No. 870,621. PATENTED NOV. 12, 1907.

N. P. FRASER & W. GRIBBEN.

ELECTRIC RAILWAY SIGNALING SYSTEM.

APPLICATION FILED MAY 17, 1907.

2 SHEETS—SHEET 1.

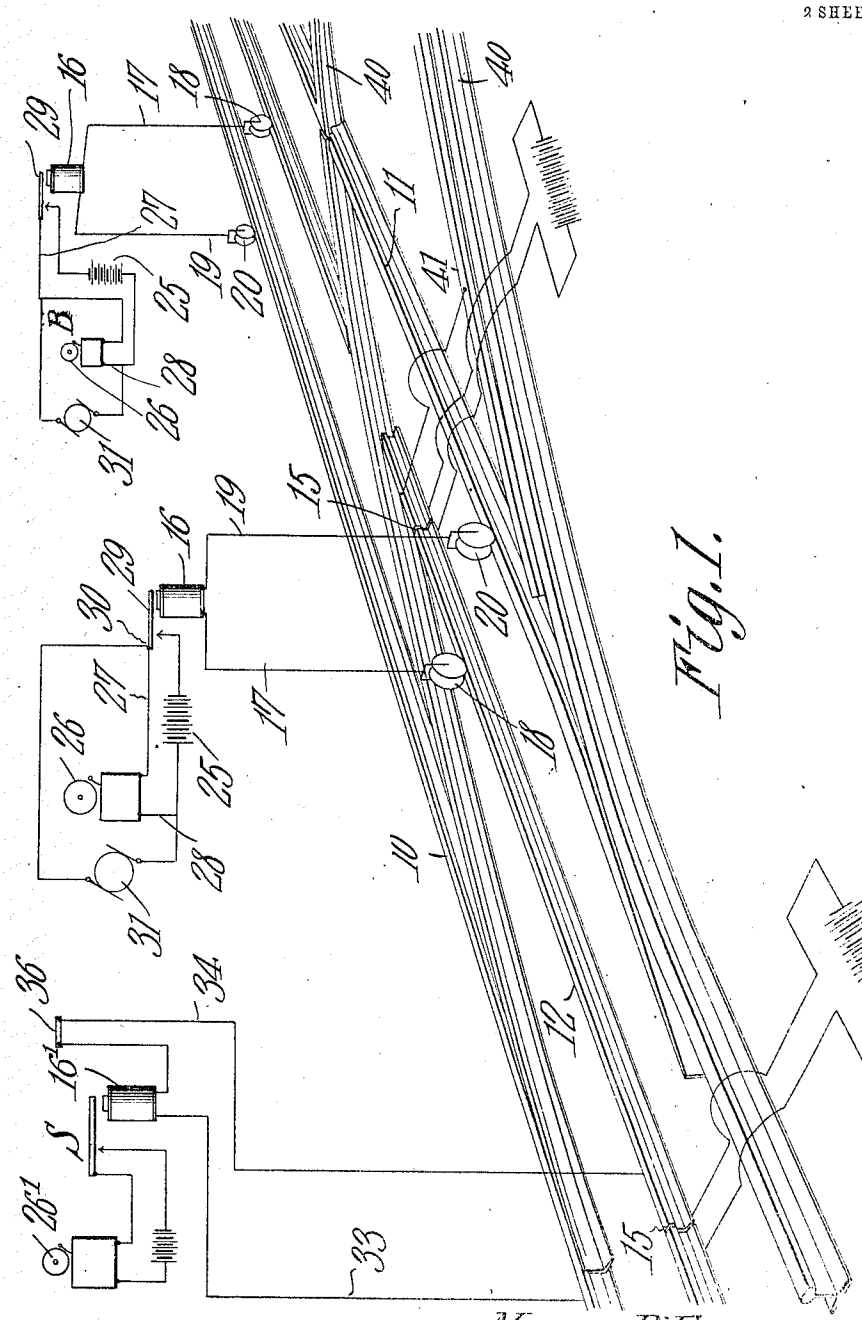


Fig. 1.

WITNESSES:

E. L. Williams

Jno. E. Parker

Norman P. Fraser
William Gribben
INVENTORS

By C. A. Snow & Co.

ATTORNEYS

No. 870,621. PATENTED NOV. 12, 1907.

N. P. FRASER & W. GRIBBEN.

ELECTRIC RAILWAY SIGNALING SYSTEM.

APPLICATION FILED MAY 17, 1907.

2 SHEETS—SHEET 2.

Fig. 2.

