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W. P. GRAY

2,932,732

SIGNAL TRANSMITTER FOR EMERGENCY PURPOSES

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2 Sheets-Sheet 1

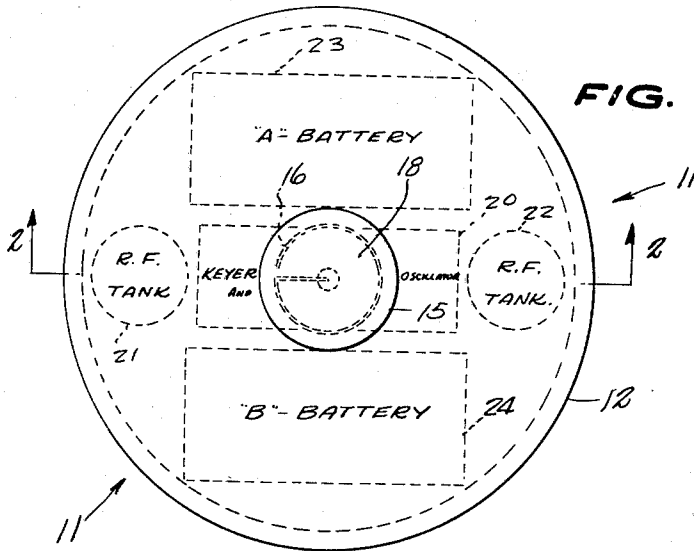


FIG. 1.

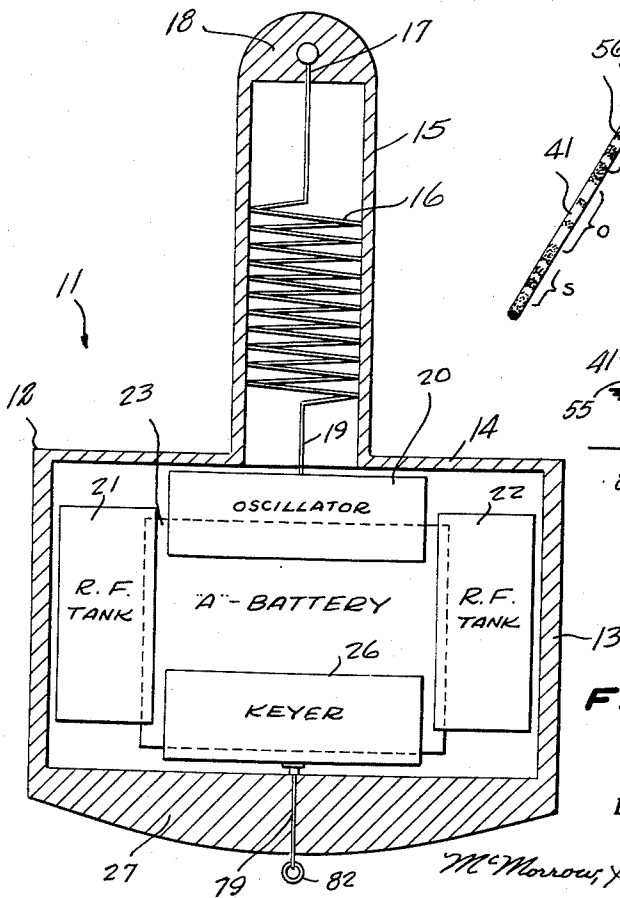


FIG. 2.

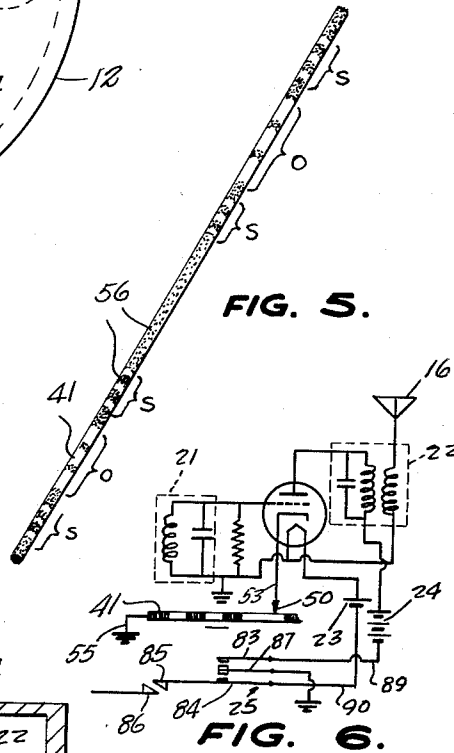


FIG. 5.

