

(No Model.)

3 Sheets—Sheet 1.

A. J. MOXHAM.
RAILWAY SWITCH WORK.

No. 539,878.

Patented May 28, 1895.

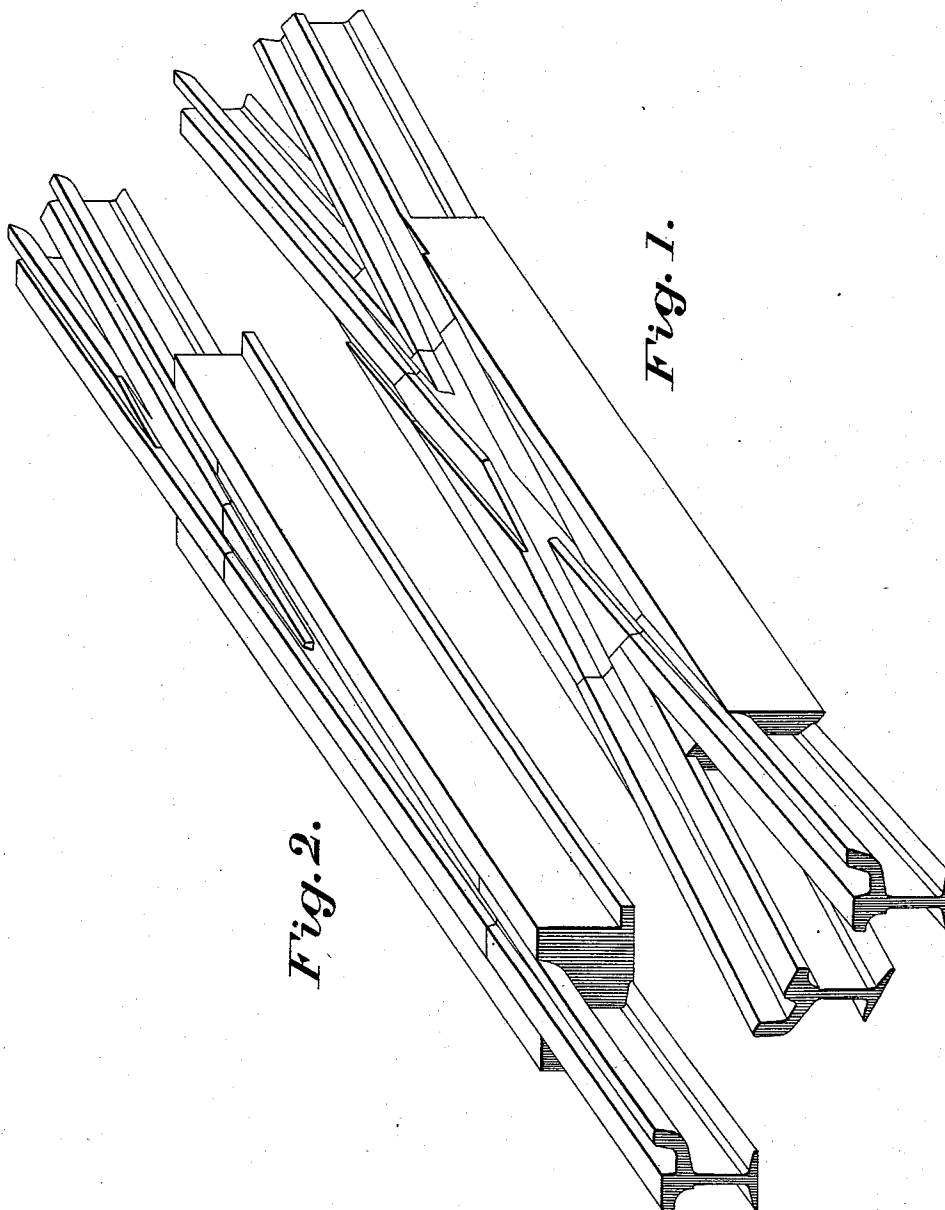


Fig. 1.

