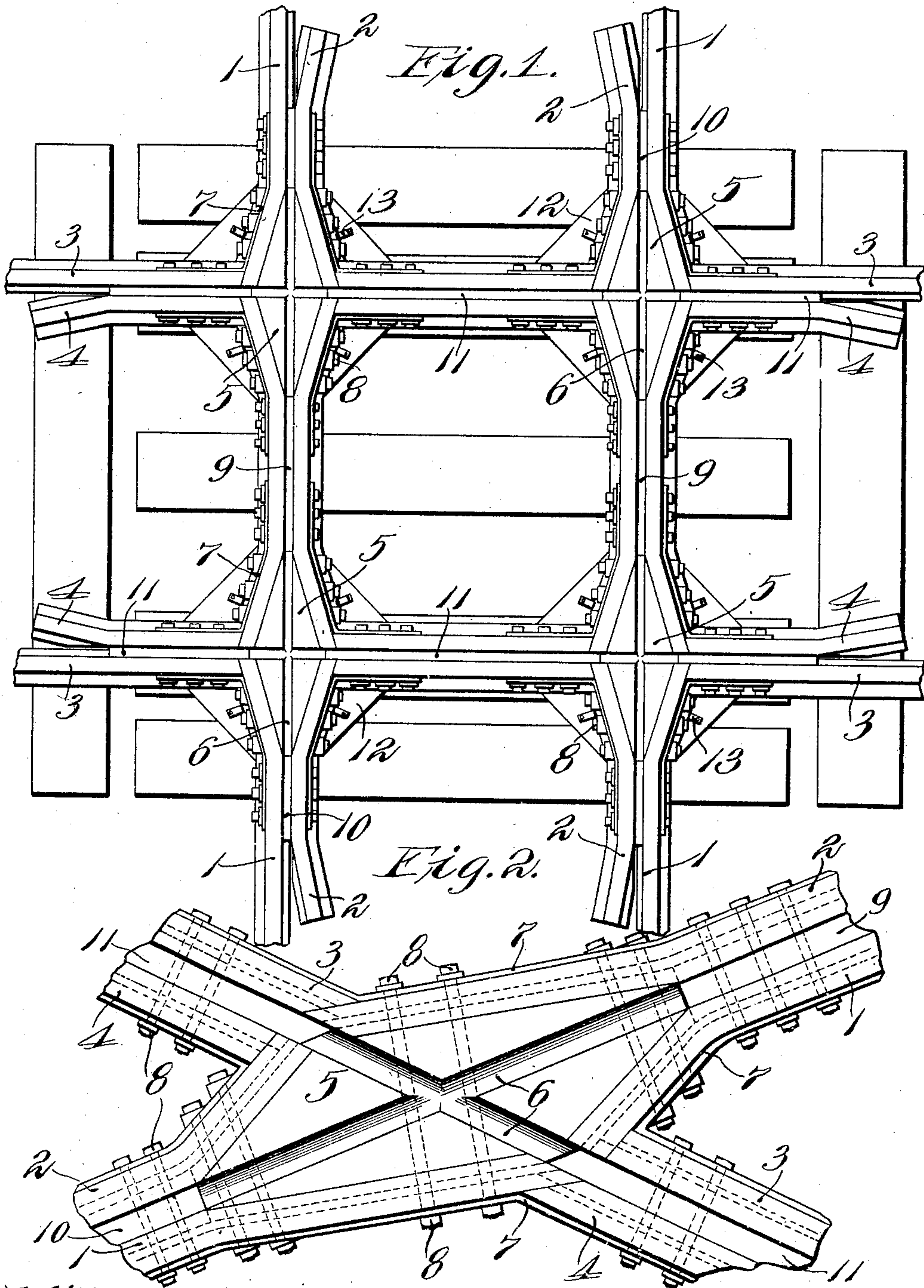


No. 829,703.

PATENTED AUG. 28, 1906.

R. E. EINSTEIN.  
RAILROAD CROSSING.  
APPLICATION FILED MAY 16, 1906.

2 SHEETS—SHEET 1.



Witnesses:  
Fred Hecker.  
Wells L. Church.

