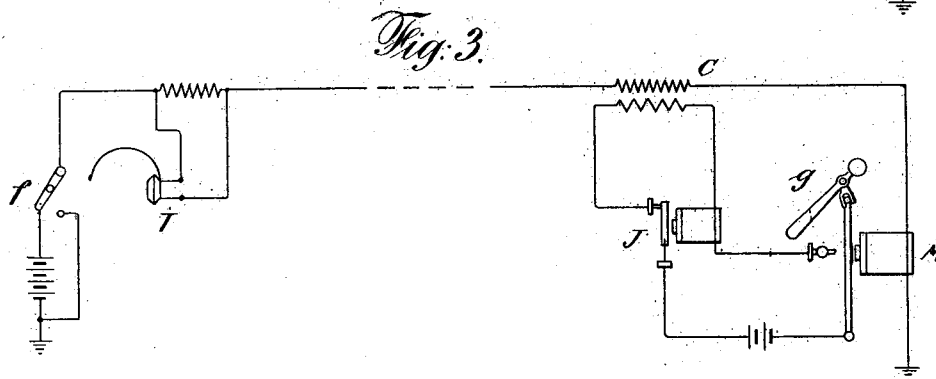
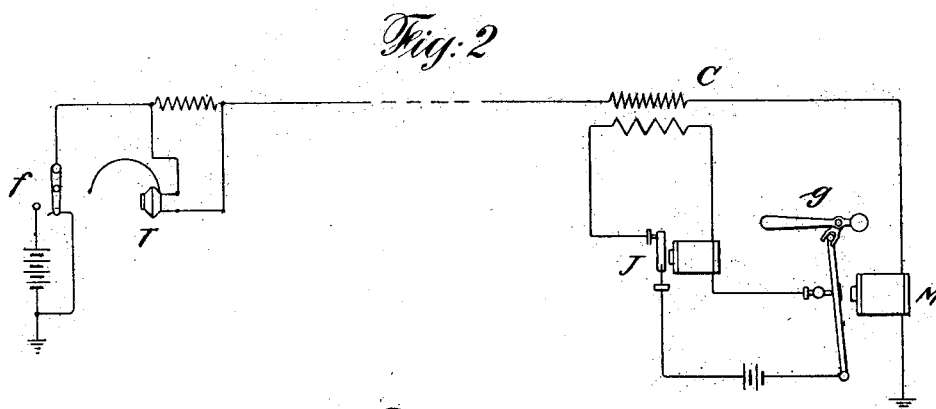
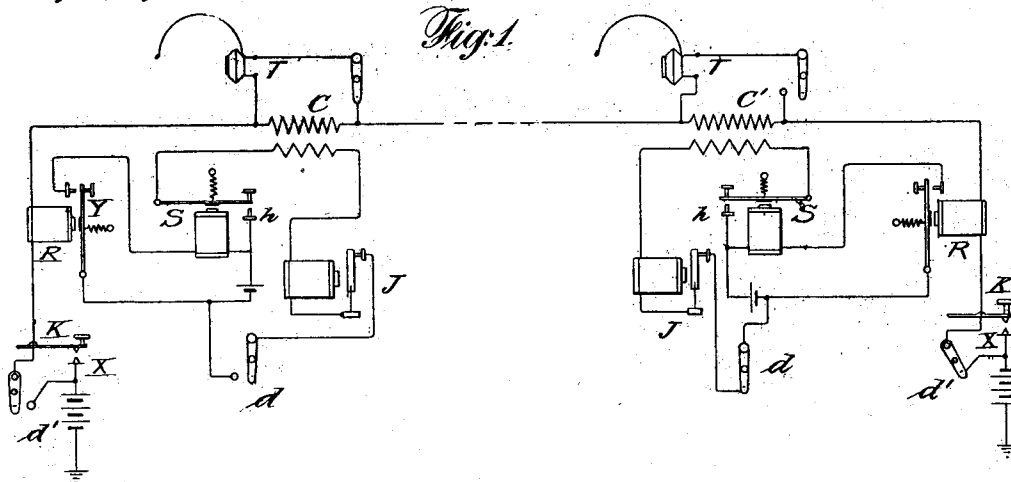


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TELEGRAPHY.  
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1,060,325.

Patented Apr. 29, 1913.



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# UNITED STATES PATENT OFFICE.

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1,060,325.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed May 9, 1911. Serial No. 625,944.

*To all whom it may concern:*

Be it known that I, PATRICK B. DELANY, a citizen of the United States, residing at South Orange, county of Essex, State of New Jersey, and at Nantucket, county of Nantucket, State of Massachusetts, have invented a certain new and useful Improvement in Telegraphy, of which the following is a specification.

My invention relates more particularly to Morse signaling but may be used in connection with various other methods of signaling.

The object of my invention is to provide an acknowledging or return signal from the distant end of a circuit to prove the operation of the distant receiver and the arrival of the signal transmitted from the sending station, so that each dot and dash sent over the line is automatically returned and registers itself at the sending station without interference with the signal impulses going out on the line.

