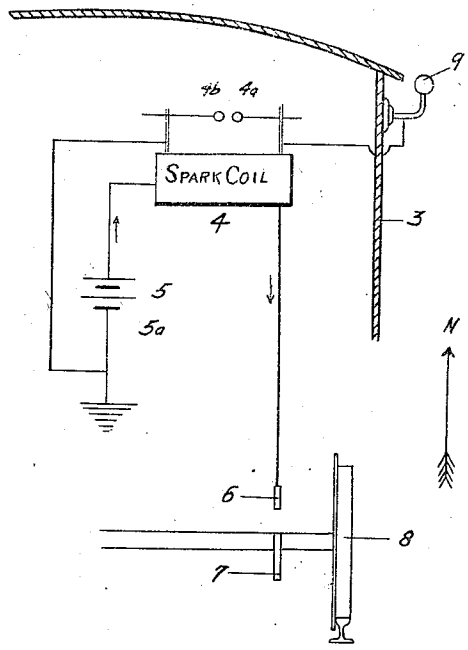
No. 829,192. PATENTED AUG. 21, 1906.

C. M. ALLEN.

ELECTRICAL SIGNALING DEVICE.

APPLICATION FILED OCT. 23, 1905.

Fig. 1.



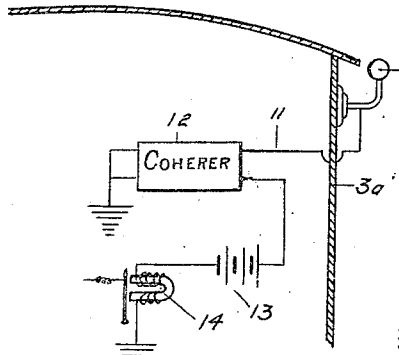
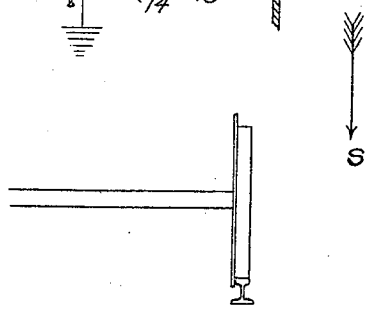
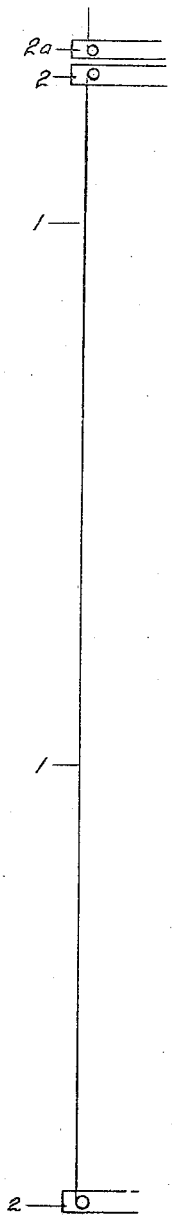


Fig. 2.





WITNESSES:

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CLINTON M. ALLEN, OF BAY CITY, MICHIGAN, ASSIGNOR OF THREE-FOURTHS TO FRANKLIN A. BENSON AND CHARLES F. BRAMAN, OF BAY CITY, MICHIGAN.

ELECTRICAL SIGNALING DEVICE.

No. 829,192. Specification of Letters Patent. Patented Aug. 21, 1906.

Application filed October 23, 1905. Serial No. 283,961.

To all whom it may concern:

Be it known that I, CLINTON M. ALLEN, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Electrical Signaling Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is an electrical signaling apparatus, and relates more particularly to devices whereby collisions may be prevented.

The object of my improved system is to warn the engineer on one train of the approach of a locomotive upon the same track.

A further object is to automatically set the air-brakes on one train when the other train approaches within a predetermined distance.

With these and other objects, which will appear later in this specification, in view, my invention consists in the devices illustrated in the accompanying drawings and the equivalents thereof.

Figure 1 is a diagrammatic view showing the installation of the transmitting apparatus on a locomotive. Fig. 2 is a similar view showing the receiving apparatus on the other locomotive.

As will be seen from the drawings, the device consists in an apparatus located on one locomotive whereby electrical waves are projected to an electrical conductor running parallel with the track, and on the other a suitable apparatus for receiving impressions from the conductor.

The general arrangement of the apparatus is as follows: A transmitter made up of a high-tension spark-coil, such as used for wireless telegraphy, having a range of, say, one hundred and fifty feet; a local battery-circuit made up of a battery, spark-coil, and contact-maker; a single iron wire of No. 9 Brown & Sharpe gage strung on a pole-line and insulated therefrom, the with to be in sections of a mile or greater in length running parallel to the right of way, and a receiving-circuit made up of a local battery, telegraph-sounder, and a coherer such as is used in a wireless-telegraph system, together with transmitting and receiving knobs made up of brass balls fastened to a suitable rod, and each connected to the system by means of wires.