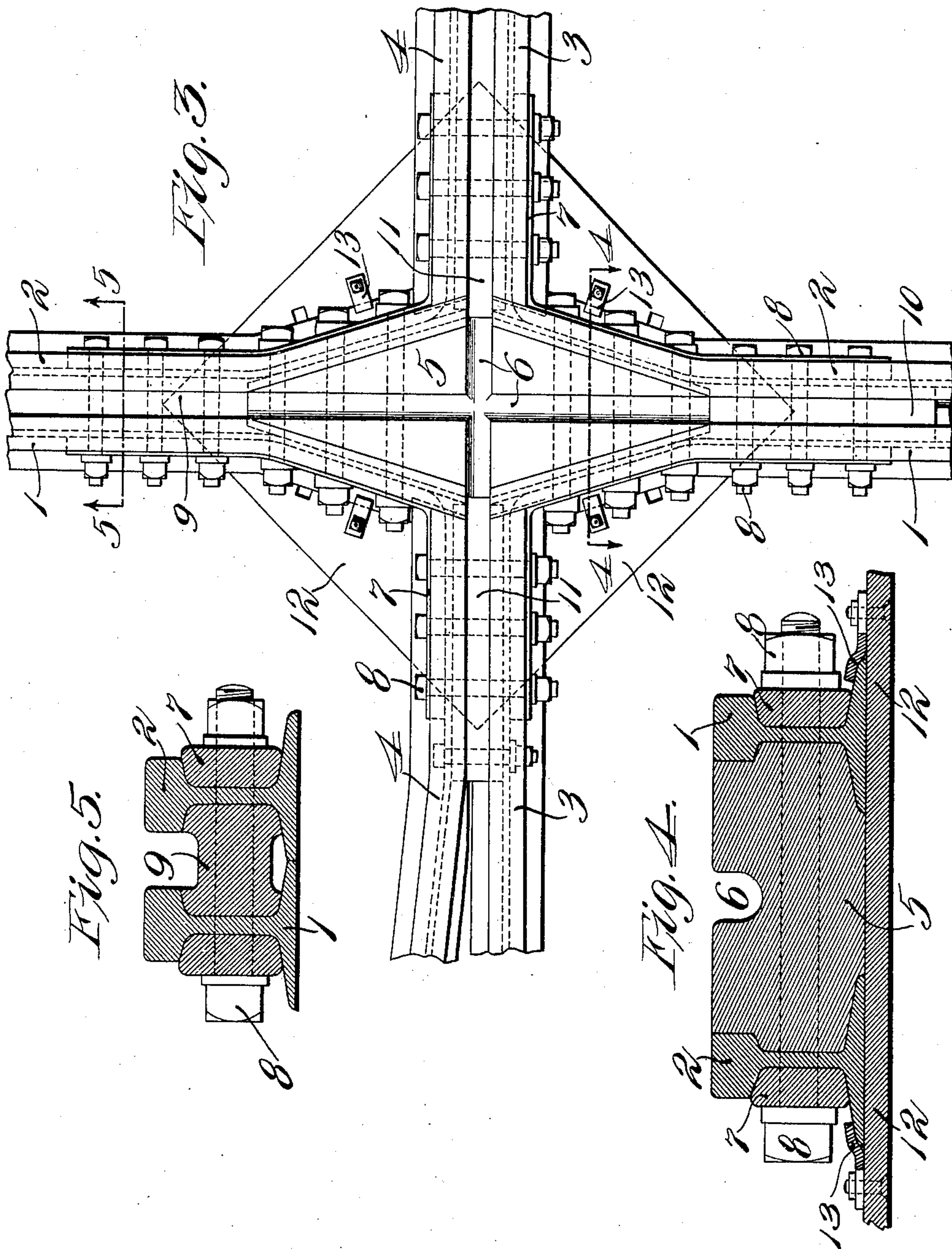
Inventor:  
Robert E. Einstein.  
by Baker & Cornwall  
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# UNITED STATES PATENT OFFICE.

ROBERT E. EINSTEIN, OF ST. LOUIS, MISSOURI.

## RAILROAD-CROSSING.

No. 829,703.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed May 16, 1906. Serial No. 317,136.

*To all whom it may concern:*

Be it known that I, ROBERT E. EINSTEIN, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Railroad-Crossings, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of a railroad-crossing at about an angle of ninety degrees constructed in accordance with my invention. Fig. 2 is a plan view of one corner of a crossing of a different angle. Fig. 3 is an enlarged view of one corner of the crossing shown in Fig. 1. Fig. 4 is a sectional view taken on the line 4 4 of Fig. 3, and Fig. 5 is a sectional view taken on the line 5 5 of Fig. 3.

