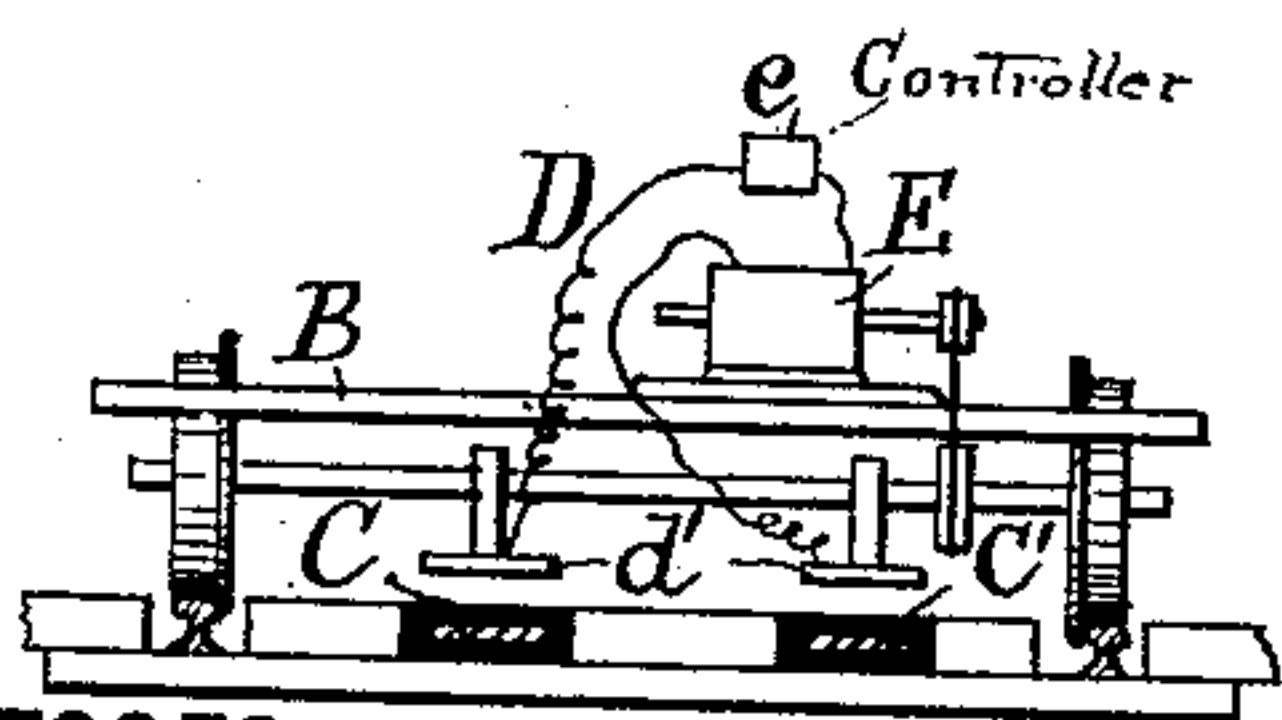
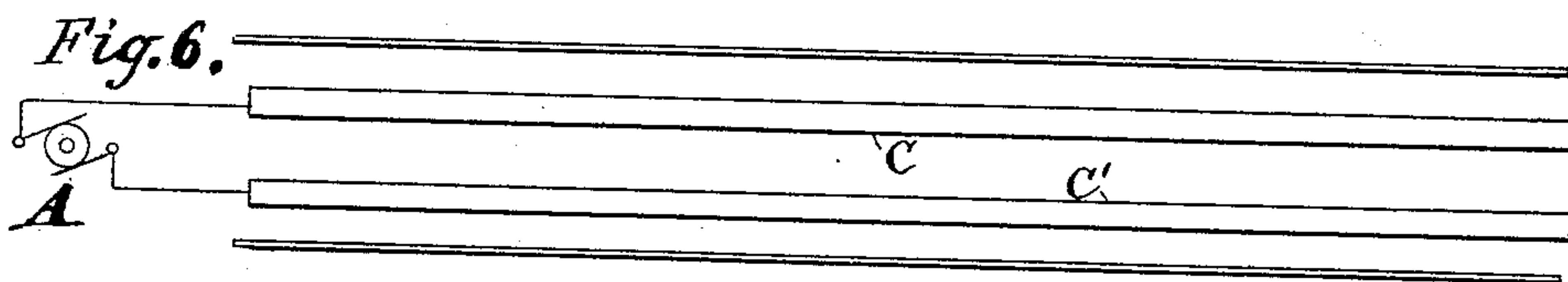