Fig. 2.

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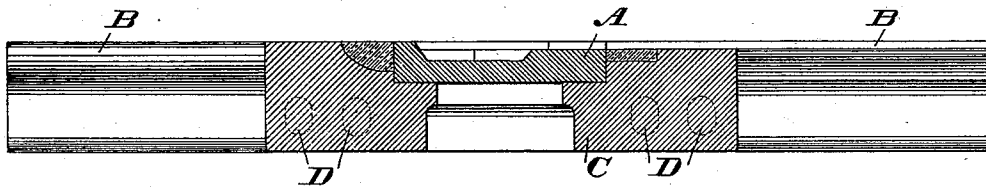


Fig. 5.

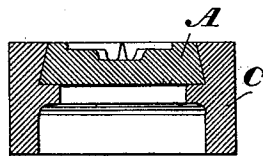


Fig. 4.

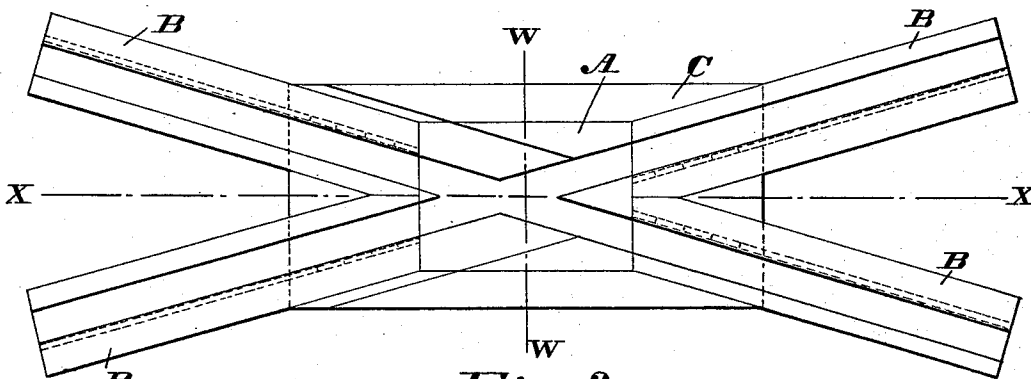


Fig. 3.

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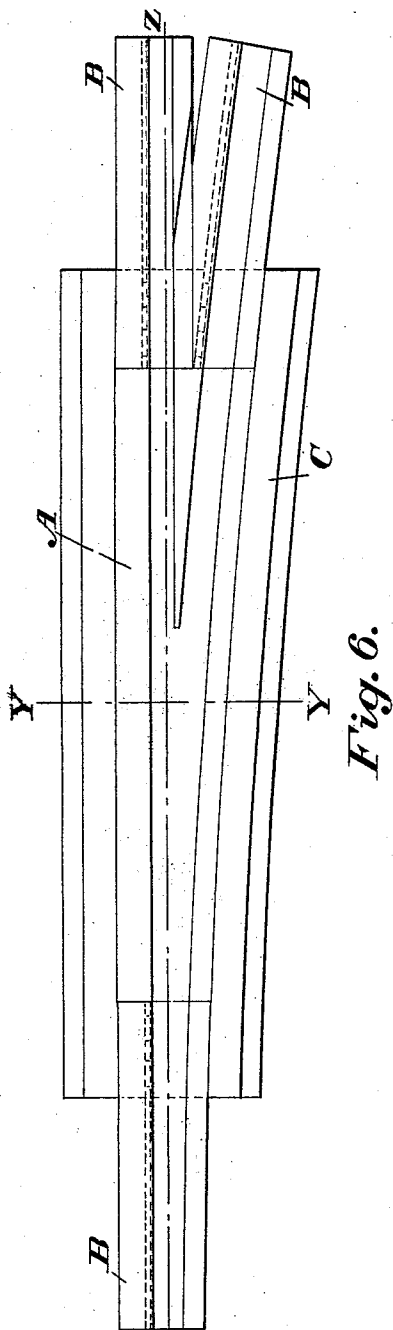


Fig. 6.

