Jan. 1, 1929. 1,697,140

H. E. REEVE

SIGNALING MECHANISM

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Fig. 1.

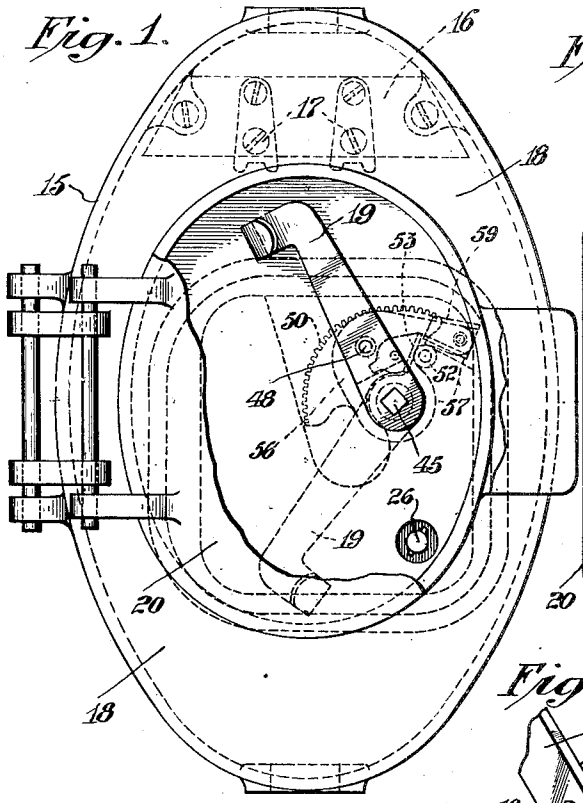


Fig. 2.

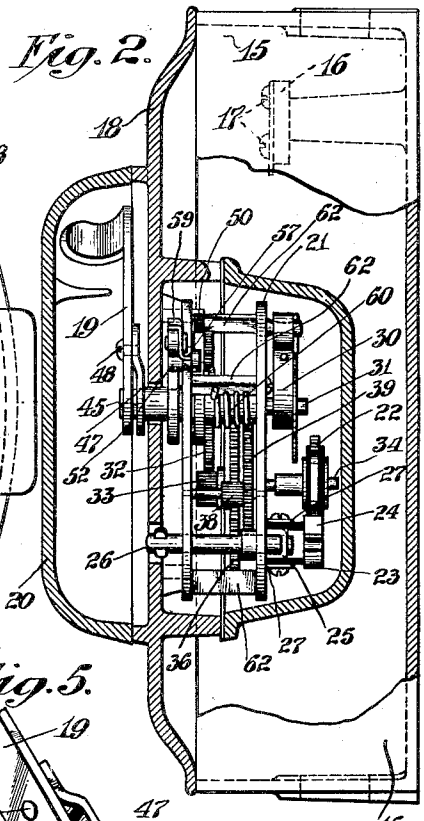


Fig. 5.

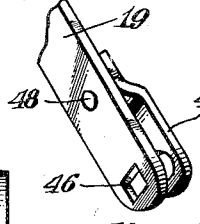


Fig. 3.

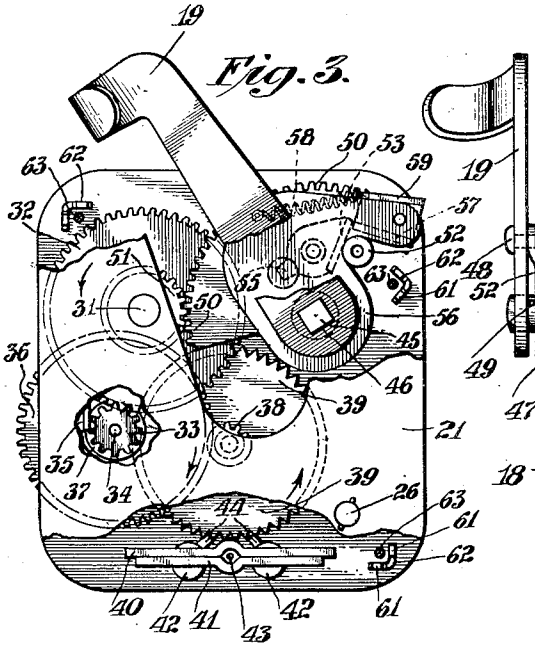


Fig. 4.

