

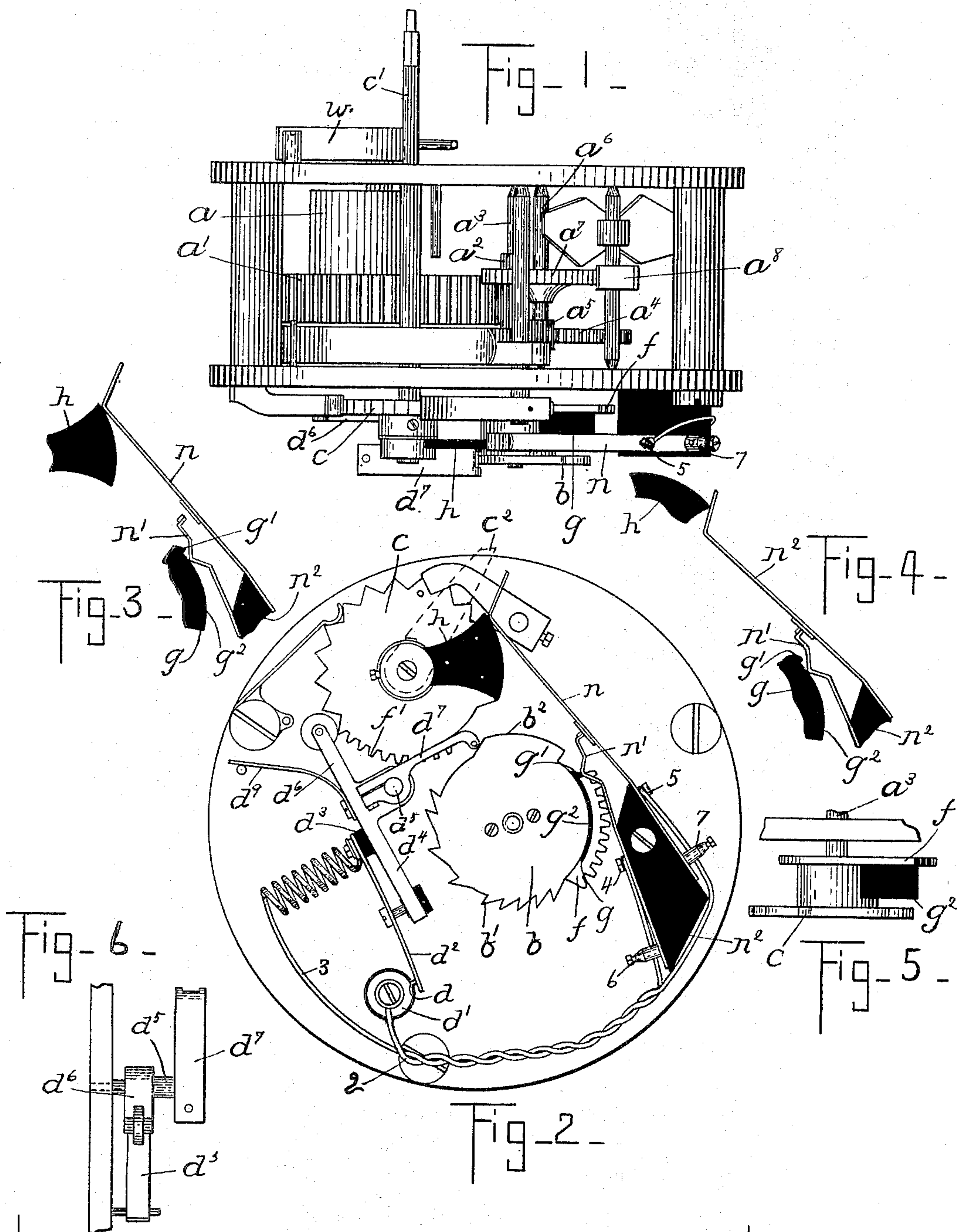
No. 640,278.

Patented Jan. 2, 1900.

L. DAWSON.
MULTIPLE SIGNAL TRANSMITTER.

(Application filed May 5, 1899.)

(No Model.)



Witnesses:
H. B. Davis.
James L. Hutchinson.

Inventor
Leonard Dawson
by B. J. Hayes
Atty.

UNITED STATES PATENT OFFICE.

LEONARD DAWSON, OF NEEDHAM, MASSACHUSETTS, ASSIGNOR TO THE
GAMEWELL FIRE-ALARM TELEGRAPH COMPANY, OF NEW YORK, N. Y.

