

N. H. TURNER.
ELECTRIC RAILWAY.
APPLICATION FILED MAR. 29, 1911.

1,019,381.

Patented Mar. 5, 1912.

Fig. 1.

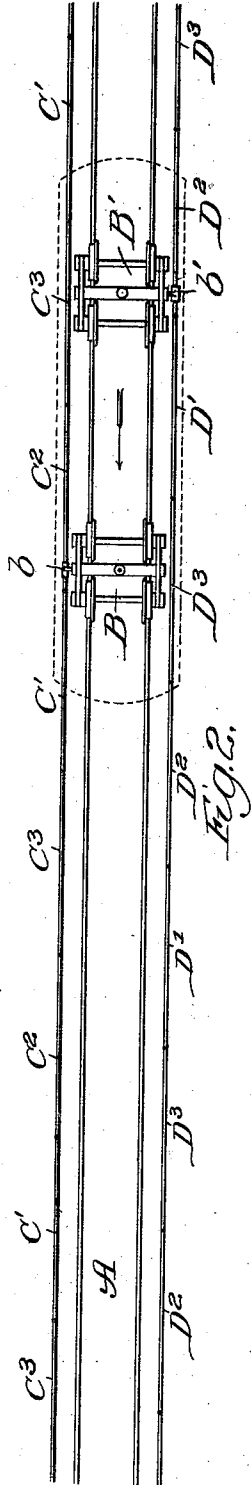
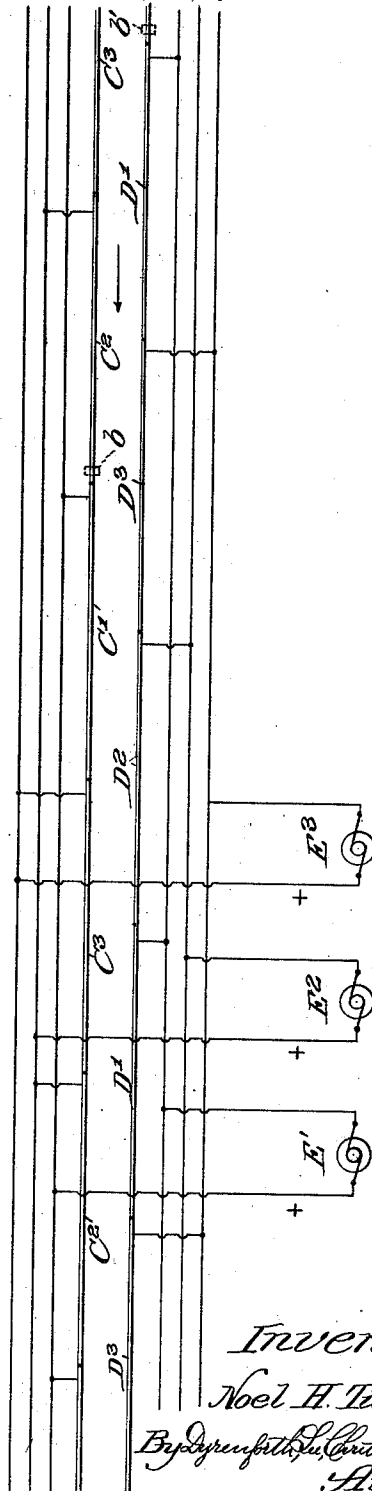


Fig. 2.



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UNITED STATES PATENT OFFICE.

NOEL H. TURNER, OF VULCAN, MICHIGAN.

ELECTRIC RAILWAY.

1,019,381.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed March 29, 1911. Serial No. 617,602.

To all whom it may concern:

Be it known that I, NOEL H. TURNER, a citizen of the United States, residing at Vulcan, in the county of Dickinson and State of Michigan, have invented a new and useful Improvement in Electric Railways, of which the following is a specification.

My invention relates to certain new and useful improvements in electric-railways, and is fully described and explained in the specification and shown in the accompanying drawing, in which:

Figure 1 is a plan view of a section of a railway embodying my invention, showing a car thereon, and Fig. 2 is a diagrammatic view illustrating the electrical connection.

Referring to the drawings, A are the rails of the track upon which the trucks of a car are run.

B and B¹ are the trucks of the car, each one carrying a collecting shoe, said shoes being indicated by *b* and *b*¹, respectively. On opposite sides of the track are electrical feed-rails or conductors made up of separate successive sections, the rails on one side being indicated by C¹, C², C³, as illustrated, and the sections on the other side being indicated by D¹, D², D³, respectively. These sections of the conductor-rails are insulated from each other and from the ground and the sections upon the opposite sides of the track are staggered with respect to each other, or break joints, so that the joint between the adjacent sections upon one side of the track is in the center of the corresponding opposite section, as illustrated. Furthermore, the section D¹ falls opposite the joint between the sections C² and C³, the section D² opposite the joint between the sections C³ and C¹, and the section D³ opposite the joint between the sections C¹ and C². Thus each section on a rail lies in its entirety opposite to the two sections upon the opposite conductor-rail having the remaining two numbers.

