

No. 682,381.

Patented Sept. 10, 1901.

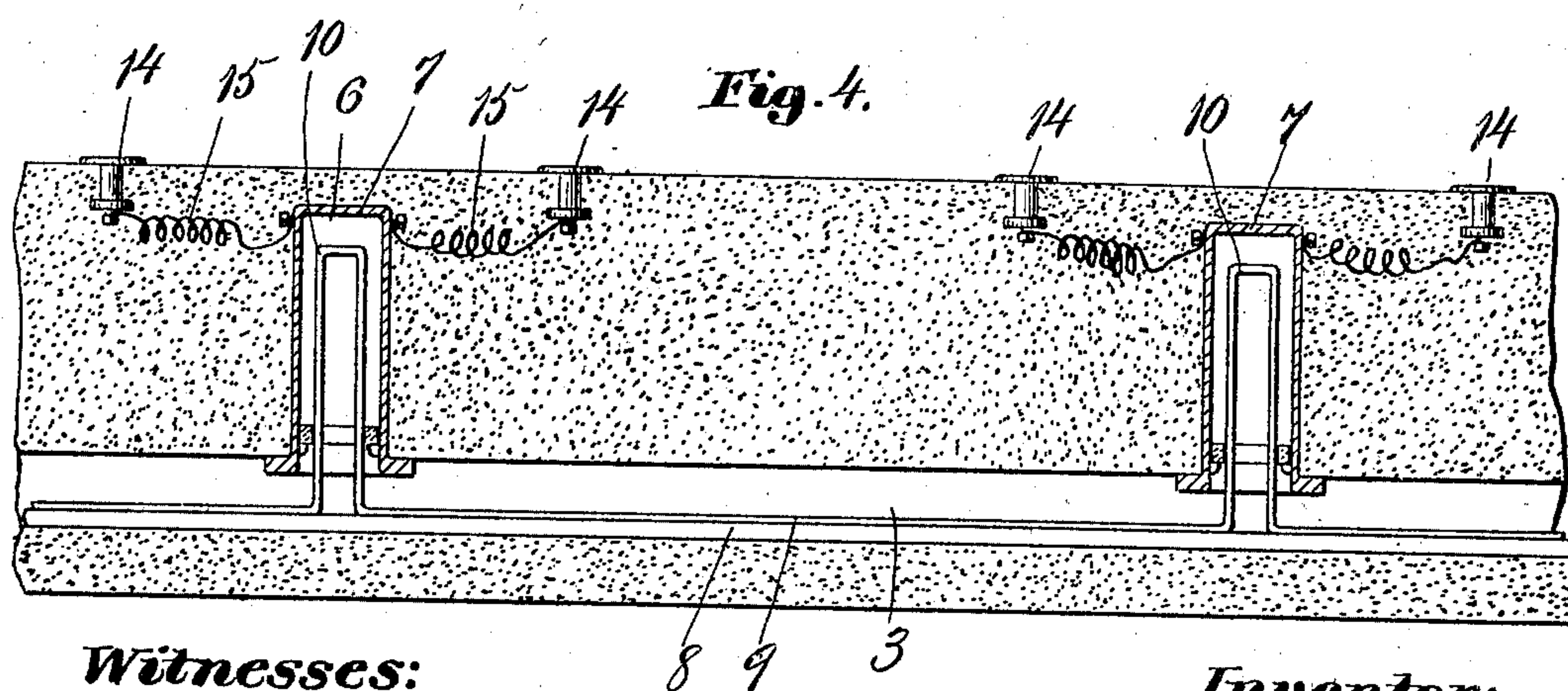
