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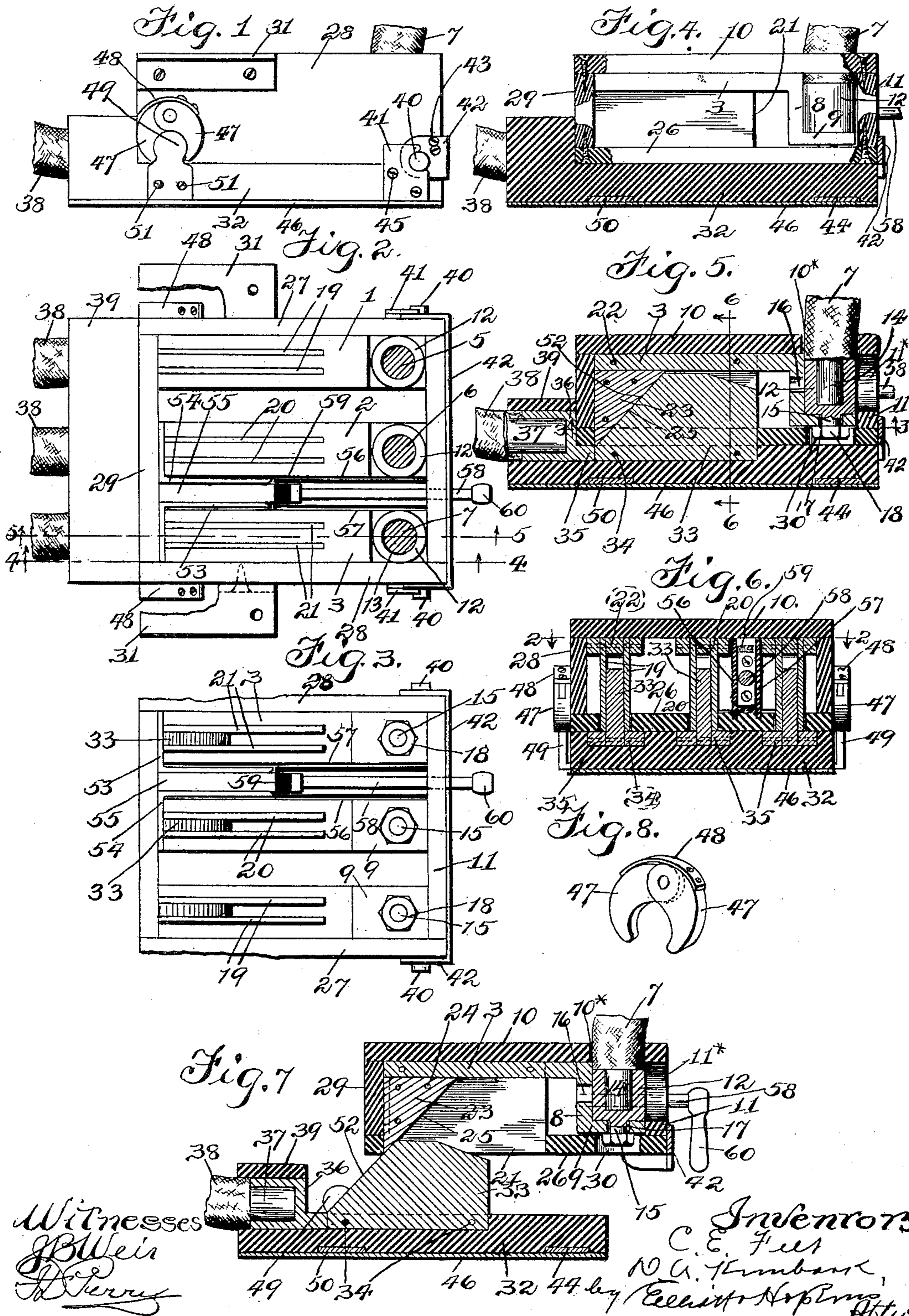
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C. E. FELT & D. A. KIMBARK.

ELECTRIC TRAIN CONNECTOR.

(Application filed Nov. 29, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

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ELECTRIC TRAIN-CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 706,226, dated August 5, 1902.

Application filed November 29, 1901. Serial No. 83,985. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. FELT and DANIEL A. KIMBARK, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Train-Connectors, of which the following is a full, clear, and exact specification.

Our invention relates to that class of electric train-connectors employed for connecting the wires or conductors of railway-cars where the wires of one car are necessarily disconnected from those of the contiguous cars to permit the cars to separate; and the invention has for one of its important objects to provide a connector which shall be of such a character that the knife-switch principle of contact may be employed, whereby a perfect electrical communication will be insured and sparking avoided.