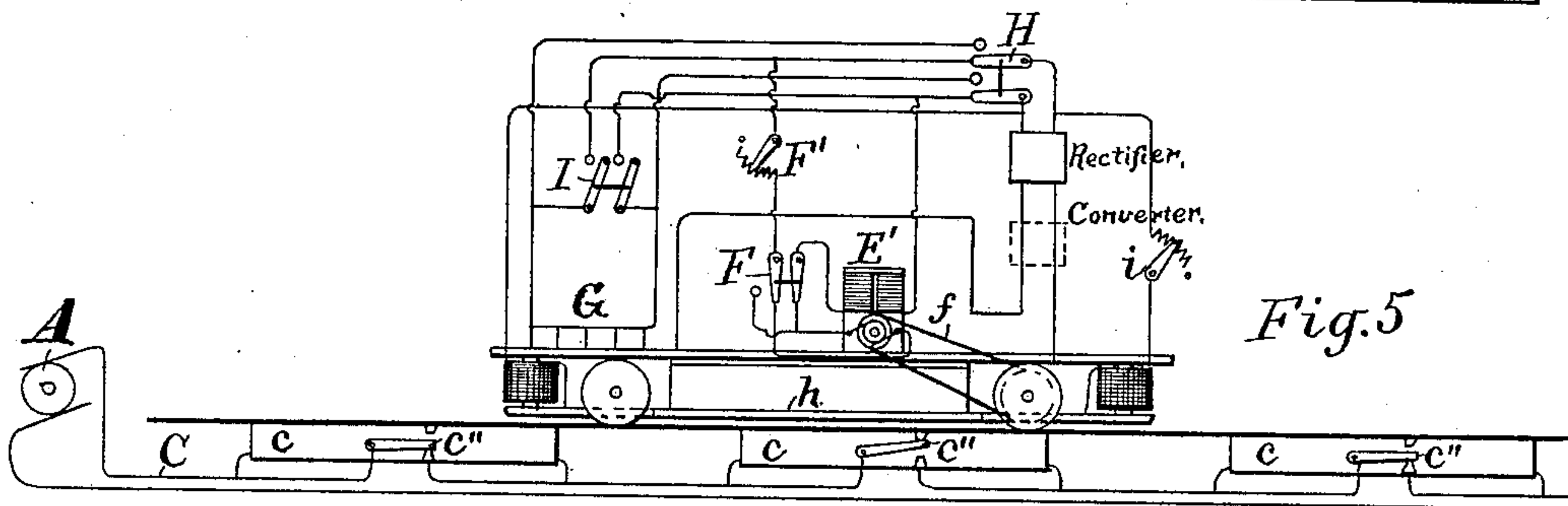
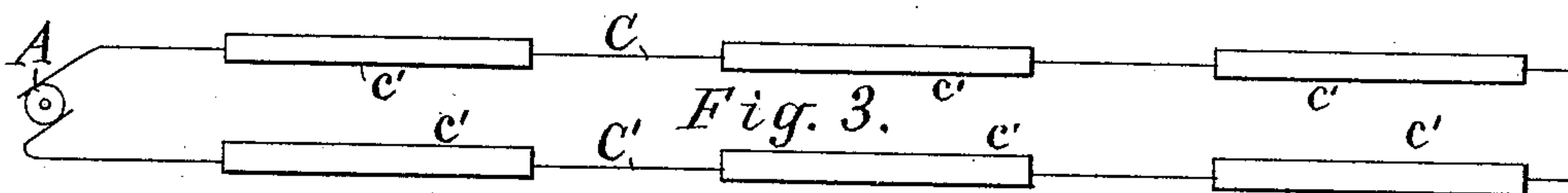