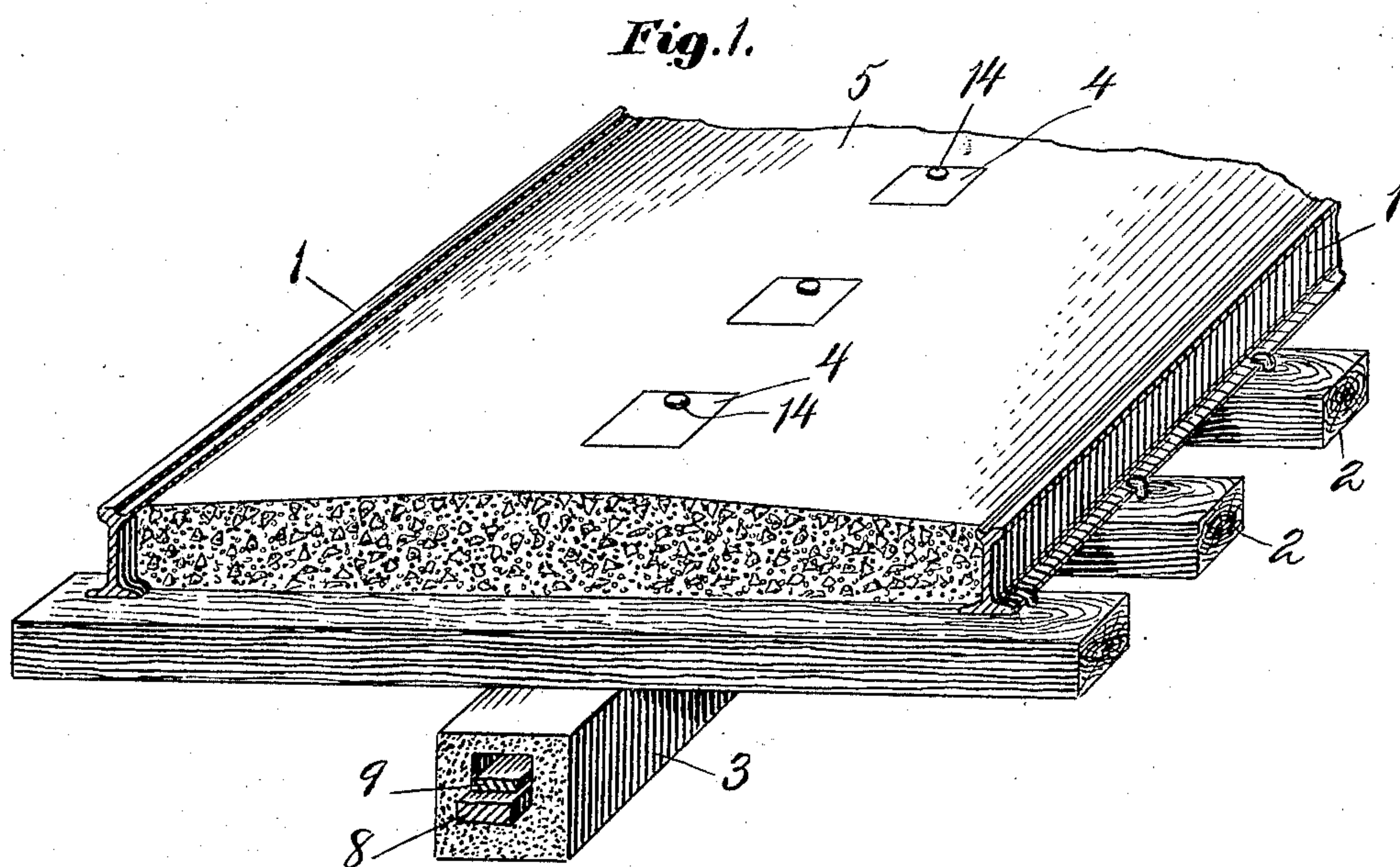
**L. DION.**

