United States Patent

[11] 3,633,106

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[45] Patented **Jan. 4, 1972**
[73] Assignee **Solid State Technology, Inc.**
Wilmington, Del.

[54] **EMERGENCY SIGNALLING TRANSMITTER**
2 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** ..... **325/185,** 290/1 E, 322/100, 325/119, 325/166, 340/293, 340/309, 340/333
[51] **Int. Cl.** **H04b 1/02**
[50] **Field of Search** ..... 325/64, 185, 186, 152, 161, 166, 169, 119; 340/286, 293, 297, 309, 333; 290/1 E, 1 R; 185/37, 39; 322/100

[56] **References Cited**

UNITED STATES PATENTS

2,623,992	12/1952	Fischler et al.	325/186
3,492,581	1/1970	Wisniewski	325/64

Primary Examiner—Benedict V. Safourek
Attorney—Martin Kirkpatrick

ABSTRACT: An enclosed batteryless remote wireless electrical signalling system with a radio transmitter having a plurality of selectable transmission modes and an electromechanical generator driven by a spring mounted within the enclosure. Manually operable means are provided for operating the generator to energize the transmitter means for a substantial period of time for transmission of the selected mode. Such means includes a manual winding lever overlying a portion of the front wall of the enclosure with its lower end pivoted adjacent the bottom of the front wall and with its free upper end having a handle. The lever is manually swingable downwardly and away from said front wall throughout an arcuate path of about 90° generally perpendicular to said front wall to wind the spring. Selecting means are provided having a plurality of push buttons contained in an electrical switch mounted on the enclosure front wall behind and normally concealed by the overlying winding lever for exposure by the downward arcuate movement of the lever, each button being connected to the transmitter to select one of the transmission modes as indicated by indicia provided adjacent said buttons. Further included in the manually operated means is a cam operated linkage for initiating driving of the generator upon return of the manual winding lever to the normal vertical position adjacent said front wall to transmit the selected transmission mode.

