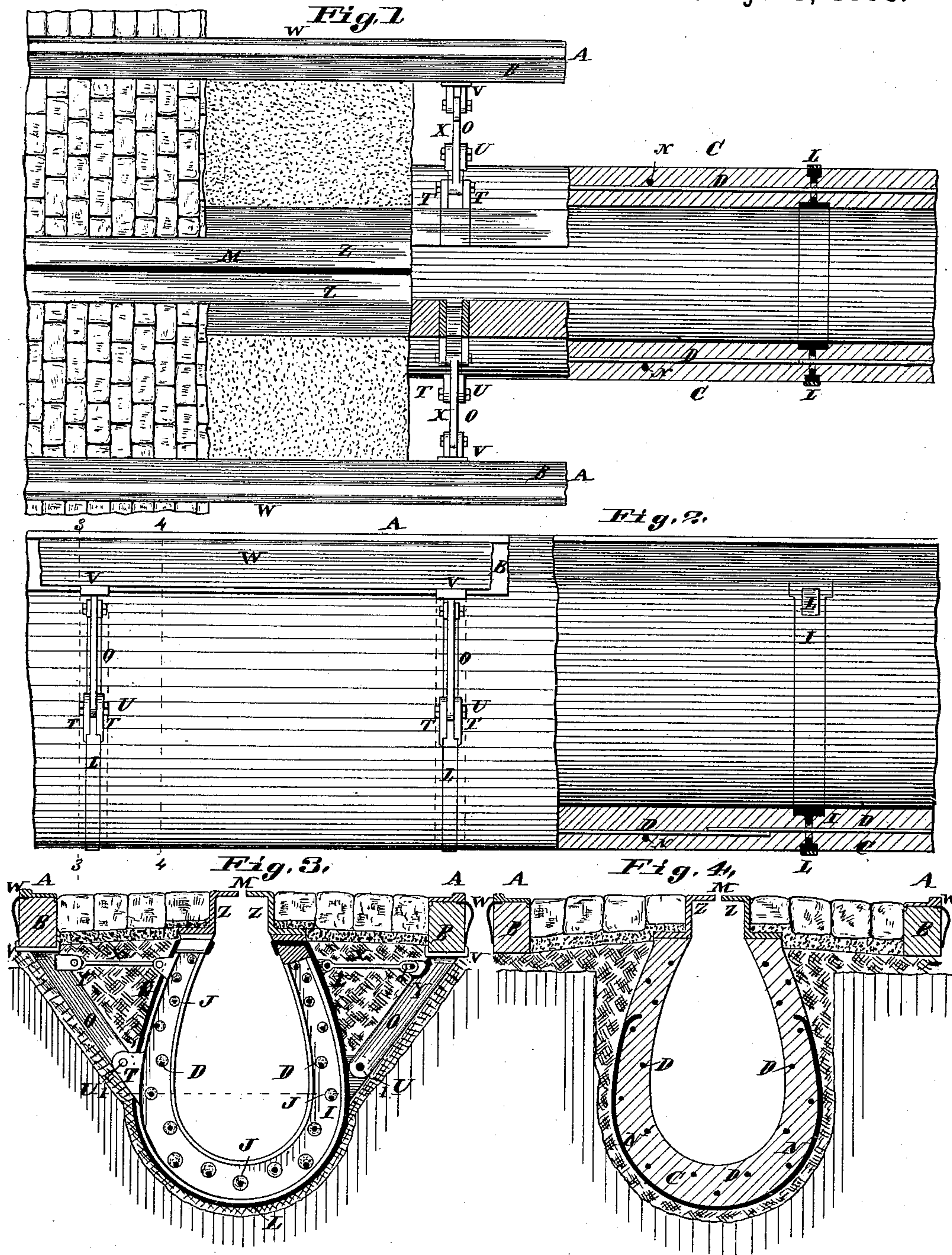


(No Model.)

P. M. BRUNER.
CABLE RAILWAY.

No. 345,616.

Patented July 13, 1886.



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UNITED STATES PATENT OFFICE.

PRESTON M. BRUNER, OF ST. LOUIS, MISSOURI.

CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 345,616, dated July 13, 1886.

Application filed February 7, 1885. Serial No. 155,165. (No model.)

