

C. F. HOLTSMANN & C. BERGMANN.
ELECTRIC RAILWAY.

No. 603,060.

Patented Apr. 26, 1898.

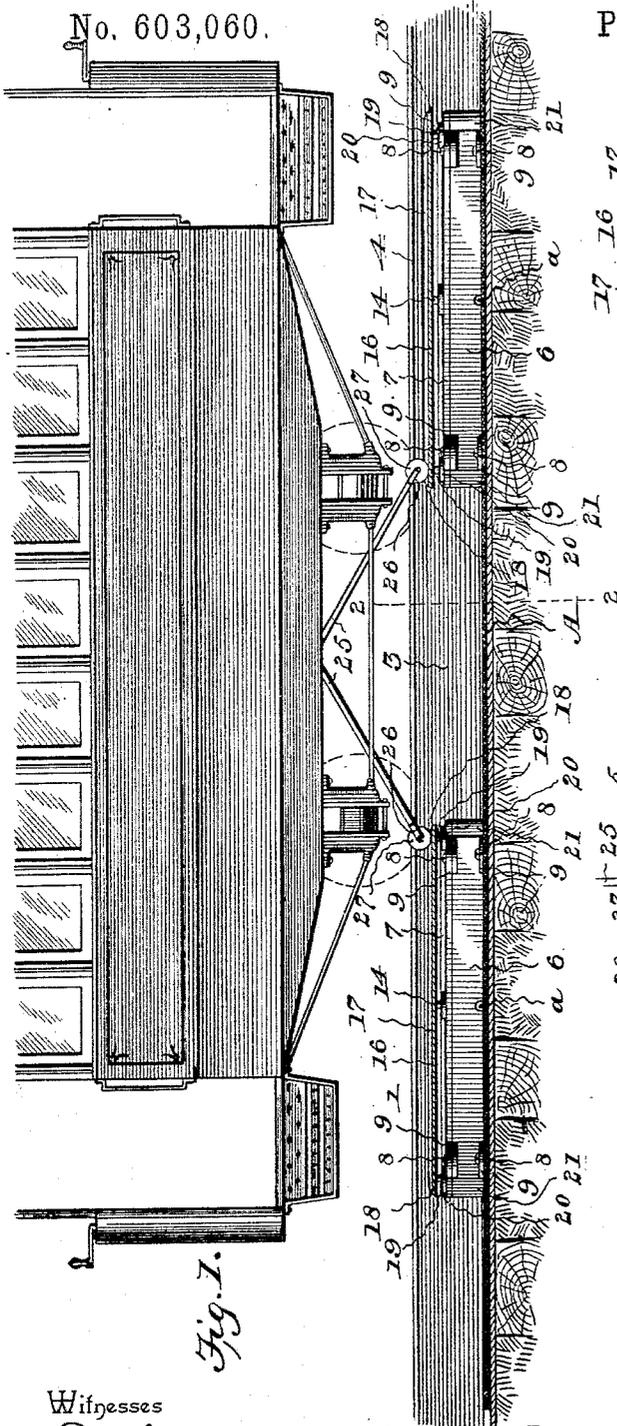


Fig. 1.

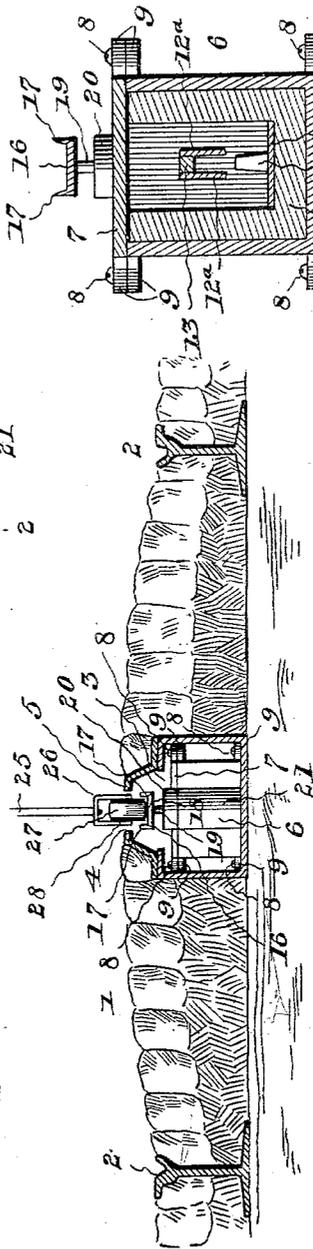


Fig. 5. 12

Fig. 2

Witnesses

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(No Model.)

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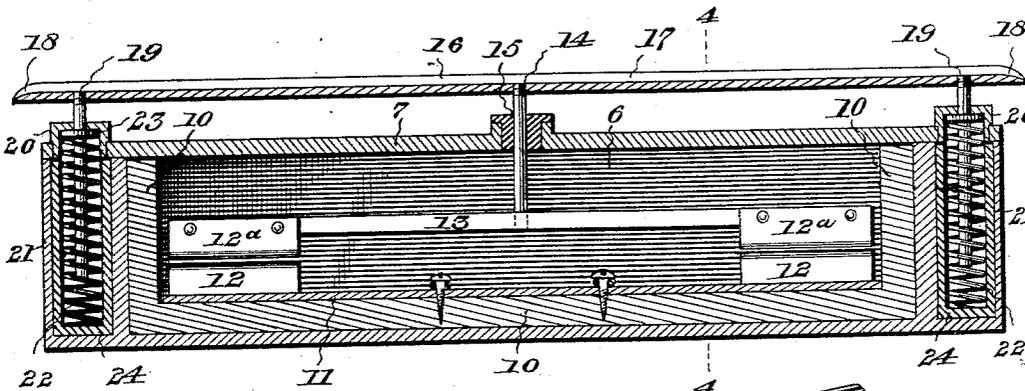
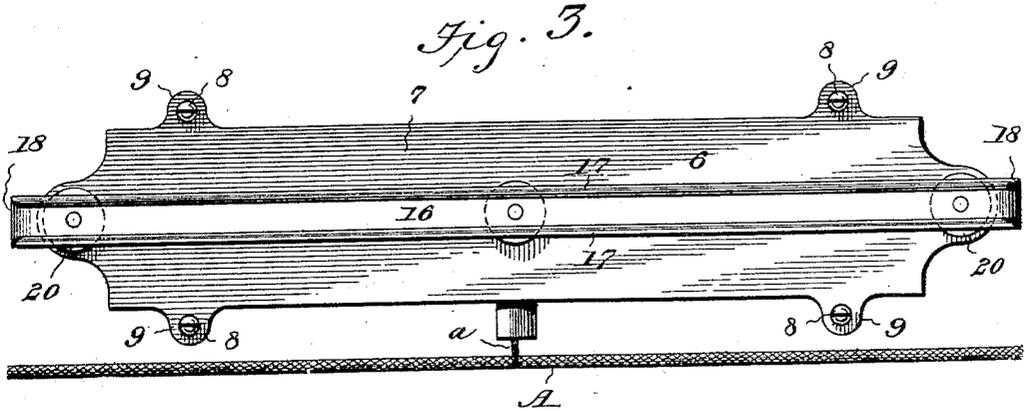


Fig. 4.

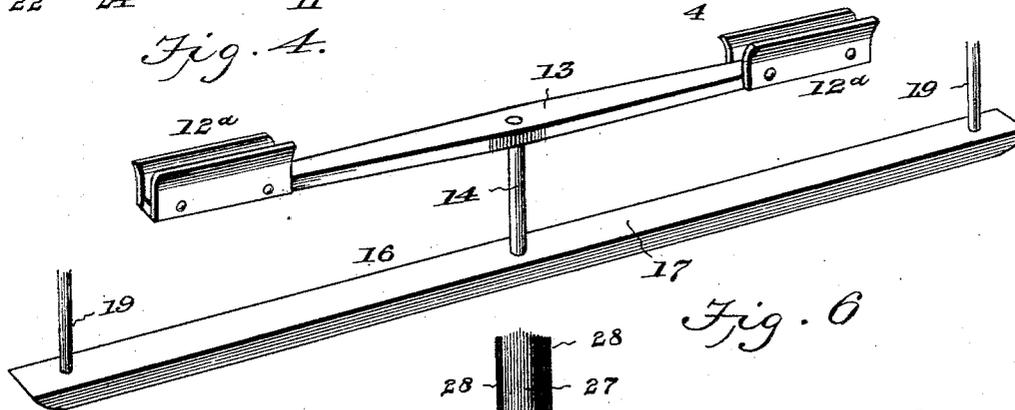
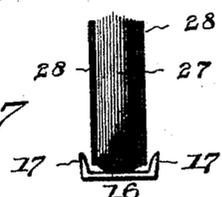


Fig. 6.

Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES F. HOLTMANN AND CHARLES BERGMANN, OF PITTSBURG,
PENNSYLVANIA.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 603,060, dated April 26, 1898.

Application filed August 5, 1897. Serial No. 647,212. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. HOLTMANN and CHARLES BERGMANN, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Electric Railway, of which the following is a specification.

This invention relates to electric railways of that class in which an underground conductor or rail is arranged in sections, so that each section shall be in electrical connection with the main feed-wire at such times only as the trolley or collector on the car is in contact with such section, all the other sections of the underground service conductor or rail being out of circuit.

The invention contemplates certain new and useful improvements in the contact devices and in the trolley connection therewith that will render the system thoroughly protected from the influences of the weather, while at the same time insuring a positive electrical connection at all times between the main feed-wire and the motors of the car, and also permitting an arrangement whereby electrical connection shall be established with one rail-section or conductor as such connection is about to be broken from the immediately preceding rail-section or conductor.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a longitudinal sectional view of the conduit of a railway-track equipped with a series of contact devices constructed in accordance with this invention and showing the trolley connections with the motor-car. Fig. 2 is a transverse sectional view on the line 2 2 of Fig. 1. Fig. 3 is a top plan view of one of the contact-boxes and the rail-section supported thereover. Fig. 4 is a central vertical longitudinal sectional view of the construction illustrated in Fig. 3. Fig. 5 is a transverse sectional view on the line 4 4 of Fig. 4. Fig. 6 is a detail in perspective of the rail-section of the contact device and its attachments. Fig.

7 is an enlarged detail view showing the trolley-wheel contacting with a rail-section.

Referring to the drawings, the numeral 1 designates an ordinary railway-track of an elevated or surface railway system, but which is illustrated in the drawings as being of the usual surface type, and comprises the ordinary track-rails 2. In the drawings the track is illustrated as being provided between the rails thereof with a shallow conduit 3, having the usual surface slot 4, formed between the parallel slot-rails 5, and while the conduit 3 is illustrated as being arranged centrally between the track-rails it will of course be understood that this conduit may be arranged directly adjacent to one of the track-rails, either between the rails or at one side of the track, the arrangement of the conduit necessarily depending upon the particular character of track which is to be fitted with the system contemplated by this invention.

The shallow conduit 3 is designed to have arranged therein a successive series of contact-boxes 6, disposed in lineal alinement at regularly-spaced distances apart, and which boxes may be conveniently secured directly on the cross-ties supporting the track-rails, as clearly illustrated in the drawings. The contact-boxes 6 lie directly beneath the surface slot 4 of the conduit and may be formed in suitable lengths proportionate to the length of the motor-cars designed to travel over the track, said boxes necessarily being elongated, but of a general shape best adapting them for use.

Each contact-box 6 is preferably made of a single casting of a substantially rectangular form and is provided with an open top, inclosed by a removable cover-plate 7, detachably secured in place, preferably by means of screws or bolts 8, passing through registering lugs 9, formed at the side edges of the cover and the upper side edges of the box. The metallic contact-box 6, which is inclosed at the top by the removable cover-plate 7, receives therein a close-fitting insulating-lining 10, of wood or other insulating material, and which lining faces the bottom and the inner sides and ends of the box, so as to thoroughly insulate the same and entirely obviate short-circuiting. Each of the contact-boxes 6 has

fitted to the insulating-lining for the bottom thereof the interior metallic contact-plate 11, provided on its upper side and at opposite ends thereof with the oppositely-located linearly-aligned contact lugs or projections 12, which are adapted to be engaged by the pairs of spaced keeper-plates 12^a, fastened to the opposite ends of the horizontal straight contact-bar 13, working within the contact-box and fitted centrally between its ends to the lower extremity of a short connecting-post 14, sliding through an insulated guide-opening 15, formed in the removable cover-plate 7, centrally between the ends of the latter.

A pair of the keeper-plates 12^a is fitted to each end of the contact-bar 13, so as to work directly over and positively engage with the contact lug or projection 12 immediately therebeneath, said plates 12^a necessarily acting as keepers by serving to maintain the contacting engagement of the lugs 12 with the contact-bar 13.

The short connecting-post 14 for the horizontal contact-bar 13 within each contact-box is rigidly connected at its upper end, above the plane of the box, with a straight rail-section 16. The straight rail-section 16 is of a U shape in cross-section, so as to be provided at its longitudinal side edges with the upwardly-disposed side guide-flanges 17, and at its opposite ends the rail-section is downwardly curved or beveled, as at 18, so as to facilitate the engagement of the trolley of the motor-car therewith. The said rail-section 16 of each contact-box is provided at its opposite ends with the downwardly-disposed supporting-stems 19, working through the insulated guide-collars 20, fitted to opposite ends of the cover-plate 7 and extending within the spring casings or pockets 21, formed integrally with the contact-box, at opposite ends thereof, and disposed in vertical planes to receive the stems 19. The spring casings or pockets 21, formed integrally at opposite ends of each contact-box, accommodate therein the coiled springs 22, encircling the stems 19 and bearing against the buffer-collars 23, formed or fitted on said stem, to provide means whereby the springs 22 in their normally-extended condition will serve to support the rail-section 16 in a position with the contact-bar 13 out of metallic contact with the interior contact-plate 11 of the contact-box. To provide for the thorough insulation and protection of the springs 22, the casings or pockets 21 are provided with an interior insulating-lining 24. The insulating-linings 24 render the casings or pockets 21 perfectly water-tight, while at the same time positively preventing a short-circuiting of the current through the springs.

The interior bottom contact-plate 11 of each contact-box has a branch wire connection *a* with the main feed or line wire *a*, which may be arranged in the conduit and thoroughly insulated; but it will of course be understood that the main feed or line wire by

reason of having branch connections with each contact-box may be strung in any desirable position and protected in any suitable manner from the weather.

In connection with the contact-boxes arranged and constructed as described there is preferably employed a pair of trolley-arms 25 for each motor-car, said trolley-arms being connected at their upper ends in any suitable manner with the motors of the car, but which connection is not illustrated, as the same forms no part of the present invention. The trolley-arms 25 have fitted to their lower ends the swiveled bearing-yokes 26, in which yokes are journaled the metallic trolley-wheels 27, having fitted to their opposite side faces insulating-plates 28, formed of any suitable non-conducting material and serving to protect the side surfaces of the trolley-wheels from metallic contact with either the slot-rails 5 or the side flanges 17 of the track-sections 16. The trolley-wheels 27 are spaced a distance apart slightly greater than the distance between the contiguous ends of the adjacent rail-sections, so that when one trolley-wheel is about to engage one track-section 16 the other trolley-wheel is about to disengage or leave the immediately preceding track-section, thereby providing means for maintaining a constant electrical connection between the feed or line wire and the electric motors, while at the same time confining the current beneath the car and having the same cut off in front and in rear of the car.

The swiveled yokes 26 for the trolley-wheels permit the latter to readily adjust themselves to the curvature of the track at any point, and said trolley-wheels are designed to project into the conduit-slot 4 only a sufficient distance so as to engage with the U-shaped track-section 16. Said track-sections are arranged to normally lie just beneath the surface of the slot 4, and by reason of the side flanges 17 on said track-sections a positive non-slipping contact is maintained between such sections and the trolley-wheels, it being observed at this point that the insulating-facings 28 prevent sparking when the trolley-wheels contact or rub against said flanges 17, as will be readily understood by those skilled in the art.

At this point it is to be noted that by reason of using the contact-bar 13 and providing for a double contact within each contact-box a contact with the interior contact-plate 11 will be made the moment a trolley-wheel strikes one end of the track-section, even though such track-section should tilt, and for the same reason a firm metallic contact will be maintained between the bar 13 and the plate 11 during the entire time the trolley-wheel is traveling over the track-section. It is of course understood the moment the trolleys pass over a track-section the springs 22 immediately elevate such track-section and break the contact within the box.

From the foregoing it is thought that the

special features of construction claimed by us and the utility thereof will be readily apparent to those skilled in the art without further description, and we will also have it understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In an electric railway, a series of separated successively-arranged contact-boxes, a fixed interior metallic contact-plate arranged longitudinally within the bottom of each box and provided at its ends with upwardly-disposed contact lugs or projections, a normally spring-elevated straight track-section arranged longitudinally above each box, each track-section being of a U shape in cross-section and carrying a depending connecting-post, and a horizontal contact-bar fitted between its ends to the lower extremity of said connecting-post and provided with oppositely-located pairs of keeper-plates adapted to engage with said contact lugs or projections, substantially as set forth.

2. In an electric railway, a series of successively-arranged contact-boxes provided with removable cover-plates and formed at their opposite ends with integral vertically-disposed spring casings or pockets, said cover-

plate having a central and end insulated guide-openings, insulating-linings fitted within each contact-box and the spring casings or pockets thereof, a fixed interior metallic contact-plate fitted within the bottom of each contact-box and provided with separate oppositely-located contact lugs or projections, springs housed within said casings or pockets, a normally-elevated straight track-section arranged longitudinally above each box, and provided with a central depending connecting-post working through the central insulated guide-opening, and at its ends with depending stems working through the end guide-openings and having buffer-collars resting on the springs within said casings or housings, a horizontal straight contact-bar fitted centrally between its ends to the inner lower extremity of said connecting-post, and provided at each end with a pair of spaced keeper-plates adapted to work over and engage with the contact lug or projection therebeneath, and a feed-wire connection with said interior metallic contact-plate, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

CHARLES F. HOLTSMANN.
CHARLES BERGMANN.

Witnesses:

W. J. WHITE,
EDWIN KIRBY.