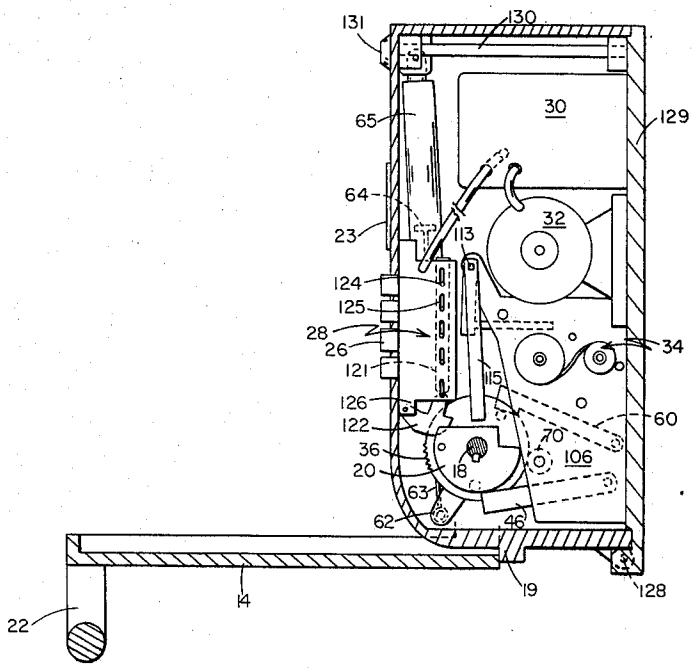


FIG 1

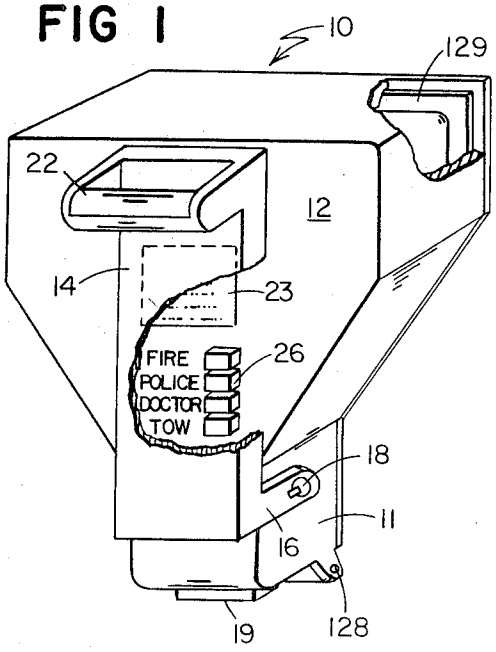


FIG 2

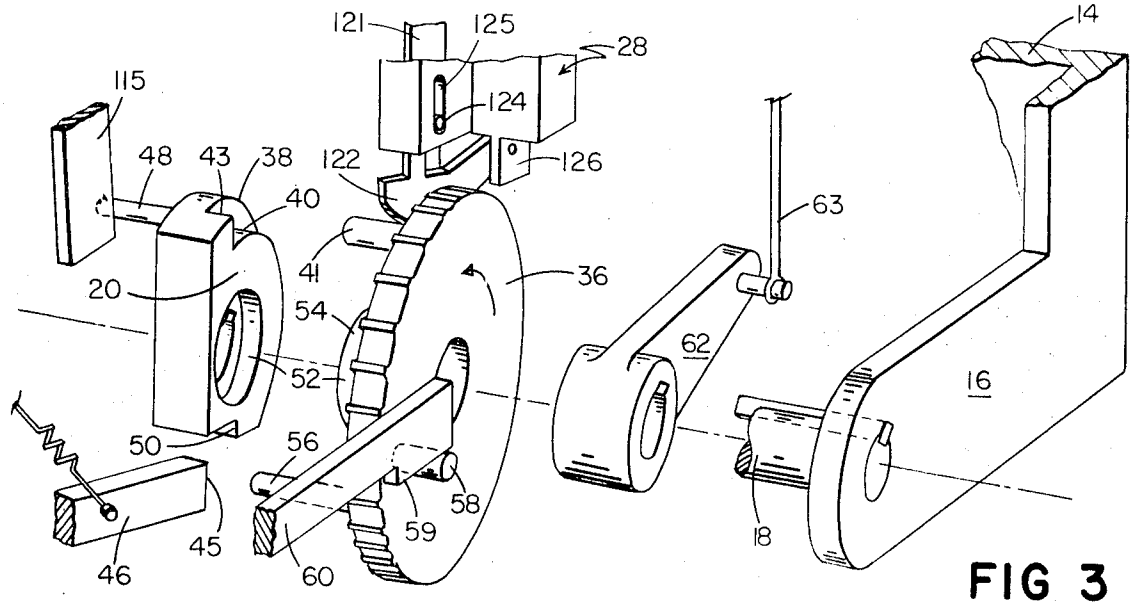
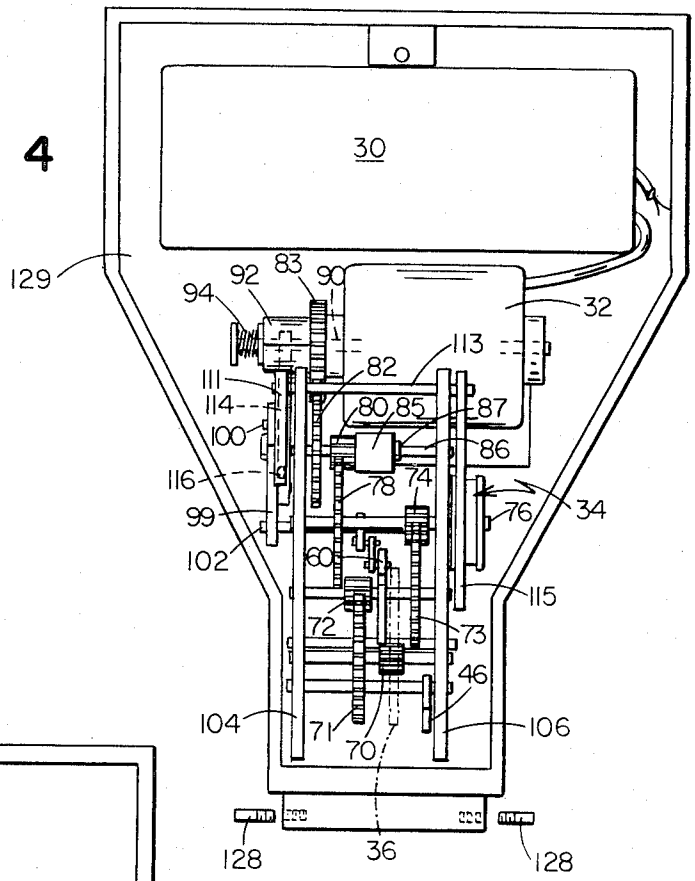


