July 13, 1926. 1,592,303

C. J. JENNE

SIGNAL BOX

Filed June 25, 1923

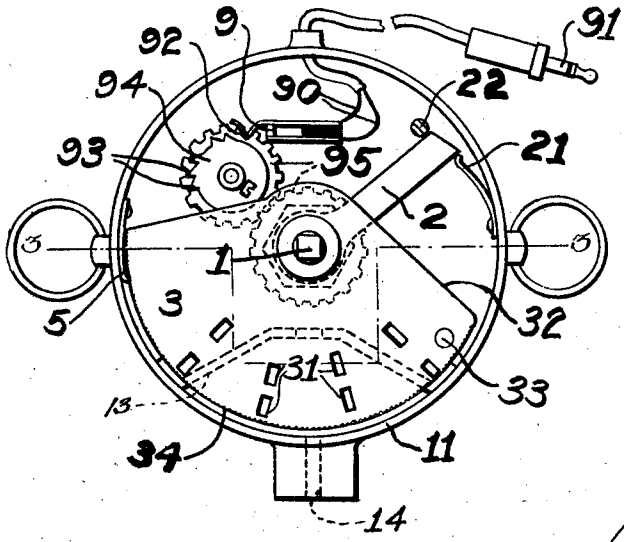


Fig. 1.

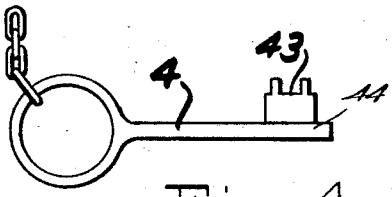
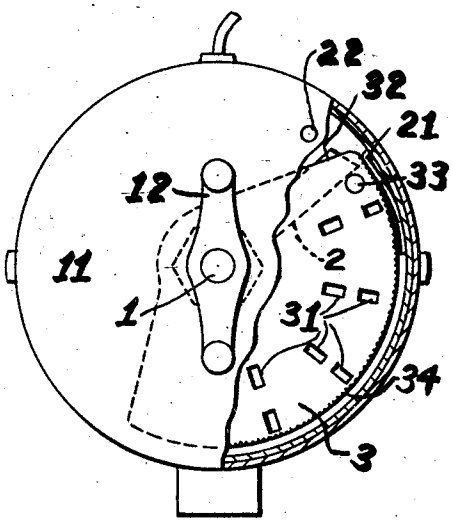


Fig. 4

Fig 2



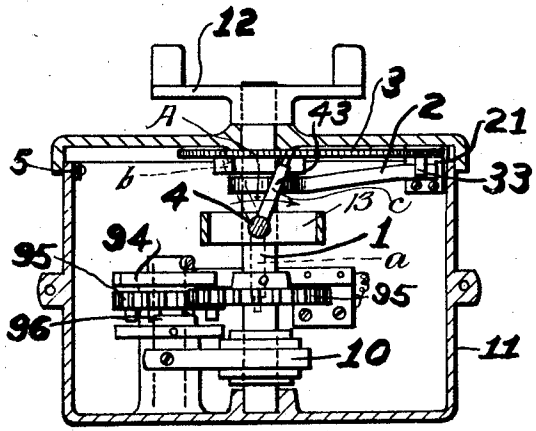


Fig. 3.

Inventor

Christian J. Jenne

By N.L. & G.L. Reynolds

Attorneys

Patented July 13, 1926. 1,592,303

UNITED STATES PATENT OFFICE.

CHRISTIAN J. JENNE, OF SEATTLE, WASHINGTON.

SIGNAL BOX.

Application filed June 25, 1923. Serial No. 647,574.

My invention relates to signal boxes and the art of signaling, particularly as employed by night watchmen whose duties require their visiting a plurality of stations at stated intervals, and particularly also when it is desirable that these stations should be visited in a fixed succession.

It is an object of my invention to provide a box which is to be carried by the watchman and which is provided with signaling means which are normally inoperative and which can be made to operate only by the use of a plurality of keys, one each of these keys being generally located at each of the stations the watchman is to visit.

A further object is the provision of such a box in which provisions are made for the unlocking of the signaling means contained therein by operation of keys located at several stations and used in the order in which it is desired the watchman shall visit these stations, and to be unlocked in no other manner.

A further object is the improvement in the art of signaling which permits the employment at each of several stations of a distinctive key only, and in the provision of a portable box intended to be carried by the watchman and containing a mechanically operated means intended for actuation by the several keys in succession.

Objects relating to structural details of the box will be apparent from a study of the following specification and attached drawings, wherein my invention is described and shown in its present preferred form, and of the claims terminating the specification, wherein the parts and combinations thereof, and the improvement in the art of signaling constituting my invention, will be particularly pointed out.