FIG. 6.

INVENTOR.
WILLIAM P. GRAY,

BY

McMorrow, Berman & Davidson
ATTORNEYS.

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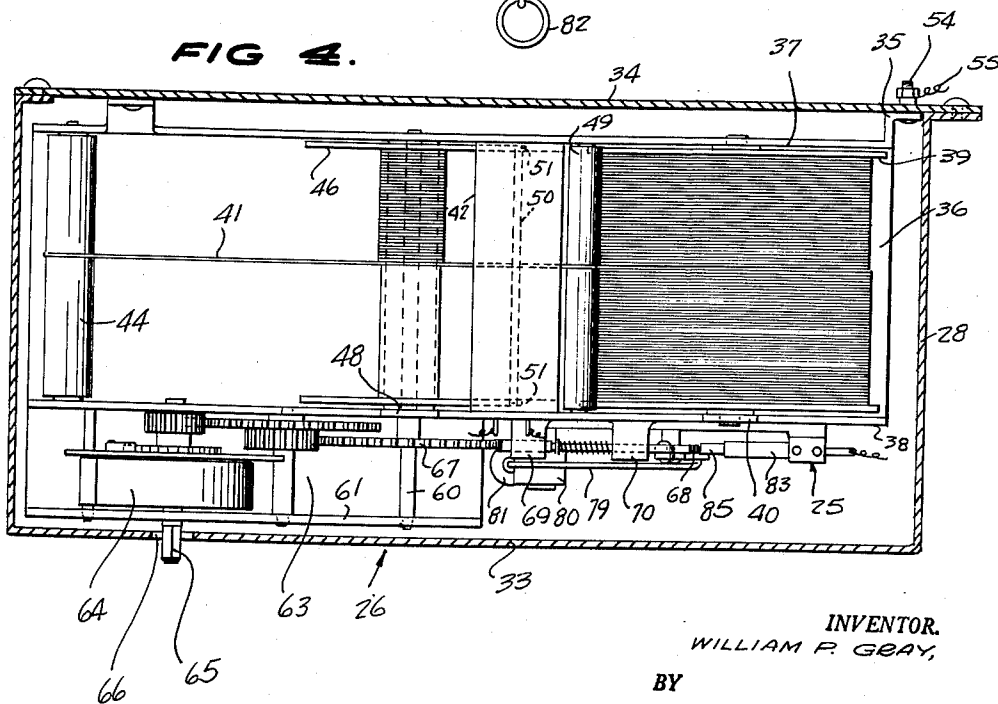
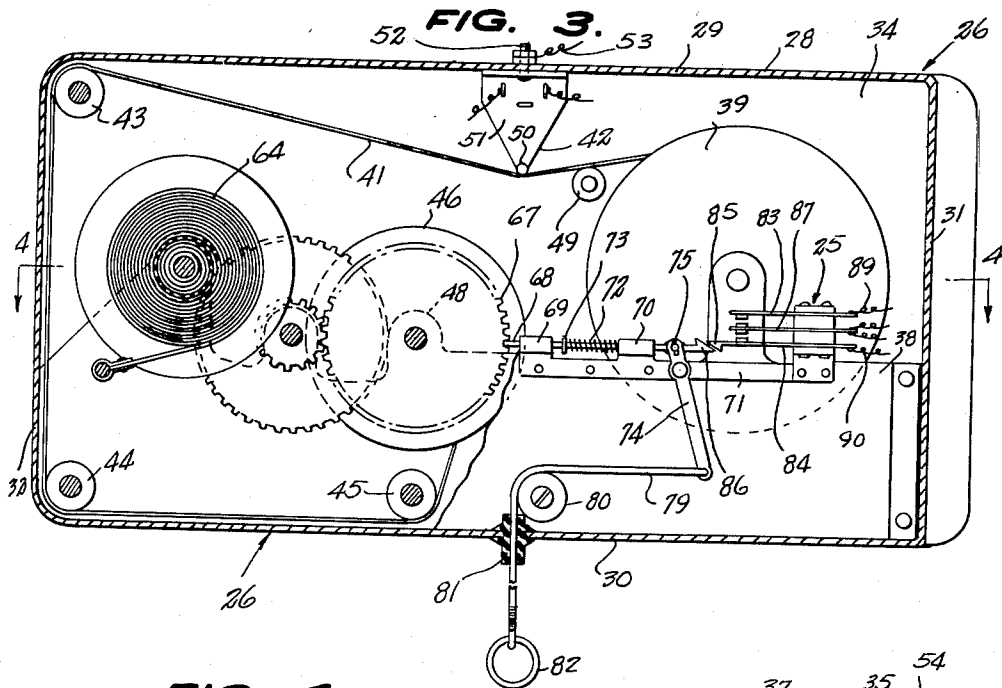
W. P. GRAY

