(No Model.) 2 Sheets—Sheet 1.

B. CADE.

ELECTRIC RAILROAD TELEGRAPH.

No. 419,313. Patented Jan. 14, 1890.

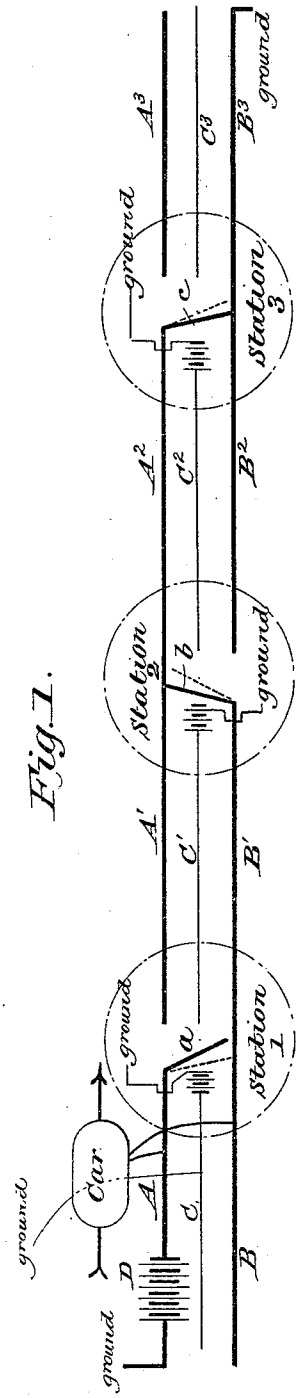


Fig. 1.

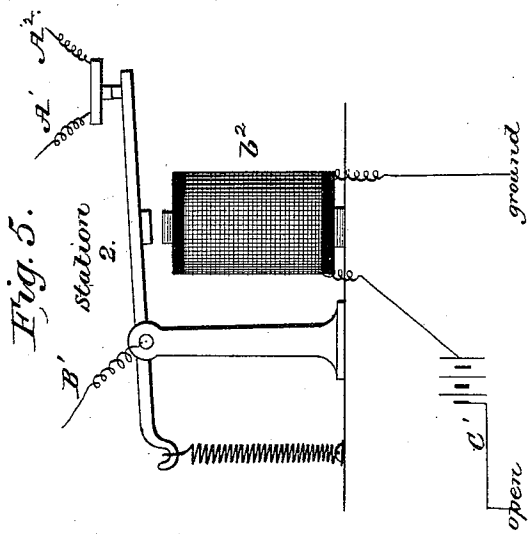


Fig. 5.

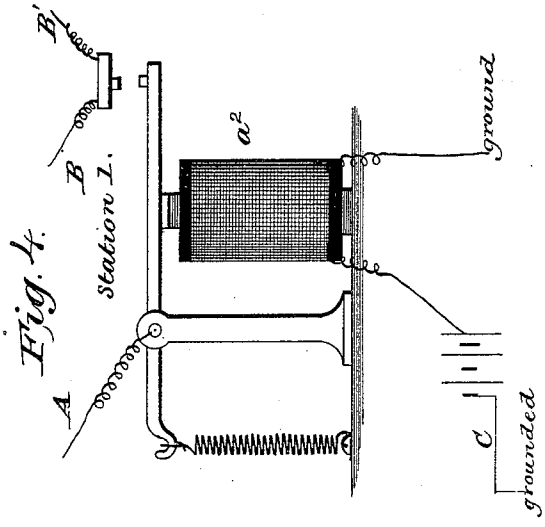


Fig. 4.

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Fig. 2.

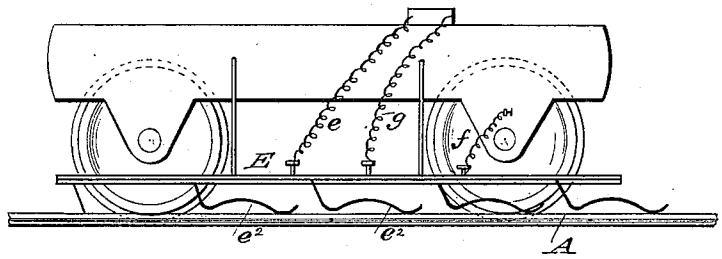
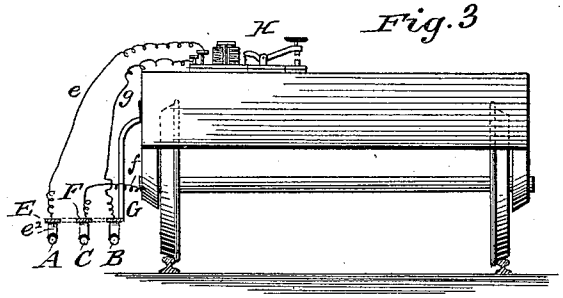


Fig. 3



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ELECTRIC RAILROAD-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 419,313, dated January 14, 1890.

Application filed May 11, 1889. Serial No. 310,363. (No model.)

To all whom it may concern:

Be it known that I, BAYLUS CADE, a citizen of the United States, residing at Louisburg, in the county of Franklin and State of North Carolina, have invented certain new and useful Improvements in Electric Railroad-Telegraphs, of which the following is a specification.