The operation of the system is as follows: A bare iron wire 1 is strung on a pole-line parallel to the right of way of a railroad over which the signal system is to operate. The wire is in one continuous length over the distance designated to be covered by one section. The wire is ended at the poles 2, which are the beginning and the end of the section. The wire covering the next section starts at the first pole 2^a following the last pole of the preceding section. The wires of each section are not to be connected together. In the cab 3 of a locomotive attached to a train which is traveling, say, north is located the signal-transmitting apparatus, comprising a high-tension spark-coil 4, a local battery 5, and a contact-maker. The contact-maker is preferably constructed as follows: An insulated contact 6, of spring-copper, is placed on any suitable stationary part of the engine, and another contact 7, of spring-copper, is located on a revolving part of the locomotive—say on the inside of one of the drivers 8—the position of these two contacts being so arranged that once during every revolution the circuit is closed. Assuming the contact to be made as above described, the current from the local battery 5 will flow as follows: from the positive side of the battery 5 to the primary winding of the spark-coil 4 and from there, by means of an insulated wire, to the stationary point 6 of the contact-maker, then to the revolving point 7 of the contact-maker, through the metal of the engine, back to the negative side 5^a of the battery, which is connected to some convenient bolt or screw attached to the metal-work of the engine. This completes the local battery-circuit, which in turn causes a spark to jump between the spark-gap on the high-tension side of the spark-coil, thereby setting up electrical vibrations. If a brass ball 9 is supported on the outside of the cab and connected by a wire to one side 4^a of the spark-gap, the other side of the spark-gap being connected by a wire 4^b to the metal part of the engine, thereby grounding the high-tension current, electrical vibrations will be set up in the iron wire on the pole-line which is parallel to the right of way, and these vibrations will affect the wire in one section.

If a locomotive traveling south on the same track is fitted with receiving devices and is within the section covered by the iron wire of the train coming north, the vibrations sent out by the transmitting devices of the north-bound train will affect the receiving device of the south-bound train. The receiving device of the south-bound train consists of a brass ball 10, suitably supported to the cab $3^{a'}$ of the engine and connected by an insulated wire 11 to one side of a wireless-telegraph coherer 12, the opposite side of the coherer being connected by a wire to the metal part of the engine, thereby being grounded. The local battery-circuit in the cab 3^{a} of the south-bound train will be thrown into action by the passage of these vibrations through the coherer, thereby causing the battery 13 to operate suitably-placed magnets 14, which in turn actuate suitable signaling devices to warn the engineer of the approach of these other trains, or the magnets may operate further to actuate auxiliary devices, such as an emergency-air-brake valve.

For the sake of clearness in the drawings I have not illustrated in specific form the means for connecting the magnet 14 to the air-brake-actuating mechanism. Means for electrically operating air-valves are well known at the present time, and many such devices are to be found in the market. I therefore do not desire to confine myself to any particular form of apparatus interposed between the magnet and the air-brake system of the train, but wish it to be understood that any suitable device for the purpose may be employed.

Having fully described my invention, what I claim as new is—

1. The combination with an electrical conductor, of a traveling vehicle, a local circuit carried thereby, the circuit being suitably grounded, an intermittent make-and-break device located in the circuit and actuated by the movement of the vehicle, a high-tension spark-coil in the circuit, a transmitting member connected with the spark-coil, a second moving vehicle, a suitably-grounded local circuit carried thereby, a coherer in the circuit, a receiving member connected with the coherer and an electromagnet in said last-mentioned circuit, adapted to be energized by the electrical vibrations received by the receiving member from the electrical conductor.

2. In a railway signaling apparatus, the combination with a stationary conductor, and moving vehicles spaced apart from and adapted to travel adjacent to said electrical conductor, of a local battery-energized circuit carried by one of said vehicles, a make-and-break device located in the circuit and adapted to open and close the same coincident with the movement of the vehicle, a spark-coil in the circuit, the secondary of which is provided with spaced terminals, a transmitting member, located exteriorly of the moving vehicle and connected with one of the terminals of the secondary, a second local battery-energized circuit carried by another moving vehicle, the circuit being suitably grounded, a coherer in said circuit, a receiving member connected with the coherer and adapted to receive electrical vibrations from the stationary conductor, and an electromagnet in said circuit, said magnet adapted to be actuated by the electrical vibrations of the local circuit received from the stationary electrical conductor.

3. An electric signaling device comprising a stationary conductor, a vehicle movable adjacent the conductor, a local battery-circuit carried by the vehicle, one end of the circuit being grounded, a stationary contact with which the opposite end of the circuit is connected, a movable contact carried by a rotating part of the vehicle and adapted to engage the stationary contact lying in its path of movement, at every rotation, means in the circuit for projecting an electrical wave to the conductor, a second vehicle, and electroresponsive receiving means carried thereby and energized by the electrical wave projected from the first-named vehicle.

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

CLINTON M. ALLEN.

Witnesses:
D. C. WENZELL,
C. R. SACKETT.