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INVENTOR.
WILLIAM P. GRAY,

BY

McMorrow, Berman & Davidson
ATTORNEYS.

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SIGNAL TRANSMITTER FOR EMERGENCY PURPOSES

William P. Gray, North Miami Beach, Fla.

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3 Claims. (Cl. 250—17)

This invention relates to emergency radio apparatus, and more particularly to an emergency radio transmitter of the buoyant type for use in case of shipwreck or other emergency at sea.

A main object of the invention is to provide a novel and improved emergency radio transmitter for use by small craft or by airplane personnel when forced down at sea, the apparatus being simple in construction, being easy to activate, and serving as a floating marker to guide rescue personnel to the location of the shipwreck or other emergency involved.

A further object of the invention is to provide an improved emergency radio signal transmitter for use at sea, said transmitter being inexpensive to manufacture, being rugged in construction, and providing a distinctive radio signal which serves to notify rescue personnel of the location of the shipwreck or other emergency and to assist such rescue personnel in locating the persons in distress.

A still further object of the invention is to provide an improved emergency radio transmitter of the floating type for use in guiding rescue personnel towards the scene of a shipwreck or other sea disaster, the transmitter being relatively compact in size, being placed in operation by a simple procedure, and providing an automatic, coded distress signal which gives an unmistakable distress signal and which serves as a marker for aiding rescue operations.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top view of an emergency radio transmitter constructed in accordance with the present invention.

Figure 2 is a vertical cross sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged vertical cross sectional view taken longitudinally through the keying device employed in the emergency radio transmitter shown in Figures 1 and 2.

Figure 4 is a horizontal cross sectional view taken on the line 4—4 of Figure 3.

Figure 5 is an enlarged fragmentary perspective view of a portion of the flexible coding wire employed in the keyer of Figures 3 and 4 to key the radio transmitter.

Figure 6 is a schematic electrical wiring diagram showing the electrical circuit of the oscillator employed in the emergency radio transmitter of Figures 1 and 2, and illustrating the manner in which the keying conductor and the switch means are electrically connected thereto.

Referring to the drawings, the improved emergency radio transmitter is designated generally at 11 and comprises a watertight buoyant housing 12 of suitable, relatively, light rigid material, preferably insulating material, such as plastic, or the like. The body 12 is formed with the main housing portion 13 which may be of any suitable shape, for example, which may be of cylindrical shape, as illustrated, the top wall 14 of said main

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housing portion being formed centrally with an upstanding vertical tubular extension 15 closed at its top end and containing the antenna 16. Said antenna comprises a plurality of turns of suitable wire having its top end, shown at 17, rigidly secured in the top wall 18 of the upstanding tubular member 15, thus supporting the antenna in a vertical position, the lower end of said antenna, shown at 19, being connected to the output of a conventional radio oscillator 20 so that the output energy from the oscillator is furnished to the antenna for emission therefrom.

Associated with the oscillator and determining the frequency thereof are the radio frequency tank elements 21 and 22 which are connected in the circuit of the transmitter to govern the oscillator frequency in a well known manner. The tank units 21 and 22 may comprise parallel connected inductances and capacitances, well known in the art and the details of the oscillator and the tank elements 21 and 22 form no part of the present invention, being entirely conventional.

