

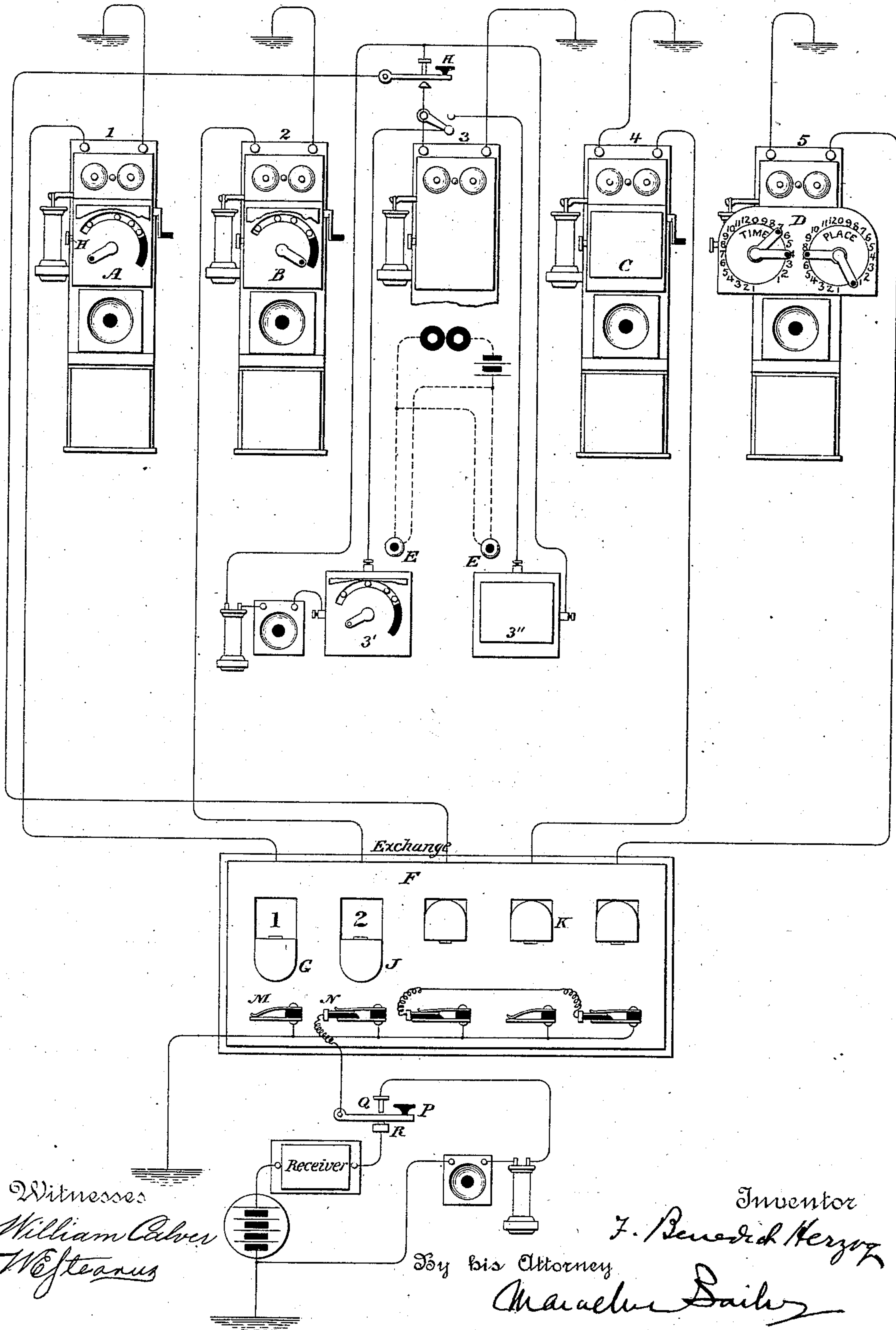
(No Model.)

F. B. HERZOG.

METHOD OF LATENT SIGNAL TRANSMISSION.

No. 314,293.

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Witnesses
William Calver
Weston

By his Attorney

Charles Bailey

Inventor

F. Benedict Herzog

UNITED STATES PATENT OFFICE.

F. BENEDICT HERZOG, OF NEW YORK, N. Y.

METHOD OF LATENT-SIGNAL TRANSMISSION.

SPECIFICATION forming part of Letters Patent No. 314,293, dated March 24, 1835.

Application filed February 10, 18 5. (No model.)

