrated one embodiment. As is conventional, a mailbox body **10** is provided with a door **11** which is hinged so as to move in an arcuate direction as shown. The mailbox body **10** is also provided with a spring-type door clasp **12**, fastened thereto with rivet **13**, which engages clasp **14** fastened to door **11** with rivets **15, 16.** Clasp **12** is normally provided with a second rivet; however, it has been removed to permit installation of my invention as will be understood from information provided hereinafter.

An elongated frame **17**, formed of sheet metal, molded plastic or the like, is typically secured into the top of the mailbox **10** as described below so as to be aligned with the long dimension of the mailbox. The frame **17** may have a top open channel **39** to prevent interference with rivet **13** or the like. Within this frame **17** is contained an axially-movable plunger or rod **18.** Rod **18** may have any desired cross section at the portion facing door **11** and, in this embodiment, is either square or rectangular in cross section in the rearward portions. An annular shoulder **19** is provided on the forward portion of the rod **18** and a helical spring **20,** wound about the rod **18,** bears against this shoulder **19** and a rod guide **21** within the frame **17** so as to normally urge or bias the rod **18** toward the door **11.** The shoulder **19** also serves as a stop for the rod during movement toward a mailbox door **11** when it encounters the end wall of frame **17.** Although not shown, a pin through the rod **18,** or the equivalent thereof, may be used in place of the shoulder **19.** The rod **18,** at its rearward end, is provided with downwardly-oriented pawls **22** having flat vertical faces toward the front of the box **10.** Guide **21** prevents rotation of rod **18** and thus assures proper orientation of pawls **22.**

Oriented perpendicularly to the rod **18** is a shaft **23.** This shaft **23** has attached thereto, or formed integrally therewith, a ratchet wheel **24** with teeth on both the upper face **25** and lower face **26** extending radially outward from the shaft **23,** the teeth on each face being, for example, oriented 90° from each other. The teeth on the upper face **25** are formed to engage the pawls **22** on rod **18.** Teeth formed on the lower face **26** are formed in an opposite direction to those on the upper

face 25 so as to engage teeth on the top of a fixed (non-rotatable) disk-like member 27 in frame 17. A spring 28 is shown in this figure as surrounding shaft 23. This spring 28 generally keeps the aforementioned teeth and pawls all engaged. The function of these interlocking teeth and pawls will become more apparent hereinafter.

The bottom of shaft 23 is rotatably supported in frame 17 and the shaft extends through the top or the wall of the mailbox 10 through a sleeve bushing 29 fastened into frame 17. A visible signal flag 30 is attached to the top of the shaft 23. The exterior of bushing 29 is threaded to receive nut 31 whereby the rear portion of the frame 17 is held in place against the interior of the wall of the mailbox 10. The forward portion of frame 17 is held in place by a stabilizer 32 which is slidable in frame 17 (in the aforementioned channel 39 if present). A stud 33 extending up from stabilizer 32 passes through the aforementioned rivet hole (or another hole provided therefor) in mailbox 10 and a nut 34 thereon secures the unit in place.

Some home owners may wish to prevent the viewing of the signal flag 30 except by themselves, as from their house. For this application, a semi-enclosed shield 43 is positioned about the flag 30. This shield 43 may be a rectangular or cylindrical box with an open side oriented toward the viewing direction. It may be held by nut 31 or by any other suitable means to box 10.

Referring now to FIG. 2, the position of the rod 18, ratchet wheel 24 and pawls 22 are shown when the mailbox door 11 is fully closed. This is an enlarged view of these components in the same position as in FIG. 1. In FIG. 3, the rod 18 has moved outward as the door (not shown) is opening. Pawls 22, engaged the upper face 25 of ratchet wheel 24, turn the ratchet wheel 24 and thus shaft 23. The teeth on the bottom face 26 of ratchet wheel 24 slide over the teeth on the fixed disk member 27 (the spring 28 of FIG. 1 is compressed). When rod 18 reaches its most forward position, the shaft 23 has turned 90° and the flag 30 attached thereto is likewise rotated to a new position. As shown in FIG. 4, the position of the flag 30 and shaft 23 remain the same as the door is closed because the teeth on the bottom face 26 of ratchet wheel 24 lock against the teeth on the fixed member 27, and the pawls 22 on the rod 18 slide across the teeth on the upper face 25 of ratchet wheel 24. The spring 28 about shaft 23 again is further compressed to permit this movement. It may thus be understood that each opening of the mailbox door rotates the signal flag 90° and no rotation of the flag occurs during closure of the door.