It is well understood that in Morse telegraphy a station may be sending to a distant station while the latter may be cut off by a ground accidentally or designedly established during transmission, and that messages may be surreptitiously intercepted and prevented from reaching their destination. With this improvement the sending operator is advised instantly by the absence of the return signal that the receiving station has been cut off. He also knows whether the line is in good working order or whether intermediate repeaters are properly adjusted. Should the operator at the distant station unjustly complain of the quality of the arriving signals in order to conceal his own deficiency, the return signals will refute him: or should he absent himself from his post or fail to answer calls promptly the transmitting operator is informed by the return signal that the line is in good order and the calls are being recorded on the instrument of the delinquent operator. Another advantage of the system consists in the protection afforded against wire tapping. Should a receiver be inserted in the circuit and a ground put on to delay the message reaching its destination, failure of the return signals would give the alarm at once; and even if the attempt at tapping was made with such elaborateness as to include the use of a return signal device, it would undoubtedly fail as it would be practically impos-

sible to hit upon the same tone as that produced by the interrupter of the primary induction circuit employed at the receiving station. For train despatching circuits, or for verification of effects, or movements of semaphore or block signal arms, or other parts at a distance set in motion by passing trains, or responsive to operation of selector devices, their echo signal would prove reassuring and affirmative of safe conditions.

In the accompanying drawings Figures 1, 2 and 3 are diagrammatic views illustrating this invention.

Fig. 1 shows diagrammatically an arrangement for automatically returning to the sending station impulses of acknowledgment from the receiving station. If key K at X be closed the relay R at Y will be actuated and the circuit of sounder S closed in the regular Morse way. When the lever of sounder S reaches its lower stop *h*, the circuit of interrupter J is completed through its vibrating armature and spring contact and the primary of induction coil C that sends rapid alternations, due to makes and breaks at the buzzer J, through the secondary over the line to the secondary of induction coil C' at X with which coil telephone T is in parallel. When either station sends, the switch *d* is thrown open, so that the circuit of the primary of induction coil C or C' is not operated, and switch *d'* is closed. When receiving, the switch *d* at the receiving station is closed and switch *d'* is opened.

Fig. 2 shows diagrammatically a railway signal or semaphore *g* which has been set to danger in any suitable manner and that then acts to close at the signal station the circuit of buzzer J which sends back to the controlling station notification that the signal arm has moved from safety to danger position. Discontinuance of these signals will show that the arm has been restored, as for instance by magnet M, to the position of safety. If desired, where several arms or signals are to be actuated, each could be made to actuate the primary of induction coil C by an interrupter J having a rate of vibration different from the others so that such arm or signal would sound its own distinctive note in the receiving telephone T.

Fig. 3, represents a signal set at safety. That it is at this position may be verified by listening in the telephone which will be silent. When the signal is in the danger

position verification is constantly sounded in the telephone if the switch *f* is connected to the ground as shown in Fig. 2.

It is not deemed necessary to show or describe in detail the adaptability of this method of automatically drawing from a receiving station return or acknowledging signals for verification of the delivery of the primary signal impulse. It is believed that the invention covers broadly the automatic return of such signals simultaneously with the primary transmission or immediately after the receipt of such primary signal without appropriating the circuit to the exclusion of primary signal impulses. It will be seen that primary signal impulses and return or acknowledging impulses may occupy the line at the same time.

I claim:

1. In electrical signaling, a main circuit, a transmitter in said circuit, a receiver in said circuit, a local circuit controlled by said receiver, an interrupter in said local circuit and a transformer whose primary circuit is controlled by said interrupter and whose secondary circuit is in said main circuit.

2. In electrical signaling, a main circuit, a transmitter in said circuit, a receiver in said circuit, a local circuit controlled by said receiver, a signal instrument in said circuit, a local circuit controlled by said signal instrument, an interrupter in said local

circuit and a transformer whose primary circuit is controlled by said interrupter and whose secondary circuit is in the main circuit.

3. In electrical signaling, a main circuit, a transmitter in said circuit, a receiver in said circuit, a local circuit controlled by said receiver, a sounder or recorder in said local circuit, a second local circuit controlled by said sounder or recorder, an interrupter in and controlling said second local circuit, a transformer whose primary is in said second local circuit and whose secondary is in the main circuit and a receiver at the transmitting station for recording impulses from said transformer.

4. In electrical signaling, a main circuit, a transmitter in said circuit, a receiver in said circuit, a local circuit controlled by said receiver, a recorder in said local circuit, a local circuit controlled by said recorder, an interrupter in said local circuit and a transformer whose primary is controlled by said interrupter and whose secondary is in the main line, for the purpose set forth.

In testimony whereof, I have hereunto subscribed my name.

PATRICK B. DELANY.

Witnesses:

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CHAS. E. PERKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."