Another object of the invention is to cause the members of the connector to automatically separate should the connectors be forgotten when the cars are uncoupled.

Another object of the invention is to have the construction such that one member of the connector may be inserted from below, whereby it will be more convenient to handle and a large part of the slack heretofore required in the short conductors between the cars may be dispensed with.

Another object of the invention is to provide the connector with a jumper as a permanent part thereof, which shall be of the knife-switch character, for connecting the conductors or wires of the same car together when the car is cut loose.

A still further object of the invention is to provide a lug for the stub ends of electric wires or conductors, which may be readily connected to either the side or the back of the electrical member with which connection is desired.

With these ends in view our invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side ele-

vation of the improved electric train-connector, showing the members in their engaged or operative position. Fig. 2 is a plan view thereof with the top or cover of the female member removed and parts of the supporting-bracket broken away. Fig. 3 is a bottom view with the male member and the bottom cover of the female member removed from the line 3 3, Fig. 5, down. Fig. 4 is a vertical longitudinal sectional view of the two members complete, taken on the line 4 4, Fig. 2. Fig. 5 is a similar section taken on the line 5 5, Fig. 2. Fig. 6 is a transverse section taken on the line 6 6, Fig. 5. Fig. 7 is a vertical longitudinal sectional view of both members, taken on the line 5 5, Fig. 2, showing the members in the act of being pulled apart by accidental longitudinal strain, as hereinafter described; and Fig. 8 is a detail perspective view of a clutch which constitutes a part of the lock hereinafter described.

The connector comprises two members—a male member and a female member—one of which is secured to the car in any suitable position or place, but usually and preferably under the hood over the platform, while the other is connected to the short conductors which extend between the cars and is adapted to be engaged with the member fixed on the car or disengaged therefrom at will, as may be necessary. In practice it is preferable to secure the female member to the car, and this one will be first described.

1 2 3 are a plurality of metallic plates equal in number to the number of wires or conductors 5 6 7 carried by each car, three being ordinarily employed. Each end of each of these plates 1 2 3 is provided or formed with an angular bend comprising two parts 8 9, preferably arranged at right angles to each other and situated near one end of the female member in such a position that the angular part 8 will be opposed to the end of the female member, while the part 9 will be opposed to the side or top thereof, and these plates 1 2 3 are covered over at top by a cover 10, composed of any suitable insulating material, and at the end by a plate 11, of insulating material, cover 10 being formed with an aperture directly opposite each of the angle parts 9 and the plate 11 with an aperture directly op-

posite each of the angle parts 8, so that the conductors 5 6 7 may be inserted through either the side or the end of the connector, as the conditions of each particular case may require. In order that the conductors 5 6 7 may be secured to one or the other of the angle parts 8 9 belonging to their respective plates 1 2 3, a lug 12 for each of the conductors is provided. These lugs are each formed with a socket 13, into which the metallic stop 14 of the conductor is inserted, and the end of each lug is provided with a threaded tenon 15, adapted to be inserted through either a perforation or socket 16 in the angle part 7 or a similar socket or perforation 17 in angle part 9 and firmly bound therein by nut 18, threaded on tenon 15 and engaging against the opposite side of the angle part through which the tenon is inserted. By this means it will be seen that one or more electric conductors may be readily attached electrically to the part with which connection is desired without unduly bending the connector and without having any contacting surface exposed, it being understood that the apertures in the insulations 10 11 being formed in each instance either in the side or the end, according to the requirements of the particular case.

To the plates 1 2 3 are secured fingers 19 20 21, respectively, arranged in pairs and constituting the forks of the female member. These fingers may be attached to their respective plates 1 2 3 in any suitable way or, if desired, formed integrally therewith. In the example shown the plates 1 2 3 are slitted and the edges of the fingers inserted in the slits and then riveted through by rivets 22, as shown in Figs. 2, 5, and 6. Arranged between the fingers of each pair is a triangular-shaped block 23, secured to the fingers by rivets 24 or any other suitable means and constituting an incline 25. The lower edges of the fingers 19 20 21 preferably project downwardly through a bottom cover 26, composed of any suitable insulating material and secured in any desired way to the lower edges of the end plate 11 and two plates 27 28, which constitute the sides, and a third plate 29, which constitutes the end opposite the plate 11, thus forming a complete inclosure or box in which the plates 1, 2, and 3 are housed, in the example shown the bottom cover 26 being provided with sockets 30 for the accommodation of the nuts 18. The female member thus constituted may be secured to the car or other suitable support by side brackets 31.