FIG 3

FIG 4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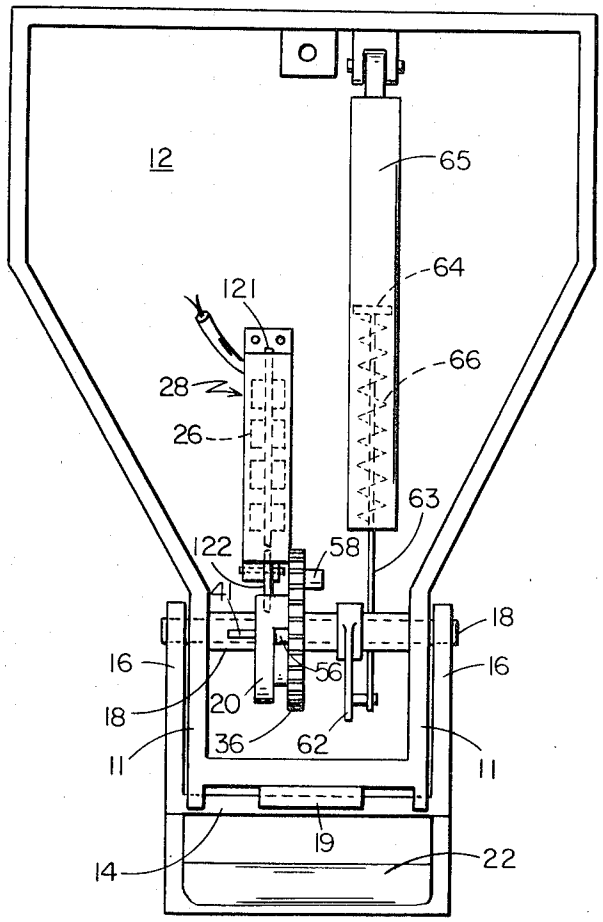
12
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FIG 5

