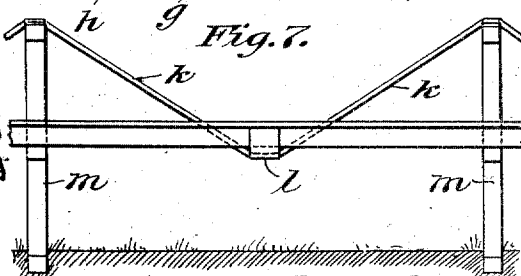
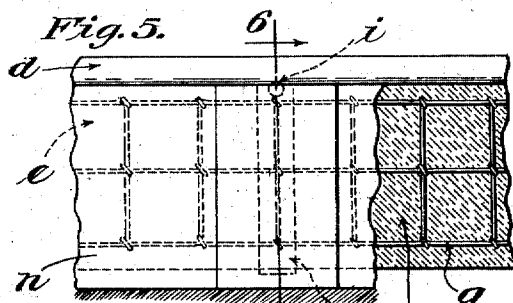
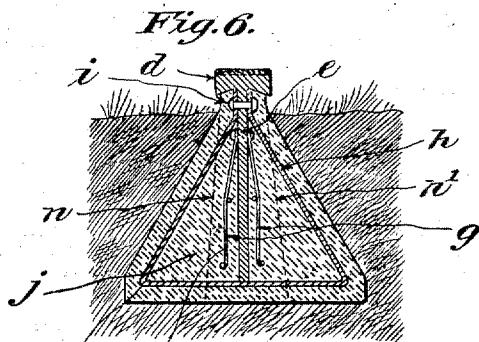
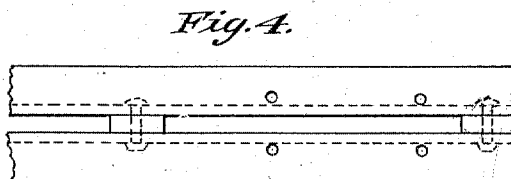
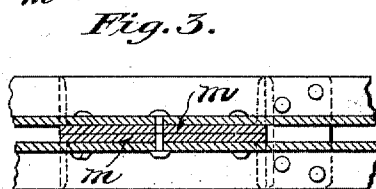
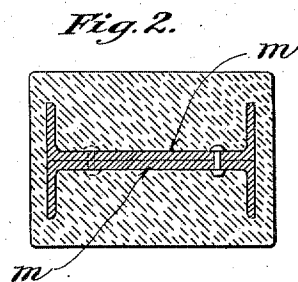
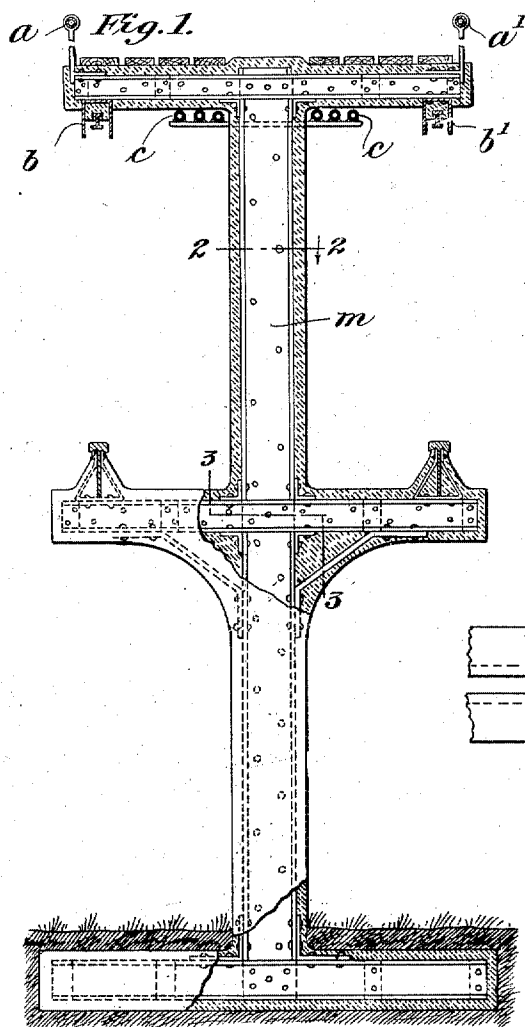


E. M. BOYNTON.
RAILWAY STRUCTURE.
APPLICATION FILED OCT. 17, 1910.

980,191.

Patented Jan. 3, 1911.



Witnesses: 6
Minot & Crozier
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UNITED STATES PATENT OFFICE.