**ELECTRIC TRACTION ROAD.**

(Application filed Jan. 28, 1901.)

(No Model.)

2 Sheets—Sheet 1.



**Witnesses:**  
 Walter O. Lombard.  
 H. A. Lindley

*Inventor:*  
*Léon Dion*



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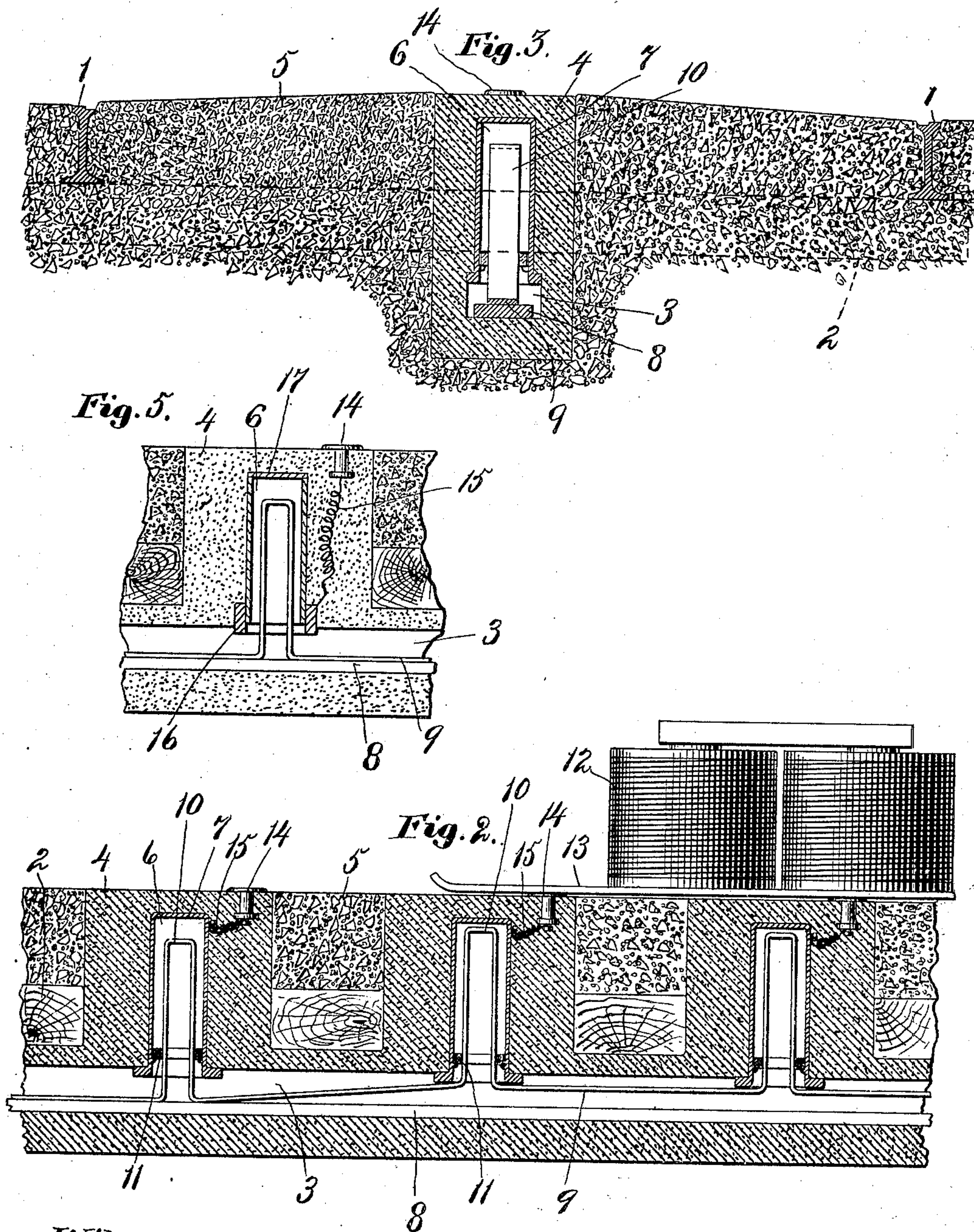
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Witnesses:  
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C. A. Godley

Inventor:  
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# UNITED STATES PATENT OFFICE.

LÉON DION, OF BOSTON, MASSACHUSETTS.

## ELECTRIC-TRACTION ROAD.

SPECIFICATION forming part of Letters Patent No. 682,381, dated September 10, 1901.

Application filed January 28, 1901. Serial No. 44,979. (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 Electric-Traction Roads, of which the following is a specification.

This invention has relation to closed-conduit or closed-pocket electric-traction roads which employ a surface conductor comprising a series of insulated conductive sections which are successively energized from an unexposed main conductor or feeder through the agency of a magnet carried by the car.

The invention has for its object to provide an arrangement of unexposed contacts and exposed contacts which will economize in the use of material, give a greater latitude in the matter of distributing the contacts, and provide a more water-tight construction for the conduit or pockets.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view, partly in section, showing an electric railway constructed in accordance with my present invention. Fig. 2 represents a longitudinal section thereof. Fig. 3 represents a transverse section. Figs. 4 and 5 represent longitudinal sections showing two modifications.

