

(No Model.)

2 Sheets—Sheet 1.

F. B. HERZOG.

CIRCUIT FOR LATENT SIGNAL TRANSMITTERS.

No. 560,212.

Patented May 19, 1896.

Fig. 1.

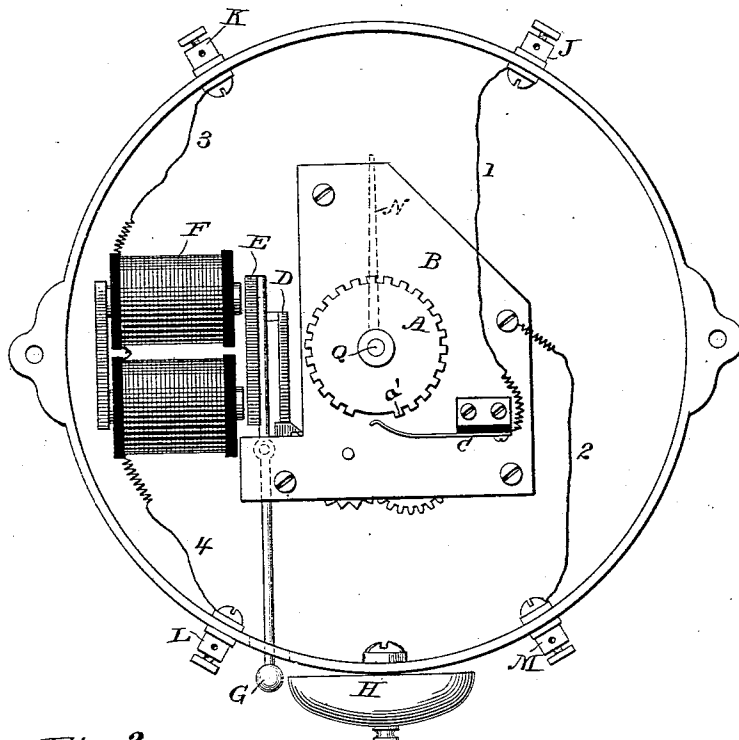
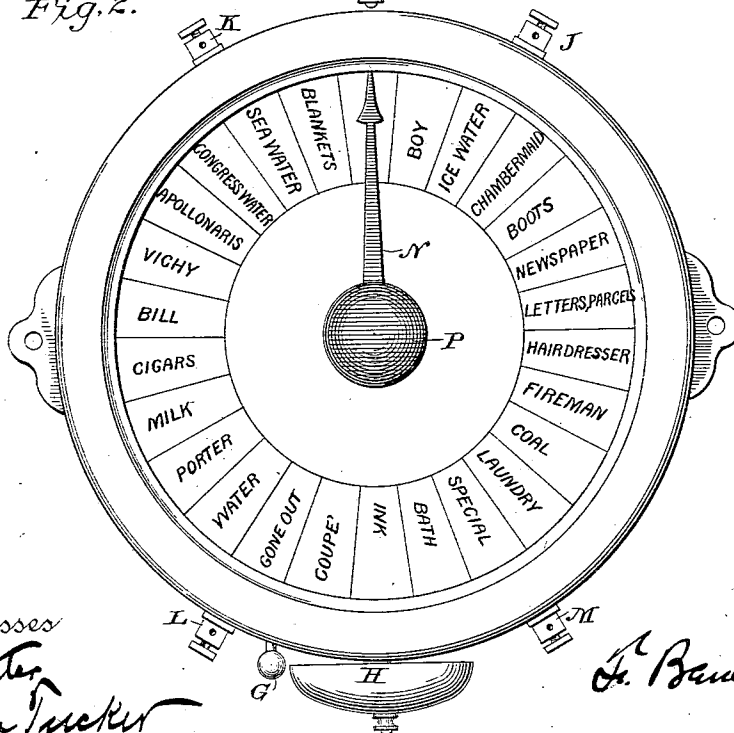


Fig. 2.



Witnesses

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Fig. 3.

