

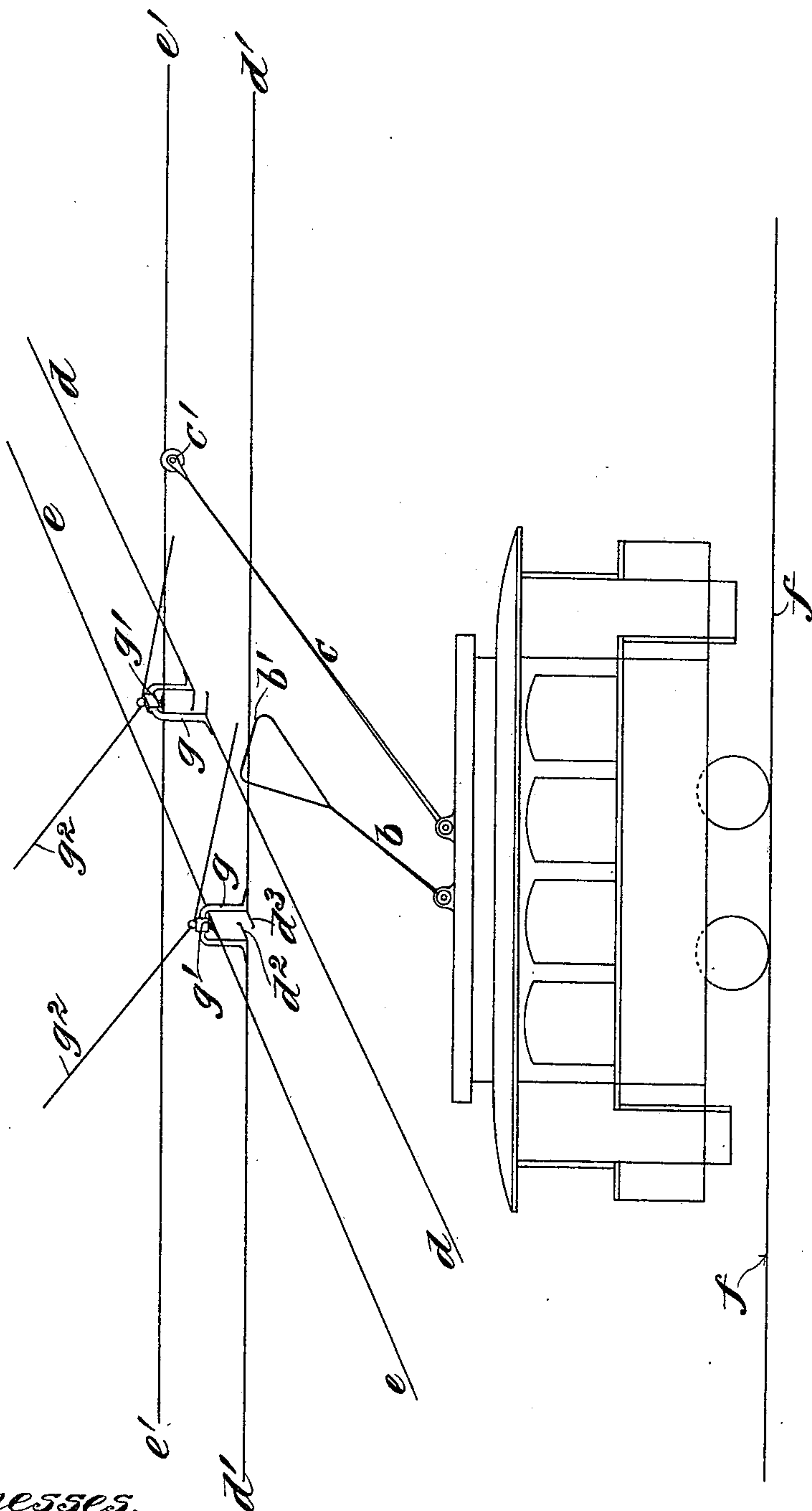
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Patented June 27, 1899.

