

No. 657,311.

Patented Sept. 4, 1900.

L. DION.
CLOSED CONDUIT ELECTRIC RAILWAY.

(Application filed Mar. 6, 1899.)

(No Model.)

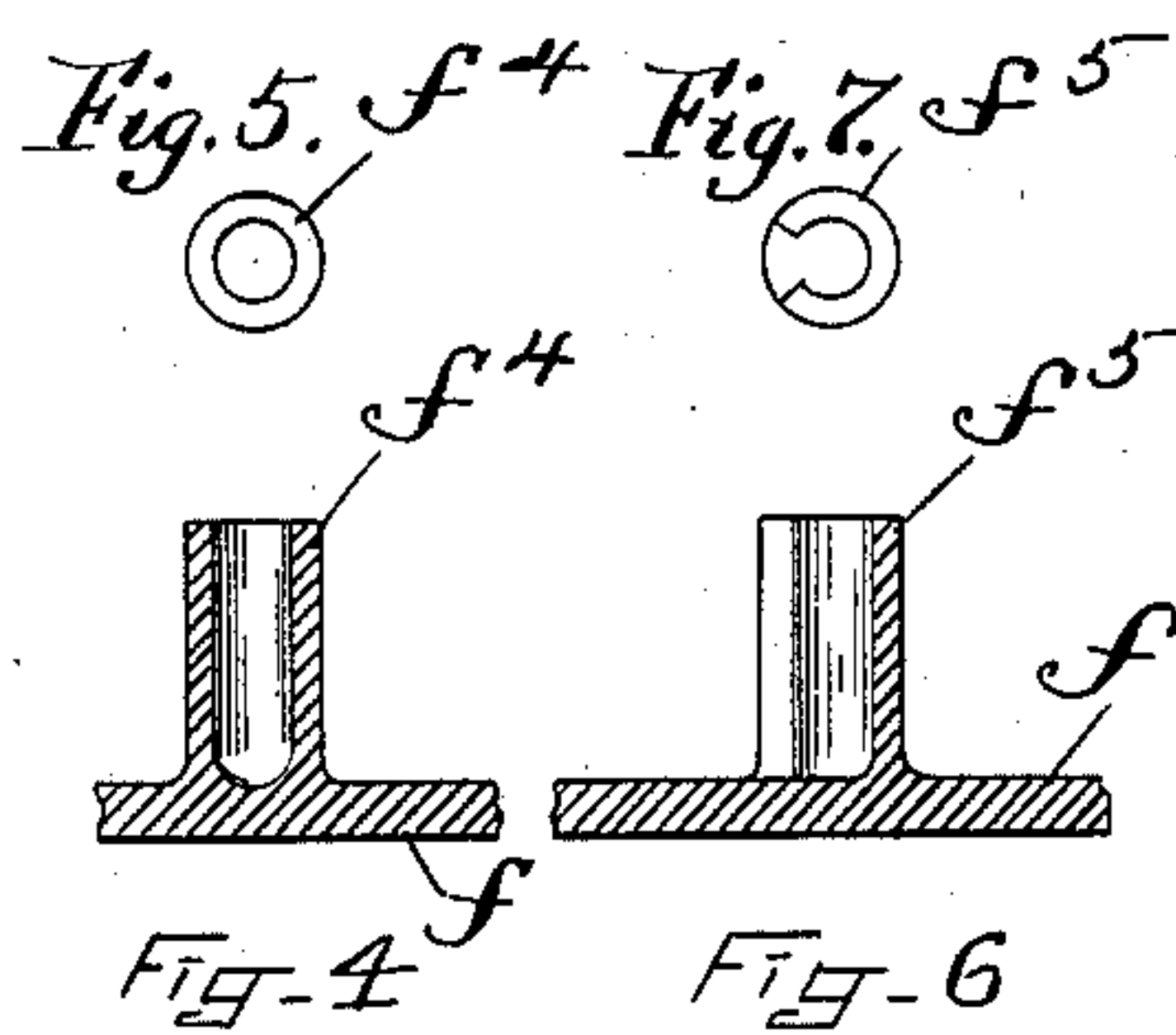