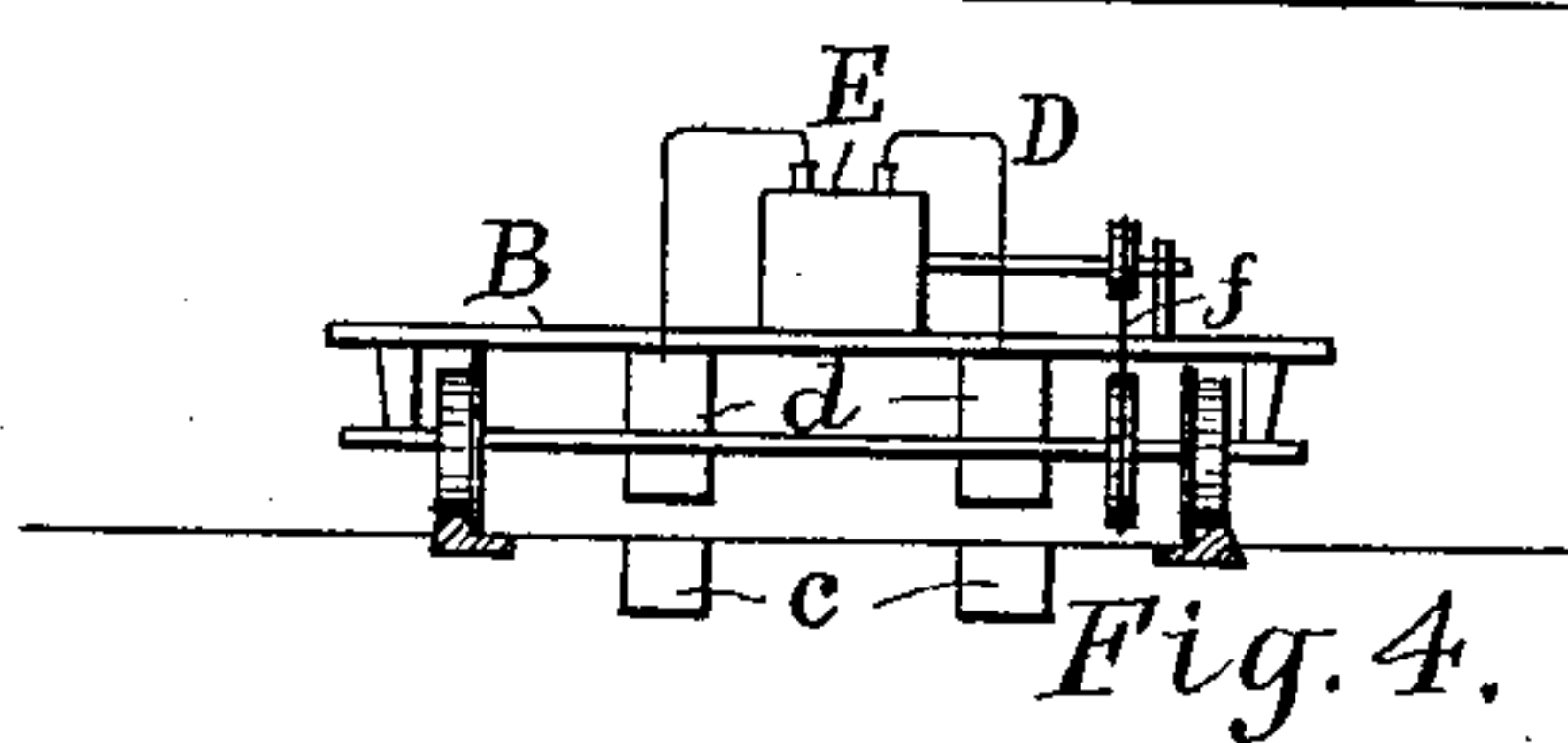
