

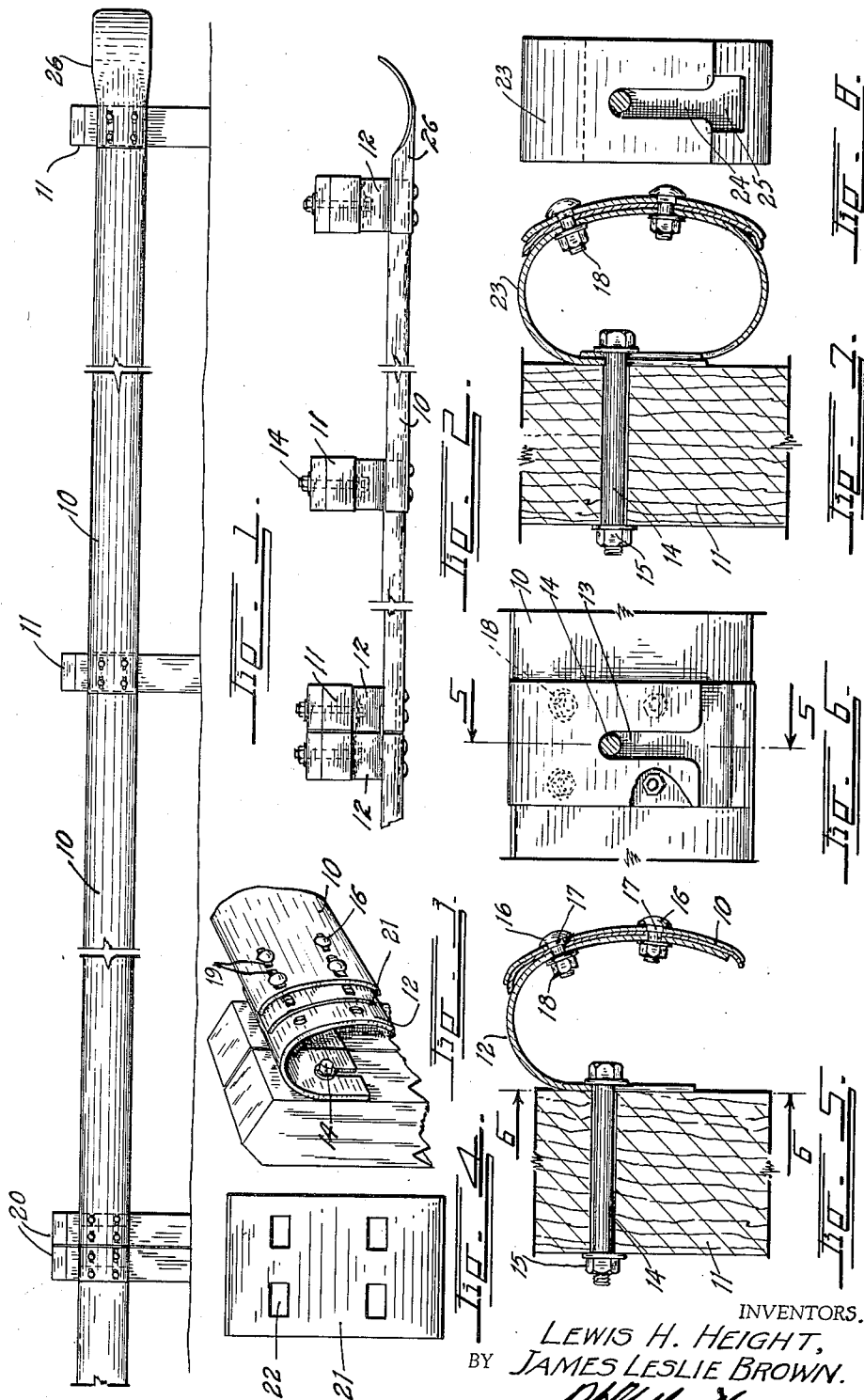
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HIGHWAY GUARDRAIL

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HIGHWAY GUARDRAIL

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This invention relates to a highway guard rail of the continuous hub-high, steel type, and has for its principal object the provision of a highly efficient rail which can be quickly and easily installed; which will resiliently resist road shocks; which will have great inherent strength; and which will swing downwardly and inwardly at its bottom when struck by a hub to prevent the hub from slipping beneath the rail and forcing the latter upwardly.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:—

Fig. 1 is an inside face view of a typical installed section of the improved guard rail.