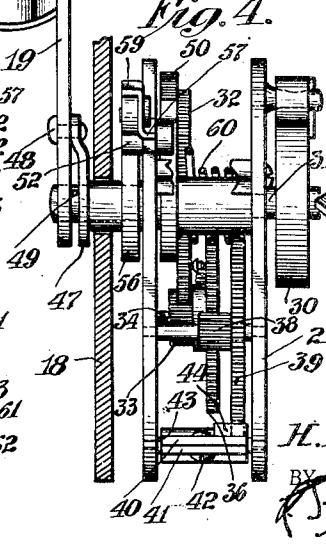
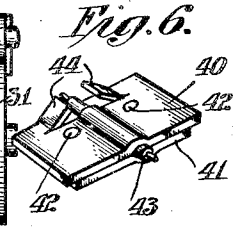


Fig. 6.



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Fig. 7.

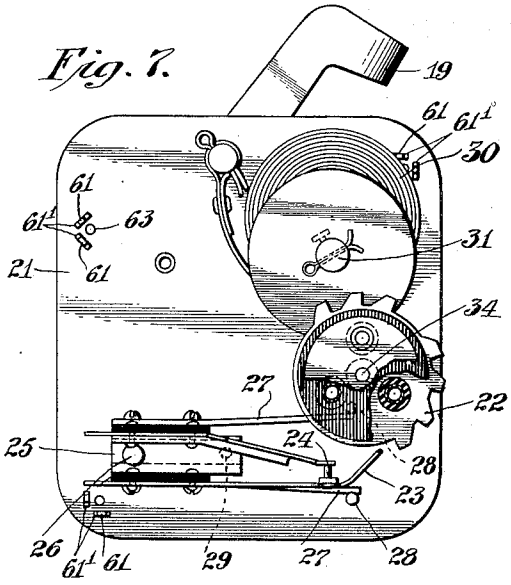


Fig. 8.

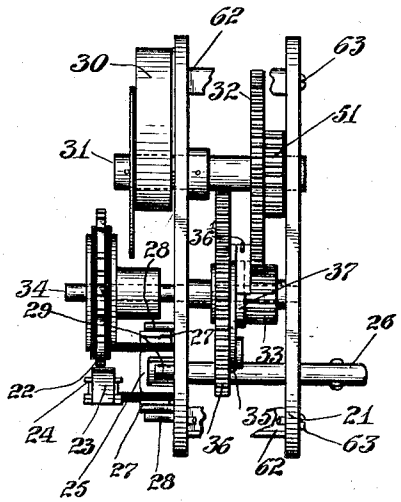


Fig. 9.

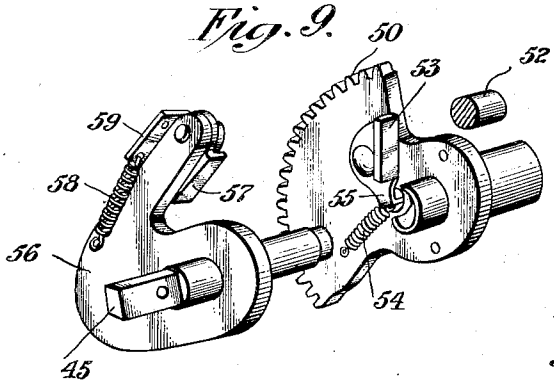


Fig. 10.

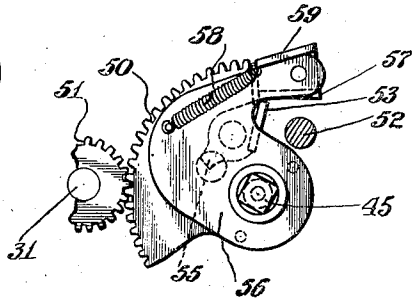


Fig. 11.

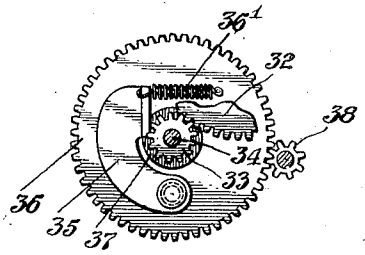


Fig. 12.