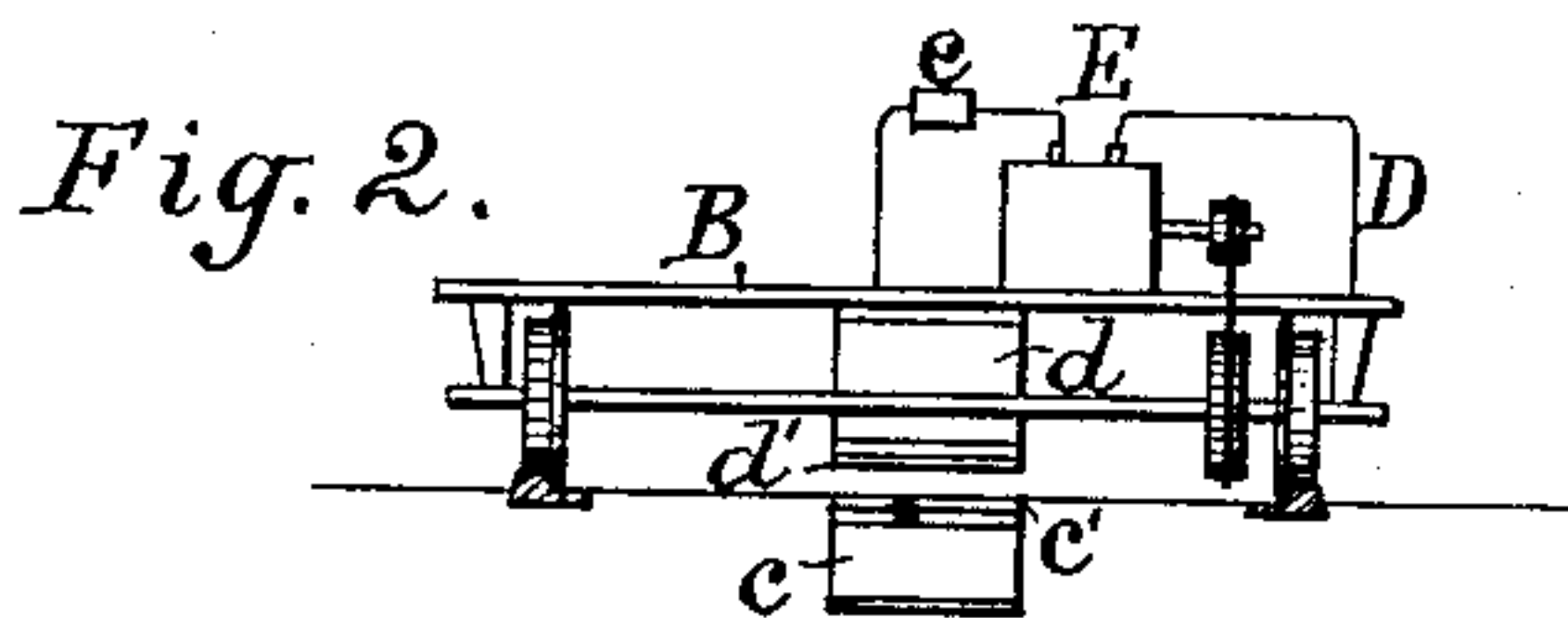
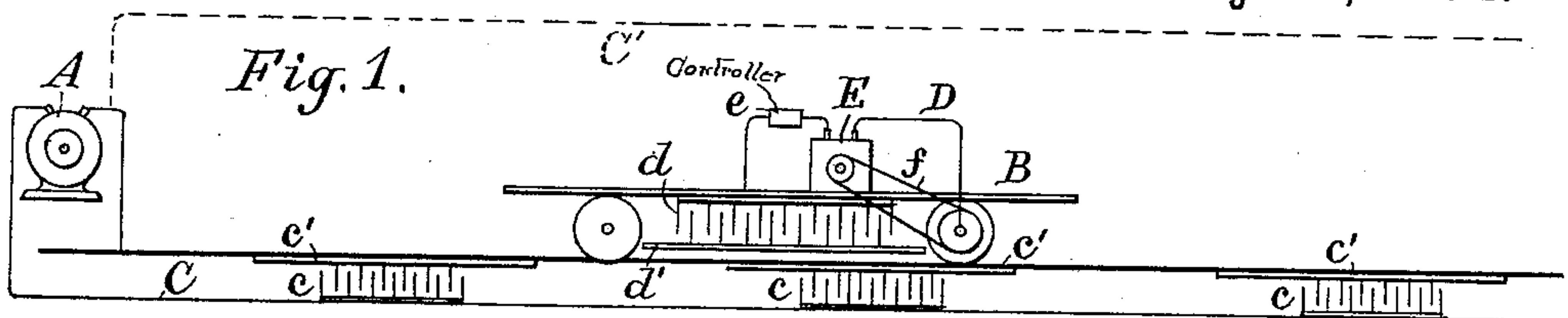


