United States Patent

[11] 3,621,398

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[54] **EMERGENCY TRANSMITTER POWER SUPPLY**
7 Claims, 10 Drawing Figs.

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

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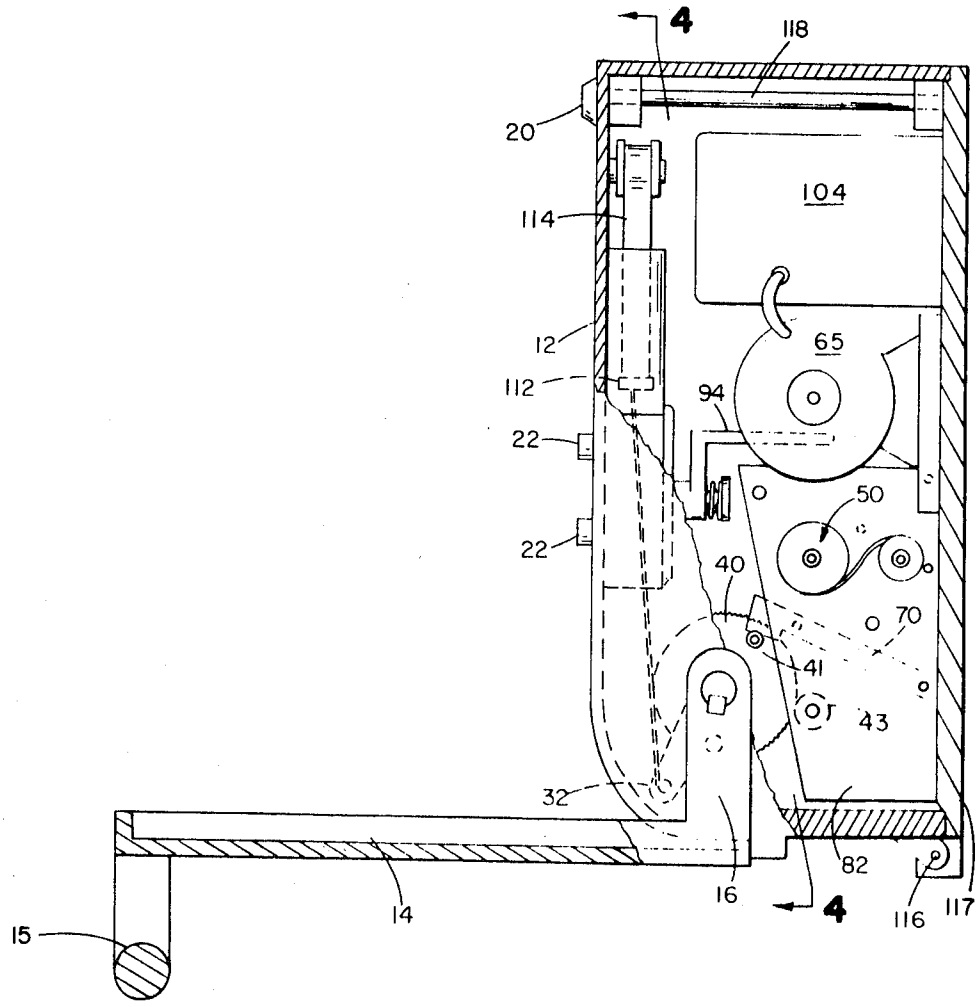
Primary Examiner—Benedict V. Safourek
Attorney—Martin Kirkpatrick

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 selecting a predetermined one of the transmission modes and 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. The manually operable means also includes manual actuating means having a plurality of pushbuttons 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 both to the transmitter to select one of the transmission modes as indicated by indicia on the buttons, and also to the spring and generator for initiating driving of the generator upon actuation of the selected button to transmit the selected transmission mode.