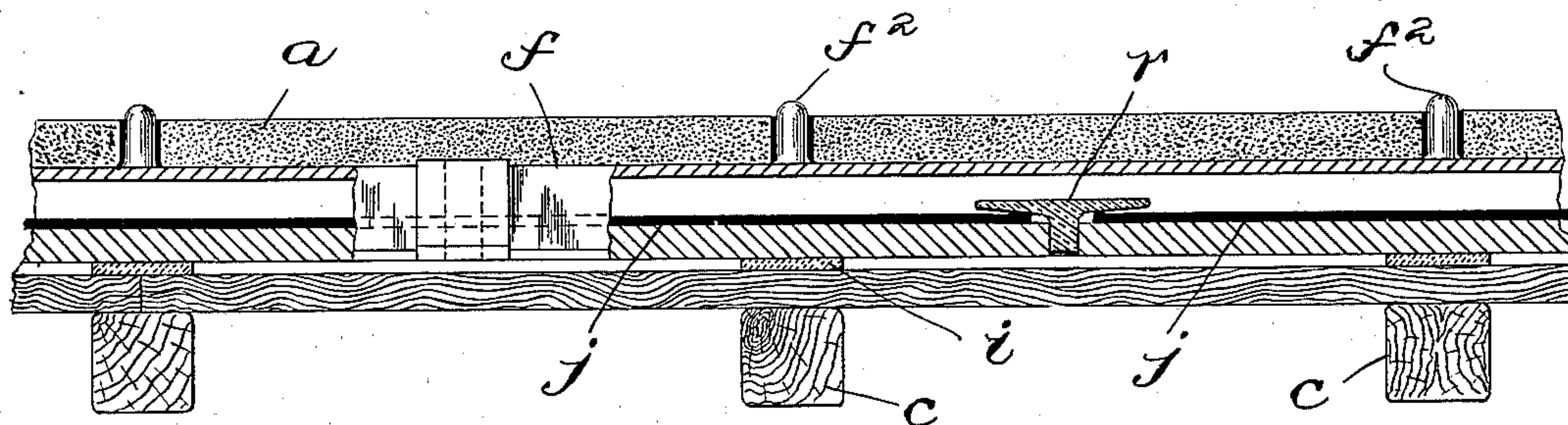
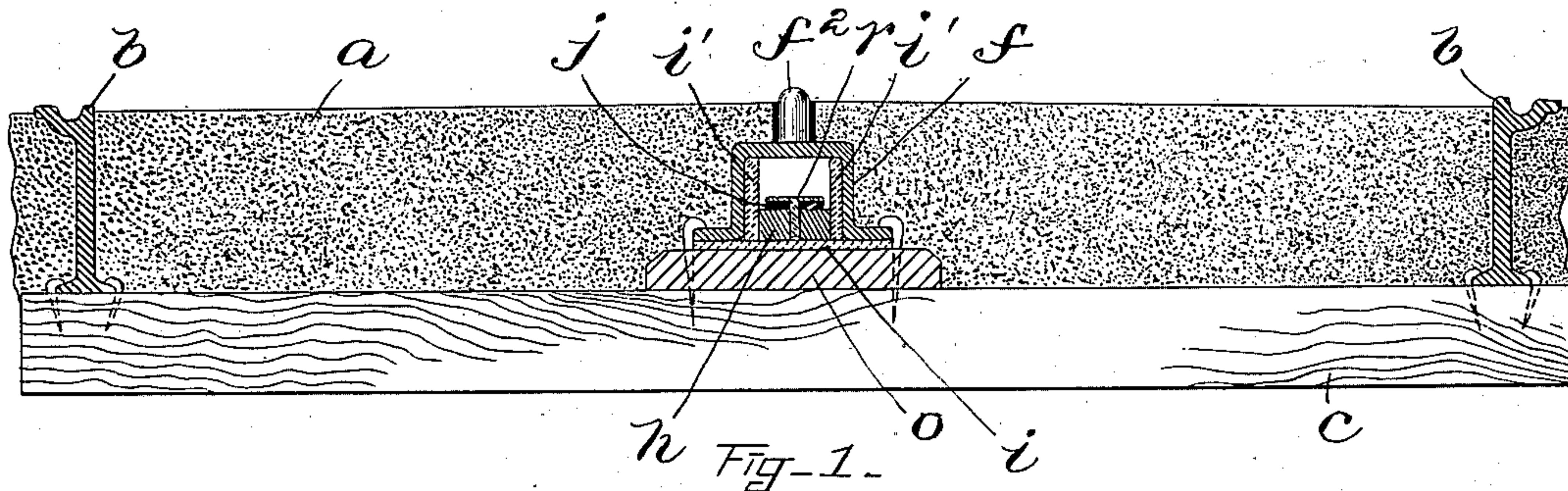