FIG 8

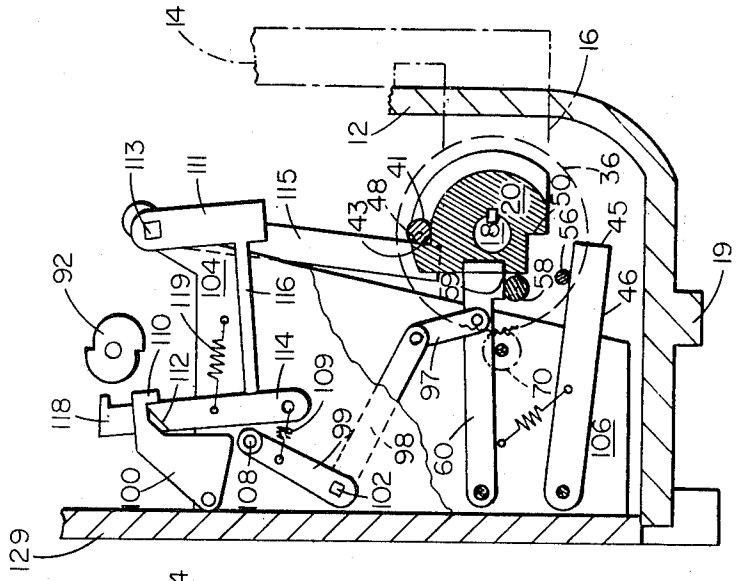


FIG 7

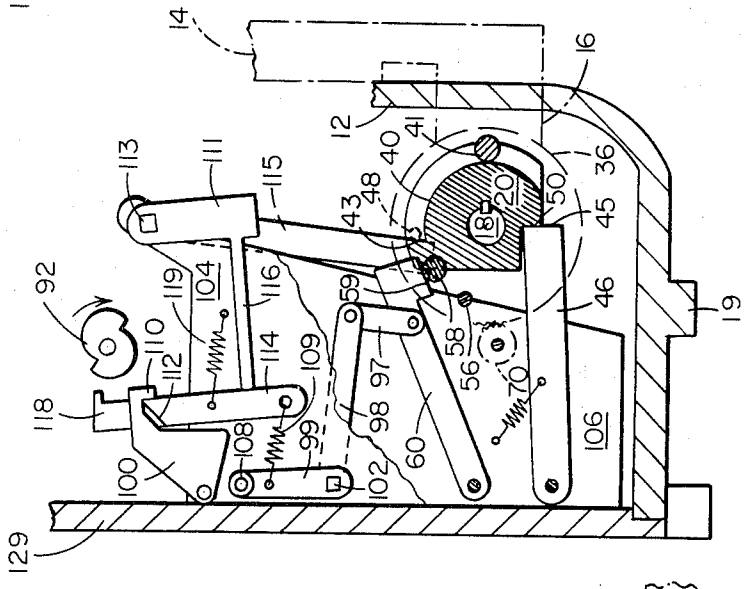
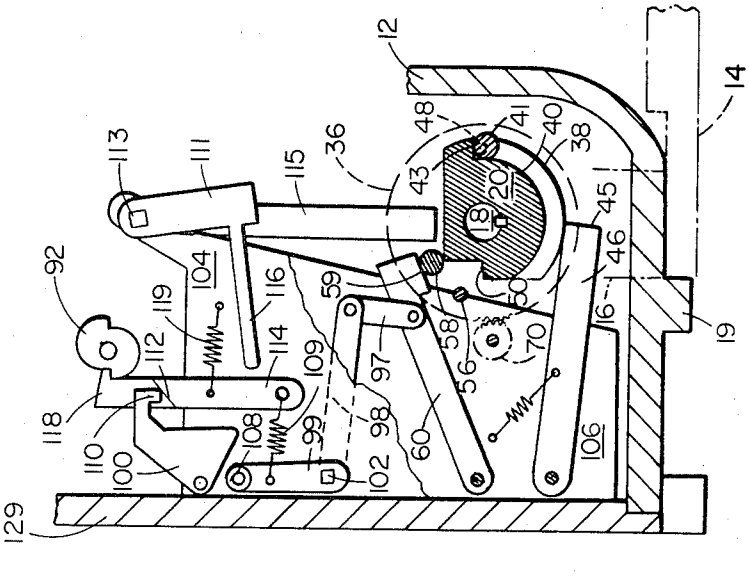


FIG 6



EMERGENCY SIGNALLING TRANSMITTER

This invention relates to signalling systems and more particularly to manually powered electrical signalling systems especially useful for use in emergencies and in remote locations.

For years, there has existed an unsatisfied need for a simple batteryless wireless signalling system for use in locations where electrical power is either not available or is subject to failure under conditions in which the signalling system is most needed. The former situation is present in modern superhighway systems, which at present must be constantly patrolled by radio-equipped vehicles for the motorists' protection. The latter situation arises in newly developed residential areas remote from urban centers, where fire protection must be provided in the form of fire alarm boxes which at present require an expensive independent underground wiring system for protection from the elements. Such a signalling device was disclosed in my prior U.S. Pat. application, Ser. No. 872,576, filed Oct. 30, 1969. (The disclosure of said application hereby being incorporated by reference).

It has more recently been recognized that the intended operator of such a signalling system may be emotionally upset by a just-experienced crisis and as a consequence be error prone in the selection of the desired emergency service as well as in the operation of the device. Furthermore, in the event of a serious emergency such as an automobile collision, the operator may well be in urgent need of multiple services and attempt to transmit two or three signals simultaneously or in rapid succession. As the signalling system is limited to the transmission of one signal at a time of substantial duration, such hasty operation of this device would only result in partial emission of either signal, thereby reducing the opportunity of reception by the proper party. To avoid defective operation of the signalling device in such situations, it would be advantageous to permit the operator to change his selection of the desired emergency service and to ensure that, once the selection has been correctly made, a complete transmission cycle will be emitted. Accordingly, it is an object of the present invention to provide such a signalling system.

It is another object of the present invention to provide a signalling system in which selection of a desired signal may be readily altered prior to energizing said system.

It is still another object of the present invention to ensure complete transmission of a selected emergency signal.

Yet another object is to prevent multiple simultaneous selection of available emergency services, especially during transmission of a given signal.