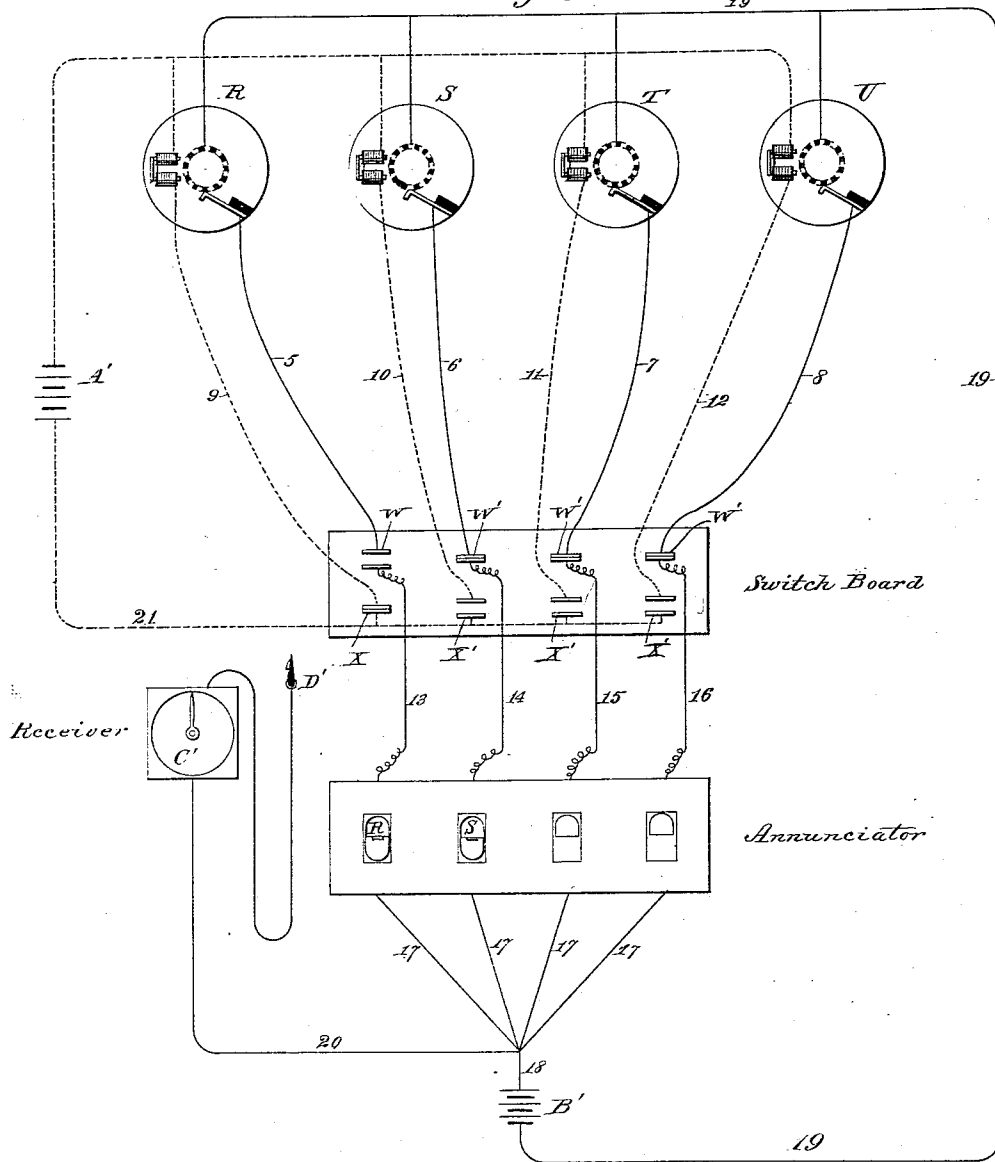


Fig. 4.

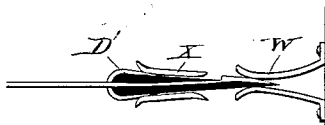
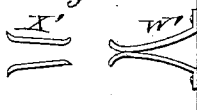


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

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CIRCUIT FOR LATENT-SIGNAL TRANSMITTERS.

SPECIFICATION forming part of Letters Patent No. 560,212, dated May 19, 1896.

Application filed February 14, 1885, Serial No. 155,873. (No model.)

To all whom it may concern:

Be it known that I, FELIX BENEDICT HERZOG, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Improvement in Circuits for Latent-Signal Transmitters, of which the following is a specification.

