Jan. 6, 1970 A. G. FARMER 3,487,998

RAILROAD CROSSING ASSEMBLY

Filed May 7, 1969 2 Sheets-Sheet 1

Fig. 1.

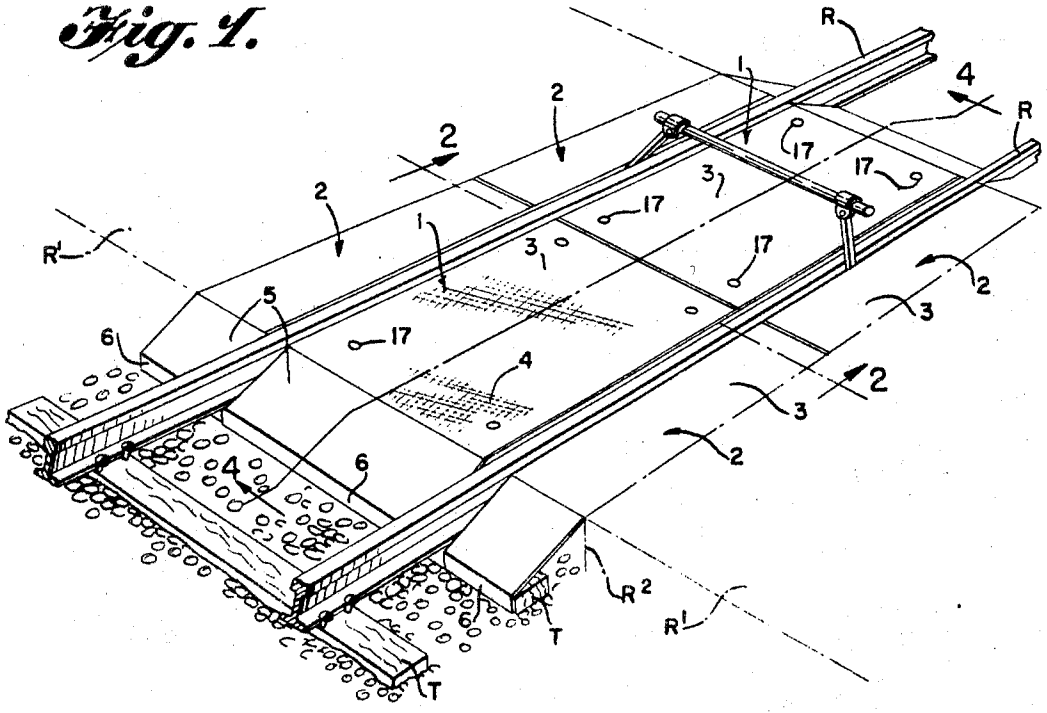


Fig. 2.

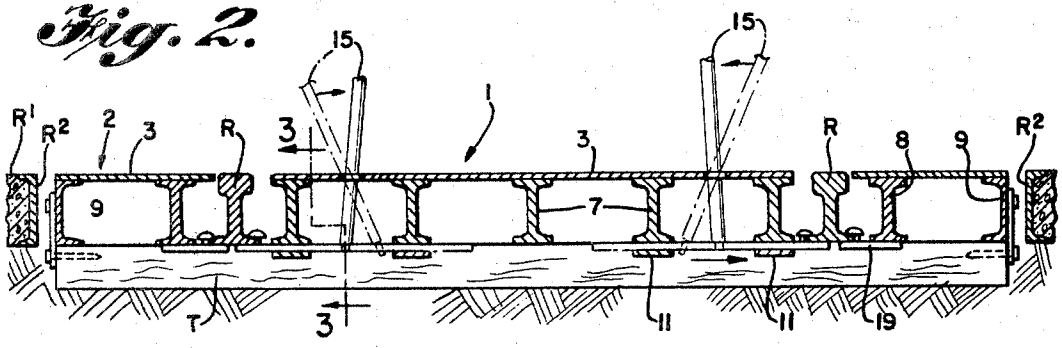
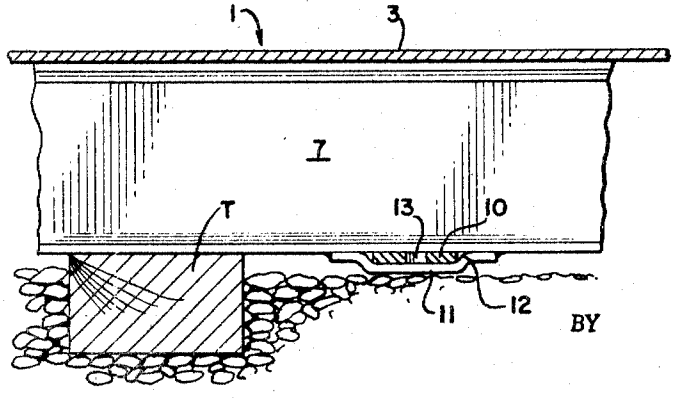