To all whom it may concern:

Be it known that I, F. 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 the Method of Latent-Signal Transmission, of which the following is a specification.

In Letters Patent No. 289,834, issued to me December 11, 1883, I have described an automatic signaling apparatus applicable to many different uses—such as telephone-exchange service, district telegraph and private circuits, hotel-annunciators, &c.—the main feature of which is that the apparatus may be properly set by a person desiring to signal to a distant point, and is so constructed that the desired signal is not transmitted at the moment of setting the instrument, (as is the case in instruments of the kind known as “transmitters,”) but the apparatus retains the signal as set until it is released directly or indirectly from a distant point by the person who is to receive the signal at the moment he is ready for it, and when he so releases it the signal is automatically transmitted to such receiver. These instruments, being capable of being set so as to transmit alterable signals or combinations of signals, enable the sender to convey any desired information within certain limits to the receiver, the time of receiving such signal, however, being entirely under the control of the receiver. In this and other pending and future applications I shall call such instruments “latent-signal transmitters.” In other pending applications I have shown the desirability of and means for enabling the transmitting operators to call the attention of the receiving operators to the fact that the “latent transmitter” is set and ready to release its signals. In others I have shown means whereby in special cases the receiving operators may be informed of the fact without, by the act of so informing the receivers, also prematurely releasing the “latent signal.” In this my present application I show a method by following which both of these desirable ends are attained. This method is applicable to many purposes; but I herein fully show it only as applied to one, which is to facilitate the attaining of connections in telephone-exchanges. To this end I use at the subscriber's station

make the subject of this application, but which I fully describe and claim in other applications, (Serial No. 144,194 and Serial No. 149,240,) to which applications I hereby refer for details of the manner in which this apparatus works. Its general nature and manner of working is that the subscriber is enabled to set this instrument so that when released by a current from the central office the instrument will automatically send back to the office a signal corresponding to the number of the subscriber he wishes to call up. This instrument can be set to indicate any number from one to ten thousand, or even more. By a simple change the indications upon the face can be arranged so that it will indicate not merely the number of the subscriber wanted, but also the number or other recognizable signal to indicate in which sub-exchange or central office of a large city system he may be.

In my application and claims for the instrument itself I do not limit myself to any particular form of construction, as I can make it in a variety of forms without departing from my invention.

Until my invention the usual method of calling up a subscriber was substantially as follows: The calling subscriber who wished to be connected with another first attracted the attention of the exchange operator, then spoke to her, giving the name of the desired subscriber. Thereupon the operator rings up the called subscriber, and, after having attracted his attention, connects the two. Of course, as there are many varieties of exchange apparatus, there are changes in the manner and detail of their operation; but they all have these general features. This of course makes it particularly necessary for the calling subscriber to remain at the telephone during the entire time required while the operator is called up, finds time to answer, hears the number wanted, calls up this number and connects the two, and until the called subscriber comes to the telephone to answer the call not only must the calling subscriber devote his time during all of these periods, but he must give all of his attention to the work, as it is well known that it is very difficult to call a number through the telephone so that it cannot be mistaken at the receiving end, and hence the required number must often be repeated sev-

eral times. If the called subscriber does not respond, or if his line is "busy," then the one who calls has wasted his time in this case just as long, or even longer, than it would have been if he had obtained his connection and if the call had been answered promptly.

The main object of this my invention is to improve upon this method, so that the subscriber has nothing to do but indicate upon the face of my apparatus the number of his want, when, by means of the variable automatic devices upon my instrument, the operator is automatically informed of the number wanted, and the subscriber's attention is not required after this until he receives the signal from the office either that the one called is at the telephone, or if he has not answered, or if the line is busy, then a signal indicating such fact. As this signal is given upon the bell of the telephone or sounded upon my instrument, it is evident that the subscriber can, after having properly set this instrument, immediately return to any part of the room in which his work may be, and, if he is successful in getting his correspondent, can, without any loss of time, go to the telephone as soon as the latter is there, and need not wait there before that.

In the accompanying drawings, 1, 2, 3, 4, and 5 represent subscribers' offices supplied with a set of telephone apparatus of the usual description, comprising transmitter, receiver, bell for receiving signals, and a magneto for calling up the central office. 1, 2, 3, and 4 are shown as supplied, in addition, with one form of my apparatus. 5 has another form which I do not claim herein, but make the subject of another application.

In 1 and 2 my apparatus is shown as fixed to the telephone. In 3 it is shown as being in a different room therefrom, and connected to it by means of a wire, and placed upon a desk in a private adjoining office. In this case two such boxes are shown and some details of construction hereinafter explained.

