

C. C. JOHNSON.
CALL BOX SIGNALING SYSTEM AND APPARATUS THEREFOR.
APPLICATION FILED OCT. 5, 1907.

957,968.

Patented May 17, 1910.

2 SHEETS—SHEET 1.

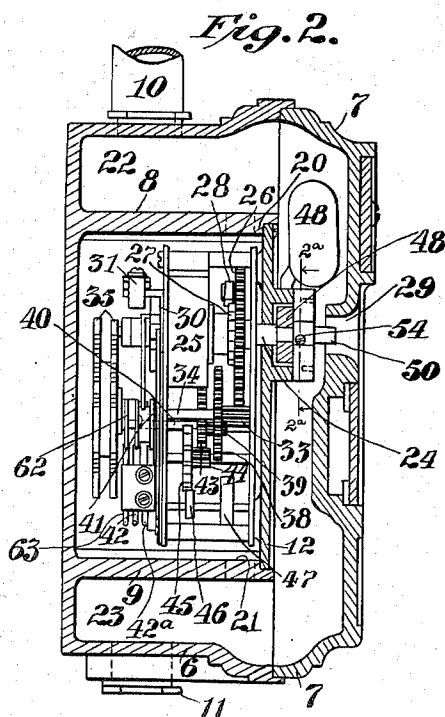
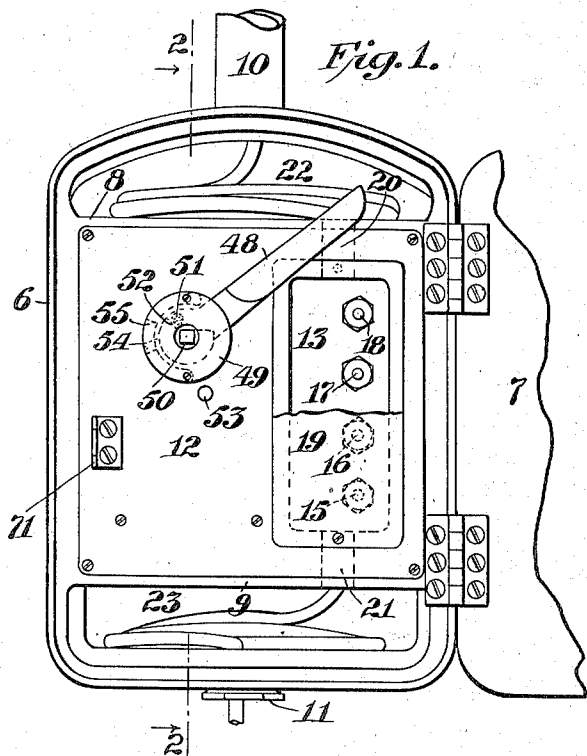


Fig. 3.

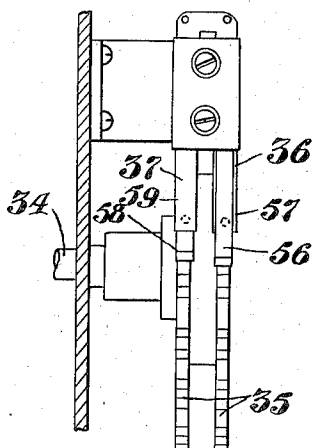
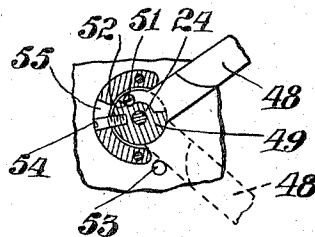


Fig. 2^a.



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R. B. Barnes
R. B. Barnes

by

Inventor:

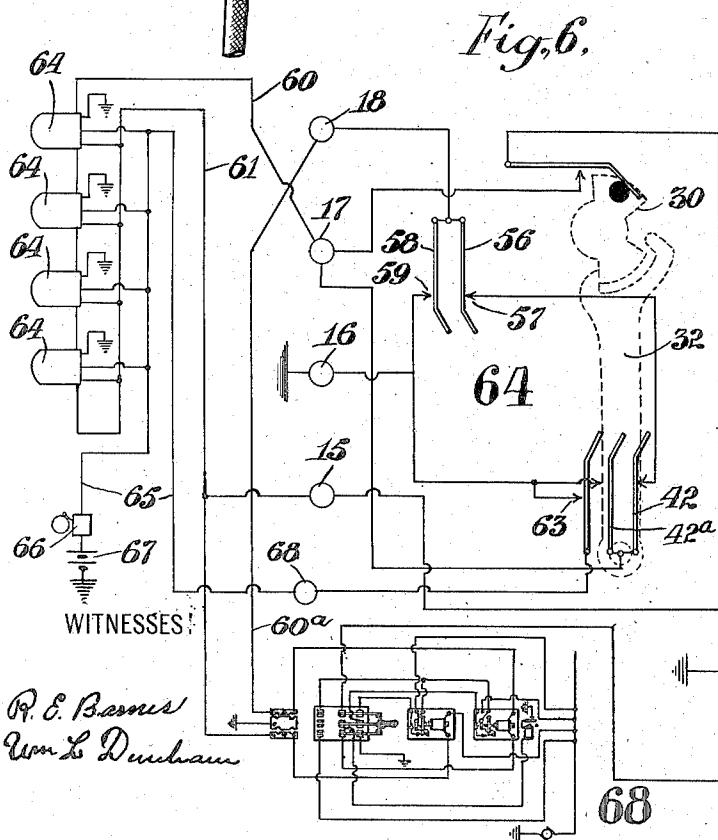
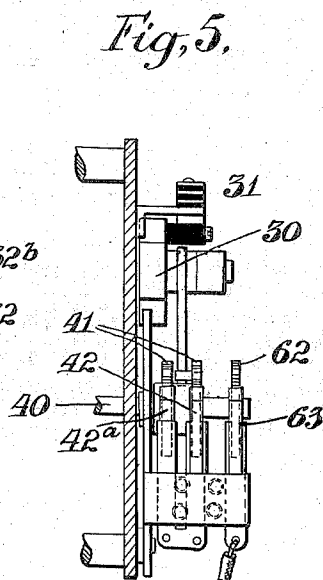
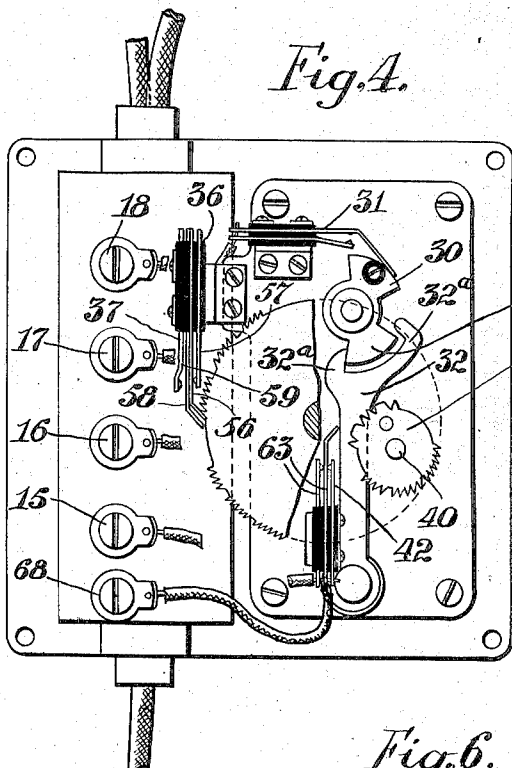
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2 SHEETS—SHEET 2.



INVENTOR
Clarence C. Johnson
BY *H. M. Marble*
ATTORNEY

UNITED STATES PATENT OFFICE.

CLARENCE C. JOHNSON, OF YONKERS, NEW YORK, ASSIGNOR TO AMERICAN DISTRICT TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CALL-BOX SIGNALING SYSTEM AND APPARATUS THEREFOR.

957,968.

Specification of Letters Patent. Patented May 17, 1910.

Application filed October 5, 1907. Serial No. 396,049.

To all whom it may concern:

Be it known that I, CLARENCE C. JOHNSON, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Call-Box Signaling Systems and Apparatus Therefor; and I do hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to combined watchman and alarm systems and apparatus, such as illustrated and described, for example, in the patents to John C. Barclay, No. 761,026, dated May 24, 1904, and 777,327, dated Dec. 13, 1904, and in the patent to H. S. Bullock, Jr., No. 883,447, dated March 31, 1908. Such systems comprise a plurality of call boxes in a line circuit leading to central station receiving or recording apparatus by which the signals of said call boxes are received; and said call boxes are arranged to transmit distinctive signals for the ordinary service or watchman's signal and for the alarm signal, so that the central station operator is at once apprised, upon the receipt of a signal from any one of the boxes, whether that signal is an ordinary service or watchman's signal, or whether it is an alarm signal. The distinction between the two classes of signals is, usually, that for ordinary service or watchman's signals, the number or characteristic signal of the box operated is sent in once or twice only, while for the alarm signal such number or characteristic signal is sent in a much greater number of times, with an additional signal (usually the letter "F" of the Morse code, *i. e.*, a dot, then a dash, and then a dot) alternated between the repetitions of the box number; this additional distinctive signal not being transmitted when the box is operated for ordinary watchman or service signals. The said patents to Barclay and Bullock describe signal-transmitting mechanism whereby a signal box may be caused, at will, to send in one or the other of these two signals.