The above objects are accomplished by providing in a remote electrical signalling system comprising an enclosure having a vertical wall containing a transmitter having a plurality of selectable transmitter modes and an electromechanical generator for energizing it, manually operable means for operating said generator and selecting means for selectively connecting a predetermined transmission mode with said generator for operating said transmission mode for a substantial time. Preferably, the manually operated means includes locking means, actuating means for controlling the generator and a manual winding lever normally overlying the portion of said enclosure wall including the selecting means and extending vertically thereacross with its lower end pivoted adjacent the bottom of said front wall and with its free upper end having a handle. Preferably, the manual winding lever is normally urged by spring means into its upright position overlying said front wall. The actuating means is connected to the generator for initiating driving of said generator to transmit the selected transmission mode only after return of said lever to its normal position by said spring means.

The selecting means comprise a plurality of push buttons mounted in an electric switch secured on the enclosure wall behind and normally concealed by the overlying winding lever for selectively operating one of said transmission modes indicated by indicia provided adjacent said buttons.

Conventional interlocking means are provided in said switch for controlling actuation of said buttons such that only one button may be depressed at a time for selecting a predetermined transmission mode. However, the selection of said transmission mode may be altered by depressing a second button, but only prior to actuation of said generator at which time said buttons are concealed by said overlying winding lever, locked in an upright position.

For the purpose of more fully explaining the above and still further objects and features of the invention, reference is now made to the following detailed description of a preferred embodiment of the invention, together with the accompanying drawings, wherein

FIG. 1 is an isometric view of a signalling system according to the invention with its operating lever partially broken away;

FIG. 2 is a vertical sectional view of the signalling system of FIG. 1;

FIG. 3 is an exploded isometric view of drive shaft subassembly portion of FIG. 2;

FIG. 4 is a vertical section of the signalling system of FIG. 1;

FIG. 5 is a partial sectional view of the signalling system of FIG. 1 showing the reset linkage assembly, the push buttons and the drive shaft assembly; and

FIGS. 6, 7 and 8 are enlarged fragmentary schematic views of the reset linkage assembly showing progressive steps in its operation.

Referring to the drawings, and especially to FIG. 1 thereof, the remote signalling system of the invention includes a weatherproof enclosure **10**, preferably red in color, having vertical sidewalls **11**, a vertical front wall **12** and a rectangular operating lever **14** normally overlying front wall **12** of the enclosure **10** and having at its lower end two arms **16** extending perpendicularly inward to receive opposite ends of drive shaft **18**. A control disc **20** is mounted on drive shaft **18** for alternatively driving a gear drive train, activating transmission of a signal and locking the operating lever, all as hereinafter described.

Lever **14** has, at its upper free end, a prominent handle **22** projecting perpendicularly outward from said front wall for use in an emergency by pulling it down, much in the same manner as the conventional fire alarm box to which people have long been accustomed.

In FIG. 2, lever **14** is shown in its lowered position to which it has been pulled down through an arcuate path of preferably about 90° about the axis of drive shaft **18** to its open position against stop **24** to expose instruction plate **23** and a plurality of pushbuttons **26** extending through wall **12** from a conventional electrical switch box **28** mounted on the inner surface of said wall, there being indicia mounted adjacent each button of separate emergency services, such as FIRE, DOCTOR, POLICE, TOW. Enclosure **10** contains a suitable radio transmitter **30** of a type well known in the art, having a plurality of transmission modes each connected by wiring to respective buttons **26**, corresponding to the desired emergency service or services selectable by said pushbuttons such as disclosed in U.S. Pat. No. 3,441,858, for example. Electrical power is supplied to said transmitter by an electromechanical generator **32** driven by a spring **34**, both mounted within enclosure **10**, said spring being wound for each transmission by pulling down lever **14** which also acts as a winding lever. Operation of transmitter **30** is delayed until operating lever **14** is returned to the normal upright position and control plate **20** releases generator **32** via a linkage, initiating the transmission selected by prior depression of one of the push buttons for alerting the appropriate emergency service through suitable radio receiving equipment, all as hereinafter more fully explained.