The object of my invention is to provide an improved electric railroad-telegraph operating upon the block system, so as to prevent one train from entering upon a given section of track until the preceding train has passed off the same, and adapted to permit one moving train to communicate telegraphically with another moving train, or all the trains that may be upon that road; and it consists in the peculiar arrangement of circuits, sliding contacts, and electro-magnets upon the train and at the various stations, which I will now proceed to describe.

Figure 1 is a diagrammatic view of the circuit-wires extending parallel with the track and past three stations. Fig. 2 is a side and Fig. 3 an end view of a car with the sliding contacts adapted to co-operate with the circuit-wires and the instrument on the train. Fig. 4 is a view showing the arrangement of the circuit-wires and the position of the instrument at the first station; and Fig. 5 is a similar view showing the position of the instrument and arrangement of circuits at the second station.

Referring to Fig. 1, there are shown three parallel circuit-wires or conductors which extend in sections the full length of the track beside the same, and which conductors are designed to be in constant sliding electrical contact with a corresponding set of sliding contact-springs on the car. Of these three circuit-wires one is composed of the sections A A′ A^2, &c., of which one section A extends from the main battery D to the first station, (indicated by a dotted circle.) The second section A′ extends from the first station to the second station, and there connects without break with the third section A^2, running to the third station, and A^3 is a duplicate of section A′ to the next station beyond, (not shown.) The other conducting-wire is composed of sections B B′ B^2 B^3, &c. The first section B extends past the first station and without break connects with the second section B′, running to the second station. The third section B^2 runs from the second station to the third station, and there without break connects with the fourth section B^3, which goes on to the next station, and so on. The other line of conductors consists of a series of independent short circuits C C′ C^2 C^3, &c., each of which extends from one station to the next. The first section C extends from the starting-point to the first station, where it has a battery and instrument, hereinafter described, and one pole of which battery is permanently grounded at this station, while its other pole C is normally open, except when grounded through a sliding contact on the car having connection with the car-wheels. The next section C′ is similarly arranged between the first and second stations, and the next section C^2 is similarly arranged between the second and third stations. At the first station there is an instrument for connecting the section A to the sections B B′. This instrument is diagrammatically indicated at *a* in Fig. 1, and is operated by the battery of the section C. The details of this instrument and its relation to the circuit are shown in Fig. 4. At the second station there is an instrument for connecting the section B′ to the sections A′ A^2. This instrument is diagrammatically indicated at *b* in Fig. 1, while its details and connections are shown in Fig. 5, and so on.

One of the cars of the train is equipped with three contact-bars E F G, (see Figs. 2 and 3,) which are spaced a distance corresponding to the distance between the line-wires A C B, &c. Each of these contact-bars is provided with a sufficient number of sliding contact-springs e^2 to insure a constant and uninterrupted contact with its corresponding line A, C, or B. The two contact-bars E and G, Fig. 3, are provided with wires *e* and *g*, leading to a telegraphic instrument H on the car, while the third middle contact-bar F has a wire *f*, leading to the wheels of the car for securing a ground-connection.

Now when there is no car on the line the main circuit (see Fig. 1) is closed at the instrument *a b c* of the several stations, and the current from the main battery D flows through A to B′, to A^2 to B^3, to ground, and returns thence to the main battery. As soon as

the car moves onto the first section between the main battery and the first station the wheels of the car make a ground-connection for the open end of section-wire C, (see Fig. 3,) and thus through the battery of that section at the first station, and a magnet a^2, Fig. 4, at that station throws the line A out of connection with B B′, breaking the main circuit at the point. The main-line current then passes from section A up through wire *e* to the instrument H on the train, and, returning through wire *g*, reaches the line-section B, thus causing on this section the main-line current to be established through the instrument on the car. It will therefore be perceived that when the car passes onto the section C the main line is broken through A B′ and is made through the car between A B. Every train therefore has the main circuit completed through its own instrument, and hence one moving train can always communicate with other moving trains as well as with the stations. Upon all sections on which no train is passing the main line is completed through the instrument at the stations, because the section-circuits (C′ C^2, for instance) are open. Thus in section C′, the end opposite the battery being open, the battery has no influence on the magnet b^2, Fig. 5, and hence the spring of the armature-lever holds the line B′ in electrical contact with A′ A^2. All other sections on which no train is passing are in a similar adjustment.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric railroad-telegraph consisting of three conductors for sliding contact, one of which is made in sections that extend from station to station, and has in each section a battery with a normally-open circuit and one pole grounded, and the other two of which conductors extend in alternating sections a distance of two stations, and are normally connected and provided with a main battery, in combination with sliding contacts and a telegraphic instrument on the car, and devices for opening and closing the main circuit at the stations by the action of the section-batteries, substantially as shown and described.

2. An electric railroad-telegraph consisting of three conductors A A′ A^2, B B′ B^2, C C′ C^2, made in sections, the alternating sections A and B, &c., forming the main line and provided with a main battery, and the sections C, &c., being each provided with a battery and extending between stations, electro-magnetic circuit-breakers located at the station and operated by the batteries of sections C, and the car having instrument H, contact-bars E F G, with springs bearing, respectively, upon the conductors, the bars E and G being connected electrically to the instrument H and the bar F to the wheels of the car, substantially as shown, and for the purposes described.

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