No. 744,187. PATENTED NOV. 17, 1903.

L. T. GIBBS.

SYSTEM OF ELECTRIC TRACTION.

APPLICATION FILED APR. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1

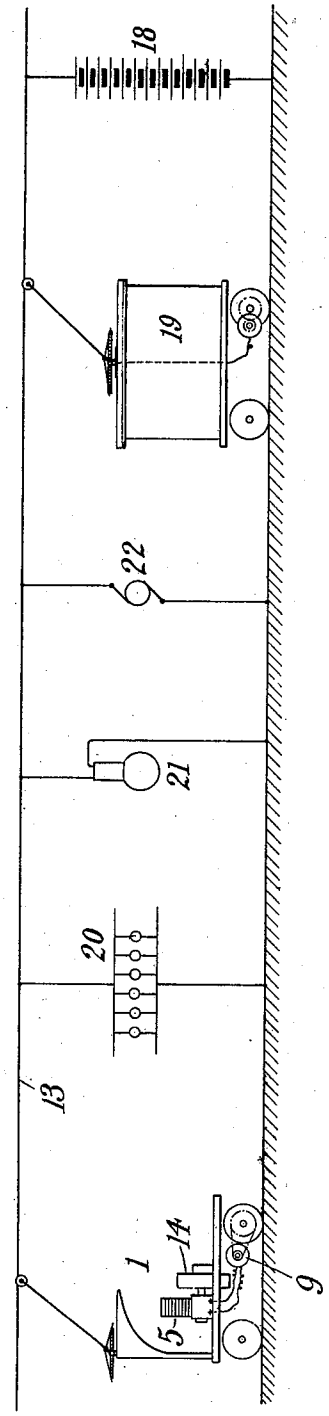
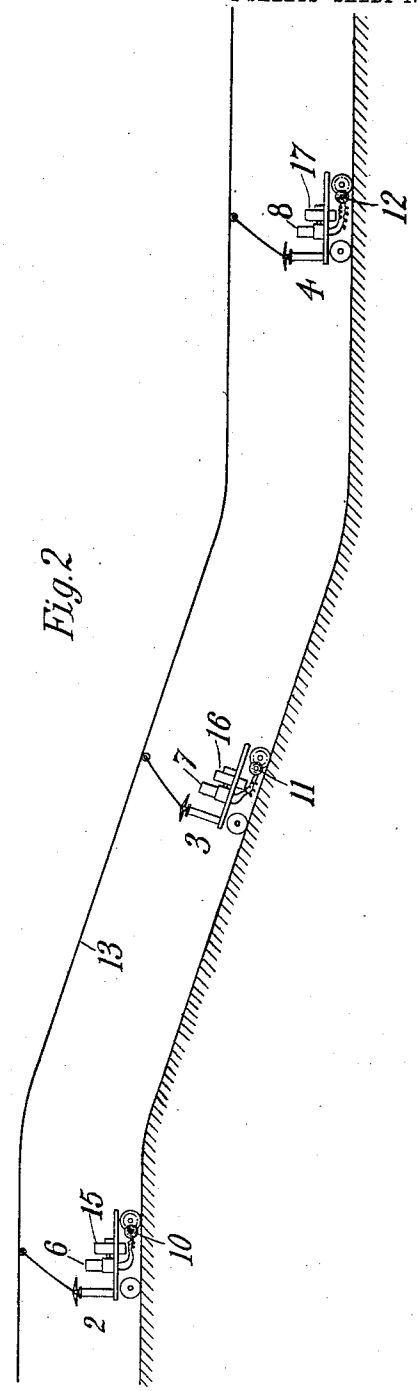


Fig. 2



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

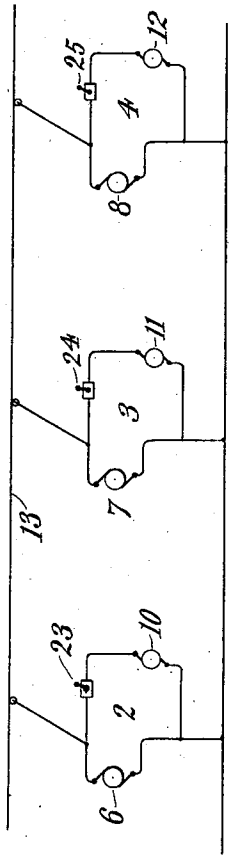
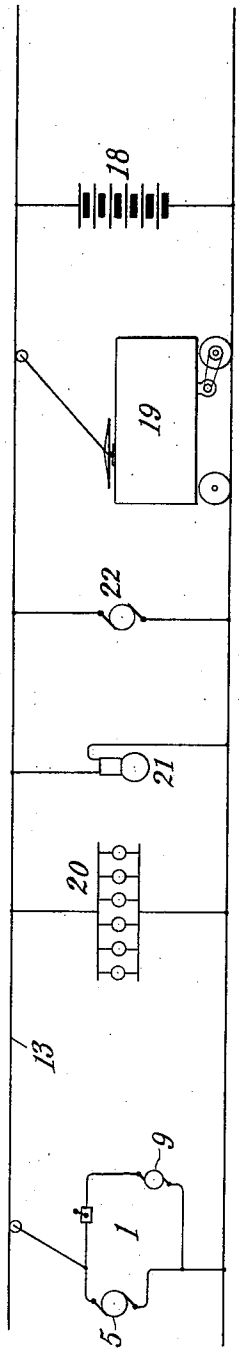


Fig. 4



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No. 744,187. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

LUCIUS T. GIBBS, OF NEW YORK, N. Y., ASSIGNOR TO GIBBS ENGINEERING AND MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SYSTEM OF ELECTRIC TRACTION.