I have also developed other rod-rotatable wheel embodiments generic to that of FIGS. 1–4 for the rotation of shaft 23. For example, as shown in a vertical section in FIG. 5, a third disk 44 may be utilized with teeth on a lower surface 45 thereof to engage the upper face 25 of ratchet wheel 24. A segment 46 of the rod 18 is pivotally connected to disk 44 with pin 47. Segment 46 may be attached directly to the remainder of rod 18 with a second pin 48, as shown, or a non-extendable flexible member (not shown) may be the connecting link. This figure also illustrates a second manner of biasing the rod 18 toward a door of a mailbox. Rather than the compressed spring 20 of FIG. 1, an extended coiled spring 49 is appropriately connected between the rod 18, using pin 40, and a portion of the frame 17, such as the rod guide 21. In this embodiment, if member 46 is flexible, a spring or other means (not shown) is required to rotate member 44 to its original position when rod 18 is moved rearwardly.

Still another embodiment of my invention is illustrated from the top in FIG. 6. In this embodiment the ratchet wheel of the prior embodiments is replaced with wheel 50 provided with teeth 51 extending radially from the periphery thereof. These teeth 51 engage pawls 42 on the side of rod 18. The number of teeth 51 and their spacing, the number of pawls 42 and their spacing, and the distance of travel of rod 18 are chosen to provide the desired angular rotation of shaft 23. Spring 52 connected to frame 17 with pin 41 and to the rod 18 with pin 40 normally maintains the pawls 42 in contact with teeth 51 in addition to biasing the rod 18 axially as the mailbox door is opened. As illustrated in this figure, the forward end of the rod 18 may be reduced in cross section so as to form a shoulder 57. This shoulder then serves as a stop for the rod in the same manner as shoulder 19 in FIGS. 1 and 5. Although not shown, the same means as illustrated in FIGS. 1–4 is used to prevent rotation of wheel 50 as rod 18 moves rearwardly.

A further embodiment of my invention is illustrated from the top in FIG. 7. Shaft 23 is provided with a substantially four-faced member 53 attached thereto and thus is effectively a rotatable member with four radially-extending projections 54 in the form of the four corners. In this embodiment, rod 18 has a flat surface 55, which normally engages one face of member 53, and a right-angled shoulder 56. As rod 18 moves axially, as when a mailbox door is closed, shoulder 56 engages with a projection 54 causing rotation of member 53 and thus shaft 23. Spring 57, attached between frame 17 and rod 18 as in FIG. 6 at an angle to rod 18 in a plane substantially perpendicular to the shaft 23, is extended during this operation and maintains contact between the components. Upon movement of the rod 18 in the opposite direction, the flat surface 55 slides along the mating surface of member 53 and thus no rotation thereof occurs.

It will be apparent that in the embodiments of FIGS. 1, 6 and 7 the shape of the engaging components may be modified so as to obtain rotation of shaft 23 during movement of the rod 18 in a direction opposite to that described above. For example, shoulder 55 of the embodiment of FIG. 7 may be located rearwardly (with respect to the mailbox door) of member 53. Thus, rotation would occur during the opening of the door rather than during closure thereof. Furthermore, in all embodiments except that of FIG. 5, the spring member for biasing the rod 18 forwardly may be located rearwardly from the position of shaft 23 by extending rod 18 a greater distance rearwardly.