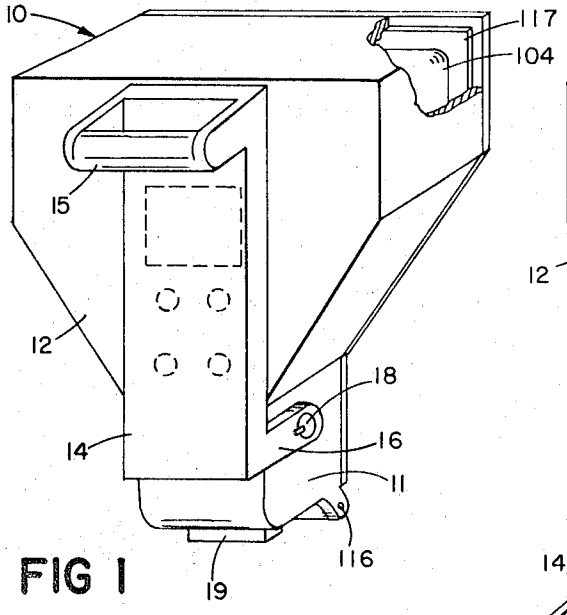


FIG 1

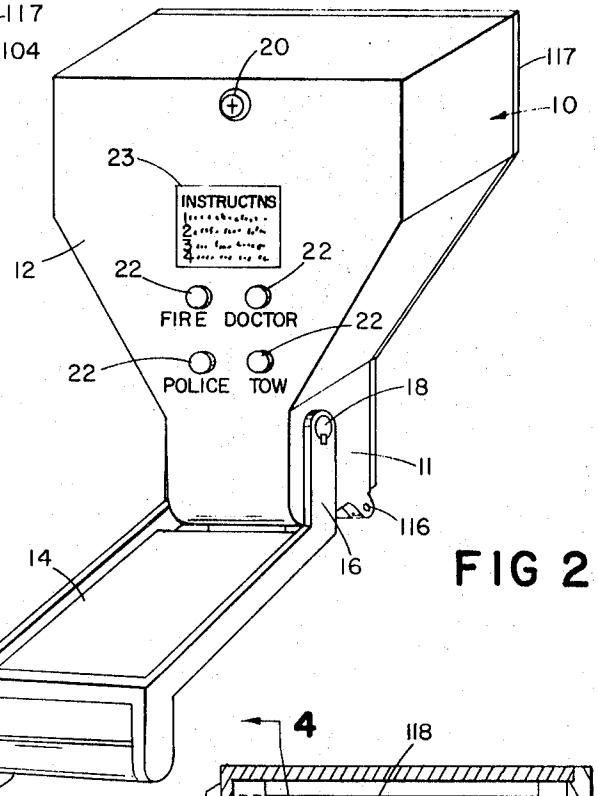


FIG 2

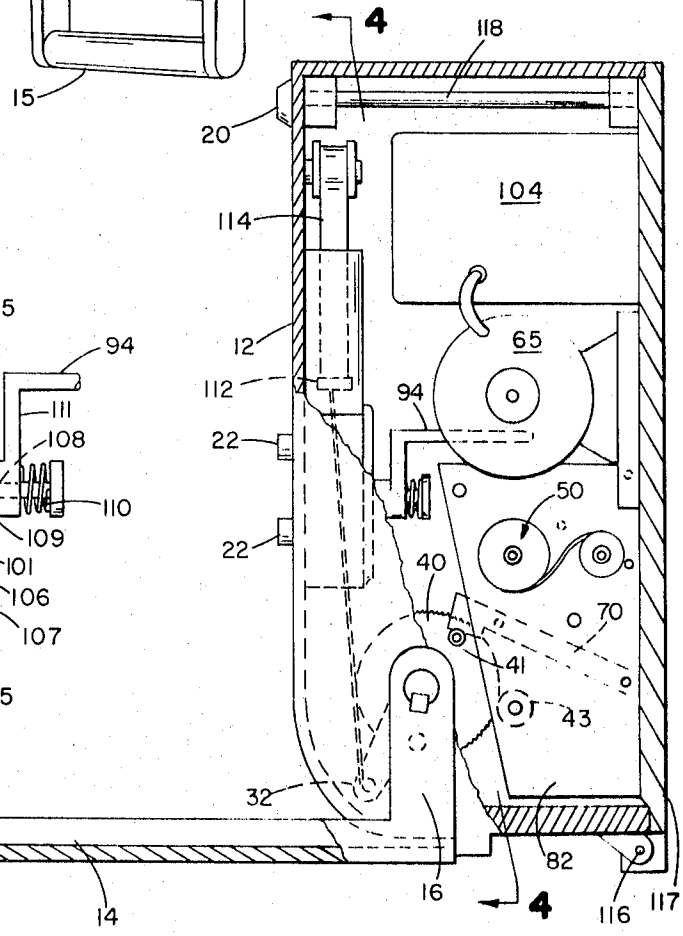


FIG 3a

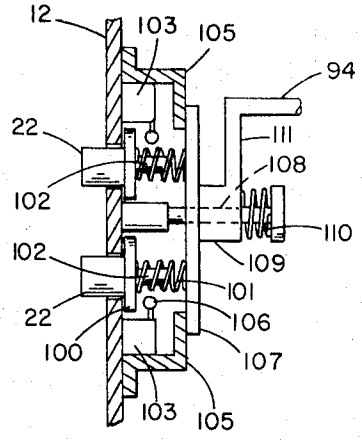


FIG 3b

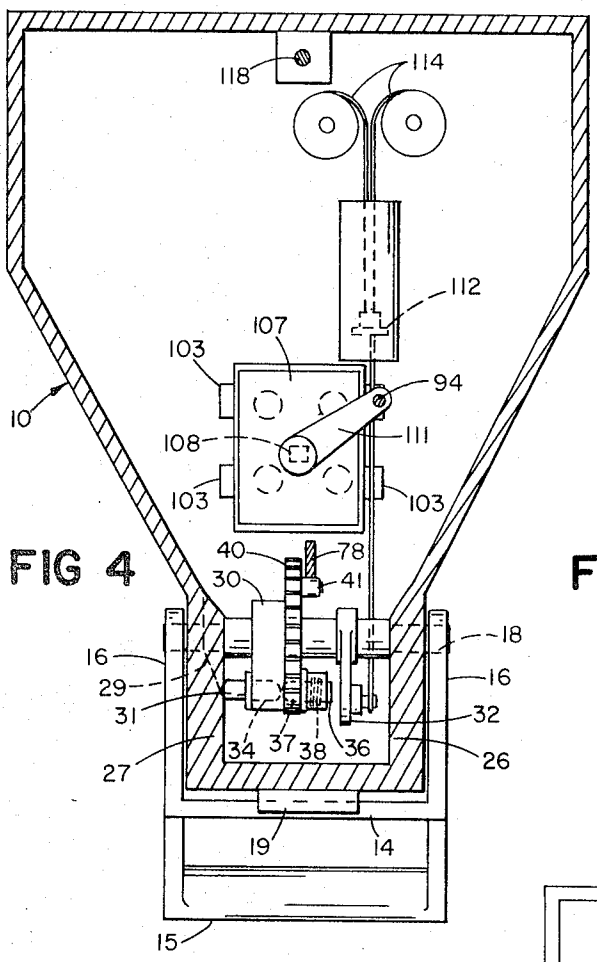


FIG 4

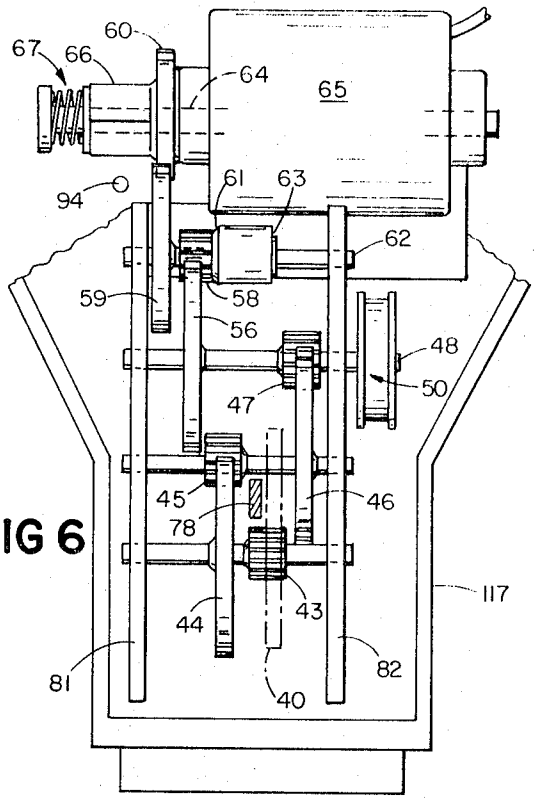