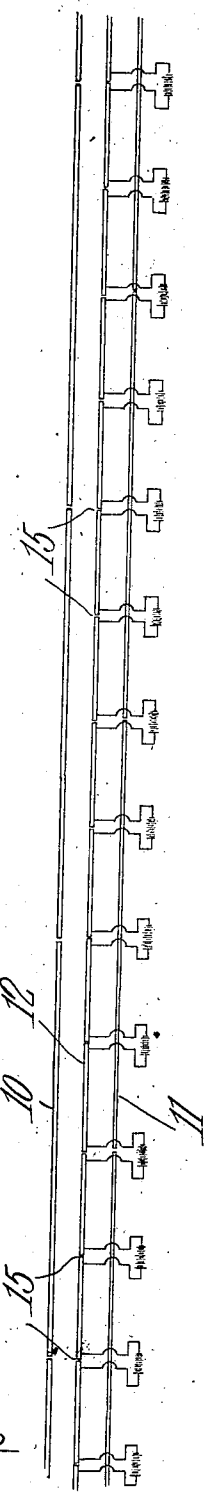
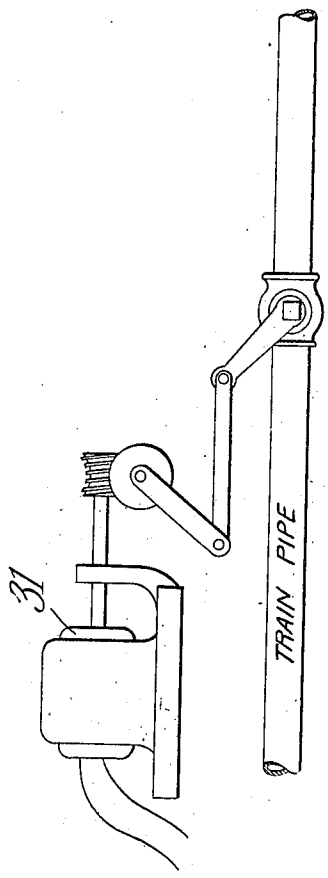


Fig. 3.



WITNESSES:

E. W. Hollenbeck

Jno. E. Parker

Norman P. Fraser and
William Gribben
INVENTORS

By C. A. Snow & Co.
ATTORNEYS

UNITED STATES PATENT OFFICE.

NORMAN PETO FRASER AND WILLIAM GRIBBEN, OF CARSONVILLE, MICHIGAN.

ELECTRIC RAILWAY SIGNALING SYSTEM.

No. 870,621. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed May 17, 1907. Serial No. 374,116.

To all whom it may concern:

Be it known that we, NORMAN PETO FRASER and WILLIAM GRIBBEN, citizens of the United States, residing at Carsonville, in the county of Sanilac and State of Michigan, have invented a new and useful Electric Railway Signaling System, of which the following is a specification.

This invention relates to electrical railway signaling systems, and has for its principal object to provide a means whereby trains running in any direction may receive warning when they approach within a danger limit, the apparatus being so constructed that a warning signal will be given whether the trains are approaching each other or traveling in the same direction, and without the necessity of employing pole changers.

A further object of the invention is to provide a system of this class by which a warning will be sounded in the cab of an engine approaching a misplaced switch or the like.

A still further object of the invention is to provide a system of this class in which a station agent or operator may control trains within a certain limit of each side of the station for the purpose of sending stopping or warning signals or the like.

A still further object of the invention is to so arrange the system that, when necessary, telephonic or telegraphic communication may be established from one end of the line to the other.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a general diagram of a signaling system arranged and constructed in accordance with the invention. Fig. 2 is a diagram of the tracks, third rail and batteries. Fig. 3 is a detail view of a form of train controlling device which may be employed.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The traffic rails 10 and 11 are divided into insulated blocks, each of any desired length, a distance of four miles being found most practicable, and each rail, therefore, forms a continuous conductor for the full length of the block circuit.

Between the traffic rails is a third rail 12 which may be mounted on the ties, or other support, in order to be engaged by a traveling shoe or other contact on the train, or it may be in the form of an elevated trolley wire. Conductor 12 is divided into sections of suitable length, preferably not less than one mile each, and at the juncture of each two sections 12 is a battery 15, so that the batteries and wire sections 12 are continuously connected in series.

At a suitable point on each train, as, for instance, in the cab, is an electro-magnet 16, which magnet is connected at one side to a wire 17 leading to a shoe 18 in contact with the conductor 12. The opposite side of the magnet is connected by a wire 19 to a shoe 20 which engages one or other of the traffic rails 10—11, and it is unnecessary to change the location of the shoe 20 when the position of the train is reversed, inasmuch as the apparatus is operable by engagement of the contact shoe with the rail 10 or the rail 11.

When two trains traveling toward each other approach within the signaling distance, that is to say, within two miles of each other, a circuit is closed from the positive pole of the battery 15 through conductor 12, contact shoe 18, wire 17, electro magnet 16 to train A, wire 19, contact shoe 20, to rail 10, thence through wheels and axles of one or both trains to the rail 11, contact shoe 20 of train B, wire 19, electro magnet 16, wire 17, contact shoe 18, conductor 12 to the negative pole of the battery, thus closing the circuit through both electro-magnets.