The male member will now be described.

32 is a block or plate of insulating material upon which are mounted a plurality of blades 33 equal in number to the number of forks 19 20 21 employed on the female member, the blades 33 being secured to the block 32 in any suitable manner, as by means of transverse dowels or rivets 34 passing through foot pieces or bars 35 at the lower edges of the blades. These bars 35 are also formed

with sockets 36, into which are inserted the stub ends 37 of the short conductors 38, which extend between the cars, the sockets 36 being inclosed by an enlargement 39 of the block of insulation 32, so that the male and female members may be fitted together in the manner shown in Figs. 1, 4, 5, and 6, with the fingers between their respective forks.

The male and female members are hinged together book fashion by detachable male and female hinge parts. The male hinge member is shown in Figs. 1 and 2 in the form of a pin 40, projecting from each side of the female member of the connector, while the female part is in the form of an open hook 41, carried by the male member of the connector and engaging partially around the male part 40. The pins 40 are supported by a strip 42, passing around one end of the female member and secured to the insulation by screws 43 or any other suitable way, while the hooks 41 are formed on a similar strip 44, which passes under the male member of the connector and is secured thereto by screws 45 or other suitable devices, the bottom of the block 32, if desired, being reinforced by a metallic sheet 46, arranged below the strips 44.

By the means described it will be seen that one end of the male member may be readily supported upon and attached to the female member by inserting the male member upwardly from below until the hook 41 has engaged over the pin 40, when if closed book fashion the end of the male member carrying the hooks 40 will be prevented from dropping down. In order that the opposite end may also be held from downward displacement, a pair of clutches, one on each side, or any other suitable means is provided. These clutches each comprise a pair of pivoted jaws 47, secured to the sides of the female member of the connector and having their opposed sides so curved as to constitute more than one hundred and eighty degrees of a circle. To one of the jaws 47 is secured a spring 48, which overlaps the other one and possesses a tendency to force the jaws together. Immediately below each pair of these jaws is located a head 49, secured to the male member of the connector in any suitable way and having its periphery constituting more than one hundred and eighty degrees of a circle or having any other suitable form that will adapt it to enter between the jaws 47 and to be grasped and held thereby. These heads 49 for convenience are formed on a strip 50, which passes under the block 32 and up on each side thereof, where it is secured by screws 51 or other suitable devices. By the means described it will be seen that if the hook 41 be first placed over the pin 40 the male and female members may be thereafter locked together and held in firm contact for all practical purposes by simply pressing the heads 49 upwardly into the jaws 47; but should the cars accidentally uncouple or the connectors be forgotten when the cars pull apart the incline 25 on the female member

will be engaged by a companion incline 52, formed at the outer side or end of each of the blades 33, as soon as the male member receives any appreciable degree of longitudinal strain, and the male member will consequently be forced downwardly as it moves longitudinally, and thus disengage the heads 49 from the jaws 47 while the hook 41 pulls away from the pin 40, the pivotal character of the jaws 47 permitting of this lateral motion.

53 54 are L-shaped contact-fingers arranged between the pairs of fingers 20 21 and connecting electrically therewith, respectively, so as to constitute a fourth fork for the reception of the jumper-blade 55, which latter, as will be understood, is employed for connecting two of the circuit-wires together at the end of the car when it is uncoupled from the train, so as to keep the lights in circuit with the local storage battery or other means provided on the car for supplying current when the car is detached from the main generator. These fingers 53 54 are connected with the forks 20 21 in any suitable way. In the example of the invention shown in the drawings their transverse portions are arranged between the plate 29 and the ends of the forks 20 21, while their longitudinal portions extend between the two plates 2 3, but in such a manner as to be out of contact therewith, strips of fiber or other suitable insulation 56 57 being arranged between the plates 2 3, so as to avoid the possibility of electrical communication between the jumper-blade and plates 2 3 when the blade is withdrawn and at the same time constituting a guideway for the blade to slide in, the blade being provided at one end with a handle or stem 58, secured to but insulated from the blade by block 59 or other suitable means and sliding through the end plate 11 to the exterior, where it is provided with a suitable handle 60. Thus when the handle is drawn out the blade 55 will be withdrawn from between the fingers 53 54 and will then stand between the insulating plates or strips 56 57, but will always be carried by the female member as a permanent part thereof and in readiness to be inserted between the fingers 53 54.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. In an electric train-connector the combination of a female member, a male member insertible transversely therein and means for locking said members together, substantially as set forth.