In office 1 the apparatus is shown as set to indicate that a certain number is wanted. The handle or crank pointing to the left indicates this.

In office 2 the apparatus is shown as having just been released. In office 4 it is shown with a flap or cover which is dropped down over the indication, so that no one in the room can see what telephone in the system is to be called up.

The lower part of the drawings represent the telephone-exchange. F represents a typical switch-board consisting of an upper row of annunciator-drops, and under this a row of spring-jacks, M N, &c. P is a double-contact key, which in its normal condition touches the upper contact, Q. The lower contact, R, is connected to a generator, which may be either a magneto-machine or a battery, (with or without a pole-changer in circuit.) The receiving-instrument is inserted in this part

of the circuit, according to my invention. In the switch-board F it will be seen that the annunciator-drops G and J, connected to the telephones 1 and 2, have their shutters or flaps dropped, (thus indicating that the preliminary call has been received upon them.) In the spring-jack M an insulated plug is inserted, connecting the operator's instrument with that of the subscriber No. 2. The operation of my invention and method of calling up the central office is then as follows: Subscriber No. 1 wishes to call the central office and to indicate the number of some one with whom he wishes to speak. He first sets his instrument, and then turns his magneto-crank, at the same time pressing in the button H, thus shunting or short-circuiting his apparatus, so that it will not be released by the action of the magneto-current. I do not here claim the circuits and manner of shunting or short-circuiting the magneto or other current thus sent to line, as I make this the subject of another application filed at even date. The magneto-current thereupon enters the switch-board by the individual line belonging to the subscriber, and after going through the annunciator-magnet it goes to the upper arm of the jack M, and then to ground, as shown. The current generated by the magneto drops the flap G in the well-known manner. The circuit and apparatus, here shown as 1, A, G, and M, here indicates the condition of the line and apparatus at this point of the operation. Thereupon, as soon as she is ready, the operator inserts a plug into the jack, as shown on line 2 and jack N. The lower part of this plug is insulated and separates the two arms of the jack, breaking contact between them, so that the line and direction of current is now changed through the key P, contact Q, and receiver and transmitter, as shown.

So far the operation at the central office is according to a well-known method. In using this method the operator would now ask the listening subscriber "what number," and would then "call up" the number desired by taking out the plug, inserting it in the proper jack, and then pressing her key P so that it touched the lower contact, R, thus sending a current to line from her generator or battery. According to my invention, however, the operator, instead of speaking to the calling subscriber, simply presses the key P, cuts out her instruments, and cuts in the generator and a receiving apparatus, as shown. The current from the generator now releases the apparatus B in station 2, (as fully described in my pending application hereinbefore mentioned,) and the operator receives the signal made by the breaks in the current upon her receiving-instrument in circuit, as shown.

It will be noticed that there can be no difficulty in correctly receiving the signal, for the reason that this signal does not come in to the operator when it is set by the subscriber, as would be the case in every form of apparatus heretofore invented for any analagous pur-

pose; but the signal is not received until she of her own accord, when she is fully ready and prepared to receive it, presses the key, thus releasing the apparatus and receiving the signal (which it is set to transmit) upon her receiving-instrument. Any form of receiving-instrument can be used—such as, for instance, a visual indicator, a sounder, a register, a single-tap bell, or a telephone in which the diaphragm would respond as an armature. In fact, if desired, a shunt can be so arranged that she receives the signal in the telephone-receiver which is on the upper contact, or, as it is called, the “talking-circuit.”

It will be seen that as the individual lines used by the subscriber can have several of my automatic signaling-instruments set at the same time, the operator can take her choice as to which of the various ones she wishes to attend to first, knowing, as she does, that in no case is the subscriber impatiently waiting at the telephone to indicate to her what number he wants. The releasing can be done by any form of current, either direct, as from a battery, or alternating, as from a magneto or pole-changer. In the drawings, office No. 2, apparatus B, annunciator-drop J, jack M, and key P show the condition at this part of the operation. It will be seen in box B that the crank points to the right, thus indicating to the calling subscriber that his signal has been transmitted to the central operator.

The apparatus is so constructed that the act of releasing the mechanism and the unwinding of the clock-work transmitter makes a noise which indicates and calls the attention of the subscriber to the fact that his call is being attended to. If, as is usual, there is also an ordinary “ringer” or bell in circuit, this of course will also respond to the call from the central office. In another application I show how a series of these boxes can be operated on one circuit.