This invention relates to railroad-crossings, and particularly to that type which have "hard centers"—namely, pieces of metal harder and more durable than the rails inserted at the points of intersection of the rails of the main line and cross-line or intersecting line.

One object of my invention is to provide a railroad-crossing which can be constructed and maintained cheaply and without the aid of special tools and which will be stronger and more efficient and last much longer than the crossings heretofore in use.

Another object of my invention is to provide a crossing in which the abutting rails will not receive a shock or blow from the wheels passing over the main line.

Another object of my invention is to provide a crossing in which the part that receives the greatest wear can be renewed or interchanged with a similar part of the same crossing or one of like angle and construction.

Another object of my invention is to provide a crossing which will not wear away rapidly at the joints or points of connection between the hard centers and adjoining rails and between the through rails of one track and abutting rails of the other track.

Other objects of my invention are to provide a crossing which can be taken apart easily for transportation and readily assembled without increasing the number of joints or connections, to provide against the breakage of that part of the crossing which receives the shock or blow from wheels passing over the same, to provide against the possi-

bility of the hard centers becoming loosened from the balance of the structure and also prevent the crossing from running or creeping under traffic or by expansion and contraction of the rails of the track, to provide for the distribution of the pounding to which the crossing is subjected over a wide area of the foundation, and also to permit the use of hard centers of a uniform shape, thereby necessitating the use of only a single mold or templet in their manufacture.

Referring to the drawings, which represent the preferred form of my invention, 1 designates the running-rails of the main line, 2 the guard-rails of said line, and 3 and 4 designate, respectively, the running-rails and guard-rails of the cross-line. Located at the intersection of these rails are four hard centers 5, which are approximately in the form of a parallelogram with the long diagonal of the parallelogram running longitudinally of the rails of one line, preferably the main line, which has the heavier and more frequent traffic. These hard centers are preferably cast or forged to approximately their finished size and are then ground, planed, or otherwise shaped to conform to the fishing-sections of the rails, so that they will accurately fit between the heads and base of the running-rails and guard-rails of the main line.

As shown in the drawings, the running-rails and guard-rails of the main line terminate at approximately the gage-line of the abutting rails of the cross-line; but, if desired, the running-rails of the main line and also their guard-rails could extend throughout the length of the crossing and have slots or grooves formed therein to receive the flanges of the wheels traveling on the rails of the cross-line.

The hard centers are provided with openings 6 or flangeways for the wheel-flanges, traveling on both of the intersecting tracks. They are made of sufficient length to allow for the required number of bolts to hold the tracks and hard centers together and of such width as to insure proper bearing of the wheel-treads in passing over the flangeway-opening at the abutting track, so that the shock at the flangeway-opening is borne entirely by these hard centers, thus relieving the ends of the abutting rails from shocks or blows. The hard centers and the running-rails and guard-rails of both lines are securely connected together by corner-braces 7, bolts 8 passing through said braces and through



the rails and hard centers, so that all of said members are firmly clamped together.

As shown in Fig. 1, the filling-pieces 9 between the running-rails and guard-rails of the main line extend the full distance between the hard centers. Filling-pieces 10 are also placed between the guard-rails and running-rails beyond the hard centers, the guard-rails being usually flared for well-known purposes. The structure formed by the running-rails and guard-rails of the main line, filling-pieces, hard centers, and corner-braces, securely connected by bolts passing through the same, is known as the "through" or "main" section and is preferably utilized for the track having the heavier and more frequent traffic. The running-rails, guard-rails, filling-pieces, and corner-braces of the cross-line form what is known as the "abutting sections" and are preferably utilized on the track having the lighter traffic. By constructing the crossing in this manner these sections can be made of such weight that they can be easily handled in one piece or in connection with such abutting sections as are convenient to handle, thus avoiding any extra joints or connections and facilitating greatly the handling and shipping of the crossing. The abutting sections are constructed as in the crossings in general use and can be easily connected to the through or main sections at their intersection with the same by means of corner-braces and bolts 7 and 8, also permitting these sections to be formed without extra joints. Preferably the filling-pieces 11 of the abutting sections extend between the ends of the running-rails and guard-rails of the main line, thus forming a shoulder that prevents these rails or their connections from creeping, due to the traffic passing over the same or by expansion or contraction of the rails. The hard centers may be renewed or interchanged without great expense or interference with traffic and without the use of special tools, metals, or appliances other than those usually handled by trackmen, as it is only necessary to remove the bolts and running-rails.