FIG 6

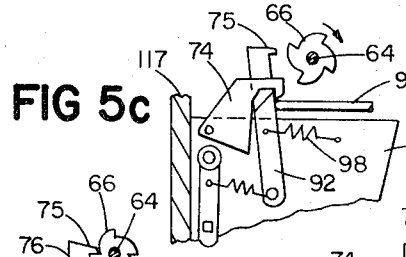


FIG 5c

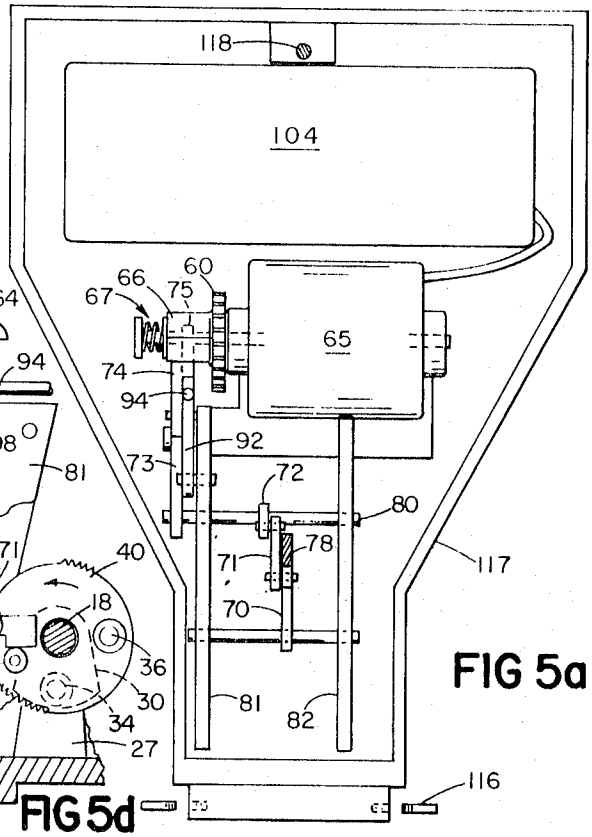


FIG 5a

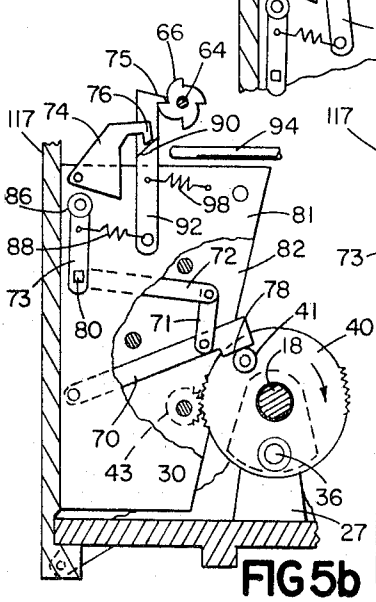


FIG 5b

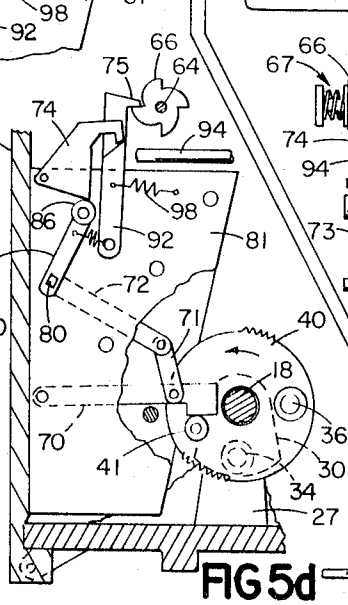


FIG 5d

EMERGENCY TRANSMITTER POWER SUPPLY

This invention relates to signalling systems and more particularly to manually powered electrical signalling systems especially useful 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.

Accordingly, it is a major object of the present invention to provide such a signalling system.

