

1,043,217.

Patented Nov. 5, 1912.

2 SHEETS-SHEET 1.

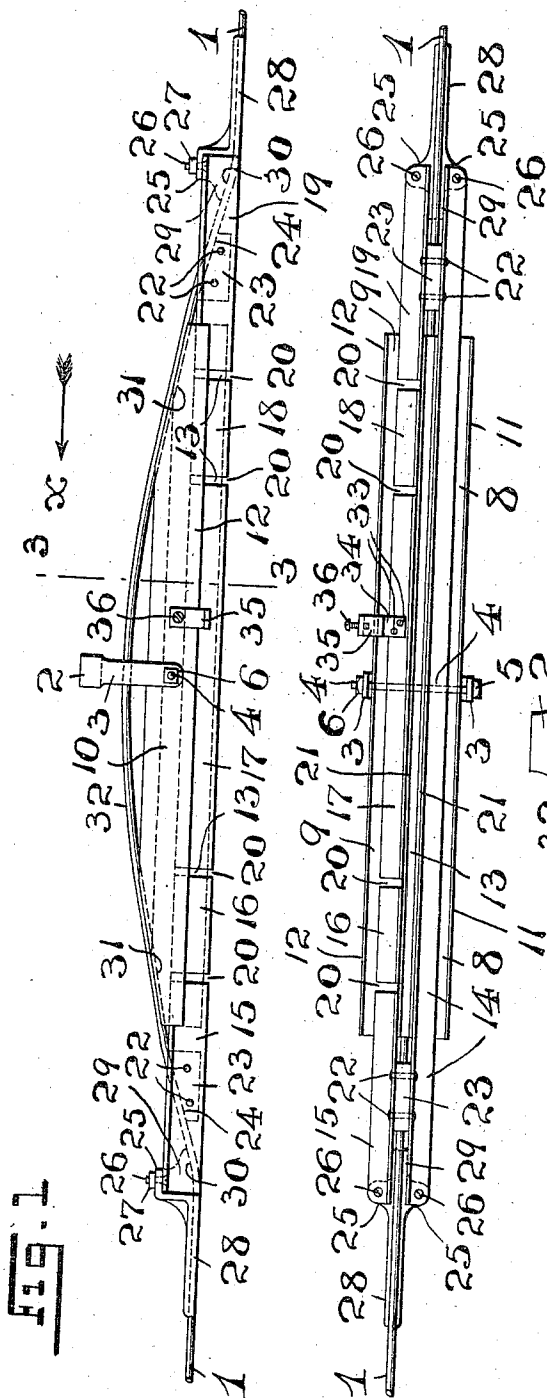


Fig. 1

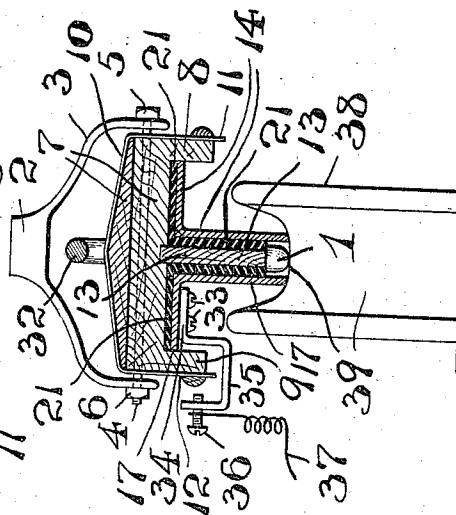


Fig. 2

WITNESSES:

Frank H. W. Fraentzel
Harry E. Pfeiffer

INVENTOR:

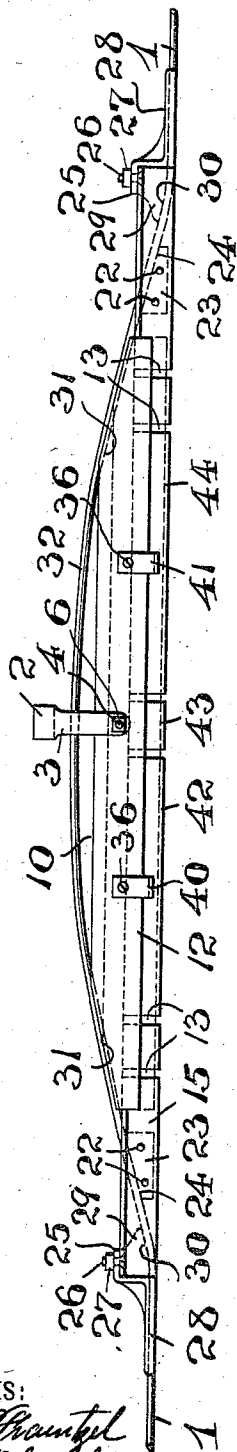
Edward J. Dunne,
BY
Fraentzel and Richards,
ATTORNEYS

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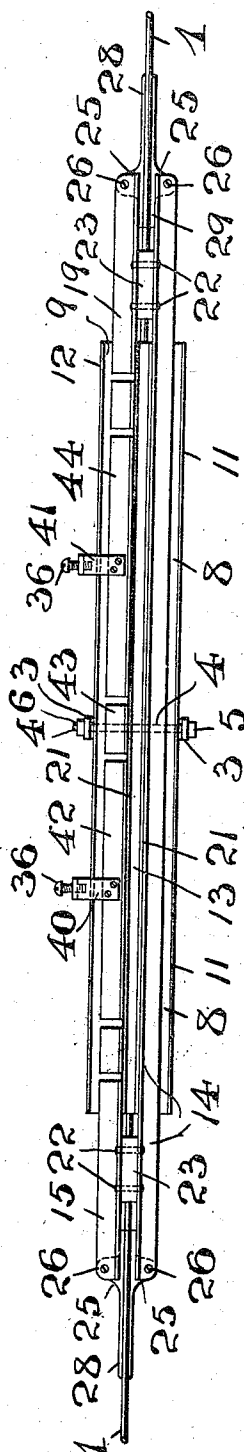
2 SHEETS—SHEET 2.

Fig. 4



WITNESSES:
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Fig. 5



INVENTOR:
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UNITED STATES PATENT OFFICE.

EDWARD J. DUNNE, OF NEWARK, NEW JERSEY.

RAILWAY-SWITCH CONTACT.

1,043,217.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed August 6, 1910. Serial No. 575,902.

To all whom it may concern:

Be it known that I, EDWARD J. DUNNE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway-Switch-Contacts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The invention relates, generally, to improvements in electric signaling or railway switch contacts; and, the invention has reference more particularly, to that class of signaling or railway switch contacts which are employed in electric systems and are used with electrically propelled cars, ordinarily termed trolley-cars, and in which a trolley-wheel is employed for making electrical contact in taking off the electricity from an electric circuit wire or line and supplied to the motor of the car.

The invention has for its principal object to provide a novel and simply constructed electric signaling or railway switch-contact for trolley-wires, which shall be very efficient in its operation, and in which electrical contact is made by means of the groove of a trolley-wheel carried by the car, instead of by means of the trolley-wheel flanges, as heretofore, and an electric circuit is established thereby through a short circuit for automatically operating a signal or signals, a crossing-bell or bells, or other suitable danger-indicating device or apparatus.

The invention has for its further object to arrange and secure at any desired point or points in the trolley-wire, an electric signaling or railway switch contact or contacts without having to sever the wire and securing its severed ends to the contact or contacts, whereby the trolley-wire remains continuous and unbroken; and whereby a positive and a strong and uninterrupted trolley-circuit is the result; and, whereby the contact presents a smooth and straight path for the trolley wheel since the lower marginal edges of the contact-members or flanges are in the same horizontal plane as the trolley

wire, the trolley wire itself being unbroken and raised from the horizontal plane by being passed over the contact.

The invention has for its further object to provide a construction which is very simple, the parts being immovably connected, and all made from the ordinary commercial materials; and, a particular feature is that the trolley wheel at all times, irrespective of its reduction in size due to the wear, operates upon the groove when making contact with the signaling device or switch-contact, so that the electrical contact is always made by means of the groove of the trolley wheel, instead of by means of its flanges; and, finally, to provide a contact of the character hereinafter more fully specified which is made with a plurality of contact plates so as to adapt the device to various uses, the construction of the devices being such that the contact plates or flanges may easily be made longer or shorter so as to compensate for any car-speed.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel electric signaling or railway switch-contact hereinafter more particularly set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the several devices and parts, as well as in the details of the construction of the same, all of which will be fully described in detail in the following specification, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of an electric signaling or railway-switch contact embodying the features of the present invention, showing the same arranged and secured in the electric circuit-wire or line upon which the trolley-wheel of a car is adapted to run and make electrical contact; Fig. 2 is a bottom view of the devices and parts represented in said Fig. 1; and Fig. 3 is a transverse vertical section, taken on line 2-3 in

said Fig. 1, looking in the direction of the arrow α , said view being made on an enlarged scale, and showing in connection therewith, and in elevation, a portion of a trolley-wheel making electrical contact with the signaling or railway switch contact. Fig. 4 is a side elevation of a railway switch contact of a slightly modified form of construction, but still embodying the principles of the present invention; and Fig. 5 is a bottom view of the same.

Similar characters of reference are employed in all of the above described views, indicating corresponding parts.

Referring now to the several figures of the drawings, the reference-character 1 indicates a portion of a trolley-wire, and 2 indicates a suitably constructed hanger which is secured to and suspended from the usual cross-wire, or other suitable support, not here shown. The said hanger 2 is made preferably in the form of a yoke-shaped suspension device, comprising a pair of downwardly extending arms, as 3, the lower end-portion of which are suitably perforated for the arrangement therein of a bolt or pin 4. The bolt is usually held in place against displacement by means of a head, as 5, at the one end thereof, and a nut, as 6, upon the opposite and screw-threaded end-portion of said bolt. Suitably mounted upon the said bolt or pin 4 is a frame-like structure, as 7, which is of wood, and is formed with the right-angled flanges or downwardly depending sides 8 and 9, so as to provide a frame substantially of the cross-section shown in the drawings.

A suitable covering, as 10, usually of canvas, but which may be of any other suitable material, and which extends down the sides of said flanges 8 and 9, as at 11 and 12, is arranged over said frame-like structure 7. The depending side flanges 11 and 12 of the covering 10 extend below the wooden flanges 8 and 9 to form longitudinal petticoats to prevent moisture from reaching the wooden flanges. The structure 7 is provided with a centrally disposed and downwardly projecting and longitudinally extending member 13, also of wood or other analogous material, said member 13 projecting downwardly to a greater depth than the flanges 8 and 9. Suitably secured to the said element or member 7, at the one side of the said central member 13, is a long and preferably L-shaped contact-plate or bar 14, and suitably secured to the said element or member 7, and at the other side of the said central member 13, are a number of L-shaped plates or bars, as 15, 16, 17, 18 and 19, made of metal, said plates or bars being electrically out of contact with each other, by the open spaces 20 intervening between the ends of the respective plates or bars 15, 16, 17, 18 and 19, substantially as illustrated in the

several figures of the drawings. As a further precaution, suitable insulating material, as 21, may be placed between the said element or member 7, the said central member 13, and the said metal plates or bars 14, and 15, 16, 17, 18 and 19, as will be more fully understood from an inspection of Fig. 3 of the drawings.

It will be noted that the angle-iron 14 on one side of the frame 7 and the angle-irons 15 to 19 on the other side thereof, depend below the insulating material 13 that separates them, thereby forming parallel metallic petticoats which protect the intermediate insulation from moisture, and consequently prevent arcing between the opposite sides. It will also be noted that the active or operating section of angle-iron 17 is insulated from the conductive ends 23 by sections 16 and 18 spaced from both 23 and 17, thereby forming a multi-gap insulation.

In practice, a single gap of sufficient width can not be used, as the gap would be so wide that the trolley-wheel would be knocked off when the wheel jumped the gap. Furthermore, the arcing that always takes place when a circuit is broken would to some extent burn the insulating material, thereby rendering it more susceptible to the absorption of moisture and the short-circuiting of the gap, no matter what its length. Consequently, for this electrical reason, I use a plurality of gaps, as shown at 20, and for mechanical reasons prefer such a structure, so as to provide a substantial continuous bearing for the trolley-wheel, to prevent it from being knocked off, and also to avoid the heavy hammer-blows of the trolley-wheel against the ends of the angle-irons at the gaps.

As shown, the respective end-portions of the L-shaped plate or bar 14, and the end-plates 15 and 19 have arranged therebetween and suitably secured in place by means of pins, screws, or bolts, as 22, the separating blocks 23, the upper surface-portions of said blocks 23 tapering, as at 24, and substantially in the manner illustrated in Figs. 1 and 4 of the drawings. Suitably connected with the end-portions of the said plate or bar 14, and the two plates or bars 15 and 19, and preferably to the upper flanged portions of the said plates or bars, by means of perforated ears or lugs, as 25, and the bolts 26 and nuts 27, are suitable connector-elements or members 28, ordinarily termed approaches, each approach 28 being also formed with the inwardly extending shoes or projections 29, said shoes or projections having their under surfaces 30 tapering upwardly in a manner substantially as indicated in Figs. 1 and 5 of the drawings. In this manner the various parts of the complete electric signaling or railway switch contact is secured to the continuous trolley-wire, the said wire leading

in under the lower faces of the said approaches 28 and then passing under the lower tapered surfaces of the previously mentioned separating blocks 23, and the upper tapered surfaces 31 of the frame 7, the trolley-wire forming a bowed portion, as 32, which passes between the arms of the yoke-shaped hanger or suspension device 2, substantially as illustrated in the several figures of the drawings.

Thus, it will be seen from the foregoing description that with the herein-before described electric signaling or railway switch contact the main trolley-wire is at no time broken, so that an uninterrupted and continuous electric circuit is always maintained through the main line; and, as there are no soldered parts, there can be no separation of the parts due to the vibration to which the trolley-wire and the contact are subjected. Suitably secured to one of the said short metal plates or bars, as 17, by means of screws 33, or other suitable fastening means, is a leading-out or terminal-plate or member 34, which is a good conductor of electricity, said plate or member 34 being formed with a U-shaped portion 35 which is provided with a terminal screw 36 for the attachment thereto of a circuit-wire 37 which leads to the various and well-known electrical instrumentalities, not here shown, when the usual trolley-wheel 38 makes a rolling contact with the plates or bars 14 and 17, by means of its groove 39, as indicated in Fig. 3 of the drawings.

From an inspection of the drawings, it will be seen that the long plate or bar 14 at the one side of the contact is at all times electrically in circuit with the main trolley-wire, the electric current thereby being conducted by means of the trolley-wheel to the motor carried by the car; but, that the short plates or bars are normally "dead", except when the trolley wheel is brought into rolling contact therewith. In that case, the short bar or plate is placed in circuit, and becomes "live", thus establishing an electric circuit through the terminal plate or member 34 and the circuit-wire 37 connected therewith.

With the form of contact shown in Figs. 1 and 2 of the drawings, a single contact is produced; the contact may be provided, however, by means of a plurality of terminals, as shown in Figs. 4 and 5, the contact shown in said last-mentioned figures being provided with two terminals, as 40 and 41, commonly termed as the "off" and "on" terminals, and in which construction, in lieu of the short metal plate or bar 17, the contact is provided with three short plates, as 42, 43 and 44, the terminal 40 being carried by the plate or bar 42, and the terminal 41 being carried by the plate or bar 44.

As has been stated, and as is shown in the

several figures of the drawings, I prefer to employ in connection with the devices, the auxiliary plates or bars 16 and 18, shown in said Figs. 1 and 2, or the auxiliary plate or bar 43 shown in Figs. 4 and 5, as thereby I guard against any possibility of the electric current passing from the block 15 to the block 19, except by the wire 32, as by this means several open spaces or breaks are provided, which will prevent a short-circuit, in case any two of the spaces or breaks should become clogged with foreign matter having properties of conducting the electric current from one block to another block, as will be clearly evident.

Of course I am aware that some changes may be made in the various arrangements and combinations of the several devices and parts, as well as in the details of the construction of the same, without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the claims which are appended to the said specification. Hence, I do not limit my invention to the exact arrangements and combinations of the several devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts, as illustrated in the accompanying drawings.

I claim:—

1. The combination with a trolley wire, of an insulating frame, a covering having sides depending below the sides of the frame to form petticoats parallel with the wire, a continuous member secured to the frame and conductively connected to said wire, a terminal element secured to said frame, gap members in alinement with said element to form a plurality of gaps at each end of said member, insulation between the continuous member and the terminal element and gap members, said members and element forming petticoats depending below the insulation and whose lower edges are in alinement with said wire and form a track for a trolley wheel, whereby current may be bridged by said wheel from the continuous member to the terminal member.

2. An electric contact comprising a frame-like structure, said frame-like structure being adapted to be secured to and mounted on a trolley-wire, and said frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between its downwardly extending flanges and upon the one side of said centrally disposed member, said contact-making plate being normally in continuous electrical circuit with the trolley-wire, and a plurality of short and disconnected contact-making plates secured to said frame-like structure

between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact making plates being out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought into rolling contact.

3. An electric contact comprising a frame-like structure, said frame-like structure being adapted to be secured to and mounted on a trolley-wire, and said frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact making plate secured to said frame-like structure between its downwardly extending flanges and upon the one side of said centrally disposed member, said contact-making plate being normally in continuous electrical circuit with the trolley wire, and a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought into rolling contact, and a terminal connected with one of said short contact-making plates for the completion of an electric circuit with other instrumentalities.

4. An electric contact comprising a frame-like structure, said frame-like structure being adapted to be secured to and mounted on a trolley-wire, and said frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between its downwardly extending flanges and upon the one side of said centrally disposed member, said contact-making plate being normally in continuous electrical circuit with the trolley wire, and a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought into rolling contact, and a terminal plate secured to one of said short contact-making plates, said terminal plate having a U-shaped portion for the attachment of a circuit-wire thereto,

substantially as and for the purposes set forth.

5. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each approach having a lower upwardly tapering surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said approaches, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, and separator-blocks between said long contact-making plate and the short end contact-making plates.

6. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each approach having a lower upwardly tapering surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges, and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said approaches, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, separator-blocks between said long contact-making plate and the short end contact-making plates, and a terminal connected with one of said short contact-making plates for the completion of an electric circuit with other instrumentalities.

7. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each approach having a lower upwardly tapering

surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said approaches, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, separator-blocks between said long contact-making plate and the short end-contact-making plates, a terminal plate secured to one of said short contact-making plates, said terminal plate having a U-shaped portion, and a terminal screw secured to said U-shaped portion for the attachment of a circuit-wire thereto, substantially as and for the purposes set forth.

8. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each approach having a lower upwardly tapering surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said approaches, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, separator-blocks between said long contact-making plates and the short end-contact-making plates, a trolley-hanger for the suspension of said frame-like structure, and a covering upon said frame, said frame having the upper surfaces of its end-portions made tapering and over which the trolley-wire passes and is bowed, substantially as and for the purposes set forth.

9. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each ap-

proach having a lower upwardly tapering surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said connector-elements, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, separator-blocks between said long contact-making plate and the short end contact-making plates, a trolley-hanger for the suspension of said frame-like structure, and a covering upon said frame, said frame having the upper surfaces of its end-portions made tapering and over which the trolley-wire passed and is bowed, and a terminal connected with one of said short contact-making plates for the completion of an electric circuit with other instrumentalities.

10. The combination of a continuous trolley-wire, of a pair of approaches secured to the wire, a shoe connected with each approach having a lower upwardly tapering surface, a frame-like structure comprising downwardly extending flanges and a centrally disposed and downwardly extending member, a long contact-making plate secured to said frame-like structure between said downwardly extending flanges and upon the one side of said centrally disposed member, said long contact-making plate being electrically connected at its ends with said approaches, a plurality of short and disconnected contact-making plates secured to said frame-like structure between the said downwardly extending flanges and upon the other side of said centrally disposed member, said short contact-making plates being normally out of electrical circuit with said trolley-wire, said long contact-making plate and said short contact-making plates being provided with flanges with which the groove of a trolley-wheel is adapted to be brought in rolling contact, separator-blocks between said long contact-making plate and the short end-contact-making plates, a trolley-hanger for the suspension of said frame-like structure, and a covering upon said frame, said frame having the upper surfaces of its end-portions made tapering and over which the trolley-wire passes and is bowed, a terminal plate secured

to one of said short contact-making plates,
said terminal plate having a U-shaped por-
tion, and a terminal screw secured to said
U-shaped portion for the attachment of a
5 circuit-wire thereto, substantially as and for
the purposes set forth.

In testimony, that I claim the invention

set forth above I have hereunto set my hand
this 25th day of July, 1910.

EDWARD J. DUNNE.

Witnesses:

FREDK. C. FRAENTZEL,

FREDK. H. W. FRAENTZEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."