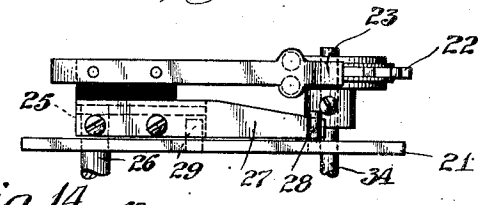


Fig. 13.

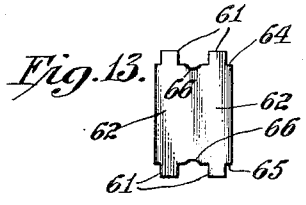
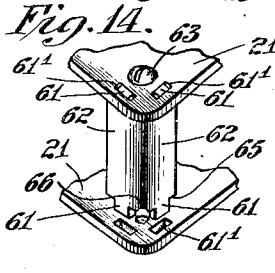


Fig. 14.



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UNITED STATES PATENT OFFICE.

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SIGNALING MECHANISM.

Application filed May 19, 1923. Serial No. 640,241.

My invention relates particularly to improvements in pull boxes for alarm systems. Among the objects of my invention are the following:

1. To provide a simple, inexpensive, and more effective means for securing the handle in place.

2. To simplify and reduce the cost of manufacture of the wigwag or escapement control member and insure against its losing connection with its fan.

3. To provide a simple, inexpensive, but very reliable form of release mechanism.

4. To provide a simple but inexpensive and reliable means for testing the signal circuit and sending special signals.

5. To simplify the wind-up ratchet mechanism so as to avoid irregular signals or accidental change in the length of signals.

A preferred solution of these various problems will be found illustrated and described hereinafter.

Figure 1 is a front view of one form of pull box embodying improvements of my invention, part of the outer cover or lid being broken away to show the operating handle or lever.

Fig. 2 is a vertical sectional view of the same.

Fig. 3 is a front view of the alarm mechanism, parts being broken away for purposes of illustration.

Fig. 4 is an edge view of the same taken from the right of Fig. 3 and showing the cover in section.

Fig. 5 is a perspective view of one end of the handle or operating arm.

Fig. 6 is a perspective view of a wigwag or escapement control member.

Fig. 7 is a rear view of the mechanism showing the signal wheel and contacts.

Fig. 8 is an edge view taken from the right of Fig. 7, or from the left of Fig. 3. It should be understood, however, that from Figs. 2, 4 and 8 some of the elements are omitted.

Fig. 9 is a perspective view of the release members with their coacting pawls.

Fig. 10 is a front view of the parts shown in Fig. 9 in the released position.

Fig. 11 is a front view of the windup ratchet and pawl.

Fig. 12 is a bottom plan view of the signal wheel and contacts.

Fig. 13 is a detail view of a blank from which one of the frame columns is formed.

Fig. 14 is a perspective view showing the frame plate connecting means.

The box 15 in the form shown is provided with means at the upper and lower ends for attaching conduits or cables for the electric conductors. The bridge-piece 16 for instance, of insulating material is suitably supported in the upper end of the box and provided with binding posts or circuit terminals 17.

The cover 18 may be hinged to the body of the box in any suitable manner and preferably supports all of the alarm mechanism including the operating handle, lever, or arm 19. An external lid 20 is also preferably provided to normally cover the handle 19 and prevent unintentional access.

The signal mechanism is all carried by a frame 21 which is suitably secured for instance to the cover 18. The signal wheel 22 has teeth or projections arranged to correspond with the signal number to be sent. Preferably this wheel 22 is so mounted as to be insulated from the rest of the mechanism. The contact members 23 and 24 (see Figs. 7 and 8) are resilient and normally in engagement in this particular construction which is of the closed circuit type. When the teeth of the signal wheel 22 engage the finger 23 the circuit is broken. The two contact fingers 23 and 24 are suitably secured to but insulated from an arm 25, which is mounted on the inner end of a shaft 26 suitably pivoted in the frame. This arm 25 also carries two spring members 27 which bear against stops 28. The member 25 may conveniently be in the form of a channel between the sides of which is mounted a stationary stop pin 29. The front end of the shaft 26 extends through the cover 18 as shown in Fig. 2 and is adapted to be engaged by a key whereby the shaft 26 may be oscillated clockwise as viewed from the front until the tip of contact 23 engages the disc 22. Continuation of this rotation causes the arm 25 to move 24 away from 23 to open the circuit when it is desired to test the circuit without rotating the signal wheel 22 or send in a special signal. By turning the shaft 26 anti-clockwise as viewed from the front the finger 23 is carried away from the signal wheel so that the mechanism can be tested without sending in any signal.