More specifically, and referring now to FIGS. **2**, **3** and **5**, arms **16** of lever **14** are secured to the opposite ends of drive shaft **18** which is in turn supported in bearings provided in sidewalls **11**. As seen especially in FIG. **3**, control disc **20**, being keyed to drive shaft **18** adjacent drive gear **36**, is provided with a curved sector having a curved circumferential edge **38** and an arcuate recess **40** for receiving clutch pin **41**

extending transversely from drive gear **36** rotatably mounted on drive shaft **18**. Responsive to arcuate movement of lever **14**, control disc **20** rotates relative to drive gear **36** when pin **41** rides in recess **40**. However, upon the striking of shoulder **43** provided at one end of said recess by said pin, gear **36** is held in fixed relation with said control plate during continued rotation thereof. Circumferential portion **38** provides a cam surface for slideably contacting a tip **45** of pivotally mounted, spring loaded locking bar **46**. Control plate **20** also is provided with post **48** projecting transversely from the side opposite drive gear **36** and a notch **50** for engaging tip **45** of locking bar **46** when lever **14** is in the upright position. Surrounding drive shaft **18** and adjacent drive gear **36**, an annular recess **52** is provided in control disc **20** for receiving sleeve **54** extending transversely from said drive gear to align said control plate with said drive gear.

A second pin **56** parallel with and spaced outwardly from drive shaft **18** is provided in drive gear **36** on the same side as clutch pin **41**, spaced therefrom by an arc of approximately 170°, and extending transversely for contacting locking bar **46** during counterclockwise rotation of said drive gear as viewed in FIG. **8**. Projecting from the opposite side of drive gear **36**, reset post **58** is positioned radially outward from drive shaft **18** for supporting cam surface **59** provided on the free end of reset arm **60** (see FIGS. **6**, **7** and **8**).

Disposed intermediate drive gear **36** and sidewall **11**, reset crank **62** is fixedly mounted on drive shaft **18** by keying and extends toward front wall **12** for connection by means of cable **63** to spring loaded piston **64** contained within with dash pot **65**.

As seen in FIG. **4**, drive gear **36** is included in an input gear train for winding coil spring **34** which is included in an input gear train for in turn is connected to an output gear train for driving generator **32**.

The input gear train, as best shown in FIG. **4**, consists of drive gear **36**, pinion **70**, gear **71**, pinion **72**, gear **73** and pinion **74**. Mounted on shaft **76** is coil spring **34**, formed of multiturns of resilient metal strips coiled around drums of known construction, such as the Negator spring manufactured by Hunter Spring Co., for storing energy supplied through the input gear train by winding lever **14** and for furnishing constant force to the output gear train for rotation of the generator **32**.

The output gear train, as also shown in FIG. **4**, consists of gear **78**, pinion **80**, gear **82** and generator drive gear **83**. Pinion **80** is affixed to sleeve **85** slideably received by shaft **86**, the sleeve inner diameter being greater than the shaft outer diameter. Sleeve **85** is attached to shaft **86** by clutch **87** constructed to impart rotational movement to shaft **86** in one direction only.

Drive shaft **90** of generator **32** projects horizontally outward slideably to receive generator drive gear **83** and ratchet stop **92** (see FIG. **4**). Slip clutch **94** is attached to the distal end of shaft **90** frictionally to maintain ratchet stop **92** and generator drive gear **83** in engagement with drive shaft **90**. The compressive force exerted by slip clutch **94** is designed to permit rotation of shaft **90** and generator **32** relative to gear **83** only when tongue **118** engages ratchet stop **92** while generator **32** is rotating.

The stop and reset linkage seen in FIGS. **6**, **7** and **8** is comprised of a series of pivotally mounted interconnected links **97**, **98** and **99** for rotating lock **100**. Reset arm **60**, pivotally connected at one end to a shaft, extends toward front wall **12** in a plane parallel to and adjacent drive gear **36** with the free end formed to provide a cam surface **59** for engaging reset post **58** throughout approximately 90° of rotation of gear drive **36** (see FIGS. **7** and **8**). One end of link **97** is pivotally secured to reset arm **60** adjacent cam surface **59**, the other end being pivotally fastened to one end link **98**. The opposite end of link **98** is securely fastened to horizontal shaft **102** at a point equidistant from vertically arranged support frames **104** and **106** (see FIG. **4**). Link **99**, being securely fastened at one end to the end of shaft **102** projecting outwardly through frame **104** (see FIG. **4**), extends upwardly in a vertical plane spaced from the plane of link **98** to engage the lower edge of lock **100** with roller **108**. Spring **109**, connected at the midsection of link **99**, is attached to a shaft to urge roller **108** toward lock **100**. Lock **100**, pivotally mounted on a shaft, is provided with a catch **110** extending horizontally to engage sloping surface **112** of stop lever **114**.