The oscillator 20, and the tank elements 21 and 22 are mounted in any suitable manner in the main portion 13 of housing 12, and also mounted in any suitable manner in said housing portion 13 are the respective batteries 23 and 24 which are suitably connected to the oscillator 20 to energize same. The battery 23 comprises a low voltage battery to energize the filament of the vacuum tube employed in the oscillator and the battery 24 is of higher voltage to supply plate current and other potential, as required, to the oscillator 20.

The circuits connecting the batteries 23 and 24 to the oscillator 20 are normally open, being controlled by a switch unit 25 (Figure 3) mounted in and forming part of the keying unit 26, shown in Figure 2 as being suitably mounted in the housing portion 13 adjacent the bottom wall 27 thereof.

The keying unit 26 comprises a generally rectangular housing 28, shown in Figures 3 and 4 having the top wall 29, the bottom wall 30, the end walls 31 and 32, and the side walls 33 and 34, the side wall 34 being detachably secured so that the remainder of the housing may be attached thereto during the assembly of the keyer unit. Secured to the side wall 34 is a bracket member 35 comprising the main plate-like portion 36 and the longitudinally extending parallel flange portions 37 and 38. Designated at 39 is a reel which is journaled horizontally in the flange 37 and an upstanding lug 40 formed on the opposing flange 38. Wound on the reel 39 is the flexible coding wire 41, presently to be described. The wire 41 extends beneath and slidably engages a conductive lug member 42 secured to and depending from the top wall 29, said wire passing around a pulley 43 journaled in the upper left corner of the housing 28, as viewed in Figure 3, and then around another pulley 44 journaled in the lower left corner of the housing. The flexible coding wire 41 passes beneath a guide pulley 45 and then onto a take-up reel 46 journaled between flange 37 and an upstanding bearing lug 48 formed on the opposing flange 38.

The respective pulleys 43, 44 and 45 are preferably in the form of cylindrical rollers so that the flexible wire 41 may move transversely as it uncoils from the supply reel 39 and winds up on the take-up reel 46.

As shown in Figure 3, a transversely extending guide roller 49 is provided between the contact member 42 and the reel 39, the guide roller 49 being of sufficient height to insure that the flexible coding wire 41 positively engages the transversely extending contact bar element 50 of the contact member 42 at all times.

The contact member 42 is preferably made of suitable conductive material, such as metal, and comprises a generally U-shaped body having the depending flanges 51

between the lower ends of which the conductive rod element 50 is connected. The contact member 42 is secured to the wall 29 by a plurality of suitable fastening elements, for example, by bolts, including a terminal bolt 52 to which is connected a wire 53, as shown in Figure 3.

The side wall 34 is preferably made of insulating material, and the bracket member 35 is of conductive material, being fastened to the wall 34 by fastening bolts, including a terminal bolt 54 to which is connected a wire 55. The wires 53 and 55 are connected in the cathode circuit of the oscillator 20 so that the oscillator will operate only when the wires 53 and 55 are connected together. The flexible coding wire 41 comprises conventional copper wire or other suitable conductive wire which is sprayed at spaced points therealong with coatings of insulation 56, as shown in Figure 5, the bare portions of the wire being thus spaced in accordance with a predetermined code, for example, the conventional distress code sequence of letters of the International Morse Code, as illustrated in Figure 5. As the coding wire 41 passes along the contact rod 50, the cathode circuit of the oscillator is intermittently energized, as the bare portions of the wire engage the rod 50, completing the cathode circuit of the oscillator, and causing the oscillator to emit radio frequency energy in coded form, providing the coded signal corresponding to that on the coding wire 41.

The reel 46 has its shaft, shown at 60, projecting beyond the bearing lug 48 and journaled in a vertical flange 61 provided on the bracket member 39, the flange 61 extending parallel to the flanges 37 and 38. A clockwork mechanism, designated generally at 63, is mounted between the flanges 38 and 61, said clockwork mechanism being of conventional construction and including a main spring 64 mounted on a shaft having a squared portion 65 projecting through an aperture 66 in the side wall 33, so that the clockwork mechanism may be wound up manually by the engagement of a suitable key with the squared shaft portion 65 and the winding up of the spring 64 by the rotation of the key. Mounted on the shaft 60 is the driving gear 67, which is gearingly connected to the clockwork mechanism 63 and which is driven thereby at a substantially constant rate when released. The gear 67 is normally locked against rotation by a detent rod 68 slidably mounted in a pair of sleeve elements 69 and 70 formed on a bracket member 71 secured to the flange 38, as shown in Figure 3. The detent rod 68 is biased into locking engagement with the teeth of the gear 67 by a coiled spring 72 surrounding the rod and bearing between the sleeve member 70 and a collar 73 fixedly secured to the locking rod 68, whereby the spring 72 urges the locking rod to the left, as viewed in Figure 3.