It is another object of the invention to provide a signalling system manually operable by pulling a lever in a manner similar to that used in operating a fire alarm box.

It is still another object of the invention to provide a signalling system in which one of several emergency services available may be selected as desired.

Yet another object is to provide a weatherproof and tamperproof enclosure for such a signalling system.

These and other objects of the invention are uniquely accomplished by providing a remote electrical signalling system comprising an enclosure having a vertical wall with an electrical transmitter, preferably a radio having a plurality of selectable transmission codes, and an electromechanical generator for energizing it, both mounted within the enclosure. Manually operable means are provided for operating said generator to energize said transmitter for a substantial period of time including spring means for driving said generator and a manual winding lever normally overlying a portion of said enclosure wall and preferably 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 pivoted on a horizontal shaft spaced behind and adjacent the bottom of said front wall, said shaft being connected to said drive means and said reset means, with said lever being normally urged by said spring means into its normal position overlying said front wall. Said lever is manually swingable downwardly and away from said front wall throughout an arcuate path of no more than about 180° and preferably of about 90° generally perpendicular to said front wall. Suitable drive means are connected between said lever and said spring for winding of said spring by the downward arcuate movement of the lever. Reset means may be connected to said lever for automatically returning it to its normal position.

Manual actuating means, preferably in the form of a plurality of pushbuttons for selectively operating said transmission modes, are mounted on the enclosure wall behind and normally concealed by the overlying winding lever for exposure by its downward arcuate movement, each said button being connected to said transmitter means to select at least one of said transmission modes indicated by indicia on said buttons and being connected to said spring and said generator for initiating driving of said generator by said spring upon actuation of one of said buttons to transmit said transmission mode selected thereby.

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 in normal position;

FIG. 2 is an isometric view of the signalling system of FIG. 1 with its operating lever pulled down;

FIG. 3*a* is a vertical sectional view of the signalling system of FIG. 1;

FIG. 3*b* is an exploded fragmentary sectional view of the pushbutton subassembly portion of FIG. 3;

FIG. 4 is a vertical section of the signalling system of FIG. 1 taken along line 4—4 of FIG. 3*a*;

FIG. 5*a* is a partial sectional view of the signalling system of FIG. 1 showing the reset linkage assembly and the generator;

FIGS. 5*b*, 5*c* and 5*d* are exploded fragmentary sectional views of the reset linkage assembly showing progressive steps in its operation; and

FIG. 6 is a fragmentary sectional view of the gear train and generator elements of the system.

Referring to the drawings, and especially 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 and mounted on pivot shaft **18**. Lever **14** has, at its upper free end, a prominent handle **15** 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 its pivot shaft **18** to its open position against stop **19** to expose a cylinder lock **20**, and instruction plate **23** and a plurality of pushbuttons **22** mounted on front wall **12**, each button bearing indicia of a separate emergency service, such as FIRE, DOCTOR, POLICE, TOW. Enclosure **10** contains a suitable radio transmitter **104**, of a type well known in the art, having a plurality of transmission modes corresponding to the desired emergency service or services selectable by said pushbuttons disclosed in U.S. Pat. No. 3,441,858, for example. Electrical power is supplied to said transmitter by an electromechanical generator **65** driven by a spring **50**, both mounted within enclosure **10**, said spring being wound for each transmission by pulling down operating lever **14** which also acts as a winding lever. Actual initiation of the transmission is accomplished by depressing one or more of the pushbuttons **22**, to alert the appropriate emergency service through suitable radio receiving equipment. Release of handle **15** automatically resets the entire system. Thus, actuation of one or more of said buttons not only selects the desired transmission mode or modes, but also initiates operation of the radio or other transmitter within enclosure **10** followed by a resetting operation, all as hereinafter more fully explained.

