Sept. 5, 1939. W. J. PATTON 2,171,948

ROADWAY RAILGUARD

Filed March 2, 1936

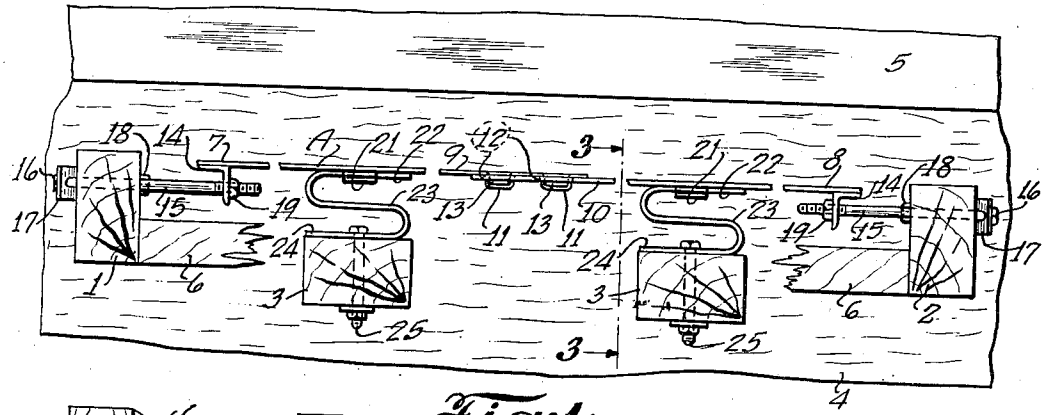


Fig. 1.

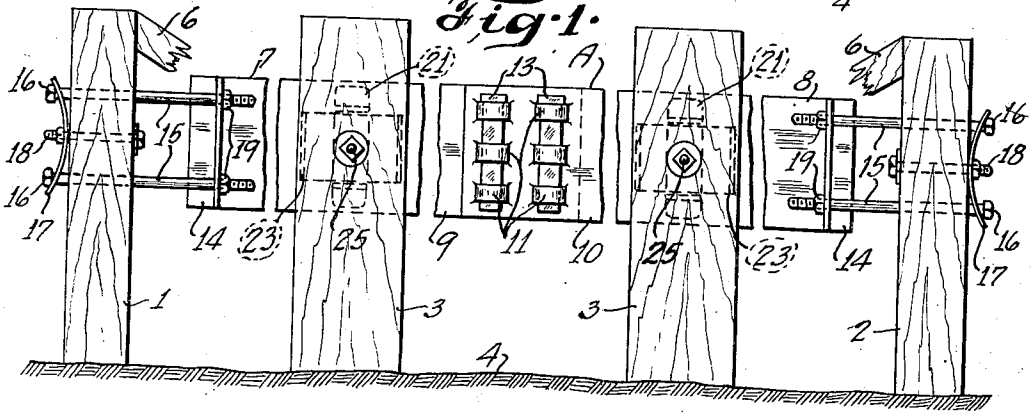


Fig. 2.

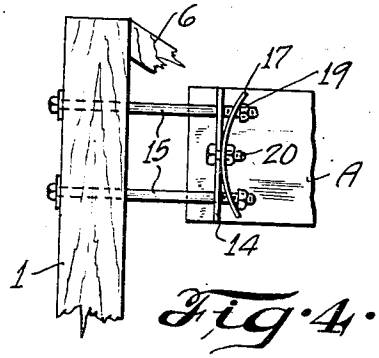


Fig. 4.

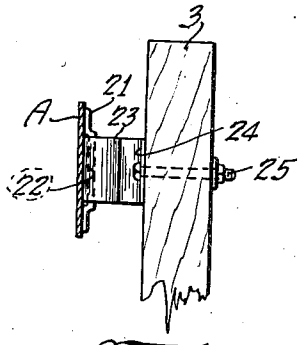


Fig. 3.

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ROADWAY GUARDRAIL

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4 Claims. (Cl. 256—13.1)

This invention relates to roadway guard-rails, that is to say, to traffic protection devices which not only serve as a positive guide to drivers of vehicles on roadways and highways at dangerous banks, curves, bridges, tunnels, etc., but also and primarily to receive and oppose the impact or shock of a moving vehicle which may deviate from its proper path on the roadway for substantially preventing the departure of the vehicle therefrom.