(No Model.)

M. W. DEWEY.
ELECTRIC RAILWAY.

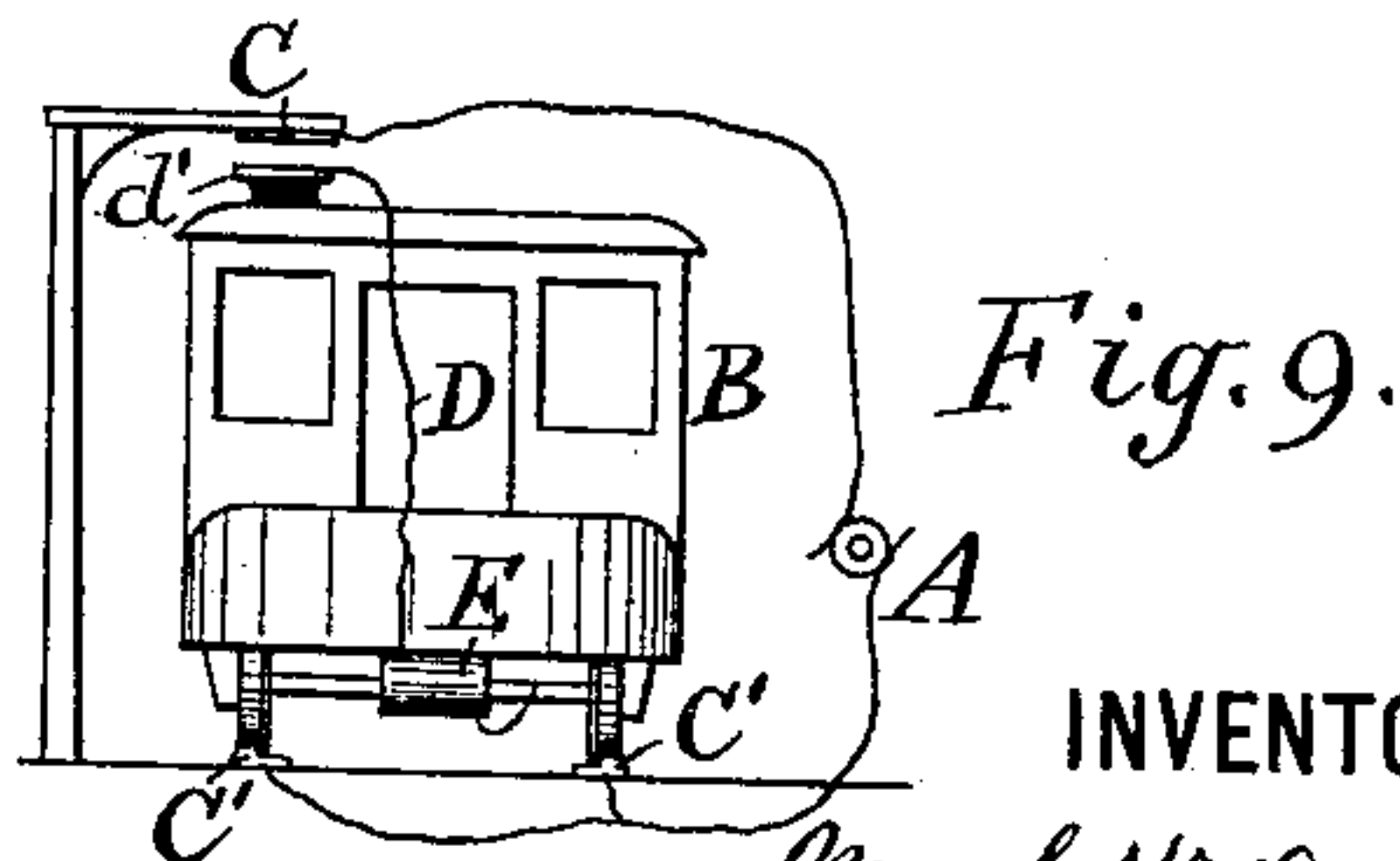
No. 479,493.

