No. 704,092. Patented July 8, 1902.

T. B. PATCH.

CONTACT SYSTEM FOR ELECTRIC RAILWAYS.

(Application filed Nov. 29, 1901.)

(No Model.)

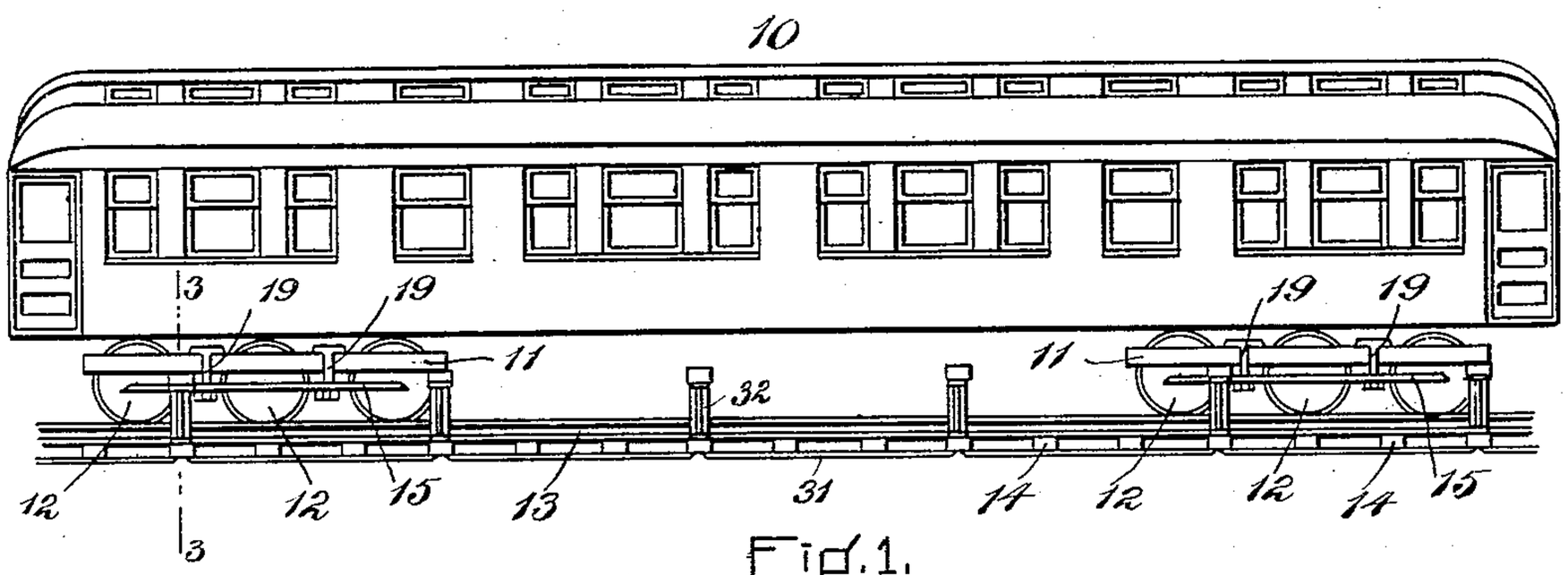

Fig. 1.

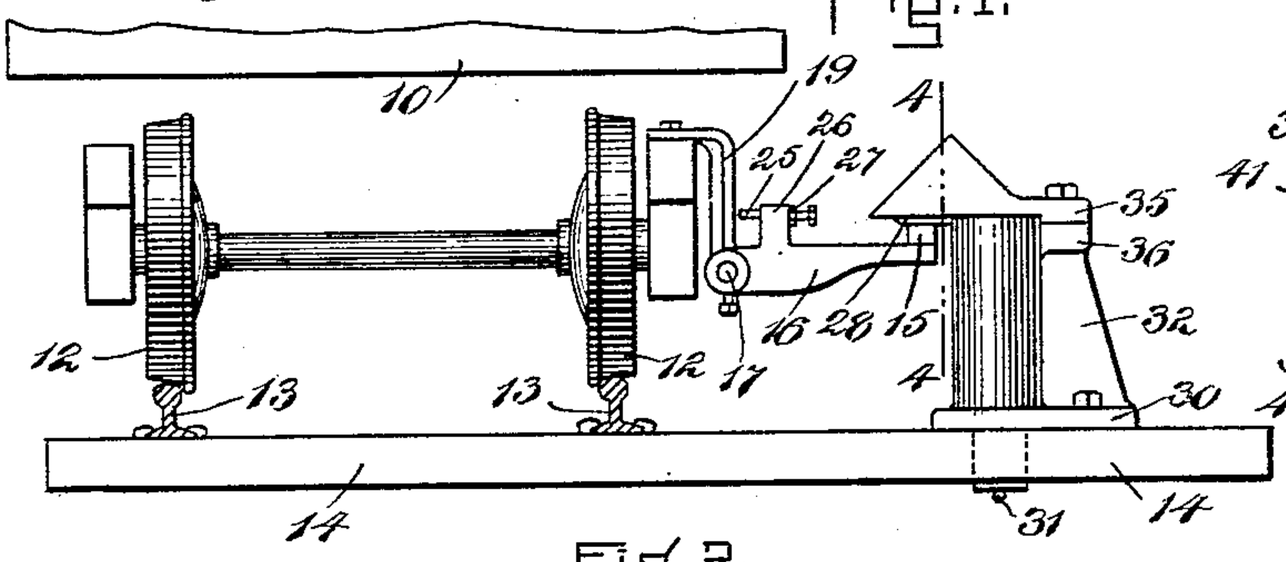

Fig. 2.

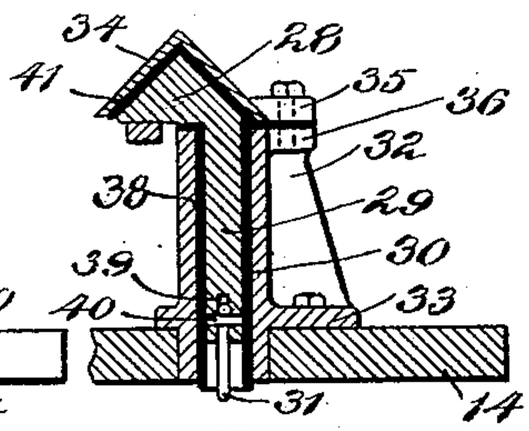

Fig. 3.

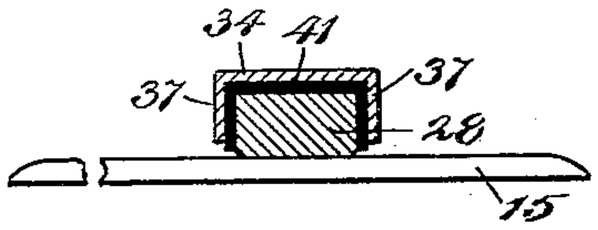

Fig. 4.

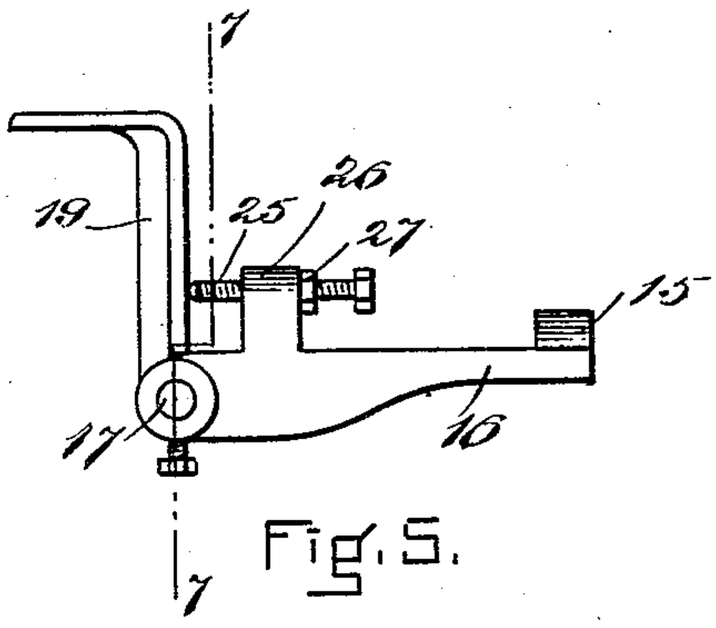

Fig. 5.

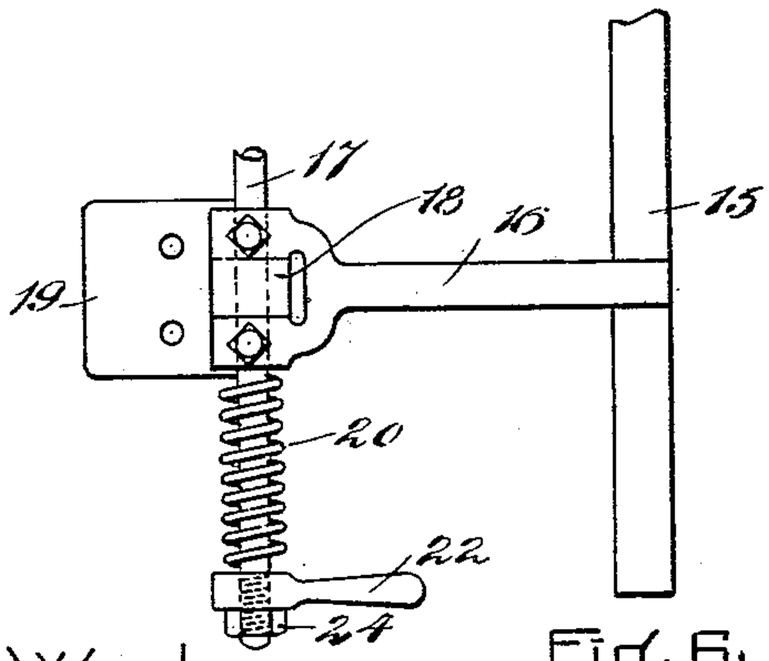

Fig. 6.

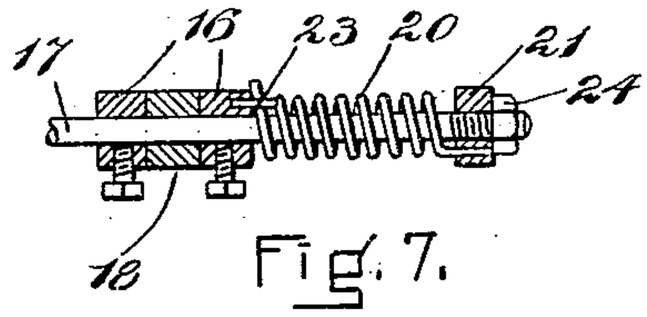

Fig. 7.

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UNITED STATES PATENT OFFICE.

THEODORE B. PATCH, OF NORTH CAMBRIDGE, MASSACHUSETTS.

CONTACT SYSTEM FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 704,092, dated July 8, 1902.

Application filed November 29, 1901. Serial No. 84,006. (No model.)

To all whom it may concern:

Be it known that I, THEODORE B. PATCH, a citizen of the United States, residing at North Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Contact Systems for Electric Railways, of which the following is a specification.

The object of this invention is to provide a cheap, durable, practical, and safe contact system for electric railways.

The invention consists in a contact system for electric railways of a series of standards, a contact-plate fast to each of said standards and insulated therefrom, said contact-plates electrically connected to each other.

The invention further consists in a contact system for electric railways of a series of standards, a contact-plate fast to each of said standards and insulated therefrom, said contact-plates electrically connected to each other, in combination with an electric-car truck, a shoe supported upon said truck and arranged to engage two of said contact-plates simultaneously.

The invention again consists in the specific construction of the contact-plate and the standard by which it is supported.

The invention still further consists, as set forth in the claims, in a contact system for electric railways of a series of standards, each having a contact-plate fast thereto and electrically connected to each other, in combination with an electric-car truck having a shoe supported upon a spring-controlled arm pivoted to a bracket fast to said electric-car truck.

The invention finally consists in the combination and arrangement of parts set forth in the following specification, and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a side elevation of an electric car, showing my improved contact system in connection therewith. Fig. 2 is an end elevation of the same. Fig. 3 is an enlarged vertical transverse section taken on line 3 3 of Fig. 1. Fig. 4 is a vertical section taken on line 4 4 of Fig. 2. Fig. 5 is an elevation, viewed from the same direction as in Fig. 2, of the shoe and its spring-supporting arm and bracket. Fig. 6 is an underneath plan of the same, and Fig. 7 is a detail section taken on line 7 7 of Fig. 5.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is an electric car of the usual construction; 11 11, the trucks of said car; 12 12, the wheels, and 13 13 the rails, supported in the usual manner upon ties 14 14. The shoe 15 is supported upon two arms 16 16, each of said arms being fastened to a pivotal shaft 17, arranged to turn in bearings 18 upon the bracket 19, fast to the truck 11. The shaft 17, to which the arm 16 is fastened, projects beyond one of the bearings 18 and is encircled by a torsional spring 20. Upon the outer end of said shaft is a collar 21, having a handle 22 thereon. Said collar has screw-threaded engagement with the shaft 17, and one end of the torsional spring 20 is attached to said collar, the other end engaging a pin 23, fast to the arm 16. By turning the handle 22 and collar 21 in the proper direction the torsional spring may be wound up or unwound and the handle locked in position upon the shaft 17 by a set-nut 24.

In order to limit the upward motion of the shoe imparted thereto by the torsional spring 20, a stop-screw 25 is provided, said screw having screw-threaded engagement with a boss 26 upon said arm 16. The stop-screw 25 is locked in position by a set-nut 27 and serves to adjust the height to which the shoe 15 can be carried by the action of the torsional spring 20. The shoe 15 is rounded or beveled off at each end and engages the contact-plates 28 as the car moves in either direction. Each of said contact-plates 28 is triangular in cross-section and has a stem 29 projecting downwardly therefrom into a sleeve 30, formed of insulating material and supported in a vertical chamber 38, extending from the top to the bottom of a standard 32. The standard 32 has a base-plate 33, which rests upon the top of one of the ties 14 and serves as a means for fastening said standard to said ties by means of lag-screws.

The lower end of the stem 29 has a slot 39 therein which engages the main conducting-wire 31, bent upwardly to engage said slot, as hereinafter described, and being held firmly in position therein by a cross-pin 40. The contact-plate 28 is covered by an insulating-plate 41, which in cross-section is angle-shaped to fit the triangular-shaped con-

tact-plate 28. The insulating-plate 41 is covered by an angle-shaped cap 34, provided with a flange 35, by which it is attached, by means of cap-screws, to a flange 36 upon the standard 32.

In setting up the standards 32 and connecting the contact-plates 28 with the main conducting-wire 31 a hole is bored through the tie to receive the portion of the standard which projects below the base-plate 33. The conductor 31 is then passed upwardly through the central chamber in said standard and through the sleeve 30, being bent in a U shape in order to engage the slot 39 in the stem 29. The cross-pin 40 is then inserted, holding the conductor-wire firmly in position in contact with the said stem. The stem is then dropped into the sleeve 30 and the wire drawn downwardly and tightened. The conductor 31 serves as a main conductor for the electric current from the dynamo, said current passing from said main conductor through the stem 29 and contact-plate 28 to the shoe 15. Thence by proper wiring the current is conducted to the motor upon the truck and returns through the rails 13 in the usual manner. The shoe 15 is made of sufficient length to contact with two of the plates 28 simultaneously.

It will be seen that by my improved contact system the third rail, with its danger to life and great expense, is done away with, as the contact-plates 28 are entirely covered and insulated, except upon the under side at the point where the shoe 15 contacts therewith. The cap 34 serves as a protector for the contact-plates 28 from the weather, and also, as it is insulated therefrom, even if a person place the hand upon said cap he would receive no shock.

By the construction of the spring-controlled arm 16 the shoe 15 may be moved up and down to adapt itself to varying heights in the under surface of the contact-plates 28, and also by adjusting the stop-screw 25 the distance to which the shoe 15 can be raised by the spring 20 is limited. At each end of the cap 34 I provide a downwardly-projecting flange 37, which serves the double purpose of holding the insulating-plate 41 and the contact-plate 28 in position, and covering said contact-plate to prevent the same from being accidentally touched by anybody.

While I consider it preferable to support the shoe 15 upon the truck of the car, it is evident that said shoe may be supported upon the body of the car without departing from the spirit of my invention.

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

1. In a contact system for an electric railway, a series of standards located outside the tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending therefrom laterally toward said track in such a manner as to present only its under side to an upward-bearing shoe of sufficient length to contact with two of said plates simultaneously, said contact-plates being insulated from said standards and connected to a source of power.

2. In a contact system for an electric railway, a series of standards located outside the tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending therefrom laterally toward said track, a cap covering each of said contact-plates, except upon the under side of said plate, and insulating material between said cap and plate, said plates being connected to a source of power.

3. In a contact system for electric railways, a standard provided with a vertical chamber extending therethrough, an insulating-sleeve in said chamber, and a contact-plate having a stem projecting downwardly therefrom into said insulating-sleeve.

4. In a contact system for electric railways, a standard provided with a vertical chamber extending therethrough, an insulating-sleeve in said chamber, a contact-plate having a stem projecting downwardly therefrom into said insulating-sleeve, a cap covering said contact-plate, and insulating material between said cap and plate.

5. In a contact system for electric railways, a standard provided with a vertical chamber extending therethrough, an insulating-sleeve in said chamber, a contact-plate triangular in cross-section having a stem projecting downwardly into said insulating-sleeve, an angle-shaped cap covering said plate, and insulating material between said cap and plate.

6. In a contact system for an electric railway, a series of standards located outside the tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending therefrom laterally toward said track, a cap covering each of said contact-plates, except upon the under side of said plate, and insulating material between said cap and plate, said plates being connected to a source of power; in combination with an electric-car truck and an upward-bearing shoe supported upon said truck and arranged to engage the under side of two of said contact-plates simultaneously.

7. In a contact system for an electric railway, a series of standards located outside the tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending laterally therefrom toward said track, a cap covering each of said contact-plates, except upon the under side of said contact-plate, and insulating material between said cap and plate, said plates being connected to a source of power; in combination with an electric-car truck and an upward-bearing spring-supported shoe supported upon said truck and arranged to engage the under side of two of said contact-plates simultaneously.

8. In a contact system for an electric railway, a series of standards located outside the

tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending therefrom laterally toward said track, a cap covering each of said contact-plates, except upon the under side of said plate, and insulating material between said cap and plate, said plates being connected to a source of power; in combination with an electric-car truck, a bracket fast to said truck, a spring-controlled arm pivoted to said bracket, and a shoe fast to said arm and arranged to engage the under side of two of said plates simultaneously.

9. In a contact system for an electric railway, a series of standards located outside the tracks of said railway, a series of plates, one of said plates fast to each of said standards and extending therefrom laterally toward said track, a cap covering each of said contact-plates, except upon the under side of said plate, and insulating material between said cap and plate, said plates being connected to a source of power; in combination with an electric-car truck, a bracket fast to said truck, a spring-controlled arm pivoted to said bracket, a shoe fast to said arm and arranged to engage the under side of two of said plates simultaneously, and means to adjustably limit the upward movement of said shoe.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

THEODORE B. PATCH.

Witnesses:

CHARLES S. GOODING,

WILLIAM H. FORREST.