SPECIFICATION forming part of Letters Patent No. 744,187, dated November 17, 1903.

Application filed April 13, 1903. Serial No. 152,309. (No model.)

To all whom it may concern:

Be it known that I, LUCIUS T. GIBBS, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Systems of Electric Traction, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

The invention which forms the subject of the present application relates to systems of electric traction in which the vehicles are connected with a trolley-wire or other conductor extending along the track or other roadway on which the vehicles or cars travel.

The chief object of my invention is to provide a system which shall accomplish the same or greater work than the existing systems with less total expenditure of power, without a central generating-station, and in general in a more economical manner.

To such ends it consists of the novel features and combinations hereinafter described, and more particularly set forth in the claims.

Referring now to the drawings, Figure 1 shows a system in which my invention is embodied. Fig. 2 illustrates a condition in which my improved system is especially advantageous. Figs. 3 and 4 are diagrammatic views of the connections of the system.

In existing systems in which the vehicles are connected with a trolley-wire, third rail, or other conductor it is customary and, in fact, necessary to have one or more generating plants to supply current to the trolley-wire or conductor. These plants represent a large outlay of capital and require the services of a number of employees to operate the same. In the present system, however, I am able to dispense entirely with the central plant, and for this purpose I provide one, or preferably more than one, of the vehicles with an independent generator and an engine for driving the same, as illustrated in the drawings. As there shown, Fig. 1, the car 1 and in Fig. 2 the cars 2, 3, 4 are provided with dynamos 5 6 7 8, connected with driving-motors, one or more on each car 9 10 11 12, of any desired type, and to a conductor 13—in the present instance an overhead-trolley wire, though it is obvious that it may be located in any convenient position. For driving the dynamos there are provided engines 14 15 16 17, preferably of the explosion kind, using gasolene or other hydrocarbon fuel.

By the arrangement just described the dynamos generating more power than enough simply to drive the vehicles on a level will deliver the excess current to the trolley-wire. This excess is utilized by one or more of the tractors when climbing hills. If only one of the vehicles is provided with a generator, its engine must of course be large enough to propel its car up any hill; but if two or more generators are employed on as many cars much smaller and less costly engines can be used, as the average power required would be considerably less than the maximum power under favorable circumstances, as little as one-third of the latter. It is equally obvious that the more cars or tractors used the smaller the engines would have to be down to a certain minimum.

The connections of the various elements of the system are shown in Fig. 4. It is clear that if an excess of current is generated by the dynamo 5 above that required to drive the motor 9 such excess will flow into the trolley 13 and thence to the translating devices 20, 21, and 22 and to the motor-car 19 and storage battery 18. In the latter the energy may be accumulated for use when the generator-car 1 is not in use.

Fig. 2 illustrates a system of tractors equipped with generators, as before described, in practical operation, one of them ascending a hill. In this case the car 3 is consuming more power than under normal conditions, drawing the same from the excess on line, which is supplied by the generators on the other vehicles. The cars would ordinarily be provided with engines of, say, thirty-horse power, and if in this instance one of them had to ascend a grade its engine would deliver its full capacity, thirty-horse power, and the dynamos on the level would furnish the balance—for example, fifteen-horse power.

Fig. 3 shows diagrammatically the connections of the system, and from an inspection thereof it will be seen that as long as the cars are taking equal amounts of energy and the generators are all at the same voltage no current will flow to the trolley 13; but if one of the motors 10 11 13 be overloaded, as in ascending a hill, this balance of the voltage of the several units will be destroyed and current will flow through the line from the lightly to the heavily loaded units.

Under some circumstances it would be desirable to equip only one tractor with a generating plant, making the same preferably more powerful than would ordinarily be required. The tractor could then be used, for example, as a switch-engine around a yard, while at the same time one or more smaller cars, as 19, having motors only, could be used for handling small work.

In addition to supplying power for running the rolling-stock the generators may be used to furnish current to lamps 20 21 or to stationary motors, as 22. A storage battery 18 may also be charged and will then furnish current to run cars which have no dynamos when the generating-tractor is not in use or to operate translating devices—as, for example, those just mentioned.

The efficiency and economy of the system herein described are apparent. It dispenses with a large and costly central power plant and employees to operate the same. The power plant, subdivided into any desired number of small traveling generators, is operated by the engineers on the cars, who must necessarily be employed under any circumstances to run the cars or trains.

Having now described my invention, what I claim is—

1. In a system of electric traction, the combination with a line conductor, of a plurality of vehicles each provided with a generator, an engine to actuate the same, and a motor to propel the vehicle, the electrical elements being connected with the line conductor, whereby excess of power from the generator will be delivered to the line, as set forth.

2. In a system of electric traction, the combination with a line conductor, and translating devices connected therewith, of one or more vehicles, each provided with a generator, an engine to actuate the generator, and a motor to propel the vehicle, the electrical elements being connected with the line, whereby excess of power from each generator will be delivered to the line, as set forth.

3. In a system of electric traction, the combination with a line conductor; of one or more vehicles each provided with a generator, an engine to actuate the same, and a motor to propel the vehicle, the electrical elements being connected with the line whereby excess power from the generator will be delivered to the line; and one or more vehicles each provided with a propelling-motor, connected with the line conductor to receive all its power therefrom, as set forth.

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