More specifically, and referring now to FIG. 3*a* and FIG. 4, arms **16** of operating lever **14** are secured to the opposite ends of pivot shaft **18** which is in turn supported on mounts **26** and **27**. Mount **27** is provided for reasons hereinafter explained, with an inward facing cam surface **29** sloping downwardly and inwardly toward mount **26** at approximately 60° to the plane perpendicular to the axis of shaft **18**. A clutch quadrant **30** is mounted on shaft **18** and is provided with pin **31** having a rounded tip slideably received in bore **34** in said quadrant, said bore being parallel to and spaced radially outward from shaft **18**. Drive gear **40** is rotatably mounted adjacent clutch quadrant **30** on shaft **18** with a sliding fit permitting axial movement relative to said shaft and contains a clutch pin **36** of diameter equal to pin **31**, also provided with a rounded tip, slideably received in bore **37** in said gear drive. Spring **38** constantly urges clutch pin **36** toward clutch disc **30**.

With lever **14** in its normally upright position, clutch pin **36** is in alignment with bore **34** (FIG. 5*b*) and, due to the force of spring **38**, extends into bore **34** to lock clutch quadrant **30** and drive gear **40** together and urge clutch pin **31** into engagement with cam surface **29**. A reset crank **32** is securely keyed to shaft **18** and disposed axially between drive gear **40** and mount **26**. Drive gear **40** (FIG. 5*b*) is also provided with reset roller **41** positioned radially outward from shaft **18**, extending toward mount **26** and spaced from clutch pin **36** by an arc of approximately 100°.

The input gear train, as best shown in FIG. 6, consists of drive gear 40, pinion 43, gear 44, pinion 45, gear 46 and pinion 47. Mounted on shaft 48 is coil spring 50 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 operating and winding lever 14 and for furnishing constant force to the output gear train for rotation of the generator 65.

The output gear train, as also shown in FIG. 6, consists of gear 56, pinion 58, gear 59 and generator drive gear 60. Pinion 58 is affixed to sleeve 61 slideably received by shaft 62, the sleeve inner diameter being greater than the shaft outer diameter. Sleeve 61 is attached to shaft 62 by clutch 63 constructed to impart rotational movement to shaft 62 in one direction only.

Drive shaft 64 of generator 65 projects horizontally outward slideably to receive generator drive gear 60 and ratchet stop 66 (see FIG. 5*a*). Slip clutch 67 is attached to the distal end of the shaft 64 frictionally to maintain ratchet stop 66 and generator drive gear 60 in engagement with drive shaft 64. The compressive force exerted by slip clutch 67 is designed to permit rotation of shaft 64 and generator 65 relative to gear 60 only when tongue 75 engages ratchet stop 66 while generator 65 is rotating.

The stop and reset linkage seen in FIGS. 5*b*, 5*c* and 5*d* is comprised of a series of pivotally mounted interconnected links 71, 72 and 73 for rotating lock 74. Reset arm 70, pivotally connected at one end to a shaft. extends toward front wall 12 in a plane parallel to and adjacent gear drive 40 with the free end formed to provide a cam surface 78 for engaging reset roller 41 throughout approximately 90° of rotation of gear drive 40 (see FIGS. 5*b* and 5*d*). One end of link 71 is pivotally secured to reset arm 70 adjacent cam surface 78, the other end being pivotally fastened to one end of link 72. The opposite end of link 72 is securely fastened to horizontal shaft 80 at a point equidistant from walls 81 and 82. Link 73, being securely fastened at one end of shaft 80 projecting outwardly through wall 81, extends upwardly in a vertical plane spaced from the plane of link 72 to engage the lower edge of lock 74 with roller 86. Spring 88, connected at the midsection of link 73, is attached to a shaft to urge roller 86 toward lock 74. Lock 74, pivotally mounted on a shaft, is provided with a catch 76 extending horizontally to engage sloping surface 90 of stop lever 92.

Stop lever 92 pivotally mounted at one end and disposed between lock 74 and push rod 94 has a tongue 75 at the distal free end for engagement with ratchet stop 66. Spring 98, attached to the midpoint of stop lever 92, is connected to a shaft for normally urging tongue 75 into engagement with stop ratchet 66.

