W. M. BROWN.

SURFACE CONTACT ELECTRIC RAILWAY SYSTEM.

APPLICATION FILED FEB. 20, 1905.

930,644.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.

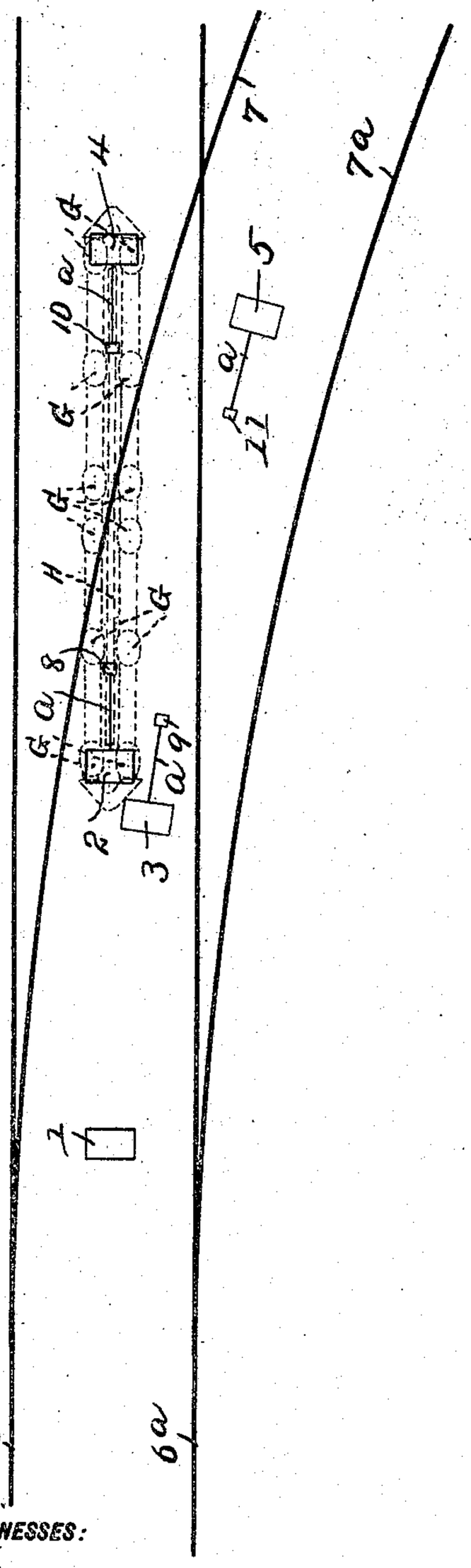

FIG. 1.

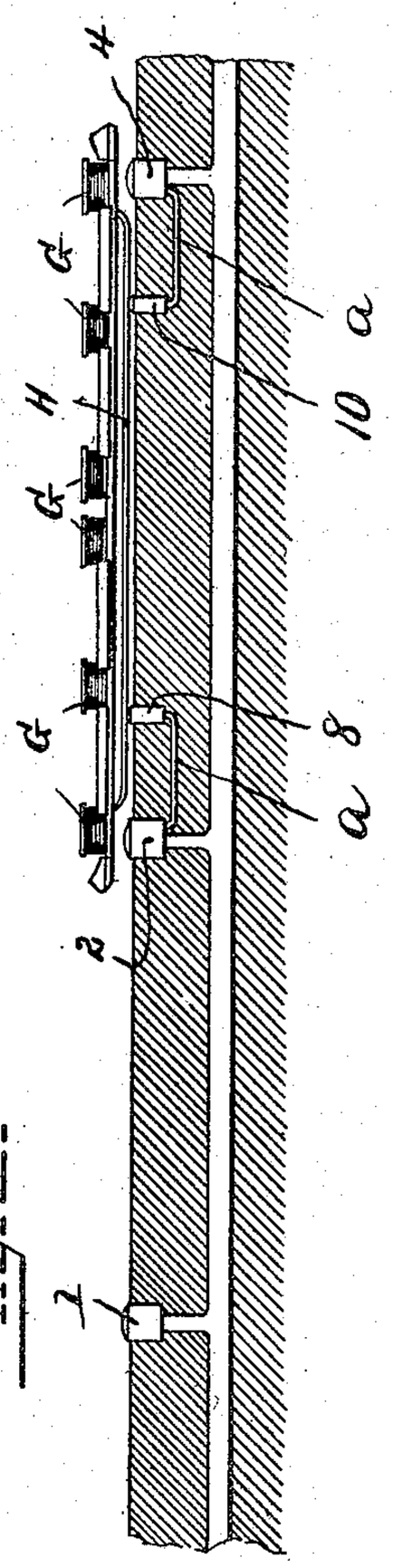

FIG. 2.