Patented July 26, 1892.



WITNESSES:

J. J. Saass.
C. L. Bendixen



INVENTOR,

Mark W. Dewey
BY
Quell, Laass & Quell
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE DEWEY CORPORATION, OF SAME PLACE.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 479,493, dated July 26, 1892.

Application filed July 24, 1891. Serial No. 400,587. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and
5 useful Improvements in Electric Railways, (Case No. 95,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to propelling vehicles—such as cars and boats—electrically; and the object is to dispense with contact-brushes, wheels, &c., in electric connection with a conductor along the route of the vehicle and to avoid the use of batteries on the vehicle.

15 The broad features of this specification are based upon matters shown and described but not claimed in my application, Serial No. 296,119, filed January 12, 1889.

This invention consists in electrically communicating with a vehicle to propel it by electrostatic induction. Any construction or arrangement may be employed and any method of electrostatic induction known to electricians used, whereby a conductor or body irregularly or alternately charged with electricity may be able to induce similar charges in a neighboring conductor or body upon a vehicle or car, all as hereinafter more fully described, and specifically set forth in the
30 claims.

In the accompanying drawings, Figure 1 is a diagram of circuits and apparatus, illustrating one way in which my invention may be carried out. Fig. 2 is a cross-section of Fig. 1.
35 Fig. 3 is a plan view of another form of road-bed apparatus that may be employed. Fig. 4 is a cross-section of Fig. 3 with a vehicle therefor. Fig. 5 is a side elevation of another arrangement of devices for carrying out my invention. Fig. 6 is a plan view of the road-bed apparatus similar to Fig. 3. Fig. 7 is a side elevation of the vehicle for use with the road-bed apparatus shown in Fig. 6. Fig. 8 is a cross-section of both the road-bed and vehicle, and Fig. 9 is an end elevation of a car
45 provided with means to propel it electrostatically that are arranged overhead.

One of the essential features of my invention is an electrical conductor, (designated by
50 reference-letter C in the figures of the drawings,) which conductor reaches from a source

of irregular or alternating currents of electricity along the line of travel of the vehicle or car. This conductor may be arranged in any desired manner along the route of the
55 vehicle—that is, it may be beneath, at the side, or overhead. The said conductor may be insulated throughout its length and in some cases may be placed beneath the pavement. Said conductor may consist of one or more
60 wires or flat strips of metal, as shown in Figs. 3, 4, 6, 7, 8, and 9, or of one or a plurality of condensers, as shown in Figs. 1, 2, and 5. In order to derive a very great effect a plurality of condensers should be employed. 65

In Fig. 1, A represents the source of irregular or alternating currents as an alternating-current dynamo; C, the line conductor connected to the source and extending along the railway or path of travel of the vehicle B. In
70 circuit with said conductor are connected electric condensers *c c*, placed at intervals along the way, preferably equal distances apart. One member of each condenser is connected to the line conductor, but the other
75 member of each condenser is connected to a metal strip *c'*, of more or less length, that extends along the roadway and on a level therewith. The terminal of the source A not connected to the line C should be connected with
80 the rails, ground, or with another conductor C', arranged along the path of the vehicle, but at a distance from the conductor C, as shown by a dotted line.

D is the conductor on the vehicle, having
85 an electric motor E and a suitable current-controller *e* in circuit therewith. One terminal of the conductor D is connected with an axle of the vehicle and the other terminal is connected with one member of a condenser *d*,
90 carried upon the vehicle. The opposite member of the vehicle-condenser is connected with a metallic strip *d'*, that is carried by the vehicle parallel to and in close proximity to the strips *c'*. The strips along the road-bed are
95 preferably placed apart a somewhat less distance than the length of the strip *d'* on the vehicle, so that the vehicle-strip will always be in inductive relation to one of the road-bed strips. The motor in this case may be an
100 alternating-current motor, which can be connected in any suitable and well-known man-

ner with the vehicle to propel it. In the drawings said motor is shown connected to a pulley on an axle of the vehicle by a belt or chain *f*.