MULTIPLE-SIGNAL TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 640,278, dated January 2, 1900.

Application filed May 5, 1899. Serial No. 715,723. (No model.)

To all whom it may concern:

Be it known that I, LEONARD DAWSON, of Needham, county of Norfolk, and State of Massachusetts, have invented an Improvement in Multiple-Signal Transmitters, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention relates to multiple-signal transmitters of that type especially adapted for use in connection with police-signal systems wherein a number of signals are employed, some of which are adapted to be registered with the sounding of an alarm and commonly termed "special" signals and others are adapted to be registered silently; and the invention has for its object to improve and simplify the construction of the same to the end
20 that but a single main-circuit breaker shall be employed for the transmission of all the signals, it being actuated by both the box-number wheel and the special-signal wheel, and also to the end that the circuit-breaker
25 in the short circuit normally shunting the main-circuit breaker shall be opened immediately on starting the box or after a predetermined length of time, and that the time that said "shunt-circuit breaker" shall be
30 opened shall be controlled by the pointer when setting the special signal—as, for instance, when the pointer is set for the transmission of all special calls—the shunt-circuit breaker will be opened immediately on starting the
35 box, and when the pointer is set for the transmission of all other calls the shunt-circuit breaker will not be opened until after a predetermined length of time.

The main-circuit breaker is so arranged
40 that whenever it is operated to transmit any one of the signals it will first open the circuit for a long interval of time and then repeatedly open the circuit for shorter intervals of time, and if the shunt-circuit breaker is
45 opened immediately on starting the box then said long break or continued change in the normal condition of the circuit will be employed to operate an alarm mechanism at the receiving-station; but if said shunt-circuit
50 breaker is not opened until after a predetermined interval of time then said long break

will not affect the normal condition of the circuit and the alarm mechanism will not be operated.

Figure 1 shows in plan view a multiple-signal transmitter embodying this invention; 55
Fig. 2, a side view of the transmitter shown in Fig. 1, the parts being in their normal position of rest; Fig. 3, a detail showing the shunt-circuit breaker opened immediately on 60
starting the box; Fig. 4, a detail showing the shunt-circuit breaker closed on starting the box and adapted to be opened only after a predetermined period of time; Fig. 5, a detail of the box-number wheel, and Fig. 6 a 65
detail of the circuit-operating device.

The main spring a is attached to a shaft, having secured to it a toothed driving-wheel a' , which engages a pinion a^2 , secured to a shaft a^3 , which has secured to it a toothed 70
gear a^4 , which engages a pinion a^5 , secured to a shaft a^6 , bearing the escape-wheel a^7 , which is adapted to be engaged by a pallet a^8 . This form of spring-actuated train is commonly used in signal-boxes; but so far as 75
my invention is concerned any other suitable train may be employed. The box-number wheel b is secured to the shaft a^3 and it has formed on it, in addition to suitable projections b' for operating the circuit-operating de- 80
vice to transmit the box-number, a long projection b^2 for operating said circuit-operating device to change the condition of the circuit for a period of long duration preceding the 85
box-number, such long change in the normal condition of the circuit being used for the purpose of operating an alarm mechanism at a receiving-station, as is well known in the art.

The special-signal wheel c is secured to a 90
shaft c' , which has its bearings in the face-plates of the frame, and said shaft has secured to it a pointer c^2 , (see dotted lines, Fig. 2,) by which it may be turned manually, as required, to thereby set said special-signal 95
wheel in any desired position according to the signal which it is desired to transmit.

d represents a contact-point fixed to a post d' , to which one of the circuit-wires, as 2, is connected, and d^2 represents a contact-pen 100
normally bearing upon said contact-point d , and said contact-pen d^2 is attached to a block

of insulating material d^3 , secured to a lever d^4 , pivoted to the face-plate, it being herein represented as mounted upon the stud d^5 . The other circuit-wire 3 is connected with the contact-pen d^2 , and said contact-pen d^2 and pivoted lever d^4 , bearing it, and the contact-point d^1 serves as and constitutes a main-circuit-operating device by means of which the circuit will be operated for the transmission of all the signals.