The signal-transmitting instrument in connection with which it is my purpose to employ the improved electric circuits or connections hereinafter described is an automatic variable electric signaling instrument which can be set to any desired signal by the operator at the sending-station, but which after having been so set retains its signal until called into action or caused to operate by the operator at the receiving-station, and when thus called into action or caused to operate transmits to the receiving-station the signal to which it was set by the operator at the transmitting-station. An instrument possessing these characteristics I term in this and contemporaneous applications a "latent-signal transmitter." One form of such instrument is shown and described in my Letters Patent No. 289,834 of December 11, 1883, the motor which drives the signal-transmitting break wheel or mechanism being in this instance of the spring or clockwork type and having combined with it mechanism by which it can be locked or released at will.

In Division C of another application of mine, Serial No. 148,374, filed September 29, 1884, I have shown that it is desirable in many instances that the operator at the sending-station should be enabled to signal to the receiving-station that the latent-signal transmitter has been set and is ready to be brought into action as soon as the receiving-operator is ready to receive its signal, and that in any such event it is indispensable that the said signal or call shall be sent without releasing or affecting the latent-signal transmitter.

The object of the invention for which the above-mentioned application is made is to provide, broadly, for that contingency; and to this end it consists in combining with the instrumentalities hereinbefore referred to a calling apparatus at the sending-station, an instrumentality to respond to that call at the receiving-station, and circuit connections so

organized and arranged that the two stations can be brought into electrical communication whenever desired without releasing or affecting the latent-signal transmitter.

My present invention has the same general object in view, and is designed more particularly with reference to a system which shall meet the needs of hotels and like establishments in which each guest's room is to be furnished with a latent-signal transmitter connected to the hotel-office, so that the guest can signal to the hotel-clerk his various wants. To this end I connected the sending-station—*e. g.*, the guest's room—and the receiving-station—*e. g.*, the hotel-office—by two distinct circuits, the one, which I term the "transmitting-circuit," being that through which the signal is transmitted, and containing the latent-signal transmitter and the receiving instrument which responds to that transmitter, the other, which I call the "actuating-circuit," being that through which the signal-transmitting instrument is called into action or caused to operate, and containing mechanism controlled by the operator at the receiving-station whereby the signal-transmitting instrument is called into action or caused to operate. With these instrumentalities I employ an annunciator for announcing to the receiving-station that the signal-transmitting instrument is set, which annunciator I find it best to place in the transmitting-circuit, and I also prefer to employ an annunciator for announcing or indicating to the sending-station that the operator at the receiving-station is receiving and attending to the signal for which the transmitter was set, which annunciator I place in the actuating-circuit.

My improvement will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a view of the mechanism of this modification of my latent-signal transmitter. Fig. 2 represents a view of the dial and cover of box in Fig. 1. Fig. 3 shows the circuits and connections whereby my present invention is carried into operation, and Figs. 4 and 5 represent a modification and details of part of my apparatus.

The particular latent-signal transmitter shown in the drawings in illustration of my

invention has its motive power furnished by spring or clockwork and is of the general form and construction of that which is described in my Letters Patent No. 289,834 hereinbefore mentioned.

In Fig. 1 B represents generally the frame of a clockwork-train such as is commonly used for district-telegraph call-box purposes. A is a break-wheel having on its periphery as many evenly-spaced teeth as there are "wants" indicated on the dial and at one point an interval preferably somewhat larger than the others. C is a contact-brush insulated from the frame in a well-known manner. The instrument when it is to be "set" is wound by turning the knob P, Fig. 2, which is attached to the arbor Q, Fig. 1. Inasmuch as the motor, which in the present instance drives the break-wheel, is of the spring or clockwork type, mechanism must be provided whereby the same can be locked and released—a result which is obtained in the present instance by the armature E, which locks the escapement verge-rod D of the clockwork and is controlled by the electromagnet F in such manner that when the armature is attracted its extension is thrown out of the path of the verge-rod. So far the instrument is substantially as described in the above-mentioned patent. The circuit-wires enter the box in any suitable manner, as by binding-posts J K L M and extensions 1 2 3 4. In that transmitter, however, there was only one circuit, while in this it will be noted there are two, one passing through and controlling the mechanism by which the transmitting device is called into action or caused to operate and the other passing through the signal-transmitting device, which consists of the break-wheel, contact-brush, and frame, as shown.