Fig. 3.



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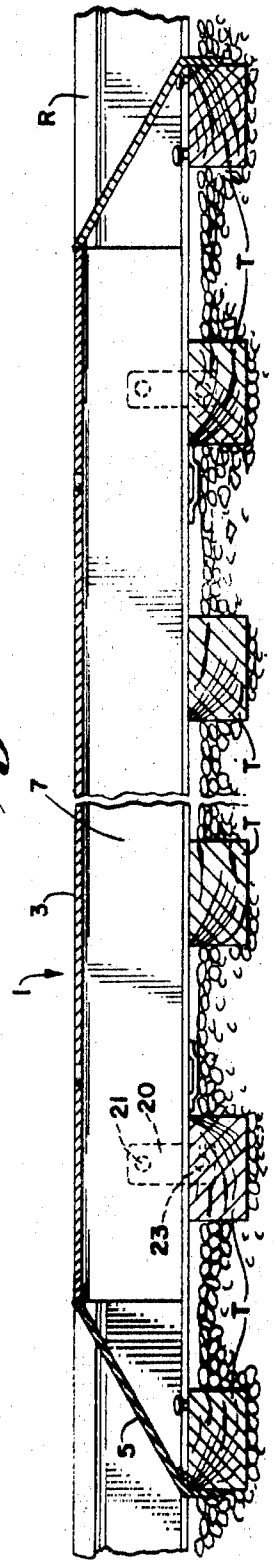


Fig. 4.