Pivoted to the bracket 71 is a lever 74 which is pivotally connected at 75 to the right end portion of the locking rod 68, the lower end of the lever 74 having a flexible cable 79 connected thereto, as shown in Figure 3. The flexible cable 79 extends over a roller 80 journaled to the flange 38 and passes slidably and sealingly through a rubber bushing 81 secured in an aperture in the bottom wall 30 of the keyer housing 28. The flexible cable 79 extends sealingly and slidably through the bottom wall 27 of the main housing 12 and is provided at its lower end with a pull ring 82.

The switch unit 25 comprises an upper flexible arm 83 and a lower flexible arm 84, said lower flexible arm terminating in a cam-like lug element 85 which is engageable by an opposing beveled cam-like lug element 86 provided on the right end of the locking rod 68, as viewed in Figure 3. The switch unit 25 further comprises an intermediate flexible arm 87. When the locking rod 68 is moved to the right, as viewed in Figure 3, for example, when the pull ring 82 is pulled, causing the lever 74 to rotate clockwise, the lower flexible arm 84 is forced upwardly, engaging the intermediate flexible arm 87, and causing the intermediate flexible arm 87 to engage the

upper arm 83, whereby the three arms 84, 87 and 83 are connected together. The upper flexible arm 83 may be connected, for example, by a wire 89, to the negative terminal of the plate supply battery 24 and the lower flexible arm 84 may be connected, for example, by a wire 90, to the negative terminal of the filament supply battery 23. The intermediate switch arm 87 may be connected to the ground conductor or chassis of the oscillator 20. The positive battery terminals are permanently connected to the associated terminals of the oscillator, namely, respectively to the plate and filament circuits of the oscillator, whereby said circuits become completed when the switch arms 84 and 83 are connected to the intermediate switch arm 87 by the interengagement of the beveled lug 86 with the beveled lug 85, as above described, namely, when the lever 74 is rotated clockwise by the pull on the flexible cable 79. As shown, the lugs 86 and 85 are substantially triangular in shape, so that the lug 86 interlocks with the lug 85 when lever 74 has been rotated a predetermined angle clockwise, whereby the rod 68 is retained in its retracted position, and whereby the gear 67 is free to rotate under the driving force provided by the clockwork mechanism 63. Thus, when the cable 79 is pulled by means of the pull ring 82, the clockwork mechanism is free to drive the take-up reel 46 and at the same time the filament and plate circuits of the oscillator 20 are energized, whereby the transmitter emits the coded distress signal defined by the spacing of the insulating coatings 56 on the coding wire 41. The wire 41 is wound up on the take-up reel 46 at a steady rate, determined by the rate of operation of the clockwork mechanism 63, providing a similar steady rate of emission of the distress signal as the cathode circuit of the oscillator is intermittently opened and closed.

In using the device, the pull ring 82 is pulled, starting the operation of the transmitter, as above described, after which the device is thrown into the water. Since the body of the device is completely sealed and since the body is of relatively light material, the device floats in the water and continues to emit the distress signal for a substantial period of time, namely, until the spring 64 of the clockwork mechanism runs down. After throwing the distress signal device into the water, the persons involved are then free to take any necessary action required for their own safety and survival until the arrival of rescue personnel.

The insulation 56 on the coding wire 41 may be arranged in any suitable manner, for example, may be arranged to provide a coded distress signal for a given period of time and thereafter may merely connect the cathode circuit of the oscillator to provide a continuous wave signal until the batteries run down. Alternatively, the device may be arranged to provide merely a continuous wave signal from the time the device is thrown into the water until the main spring 64 runs down, or the device may omit the coding and clockwork mechanism and merely provide a continuous wave signal which is initiated by the closure of a simple switch device prior to throwing the transmitter into the water.