E. FRISCHMUTH.
OVERHEAD TROLLEY SYSTEM.

(Application filed Feb. 17, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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OVERHEAD-TROLLEY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 627,495, dated June 27, 1899.

Application filed February 17, 1899. Serial No. 705,799. (No model.)

To all whom it may concern:

Be it known that I, EMMERICH FRISCHMUTH, a subject of the German Emperor, residing at Berlin, Germany, have invented a certain new and useful Improvement in Current-Supply Apparatus for Electrically-Propelled Vehicles, (Case No. 185,) of which the following is a full, clear, concise, and exact description.

My invention relates to improvements in current-supply apparatus for electrically-propelled vehicles, and has for its object the provision of means for furnishing to a moving car or vehicle its propelling current without involving any material interruption in the circuit at crossings and switches and avoiding, as well, the danger of connecting lines of unlike polarity.

In practice it has been found extremely difficult to effect a crossing for trolley-lines where conductors of different potential intersect, and with the apparatus employed frequent displacement of the trolley contact-arms is liable to occur, thereby interrupting the operating-current. Practically the same problems are also met with at points along an electric railway at which switches are employed. By employing the apparatus herein described, constructed in accordance with my invention, I am enabled not only to provide a satisfactory crossing for trolley-conductors carrying different potentials, but in addition the car is supplied practically with an uninterrupted current and the crossing is not liable to displace the trolley-arms from their position of engagement with the supply-conductors.

I may briefly describe the current-supply apparatus shown in the annexed drawing, in connection with which I will explain my invention as consisting of intersecting trolley-conductors which are disposed in different planes along the length of track, according to the potential carried. The conductors lying in the lower plane are broken at the points of intersection and maintained in their relative positions by means of insulating-arches adapted to permit the passage of the trolley-arm when in engagement with the conductors of opposite polarity. The car or vehicle operated by the system in question is provided

with two trolley-arms, one of which preferably carries the well-known contact-wheel and the other a contact shoe or brush, which are adapted, respectively, to engage the two conductors extending in different planes. 55

The accompanying drawing illustrates this construction, the same indicating two intersecting lines of electric railway, upon one of which a car equipped with two trolley contact-arms is about to pass the crossing. 60

Upon the car *a* are mounted two trolley-arms *b c*, the former being provided with a diagonally-extending contact-shoe *b'* and the latter with the ordinary form of trolley-wheel *c'*. These trolley-arms are of different lengths, being adapted to be forced into engagement with the corresponding trolley-conductors *d e* or *d' e'*, which are connected with different poles of the dynamo-electric machine supplying power to the system. This dynamo may, for example, be a direct-current machine, in which instance *d* would be connected with the positive and *e* with the negative terminal of the dynamo; or, again, said dynamo-electric machine may be of the multiphase type, in which case the rails *f* would be utilized as a third conductor. The trolley-conductors *e* and *e'* are carried upon insulating-supports in the usual manner to one side and in a plane above that of the trolley-conductors *d d'*. At the intersections supporting-arches *g* are provided, which carry the conductors *e* or *e'* by means of insulating-supports *g'*, while the conductors *d* or *d'* are connected with and open beneath the arches to permit the passage of the trolley arms and wheels *c c'*. The crossing shown in the drawing is made at an acute angle, and the ends of the conductors *d d'* beneath the arches are bent in opposite directions parallel to the conductors *e* or *e'*, thus insuring the continued engagement of the contact-shoe *b'* at the point of intersection, since it will be seen that the said shoe will come into engagement with the receiving end *d²* of conductor *d'* before it is disengaged from the portion *d³* upon the opposite side of the arch *g*. The arches are carried by supporting-wires *g²* in the usual manner. In constructing the apparatus the trolley-arm *b* is preferably made of such length 100

that it will not come into contact with the conductors e or e' when in a vertical position. Especially is this desirable at crossings or switches, and the height at which the trolley-conductors are carried at these points preferably is sufficient to insure this result.