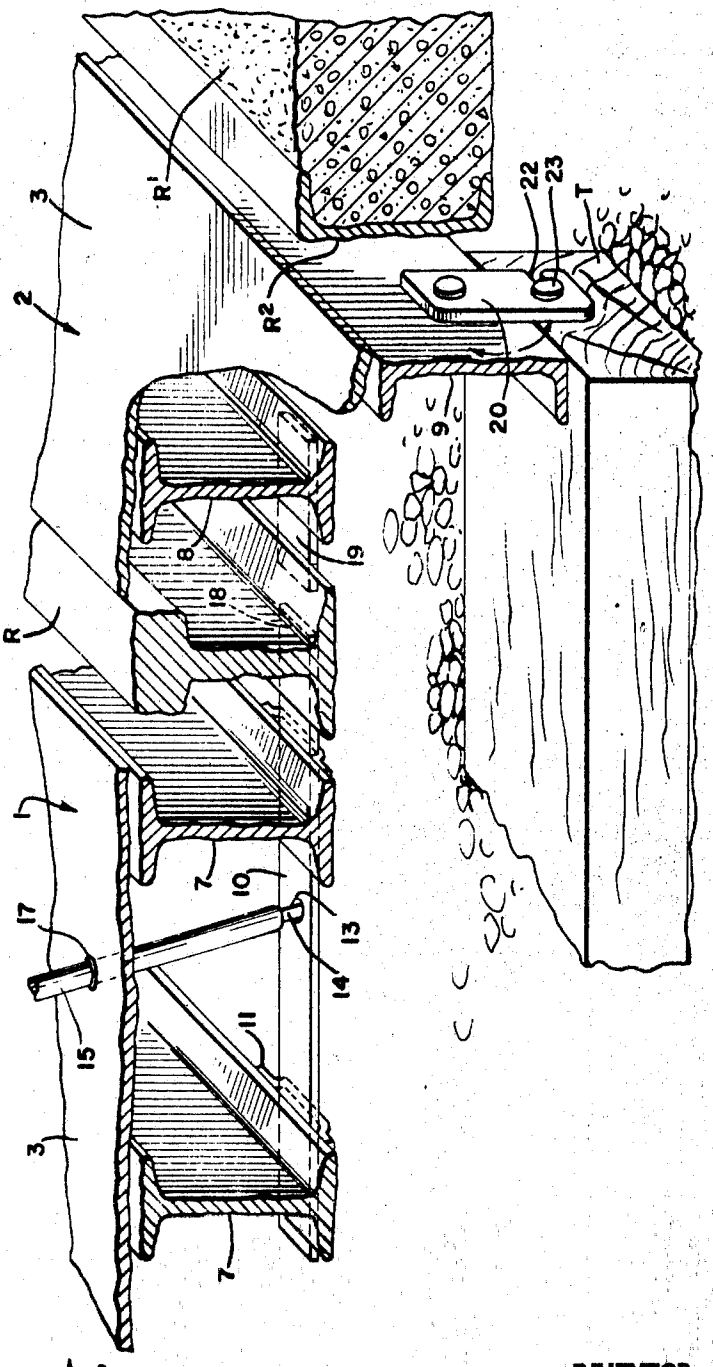


Fig. 5.

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RAILROAD CROSSING ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A readily replaceable crossing assembly for a railroad track having self-contained locking means on both center and approach deck segments. Means are provided for displacing the locking means thus permitting anchorage to both the rails and cross ties.

This invention relates generally to a railroad appliance, and more particularly to an improved grade crossing structure as utilized to provide a smooth planar transition across railroad tracks between the opposed ends of a crossing motor vehicle roadway.

Numerous prior examples of the subject structure are evident, including various assemblies of metal plates, beams and other structural elements intended to be positioned between spaced apart rails to provide the desired top surface at a level which is maintained coplanar with the top of the rail heads. Many of these prior installations utilize a multitude of components, some of which are intricately contrived and which require an extreme amount of labor for the installation and maintenance thereof.

By the present arrangement only two primary components are involved, namely flat metal plate stock and longitudinal beam or channel elements, neither of which require any specialized fabrication and both of which are assembled, prior to shipment to the site, by any suitable means such as welding. There is no requirement during installation of the present crossing assembly to provide a multitude of loose separate fastening members, as is so prevalent in many of the prior known devices, as the installation and any subsequent removal of the instant crossing assembly is achieved by the instantaneous manipulation of a self-contained movable latch construction, which latch mechanism engages the undersurface of the present installed rails. Unlike certain of the heretofore offered crossing assemblies which are spiked or bolted to several or all of the underlying cross ties, the present crossing arrangement will not be significantly affected during passage of rail traffic by the inherent uneven pumping action to which all cross ties as normally embedded in ballast are subjected.

Accordingly, one of the primary objects of the present invention is to provide an improved railroad crossing assembly including center and approach deck segments all of which may be installed or removed with a minimum of time and expense.

Another object of the present invention is to provide a railroad crossing including a center segment adapted to be disposed between the rails and including movable latch members carried thereby and displaceable to engage the undersurface of the adjacent rails.

Still another object of the present invention is to provide a railroad crossing including an approach segment adapted to be installed adjacent the field side of a rail and including lock means carried thereby engageable with the undersurface of the rail.

A further object of the present invention is to provide a railroad crossing including center and approach segments, each of which are provided with locking means engageable with the undersurface of a rail and additional latch means selectively locking one side of the approach segment to the rail cross ties.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the invention consists in the novel construction, combination and arangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:

FIGURE 1 is a top perspective view of a railroad crossing assembly according to the present invention as installed in the operative position.

FIGURE 2 is a transverse sectional view along the line 2—2 of FIGURE 1, and illustrates in broken lines the alternate positions of the actuating key and movable latch members.

