A. YULE.

RAILWAY CROSSING.

APPLICATION FILED MAR. 14, 1911.

1,051,050.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 1.

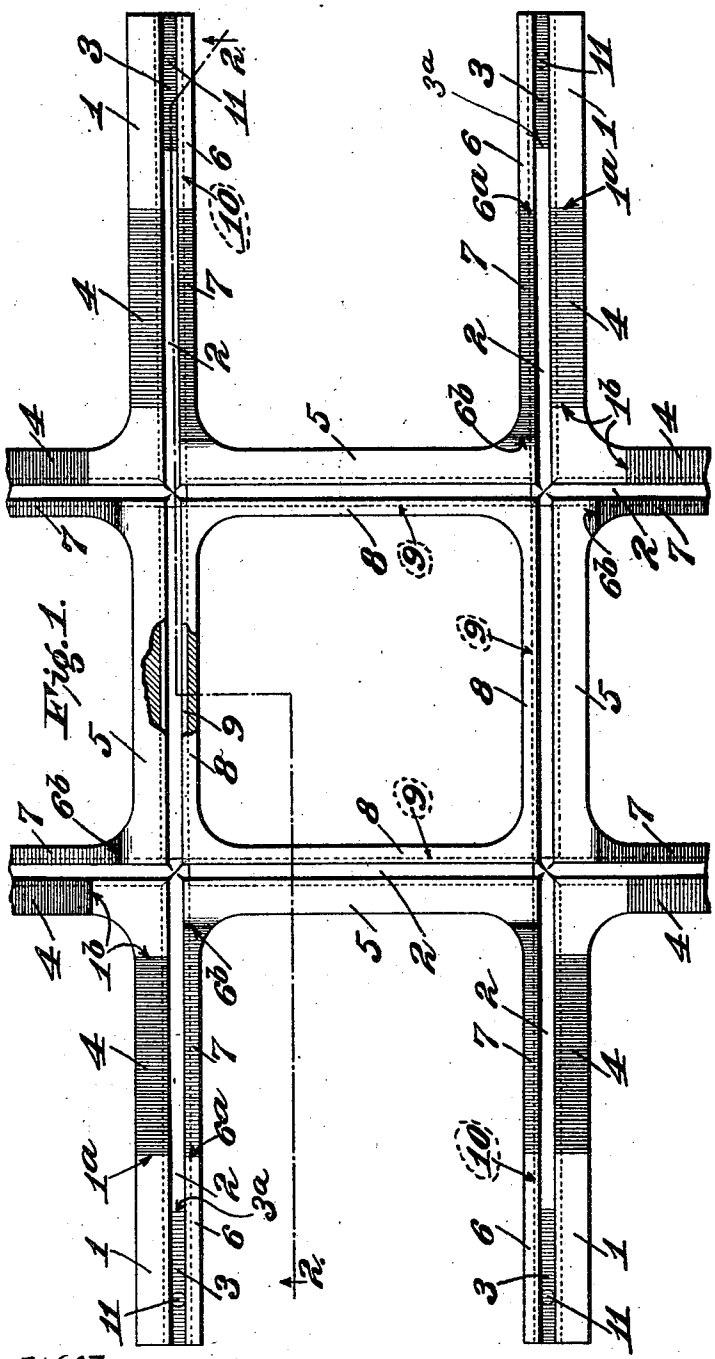


Fig. 1.

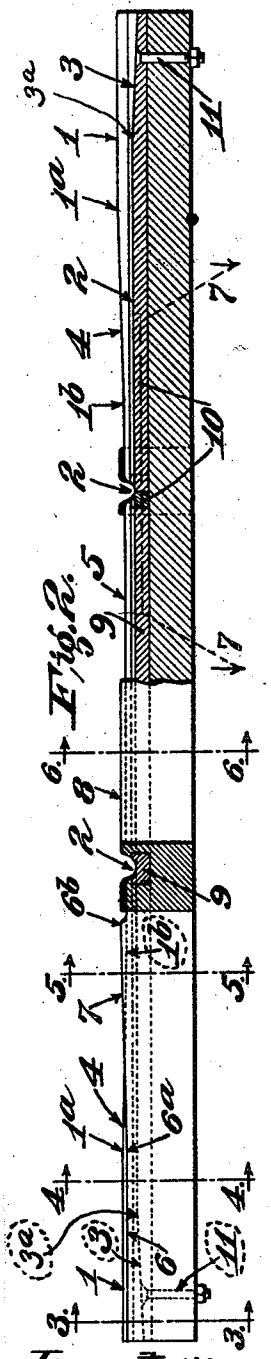


Fig. 2.