To all whom it may concern:

Be it known that I, PRESTON M. BRUNER, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Cable Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is part in top view and part in horizontal section taken on line 1 1, Fig. 3, illustrating my improvement. Fig. 2 is part in side view and part in vertical section. Figs. 3 and 4 are vertical transverse sections taken on lines 3 3 and 4 4, Fig. 2.

My invention relates to an improved manner of constructing cable tubes and tracks for railway purposes; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, A represents the rails, and B the sleepers or ties, which are of common construction.

The tube consists of concrete C, longitudinal rods D, and transverse flanged plates I. The inner flanges of the plates are preferably wider than the outer flanges, as shown, and between the flanges the plates are perforated, at J, for the passage of the rods D. The body of the tube thus consists of concrete, which is strengthened and supported by the plates and rods; or, in other words, the plates and rods form a skeleton in which the concrete is cast, which becomes in the whole a solid mass, capable of withstanding a great amount of pressure and of supporting itself in case the ground should sink beneath it. The plates are preferably cast-iron, with wrought-iron bands L, that extend up and are hooked over the upper ends of the plates. These bands act to strengthen the tube and prevent the contraction of its upper part in cold weather and the consequent closing up of the slot M, which is the source of great annoyance, and for the same purpose the tube between the plates (see Fig. 3) is strengthened by rods N, around which the concrete is cast. The closing together of the upper part of the tube, which is caused by the expansion of the surface of the street, due in winter to the freezing of mud and water that work into and beneath the sur-

face, tends to close the slot, and these bands L and rods N act to prevent its closing, for the force brought to bear upon them will be in the direction of their lengths. It is my opinion, however, that it is impossible to make a tube of sufficient strength to entirely obviate this difficulty, and therefore I connect the sleepers or ties B of the track to the tube by means of arms O, hinged to the tube at P. They are preferably connected to the plates, which have ears T, the inner ends of the arms fitting between the ears and held by pintles or pins U. The upper ends of the arms have flanged plates V, fitting the bottom of the sleepers. Thus, as the tracks are forced inward by the expansion of the street, as above mentioned, they are caused to move on the arcs of circles by these arms, of which the pivots U are the centers, and their movement is thus partly converted into a vertical one, decreasing the amount of horizontal movement. To still further obviate this difficulty, I prefer to locate spring-metal plates W outside the sleepers, that will compress before the sleepers or tracks begin to move.

X represents rods made fast by their inner ends to the tube and by their outer ends to the upper ends of the arms O, or to the sleepers, if desired. At either their outer or inner ends they have slots Y, through which the connecting-pins pass, to permit the inward movement of the tracks, as specified. By thus connecting the tube to the tracks the latter are supported by the former, should the ground or street sink away from the outside of the sleepers. On top of the tube are the plates Z, that do not quite meet, forming the slot M.

I prefer to lay the tube in a bed of sand.

The metal of the tube is so surrounded by the concrete as to prevent its rusting.

The perforations J are preferably so large that the concrete, while in a plastic form, will run through them, forming necks that unite with the main body on each side of the plates.

I claim as my invention—

1. In a cable-railway tube, the combination of the concrete, transverse plates, and transverse rods located between the plates, substantially as and for the purpose set forth.

2. In a cable-railway tube, the combination

of the concrete, transverse plates, and bands surrounding the plates, substantially as set forth.

3. In a cable-railway tube, the combination of the concrete, transverse perforated strengthening-plates, and longitudinal rods, arranged and operating substantially as and for the purpose set forth.

4. In a cable-railway tube, the combination of the concrete, transverse plates, bands around the plates, and transverse rods located in the concrete between the plates, substantially as and for the purpose set forth.

5. In a cable railway, the combination of the tube, tracks, and hinged connecting-arms, arranged and operating substantially as and for the purpose set forth.

6. In a cable railway, the combination of

the tube, tracks, and connecting-arms hinged to the tube at their lower ends, and having plates on their upper ends fitting the sleepers of the tracks, substantially as and for the purpose set forth.

7. In a cable railway, the combination of the tube, tracks, and connecting slotted rods X, arranged and operating substantially as and for the purpose set forth.

8. In a cable railway, the combination of the tube, tracks, and spring-plates W, located outside the tracks, substantially as and for the purpose set forth.

PRESTON M. BRUNER.

In presence of—

GEO. H. KNIGHT,

SAML. KNIGHT.