In the drawings, office No. 3 is shown as supplied with two separate instruments, 3' and 3". 3' is shown in connection with a duplicate receiver and transmitter. This shows an application of my machine to office use, in which there is frequently a telephone in some outer office, and in which it is very desirable that the occupants of private offices should be enabled to have telephone communication with as little waste of time as possible, and also that they should be able to call up a desired correspondent without letting clerks and others in the outer office know who this correspondent is. The push-button E is supposed to be in the private office, and connects by a local circuit with a bell in the outer office. By means of this bell the attendant can be informed that a number is set on this apparatus, and can thereupon ring the magneto and connect the proper private office (if there are several) by the multiple-point switch shown; or he can first switch on the proper instrument and then press in the button H, thereby pre-

venting the signal from being released by the operation of his magneto; or it can be done automatically, as described in another pending application. Thereupon, when the central office releases his apparatus in the manner already described the occupant of the private office can, in the case of 3', speak directly with his correspondent, or, in the case of 3", go to the telephone in the next room without any unnecessary waste of time. I make this the subject of a separate application.

Upon hearing the signal the operator should answer by some arbitrary signal upon the bell or call-receiving instrument of the calling subscriber. This answer can be made by returning by signal-taps the number corresponding to the one called, thus preventing any mistake. This answering-number need not be the same, provided only it is prearranged, so as to be understood by the subscriber. The operator at the exchange can, if the called subscriber does not respond, indicate this fact to the calling subscriber by a properly-prearranged signal. In like manner, if the line is busy, she can inform the calling subscriber of that fact. In either of these cases, or in the case where the operator responds by the bell of the calling subscriber that the called subscriber will return at a certain hour, (as fully described in my Patent of December 11, 1883, No. 289,834,) the calling subscriber is informed of these facts without having to leave his seat, and without going to the telephone unless his correspondent is there ready to talk with him.

I have herein shown how to follow my method of latent-signal transmission in telephone-exchanges; but I do not limit myself to it for that purpose. It has been shown in that connection only merely for convenience of illustration. It is equally applicable to signaling between any two private stations, or to signaling between a central station and two or more outlying sub-stations, as in the case of a hotel; nor do I limit myself to its use with any particular form of latent-signal transmitters or of circuits.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a circuit system containing two or more electrically-connected stations at one of which (the sending-station) is a latent-signal transmitter and calling apparatus, and at the other of which (the receiving-station) are apparatus responding to the said calling apparatus and latent-signal transmitter and means for transmitting an impulse over the circuit to release said latent-signal transmitter, the hereinbefore-described method of signaling, consisting in first setting at the sending-station the latent-signal transmitter, and sending in a call from the station to indicate to the receiving-station that the transmitter is set and ready to be operated, and then at the receiving-station, upon receipt of said call, operating the releasing mechanism to release the latent-

signal transmitter at the sending-station, substantially as set forth.

2. In a circuit system containing two or more electrically-connected stations at one of which (the sending-station) are a latent-signal transmitter, a calling apparatus, and a safety apparatus, (to permit of the operation of the calling apparatus without during its operation releasing the latent-signal transmitter,) and at the other of which (the receiving-station) are apparatus for releasing and responding to the said calling apparatus and latent-signal transmitter and means for transmitting an impulse over the circuit to release the said latent-signal transmitter, the hereinbefore described method of signaling, consisting in, first, setting at the sending-station the latent-signal transmitter, sending in a call to the receiving-station, and operating the safety mechanism to indicate that the transmitter is set and ready to operate; and, secondly, at the receiving station, upon receipt of said call, operating the releasing mechanism to release the latent transmitter at the sending-station, substantially as and for the purposes hereinbefore set forth.

3. In an electric circuit containing two sta-

tions at one of which (the sending-station) are latent-signal transmitter, calling apparatus, and call-receiving apparatus so constructed as to be operated from the receiving-station, and where at the other of which (the receiving-station) are apparatus for releasing the said latent-signal transmitter responding to said calling apparatus and operating the call-receiving apparatus at the sending-station, the herein-described method of signaling, which consists in, first, at the sending station setting the latent-signal transmitter and sending in a call to the receiving-station; and, secondly, at the latter station releasing the latent-signal transmitter and sending in a call to the sending-station through the call-receiving apparatus at that station, to indicate to said sending-station that the call has been received and noted, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 10th day of February, 1885.

F. BENEDICT HERZOG.

Witnesses:

J. WALTER BLANDFORD,

M. BAILEY.