FIGURE 3 is a fragmentary side elevation, partly in section, taken along the line 3—3 of FIGURE 2.

FIGURE 4 is a vertical sectional view taken along the line 4—4 of FIGURE 1.

FIGURE 5 is a fragmentary perspective view, partly in section, and illustrates on an enlarged scale the retaining means for both the center and approach deck segments.

Similar reference characters designate corresponding parts throughout the several views of the drawings.

Referring now to the drawings, particularly FIGURE 1, the present invention will be seen to comprise an assembly including a plurality of segments disposed both between the spaced apart rails R—R and between the field side of these rails and the juxtaposed ends of the two roadway sections R'—R' so as to provide a smooth transition from the upper surface of the roadway at the end R^2 thereof across the space between the top of the rail heads and thence across to the top of the opposite roadway R'. Substantially filling the space between the gauge sides of the two rails R—R are a plurality of center deck segments **1** while the aforedescribed space between the field side of each rail and the end R^2 of each roadway section is substantially filled by a plurality of approach deck segments **2**. In each instance it will be understood that any number of either segments **1** or **2** may be provided for a specific installation, the number thereof being determined primarily by the width of the roadway R', and there being no disadvantage in providing numerous separate segments either between the rails or outside of the rails with the present assembly, as will be appreciated hereinafter.

Each center deck segment, generally designated **1**, includes a planar top plate **3** which may be grooved or otherwise fabricated on its upper most surface to provide an anti-skid finish such as shown at **4** in FIGURE 1. If only two center deck segments **1—1** are being used as shown in FIGURE 1 it will be noted that the opposite end of each such segment will be provided with a side edge ramp **5** connected to the edge of the top plate **3** and inclined downwardly to a point corresponding to the top surface of the cross ties T, the lower edge of the ramp **5** then terminating in a vertical depending flange **6**. The adjacent edges of the top plate **3** and side edge ramp **5** may be welded or otherwise suitably rigidly connected, and from a review of FIGURE 2 it will be seen that this structure is then supported upon a plurality of longitudinally extending structural member such as the center deck beams **7**, each of which extends substantially the length of the top plate **3** and is suitably attached to the undersurface thereof such as by welding. Quite obviously the vertical height of the beams **7** will be selected so as to insure that the combined height of each beam and the top plate **3** will result in the upper surface of the top plate being disposed substantially coplanar with the top of the rail heads when the beams **7** are resting upon the top surface of the cross ties T between the two rails R—R.

If more than two center deck segments **1—1** are being utilized it will follow that the two outermost of said segments will be constructed as above described and as

shown in FIGURE 1 and that any intermediate segments positioned between these two segments would not be provided with a side edge ramp **5** but otherwise would be identical in construction.

Insofar as the visible components of the outboard or approach deck segments **2** are concerned, the construction of these segments is analogous to the construction of the center deck segments **1**, that is, each approach deck segment generally designated **2** includes a top plate **3** and, in the case of the outermost segments, a side edge ramp **5** having a lower depending flange **6**. As shown in FIGURE 2 the supporting members for each of the approach deck segments **2** include a pair of structural members, namely, an I-beam **8** disposed adjacent the field side of the rail R and a channel element **9** disposed substantially flush with the outermost edge of the top plate **3**. It will be appreciated that any number of structural members may be employed to support the approach deck segment top plate **3** depending upon the width thereof.

The inclined side edge ramps **5** of both the center and approach deck segments serve a three-fold purpose. Foremost may be considered the safety aspect wherein it will be seen that should a vehicle tire drop off the edge of the top plates **3** the possibility of an abrupt stoppage of the vehicle is minimized while recovery is facilitated. Secondly, any debris entrapped beneath and carried forward by oncoming train traffic will be directed over the top plates **3** and not strike an otherwise exposed blunt edge. Also, the downwardly inclined ramps will be seen to form an enclosure thus excluding large amounts of trash and the elements from the locking mechanisms contained beneath the plates.