As will be well understood, in the device illustrated in the drawings, when the main spring 64 runs down, the transmitter will continue to operate and emit a continuous wave signal as long as the oscillator is energized by the batteries 23 and 24. Thus, the device will serve as a marker means to guide rescue personnel to the location of the shipwreck or other emergency, even though the coded distress signal is no longer being given.

As above mentioned, the device may be manufactured without the coding means, merely to provide a continuous wave signal without coding, whereby it serves as a marker of the location of the shipwreck or emergency.

While a specific embodiment of an improved emergency radio signal transmitter has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended

that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. An emergency radio transmitter comprising a hollow substantially sealed buoyant body, an upstanding antenna on said body, a radio frequency oscillator in said body, means connecting said antenna to the output of said oscillator, a source of current in said body, normally open switch means in said body, an energizing circuit including said switch means and connecting said source to said oscillator, keying means formed and arranged to pulse the oscillator in accordance with a predetermined code, clockwork mechanism in said body drivingly connected to said keying means, a detent rod slidably mounted in said body and being engageable with a portion of said clockwork mechanism to restrain operation thereof, spring means biasing said detent rod toward engagement with said portion, means on said detent rod constructed and arranged to close said switch means responsive to the retraction of said rod from said portion, interengaging latch elements on the detent rod and switch means holding said detent rod in retracted position, and a movable release member extending sealingly and slidably through a wall of said body and operatively connected to said detent rod and being constructed and arranged to retract said detent rod against the force of said spring means responsive to the retraction of said release member through said wall.

2. An emergency signalling device of the character described comprising a hollow substantially sealed buoyant body, an upstanding tubular member closed at its top end formed on said body, an antenna housed in said tubular member, a radio transmitter in said body, said transmitter comprising an oscillator having its output connected to said antenna, a source of current in the body, normally open switch means in the body, an energizing circuit including said switch means connecting said source to said oscillator, a clockwork mechanism in said body, a detent rod slidably mounted in said body and being engageable with a portion of said clockwork mechanism to restrain operation thereof, spring means biasing said detent rod toward engagement with said portion, means on said detent rod constructed and arranged to close said switch means responsive to the retraction of said rod from said portion, interengaging latch elements on the detent rod and the switch means holding the detent rod in retracted position, keying means in the oscillator circuit, said keying means comprising a reel mounted in the body and drivingly connected to said clockwork mechanism, an elongated flexible conductor secured to and adapted to be wound on said reel, a stationary contact element engaging said conductor, spaced insulating portions on said conductor, means electrically connecting said flexible conductor and stationary contact element in series with a portion of the oscillator circuit, whereby the oscillator circuit is intermittently opened by the engagement of said insulating portions with said con-

tact element responsive to the movement of the flexible conductor past said stationary contact element, and a movable release member extending slidably and sealingly through a wall of the body and being operatively connected to said detent rod and being constructed and arranged to retract said detent rod against the force of said spring means responsive to the retraction of said release member through said wall.

3. An emergency signalling device of the character described comprising a hollow substantially sealed buoyant body, an upstanding tubular member closed at its top end formed on said body, an antenna housed in said tubular member, a radio transmitter in said body, said transmitter comprising an oscillator having its output connected to said antenna, a source of current in the body, normally open switch means in the body, an energizing circuit including said switch means connecting said source to said oscillator, a clockwork mechanism in said body, a detent rod slidably mounted in said body and being engageable with a portion of said clockwork mechanism to restrain operation thereof, spring means biasing said detent rod toward engagement with said portion, means on said detent rod constructed and arranged to close said switch means responsive to the retraction of said rod from said portion, interengaging latch elements on the detent rod and switch means holding said detent rod in retracted position, keying means in the oscillator circuit, said keying means comprising a reel mounted in the body and drivingly connected to said clockwork mechanism, an elongated flexible conductor secured to and adapted to be wound on said reel, a stationary contact element engaging said conductor, spaced insulating portions on said conductor, means electrically connecting said flexible conductor and stationary contact element in series with a portion of the oscillator circuit, whereby the oscillator circuit is intermittently opened by the engagement of said insulating portions with said contact element responsive to the movement of the flexible conductor past said stationary contact element, a flexible cable extending slidably and sealingly through a wall of the body, and means in said body connected between said flexible cable and detent rod and being formed and arranged to retract said detent rod from said portion of the clockwork mechanism responsive to a pull exerted on said cable.

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