It is sometimes desirable to provide means for sending the alarm signals not only to the central station to which the watchman's signals are sent, but also to another point as well, and to send only the alarm signals to

such second point. For example, in buildings provided with fire pumps, fire mains, sprinklers, etc., it is desirable that alarm signals shall be sent to the engineer of the building, so that he may instantly start the pumps; and in large stores, it is desirable that the managers shall be notified instantly of an alarm, in order that provision may be made for the orderly exit of people in the building; and in both of these cases, it will be noted, it is not desirable to have the ordinary service or watchman's signals sounded on the same gongs or received on the same apparatus which receive the alarm signals. According to my invention, therefore, I provide each call box with separate contact mechanism or signal transmitting mechanism in a circuit leading to special alarm receiving apparatus, and I so arrange this separate alarm transmitting mechanism that while it is operated whenever the main signal transmitting mechanism of the box is operated, it sends in its signals only when the box is operated to send in an alarm signal.

The accompanying drawings illustrate a system and apparatus such as referred to above; the particular signal-transmitting mechanism shown being that of said Bullock Patent No. 883,447.

In said drawings;—Figure 1 shows a front view of a signal box open, the door of the box having been removed; Fig. 2 shows a transverse section of the box taken on the line 2—2 of Fig. 1; Fig. 2^a is a detail view showing partly in elevation and partly in section on the line 2^a—2^a of Fig. 2, how the operating handle 48 is connected to the winding staff of the clock train; Fig. 3 shows a side view of the main line circuit break wheel and contact device or pens; Fig. 4 shows a detail elevation of the contact mechanism looking from the left of Fig. 2, the main break wheel being partly broken away. Fig. 5 shows a detail side view of the break-wheels and pens for transmitting the distinctive signal and the special alarm signal and associated parts. Fig. 6 is a diagram showing the circuit connections of a box in the system.

Boxes of the sort referred to above usually comprise a door provided with a key-hole through which the watchman may insert a key to send in his regular service signals; which door, however, must be opened

when the alarm signal is to be sent in. Such is the case with the box illustrated herein.

Numeral 6, in the drawings, designates the casing of the box, and 7 the door thereof, the main portion of said door having been broken away, in Fig. 1. 29 is a key-hole in said door, for the insertion of a key into engagement with the squared projection 50 for operating the winding staff 24 of a clock train by which the break wheels of the box are driven. This clock train comprises the usual spiral clock spring 25 and a gear wheel 26, the latter driven from the winding staff 24 through a ratchet and pawl, 27 and 28, in the ordinary manner. Upon staff 24 there is also mounted a cam 30 (Fig. 5) arranged to operate a shunt contact device 31 and also to operate a mechanical cutout device 32 by which the sending of the distinctive alarm signal and of the special alarm signal is controlled. Gear 26 drives, through pinion 33, the second staff 34, upon which is mounted the main or line signal or break wheel 35; this latter being double, as is common in boxes of this sort which operate according to the well-known McCullough system, embodying both line and ground circuit connections. Two contact devices, 36 and 37, (Figs. 3 and 4), engage the two disks of the break wheel 35. The second staff, 34, drives, through gear wheel 38 and pinion 39, the third staff, 40, upon which is a second break wheel 41 for giving the distinctive signal, and a third break wheel for the special alarm signal, referred to, the contact devices 42 and 42^a for this second break wheel being mounted upon the mechanical cutout lever 32 above mentioned. The third staff 40 drives, through gear 43 and pinion 44, the usual escapement 45 having the usual escapement anchor 46 and pendulum 47.