On each of the trains is a source of electrical energy represented in the present instance by storage battery 25. This storage battery is connected to an electrical alarm bell 26 through the wires 27, 28, the wire 27 being connected to the armature 29 of the electro-magnet 16, and said armature is movable into engagement with a contact point 30 when the electro magnets are energized. The circuit is closed simultaneously through both electro-magnets, so that both bells are sounded at the same time. When the armature moves down it also closes a circuit through the wires 30 to a motor 31, which motor is connected to a train controlling device, as, for instance, the air brake or the reversing lever or throttle valve, so that as soon as the signal is sounded the brakes will be set or the train stopped, as desired, thus positively preventing collision in case the engineer pays no attention to the warning signals.

Arranged at each station S is an electromagnet 16′ connected to an electric bell 26′ in the manner previously described, and the magnet circuit is connected to the conductor 12 by a wire 34, and to the traffic rail or rails by wire 33, so as to sound a warning in the station when a train is approaching. At each station there is also a switch 36 by which the circuit may be closed a predetermined number of times in order to send a signal to a train in accordance with any predetermined code.

The system is further applicable to frogs, switches, and the like, and in Fig. 1 there is shown a portion of a siding 40 including a guard rail 41.

As the guard rail is located only on the curved portion of the siding, it is not engaged by a car that has passed to proper position. One of the traffic rails 40 at the siding is electrically connected to one of the main line traffic rails, and the guard rail 41 is connected to one of the sections of the conductor 12 so that in case a car remains on the curved portion of the siding with one of the wheel flanges in engagement with the guard rail, the guard rail and track 40 will be in electrical connection and where a train approaches on the main line the circuit will be closed through the alarm of such train.

The invention may be further applied to effect closing of the circuit at different points, as, for instance, by an open switch, by the turning of a draw bridge, or by short circuiting between one of the traffic rails and conductor, the latter closing permitting the sending of a signal to an approaching train by a section boss or other workman.

Inasmuch as the electric circuit of the conductor 12 is continuous to the end of the road, it is possible in case of a break down or at any other time to connect a telephone or telegraph instrument by connecting the instrument between the conductor and the ground. To make the connection it is merely neeessary to drive an iron or other metallic stake into the ground and connect the instrument in circuit with the conductor 12.

It will be noted on reference to Fig. 2 that the four mile sections of traffic rail are staggered, and that the joints of the one mile sections of the conductor 12 are arranged opposite the meeting ends of the sections of the traffic rails. This will permit of a four mile signaling limit in case two approaching trains arrive at the same time at the opposite ends of one of the four mile sections of traffic rail.

I claim:

1. In an electric railway signaling system, traffic rails, a conductor divided into sections, a source of energy connecting each two sections, the entire series of sections and entire series of sources of electrical energy being connected in series, an alarm mechanism on each train, and a train circuit including contacts, one arranged to engage the sectional conductor, and the other arranged to engage one or other of the traffic rails in accordance with the direction in which the train is to travel.

2. In an electric railway signaling system, a pair of traffic rails, a sectional conductor, a battery connecting each two sections, the several sections and batteries being connected in a continuous series, an electro magnet on each train, a train circuit extending from the electro-magnet to traveling contact shoes arranged to engage the conductor and one or other of the traffic rails, a source of energy on each train, a local alarm circuit connected to such source of energy, and an armature arranged under the control of the electro-magnet and serving to close the local circuit when the magnet is energized.

3. In an electric railway signaling system, a pair of traffic rails, a conductor divided into sections, a battery connecting each two sections, the entire series of conductor sections and batteries being connected in series, an electro magnet on each train, conducting wires extending from the electro magnet to traveling contacts on the train, one contact arranged to engage the conductor, and the other one or other of the traffic rails, an armature disposed within the field of force of the electro magnet, a source of electrical energy, an alarm, and an electric motor, all arranged on the train, the motor being designed to operate a train controlling device, and local circuits connecting the source of energy, the alarm and the motor, said local circuits being under the control of the armature.

4. In an electric railway signaling system, the combination with traffic rails, and siding rails, the latter including a guard rail, a sectional conductor parallel with the main traffic rails, batteries connecting each two sections of the conductor, connections between the guard rail and one of the sections of the conductor and between one of the siding rails and one of the main rails, and an alarm arranged on each engine and disposed in the train circuit having terminals arranged to engage one with the sectional conductor, and the other with one or other of the traffic rails.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

NORMAN PETO FRASER.
WILLIAM GRIBBEN.

Witnesses:
WM. J. MCCAREN,
F. C. CRABEY.