While it is possible to construct a guard rail of such strength that any short section thereof will adequately receive the impact of a moving vehicle, the rigid resistance of such a guard rail will be destructive both to the guard rail and the impacting vehicle.

My invention has hence for its prime object the provision of a highway guard rail which is flexible and resilient throughout its length, and which is supported on suitable elements, as upstanding posts or the like, of economical dimensions, the guard rail proper having such a degree of both longitudinal and lateral mobility as to yield to a substantial degree to the impact of a moving vehicle for both gradually absorbing the momentum of the vehicle and effectively distributing the impact load over several or a substantial plurality of the supporting elements, thus obviating both destruction of the guard rail and the vehicle.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing,

Figure 1 is a broken plan view of a highway guard rail constructed in accordance with and embodying my invention, a fragmentary portion of a highway pavement and the adjacent ground being also shown;

Figure 2 is a broken side elevational view of the guard-rail, the view being taken as looking inwardly toward the highway;

Figure 3 is a sectional view of the rail, taken approximately along the line 3—3, Figure 1; and

Figure 4 is a fragmentary view of a modified form of resilient rail anchoring construction.

Referring now more in detail and by reference characters to the drawing, which illustrates practical embodiments of my invention, my new guard rail comprises a supporting and impact opposing structure including a pair of end-posts or anchor elements 1, 2, and a series of intermediate posts or impact-opposing elements 3, constructed of a suitable relatively non-elastic or rigid material, for example, wood as here shown, the dimensions of said elements being of an economical size or section, each, it may be said, unsufficient to itself withstand a severe vehicular impact, but adequate for such purpose when the load is distributed over several of the posts, as is accomplished in my guard rail in a manner presently appearing.

The several elements 1, 2, 3, are all located in suitably spaced relation along, and, in the present instance, upstanding from the ground or shoulder 4 at the marginal boundary of the roadway or pavement 5 protected by the guard-rail, the intermediate posts 3 being preferably located farther from the roadway 5 than are the end posts 1, 2, and the end-posts 1, 2, being equipped with suitable braces 6, as best seen in Figure 1.

A designates the guard rail proper, which comprises an elongated band of preferably relatively thin sheet metallic material, as steel or the like, and of sufficient width and thickness to withstand the loads to which the rail is to be subjected. As an example, the band A may be composed of No. 12 gauge sheet steel approximately twelve inches wide, in single ply, as here shown, or, for greater strength and resiliency, a plurality of plies or laminations may be employed, as best to serve the intended purpose.

For convenience in manufacture and assembly, the band A is preferably composed of a plurality of individual end-sections 7, 8, and intermediate sections 9, 10, etc., and the several sections are suitably joined by suitable fastening elements, as bolts, rivets, or the like.

However, a preferred method of joining the sections is to provide on an end of one section, as 9, a series of vertically spaced pressed-in loops 11, and on the mating end of an adjoining section a series of corresponding apertures 12 for receiving the loops 11, a lacing-bar 13 being inserted in and through the loops 11 for securing the sections 9, 10, together.

The band A is stretched continuously between the end elements 1, 2, for spanning across, and in front of, the intermediate elements 3, that is to say, the band A extends past each element 3 in spaced relation to the roadway facing side thereof.

For such purpose, the end sections 7, 8, are respectively provided with a suitable vertical clip or angle-member 14 provided in its outstanding leg with suitable apertures for receiving a pair of adjustable fastening elements or anchor bolts 15, which are horizontally disposed for pref-

erably slidably extending endwise through the end post 1, or 2, as the case may be, the bolts 15 at their heads 16 being engaged with the respective ends of a leaf spring or other suitable preferably arcuate resilient element 17 mounted preferably on the outer face of the post 1, or 2, as by a fastening element or through bolt 18 disposed at the center of the spring 17.

The concave face of the spring 17 is, as will be seen, disposed outwardly of the end post 1, or 2, whereby the band A may be tensioned or stretched between the posts 1, 2, by merely drawing up the nuts 19 of the bolts 15 on the clip-angles 14 of the band A.