The main spring 30 which provides the power for operating the signal wheel 22 has one end secured to the frame and the other end secured to the shaft 31 on which is mounted a gear wheel 32 inside the frame. This gear 32 meshes with a pinion 33 loosely mounted on the shaft 34. The pawl 35 is pivoted to the gear 36 secured to the shaft 34 and the pawl 35 is under tension of the spring 36′ which holds it against a single toothed ratchet 37 which is integral with or secured to the pinion 33. The gear 36 meshes with the pinion 38 which is secured to the toothed escapement wheel 39. The wigwag member is preferably formed of two plates 40 and 41 secured together for instance by means of screws or rivets 42 and clamped on the shaft or spindle 43. The teeth 44 which engage the wheel 39 are formed integrally with one or both of the plates of the wigwag so as to materially reduce the cost of manufacture and also to assure the toothed portion remaining fixed to the plates.

The shaft 45 is suitably supported in the frame and is angular in form on its outer end so as to receive an operating lever or arm 19.

The lever has a hole 46 of the same angular section for the shaft. To secure the handle in place on the shaft 45 I preferably provide a member 47 which fits over the shaft and is secured to the arm 19 for instance by means of a rivet or screw 48. A pin 49 passed through the shaft 45 between the members 47 and 19 prevents the handle from coming off. The hole 46 in the lever 19 or the hole in the member 47 (or both) is shaped to fit the angular end of the shaft so that the swinging of the lever will turn the shaft.

A segmental gear 50 mounted to oscillate on the shaft 45 meshes with the gear 51 on the spring shaft 31. The power of the spring 30 is normally exerted to hold the train of gears with the member 50 pressing clockwise against the stop 52. This would of course be reversed should the pull lever work in the opposite direction.

The member 50 carries a pawl 53 which is under tension of a spring 54 which tends to throw the tip of pawl 53 into the positions shown in Figs. 9 and 10 when free from the stop 52. Just before member 50 engages the stop 52 however, the pawl 53 also engages the stop 52 and its tip is swung outwardly into the position shown in Fig. 3. The inward movement of the tip of the pawl 53 is however limited by the engagement of the tail 55 with a recess in the member 50 or by other suitable means. The shaft 45 has fixed upon it an arm 56 which carries a pawl member 57 which is normally under tension of a spring 58. A flange 59 may be provided on the pawl 57 to rest against the outer edge of the arm 56 when the parts are in the normal position of rest and the spring 58 is attached to the flange 59. Of course there may be other means of stopping the pawl. A spring 60 tends to return the shaft 45 and the operating lever 19 to the normal position of rest in which some part of this member (including lever) is brought in contact with a suitable stop preferably as shown in drawing at 52 at which time the relative positions of the pawls 53 and 57 are as shown in Fig. 3.

Instead of using ordinary studs or turned rods for holding the parts of the frame in their proper spaced relation, I prefer to use three angular columns. Each column is formed or bent from a blank of sheet metal as shown in Fig. 13 having lugs 61 on its opposite ends adapted to extend into holes 61′ in the frame plates. The sides 62 when the column is formed lie in different planes and a screw 63 is passed through the frame plates to clamp the side plates against the end shoulders 64, 65 of the column and hold the parts securely together. The arrangement is such that the parts may be readily assembled and securely held even though the holes 61′ are somewhat larger than the lugs 61. By cutting notches 66 in the ends of the blank I avoid the formation of burrs or fins when the blank is bent to form the column.