WITNESSES:

Ed F. Connor.

L. O'Connell

INVENTOR

W. M. Brown,

BY

Jesse B. Heller,

ATTORNEY.

W. M. BROWN.

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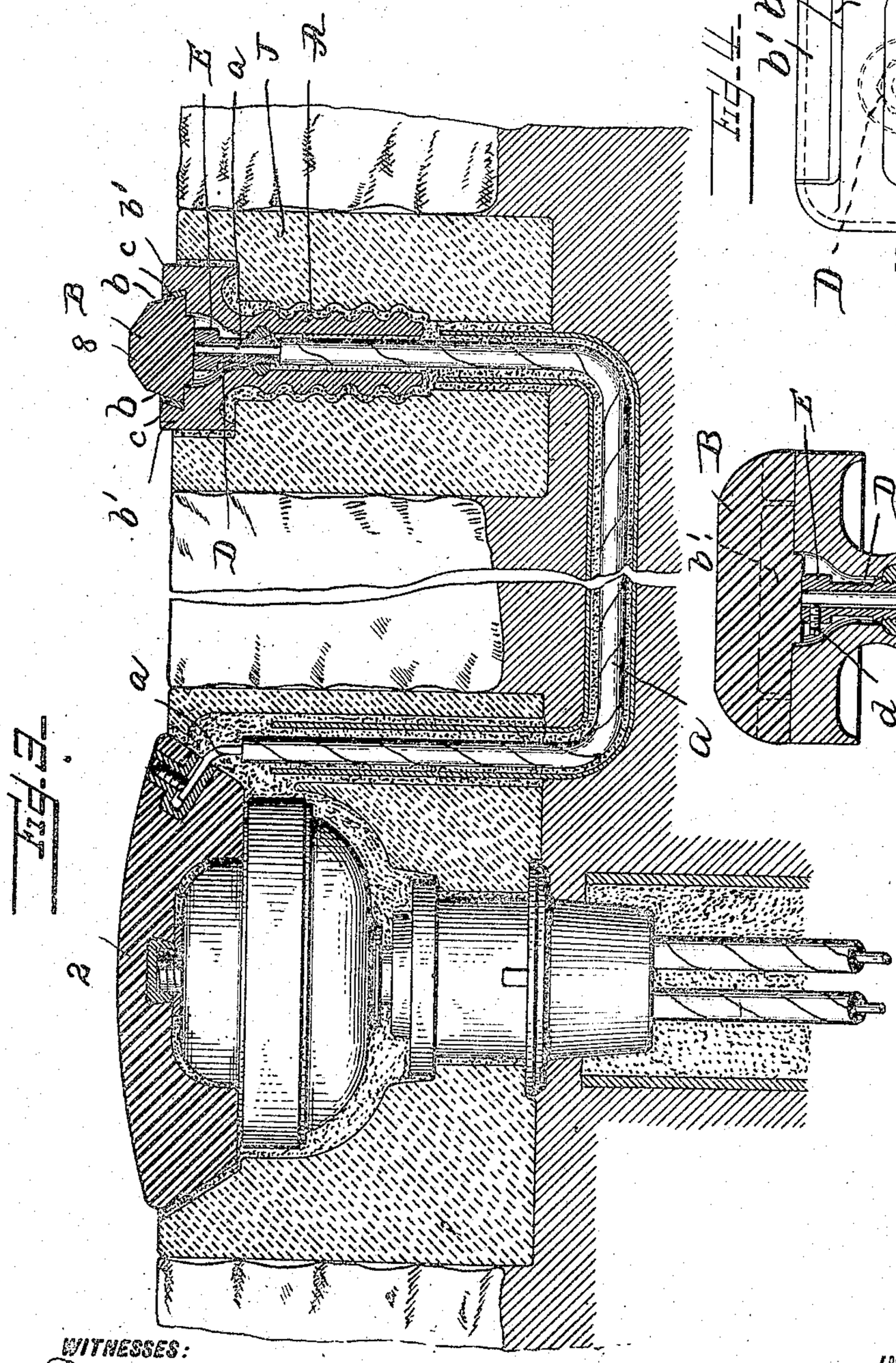

Fig. 3.