From the foregoing description it will be seen that by this construction the points of crossing are all at an angle or bevel, a feature that adds greatly to the strength and durability of the crossing. The connection between the hard centers and the adjoining rails is likewise on a bevel or angle, thus tending to make the passage of the wheels over them without any jarring or pounding and adding to the life of the crossing and preventing unnecessary or undue motion to the rolling-stock. If desired, the rails of the main line could be continuous and be bent at approximately a right angle, so as to form the rails of the cross-line instead of terminating at the rails of the cross-line, as in the construction shown in the drawings. Prefer-

ably a plate 12 is arranged underneath each corner of the crossing, the bases of the rails and the hard center resting on said plate, said plate being provided with removable clips 13, which engage the bases of the rails, and thus enables the same to be removed easily. These plates are not absolutely essential to the successful operation of my crossing; but they are desirable, as they distribute the shock or pound to the ties on which the crossing rests.

It will of course be understood that my improved crossing may be formed for any angle, and in Fig. 2 I have shown a crossing at an angle of about forty-five degrees.

In view of the fact that the sides of the hard center are of uniform dimensions it is possible to interchange the hard centers of the crossing when they become worn, and thus reduce greatly the cost of maintaining the crossing. By "interchanging" I mean either transferring the two hard centers at one end of the crossing or turning the hard centers at each corner of the crossing end for end, so that the side of the groove or flange-way in the hard center which has acted as a guard, and accordingly has received practically no wear, will act as a continuation of the running-rail in its new position.

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

1. A railroad-crossing comprising hard centers of approximately parallelogram form arranged at the corners of the crossing, each hard center being embraced by the running-rails and guard-rails of one line; substantially as described.

2. In a railroad-crossing, a hard center of approximately parallelogram form, rails embracing the side faces of the hard center and being secured thereto, and abutting rails connected to said rails; substantially as described.

3. In a railroad-crossing, a hard center which is of greater length than breadth, and being of approximately the same depth as the rails which embrace same, the side edges of said hard center being formed regular and converging at the ends of the hard center; substantially as described.

4. In a railroad-crossing, a hard center which is adapted to be embraced by rails, said hard center being of greater length than breadth and having the edge portions of its opposite sides of approximately the same dimensions and conforming to the fishing-sections of the embracing rails; substantially as described.

5. In a railroad-crossing, a hard center provided with a central groove for receiving the flange of a car-wheel and having its side edges formed at an angle to said groove and diverging from the end of said groove, rails embracing the side edges of the hard center



and comprising straight portions which form continuations of said groove, and means for connecting said members together; substantially as described.

5 6. In a railroad-crossing, a hard center of approximately parallelogram form arranged between the running-rail and guard-rail of a line in combination with the abutting rails of an intersecting line, said hard center being of  
10 great enough dimensions adjacent the abutting rails to receive the entire tread of the car-wheel passing over the line and thus relieve the ends of the abutting rails from shocks; substantially as described.

15 7. In a railroad-crossing, a hard center of approximately parallelogram form, running-rails and guard-rails embracing the side edges of said hard center and terminating adjacent the center thereof, abutting rails terminating  
20 adjacent said running-rails and guard-rails, and filling-pieces connected to the abutting rails and projecting between the ends of the running-rails and guard-rails; substantially as described.

25 8. In a railroad-crossing, a plurality of hard centers of approximately parallelogram form, running-rails and abutting rails embracing the side edges of said hard centers, abutting rails extending at an angle to said  
30 running-rails and guard-rails, and corner-

braces for securing all of said members together; substantially as described.

9. In a railroad-crossing, hard centers of approximately diamond shape, running-rails and guard-rails forming one line embracing 35 said hard centers and securely bolted thereto, running-rails and guard-rails forming an intersecting line connected to the rails first referred to, and plates located at the corners of the crossing underneath said hard centers, 40 and means for securing said plates to the bases of the rails; substantially as described.

10. A railroad-crossing having four hard centers of uniform shape and dimensions 45 provided with flangeways, thereby enabling the two hard centers at one end of the crossing to be interchanged so that the sides of the flangeways which have acted as guards in the former positions of the hard centers will act 50 as continuations of the running-rails in the changed positions of the hard centers; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, 55 this 12th day of May, 1906.

ROBERT E. EINSTEIN.

Witnesses:

WELLS L. CHURCH,  
GEORGE BAKEWELL.