April 15, 1924. 1,490,410

J. H. ASSELIN

HARD CENTER FOR RAIL CROSSINGS, FROGS, AND LIKE TRACK STRUCTURES

Filed Dec. 10, 1923 2 Sheets-Sheet 1

Fig. 1.

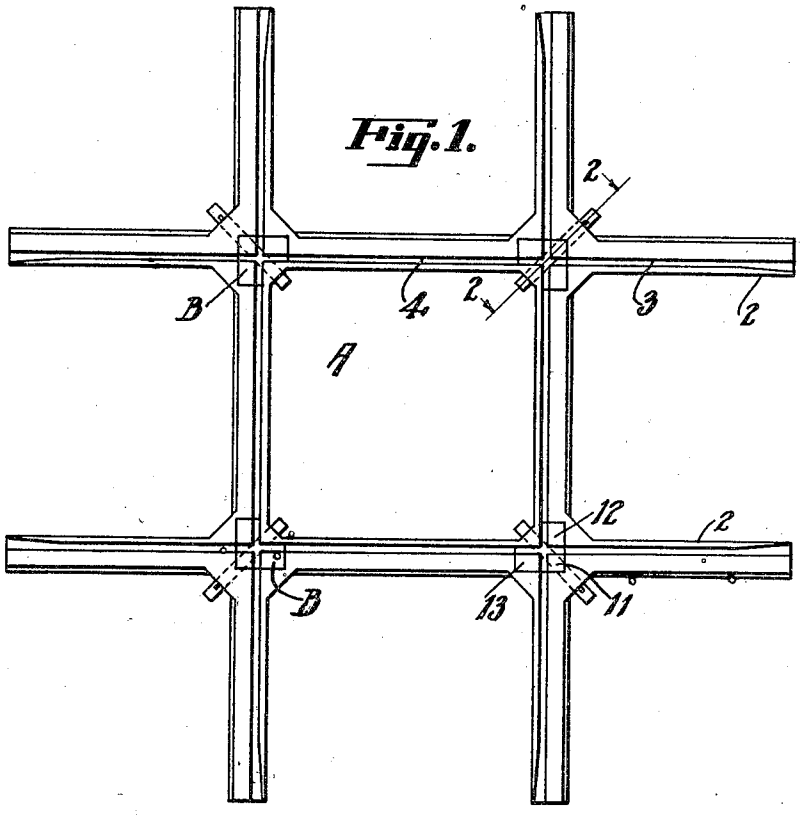
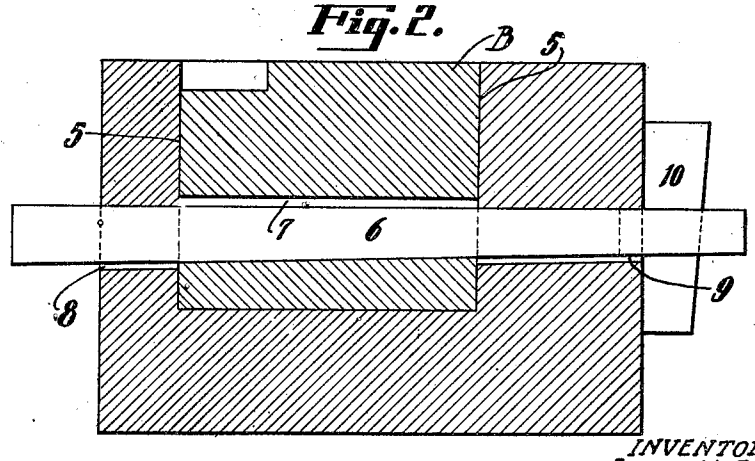


Fig. 2.



INVENTOR
JAMES H. ASSELIN.
By Dewey, Strong
Jaunsend & Lothrop.
ATTORNEYS

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Fig. 3.

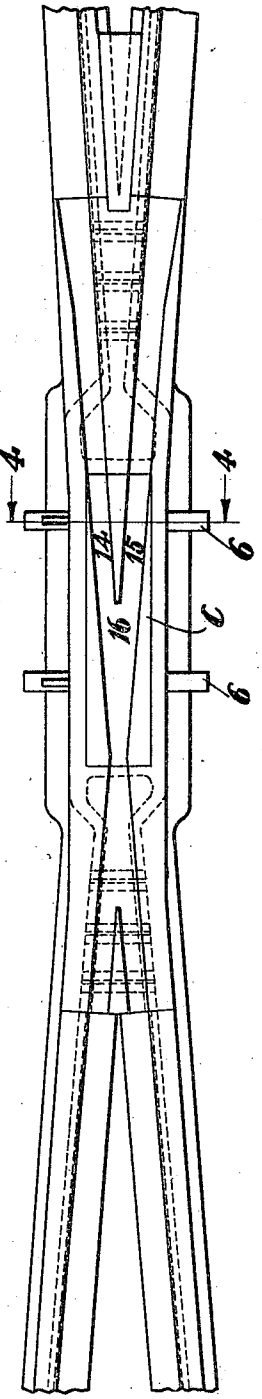
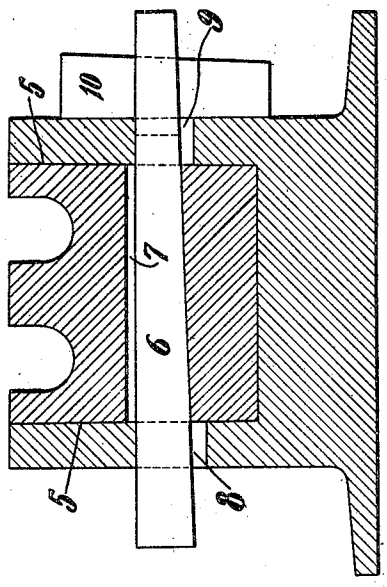