Fig. 3 represents the circuit connections of a hotel system worked according to my invention. R, S, T, and U represent guests' rooms supplied with the boxes shown in Figs. 1 and 2. The lower part of the drawings represent the office, and here are placed a switchboard or circuit-changing device, an annunciator, and a signal-receiver, as shown. The circuits are as follows: There are two separate batteries and sets of circuits. One battery is A', whose circuits pass through the electromagnet of the boxes in the rooms and are kept normally open at the switchboard by a spring-jack or equivalent X'. (Shown in detail in Fig. 5, side view.) These circuits 9, 10, 11, 12, and 21 are shown in dotted lines. Battery B' is on another set of circuits, as shown by lines 5 6 7 8 and 13 14 15 16 and 17 18 19. These circuits are normally closed at the switchboard by the spring-jack W' and normally open at the rooms, where when a guest desires to signal they are closed either independently by proper keys or buttons or automatically by the act of setting the latent-signal transmitter, as shown hereinafter. The usual ratchet on the latent transmitter is arranged so that at every "click" or resting-place the point of the con-

tact-brush bears on a tooth and not in an interval, as in its normal position.

The method of operation is now as follows: When the guest desires to signal to the clerk, he grasps the knob P, Fig. 2, and turns it to the right, thereby turning the hand or pointer N, attached to it. Suppose, for instance, that he wishes newspapers. He turns the hand to the fifth space, thereby also turning the ratchet and break-wheel five teeth. The wheel will remain there, for the reason that the escapement cannot operate on account of the armature E, as while turning the spindle the first tooth *a'* of the break-wheel rubs against the brush C it closes the circuit, and thereby operating the annunciator S and causing it to drop attracts the notice of the attendant. The position and condition of the instrumentalities are now, as shown by Fig. 3, box S, lines 6, 10, 14, and 17, and spring-jacks W' X'. It will be noticed that as the ratchet-wheel in the transmitter mechanism always stops the wheel so that when at rest a tooth touches the contact-brush, as shown, the circuit is normally closed through the annunciator, and hence the magnet of the annunciator-drop corresponding to the room continues to attract its armature, so that the drop cannot be restored to its normal position until the corresponding latent-signal transmitter has been released. This modification of the means for bringing about this result I describe and claim in application filed October 25, 1884, Serial No. 146,447, and I do not herein claim it broadly. As soon as the clerk notices the drop of the annunciator, and as soon as he is ready and at leisure to attend to it, he opens jack W' and closes jack X'. The circuits and parts are now in the condition represented by W and X of Fig. 3. The clerk closes the one and opens the other circuit by means of the plug D'. (Seen in detail in Figs. 4 and 5.) By inserting the plug in the manner shown the jack X' is closed and W' is opened. The lower branch thereof, which leads to the annunciator, is cut out, and the upper branch becomes electrically connected with a receiving instrument C'. At the same instant the current from the battery B' now passing through D', X, and energizes the electromagnet on that line, which by attracting its armature E removes it from the path of the escapement and allows the transmitter to unwind. In unwinding, this breaks the circuit a certain number of times in a well-known manner, thus operating the receiving instrument C', and enabling the clerk to discover what is wanted. The form of receiver here shown is an example of the well-known step-by-step type, the dial of which is graduated to correspond with the indications of the transmitter. At the same time and upon the first closure of the circuit which passes through the magnet the single tap of the hammer G on the bell H in the guest's room and then the noise of the unwinding mechanism indicate to him that

his call has received attention. If desired, the clerk can give an answer or response which differs from the call received. This can be done by a code. He does this by operating a suitable key in the office.

Having now described the nature of my invention and what I deem on the whole to be the best way of carrying the same into effect, I desire to state in conclusion that I do not restrict myself to the particular details hereinbefore shown and set forth in illustration of the invention. Any form of latent-signal transmitter may be used in which the signal-transmitting device proper is not in the same circuit with the mechanism by which it is called into action or caused to operate from the receiving-station. The office call or annunciator, as well as the call or annunciator at the sending-station, may also be variously arranged, and other modifications in the construction of the working devices themselves as well as in the circuit connections will suggest themselves to those skilled in the art.