5 When two sets of condensers or strips are employed, one set preferably extends along on one side of the railway or the center thereof and the other set along on the other side, as shown in Fig. 3, one set being connected
10 with one terminal of the source of electricity and the other set with the other terminal. In this arrangement one set of condensers will be charged with positive electricity, while the corresponding set will be charged with
15 negative electricity. When two sets of road-bed condensers are used, the vehicle is provided with two condensers or strips to be carried in close proximity to those in the road-bed, as shown in Fig. 4. The vehicle-con-
20 ductor in this case has its terminals connected one to one condenser and the other terminal to the other condenser.

In Fig. 5 the condensers *c c c* are adapted to be shunted, except the one or two beneath
25 the car B, so that energy will not be expended in charging the condensers along the route that are not in proximity to a car and cannot induce a current in the circuits thereon.

Contact makers and breakers or switches
30 *c''* are placed in the shunts to be automatically operated by suitable means, as a magnetic device *h*, carried on the vehicle, which will attract one or more of the switches in the vicinity of the vehicle to include one or more
35 of the condensers in the immediate vicinity of the vehicle in circuit with the charging-conductor, and thus concentrate at the vehicle the required power. These switches and the electric connections may be greatly varied in
40 form and construction, and I therefore do not limit myself to the precise form shown. The switches and magnetic device on the car may be the same or similar to those fully set forth in my United States Letters Patent, No.
45 473,253, dated April 19, 1892.

In order to magnetize the device carried by the car to attract the switches, a direct current is employed. The alternating current induced in the vehicle or secondary circuit is
50 straightened or rectified by means of a suitable current-rectifier indicated in the figure.

The switch *c''* beneath the car is shown as having been moved by the magnetic device to include its condenser *c* in circuit. When
55 the car is between two switches, both will be attracted, so that at no time will the supply of current cease.

As the currents on the vehicle are rectified, the usual continuous or direct-current motor
60 *E'* is employed to propel the vehicle. *F* represents the current-reverser therefor, and *F'* the adjustable resistance. For the purpose of supplying the motor with current in case there is none flowing in the line or to a con-
65 denser for some reason or other a secondary battery *G* is provided on the car and arranged

to be charged or connected with the vehicle-conductor whenever the motor-circuit is open, as when the vehicle is at rest. The secondary battery may be employed for supplying
70 current to the magnetic-device coils or for any other translating devices that may be placed on the car, such as lamps or heaters.

H is a switch in the vehicle-conductor leading from the rectifier for connecting either
75 the motor *E'* or the secondary battery *G* in circuit. The circuit *l*, containing the secondary battery, is shown open.

I is a switch for connecting the battery with the motor-circuit or magnetic device *h*, and *i*
80 is an adjustable resistance in the magnetic-device circuit for regulating the current. A suitable inductional transformer or converter may be located in circuit on the vehicle, as indicated, to change the character of the cur-
85 rent.

In Fig. 6 two continuous flat strips of metal *C C* extend along the way between the rails and are connected with the terminals of the
90 source of electricity, as described in reference to Fig. 3. In this, as in the other arrangements, the line conductors do not form a closed circuit, being open at the distant end of the road.

Fig. 7 shows a side elevation of the car B to
95 be used with this arrangement partly in section and equipped with a conductor *D* for receiving the effect inductively produced by the changes in the line conductors. In the cir-
100 cuit of the conductor *D* are metal strips *d'*, which are stretched in proximity to and parallel with the line conductors or strips. The changes in the lines induce like or similar changes in the strips on the vehicle, and consequently produce currents in the vehicle-
105 conductor *D*, connecting the strips together. In this case the strips alone form the condensers. The end elevation in Fig. 8 shows the conductors *C* and *C'* covered with insula-
110 tion and below the level of the railway, but it will be obvious that they may be supported overhead or one overhead and the other formed by the rails of the track, as clearly shown in Fig. 9.