When the handle or arm 19 is pulled it rotates the shaft 45 and the arm 56, and the pawl 57 engaging the pawl 53 rotates the segmental gear 50 anti-clockwise so as to tighten the main spring 30. The clockwise rotation of the gears 51 and 32 rotates the pinion 33 anticlockwise until the single toothed ratchet 37 snaps past the pawl 35. When the handle 19 is released so as to remove pressure of the pawl 57 from the pawl 53, the spring 54 tilts the pawl 53 so as to move the tip inwardly radially out of the path of the pawl 57. The gear 50 is therefore free to move back toward the stop 52 under impulse of the main spring 30 at the same time the signal wheel 22 is rotated by the spring 30 through the train of elements 32, 33, 37, 35, 36 and 34.

When the parts are in the normally inactive position of Figs. 1, 2, 3 and 4 the pawls 57 and 53 are interlocked so that the rotation of the pull shaft 45 and member 56 anti-clockwise rotates the gear member 50 in the same direction. As soon as the pull lever 19 and shaft 45 are released the pawl 53 tilts so as to draw its outer end or tip inwardly and clear of the path of movement of the pawl 57. The signal mechanism will then be free to operate and the operator can not interfere with the signal by again pulling the lever or handle 19 inasmuch as the pawl 57 can not again be brought to act upon pawl 53 until the entire signal has been completed and the pawl 53 has been tilted out and restored to its normal position by engagement with the stop 52.

When the handle is pulled down it rotates the shaft 31 and winds up the main spring 30 and rotates the pinion 33 and single toothed

ratchet 37. The gear 36 and pawl 35 however remain stationary during the winding of the spring 30. When the handle is released the main spring returns it to its normal position of rest and rotates the pinion 33 clockwise. This rotation, however, of pinion 33 clockwise will not effect the pawl 35, gear 36 and signal wheel shaft 34 unless the ratchet 37 has been previously rotated at least a full turn so as to pick up the pawl. It is certain therefore that there will be a full turn of the signal wheel or none at all. This makes it impossible to turn the signal wheel a fraction of a turn and send in a partial and hence misleading signal as is possible with other devices with which I am familiar. The mechanism herein shown is intended to rotate the signal wheel four times when the handle has been pulled down fully.

The repetition of the full signal is most desirable as it avoids mistakes or misunderstanding. This is particularly desirable where a number of boxes are arranged on the same circuit where one box may be "pulled" while another is operating and thus cause confusion with one or more rounds. If it were possible to pull the box partway only, one round might be sent and if a part of this were lost or confused the entire alarm would be lost. By providing the single tooth pawl and gear train the operator can start either one, two, three or four rounds but he can not send a partial alarm.

The spring motor mechanism herein shown and described is claimed in divisional application No. 734,572, filed August 28, 1924.

I claim:

1. Signal mechanism comprising a signal wheel provided with projections, a shaft mounted for limited rotation in either direction, two relatively movable insulated contact members carried by said shaft normally in contact with each other and spring means for holding the shaft normally in a position wherein one of the contacts is engageable by the wheel projections in the rotation of the wheel and is out of engagement with the body of the wheel, whereby when the shaft is rotated in opposition to the spring means in a direction to move the contacts away from the signal wheel the projections will not separate the contacts and when the shaft is rotated to move the contacts towards the wheel the said one contact will engage the body of the wheel and be separated from the other contact.

2. Signal mechanism comprising a shaft having limited rotative movement in opposite directions, means for limiting the rotative movement of the shaft and holding it in a normal position including two springs carried thereby and projecting therefrom, stops for said springs, two contact arms carried by said shaft and insulated therefrom, and having movable contact tips, one tip normally engaging the other, a signal wheel having teeth adapted to engage one contact tip and separate it from the other for signaling, an abutment for one of said tips to hold it and permit the other tip to be separated from it by rotating said shaft in one direction for testing, said contact arms being rotatable in the opposite direction together to clear said teeth and permit said wheel to turn without separating said tips.

3. Signal mechanism comprising a frame, a toothed signal wheel carried thereby but insulated therefrom, driving means for said wheel, a shaft supported by said frame and mounted for limited rotative movement, two contacts carried by said shaft and adapted to engage each other, one of said contacts having a portion adapted to be engaged by the teeth of said signal wheel to move one contact into and out of contact with the other and send a predetermined signal, said contacts being movable together away from the influence of said wheel to permit testing the signal wheel driving means, and means for arresting the movement of one contact and permitting said shaft to be rotated and bring the other contact into and out of contact with the one contact.

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