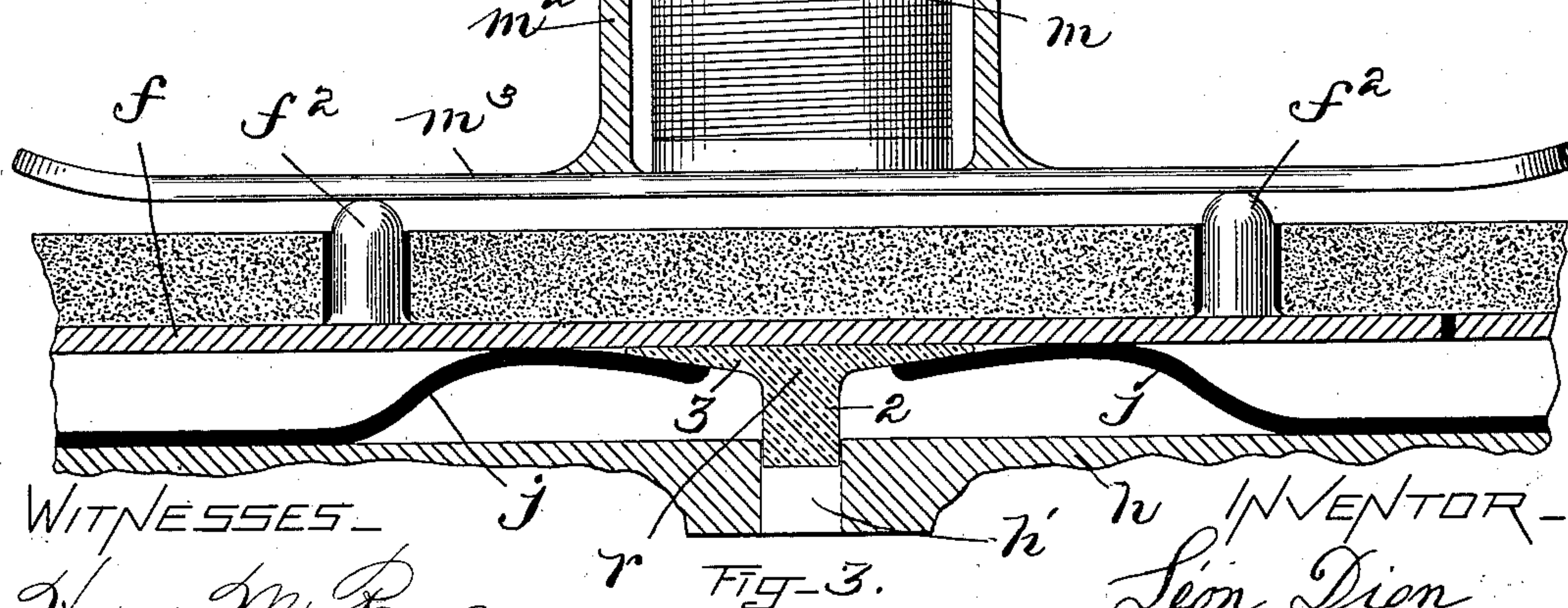
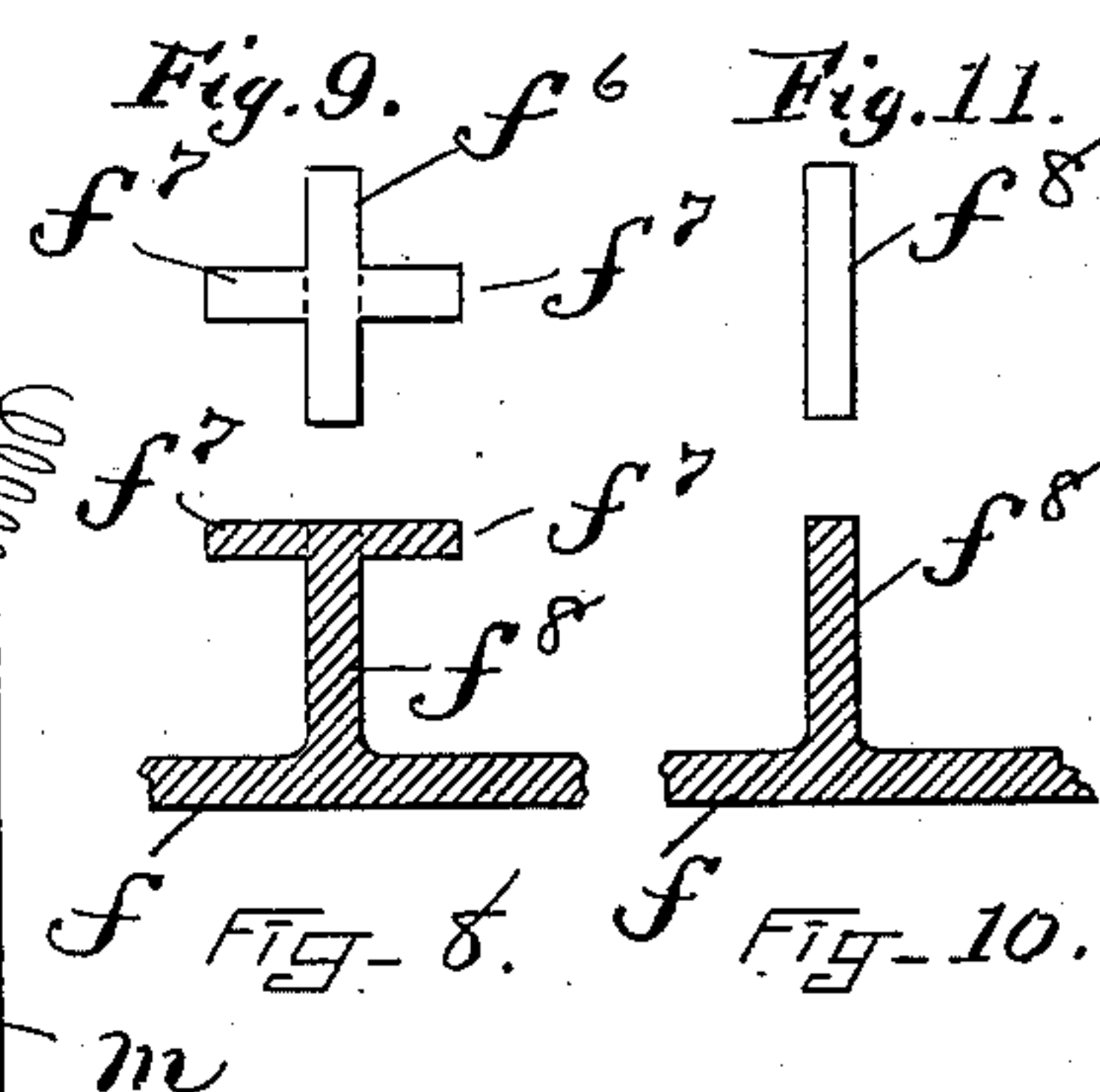