The pivoted lever d^4 has a rearwardly-extended arm or projection d^6 , preferably bearing a roll at its extremity, which engages the special-signal wheel c , and as said wheel c is turned its teeth will act upon said arm d^6 and vibrate the lever d^4 on its pivot, thereby operating the circuit-operating device. An arm d^7 is also secured to the pivoted lever d^4 , projecting therefrom at substantially right angles, as shown in Fig. 2, and said arm d^7 may or may not have at its extremity a roll, and the extremity of said arm engages the box-number wheel b , and as said box-number wheel revolves the arm d^7 will be operated to in turn operate the pivoted lever d^4 , and thereby transmit the box-number signal. The arm d^7 is adjustably secured to the pivoted arm d^4 , so that its extremity may be brought nearer to or farther from the box-number wheel, as desired, which results in varying the lengths of the periods of time that the circuit will be opened by the vibrations or movements of the arm d^4 as the box-number wheel revolves. When said arm d^7 is adjusted near to the box-number wheel, the periods of time that the circuit is opened will be longer than when said arm is adjusted remotely from said wheel.

A spring d^9 bears upon a pivoted lever d^4 , which tends to hold the arms d^6 and d^7 in engagement with their respective wheels and also normally holds the contact-pen d^2 in engagement with the contact-point d^1 .

The train is started by operating the winding-arm or pull w , which is herein represented as secured to the winding-shaft, and at each time it is operated the train runs so that the box-number wheel shall make one complete revolution, and thereby transmit the box-number preceded by a current change of long duration, although for some signals said current change of long duration will be omitted, as will be described. Also whenever the pointer is set for the transmission of any special signal said special-signal wheel c will be turned one or more teeth, according to the signal desired, and as the box-number wheel revolves the toothed sector f , which is secured to the shaft of said box-number wheel, and which consequently moves in unison with it, will engage a similar toothed sector f' , cut or formed in the special-signal wheel, and will act to turn said special-signal wheel and restore it to its normal position, and as said special-signal wheel is restored its teeth will act upon the arm d^6 and vibrate the circuit-operating lever d^4 .

It is herein designed that one of the signals

shall be transmitted which shall consist solely of the box-number preceded by a current change of long duration, and to transmit such signal the box will be simply "pulled" and the box-number wheel caused to make one complete revolution, and as it revolves the long projection b^2 will first act upon the arm d^7 and vibrate the circuit-operating lever d^4 , and thereafter the several teeth b^1 will act upon and vibrate said arm d^7 in a similar manner.

It is herein designed that all special signals shall be preceded by a current change of long duration, and consequently the pointer having been set for any special signal the box will be pulled and the long projection b^2 will first act upon and vibrate the arm d^7 . Then the toothed sector f will engage the toothed sector f' and restore the special-signal wheel c , causing its teeth to act upon and vibrate the arm d^6 . Then the teeth b^1 on the box-number wheel will operate the arm d^7 , it being understood that the box-number wheel will be cut away for a suitable interval between the long projection b^2 and the first tooth of the box-number to allow for all signals on the special-signal wheel.

A short circuit is provided for normally shunting the main-circuit-operating device, which is herein represented as a pair of contact-pens $n n'$, secured to opposite sides of a block n^2 , of insulating material, and the circuit-wires 2 3 are respectively connected at 4 5 to said contact-pens, and the leading-in wires of the box will be connected to binding-posts 6 7, which are also connected to said contact-pens.

A cam g on the shaft of the box-number wheel, composed of insulating material, has a projection g' , which engages the contact-pen n' and holds it pressed up against the contact-pen n , thereby normally closing said short circuit when the box is at rest. These contact-pens, shunting, as they do, the main-circuit-operating device, are herein termed the "shunt-circuit breaker."

When the box is at rest, the projection g' on the cam g is normally holding the contact-pens closed, as represented in Fig. 2; but as soon as the box is started the projection g' passes from beneath the contact-pen n' and allows said pen to fall by its inherent spring action, and thereby separate the pens and open the short circuit preparatory to the signals being transmitted. If the contact-pens $n n'$ are separated at this time—viz., immediately upon starting the box—then as the long projection b^2 operates the arm d^7 and separates the main contacts $d^1 d^2$ a current change of long duration will be produced, and consequently for all signals which require a long current change to precede the signal these contact-pens $n n'$ will be separated immediately on starting the box. In other instances where it is desired that no such current change shall precede the signal—as, for instance, for all signals which it is intended

shall be registered "silently"—the contact-pens n n' will not be separated until after the train has run a predetermined length of time or until after the long projection b^2 has passed by the arm d^7 . To accomplish this result, the cam g has formed on it a long bearing portion g^2 , which will receive upon it the contact-pen n' as it slips off the projection g' , and a prop h is provided for the contact-pen n , which normally holds said pen n in its normal elevated position, and when said prop h occupies a position beneath the pen n said pen n will be held in its elevated position, so that just as soon as the pen n' slips off the projection g' and falls onto the long bearing portion of the cam g the short circuit will be opened; but if said prop shall be removed from its position beneath the contact-pen n then as soon as said pen n' slips off the projection g' and falls onto the long bearing portion of the cam g the contact-pen n will follow the contact-pen n' by its inherent spring action and said contact-pen will remain closed while resting upon said long bearing portion, and such engagement of the contact-pens will continue until the contact-pen n' passes by or slips off the long bearing portion of the cam. Therefore whenever it is desired to transmit a signal which does not require a long current change to precede the signal the prop h will be moved from beneath the contact-pen n .