Upon the main spring winding staff 24 is a hand lever 48 for operating the box. As particularly shown in Figs. 2 and 2^a there is, in front of the hub of said hand lever 48, a disk 49, mounted upon the same staff 24 and having a square projecting portion 50 adapted to receive a key inserted through a key hole 29 in the cover. Hand lever 48 has a pin 51 adapted to be engaged by shoulder 52 of part 49 so that when said part 49 is rotated it will carry with it the hand lever and therefore will rotate the winding staff 24; but as will be seen from Fig. 2^a, hand lever 48 may be moved through a considerable range (corresponding to several repetitions of the box signal) before said lever engages the stop 53. A screw 54 carried by part 49 and working in a slot 55 limits the motion of disk 49 to such extent that when the disk 49 is operated by a key, the box signal is sent in only once or at the most, a limited number of times. When the hand

lever 48 is depressed, however, the winding staff 24 is rotated through an arc corresponding to that through which the pin 51 travels between shoulder 52 and stop 53. When the box is operated by means of lever 48, therefore, the signal of the box is repeated many more times than when the box is operated by a key engaging stem 50.

The contact devices 31, 36, 37, 42 and 42^a are all similar and comprise spring contact pieces arranged to make and break contact with each other, such contact devices being mechanically operated by the cam 30, the break wheel 35, or the break wheel 41, as the case may be. Such mechanically operated contact devices are in many respects preferable to and more reliable than contact brushes making contact with the break wheels or shunt cam 30, such as might be employed. Contact device 36 comprises a pen 56 and contact spring 57, normally in contact but separated when the teeth of break wheel 35 pass the end of 56. Contact device 37 comprises a similar pen 58 and contact spring 59, normally out of contact but placed in contact when the teeth of wheel 35 pass the end of 58. The two contact devices, 42 and 42^a, carried by lever 32, are similar to 36 and 37 respectively, one being a normally open contact, the other a normally closed contact. Contact device 31 consists of a pen and contact spring, normally held out of contact with each other by cam 30, but which make contact when staff 24 is rotated for an alarm signal.

Fig. 6 shows the circuits of the instrument. 60^a and 61 are two line wires, one connected to binding post or screw 18 and thence to pens 56 and 58 of contact devices 36 and 37; the other connected to binding post 15 and thence to one spring of contact device 31, the other spring of which is connected to line wire 60 (wire 60^a continued). Contact points 57 and 59 are connected to the contact springs of contact devices 42 and 42^a, and contact 59 is also connected to terminal screw 16 and so to ground. The brushes of contact devices 42 and 42^a are connected to terminal screw 17 and so to line 60.

The operation of the call box as so far described is as follows: To send in one of the two classes of signals of which the box is capable—we will suppose it to be a watchman's signal, a key is inserted through the keyhole into engagement with the extension 50 of winding staff 24 and the key is turned as far as it can be turned and then withdrawn. This winds up the spring 25, and rotates the cam 30 far enough to permit the number of the box to be sent in a limited number of times (once, we will say) but does not rotate the cam 30 far enough to permit contact to be closed at 31, or to move cutout lever 32 far enough to bring its contact de-

vices 42 and 42^a into contact with break wheel 41. As soon as the key is released or withdrawn, break wheel 35 begins to rotate, operating the contact devices 36 and 37, and sending in the number of the box in the well-known manner. To send in the other signal, which we will suppose to be an alarm signal, the cover of the box is opened and the lever 48 pulled down as far as it will go. This winds up the spring 25 enough to send in the box number many more times than before, and also moves the cam 30 far enough to bring the contact devices 42 and 42^a into engagement with break-wheel 41 and to cause the contact device 31 to close the shunt between terminals 15 and 17 shown in Fig. 6, thereby cutting out all boxes in circuit 60 beyond. As soon as the hand-lever is released the break wheels 35 and 41 begin to rotate. The teeth and blank spaces of these two wheels are so placed relatively that the contact devices 36—37, and 42—42^a are operated alternately, thus sending in the number of the box and the character on wheel 41 alternately; it being immaterial, in a broad sense, whether the number of the box or the character on wheel 41 (the "distinctive signal" above mentioned) is sent in first. In practice, the handle 48 is usually arranged to be moved through such an arc that the number of the box and the distinctive signal will be repeated a large number of times, when the alarm is sent in. It will be noted that the cutout lever 32 carrying the contact device 42—42^a has lugs 32^a embracing a cam-projection 32^b of cam 30, so that said cam 30 moves the cutout lever 32 positively in both directions; also, as lug 32^b moves out of the recess between lugs 32^a when the handle 48 is operated as described, its face, engaging the end of one lug 32^a, prevents the arm 32 from rotating so as to disengage contact device 42—42^a from break wheel 41 until, in the last round of the signal, the lug 32^b enters the space between lugs 32^a and then moves the lever 32 away from wheel 41; the construction being similar to the well-known "Geneva stop-motion."