Fig. 2.



WITNESSES—

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CLOSED-CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 657,311, dated September 4, 1900.

Application filed March 6, 1899. Serial No. 707,859. (No model.)

To all whom it may concern:

Be it known that I, LÉON DION, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Closed-Conduit Electric Railways, of which the following is a specification.

This invention relates to closed-conduit electric-railway systems in which a magnet carried by the car is used as a means for energizing the surface conductor.

The invention has for its object to improve the construction of the conduit and the inclosed parts; and it consists in the novel features of construction and arrangement which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a cross-section of a roadway, showing a conduit constructed in accordance with my invention. Fig. 2 represents a longitudinal section thereof. Fig. 3 represents a similar section, on an enlarged scale, showing the car-magnet and collecting-shoe. Figs. 4 to 11, inclusive, represent sectional and plan views, showing several modifications in the construction of the surface conductor.

The arrangement shown in Fig. 3 differs slightly from that shown in Fig. 2 in that the conductive studs, hereinafter referred to, are placed closer together in Fig. 3 than in Fig. 2, and the collecting-shoe shown in Fig. 3 is shorter than would be required with the conduit in Fig. 2.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, *a* designates the roadway, which may be of any suitable or approved construction. *b b* designate the car-supporting rails, and *c c* designate cross-ties supporting said rails. In the middle of the roadway and supported on said ties is a plank or stringer *o*, supporting the conduit. The latter is constructed with an inverted-trough-shaped outer casing *f*, made up of independent insulated sections, preferably composed of a non-magnetic metal, such as manganese steel. Inside of the casing is a main conductor *h*, supported by horizontal insulating-pieces *i i*, and flanked by vertical insulating-pieces *i' i'*. Overlying the main conductor *h* is an auxiliary conductor *j*, composed of independent

flexible bands or strips of a magnetic metal, such as soft iron. The sections of the said auxiliary conductor *j* lie loosely on the main conductor *h*, and the ends of the sections are separated by T-shaped separators *r*, which have flat tops 3 and stems 2 fitting in slots *h'* in the main conductor *h*. The object of these separators is to prevent longitudinal displacement of the sections of the auxiliary conductor, and at the same time to permit the latter to rise and fall with great freedom under the influence of the car-magnet. Said separators may be composed of a non-magnetic material, such as brass or bronze.

The surface conductor *f* is, as shown in the drawings, buried beneath the surface of the roadway, the material of the roadway, which may be asphalt or other road-making material, covering the conduit on three sides. At intervals the surface conductor *f* is provided with upwardly-projecting conductive studs *f² f²*, which are preferably cast integrally with the several sections of the said conductor and extend slightly above the surface of the roadway. These studs or members may have various forms. In Figs. 4 and 5 a cupped or hollow cylindrical stud *f⁴* is shown. Figs. 6 and 7 show a variation of this form in the shape of a stud *f⁵*, which is C-shaped in horizontal section. Figs. 8 and 9 show a stud having an elongated vertical portion *f⁶*, with lateral projections *f⁷* on its top edge, the whole making a plan in the form of a cross. Figs. 10 and 11 show a stud *f⁸* of elongated form without the lateral projections. The object of these several modifications is to reduce the amount of metal, while providing for sufficient contact-surface.

m represents the magnet carried by the car, the said magnet being inclosed in a hollow casing *m²*, which supports at its lower end a collecting-shoe *m³*, adapted to run in contact with the upper ends of the studs on the surface conductor *f*. The magnet being energized by the electrical current attracts the auxiliary conductor *j*.

In operation the magnet *m*, being energized by the electric current, exerts a magnetic influence which lifts the auxiliary conductor *j* into contact with the sectional surface conductor *f*, and thereby energizes the

latter, so that the shoe m^3 can collect current from the studs f^2 and convey the same to the car-motor. The rails $b\ b$ may form the return-conductor, as usual. As the car passes along the road each section of the auxiliary conductor j is elevated in turn, a loop being formed beneath the magnet m , as shown in Fig. 3, and when the car passes onto the next section of the auxiliary conductor the preceding section falls into its normal position on top of the main conductor h , and the sections of the surface conductor are thereby successively energized and deenergized. When the ends of two adjoining sections of the auxiliary conductor rise under the influence of the magnet m , they carry with them the separator r , and when said ends fall after the magnet has passed the separator descends by its own weight.

It is obvious that the conduit and inclosed parts constructed in accordance with my present invention may be employed in connection with magnets and collecting-shoes of forms other than those shown in the drawings and hereinbefore described.

I do not herein claim a magnet carried by the car and inclosed in a protective hollow casing which carries at its lower end a collecting-shoe, as the same forms the subject of another application, Serial No. 707,857 filed by me concurrently with this.

I claim—

1. In an electric-railway system, a closed conduit having an upper conductor located beneath the surface of the roadway, and a series of conductive members projecting from

said conductor at intervals and having their ends located above the roadway-surface.

2. In an electric-railway system, a closed conduit having an upper conductor located beneath the surface of the roadway, and a series of conductive members projecting from said conductor at intervals and having their ends located above the roadway-surface, said members being composed of non-magnetic material.

3. In an electric-railway system, a closed conduit, a main conductor therein, and an auxiliary conductor composed of independent strips of magnetic material overlying the main conductor, and movable separating members interposed between the ends of said strips.

4. In an electric-railway system, a closed conduit, a main conductor therein, and an auxiliary conductor composed of independent strips of magnetic material overlying the main conductor and disconnected therefrom, and movable separating members interposed between the ends of said strips.

5. In an electric-railway system, a closed conduit having a sectional upper conductor composed of material not subject to magnetic attraction, and a series of conductive members projecting upwardly from said conductor at intervals.

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

LÉON DION.

Witnesses:

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