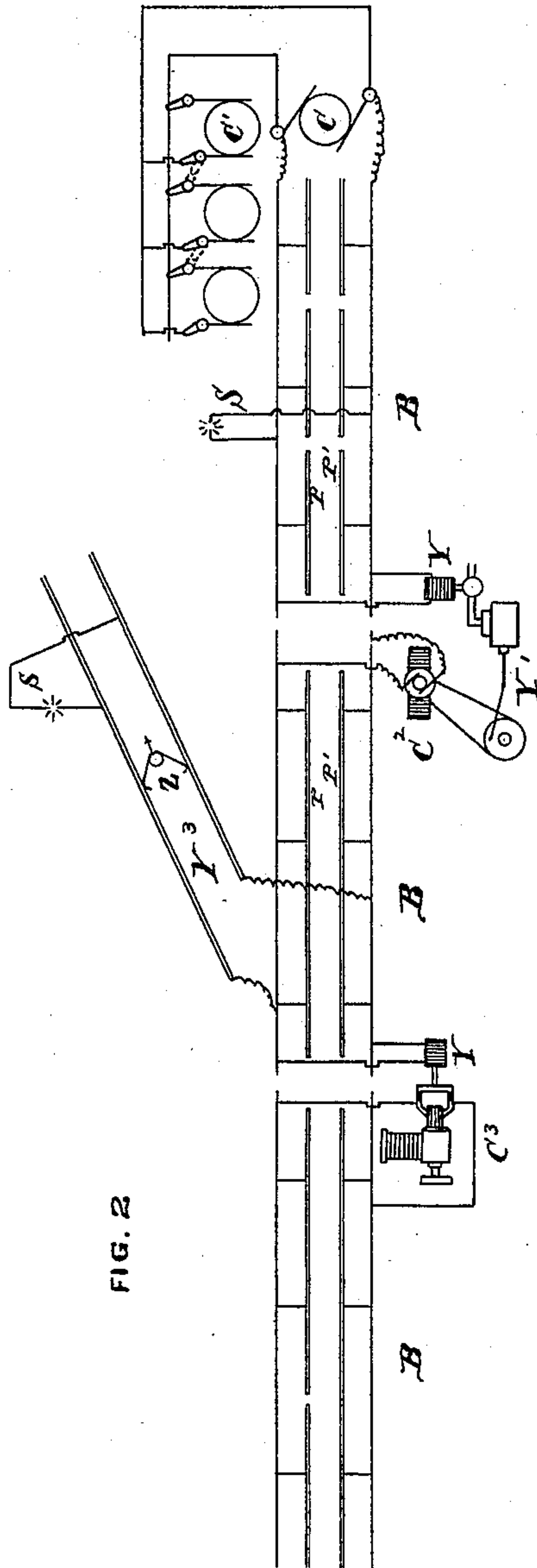
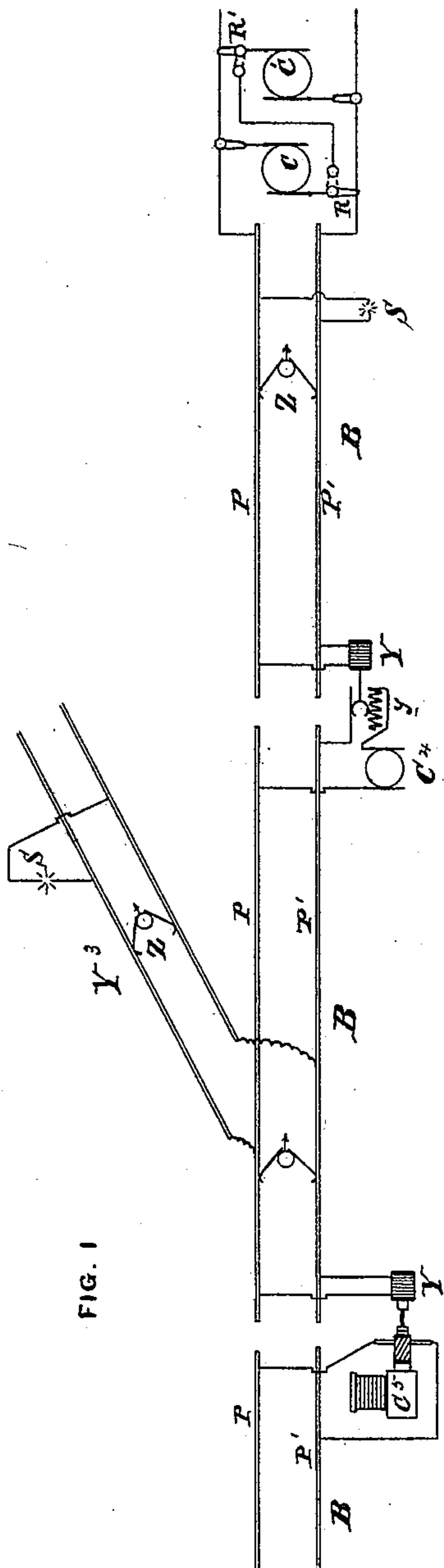


(No Model.)

R. M. HUNTER.
ELECTRIC RAILWAY.

No. 451,154.

Patented Apr. 28, 1891.



Attest:
Henry Drury
C. W. Breckinridge

Inventor:
R. M. Hunter

UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE THOMSON-HOUSTON ELECTRIC COMPANY,
OF BOSTON, MASSACHUSETTS.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 451,154, dated April 28, 1891.

Original application filed March 18, 1886, Serial No. 195,742; Divided and this application filed September 21, 1887. Serial No. 250,273. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electric Railways, of which the following is a specification.