The installation of both the center and approach deck segments is a relatively simple maneuver and yet results in a positive locking of the segments in place while at the same time permitting a removal which is just as simple and effective. In the case of the center deck segments **1** a sliding latch mechanism is provided on the undersurface of certain of the longitudinal beams **7** so that after the segment has been lowered into position between a pair of rails and is supported upon the top surface of the intermediate cross ties therebetween this latching mechanism may be quickly manipulated to positively secure the entire deck segment in position by means of engagement of the latching structure with the undersurface of the two rails R.

The structure of the latching mechanism is illustrated most clearly in FIGURES 3 and 5 wherein it will be seen that a plurality of latch bolts **10** are slidably mounted beneath the undersurface of tthe two outermost longitudinal beam members **7** along each edge of each center deck segment **1**. The bolt **10** preferably comprises a longitudinal plate member and is supported for transverse reciprocating movement by means of a pair of latch guide plates **11—11** suitably attached such as by welding to the bottom of the two longitudinal beams **7—7** involved. As shown most clearly in FIGURE 3 each guide plate **11** is substantially U-shaped so as to provide a pocket **12** bounded by the upper surface of the guide plate and the lower surface of the beam **7** and dimensioned to provide a smooth sliding fit on the latch bolt **10** therethrough. One or more openings **13** such as shown in FIGURE 5 are provided through the intermediate portion of each sliding latch bolt **10** for the reception of the pin **14** on the lower end of an operator key **15**. This pin **14** is preferably of lesser diameter than the main body of the key **15** so as to provide an intermediate shoulder **16** therebetween as will be seen in FIGURE 5.

By the foregoing arrangement, when the key **15** is inserted through one of a plurality of access openings **17** in the top plate **3**, the key may be progressively lowered until the pin **14** is inserted within the opening **13** of the latch bolt **10** with the shoulder **16** serving as a stop or abutment to preclude excessive lowering of the key which would otherwise cause the bottom of the pin **14** to strike and drag through the ballast normally disposed between the cross ties T. At this point it would be well to observe that the installation of the plurality of latch bolts **10** must be so located to insure that these bolts and their attendant guide plates **11** will be positioned between or adjacent the cross ties and not strike or engage the upper surfaces of any of the cross ties upon lowering of a deck segment into position. In view of the standard placement of cross ties in a rail line this positioning of the latching mechanism is readily predetermined, and with this in mind a proper installation is achieved during lowering of a center deck segment **1** into position by insuring that the depending flange **6** on the edge ramp **5** of the endmost segment is vertically aligned with the side edge of a cross tie T as the segment is lowered.

The thus properly positioned segment is locked into a fixed position after insertion of the key **15** into the latch bolt opening **13** by the angular displacement of the upper end of the key **15** in the manner illustrated in FIGURE 2 in order to axially displace each bolt **10** whereupon the free end or lock tab **18** thereof will be moved into position beneath the adjacent rail R. Preferably, the above described latch mechanism is provided at each of the four outer corners of each deck segment **1**; however it will be understood that any number of additional latch bolts **10** may be provided particularly in the case of a deck segment of extremely long length wherein additional latch bolts may be installed intermediate the outermost latch bolts in order to positively preclude any swelling of the outer portion of the top plate **3** during subsequent use of the crossing assembly.

The installation of each of the approach deck segments **2** is somewhat analogous to the aforedescribed installation of the center deck segments **1** in that a simple single maneuver is required to position these latter segments, as illustrated most clearly in FIGURES 2 and 5. During the lowering of each deck segment **2** into position the subassembly is slightly tilted downwardly toward the field side of the rail R to permit the free end of a plurality of lock tabs **19** fixedly attached to the bottom surface of the base flange of the beam **8** to be guided underneath the field side of the rail base flange. Again, any number of lock tabs **19** may be provided along the undersurface of each beam **8**, it being understood that the spacing of these tabs must permit suitable clearance to preclude interference from the top surface of the cross ties T upon which the rails R and beams **8** are disposed.