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

Referring to the drawings, 1 1 represent the car-supporting rails resting upon cross-ties 2 2, and 3 represents a closed conduit laid underneath the ties and composed of suitable material, such as cement, though I do not confine myself to the use of any particular material. At intervals between the ties the walls or material of the conduit is provided with upwardly-extending projections 4 4, located between the ties 2 2 and reaching the surface of the roadway, the rest of the roadway 5 being composed of any suitable roadway material. Each of the projections 4 4 contains a pocket or recess 6, which branches off from the main body of the conduit, which pockets in Figs. 1 to 4, inclusive, are formed by embedding inverted-cup-shaped members 7 7 in the upper wall of the conduit, said members being preferably composed of non-magnetic material. Within the conduit 3 is

located a main conductor or feeder 8, on which rests a flexible auxiliary conductor 9, composed of magnetic material, such as soft iron, bent at intervals to form upwardly-projecting loops 10 10, which extend into the pockets 6, but are insulated from contact with the sides of said pockets by insulating-rings 11 11.

The pockets 6 and their relation to the conduit are not herein broadly claimed, being claimed in another application, Serial No. 25,975, filed by me August 6, 1900. Neither do I herein broadly claim a conduit laid below the ties of a railway and having pockets which project upwardly between the ties, since this construction is claimed in a copending application, Serial No. 44,980, filed by me January 28, 1901.

As the car passes along the attraction of a magnet 12, carried by said car, exerted on the upper ends of the loops 10 10, which constitute armature members for said magnet, lifts the flexible conductor 9 into contact with the lower ends of the metallic cups 7. The current is collected by a collecting-shoe 13, carried by the car from a surface conductor composed of a series of studs or contact members 14 14, embedded in the roadway and connected by wires 15 15 with the cups 7 7, said studs projecting slightly above the surface of the roadway. It will be noted that the studs or contact members 14 are isolated from the pockets 6 and are located between adjacent pockets in a longitudinal direction. This relative location of the studs and pockets provides a compact organization occupying a minimum width or lateral space in the roadway, and it furthermore economizes the material, since the cups 7 may be terminated short of the roadway-surface and the material which would go into their construction were they carried up to the surface of the roadway and their upper ends caused to act as the surface conductor is saved, the material entering into the studs 14 and wires 15 being relatively small and inexpensive as compared with the material saved by omitting such extension. Furthermore, by terminating the cups as described and isolating the studs an improved waterproof construction is afforded. The arrangement de-



scribed also provides for considerable latitude in the matter of arranging the conduit and surface conductor in extraordinary situations, such as are found at switches and crossings with other roads, where it will often be found an advantage to bring the pockets 6 up in one location and locate the studs 14 at a distance from their corresponding pockets in a longitudinal direction. Any desired number of studs 14 may be connected with one cup 7. In Figs. 1 to 3 and 5 one stud is shown as corresponding to each pocket. In Fig. 4 each pocket 6 has two studs 14, connected by wires 15 with the cup 7, inclosing said pocket.

Further economy of the non-magnetic metal composing the unexposed sectional fixed conductor is afforded by the construction shown in Fig. 5, in which said unexposed conductor is composed of rings 16, associated with the lower ends of the pockets 6 and connected by wires 15 with the surface-studs 14, the main portion of the pockets 6 being located above said rings. In this instance the pockets 6 are shown as provided with a suitable lining 17, the material of which need not be conductive, said lining being inserted mainly for the purpose of giving the pocket form during the construction of the conduit.

I claim—

1. In an electric-traction road the combination of a closed conduit having a series of pockets or recesses projecting toward the roadway-surface, a conductor in said conduit having movable magnetic members occupying said pockets, unexposed contact members associated with said pockets, and a surface conductor comprising a series of exposed contact members isolated from the pockets and

electrically connected with said unexposed contact members.

2. In an electric-traction road the combination of an unexposed feeder, a series of pockets containing movable magnetic members connected with the feeder, unexposed contact members associated with the pockets, and a surface conductor comprising a series of exposed contact members isolated from and located between said pockets and electrically connected with the unexposed contact members.

3. In an electric-traction road the combination of an unexposed feeder, a series of pockets containing movable magnetic members, a series of unexposed contact members shorter than the pockets associated with their lower ends and a surface conductor comprising a series of exposed contact members isolated from the pockets and electrically connected with said unexposed contact members.

4. In an electric-traction road the combination of a closed conduit having a series of pockets or recesses projecting from it toward the roadway-surface, a conductor in said conduit having movable magnetic members occupying said pockets, a series of unexposed contact members shorter than the pockets associated with their lower ends, and a surface conductor comprising a series of exposed contact members isolated from the pockets and electrically connected with said unexposed contact members.

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

LÉON DION.

Witnesses:

C. A. GODLEY,  
R. M. PIERSON.