2. In an electric train-connector the combination of a female member, a male member insertible transversely therein and spring-actuated locking means for holding said members together, substantially as set forth.

3. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located

on said members respectively, and means for holding said members against accidental turning on said hinge, substantially as set forth.

4. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located on said members respectively, the female member of said hinge having an open side for the transverse insertion of the male hinge member, and means for holding said connector members against accidental turning on said hinge, substantially as set forth.

5. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located on said members respectively and a clutch for holding said members against accidental turning on said hinge, substantially as set forth.

6. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located on said members respectively at one end thereof, and means located at the other end of the connector for holding the members thereof against accidental turning on said hinge, substantially as set forth.

7. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located on said members respectively, the female part having an open side for the transverse insertion of the male part of said hinge, and a pivoted clutch for holding said members against accidental turning on said hinge, substantially as set forth.

8. In an electric train-connector the combination of a female member, a male member, a hinge connection for said members comprising two parts, male and female, located on said members respectively, the female part of said hinge having an open side for the transverse insertion of the male part thereof, and a pivoted clutch comprising two independently-movable spring-actuated members for locking the first said members against accidental turning on said hinge, substantially as set forth.

9. In an electric train-connector the combination of male and female members hinged together book fashion and a clutch for holding them from opening or swinging on their hinge, substantially as set forth.

10. In an electric train-connector the combination of male and female members detachably hinged together book fashion and separable both transversely and longitudinally, and means for holding them from accidental turning on their hinge, substantially as set forth.

11. In an electric train-connector the combination of male and female members hinged

together book fashion and having engageable inclines for forcing them transversely when subjected to longitudinal strain, substantially as set forth.

5 12. In an electric train-connector the combination of a female member having an incline at one end and a hinge member at the other end, and a male member having an incline at one end and a hinge member at the
10 other end adapted to be inserted between and engage with said first incline and hinge member respectively, substantially as set forth.

13. In an electric train-connector the combination of a female member having an incline at one end and a hinge member at the
15 other end, a male member having an incline at one end and a hinge member at the other end adapted to be inserted between and engage with said first incline and hinge member respectively, and a clutch for holding said
20 male and female members against accidental turning on their hinge, substantially as set forth.

14. In an electric train-connector the combination of male and female members engageable with each other in a transverse direction, means for yieldingly locking said members against transverse movement, and means
25 for forcing said members transversely against the action of said locking means, when one of them is subjected to longitudinal strain, substantially as set forth.

15. In an electric train-connector the combination of a female member provided with
35 an internal incline, a male member having an incline adapted to be engaged with said first incline, a hinge located at one end of said train-connector and comprising disengageable male and female parts, and a clutch located at the opposite end of said connector and
40 comprising male and female parts located on said male and female members for holding the latter from accidental turning on said hinge, substantially as set forth.

45 16. In a train-connector the combination of a male and a female member one of which comprises an angular bend, each angle of which has a perforation or socket therein, and an electric conductor-lug having means adapted
50 to be inserted in and secured to either of said sockets, substantially as set forth.

17. In an electric train-connector the combination of male and female members one of

which comprises an angular part, and an electric conductor-lug, said lug and each angle of
55 said angular part having engageable fastening means for attaching the lug thereto, substantially as set forth.

18. In an electric train-connector the combination of male and female members one of
60 which is provided with apertures in the side and the end thereof and an angular part with its angles opposed to said apertures respectively, and an electric conductor-lug adapted to be inserted through either of said apertures
65 and to connect with either of said angles, substantially as set forth.

19. In an electric train-connector the combination of male and female members one of
70 which comprises an angular part arranged so that one of the angles thereof will be opposed to the adjacent end of the member, an electric conductor-lug adapted to be inserted through either said side or end, and means whereby said lug may be attached to either
75 of said angles, substantially as set forth.

20. In an electric train-connector the combination of male and female members, a plurality of electric conductors connected with
80 each of said members, a plurality of electric contacts carried by each of said members and connecting with said conductors respectively, and a jumper comprising a flat blade slidable between two of said contacts on one of said
85 members and an exterior operating-handle connecting with said blade, substantially as set forth.

21. In an electric train-connector the combination of male and female members, a plurality of electric conductors for said members, respectively, a plurality of contacts carried by said members for said conductors respectively, two flexible fingers connecting
90 two of said contacts together on one of said members, a longitudinally-slidable blade carried by one of said members and adapted to slide between said fingers, and a handle connected to and insulated from said blade and
95 slidably mounted in one of said members, substantially as set forth.

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Witnesses:

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