My invention has reference to electric railroads; and it consists in certain improvements in the construction, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

This is a division of my application filed March 18, 1886, Serial No. 195,742.

The object of my invention is to provide a main-line railway with working-conductors, which may be the rails or independent conductors, and supply current thereto by supply or line conductors leading from a stationary source of electric supply and connected at intervals by branch conductors and combine therewith a branch railway receiving current from the same source as the main-line railway by means of the supply-conductors.

My object is also to employ the supply-conductors as conveyers of current for electric lighting of the railway, whereby the lamps may be independent of the working-conductors.

In the drawings, Figure 1 is a diagram illustrating an electric railway made in sections and each having an independent generator, and which generators are all controlled from the home station. Fig. 2 is a similar view illustrating modifications of the details of construction.

C and C' are two generators to supply electricity to the line, and may be coupled up in multiple arc or series.

R and R' are switches, which when moved change the connection of the generators from multiple arc to series, or vice versa. These switches R R' might be moved by hand. The multiple connection will suffice unless the atmospheric condition is such that it interferes with the contacts on the various parts, motors, circuits, &c., or if the moist atmosphere carries off current on the leakage account to such an extent that the remaining current is

inadequate to the requirement. It often necessitates that an increased electro-motive force is required to keep the road in working condition; also, in the case of one or more short branch roads Y³ suddenly thrown into working connection by one or more motors Z thereon being put into action, the resistance will decrease and the demand for current in the system is increased. It is evident that there may be more than two generators with similar coupling devices.

In Fig. 1 I have several sections B of working-conductors P P', controlled from the home station, where the generators C C' are located.

In Fig. 2 I have the working-conductors in sections and supplied with electricity from supply-conductors; but so far as my invention is concerned it is immaterial what these arrangements are.

In Fig. 1 the current in the first section of railway is made to act by the helix Y to cut in or out resistances γ to vary the current delivered by the generator C⁴ to the next section, or a helix may be used to shift the commutator of the generator C⁵ for the next section to control its current delivered to the next section.

In Fig. 2 the end of a long section of line conductors is provided with a controlling helix or magnet Y to control the speed of the steam-engine Y', which drives the dynamo-electric machine C², which supplies electricity to the next section and so on, or the magnet Y may be used to move the brushes, as shown at C³, to control the current in said distant sections. By this means the current in the various sections of the main lines may be kept relatively uniform with that indicated at the home station.

By making the line conductors separate from the working-conductors they may be thoroughly protected, and not having the severe usage of the working-conductors there will be less liability to leakage. When a section of working-conductor needs repairing, it may be removed without disturbing the main or line conductors, or the line conductors may be changed or tapped for auxiliary uses as a

branch road or for an electric light (see Figs. 1 and 2) without interfering with the working-conductors, and these additions or changes may be made while the electric railway is in operation. The line conductors may be bare or insulated rails or wires and may be hung on poles, buried in the ground, or placed in the conduit.

8 are electric lights in multiple connection with the line or working conductors of the main line and branch road, and receive current from the generators C C' through the electric-railway conductors.

It is desirable that the generators be small in size and in numbers sufficient that they may be coupled up in the series or multiple-arc connection to supply the demand. It is evident that part of such generators might be coupled up in series and these as a unity coupled up with other generators. By using small generators the various ways of coupling up the generators enables the requisite tension or volume of current desired to be readily obtainable.

I do not limit myself to the details herein set out, as they may be modified in various ways without departing from my invention.

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

1. In an electric railway, the combination of a main-line railway having a working-conductor with which the electric vehicle makes traveling contact, a branch railway also having a working-conductor, a fixed source of electric supply, a line or supply conductor extending along the main-line railway to and connecting with the working-conductor of the branch, and conductors electrically connecting the supply-conductor at intervals along its length with the working-conductor of the main-line railway.

2. In an electric railway, the combination of a main-line railway having a working-conductor with which the electric vehicle makes traveling contact, a branch railway also having a working-conductor, a fixed source of electric supply, a line or supply conductor extending along the main-line railway to and connecting with the working-conductor of the branch, conductors electrically connecting the supply-conductor at intervals along its

length with the working-conductor of the main-line railway, and electric lights receiving current from the supply-conductors to light the railway from the same source as the source of power.

3. In an electric railway, the combination of a main-line railway having a working-conductor with which the electric vehicle makes traveling contact, a branch railway also having a working-conductor, a fixed source of electric supply, a line or supply conductor extending along the main-line railway to and connecting with the working-conductor of the branch, conductors electrically connecting the supply-conductor at intervals along its length with the working-conductor of the main-line railway, and a regulator for controlling the current fed to the line or supply conductor, and thereby the current simultaneously supplied to the main-line and branch railways.

4. In an electric railway, a main-line railway, combined with a branch railway, a sectional working-conductor arranged along the main-line railway, a working-conductor for the branch railway, a stationary source of electric energy, a continuous-supply conductor leading from the source of supply to the conductor of the branch railway, and conductors connecting each section of the working-conductor of the main line with the continuous-supply conductor.

5. In an electric railway, a main-line railway, combined with a branch railway, a sectional working-conductor arranged along the main-line railway, a working-conductor for the branch railway, a stationary source of electric energy, a continuous-supply conductor leading from the source of supply to the conductor of the branch railway, conductors connecting each section of the working-conductor of the main line with the continuous-supply conductor, and an automatic regulating device at the source of supply for controlling the current delivered to the supply-conductor.

In testimony of which invention I hereunto set my hand.

RUDOLPH M. HUNTER.

Witnesses:

RICHD. S. CHILD, Jr.,
E. M. BRECKINREED.