It will be seen from the above description that there is no tendency for the trolley-wheel c' to become disengaged from its corresponding conductor, since the arches g readily permit its passage, and the upper trolley-conductors are carried over the crossing in the usual manner. By reason of providing upon the trolley-arm b the diagonally-extending contact-shoe b' it will be seen that at all acute-angled crossings the circuit will not be interrupted, since the contact-shoe is of such length as to prevent any disengagement from its corresponding trolley-conductor, and at the intersections the receiving end of the trolley-conductor beneath the arch will be engaged by said contact-shoe previous to its disengagement from the other end. It is also apparent that by duplicating the contact-shoes b' upon trolley-arm b and separating them by the width of the arch, or more, the circuit will be constantly maintained, even at crossings where the tracks meet at right angles to each other, or, if desired, the simpler apparatus herein shown may be employed, since it is not necessary that the angles at which the tracks and trolley-wires, respectively, meet shall be equal.

By employing the arrangement of apparatus of my invention it will be seen that the likelihood of disconnecting a car from the power-supply circuit at points of intersection with other lines is reduced to a minimum, and, moreover, there is no opportunity for accidentally causing a short circuit between conductors of different potential.

It will be understood that modifications of the apparatus herein specifically shown and described may be made without departing from the spirit of my invention, and

I therefore claim, and desire to secure by these Letters Patent, the following:

1. In a system of electrical distribution, the combination with a trolley-conductor connected with the source of electrical current, of a supporting device g beneath which the said trolley-conductor is opened, a trolley-arm provided upon a car or vehicle operated by the said system, and a contact-making appliance mounted upon the trolley-arm adapted continuously to engage the trolley-conductor, the said conductor being provided with laterally-extending terminals or parts at the supporting device, substantially as described.

2. The combination with the trolley-con-

ductor d' , of the supporting-arch g beneath which the said trolley-conductor is opened and its ends d^2 , d^3 laterally extended, of a contact device b' carried upon a moving car or vehicle operated by current from the conductor d' , the said contact device being adapted to maintain continuous contact with the conductor d' , substantially as described.

3. In a system of electrical traction, the combination with intersecting trolley-conductors disposed in different planes according to their polarity, of supporting-arches g beneath which the conductors of one polarity are maintained open or discontinuous, and trolley-arms b c provided upon a car or vehicle operated by the said system, the said trolley-arms respectively carrying contact-making parts adapted to maintain continuous engagement with their respective trolley-conductors, substantially as and for the purpose described.

4. The combination with intersecting conductors d d' and e e' of different polarity, of supporting-arches g beneath which the said conductors d and d' are maintained open, and trolley-arms b c carrying contact parts adapted to maintain continuous engagement with the respective conductors d and e or d' and e' , substantially as and for the purpose described.

5. The herein-described means for continuously supplying current to a moving car or vehicle consisting of a trolley-conductor d' connected with a source of electrical energy, of a supporting-arch g disposed at an intersection or switch, beneath which arch the said trolley-conductor is discontinuous and at which the ends of said conductor are laterally extended, a diagonally-disposed contact part b' carried upon the moving car or vehicle, the same being adapted continuously to engage the conductor d' and to supply current to the propelling-motor provided upon the car, substantially as described.

6. In a system of electrical distribution, the combination with intersecting conductors d' e , of a supporting-arch g beneath which conductor d' is maintained open, a trolley-arm b , and a contact part b' provided thereon, the said conductor d' being provided with angularly-extending terminals d^2 d^3 beneath the arch g adapted to maintain continuous electrical connection with contact part b' .

In witness whereof I hereunto subscribe my name this 25th day of January, A. D. 1899.

EMMERICH FRISCHMUTH.

Witnesses:

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