As seen in FIGS. 3*a* and 3*b*, the four pushbuttons 22 extend through mounting holes in front wall 12, each provided with a shoulder 100 for limiting outward displacement, a helical spring 101 and an inward extending shaft 102 for positioning spring 101. Adjacent each button is a switch 103 connected electrically to a separate transmission circuit in transmitter 104 (see FIG 3*a*) and having an actuator 106 overlying a portion of the shoulder 100, normally spaced apart, being disposed between shoulder 100 and a plate 107. A post 108, being securely fastened at one end to the interior of front wall 12 at a central position equidistant from the four buttons 22, extends horizontally inward to slideably support plate 107, ring 109, and helical spring 110, the inner end being provided with a retaining cap. The force exerted by spring 110, acting in a horizontal direction toward front wall 12, being greater than the combined opposing forces of springs 101, holds plate 107 normally against brackets 105. Ring 109, being slideably mounted on post 108 adjacent plate 107, is provided with arm 111 extending in a vertical plane parallel to front wall 12 at approximately 45° to the plane of drive gear 40 (see especially FIG. 4). Push rod 94, one end being secured to the distal end of arm 111, extends in a horizontal plane toward generator 65 to the position adjacent stop lever 92.

As seen in FIGS. 3*a* and 4, reset crank 32, mounted on shaft 18, is connected by a cable to dash pot 112. The dash pot in turn is connected to coil spring 114.

Enclosure 10 is pivotally mounted on pins 116 extending from the bottom of rear wall 117 (see FIG. 3*a*) and is secured by stud 118 to the upper portion of the rear wall 117. Lock 20 is provided on the front end of stud 118 to lock enclosure 10 in fixed relation with rear wall 117 and prevent tampering with the components contained within said enclosure.

To operate the signalling system of the invention, by grasping its handle 15, lever 14 is manually swung downward through an arc of 90° against lever stop 19 to rotate shaft 18, clutch disc 30 and reset crank 32. Drive gear 40, being locked to clutch quadrant 30 by clutch pin 36 engaging bore 34, rotates counter clockwise until pin 31, riding on cam surface 29, forces clutch pin 36 out of engagement with bore 34, thereby disengaging drive gear 40. Upon disengagement from clutch quadrant 30, drive gear 40 is free to rotate relative to shaft 18. Rotation of drive gear 40 drives the input gear train (consisting of pinion 43, gear 44, pinion 45, gear 46 and pinion 47) to wind coil spring 50 and moves reset roller 41, causing the free end of reset arm 70 to rotate in a clockwise direction, thereby displacing links 71, 72 and 73 (seen in FIGS. 5*a* and 5*c*). Roller 86, being urged by link 73 into engagement with the lower edge of lock 74, causes catch 76 to be raised along sloping surface 90 (see especially FIG. 5*c*).

As coil spring 50 is wound by the input gear train, generator 65 is held stationary by the engagement of ratchet stop 66 by tongue 75, ratchet stop 66 being firmly pressed against shaft 64 by slip clutch 67. Reverse rotation of generator 65 is prevented by clutch 63 which engages shaft 62 only when driven in a clockwise direction by coil spring 50. The output gear train (consisting of gear 56, pinion 58, clutch 63, shaft 62, gear 59 and generator drive gear 60) being locked by ratchet stop 66 prevents coil spring 50 from unwinding.

As lever 14 is pulled down, the internal piston of dash pot 112, being connected by cable to reset crank 32, is displaced downward to wind coil springs 114.

By selectively depressing one of the pushbuttons 22 (see FIG. 3*b*), plate 107 and ring 109 are displaced inwardly by the respective shaft 102, and switch 103 is closed by shoulder 100. Displacement of ring 109 causes push rod 94 to strike stop lever 92 urging tongue 75 out of engagement with ratchet stop 66, permitting catch 76 to drop over the edge of sloping surface 90, thereby locking stop lever out of engagement with ratchet stop 66. Upon the release of ratchet 66, coil spring 50 is free to drive the output gear train (gear 56, pinion 58, clutch 63, shaft 62, gear 59 and generator drive gear 60) causing generator 65 to spin for a period of 3 to 20 seconds to energize the mode of transmitter 104 connected to the switch 103 closed by the selected button 22.

Upon disengagement of clutch quadrant 30 from drive gear 40, lever 14, being manually released, is automatically returned to the upright position due to the force of springs 114, being damped by dash pot 112, acting on reset crank 32 to rotate shaft 18.