Stop lever **114**, pivotally mounted at one end and disposed between lock **100** and push rod **116** has a tongue **118** at the distal free end for engagement with ratchet stop **92**. Spring **119**, attached to the midpoint of stop lever **114**, is connected to a shaft for normally urging tongue **118** into engagement with ratchet stop **92**.

Push rod **116** extends perpendicularly from vertical arm **111** mounted on one end of rotatable shaft **113** horizontally mounted between frames **104** and **106**. The opposite end of said shaft is provided with rigidly attached lever arm **115** having a free end projecting vertically downward to a position adjacent post **48** extending horizontally from control plate **20** (see FIG. **3**).

As seen in FIGS. **1** and **2**, the four rectangular vertically arranged push buttons **26** extend from the within-mounted electrical switch **28** through respective openings in front wall **12** and project outwardly a short distance, being accessible only when lever **114** is pulled down. Electrical switch **28**, being of known construction, contains internal interlocking mechanisms permitting only one button **26** to be depressed at a time for connecting a given transmission mode with generator **32**. Depression of a second button results in return of the first button to its normal extended, open position. Included in electrical switch **28** is a rack **121** connected to each button **26** and to return cam **122**, said rack being slideably supported by eight pins **124** respectively received in vertical extending slots **125** provided in the wall of said electrical switch. Return cam **122** is pivotally mounted on bracket **126** projecting downwardly from electrical switch **28** and extends rearwardly and inwardly from front wall **12** to engage clutch pin **41**. Rotary movement of clutch pin **41** is translated by return cam **122** into vertical movement of rack **121**, and upward movement of said rack displaces an inwardly depressed button **26** outwardly.

Enclosure **10** is pivotally mounted on pins **128** extending from the bottom of rear wall **129** (see FIG. **2**) and is secured by stud **130** to the upper portion of the rear wall **129**. Lock **131** is provided on the front end of stud **130** to lock enclosure **10** in fixed relation with rear wall **129** and prevent tampering with the components contained within said enclosure.

To operate the signalling system of the invention, handle **22** is manually grasped and lever **14** is manually swung downward through an arc of 90° against lever stop **24** to rotate drive shaft **18**, reset crank **62** and control plate **20** in a clockwise direction as viewed in FIGS. **3**, **6**, **7** and **8**. As control plate **20** rotates, clutch pin **41**, riding in recess **40** is engaged by shoulder **43** causing drive gear **36** to rotate in a clockwise direction (see FIG. **6**). Rotation of drive gear **36** drives the input gear train (consisting of pinion **70**, gear **71**, pinion **72**, gear **73** and pinion **74**) to wind coil spring **34** and moves reset post **58** downwardly, causing the free end of reset arm **60** to rotate in a clockwise direction, thereby displacing links **97**, **98** and **99** (seen in FIGS. **6**, **7** and **8**). Roller **108**, being urged by link **99** into engagement with the lower edge of lock **100**, causes catch **110** to be raised along sloping surface **112** (see especially FIG. **6**).

As coil spring **34** is wound by the input gear train, generator **32** is held stationary by the engagement of ratchet stop **92** by tongue **118**, ratchet stop **92** being firmly pressed against shaft **90** by slip clutch **94**. Reverse rotation of generator **32** is prevented by clutch **87** which engages shaft **86** only when driven in a clockwise direction by coil spring **34**. The output gear train (consisting of gear **78**, pinion **80**, clutch **87**, shaft **86**, gear **82** and generator drive gear **83**), being locked by ratchet stop **92**, prevents coil spring **34** from unwinding.

As lever **14** is pulled down, the internal piston **64** of dash pot **65**, being connected by cable **63** to reset crank **62**, is displaced downward to compress spring **66**. While lever **14** is held against stop **19**, one of the pushbuttons **26** may be selectively depressed to close a contact (not shown) in electric switch **28** connecting a predetermined transmission mode (e.g., "Tow") with generator **32** held immobile by stop lever **114**. If desired, the selected transmission mode may be changed while lever **14** is held down and away from front wall **12** by depressing a second button **26** to connect a second transmission mode (e.g., "Police") with generator **32** and at the same time disconnecting the first selected mode by displacing said first button outwardly by interlocking means not shown. Upon manual release, lever **14** is automatically returned to the normally upright position due to the force of spring **66**, being damped by dash pot **65**, acting on reset crank **62** to rotate shaft **18** in a counterclockwise direction.