Fig. 4.



INVENTOR
JAMES H. ASSELIN.
By Dewey, Strong, Townsend & Loftus
ATTORNEYS.

Patented Apr. 15, 1924. 1,490,410

UNITED STATES PATENT OFFICE.

JAMES H. ASSELIN, OF SAN FRANCISCO, CALIFORNIA.

HARD CENTER FOR RAIL CROSSINGS, FROGS, AND LIKE TRACK STRUCTURES.

Application filed December 10, 1923. Serial No. 679,552.

To all whom it may concern:

Be it known that I, JAMES H. ASSELIN, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Hard Centers for Rail Crossings, Frogs, and like Track Structures, of which the following is a specification.

This invention relates to street car and railway track structures, such as frogs, crossings and the like, and especially to a wearing block or insert to be placed at the point of greatest wear.

It is well known that the parts of the track structure that are subjected to the greatest wear are the intersecting points of frogs and crossings. This is due to the fact that each cross-over is grooved in opposite directions to form a clearance for the wheel flanges. The tread of the car wheels in passing jump the flange grooves and therefore produce a severe pounding action and vibration which gradually crystallizes and breaks down the track structure. It is customary to place a wearing plate or insert at this point to take care of the excess wear, but the plates now in use are found to have many defects and have not proven satisfactory.

No effective method has been devised whereby the plates can be rigidly and permanently secured. Bolts and screws have been employed, but the threads are soon stripped by the continuous pounding action and the bolts fall out. Projecting lugs of various shapes and sizes for the reception of securing wedges, keys, etc., have been tried, but the lugs break off or the wedges work loose. A filling of spelter or other soft metal in connection with bolts, wedges, etc., is also used, to secure this in place, but the results are far from satisfactory, as the spelter crumbles and works out. I have found that the majority of the plates employed are either too large in area or too thin, and are therefore cut through by the wheel flanges or otherwise broken by pounding and leverage. I have further found that the fastening means employed are not correctly applied or not sufficiently substantial to withstand the severe pounding and wear to which they are subjected.

The object of the present invention is therefore to generally improve and simplify the construction of the wearing plates now in use, to increase their thickness and weight, and further, to provide rigid and effective means whereby the plates will be permanently secured in place.

Two forms which my invention may assume are exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a plan view of a standard form of rail crossing showing the application of the invention.

Fig. 2 is a cross-section on line 2—2, Fig 1.

Fig. 3 is a plan view of a standard form of frog showing the application of the invention.

Fig. 4 is a cross-section on line 4—4, Fig. 3.

Referring to the drawings in detail, and particularly to Figs. 1 and 2, A indicates in general a standard form of rail crossing, such as used in street car and railway service; the crossing illustrated in the present instance being a so-called cast or integral crossing of the flange bearing type. A crossing of this character usually consists of a single casting provided with wings or extensions such as indicated at 2, to which the rails proper are bolted or otherwise secured by means of fish plates or the like. Crossings of this character are grooved in opposite directions as indicated at 3 and 4 to form a clearance for the car wheel flanges, and a severe pounding action is thus produced whenever a car or train passes as the wheels of each car or coach will jump the grooves and thus produce a severe pounding or hammering action. The wear at the intersection of the crossings is rather excessive and it is for this reason that hard steel inserts, such as indicated at B, are provided.

It has previously been stated that a variety of types of inserts are employed, but that their life and general utility are rather short due to numerous factors, first, because efficient means for securing them in place has not been devised, and secondly, because they are too large in area and too thin. The large area produces a lever action, causing gradual bending and breaking of the plates, while the lack of body and weight when the plates are too thin permits the wheel flanges to cut through and the plates to be otherwise broken by the pounding and wear to which they are subjected.