As herein shown, the prop h is secured to the shaft carrying the pointer and special-signal wheel and will be moved by turning the pointer, and for such unimportant signals as do not require the sounding of the alarm the pointer will be turned far enough to move the prop h from beneath the contact-pen n , as shown in Fig. 4, and then if the box is pulled the contact-pen n' will at once slip off the projection g' onto the long bearing portion of the cam g and the contact-pen n will follow it, retaining its engagement with it, and as the long projection b^2 operates the arm d^7 the circuit-operating device will be operated; but as the short circuit is closed the condition of the main circuit will not be changed; but as soon as the long bearing portion of the cam g passes from beneath the contact-pen n' then said contact-pen will fall and open the short circuit, after which the special-signal wheel will be restored, as heretofore explained, and the box-number signal will subsequently be transmitted. Thus it will be seen that the shunt-circuit breaker is adapted to be operated either immediately on starting the box or after a predetermined length of time and that the prop h serves as a controlling device for determining which time the shunt-circuit breaker shall operate to open the short circuit of the main-circuit-operating device.

I do not desire to limit my invention to the employment of a prop h , as herein shown, for accomplishing this result, as it is obvious that other forms of controlling devices may be pro-

vided adapted to be operated manually which will subserve the same end.

It will be noted that the shunt-circuit breaker remains closed during the time the pointer is being moved to set the signal, so that any vibrations of the arm d^6 incident to thus moving the pointer will not produce changes in the circuit.

I claim—

1. In a multiple-signal-transmitting device, a circuit-operating device, a box-number wheel and a special-signal wheel and arms projecting from said circuit-operating device adapted to cooperate with both of said wheels, substantially as described.

2. In a multiple-signal-transmitting device, a circuit-operating device consisting of a contact-point and a pivoted lever bearing a contact-pen, a box-number wheel, a special-signal wheel and arms projecting from said circuit-operating device adapted to cooperate with both of said wheels, substantially as described.

3. In a multiple-signal-transmitting device, a circuit-operating device, a box-number wheel and a special-signal wheel and arms projecting from said circuit-operating device adapted to cooperate with both of said wheels, one of said arms being adjustable relatively to the other whereby the length of the intervals of time the circuit is opened by the circuit-operating device may be varied, substantially as described.

4. In a multiple-signal-transmitting device, a circuit-operating device, a box-number wheel and a special-signal wheel, a short circuit shunting said circuit-operating device, a circuit-breaker for said short circuit, a cam for normally holding said "shunt-circuit breaker" closed when the box is at rest and for opening it immediately upon starting the box or after a predetermined interval of time, and a controlling device operated by the pointer when "setting" said special-signal wheel for determining which time said shunt-circuit breaker shall operate, substantially as described.

5. In a multiple-signal-transmitting device a circuit-operating device, a box-number wheel and a special-signal wheel, a short circuit shunting said circuit-operating device, a circuit-breaker for said short circuit, a cam operated by the train for normally holding said "shunt-circuit breaker" closed when the box is at rest and for opening it immediately upon starting the box or after a predetermined interval of time, and a controlling device operated in unison with the special-signal wheel for determining which time said "shunt-circuit breaker" shall operate, substantially as described.

6. In a multiple-signal-transmitting device, a circuit-operating device, a box-number wheel and a special-signal wheel, a short circuit shunting said circuit-operating device, a shunt-circuit breaker for said short circuit consisting of a pair of spring-acting pens, a

cam operated by the train for engaging one
of said pens and normally holding it pressed
into engagement with the other pen when the
box is at rest and for permitting said pens to
5 separate immediately on starting the box or
after a predetermined length of time, and a
prop operated by the means employed for set-
ting the special-signal wheel which controls
the position of the other pen and thereby de-

termine which time said pens shall separate, 10
substantially as described.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

LEONARD DAWSON.

Witnesses:

B. J. NOYES,

JENNIE L. HUTCHINSON.