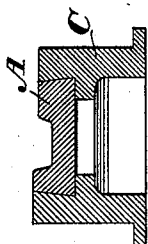


Fig. 7.

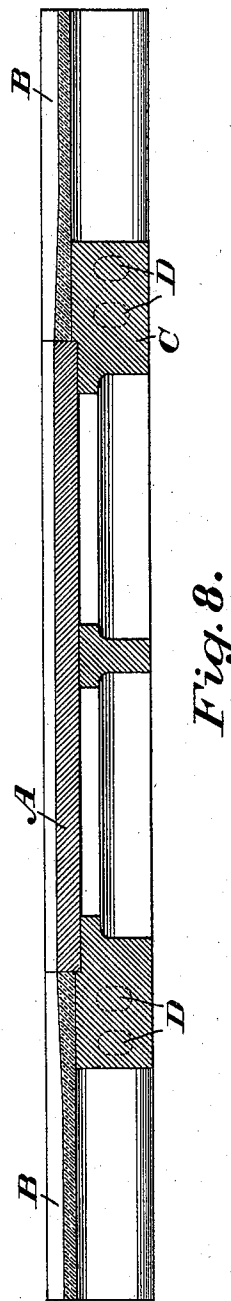


Fig. 8.

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UNITED STATES PATENT OFFICE.

ARTHUR J. MOXHAM, OF JOHNSTOWN, PENNSYLVANIA.

RAILWAY-SWITCH WORK.

SPECIFICATION forming part of Letters Patent No. 539,878, dated May 28, 1895.

Application filed March 30, 1894. Serial No. 505,767. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. MOXHAM, of Johnstown, county of Cambria, State of Pennsylvania, have invented a new and useful Improvement in Railway-Switch Work, of which the following specification is a true and exact description, due reference being had to the accompanying drawings.

My invention relates to that class of switch work in which one part of the track surface is subjected to more wear than the remainder of the structure, as occurs in a frog, cross or mate at the point, the point being that place where two or more tracks cross or converge. More or less of the head being cut away here, the car wheel does not secure the same bearing upon the rail that it does elsewhere, and the head rapidly wears down. Sometimes floor plates are placed adjacent to the gage line of the rail to carry the wheel; but these plates also wear and are a source of trouble.

The object of my invention is to provide a switch structure in which the part subjected to excessive wear may be constructed of a material more durable than the remainder.

Referring to the drawings, Figure 1 represents a frog, and Fig. 2 a mate, embodying my invention. Fig. 3 shows a top view of the frog, Fig. 1. Fig. 4 is a section on line W W of Fig. 3, and Fig. 5 a section on line X X of Fig. 3. Fig. 6 is a top view of the mate in Fig. 2. Fig. 7 is a section on line Y Y of Fig. 6, and Fig. 8 a section on line Z Z of Fig. 6.

In general, my invention consists in providing, at the point of excessive wear, a center piece or plate with the necessary track upon its top surface, which surface is harder than the remainder of the track so that it may the better resist the wear. To the ends of this plate I abut the rails diverging therefrom and I securely bond the whole together by casting molten metal around them, which, in solidifying unites the whole into one solid structure.

In the drawings, A is the plate having the top surface hardened and the necessary track formed thereupon.

B shows the abutting rails, which, extending outward, connect with the track rails. C is the metal, which, being cast around them, holds the plate and rails together.