E¹, E², and E³ are three dynamos which may be independently driven, or may have their rotors mounted, if desired, upon a single shaft. The three generators have their two poles connected to the correspondingly numbered sections in the opposite conductor-rails. That is, the poles of the generator E¹ are connected to the conductor-rail sections C¹ and D¹, etc. Each conductor-section is in length two-thirds of the distance between the trucks upon the cars adapted to

be used upon the track. The result of this construction is that the collector-shoes *b* and *b*¹, carried by the trucks, will at all times lie upon the correspondingly numbered section of the conductor-rails, so that at any given moment the current from a single generator will flow through the car. As the car moves along, it will be supplied with current successively by the three generators. The correspondingly numbered sections of the conductor-rail are, however, so spaced with reference to each other that no section lies opposite a correspondingly numbered section and therefore, there is no danger of a short-circuit transversely of the track. It is thus possible to build a system with bare conductor-rails which can be crossed with impunity.

I have illustrated a system embodying the least possible number of generators which can be used and still obtain the benefits inherent in my invention. It is, of course, desirable to get the greatest possible longitudinal separation between the closest parts of correspondingly-connected rails in the two opposite conductors. If only two generators were used, the greatest possible degree of separation that could be secured would be to place the rails in alternation, the sections connected with the two generators lying opposite to each other, that is, the section No. 1 opposite section No. 2, and so on. In such a construction a short-circuit could be obtained between two No. 1 sections by anything lying at the very small angle to the track. As the number of generators is increased, as long as the correspondingly-connected sections in one rail are put exactly opposite the center of the gap between the correspondingly-connected sections of the opposite rail, the distance which must be bridged to make a short-circuit becomes gradually greater. It will be understood, of course, that the distance between the collector-shoes is relatively fixed on account of practical considerations connected with car building. With three generators, as here illustrated, each rail will be, in length two-thirds of the distance between the trucks and the longitudinal distance which must be bridged to make a short-circuit will be one-third of that distance or, in practice, something over ten feet. Should four generators be used, the sections will be correspondingly shorter and the correspondingly numbered sections being placed oppo-

site the center of the gap between the corresponding sections in the opposite conductor, section 1 will lie directly opposite section 3 in the other rail. In this case the conductor-sections will each be made one-half the distance between the trucks, and it would be necessary to span an equal longitudinal distance to make a short-circuit. If five successive sections were used and five generators, the same staggering arrangements being adopted, that is, section 1 in one rail being placed midway between two section 1's in the opposite rail, each section could be made two-fifths of the distance between trucks and it would be necessary to bridge a longitudinal distance of three-fifths of the distance between the trucks to get a short-circuit. In this way and in an obvious manner, the same principle as is here outlined can be used with any number of generators, the sections being correspondingly shortened, and the danger of a short-circuit correspondingly lessened. However, since the increase in the number of sections will greatly increase the expense in lead wire and in track-laying, and since a gap 10 ft. long and the full width of the track is probably quite sufficient for practical safety under all conditions, I prefer the arrangement here shown. However, I do not intend, by having described this preferred form in detail to limit myself thereto, my intention being in the accompanying claims to set out all the novelty which is inherent in the construction illustrated as broadly as the state of the art will permit.

I claim as new and desire to secure by Letters Patent—

1. In an electrical-railway system, two parallel conductors, each divided into successive sections insulated from each other, more than two generators, leads from the poles of the generators running to the conductor sections, and connecting them in groups, the lead from one pole of each generator running successively to correspond-

ing sections of each group in one conductor and the lead from the other pole of each generator running successively to corresponding sections of each group in the other conductor, the sections in each group being equal in number to the generators and being arranged in the same order, the sections in one conductor being placed opposite the gaps between the correspondingly-connected sections in the opposite conductor, and a car having two shoes contacting with the two conductors and separated longitudinally by such distance that the two shoes lie always on sections connected to the same generator.

2. In an electric-railway system, two parallel conductors, each divided into successive sections insulated from each other, three generators, leads from the poles of the generators running to the conductor sections, and connecting them in groups, the lead from one pole of each generator running successively to corresponding sections of each group in one conductor and the lead from the other pole of each generator running successively to corresponding sections of each group in the other conductor, the sections in each group being equal in number to the generators and being arranged in the same order; the sections in one conductor which are connected to any one generator being placed directly opposite the junction between the two sections in the opposite conductor which are connected to the remaining two generators, as illustrated, and a car having two shoes contacting with the two conductors and separated longitudinally by such distance that the two always lie on the sections connected to the same generator.

In testimony whereof I have hereunto set my hand and affixed my seal this 28th day of February, 1911.

NOEL H. TURNER. [L. s.]

In the presence of two subscribing witnesses—

A. F. BRACKETT,
RAYMOND TURNER.