As each approach deck segment **2** is lowered into its normal horizontal position the outermost longitudinal beam or channel **9** will come to rest on the top surface of the cross ties at a point substantially vertically aligned with the end surface of the cross ties. The outermost edge of the approach deck segments is positively secured into position by the pivot latch arrangement shown most clearly in the perspective view of FIGURE 5 and includes the latch bolt **20** pivotally attached to the outer surface of the channel **9** by the pin **21** to permit uninhibited angular displacement of the latch bolt **20** in the direction of the arrow shown in FIGURE 5. The lower free end of the latch bolt **20** will be seen to include a suitable notch **22** which cooperates with a fixed lock pin **23** driven into the end of the cross tie T and by providing a headed lock pin **23** it will follow that both vertical and transverse displacement of the installed approach deck segments is precluded.

Removal of both the center and approach deck segments is achieved in a rapid manner by a simple reversal of the above described steps whereby it will be appreciated that at any time any specific one of the segments may be removed and replaced without disturbing or affecting the installation of the remaining adjacent segments.

I claim:

1. A railroad crossing assembly including, an approach deck segment removably disposed upon the cross ties between the field side of a rail and the end of a roadway, said segment provided with a top plate extend-

ing substantially the transverse distance between the rail and roadway end, beam elements disposed upon the top surface of the cross ties and supporting said plate with its upper surface substantially coplanar with the top of the rail and roadway, and rigid planar locking means fixedly carried by the lower portion of one of said beam elements adjacent the plane of the upper surface of the cross ties, said locking means projecting in a horizontal plane beneath the undersurface of the base of said rail.

2. A railroad crossing assembly according to claim **1**, wherein said segment includes a ramp inclined downwardly from one edge of said top plate to the top of an adjacent cross tie.

3. A railroad crossing assembly according to claim **2**, wherein the lower edge of said ramp is provided with a depending flange overlying the side of the cross tie.

4. A railroad crossing assembly including, a center deck segment removably disposed upon the cross ties between the two spaced rails, said segment provided with a top plate extending substantially the transverse distance between the rails, beam elements disposed upon the top surface of the cross ties and supporting said plate with its upper surface substantially coplanar with the top of the rails, and planar locking means carried by the lower portion of said beam elements adjacent the plane of the upper surface of the cross ties, said locking means movable in a horizontal plane to engage the undersurface of the base of the rails.

5. A railroad crossing assembly according to claim **4**, including, an approach deck segment removably disposed upon the cross ties between the field side of a rail and the end of a roadway, said approach deck segment provided with a top plate extending substantially the transverse distance between the rail and roadway end, beam elements disposed upon the top surface of the cross ties and supporting said approach deck segment plate with its upper surface substantially coplanar with the top of the rail and roadway, and rigid planar locking means fixedly carried by the lower portion of one of said approach deck segment beam elements adjacent the plane of the upper surface of the cross ties and engageable beneath the undersurface of said rail.

6. A railroad crossing assembly according to claim **4**, wherein said locking means includes a latch bolt mounted for sliding movement transversely of said rails.

7. A railroad crossing assembly according to claim **6**, wherein said latch bolt is provided with an opening and said top plate includes an opening substantially overlying said bolt opening.

8. A railroad crossing assembly according to claim **1**, wherein said approach deck segment locking means includes a lock tab extending transversely from said segment to said rail.

9. A railroad crossing assembly according to claim **8**, including a beam element juxtaposed the roadway end and vertically aligned with the ends of the underlying cross ties, and said approach deck segment locking means includes a latch bolt pivotally mounted upon said latter beam element, and a lock pin anchored in the end of the cross tie underlying said latch bolt and engageable thereby.

10. A railroad crossing assembly according to claim **4**, wherein said segment includes a ramp inclined downwardly from one edge of said top plate to the top of an adjacent cross tie.

11. A railroad crossing assembly according to claim **10**, wherein the lower edge of said ramp is provided with a depending flange overlying the side of the cross tie.

References Cited

UNITED STATES PATENTS

983,982	2/1911	Davis	238—8
1,623,911	4/1927	Dailey et al.	238—8
1,769,464	7/1930	Rich	238—8
1,844,912	2/1932	Eckhart	238—8
1,941,967	1/1934	Bell	238—8

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