My method of constructing the switch-piece shown is as follows: The plate A may be rolled,

forged or cast but I preferably form it of rolled steel, and, when desirable, I make it rectangular, as shown in Fig. 3, as a bar may be rolled of the proper width and height from which plates of the desired length may be cut. The plate is formed wedge shaped, as shown in Fig. 7, for a purpose hereinafter explained. The blank plate being provided, I next mill, plane or otherwise form the proper track surfaces upon the top of it, after which I may subject it to any suitable hardening process whereby the surface may be rendered more durable. The abutting rails having been cut so that they closely abut the ends of the plates and align with the track surfaces thereon, I place the whole in a mold in the proper relative position to each other, and, with a cavity around them of the proper form to make the casting C, I now pour the molten iron into the mold thus formed, which iron surrounds the plate and rail ends, and, in cooling, firmly unites the whole together. The holes D in the webs of the rails allow the molten metal to flow through and thoroughly bond them therein. The wedge shape of the plate A locks the same securely in place.

I have said that the plate may be hardened before being placed in the mold, which, being the case, the hot metal surrounding it would tend to heat and anneal it. To prevent this I may provide in the mold suitable means of access to the top and bottom of the plate, and keep the same cool by the application of water; or I may place in the mold against the plate a porous block, as coke, through which I may force water against the plate. This keeping the plate cool serves two purposes. First, it preserves the hardness of the plate; and, second, it prevents the plate from expanding while the surrounding metal is contracting. If this expansion of the plate were not thus prevented while the surrounding cast metal was shrinking, great difficulty would be experienced in preventing the shrinkage strains in the casting-frame from fracturing it.

In order that the ultimate strains in the casting may be as small as possible the plate may be warmed before the metal is poured around it thus expanding it somewhat, but if the plate has been hardened care must be taken not to heat it sufficiently to destroy its

temper. In the warm state the plate is larger than when cool and the water upon it cools and shrinks it while the surrounding metal is also shrinking. Were it not for the water the plate would absorb the heat from the surrounding metal and thus would expand while the other was contracting as before said. In cases where the plate is so long that this shrinkage must be allowed for, I suggest applying some yielding material to the ends of the plate, which will prevent the molten metal from flowing directly against the plate, but which, when the metal hardens and commences to shrink, may be squeezed out by the metal so that when cool the cast-metal may engage the ends of the plate. This yielding material may be a liner formed of a sheet of thin metal, as tin or sheet-iron bent U shaped, the two parts standing apart whatever amount of contraction is to be provided for. The hot metal will flow against this liner and as it cools and shrinks will gradually close it until finally its two halves will be tightly pressed together against the plate. These liners will be so thin that their presence will not be objectionable. For a plastic material, common putty answers very well, as it may be sufficiently hard to hold the metal back at first but it soon becomes very soft from the heat and readily squeezes out.

In cases where there is a larger amount of molten metal which does not chill quickly enough, a thin piece of sheet-iron may be placed over the putty to protect it from the wash of the fluid metal.

In this manner I provide a switch structure in which the part subjected to excessive wear is made of a material more durable than the remainder of the structure. I also provide a switch structure which may be economically made as there is little or no fitting of the sev-

eral parts together; and the labor and expense incident to the usual type of switch work, which is fitted and bolted together, is done away with.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. A railway switch structure which consists of a center piece provided with track surfaces, rails forming extensions of said center piece, the whole being secured together by a separate body of cast metal.

2. A railway switch structure, which consists of a center piece provided with hardened track surfaces, rails forming extensions of said center piece and a separate body of cast metal, whereby the whole is secured together.

3. The improvement in the method of constructing railway switch structures, as herein set forth, which consists in placing in the mold and against the ends of the center piece, compressible or plastic liners or filling pieces adapted to prevent the molten metal from coming into contact with the ends of the center piece and which are adapted to yield as the metal shrinks in cooling, whereby the plate is securely held by the body of metal without undue stress due to contraction in the latter.

4. The improvement in the method of constructing railway switch structures as herein set forth, which consists in applying a cooling medium to the center piece while the molten metal is poured against it, as and for the purpose set forth.

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

ARTHUR J. MOXHAM.

Witnesses:

WM. A. DONALDSON,
D. BRYAN.