As control plate **20** is rotated by shaft **18**, drive gear **36** remains stationary being connected to the input gear train, locking bar **46** rides along circumferential edge **38** until tip **45** is received by notch **50** and post **48** rotates lever arm **115**.

Displacement of lever arm **115** causes push rod **116** to strike stop lever **114** urging tongue **118** out of engagement with ratchet stop **92**, permitting catch **110** to drop over the edge of sloping surface **112**, thereby locking stop lever out of engagement with ratchet stop **92**. Engagement of locking bar **46** by notch **50** prevents clockwise rotation of shaft **18** and thus locks lever **14** in the upright position overlying pushbuttons **26** preventing access thereto. Upon the release of ratchet stop **92**, coil spring **34** is free to drive the output gear train (gear **78**, pinion **80**, clutch **87**, shaft **86**, gear **82** and generator drive gear **83**) causing generator **32** to spin for a period of three to twenty seconds to energize the mode of transmitter **30** connected to the electric switch **128** closed by the selected button **26**. Drive gear **36** is now free to rotate about shaft **18** in a counterclockwise direction through an arc of 90° responsive to operation of the output gear train because shoulder **43** is arcuately spaced from clutch pin **41** by approximately 90° due to relative displacement of control plate **20**.

As drive gear **36** is driven in a counterclockwise direction by coil spring **34** during the unwinding driving cycle, reset post **58** is arcuately moved to the position shown in FIG. **8** to displace link **97** downward, rotating links **98, 99**, driving roller **108** into engagement with lock **100** to raise catch **110**. As catch **110** is raised, stop lever **114** is released, being urged by spring **119** to move tongue **118** into engagement with stop ratchet **92**, even as generator **32** continues to turn, with slip clutch **94** permitting some rotation of shaft **90** relative to stop ratchet **92**. At the completion of the unwinding cycle, drive gear **36** urges pin **56** against locking bar **46** to disengage tip **45** from notch **50**, thereby unlocking lever **14**, permitting repeated operation of the signalling system (see FIG. **8**).

Other embodiments will occur to those skilled in the art and are within the following claims.

What is claimed is:

1. In a remote electrical signalling system comprising an enclosure having a vertical wall, a transmitter having a plurality of selectable transmission modes mounted within said enclosure, and an electromechanical generator for energizing the transmitter also mounted within said enclosure,

that improvement which consists of:

manually operable means for operating said generator to energize said transmitter for transmission of a signal, including

manual operating lever means normally in a first position overlying a portion of said enclosure wall with its lower end pivoted adjacent the bottom of said wall with its lower end pivoted adjacent the bottom of said wall and with its free upper end having a handle, said lever means being manually swingable downwardly and away from said front wall throughout an arcuate path to a second position exposing said wall,

lever operated actuating means connected between said lever means and said generator actuating operation of said generator only upon return of said lever means from said second position to said normal first overlying position, and

selecting means having a plurality of push buttons mounted on said wall behind said lever means for exposure by said downward arcuate movement of said lever means,

each button being connected by said selecting means to said transmitter to select one of said transmission modes, indicated by indicia provided adjacent said buttons, upon actuation of one of said buttons, and

said selecting means being changeable to select a different one of said transmission modes by actuation of a second one of said buttons, but only prior to return of said lever means to said first overlying position, and the consequent actuation of the operation of said generator by said actuating means and the energization of said transmitter for transmission of a signal according to the transmission modes selected upon actuation of one of said buttons.

2. A signalling system as claimed in claim **1** wherein locking means are provided for cooperation with said manually operable means to prevent, after return of said lever means to said first position and actuation of the operation of said generator by said actuating means, operation of said manual winding lever and selection of a second transmission mode until a first selected signal has been completely transmitted.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,633,106 Dated January 4, 1972

Inventor(s) John George Willis

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

In the Heading, "Wilmington, Del." should be --Wilmington, Mass.--;

Column 3, lines 33 and 34, delete "is included in an input gear train for";

Column 3, line 71, after "end" insert --of--;

Column 6, claim 1, lines 17 and 18, delete "with its lower end pivoted adjacent the bottom of said wall".

Signed and sealed this 8th day of August 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

ORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334

UNITED STATES PATENT OFFICE
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FORM PO-1050 (10-69)

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