The same effect may also be secured by a modification of the resilient-anchor construction shown in Figure 4, wherein the leaf spring 17 is mounted on the inside face of the outstanding leg of the clip angle 14 as by a suitable fastening element 20, the spring 17 being disposed with its concave face inwardly of the angle 14 and the nuts 19 of the bolts 15 in this case engaging the respective ends of the spring 17, so that the band A may be adequately tensioned when the nuts 19 are drawn up on the bolts 15.

Opposite each intermediate post 3, the band A is provided with a vertical loop 21, into which is slidably inserted the broad, flat, tongue or end 22 of a resilient element or bracket 23 constructed of relatively thin, preferably metallic, springable material which is relatively flexible and resilient and has an S-shaped plan in its horizontal dimension, and is relatively deep and stiff in its vertical dimension, the other end 24 of the S-bracket 23 being flatwise engaged with the road-side face of the post 3, and secured thereto by a suitable fastening element or through-bolt 25, as best seen in Figures 1 and 3.

The S-bracket 23, being relatively stiff in its vertical dimension, serves adequately for supporting the band A at the desired vertical elevation thereof above the plane of the roadway 5.

On the other hand, the bracket 23, being relatively flexible in its horizontal dimension and being merely slidably engaged with the band A, the band A is permitted to partake of both a longitudinal mobility relatively to the post 3, as by slipping along the tongue 22 of the S-bracket 23, and also a lateral mobility toward the post 3, as by compressing the S folds of the spring 23 upon the post, as will be readily understood.

In use, any impact of a vehicle upon the guard rail will cause the band A to belly or bow outwardly of the roadway, the band A resiliently yielding to the blow, and, by reason of its mobility, both laterally and lonigtudinally, serving to distribute the shock of the collision to the several posts adjacent the place of impact.

It will be seen that the guard rail structure does not depend upon a single panel, as it may be said, of the band A between any particular pair of posts 3, and, as a result, it is possible to employ relatively light sections of materials for both the band and the posts, providing thus an inexpensive structure highly effective for its intended purpose.

It will be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of my improved guard rail may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A roadway guard-rail comprising a plurality of rigid members, a resilient impact band, a plurality of sockets formed rigidly on the band, and a flexure member operably mounted in each socket and rigidly connected to each rigid member, said flexure member having substantially long S-shaped form with ends and center bar extending in substantially parallel relation, one of the ends of each of said flexure members being sized for flat-wise shiftable disposition in a band-socket for movement longitudinally thereof.

2. In a roadway guard-rail, a plurality of rigid members, a resilient impact band, a plurality of substantially vertical strap-like members rigidly mounted at their ends upon the rearwardly presented face of the impact band and being intermediate their ends spaced away from said impact band in the provision of a socket, a flexure member operably mounted on each rigid member and comprising a plurality of substantially parallel straight sections arranged in spaced apart face-wise juxtaposition, and being integrally connected across aligned transverse margins by arcuate sections, the outermost one of said parallel members being disposed within one of said sockets for freely shiftable movement therein with respect to the impact band.

3. In a roadway guard-rail, a plurality of rigid members, a resilient impact band, a plurality of substantially vertical strap-like members rigidly mounted at their ends upon the rearwardly presented face of the impact band and being intermediate their ends spaced away from said impact band in the provision of a socket, a flexure member operably mounted on each rigid member and comprising three mutually parallel rectangular resilient sections arranged in spaced apart peripheral registration with each other and being integrally connected across aligned transverse margins by arcuate sections, the outermost one of said parallel members being disposed within one of said sockets for freely shiftable movement therein with respect to the impact band.

4. In a roadway guard-rail, a plurality of rigid members, a resilient impact band, a plurality of substantially vertical strap-like members rigidly mounted at their ends upon the rearwardly presented face of the impact band and being intermediate their ends spaced away from said impact band in the provision of a socket, a flexure member operably mounted on each rigid member and comprising a plurality of rectangular sections disposed in spaced apart parallel planes and having their respective longitudinal margins in registration, said sections further being integrally connected across aligned transverse margins by arcuate sections, the outermost one of said parallel members being disposed within one of said sockets for freely shiftable movement therein with respect to the impact band.

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