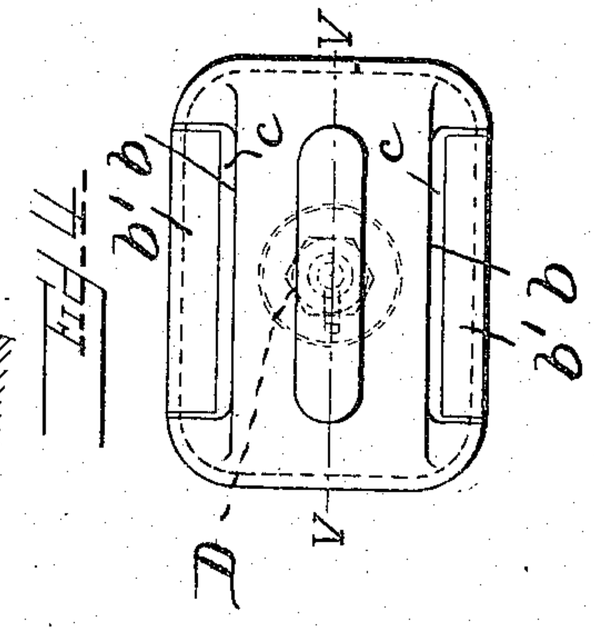

Fig. 4.

Fig. 5.

WITNESSES:

E. F. Bonnell.

L. O'Bonnell

INVENTOR

W. M. Brown

BY

Jesse B. Heller,

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM MILTON BROWN, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO THE LORAIN STEEL COMPANY, A CORPORATION OF PENNSYLVANIA.

SURFACE-CONTACT ELECTRIC-RAILWAY SYSTEM.

No. 930,644. Specification of Letters Patent. Patented Aug. 10, 1909.

Application filed February 20, 1905. Serial No. 246,436.

To all whom it may concern:

Be it known that I, WILLIAM MILTON BROWN, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Surface-Contact Electric-Railway Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

In the installation of surface contact electric railway systems, more especially at branches or turn outs of small angle, on an acute angle it is sometimes difficult to place the contact boxes so that adjacent boxes can be spanned by the current collecting shoe, without placing them so near the track rails as to cause the liability of a circuit being established between the box and rail.

My present invention is designed to provide means for overcoming this difficulty in a satisfactory manner, and it consists in the provision of auxiliary contact devices or studs electrically connected with the adjacent boxes, and so arranged as to be engaged and spanned by the current collector, all substantially as hereinafter described and pointed out in the appended claims.

My invention will be better understood by reference to the accompanying drawing, in which—

Figure 1 is a diagram of a main track having a turnout, the main and auxiliary contacts, the car magnets and the collector, the magnets and collector being shown in dotted lines. Fig. 2, is a vertical longitudinal section of Fig. 1; Fig. 3, is a similar view showing the connection between the main contact and the auxiliary contact; Fig. 4, is a plan view of the auxiliary contact; Fig. 5, is a sectional view on the line V—V of Fig. 4.

In Fig. 1, the numerals 1, 2, 3, 4 and 5 designate the regular contact boxes of the road, 6, 6^a the main track rails, 7, 7^a the branch track rails, and 8, 9, 10 and 11, the auxiliary contacts. It will be readily seen from this figure that, supposing the auxiliary contacts 8 and 10 of the main track and the contacts 9 and 11 of the branch track to be respectively, the proper distance apart to be spanned by a current collecting device, that it would not be practicable to put the boxes 2, 3, 4 and 5 in the respective positions of said auxiliary contacts, for the reason that said boxes would then lie too close to the adjacent rails. Therefore, I separate the said boxes to such a distance that while they are still spanned by the car magnet or magnets G whose pole pieces are usually longer than the collecting shoe H as can be seen by reference to Figs. 1 and 2, the main contacts 2, 3, 4 and 5 are about the same distance from the rails as the auxiliary contacts 8, 9, 10 and 11. The contacts 2 and 4 are spanned by the car magnets G, but the collector is not long enough to span the main contacts 2 and 4, but is in contact with the auxiliary contacts 8 and 10. Each of these auxiliary contacts is electrically connected with the adjacent main contact, as indicated by *a*, so that when the circuit closer in the main box is operated by a car magnet to close the circuit of said box, the adjacent auxiliary contact is connected in parallel with the main contact.