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

1. The combination of a line conductor extending along the path over which a vehicle moves, a source of irregular or alternating
120 electricity connected to the line, a condensing plate or strip upon the vehicle, carried in inductive proximity to said conductor, and an electric motor on the vehicle, connected to the condensing plate or strip and with the vehi-
125 cle for moving the same.

2. In an electric railway, the combination of a line conductor extending along the rail-
way, a source of irregular or alternating elec-
130 tricity connected to the line, a condensing plate or strip upon the vehicle, carried in inductive proximity to said conductor, and an

electric motor on the vehicle, connected with the condensing plate or strip and with the vehicle for moving the same.

3. The combination of a vehicle, a line conductor parallel to the path over which the vehicle moves and in static inductive proximity to a plate or strip of conducting material upon the vehicle, means for alternately charging the line with positive and negative electricity at a fixed station, a conductor on the vehicle, connected to the vehicle plate or strip, and an electric motor on the vehicle in the vehicle-conductor and arranged to propel the vehicle.

4. The combination of a vehicle, two line conductors parallel to the path over which the vehicle moves, a source of irregular or alternating electricity at a fixed station and connected to and between said lines, two condensing plates or strips upon the vehicle, carried in inductive proximity to said conductors, and an electric motor on the vehicle, connected to and between the condensing plates or strips and arranged to propel the vehicle.

5. The combination, in an electric railway, of an open-circuit line conductor having a condensing-surface, a condensing plate or strip upon a car, carried in inductive proximity to said conductor and connected with a rail, a source of alternating currents at a fixed station connected to the line, and an electric motor on the vehicle, connected to the condensing plate or strip and with the vehicle for moving the latter.

6. In an electric railway, the combination of a vehicle, two condensing-strips a distance apart and parallel to the railway, a source of irregular or alternating electricity at a fixed station and connected to and between said strips, two condensing plates or strips upon the vehicle, parallel with the former strips and carried in inductive proximity thereto, and an electric motor on the vehicle, connected to and between the plates or strips thereon and arranged to propel the vehicle.

7. In an electric railway, the combination of a vehicle, a source of irregular or alternating current, an electric condenser extending along the railway and connected to the source, an electric motor on the vehicle, arranged for propelling the same, and an electric condenser carried on the vehicle in inductive proximity to the former condenser and connected to the motor.

8. In an electric railway, the combination of a source of irregular or alternating current at a fixed station, a conductor connected to the source and extending along the railway, a plurality of condensers connected to the conductor and having condensing-plates parallel to the railway, an electric motor on the vehicle, arranged for propelling the same, and an electric condenser carried on the vehicle and having a condensing-plate parallel to and adapted to be moved in inductive proximity to the former plates successively and electrically connected to the motor.

9. In an electric railway, the combination of a source of irregular or alternating current at a fixed station, line conductors connected to the terminals of the source and extending along the railway, a plurality of condensers connected to each conductor and having condensing-plates parallel to the railway, an electric motor on the vehicle, arranged for propelling the same, two electric condensers carried on the vehicle and each having a condensing-plate parallel to and adapted to be moved in inductive proximity to the plurality of condensing-plates of the condensers connected to one of the line conductors, and electric connections between the vehicle-condensers and the motor.

10. In an electric railway, the combination of a source of irregular or alternating current at a fixed station, line conductors connected to the terminals of the source extending along the railway and open-circuited at the distant end thereof, a plurality of condensers distributed at intervals along the way and connected to each conductor, condensing-plates parallel to the railway and connected to the condensers, an electric motor on the vehicle, arranged for propelling the same, two electric condensers carried on the vehicle, a condensing-plate parallel to and adapted to be moved in inductive proximity to the plurality of condensing-plates of the condensers connected to one of the line conductors, and electric connections between the vehicle-condensers and the motor.

In testimony whereof I have hereunto signed my name this 5th day of June, 1891.

MARK W. DEWEY. [L. S.]

Witnesses:

C. L. BENDIXON,
H. M. SEAMANS.