In the present instance it will be noted that the exposed area of each plate is reduced to a minimum. I employ a block which is angle shaped in horizontal cross-

section, thereby reducing the amount of metal required and the exposed area to a minimum. I furthermore increase the thickness of the plates, thereby reducing wear and breakage action to a minimum. I furthermore provide effective means for securing the plates in place, and this is accomplished as follows:

By referring to Fig. 2, we will assume that the total height of the rail structure is approximately nine inches. If this is the case, I provide a recess at the intersection of each crossing point which has a depth of approximately six inches and a contour or shape similar to that of the insert or block which, in this instance is angle shaped.

By providing a recess which has a depth approximating two-thirds that of the total height of the structure, it is possible to employ a thick plate or block and to permanently and rigidly secure it by shrinkage fit and wedge action. The side walls of the recess indicated at 5 are slightly tapered; that is, the dimensions between the side faces may be approximately one-eight of an inch greater at the upper end of the recess than at the bottom. The wearing block B is similarly tapered and the side walls thereof are ground to form a snug fit; the fit being so close that it is necessary to heat the casting and expand the same before it is possible to insert the wearing block. This block is inserted cold and as the casting proper cools, it contracts a sufficient amount to securely grip and secure the block. The block is further secured by means of a heavy, long tapered wedge, such as shown at 6. This wedge passes completely through the block as this is provided with a central passage 7 for its reception. The wedge also passes through the side walls of the rail structure indicated at 8 and 9, and it is secured when inserted by an auxiliary wedge such as shown at 10.

The block B is preferably constructed of manganese steel and therefore possesses great tensile and shearing strength, and as such should withstand practically any amount of pounding action and wear.

The wedges 6 are disposed on an angle with relation to intersection of the crossing and the wearing block and as such are readily accessible when inserting or removing the same. This method of applying wedges permits the use of a heavy and substantial structure, or, in other words, a type of wedge which is equal to the load and wear imposed thereon.

A reduced area is also important and it is obtained in this instance by making the blocks angle shaped in plan view or horizontal cross-section; that is, substantially one-fourth of each plate is cut away as it is neither required nor used, as traffic moving in one direction will be supported by the portions of the blocks indicated at 11 and 12, while traffic traveling in the opposite direction will be supported by the blocks indicated at 11 and 13. The fourth block, which would appear if the plate were square or rectangular, is eliminated, as was previously stated, as it could never be used regardless of the direction of the traffic. The blocks are therefore materially reduced in area and leverage action is similarly reduced.

By referring to Fig. 3 it will be noted that a standard form of rail frog is shown. The insert is here generally indicated at C and as such is rectangular in shape. The upper surface is provided with two grooves as shown at 14 and 15 which join each other at the point 16, but the block is otherwise heavy or deep in cross-section to obtain the required strength and rigidity. Two tapered wedges are employed, one at each end thereof, said tapered wedges passing completely through the wearing block and the side walls of the rail structure. The tapered wedges are proportionately heavy and they are secured in a manner similar to that illustrated in Fig. 2. They are therefore equal to the load imposed and should withstand the usual pounding and wear without danger of fracture or removal.

The block C is also shrunk fitted and as such is not only held in position by the tapered wedges, but also by the contracted side walls of the rail structure.

The wearing blocks here shown may be removed if required, but actual practice shows that they outwear the adjoining rail structure if anything. This is contrary to common practice inasmuch as the wearing plates are usually the first part of the rail structure to give way, but this is caused by the defects previously mentioned; that is, if the fastening means are not sufficiently rigid they soon break or work loose and the plates then begin to vibrate and work in their seats. This vibration causes a gradual crystallization and wearing away of the metal, this being true of the plates proper, as well as the surrounding structure. It is for this reason, that a rigid attachment is one of the most essential features. This has been amply taken care of in the structure illustrated in the present application and is proving a great improvement over present practice.

While certain features of the present invention are more or less specifically illustrated, I wish it understood that various changes in form and proportion may be resorted to within the scope of the appended claims. I similarly wish it understood that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

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

1. The combination with a rail crossing having a recess formed centrally of the crossing, of a wearing block adapted to be received by the recess, and a taper wedge member extending completely through the wearing block and the crossing to secure the block in the recess.

2. The combination with a rail crossing having a recess formed centrally of the crossing, of a wearing block adapted to be received by the recess, a taper wedge member extending completely through the wearing block and the crossing to secure the block in the recess, and other means securing the wedge against removal.

3. The combination with a rail crossing having a recess formed therein at the point of crossing, of a wearing block adapted to be received by the recess, said block having a wedge-receiving passage formed therein and extending therethrough, and said rail crossing having aligning openings formed therein, and a wedge adapted to be passed through the aligned passages and to be secured when inserted.

4. A crossing of the character described, having a recess formed therein which is angle shaped in horizontal cross-section, a wearing block of similar shape insertible in the recess, said block and crossing having aligned openings formed therein, and a wedge adapted to be received by the aligned openings and to extend therethrough, said aligned openings and wedge passing through the apex of the angle block and the crossing.

JAMES H. ASSELIN.