The apparatus so far described provides for the sending of ordinary service signals (watchman's signals for example) and of another class of signal (alarm signal for example) at will, from the box. The second class of signals (usually alarm signals) being distinguished from the first class of signals by the fact that in addition to the characteristic signal or box number, the box transmits an additional distinctive signal, namely, in the case illustrated, the Morse letter F. As above explained, it is sometimes desirable to send signals of this second class (alarm signals in the case assumed) to another point than to the central office. To this end I provide in connection with the

alarm-signal break wheel 41 a further similar break wheel 62 (Fig. 5) which may have on it the same box number and distinctive signal as wheel 41, or may have any other suitable number or character for the signal. In connection with this break wheel there is a contact device 63 similar to the contact device 42^a; that is to say, a normally open contact which will be closed by the action of the break wheel on its pen. The circuit through this contact device 63 leads to a suitable bell or other signal receiving device.

In Fig. 6 I have shown in full the circuits of one box and have also indicated other boxes 64, assumed to have the same circuits; and I have shown the special alarm circuit conductor 65 leading from these various boxes through the alarm indicating device (or bell) 66 and battery 67 to ground; this circuit being connected to the pen of the contact device 63 of each of said boxes, as is indicated in the circuits of one box, the circuits of which are fully illustrated in said figure. This contact device 63 being mounted on the cutout lever 32 on which the contact devices 42 and 42^a are mounted, it will be obvious that contact device 63 is operated by its break wheel 62 only when contact devices 42 and 42^a are also being operated by their break wheel; that is to say, only when an alarm signal is being sent in. Therefore the operation of the box to send in the ordinary service or watchman's signals (the first class of signals above referred to) will not affect the signal receiving device 66, which is affected only when a signal of the second class (assumed to be an alarm signal) is sent in.

In Fig. 6 I have shown generator connections and signal receiving devices 68 for conductors 60^a and 61, such as are commonly used in connection with call box systems; the particular arrangement shown being that of patent to M. W. Hamblin, No. 808,451, dated December 26, 1905.

It will be obvious that instead of cutting out signals in circuit 65 during the transmission of the ordinary watchman's or service signals by the method employed in the said Bullock Patent No. 883,447 for cutting out the alarm signals in the main circuit 60—61, I may accomplish the same result by shunting the contact device 63, during the transmission of ordinary service or watchman's signal, as is done with respect to the distinctive signal in the Barclay Patent No. 777,327 and in the Bullock Patent No. 932,753, dated Aug. 31, 1909.

What I claim is:—

1. A signaling system comprising in combination a line circuit, signal receiving means therefor, and signal transmitting means therefor comprising means for transmitting at will either of two different signals through said circuit, and another signal cir-

cuit and signal receiving means therefor to which said signal circuit leads from said signal transmitting means, independent of said line circuit; said signal transmitting means comprising means, additional to the means for transmitting either of the signals through the line circuit, for transmitting a signal through such other circuit concurrently with the transmission through such first circuit of one of said two classes of signals to be transmitted therethrough.

2. Signal transmitting apparatus comprising in combination main signal transmitting means including means for transmitting through one circuit either of two different classes of signals at will, and comprising also other transmitting means for transmitting a signal through another circuit concurrently with the transmission of one of the two classes of signals transmitted by said first mentioned transmitting means.

3. Signal transmitting apparatus comprising in combination main signal transmitting means including means for transmitting through one circuit either of two different classes of signals at will, and other transmitting means for transmitting a signal through another circuit concurrently with the transmission of one of the two classes of signals

transmitted by said first mentioned transmitting means, comprising a break wheel and contact means operated thereby, said break wheel driven by the mechanism of said main transmitting means.

4. Signal transmitting apparatus comprising in combination main signal transmitting means adapted to transmit successively and alternately a characteristic signal and a distinctive signal, said mechanism arranged to transmit said signals in alternation a greater or less number of times at will, and further comprising means for preventing the transmission of the distinctive signal, when said mechanism is operated to transmit the characteristic signal the less number of times, said transmitting apparatus further comprising transmitting means arranged to transmit a signal through another circuit when said main signal transmitting means is operated to transmit its signal the greater number of times.

In testimony whereof I affix my signature in the presence of two witnesses.

CLARENCE C. JOHNSON.

Witnesses:

C. F. PATTERSON,
C. W. CONKLIN.