In the accompanying drawings I have shown the box forming part of my invention in its present preferred form.

Figure 1 is a side elevation of a box with the cover removed, showing parts in their normal locked position and the lock releasing means partly actuated.

Figure 2 is a side elevation with part of the cover broken away, showing the locking mechanism in process of being unlocked.

Figure 3 is an axial section through the box on line 3—3 of Fig. 1.

Figure 4 is an elevation of a typical key which may be employed in connection with my box and which is the only device necessary to station at any of the stations the watchman intends to visit.

It is my intention that a watchman who is required to visit a given succession of stations shall carry with him a signal box such as I will describe hereafter, and which contains means for sending a signal, other means for normally locking said signaling means against actuation, and further means which are controlled by a plurality of keys, generally to be used in a given succession, for releasing or unlocking the locking means. Such keys, of which the one shown in Figure 4 is typical, are located at the points the watchman is required to visit, and when used in the order in which it is intended the watchman shall visit them, these keys will actuate the unlocking mechanism, each partially, until the last key will complete the actuation thereof and permit release of the locking mechanism.

In this manner it is necessary to provide only a simple and inexpensive key at each of the several stations. No electrical connections, signal box, or recording mechanism is required at the stations. The signal box itself need contain no recording or electrical mechanism, as any means of sending a signal may be employed. It will be apparent, if the lock releasing means contained within the box have been completely actuated to permit release of the lock, that the watchman has visited the several stations in his route and in the order in which it was intended he should visit them, for otherwise the lock could not have been unlocked. Only on unlocking thereof is it possible to send a signal, and hence when a signal has been received from a signal sending station, this is evidence that the several stations have been visited in the proper order, since the last signal was sent from the signal sending station. Such reception may be arranged to leave whatever record is necessary, according to any usual method now in use, and gives all the information that it is desired to record.

The box shown in the accompanying drawings is particularly adapted for such use as that described above. I have shown therein, as the signaling means, a switch 9 connected through leads 90 to a plug 91. One arm of the switch 9 is mounted upon a spring arm, the latter being provided with a contact member 92 engageable by lugs or teeth 93 upon a rotatable circuit breaker wheel 94. The teeth 93 may be arranged in any desired

order to give a distinctive signal. Upon rotation of the wheel 94 the switch 9 will be opened and closed as the teeth 93 contact with the point 92. If the plug 91 has been inserted in any well-known or usual signaling circuit, the making and breaking of the switch 9 will convey a signal to a central station. It is to be understood, however, that while electrical means (the switch 9) has been shown herein for sending a signal, any other signaling means may be employed, and I do not wish to be limited to the particular signaling means shown and described nor to an electrical means as distinguished from mechanical means.

The circuit breaker wheel 94 is suitably connected with a shaft 1 to be rotated upon rotation thereof, as by means of intermeshing gears 95, one of which is secured upon the shaft 1, and the other of which is connected to the same shaft as is the wheel 94 through suitable ratchet means 96, such as is common in various types of call-boxes, and which is therefore not illustrated in detail. The ratchet means may be positioned at any desired point in the train, its object being to prevent movement of the wheel 94 when the shaft 1 is turned in one direction but to rotate the wheel when the shaft 1 is rotated in the opposite direction. A spring 10 has one end secured to the shaft 1 and its other end secured to the casing 11 or to a member fixed thereto. This spring, coiled about the shaft 1, is tightened as the shaft is rotated in one direction by the handle 12, and when the handle is released serves to rotate the shaft 1 in the opposite direction. Any suitable means of performing this latter operation may be employed.

As a means of preventing rotation of the shaft 1 by the handle 12 (the latter being outside of the casing 11) I may provide an arm 2 which is fast upon the shaft 1 and which is normally engaged by a spring pawl 21, which may be mounted on the casing 11, and which is positioned to intercept the arm 2, in this manner to prevent rotation of the shaft 1 in a clockwise direction as seen in Figures 1 and 2. A stop pin 22 may be employed, if desired, to limit movement of the arm 2 in the opposite direction. Preferably the pawl 21, which is shown herein as a bent piece of flat spring metal, extends beyond the plane of movement of the arm 2.

In order to release the locking means, consisting of the arm 2 and pawl 21, I provide a member such as the plate 3 which is intended to be actuated by a plurality of different keys employed in proper succession. The plate 3 is loosely mounted about the shaft 1 and is provided with a plurality of key-slots 31 which may be arranged in various combinations to be engaged by the bits 43 of a series of keys 4, such as the one which is shown in Figure 4. The plate 3 is adapted to rotate within the casing 11 past one or more keyholes 14 therein. A key 4 is insertible through the keyhole 14, with the bits down, its tip 44 being receivable in an aperture in a fixed brace 13 within the casing 11. Upon rotation in the direction of the arrow A in Figure 3 its bit 43 is engaged in one of the key-slots 31, as shown in dotted lines, and advances the plate 3, before its disengagement therefrom, by the amount allotted to each key.

It is only necessary to provide against continued movement of the plate 3 by successive operation of a single key, and to permit its operation only by a succession of different keys. To this end I prefer to provide a single keyhole 14 only, and to provide differently arranged key slots 31 movable with the plate 3 past such keyhole 14, and each engageable only by the particular key 4 intended for this key slot.

The forward edge 32 of the plate 3 is advanced in the manner described towards the pawl 21. When the last key in the series has been employed to advance the plate 3, its edge 32 will engage and depress the pawl 21, which lies in its path as well as in the path of the arm 2. The arm 2 may then be swung from engagement with the pawl 21, as is shown in Figure 2, by rotation of the handle 12 and shaft 1. Once past the pawl 21 it may be swung through a considerable arc within the casing and in so doing the spring 10 is wound up. Upon release of the handle 12 the tension of the spring 10 returns it and the shaft 1 and arm 2 to normal position, the pawl 21 again engaging with the arm 2 to lock the latter in place; at the same time, through the ratchet device 96, the circuit breaker wheel 94 is rotated to make and break the switch 9 and send a signal, and has been described.

I have provided means whereby the movement of the arm 2 in the direction to wind up the spring 10 will serve to return the plate 3 to its normal position, out of engagement with the pawl 21 and in position to have the first of its key-slots 31 engaged by the bit of the first key in the particular series pertaining to this box. This means is shown herein as simply a pin 33 depending from the plate 3 in position to be engaged by the arm 2 immediately after this arm has moved beyond the point of engagement with the pawl 21. The arm 2 and pin 33 are shown as engaging in Figure 2.

I may also provide means to maintain the plate 3 in any given position, such, for instance, as a spring ratchet dog 5 which is secured within the casing 11 to engage the milled edge 34 of the plate 3. Any suitable means for maintaining the position of the plate 3 may be employed, however.

What I claim as my invention is:

1. In a portable signal box, signaling

means, a lock therefor, and a release for said lock comprising a member having means engageable by a plurality of different keys in succession to advance it into position for actuation by the next key in the succession, and operable only by the last of said keys to engage and release said lock.

2. In a portable signal box, signaling means, actuating means therefor including a pivoted arm adapted to be swung on its pivot, said signaling means being inoperative prior to such swinging of the arm, a pawl normally positioned to intercept said arm and to prevent its swinging, and a member having means engageable by a plurality of different keys in a predetermined succession to be advanced thereby towards said pawl, and movable by the last key in the succession to engage said pawl to move it from the path of said arm.

3. In a portable signal box, signaling means, actuating means therefor including a pivoted arm adapted to be swung on its pivot, said signaling means being inoperative prior to such swinging of the arm, a pawl normally positioned to intercept said arm and to prevent its swinging, a member having means engageable by a plurality of different keys in a predetermined succession to be advanced thereby towards said pawl, and movable by the last key in the succession to engage said pawl to move it from the path of said arm, and means operable by the swinging of said arm after release from said pawl, to return said member to its original position for engagement by the first key in the succession.

4. In a portable signal box, signaling means, a shaft oscillable to actuate said signaling means, an arm secured upon said shaft, a spring pawl positioned partly in the plane of movement of said arm to intercept it, a plate loosely mounted upon said shaft, and having a plurality of key-slots each engageable by a particular one of a series of keys, and movable thereby towards said pawl, the last key effecting movement of the plate to depress said pawl to permit movement of the arm and shaft.

5. In a portable signal box, signaling means, a shaft oscillable to actuate said signaling means, an arm secured upon said shaft, a spring pawl positioned partly in the plane of movement of said arm to intercept it, a plate loosely mounted upon said shaft, and having a plurality of key-slots each engageable by a particular one of a series of keys, and movable thereby towards said pawl, the last key effecting movement of the plate to depress said pawl to permit movement of the arm and shaft, and means upon said arm engageable with said plate, after the arm has passed the pawl, to return the plate to its normal position, disengaged from the pawl and in position to be engaged by the first key of the series.

6. In a portable signal box, signaling means, a shaft oscillable to actuate said signaling means, an arm secured upon said shaft, a spring pawl positioned partly in the plane of movement of said arm to intercept it, a plate loosely mounted upon said shaft, and having a plurality of key-slots each engageable by a particular one of a series of keys, and movable thereby towards said pawl, the last key effecting movement of the plate to depress said pawl to permit movement of the arm and shaft, and power storage means energizable by movement of the arm away from said pawl to effect its return and to actuate said signaling means, when released.

Signed at Seattle, King County, Washington, this 19th day of June 1923.

CHRISTIAN J. JENNE.