As stated above, my invention may be very easily installed on any standard mailbox. To install, the front rivet holding clamp 12 (see FIG. 1) is removed and a second hole is made (punched or drilled) to accept bushing 29. Stud 33 then is passed through the rivet hole and bushing 29 through the second hole. Rubber and metal washers 35, 36, and 37, 38 may be applied to provide a waterproof seal, and nuts 34 and 31 are then applied and tightened. The flag 30 is then attached on shaft 23 to provide the desired orientation for viewing by the mailbox owner. If present, shield 43 is then appropriately oriented for best viewing by the owner.

Assuming that the flag **30** is crosswise the mailbox for best viewing from an owner's house, a house owner sets the flag **30** at 90° to that position when the box is empty. Then if the mailman opens the box to deposit the mail, the flag **30** is automatically rotated into viewing position. If the desired orientation is lost due to an extraneous opening of the door, an intentional opening thereof will correct the orientation.

It will be apparent to those versed in the art that my unit may be installed within a mailbox at other positions than only at the exact top. The only change from the above installation description would be the forming of two holes through the wall of the box at appropriate positions. Similarly, a change of the number of teeth or projections of the rotating unit could be made to provide for 180° rotation. The surfaces of the flag would then be color coded.

While the foregoing describes my invention in several of its specific forms, it will be understood that certain modifications of elements may be made without departing from the invention as claimed.

I claim:

1. A signaling device of unitary construction for simple installation to indicate when a door of a front-opening mailbox has been opened, which comprises:

an elongated frame to be mounted within the top of the mailbox with the long dimension thereof oriented perpendicular to the mailbox door, the frame being provided with an open top channel along its length;

a non-rotatable rod mounted within the frame and axially movable therein, one end of the rod engaging the mailbox door during closure of the door;

a coiled spring connected between the rod and the frame for normally biasing the rod toward the mailbox door;

a rotatable shaft extending vertically from the frame for projection through the top of the mailbox;

a visible signal flag attached to the shaft exterior to the mailbox;

a rotatable member attached to the shaft within the frame, the rotatable member having radially-extending projections thereon;

a notched surface on the rod normally engaged with a portion of the projections on the rotatable member whereby the rotatable member and shaft are rotated by axial movement of the rod in one direction and thereby the signal flag is moved from a first position to a second position;

an upstanding threaded mounting stud adjustable along the top channel in the frame; and

an externally threaded sleeve bushing engaged with the frame and surrounding a portion of the shaft between the frame and the signal flag.

2. The signaling device of claim **1** further comprising a partial enclosure for the signal flag whereby the position of the signal flag may be viewed at all times only from a limited direction, the partial enclosure being mountable on the exterior of the mailbox and adjustably rotatable about the axis of the shaft for a selection of the viewing direction.

3. The signaling device of claim **1** wherein the rotatable member is square in cross section perpendicular to the shaft, the corners between flat surfaces thereof forming the radially-extending projections, wherein the notched surface is a flattened portion on the rod terminated by a right-angled shoulder, the shoulder engaging a corner of the rotatable member during axial movement of the rod in one direction; and wherein the spring between the rod and the frame is oriented at an angle to the rod in a plane substantially perpendicular to the shaft.

4. The signaling device of claim **1** wherein the rotatable member is a ratchet wheel having radially extending teeth on both top and bottom faces of the ratchet wheel extending outward from the shaft, the teeth on the top of the ratchet wheel being oriented in an opposite direction to the teeth on the bottom, and wherein the notched surface on the rod is engaged with teeth on the top face of the ratchet wheel.

5. The signaling device of claim **4** further comprising a non-rotatable disk attached to the frame, and coaxial with the shaft, having radially extending teeth normally engaged with the teeth on the bottom surface of the ratchet wheel whereby the ratchet wheel, and thus the signal flag, is rotated only when the rod is moved axially in one direction but not during movement of the rod in the second direction.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,889,974

DATED : June 17, 1975

INVENTOR(S) : CHARLES A. KALLANDER

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 12, line 17, after "from" insert ---said rotatable member---

Column 12, line 37, change "drive" to ---driven---

Signed and Sealed this

thirteenth Day of *January 1976*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks