

No. 692,898.

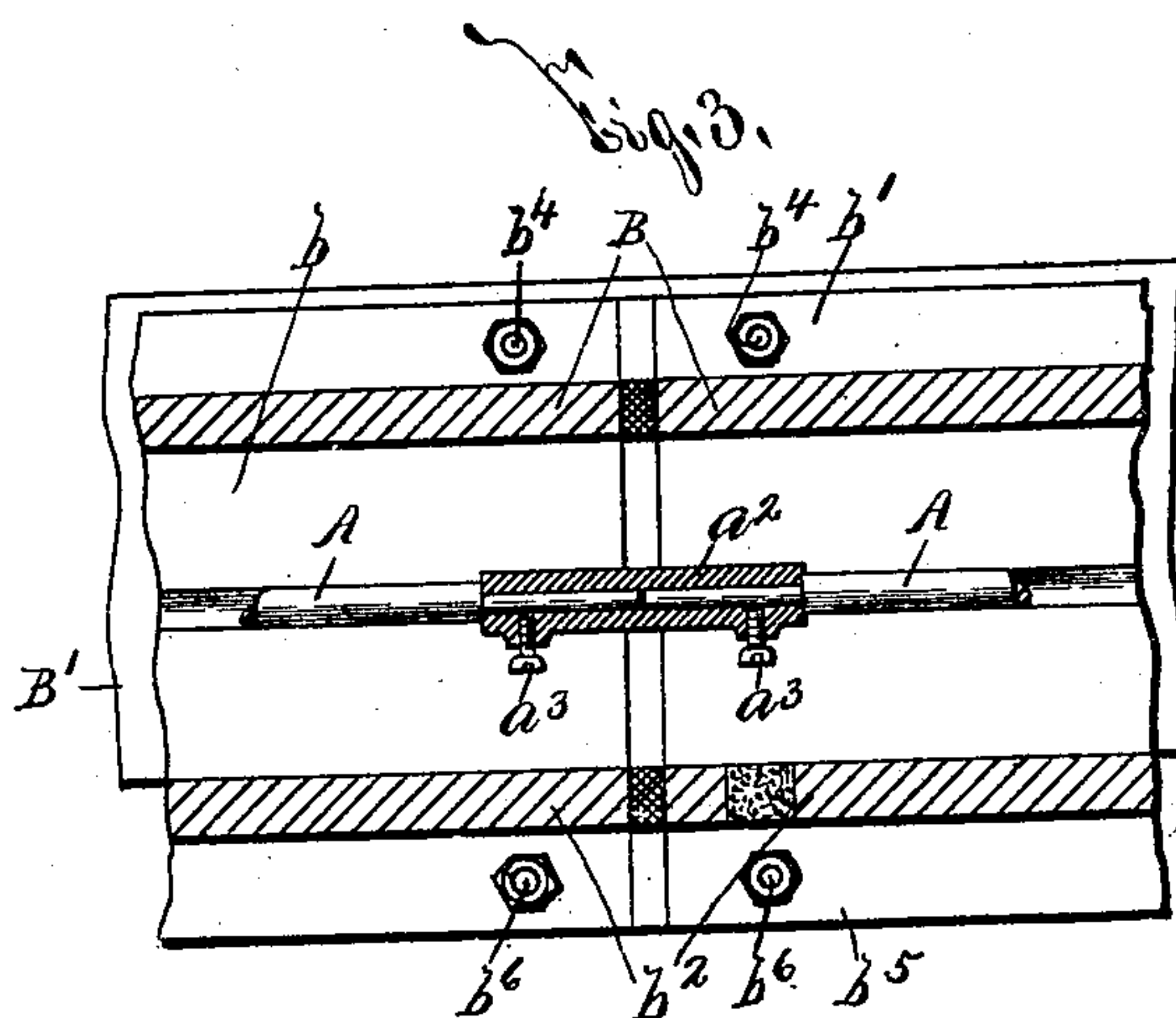
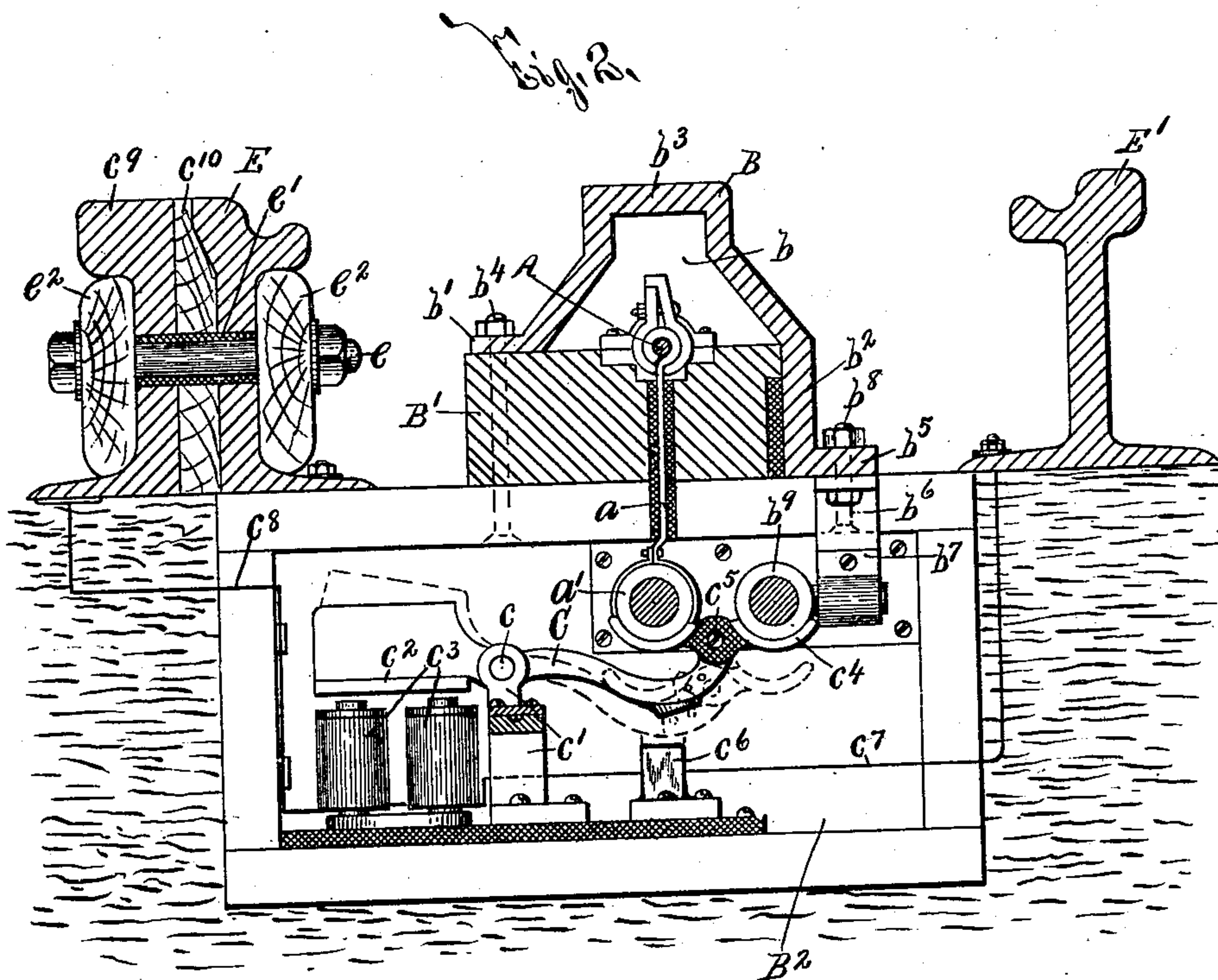
Patented Feb. 11, 1902.

B. E. OSBORN.
ELECTRIC RAILWAY SYSTEM.

(Application filed May 13, 1897.)

2 Sheets—Sheet 2.

(No Model.)



WITNESSES:

J. J. Brewer.

H. C. Chase,

INVENTOR

INVENTOR
Byron E. Osborn

BY

BY
Key & Parsons
ATTORNEYS

ATTORNEYS.

UNITED STATES PATENT OFFICE.

BYRON E. OSBORN, OF AUBURN, NEW YORK.

ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 692,898, dated February 11, 1902.

Application filed May 13, 1897. Serial No. 636,370. (No model.)

To all whom it may concern:

Be it known that I, BYRON E. OSBORN, of Auburn, in the county of Cayuga, in the State of New York, have invented new and useful
5 Improvements in Electric-Railway Systems, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in
10 electric-railway systems of the class set forth in my prior patents, Nos. 549,580, 556,516, and 573,033, dated, respectively, November 12, 1895, March 17, 1896, and December 15, 1896, which are provided with a concealed
15 conductor for conveying an electric current to a terminal movable along the railway, and has for its object the production of a device which is particularly simple in construction, requires a minimum amount of excavation or
20 preparation of the road-bed, and is highly efficient and safe in operation; and to this end the invention consists in the combination, construction, and arrangement of the component parts of a railway system, all as hereinafter fully described, and pointed out in
25 the claims.

In describing this invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the
30 views.

Figure 1 is a perspective view, partially diagrammatic, of a portion of a railway system embodying my invention, a portion of a
35 vehicle forming part of said system being shown by dotted lines. Fig. 2 is a transverse sectional view taken on line 2 2, Fig. 1, the vehicle being omitted; and Fig. 3 is a detail sectional view taken on line 3 3, Fig. 1.

40 A B represent, respectively, concealed and exposed conductors for the main or dynamic current; C, connecting-pieces for connecting said conductors; D, a vehicle movable along the conductors, and E E' suitable rails for
45 supporting and guiding the vehicle. The conductors A B are normally insulated from each other and are usually so constructed and arranged that the conductor A is concealed and partially inclosed by the con-
50 ductor B.

The conductor A is connected to one pole of a suitable source of electric energy A', hav-

ing its opposite pole connected to the rail E or any other desirable conductor. I preferably support the conductor A upon an insu- 55
lating bar or stringer B', interposed between the rails E E' and arranged substantially parallel therewith, and provide said conductor with a series of branch conductors a , extending
60 downwardly through the insulating bar or stringer B' into chambers B², arranged at intervals beneath said bar or stringer. The upper ends of the branch conductors a are suitably clamped to the concealed conductor
65 A, and their lower ends are provided with contact-pieces a' . The conductor A preferably consists of a series of separate sections arranged end to end and having their adjacent ends secured together by suitable metallic sleeves or connections a^2 and set-screws
70 or clamps a^3 . The conductor A is particularly simple and practical in construction, may be readily manufactured, and is delivered and installed with the utmost economy. It is obvious, however, that said conductor
75 may consist of a single piece instead of a number of sections detachably connected together.

The conductor B usually consists of a series of sections arranged end to end and insulated from each other, and is preferably
80 formed with a lengthwise chamber b in its lower face, which partially incloses the conductor A and the clamps for securing the branch conductors a to the conductor A. As
85 usually constructed the conductor B is formed with depressed side portions b' b^2 , arranged one above the other, and an elevated central portion b^3 disposed in substantially the same
90 plane as the top faces of the rails E E'. The side portion b' of the conductor B is mounted upon the upper face of the insulating bar or
stringer B' at one side of the conductor A and is secured in position by suitable fastening
95 means b^4 , passed through said bar or stringer. The side portion b^2 of the conductor B is arranged at the opposite side of the conductor A, is engaged with the adjacent side face of
the bar or stringer B', and is provided with a laterally-projecting rib b^5 , which is secured
100 in position by suitable fastening means b^6 . The conductor B and the insulating bar or stringer B' thus form a conduit, which conceals and incloses the conductor A for entirely preventing access to said conductor.

The conductor B is preferably provided with a series of branch conductors b^7 , which extend downwardly into the chambers B^2 . The upper ends of the branch conductors b^7 are secured by suitable fastening means b^8 to the laterally-projecting rib b^5 of the conductor B, and the lower ends of said branch conductors are provided with contact-pieces b^9 , arranged in close proximity to the contact-pieces a' .

The connecting-pieces C are usually arranged within the chambers B^2 and are pivoted at c to suitable supports c' . Corresponding ends of the connecting-pieces C are provided with armatures c^2 , which are attracted by electromagnets c^3 . The opposite ends of said connecting-pieces are provided with engaging pieces c^4 , which are usually flexibly connected thereto, as by pivots c^5 , and engage and connect the contact-pieces a' b^9 . The ends of the connecting-pieces C, provided with the engaging pieces c^4 , are held in their normal position by permanent magnets c^6 of any suitable form, size, and construction. The electromagnets c^3 are connected by conductors c^7 c^8 to the rail or exposed conductor E' and to an exposed sectional conductor c^9 , suitably secured to the rail E. An insulating bar or strip c^{10} is usually interposed between the rail E and the exposed sectional conductor c^9 , and the bolts or fastening means e for securing the conductor c^9 to the rail E are usually passed through insulating sleeves and washers e' e^2 . The conductor c^9 is thus insulated from the rail E.

The vehicle D (partly illustrated by dotted lines in Fig. 1) is of any desirable form, size, and construction and is provided with a suitable motor or other electrically-operated means d' , terminals d^2 d^3 d^4 d^5 d^6 , and switches d^7 d^8 . The motor or electrically-operated means d' , which is shown diagrammatically, is suitably connected to the vehicle D for actuating the same; but as said electrically-operated means and connections form no part of my present invention it is thought unnecessary to herein illustrate and describe the same. The terminals d^2 d^3 d^4 are respectively engaged with the conductor B, the rail or conductor E' , and the conductor c^9 , and the terminals d^5 d^6 are arranged in front and at the rear of the terminals d^2 d^3 . The terminal d^3 preferably consists of one of the wheels of the vehicle D, but may be otherwise constructed, if desired. A conductor d^9 connects the terminals d^2 d^5 to the switch d^8 , and a conductor d^{10} connects said switch to the electrically-operated means d' , which is connected by a conductor d^{11} to the axle D' for the terminal or car-wheel d^3 . A conductor d^{12} connects the terminals d^4 d^6 to the switch d^7 , and conductors d^{13} d^{14} , respectively, connect the opposite poles of the source of electric energy d to the switch d^7 and the axle D' .

In the operation of my railway system the dynamic current is conveyed by the concealed conductor A, and the exposed conduc-

tor B serves to conduct said current to the vehicle D whenever one of the connecting-pieces C operates to connect said conductor A to one of the sections of the conductor B, since the current is then free to flow from the concealed conductor A and one of its branch conductors a to the engaging piece c^4 in contact with the contact-piece a' of said branch conductor and thence to the contact-piece b^9 , also in contact with said engaging piece, the corresponding branch conductor b^7 , and the section of the conductor B provided with said branch conductor. The connection of the conductors A B is entirely controlled by the source of electric energy d , the switch d^7 , and the position of the vehicle D, and when the conductors d^{12} d^{13} are connected by the switch d^7 a current is free to flow from one pole of the source of electric energy d along the conductor d^{13} , through the switch d^7 , along the conductor d^{12} and the terminals d^4 d^6 to one of the sections of the conductor c^9 , whence said current passes along a corresponding conductor c^8 to the electromagnets c^3 connected to said conductor and thence along the conductor c^7 to the rail or conductor E' .

The construction and operation of my improved railway system will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be apparent that considerable change may be made in the detail construction and arrangement of the component parts of said system without departing from the spirit of my invention.

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

1. The combination of a moving vehicle, a concealed conductor for the main current, an exposed sectional conductor consisting of upper and side walls united to each other transversely for concealing the first conductor and conveying the main current to the vehicle, electromagnets for operating the connecting-pieces, and means carried by the vehicle for controlling the operation of the electromagnets, substantially as and for the purpose described.

2. The combination of a moving vehicle, a concealed conductor for the main current, an exposed sectional conductor for conveying the main current to the vehicle, independently-movable connecting-pieces for connecting the conductors, said connecting-pieces being provided with engaging pieces flexibly connected thereto, electromagnets for operating the connecting-pieces, and means carried by the vehicle for controlling the operation of the electromagnets, substantially as and for the purpose specified.

3. The combination of a moving vehicle, a concealed conductor for the main current, an exposed sectional conductor for conveying the main current to the vehicle, separated contact-pieces connected respectively to the con-

cealed and sectional conductors, independently-movable connecting-pieces for connecting the conductors, said connecting-pieces being provided with engaging pieces flexibly connected thereto for connecting the contact-pieces, electromagnets for operating the connecting-pieces, permanent magnets for holding the connecting-pieces in their normal position, and means carried by the vehicle for controlling the operation of the electromagnets, substantially as and for the purpose specified.

4. The combination of a moving vehicle, a concealed conductor for the main current composed of separate sections having their adjacent ends electrically connected together, an exposed sectional conductor for concealing the first conductor and conveying the main current to the vehicle, independently-movable connecting-pieces for connecting the conductors, electromagnets for operating the connecting-pieces, and means carried by the vehicle for controlling the operation of the electromagnets, substantially as and for the purpose set forth.

5. The combination of a concealed conductor for the main current, an exposed sectional conductor provided with a lengthwise passage for partially inclosing the first conductor, independently-movable connecting-pieces for connecting the conductors, a pair of rails, an exposed conductor secured to one of the rails, electromagnets for operating the connecting-pieces, said electromagnets being connected to the second exposed conductor and to one of the rails, a vehicle movable along the conductors and rails and provided with terminals for engaging the exposed conductors and one

of the rails, electrically-operated means carried by the vehicle and connected to the terminal for engaging the first exposed conductor, and a source of electric energy carried by the vehicle and connected to the terminals for engaging the second exposed conductor and said one of the rails connected to the electromagnets, substantially as and for the purpose set forth.

6. The combination of a pair of rails, an exposed conductor secured to one of the rails, a vehicle movable along the rails, a concealed conductor, a conduit having a lengthwise chamber for receiving the concealed conductor, a portion of said conduit consisting of an exposed sectional conductor for conveying the main current to the vehicle, chambers arranged at intervals beneath the conduit, independently-movable connecting-pieces supported within the chambers for connecting the concealed conductor and the exposed conductor forming part of said conduit, electromagnets arranged within the chambers for operating the connecting-pieces, said magnets being connected to one of the rails and to the exposed conductor secured to the other rail, and means carried by the vehicle for engaging said rails and exposed conductors, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Auburn, in the county of Cayuga, in the State of New York, this 28th day of April, 1897.

BYRON E. OSBORN.

Witnesses:

RUTH E. OSBORN,

BYRON E. OSBORN, Jr.