What I therefore claim as new and of my own invention is as follows:

1. The combination with the sending and receiving stations of two circuits connecting the same—the one, the transmitting-circuit, containing at the sending-station a variable-signal-transmitting instrument adapted to be set by the operator at that station, and at the receiving-station connections for an instrument controlled by and adapted to respond to said signal-transmitting instrument; the other, the actuating-circuit, containing at the sending-station mechanism controlled from the receiving-station whereby the signaling instrument when set, is called into action or caused to operate, substantially as and for the purposes hereinbefore set forth.

2. The combination with the sending and receiving stations, of a transmitting-circuit containing at the sending-station a signal-transmitting instrument, and at the receiving-station connections for an instrument controlled by and adapted to respond thereto, and a call or annunciator for announcing that the signaling instrument is set, and an actuating-circuit containing mechanism controlled from the receiving-station whereby the signal-transmitting instrument is called into action or caused to operate, substantially as and for the purposes hereinbefore set forth.

3. The combination with the sending and receiving stations of two circuits, containing the one a signal-transmitting device and an instrument controlled thereby and adapted to respond thereto located at the sending and receiving stations respectively, and the other, mechanism at the sending-station controlled from the receiving-station, for calling into action or causing to operate the signal-transmitter, and an answer-back call located at the sending-station for indicating that the signal for which the signal-transmitter has been set is being attended to at the receiving-

station, substantially as and for the purposes hereinbefore set forth.

4. The combination with the sending and receiving stations of a transmitting-circuit containing a variable-signal transmitter and instrument to respond thereto, and a call or annunciator to indicate that the transmitter has been set, and an actuating-circuit containing mechanism at the sending-station controlled at the receiving-station, for calling into action or causing to operate the signal-transmitter, and means for indicating at the sending-station that the signal for which the transmitter has been set, has been attended to at the receiving-station, substantially as and for the purposes hereinbefore set forth.

5. The combination, substantially as hereinbefore described, of electromagnetically-controlled signaling mechanism at one station, controlling mechanism for the same at a second station, and more than one circuit connecting the two stations; one of said circuits being normally open at the first or sending station, and becoming normally closed when the mechanism is set, ready to operate; together with means whereby said circuit may be so closed when the signal is set and automatically reopened at the time of the completion of a signal transmitted, or after the control has begun at the receiving-station.

6. The combination, substantially as hereinbefore described, of electromagnetically-controlled signaling mechanism at one station, controlling mechanism for the same at a second station, and more than one circuit connecting the two stations; one of said circuits being normally open at the first or sending station, and becoming normally closed when the mechanism is set, ready to operate; together with means whereby said circuit may be so closed when the signal is started and is automatically reopened at the time of the completion of a signal transmitted, said means being electromagnetically controlled through the second circuit.

7. The combination, substantially as hereinbefore described, in an electromagnetically-controlled signal-transmitting mechanism; of a magnetically-controlled locking device, and organizations whereby the latter is not directly affected by the circuit changes accompanying or causing the signal transmission; and mechanism for causing the operation of the locking device to precede the signal transmission.

8. The combination, substantially as hereinbefore described, in a signaling instrument at one station of signal-transmitting mechanism on the circuit normally open at that station and signal-receiving mechanism on the circuit normally closed at that station; together with means for closing the normally-open-circuit terminals when the transmitting mechanism is in condition to transmit; and an electromagnetically-controlled unlocking device, operated from a distant station, and operating to permit the actuation of the re-

ceiving mechanism and to unlock the transmitting mechanism simultaneously.

9. The combination, substantially as here-
inbefore described, of a normally-open-circuit
5 signal-transmitting mechanism at one sta-
tion; a circuit-closer closing said circuit by
the act of preparing said transmitter to trans-
mit its signal, and means, on another circuit,

for controlling the operation of said signal-transmitter.

In testimony whereof I have hereunto set
my hand this 12th day of February, 1885.

F. BENEDICT HERZOG.

Witnesses:

PHILIP HERZOG,
F. E. Lyster.