Fig. 2 is a plan view of the rail shown in Fig. 1.

Fig. 3 is a perspective view illustrating a pair of intermediate anchor posts of the rail with their supporting brackets.

Fig. 4 is a detail face view of the tie plate employed at the intermediate anchor posts.

Fig. 5 is a detail section through one of the supporting posts, taken on the line 5—5, Fig. 6.

Fig. 6 is a rear view of the supporting bracket, taken on the line 6—6, Fig. 5.

Fig. 7 is a section through an alternate form of supporting bracket.

Fig. 8 is a rear view of the alternate form of Fig. 7.

The invention comprises a series of connected, longitudinally extending, plate rails 10 of special cross sectional design. In cross section, these rail plates, for the major portion of their width are formed on a large radius, preferably about 11¼". Along their upper and lower edges they are curved rearwardly on an abrupt radius, preferably of about 1", so as to present a broad curved surface to the vehicles with turned edges which prevent cutting and sawing of those portions of the vehicles which may pass over or under the rail.

The rail is supported at the average hub height of vehicles by a series of supporting posts 11, which can be of wood, concrete, steel, or stone. For economic reasons, wood is preferably employed, and is illustrated in the drawing.

In the first form of the invention, the rail is supported from the posts upon inverted U-shaped brackets 12 preferably formed of tempered spring steel. The brackets 12 consist of a downwardly extending rear leg containing a vertical bolt receiving slot, 13, and an outwardly and down-

wardly extending outer leg formed on a radius conforming to the major radius of the rail 10. A clamp bolt 14 passes through the post 11 and through the slot 13 in the rear leg so that the bracket may be clamped to the posts by means of suitable clamp nuts 15.

It is desired to call attention to the fact that the outer leg of the bracket does not lie in a vertical plane but is positioned so as to project the lower edge of the rail 10 further from the post 11 than the upper edge thereof.

The adjacent rails 10 are overlapped at each of the brackets 12 and the overlapped portions are formed with elongated bolt slots 19 for receiving shoulder bolts 16, there being preferably four of these bolts for each bracket. The bolts 16 are formed with a square portion 17 of a width slightly exceeding the thickness of the two overlapped rails 10 so that the clamping nuts 18 will draw this square shoulder portion 17 of the bolt tightly against the forward face of the bracket 12. By this construction the rails 10 are not clamped against the brackets but are free to move longitudinally thereon to accommodate temperature expansion, impacts, etc. The square shoulders 17 on the bolts cannot rotate in the elongated slots 19 of the rail so that the bolts are held while their nuts are tightened.

At spaced apart intervals along a long guard rail, a pair of anchor posts 20 are positioned adjacent each other. Each of these posts carries one of the brackets 12. The adjacent rails 10 each terminates on one of the brackets 12, and the two adjacent brackets are tied together by means of a tie plate 21, shown in Fig. 4. The tie plate is provided with elongated perforations 22 for receiving the four adjacent bolts 16 of the two brackets 12.

In installing the rail, the posts 11 are put in position each with one of the tie bolts 14 loosely projecting from the road face thereof. The assembled rail is then lifted and the rear legs of the brackets 12 are slipped downwardly along the posts back of the heads of the bolts 14. The clamp nuts 15 are then tightened to securely lock the rail in place. It can be readily seen that this construction facilitates quick installation and provides a secure anchorage for the rail.

In Figs. 7 and 8, a slightly alternate form of the bracket is illustrated. In this form the rails are similar to the rails 10 of the previous form. The brackets however consist of oval spring plates 23, the upper portion of each plate is similar in contour to the upper half of the brackets 12. The lower portion of each plate 23, however, is curved toward the post thence upwardly so as to lie parallel with the rear leg of the upper portion. The rear leg of the upper portion is provided with a bolt receiving slot 24 similar to the previously described slot 13. The lower portion is also pro-

vided with a T-shaped, vertically extending, slot 25.

The latter form of bracket is installed similarly to the previously described form, that is, it is lowered downwardly over the head of the loosened clamp bolt 14, the head of the bolt passing through the T-shaped slot 25. The bolt then acts to clamp both extremities of the plate 23 to the post.