Witnesses:
Edgar T. Farmer.
G. A. Pennington

Inventor:
Alexander Yule,
By Cornet Cake
his Attys.

A. YULE.

RAILWAY CROSSING.

APPLICATION FILED MAR. 14, 1911.

1,051,050.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 2.

Fig. 3

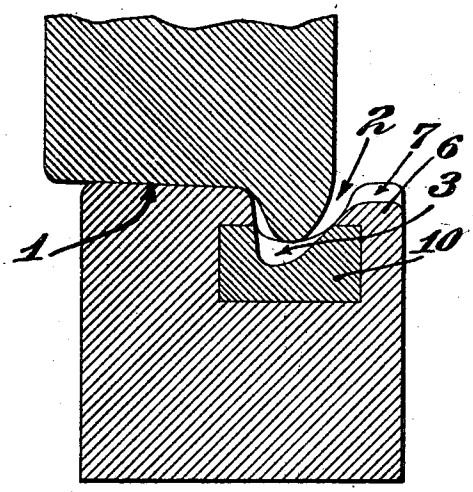


Fig. 4.

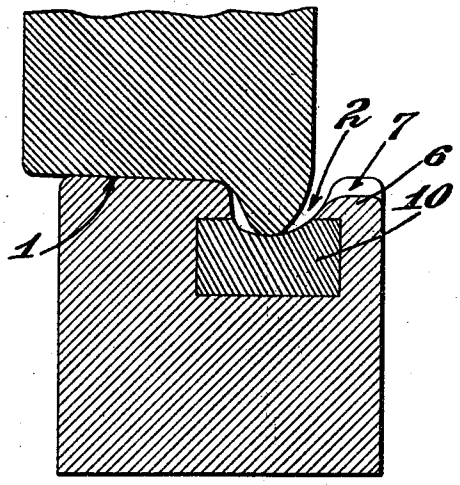


Fig. 5.

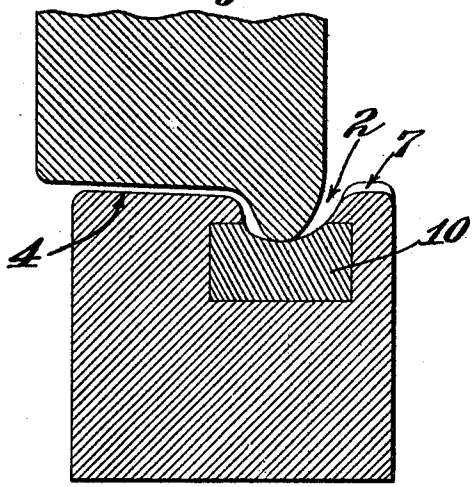
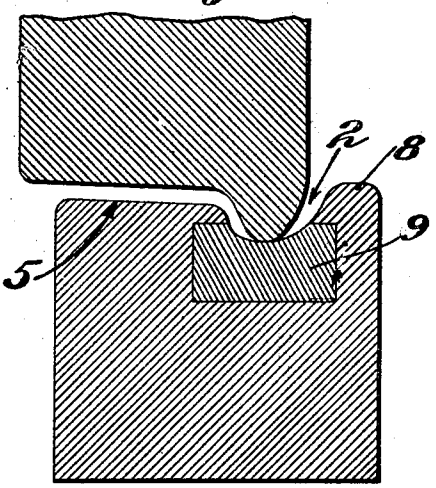


Fig. 6.



Witnesses:

Edgar T. Farmer.

G. A. Pennington

Inventor:

Alexander Yule,

By Count & Co.,

his Attys.

A. YULE.

RAILWAY CROSSING.

APPLICATION FILED MAR. 14, 1911.

1,051,050.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 3.

Fig. 7.