As drive gear 40 is driven in a clockwise direction through an arc of 90° by coil spring 50 during the unwinding driving cycle, reset roller 41 is arcuately moved to the position shown in FIG. 5*d* to displace link 71 downward, rotating links 72 and 73, driving roller 86 into engagement with lock 74 to raise catch 76. As catch 76 is raised, stop lever 92 is released, being urged by spring 98 to move tongue 75 into engagement with stop ratchet 66, even as generator 65 continues to turn, with slip clutch 67 permitting some rotation of shaft 64 relative to stop ratchet 66. Upon the completion of the unwinding cycle, clutch pin 36 is realigned with bore 34 and engaged therein to lock drive gear 40 to clutch quadrant 30.

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

What is claimed is:

1. A remote electrical signalling system comprising

an enclosure having a vertical wall

a transmitter means mounted within said enclosure

an electromechanical generator connected to said transmitter means for energizing it mounted within said enclosure and

manually operably means for operating said generator to energize said transmitter means for a substantial period of time for transmission of a signal, including

spring means for driving said generator

manual winding lever overlying a portion of said enclosure 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 of at least about 90° generally perpendicular to said wall and

drive means connected between said lever means and said spring means for winding of said spring means by said downward movement of said lever means.

2. A signalling system as claimed in claim 1 wherein said manually operable means includes automatic reset means for said manual winding lever.

3. A signalling system as claimed in claim 1, further including

manual actuating means having a pushbutton mounted on said enclosure wall behind said overlying winding lever means for exposure by said downward movement of said lever means,

said button being connected to said spring means and said generator for initiating driving of said generator by said spring means upon actuation of said button to transmit a signal.

4. A remote electrical signalling system comprising

an enclosure having a vertical wall

transmitter means having a plurality of selectable transmission modes mounted within said enclosure

an electromechanical generator connected to said transmitter means for energizing it mounted within said enclosure and

manually operable means for selecting a predetermined one of said transmission modes and operating said generator to energize said transmitter means for a substantial period of time for transmission of said predetermined modes, including

spring means for driving said generator

manual winding means overlying a portion of said enclosure wall and having a handle, said handle being manually movable relatively to said enclosure wall

drive means connected between said winding means and said spring means for winding of said spring means by movement of said winding means and

manual actuating means having a plurality of pushbuttons mounted on said enclosure wall,

each said button being connected to said transmitter means to select one of said transmission modes indicated by indicia on said buttons and being connected to said spring means and said generator for initiating driving of said generator by said spring means upon actuation of one of said buttons to transmit said transmission mode selected thereby.

5. A signalling system as claimed in claim 4 wherein said manual actuating means pushbuttons are mounted behind and concealed by said winding means for exposure upon winding movement of said handle.

6. A remote wireless electrical signalling system comprising

an enclosure having a vertical wall

a radio transmitter means having a plurality of selectable transmission modes mounted within said enclosure

an electromechanical generator connected to said transmitter means for energizing it mounted within said enclosure and

manually operable means for selecting a predetermined one of said transmission modes and operating said generator to energize said transmitter means for a substantial period of time for transmission of said one mode, including

multiturn spring means for driving said generator

a manual winding lever normally overlying a portion of said enclosure wall and extending vertically thereacross with its lower end pivoted adjacent the bottom of said wall and with its free upper end having a handle, said lever being manually swingable downwardly and away from said wall throughout an arcuate path of about at least 90° generally perpendicular to said wall

reset means connected to said lever for automatically returning said lever to its normal position

drive means connected between said lever and said spring for multiturn winding of said spring means by said downward movement of said lever

manual actuating means having a plurality of pushbuttons mounted on said enclosure wall behind and concealed by said overlying winding lever for exposure by said arcuate movement of said lever,

each said button being connected to said transmitter means to select one of said transmission modes indicated by indicia on said buttons and being connected to said spring means and said generator for initiating driving of said generator by said spring means upon actuation of one of said buttons to transmit said transmission mode selected thereby.

7. A signalling system as claimed in claim 6 wherein

said manual winding lever is pivoted on a horizontal shaft spaced behind and adjacent the bottom of said front wall, said shaft being connected to said drive means and said reset means, with said lever being normally urged by said spring means into its normal position overlying said front wall.

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