EBEN MOODY BOYNTON, OF WEST NEWBURY, MASSACHUSETTS.

RAILWAY STRUCTURE.

980,191.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed October 17, 1910. Serial No. 587,383.

To all whom it may concern:

Be it known that I, EBEN MOODY BOYNTON, of West Newbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Railway Structures, of which the following is a specification.

This invention relates to an improvement in railway structures, and its object is to provide a girder rail and tie capable of being embodied in elevated or surface roads and having greater strength, durability and efficiency than is at present secured.

Of the accompanying drawings forming a part of this application: Figure 1 represents, in front elevation, a standard single-rail structure suitable for cities, and the post below the girders is shortened for surface roads. Fig. 2 is a section on line 2—2 of Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 1. Fig. 4 is a vertical view of a girder which supports the train, whether surface or elevated. Fig. 5 is a partly uncovered side view of the rail cap and the protecting side of cement, and of wire within said cement for holding it in place. Fig. 6 is an end section exposing the cap and entire girder, with a triangular tie of metal. Fig. 7 shows a firm support to a cross tie where projecting and elevating for spans of fifty feet or more may be required.

The same reference characters indicate the same parts wherever they occur.

In Fig. 1, *a* and *a'* are high pressure water pipes for the conveyance of water, or of wires and cable in such number as may be found convenient. *b* and *b'* represent box girders held by any suitable means for operating as guides of a single-rail train, as conduits for electric power; and they are properly insulated to support wooden cross ties (see Fig. 7) where necessary beneath the wooden planks of the roof. *c* represents cables for conveying power, or electric wires for telegraph and telephone.

Referring to Fig. 6, *d* indicates the cap of a girder rail *e*, *h* indicates the triangle, *g* indicates the steel network, and the dotted lines *n* and *n'* indicate the continuous covering of the rail between the ties, excluding all moisture from said girder rail, and the bolt *i* unites the steel that holds the cement both of the wide tie and of the continuous cement together. *j* represents the body of cement within and around said steel which holds it firmly together.

In Fig. 7, *k* is the supporting rod for the cross tie *l*, which is in turn supported by the posts *m* and *m*.

The rail shown in Fig. 6 is a combination of cement and steel. The waist is rolled with the base to a depth much greater, and, if three-fold in depth, has nine-fold the strength of the metal in the waist and base as now employed. It is also supported by the cement with one-half the strength of granite, and is so held and covered, if moisture be excluded, as to have greatly increased durability and strength. The cap of the rail is shown as slanting downward to any needed angle, and thus automatically gripping the cement to the steel waist instead of detaching it from it, and also roofing it from moisture by its form in the metal and in the cement; and the cap of the rail, painted with asphalt, will exclude the water and corrosion for an indefinite period if the asphalt tar be applied at intervals of one or more years. The cap of the rail is designed for using the carborundum combination shown in the patents granted me upon rails and wheels and in the patent for the apparatus for applying the carborundum, also allowed.

The above patents are identified, respectively as follows: Nos. 976,544, 976,543 and 976,627, granted Nov. 22nd, 1910.

I claim:

1. The combination with a traction rail of T cross section of a series of transverse strips attached thereto, each strip having a base portion arranged to support the lower edge of the rail, and end portions extending upwardly and toward each other, said ends being attached to the vertical web of the rail, and a body of hardened plastic material incasing said strips and said rail up to the cap at the upper edge of said vertical web.

2. The combination with a traction rail of T-shaped cross section, the traction rim thereof having depending longitudinal flanges at the sides whereby longitudinal grooves are formed in the under surface of the rim between said flanges and the vertical web, of a base composed of cement, said base inclosing the vertical web of the rail and extending into the grooves in the under surface of the cap.

3. An elevated railway structure comprising a rigid frame consisting of a series of separated upright posts having laterally extending base portions and laterally extending arms above said base portions; and

steel cross-ties arranged between said upright posts, steel rods connecting said upright posts and underlying and supporting said cross ties, traction rails lying upon said
5 laterally extending arms and said cross-ties, and hardened plastic material incasing said upright posts, said base portions, said arms, said cross-ties and the lower portion of said rails, the traction caps of said rails projecting up from said plastic material.
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4. The combination with a traction rail of T-shaped cross section, the traction cap thereof having depending longitudinal

flanges at the sides whereby longitudinal grooves are formed in the under surface of the cap between said flanges and the vertical web, of a base composed of cement, said base inclosing the vertical web of the rail and extending into the grooves in the under surface of the cap. 15 20

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

EBEN MOODY BOYNTON

Witnesses:

JOHN E. POVEY,

A. L. FOLSOM.