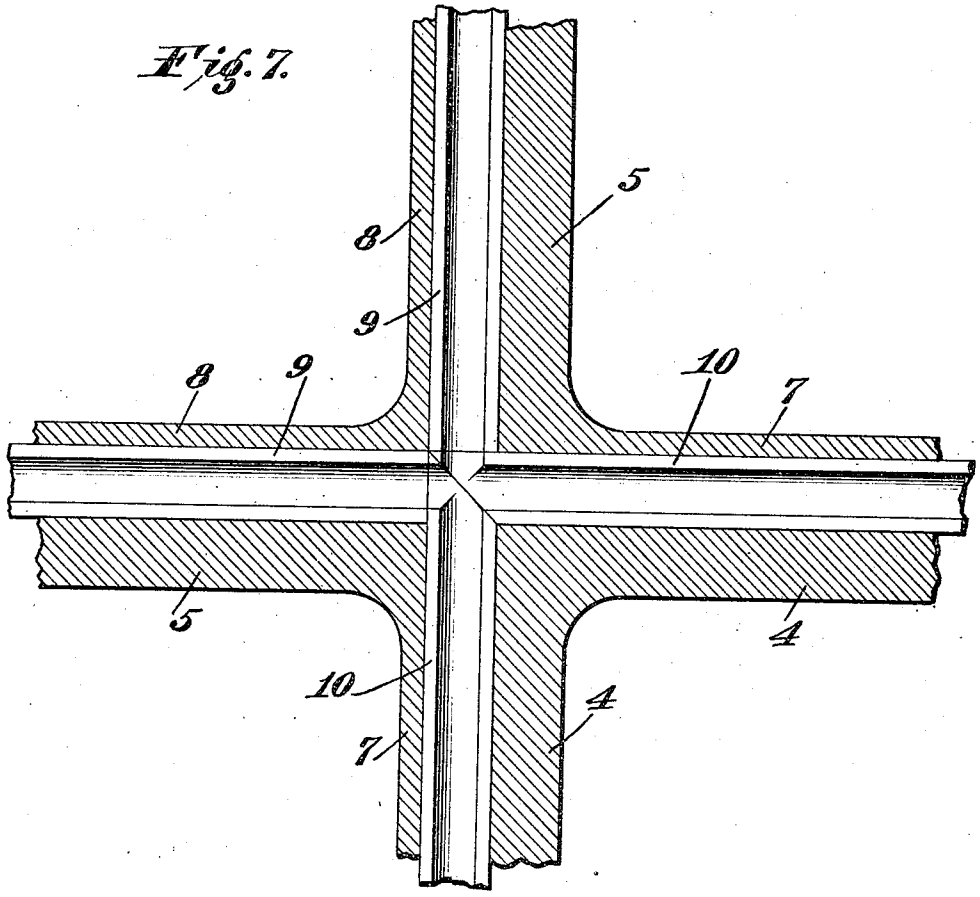
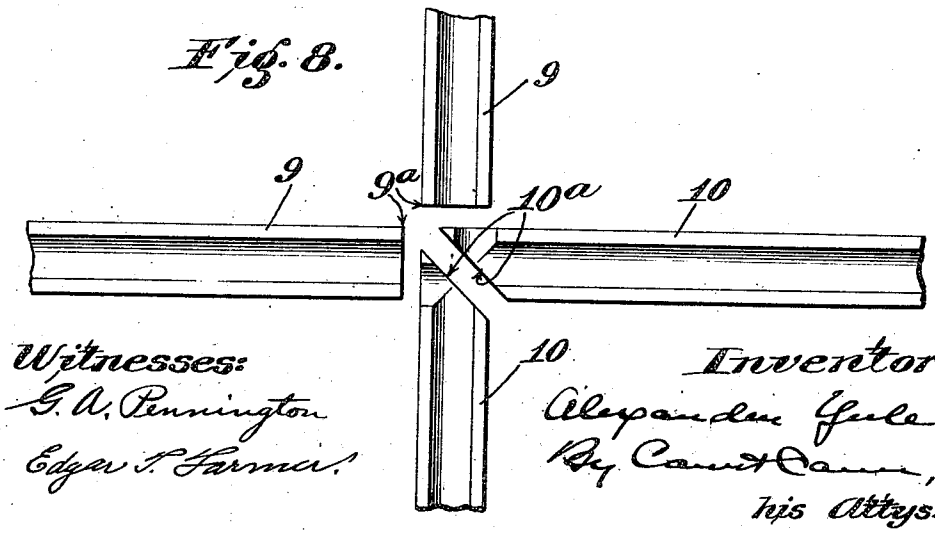


Fig. 8.



Witnesses:
G. A. Pennington
Edgar T. Farnum

Inventor:
Alexander Yule
By Count Cann,
his Attys.

UNITED STATES PATENT OFFICE.

ALEXANDER YULE, OF ST. LOUIS, MISSOURI.

RAILWAY-CROSSING.

1,051,050. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed March 14, 1911. Serial No. 614,482.

To all whom it may concern:

Be it known that I, ALEXANDER YULE, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Railway-Crossings, of which the following is a specification.

This invention relates to cross-over structures, and it has for its principal objects to obviate the pounding of the wheels as they cross over the intersecting tracks and the annoyance to passengers and those residing in the immediate neighborhood of the crossing, to carry the car wheel across the structure without raising or lowering it from its normal horizontal plane, to produce a structure adapted for car wheels having flanges of various depths, to minimize the cost of installation and up-keep of cross-over track structures, and to attain certain other advantages hereinafter more fully appearing.

The invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings which form part of this specification and wherein like symbols refer to like parts wherever they occur,—Figure 1 is a top plan of a railway crossing embodying my invention; Fig. 2 is a section on or about the line 2—2 of Fig. 1; Figs. 3 to 6, inclusive, are sections, on an enlarged scale, taken respectively on the lines marked with numbers corresponding to the numbers of the figures, and showing the different positions of the car wheel with respect to the track rails in passing over the crossing; Fig. 7 is a horizontal section on an enlarged scale on the line 7—7 of Fig. 2, showing the end portions of the flange plates at one of the points of intersection of the cross-over structure; and Fig. 8 is a fragmentary view showing said end portions of the flange plates detached.

The crossing illustrated in the drawings comprises an integral casting. However, the same may obviously be a built-up structure, if desirable. Each terminal of the crossing comprises a rail whose tread portion 1 corresponds to the tread portion of the particular type of the adjoining rail used in the track proper. At the inner side of the rail is a groove 2. The depth of the groove 2, at a point near the terminal portion 1 of the rail, is the same as the depth of the flange of a car wheel. That is, a car wheel of a certain standard size or wheels having flanges of the same depth. The bottom of the groove 2 continues in a straight line or horizontal plane entirely across the crossing excepting portions 3 at the terminals, which are inclined downwardly from the points 3^a toward the ends of the terminal tread portions 1, as shown more clearly at the right of Fig. 2.

From the points 1^a some distance inwardly from the points 3^a the treads of the rails are inclined downwardly to the points 1^b, as at 4, the intermediate portions 5 of the rails extending between the points of intersection of the rails at the lower elevation of the points 1^b on opposite sides of the points of intersection. Thus the car wheel in passing over the crossing, rides first with its tread on the terminal tread portion 1 of the rail, and at the point 3^a, the flange of the wheel passes tangentially onto the bottom of the groove 2 before the incline 4 is reached without being raised or lowered out of its normal horizontal plane and without a jar or shock. That is, provided, the depth of the flange of the wheel corresponds to the depth of the groove between the points 3^a and 1^a. As the wheel passes above the inclined portion 4, the tread of the wheel is relieved from the tread of the rail, and the wheel travels on its flange across the intersecting points of the tracks and passes onto the tread portion 1 at the opposite terminal without any perceptible jar or shock.

In case the flange of the wheel is not so deep as the groove, the crossing is still effective to eliminate the pounding considerably by reason of the arrangement of the inclines 4, down which the wheel will travel until its flange contacts with the bottom of the groove. Of course, in this instance the wheel is necessarily lowered from its normal horizontal plane prior to passing the intersecting points of the rails and is raised again as it approaches the opposite terminal of the crossing. So, too, in case the flange of the wheel is deeper than the groove, the flange will ride up the incline 3 at the terminal of the groove and lift the tread of the wheel from the tread of the rail. Hence, while the crossing is particularly designed to carry the wheel across the cross-over structure without raising or lowering it from its normal horizontal plane, the car wheels being usually of a

certain standard, yet in case there is a variation in the depth of the flanges, the passage over the crossing is effected as noiselessly and efficiently as may be accomplished by such crossings that are arranged for merely relieving the tread of the wheel from the rail by inclined risers to coöperate with the flange of the wheel, or by inclining the tread of the rail downwardly to allow the flange of the wheel to contact with the bottom of the groove, all of which necessitate lowering and lifting the car from its normal horizontal plane and do not entirely eliminate all the shock or jar.

The portions 6 of the cross-over structure at the inner side of the groove constitute guard rails and, adjacent to the terminal portions 1, correspond substantially to the cross section of the guard flange of an ordinary groove railway rail; but from the points 6^a to the points 6^b, the guard rails incline upwardly, as at 7, to substantially the same plane as the top of the terminal tread portions 1; or, in some cases, to a higher plane, so as to serve as a guard at the places where the tread of the rail is cut down. The portions 8 of the guard rails between the intersecting points of the tracks are in the same plane with the point 6^b.