The auxiliary contacts may be of various forms, a suitable form being shown in Figs. 3, 4 and 5. In these figures, the letter A designates a stud having a hollow shank portion designed to be set or embedded in an insulating support J, and a head portion which supports and retains a separable, renewable contact piece B of conducting material. To retain this piece B on the stud, it has the lateral recesses *b*, which embrace lugs *b'* of the stud, with a filling *c* of some suitable retaining material, such as spelter. The conductor *a* which forms the electrical connection with the adjacent contact box, is led up through the hollow interior of the stud where it is held in contact with the contact piece B, by means of a sleeve D, carrying a binding screw *d*, and held in a nut E.

By reference to Figs. 1 and 2, it will be readily understood that a car while passing over the space between contacts 2 and 4, or between contacts 3 and 5, (without the auxiliary contacts 8, 9, 10 and 11), the magnets G would lose the line current, as the collecting shoe H is not long enough to span the space between the main contacts 2 and 4, or 3 and 5. Therefore, as soon as the collecting shoe H would clear either of these main contacts 2, 3, 4 or 5, the line current to the magnet G would be broken, and the armature in the succeeding main contact would drop, and the only way to pick up an armature in one of the succeeding main contacts, is to raise it by means of an inde-

pendent current passing through the magnets G, which would raise the armature, and reëstablish the line current. By the use of an auxiliary contact this will not occur. The operation of a car running from left to right on the rails 6 and 6ª is as follows:—

The distance between main contacts 1 and 2 is less than the length of the collecting shoe H. Therefore, it would receive current from the main contact 2 before it passed off of the main contact 1. In passing from main contact 2, to main contact 3, current will be collected from main contact 2, and its auxiliary contact 8. Shortly after the main contact 2 is passed by the collecting shoe H, the magnets will cover main contact 4, raise its armature, and connect main contact 4 and its auxiliary contact 10 with the line current. The collecting shoe H will then be in contact with the auxiliary contacts 8 and 10, and after passing off of the auxiliary contact 8, it will contact with main contact 4. The succeeding main contacts can be placed at a distance less than the length of the collecting shoe H without being placed close to the rails.

As I have before stated, the auxiliary contact may be constructed in various ways, and hence I do not wish to be limited to the specific device which I have herein shown and described. The arrangement of contacts herein shown and described is designed for use in connection with an electric railway system such as shown and described in my Patent No. 558,151, dated April 14th, 1896, in which the cars are provided with a circuit-closing magnet having an extended pole-piece of sufficient length to span two adjacent contact boxes, and also having a current-collecting shoe which is of less length than the magnets.

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

1. In a surface contact electric railway, the combination with two contact boxes separated from each other by a distance greater than the length of the car current collecting device, but sufficiently close together to be spanned by the car magnet, of an auxiliary contact device adjacent to one or both of the said boxes and electrically connected therewith.

2. In a surface contact electric system, two tracks crossing at an acute angle with relation to each other, main surface contacts for each of the tracks, auxiliary contacts of smaller surface area than the main contacts, and each of the auxiliary contacts in electrical connection with one of the main contacts, the auxiliary contact being in advance of the main contact to which it is connected, and so positioned that it is as remote from the crossing rail of the other track as its main contact; substantially as described.

3. In a surface contact electric system, a through-track, and a turn-out from the through track, one of the rails of the turn-out track crossing a rail of the through track, main surface contacts for the turn-out tracks, auxiliary contacts of smaller surface area than the main contacts, and each of the auxiliary contacts in electrical connection with one of the main contacts, the auxiliary contact being in advance of the main contact to which it is connected, and so positioned that it is as remote from the crossing rail of the other track as its main contact; substantially as described.

4. In a surface contact electrical system, a through track, a turn-out from the through track, one of the rails of the turn-out track crossing a rail of the other track, main surface contacts for the through track, main surface contacts for the turn-out, two auxiliary surface contacts of smaller surface area than the main contacts between two adjacent contacts, each of the auxiliary contacts being in electrical connection with one of the main contacts, and the auxiliary contacts being so positioned that they are as remote from the crossing rails of the two tracks as the main contacts to which they are connected; substantially as described.

In testimony whereof, I have affixed my signature in presence of two witnesses.

WILLIAM MILTON BROWN.

Witnesses:

GEO. H. PARMELEE,

H. W. SMITH.