The latter form provides a resilient bracket between the rail and the post similar to the first described bracket. Due to its complete loop construction, however, it can be formed of lighter material.

The extremities of the guard rail are provided with terminal members 26 consisting of a plate, one extremity of which is formed with a horizontal channel to receive the extremity of the terminal rail 10 and its bracket bolts 16. The other extremity is curved about a vertical axis to provide a resilient, rearwardly extending, curved end portion which will tend to fend traffic inwardly toward the road.

It is desired to call attention to the fact that the lower edge of the rail projects further toward the road than the upper edge thereof. Thus if a hub should strike the rail, it will swing outwardly and downwardly at its lower edge to prevent the hub from forcing itself beneath the rail.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. A highway guard rail consisting of a series of longitudinally extending plate rails, said rails being curved in vertical cross section; a series of posts, each post being positioned opposite the joining extremities of a pair of said rails; bracket members on said posts extending downwardly and outwardly therefrom so as to support said rails with their convex faces toward said road and with their lower edges further from said posts than the upper edges thereof.

2. A highway guard rail consisting of a series of longitudinally extending plate rails, said rails being curved in vertical cross section; a series of posts, each post being positioned opposite the joining extremities of a pair of said rails; bracket members on said posts for supporting said rails with their convex faces toward said road; and with their lower edges further from said posts than the upper edges thereof, the latter edges of said rails being curved rearwardly on a shorter radius than the midportion of said rail.

3. A highway guard rail consisting of a longitudinally extending plate rail having a convex outer face and a concave inner face; a series of posts; a U-shaped resilient bracket member on each of said posts for supporting said rail therefrom, said bracket member having a vertical leg lying against said post; and an outwardly and downwardly extending leg adjacent said rail, said latter leg being curved to conform to the convex rear face of said plate; and means for securing said bracket member to said rail and to said post.

4. A highway guard rail consisting of a longitudinally extending plate rail having a convex

outer face and a concave inner face; a series of posts; a U-shaped resilient bracket member on each of said posts for supporting said rail therefrom, said bracket member having a vertical leg lying against said post; and an outwardly and downwardly extending leg adjacent said rail, said latter leg being curved to conform to the convex rear face of said plate; said vertical leg of said bracket member having a vertical slot extending upwardly from the lower edge thereof; a clamp bolt extending through said post and through said slot for clamping said bracket to said post; and means for securing said rail to said bracket members.

5. A highway guard rail consisting of a longitudinally extending plate rail having a convex outer face and a concave inner face; a series of posts; a U-shaped resilient bracket member on each of said posts for supporting said rail therefrom, said bracket member having a vertical leg lying against said post; and an outwardly and downwardly extending leg adjacent said rail, said latter leg being curved to conform to the convex rear face of said plate, said vertical leg of said bracket member having a vertical slot extending upwardly from the lower edge thereof; a clamp bolt extending through said post and through said slot for clamping said bracket to said post; clamping bolts for securing said rail to said bracket member; and means for preventing said bolts from being drawn tight against said rail so as to allow longitudinal movement of the latter.

6. A highway guard rail consisting of a series of longitudinally extending plate rails, said rails being curved in vertical cross section; a series of posts, each post being positioned opposite the joining extremities of a pair of said rails; bracket members on said posts for supporting said rails with their convex faces toward said road; and a terminal member at each extremity of said series of rails, said terminal member having one extremity curved about a horizontal axis to conform to the contour of said rail and having its other extremity curved about a vertical axis.

7. A bracket for supporting a highway guard rail comprising: a supporting post; an inverted U-shaped bent plate having two downwardly depending legs, the outer leg being curved to conform to the contour of said rail, the inner leg being vertical to lie against said post, said inner leg being vertically slotted from its lower extremity; and a clamp bolt passing through said post and through said slot for clamping said bracket to said post.

8. A bracket for supporting a highway guard rail comprising: a supporting post; an inverted U-shaped bent plate having two downwardly depending legs, the outer leg being curved to conform to the contour of said rail, the inner leg being vertical to lie against said post, said inner leg being vertically slotted from its lower extremity; a clamp bolt passing through said post and through said slot for clamping said bracket to said post; and a downwardly, inwardly and upwardly extending lower extremity on said outer leg, said latter extremity lying against the inner leg of said bracket member and being also slotted for the passage of said bolt.

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