As above stated, it is preferable to make the cross-over structure as an integral casting; and it is also desirable to line the grooved portion with a hardened wear plate, preferably of manganese steel. The groove in the main or body portion of the cross-over structure may be made square in cross section and the plates dropped therein and secured by bolts; or, preferably, as shown in the drawings, by forming undercut grooves or channels in the body portion and driving the wear plates into them. Preferably, four intermediate plates 9 having squared ends and of a length so that their inner corners 9^a coincide are first driven into position and then the terminal plates 10, having mitered inner ends 10^a so as to meet in the crotches formed by the adjacent ends of the plates 9, are driven into place. By forming the undercut channels and driving the plates, the necessity of using a multiplicty of securing bolts to hold the plates in position is obviated and it is only necessary to employ a bolt 11 at the end inclined portion 3 of each of the terminal plates 10; and the heads of these bolts being countersunk into the inclined portions 3, the surface of the horizontal bottom portion of the groove 2 which carries the flange of the wheel is unbroken and free from depressions or projections liable to cause pounding.

Obviously, the structure admits of considerable modification without departing from my invention. Therefore, I do not wish to be limited to the specific construction and arrangement shown.

What I claim is:

1. A railroad crossing comprising intersecting rails whose portions remote from the respective intersections of the cross tracks have normal tread faces in the same plane as the tread faces of the adjoining track rails so as to receive the normal tread portions of car wheels of one and the same standard, and flange-receiving portions extending across the track intersections parallel with the respective rails and terminating at points outwardly from the inner ends of said normal tread portions thereof, said flange-receiving portions being located a distance below said normal tread faces corresponding to the depth of the car wheel flange so as to receive said flange tangentially while the normal tread portion of the wheel is upon the normal tread face of the rail.

2. A railroad crossing comprising intersecting rails whose terminal portions have normal tread faces in the same plane as the tread faces of the adjoining track rails so as to initially receive the normal tread portions of car wheels of one and the same standard, said crossing rails being inclined downwardly from points inwardly from the terminals to points outwardly from the intersecting points and extending in the lower plane between said inclines, flange-receiving portions extending continuously across the structure between points outward from the inner ends of said normal tread receiving portions of the rails parallel with the respective rails in coöperative relation thereto, in a plane below the normal tread faces of the rails at a distance equal to the depth of the car wheel flange, so as to receive the flanges of the wheels while the normal tread portions of the wheels are on said normal tread faces of the rails, and inclines extending downwardly from the terminals of said flange-receiving portions and adapted to initially receive car wheel flanges of a depth greater than the standard for which the crossing is primarily adapted.

3. A railroad crossing comprising intersecting rails whose terminal portions have normal tread faces in the same plane as the tread faces of the adjoining track rails, a bearing surface extending in a straight line from a point near the terminals across the intersections of the cross tracks parallel with and at a distance below the respective normal tread faces equal to the depth of a car wheel flange and adapted to receive the flange portion of the car wheel tangentially, the tread portions of the respective crossed rails being inclined downwardly from points inwardly from the terminals of said flange-receiving bearing surface to points outwardly from the respective intersections of the cross tracks and extending between such points in a plane lower than the normal

tread faces of the terminal portions, and guard flanges opposite to the portions of the tread rail that are inclined and lower than the normal tread faces thereof.

4. A railroad crossing comprising intersecting rails, the structure being integral, the terminals of the tread portions of the rails being in the same plane as the adjoining track rails so as to initially receive the tread portions of car wheels, said crossing rails being grooved, the grooves being undercut on opposite sides, hardened metal inserts fitted in said undercut portions and adapted to receive the flanges of car wheels while their tread portions are still upon the tread portions of the rails, said inserts extending continuously across the structure and the tread portions of the rails being lowered between points outwardly remote from the respective intersecting points of the rails.

5. A railroad crossing comprising intersecting rails, the structure being integral, the terminals of the tread portions of the rails being in the same plane as the adjoining track rails, the tread portions of the crossing rails being lowered between points outwardly remote from the respective intersecting points of the rails, said crossing rails being grooved, the grooves being undercut on opposite sides, hardened metal inserts fitted in said undercut portions, said inserts having squared ends and being of a length so that their inner corners coincide, and hardened metal inserts fitted in said undercut portions outward from the portions occupied by said first mentioned inserts, the inner ends of said second mentioned inserts being mitered so as to meet in the crotches at the ends of said first mentioned inserts, the upper faces of said inserts being in a plane so as to receive the flanges of the car wheels while their tread portions are still upon the terminal tread portions of the rails.

6. A railroad crossing comprising intersecting rails, the structure being integral, said crossing rails being grooved from end to end, the grooves being undercut on opposite sides, and hardened metal inserts fitted in said undercut portions and adapted to receive the flanges of the car wheels.

Signed at St. Louis, Missouri, this 8th day of March, 1911.

ALEXANDER YULE.

Witnesses:
GEO. T. PUMPELLY,
J. E. SCOTT.