June 27, 1939. H. ROBERTSON 2,164,084

ROAD GUARD FENCE

Filed Feb. 20, 1937

Fig. 1

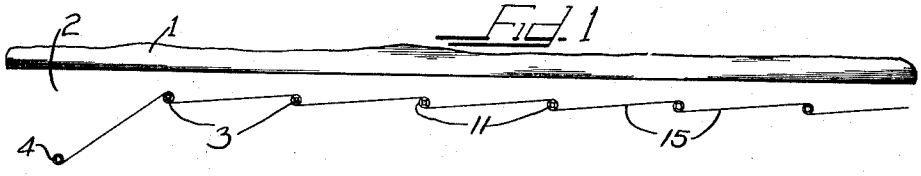


Fig. 2



Fig. 3

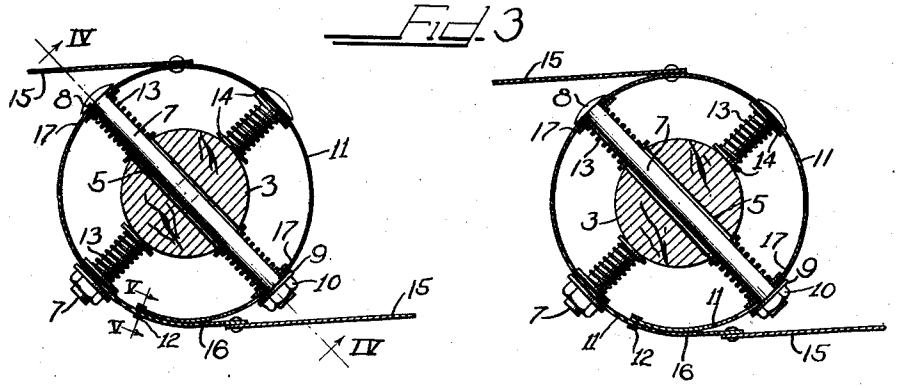


Fig. 4

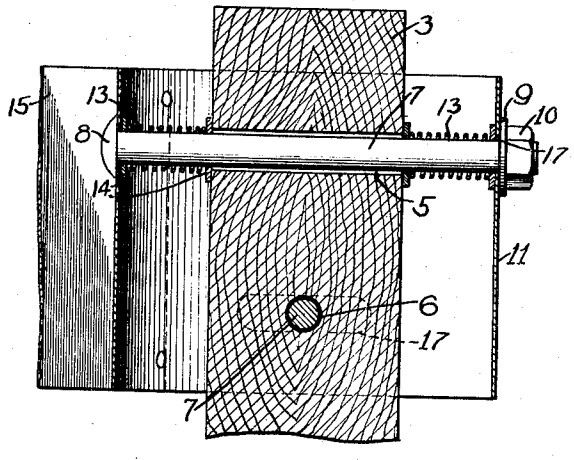
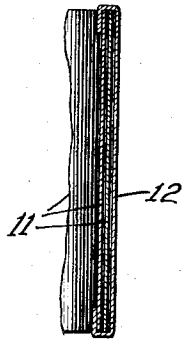


Fig. 5



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ROAD GUARD FENCE

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19 Claims. (Cl. 256—13.1)

The present invention relates to an improved type of guard fence for use adjacent roads or highways at curves or at dangerous locations along the road. It is the intention to provide an improved protecting or guard fence which will serve to prevent automobiles from completely leaving the roadway at curves and other dangerous points along the right of way by constructing the fence to provide cushioning posts which are connected by means of substantially parallel groups of resilient rails which are positioned at an incline with respect to the roadway to prevent vehicles when striking the guard fence from binding therewith, and furthermore serving as a means for directing the vehicles back onto the roadway proper to obviate serious accident and at the same time prevent serious damage to the vehicles when driven into contact with the guard fence.

It is an object of this invention to provide a road guard fence which will act as a cushioning obstruction to prevent vehicles from leaving the side of a highway and furthermore serve as a means for directing the vehicles which have run off the side of the road, onto the shoulder, back upon the road.

It is also an object of this invention to provide an improved guard fence adapted to be located at the side of a road or at a road bend, said guard fence being constructed of posts provided with cushioning means, with the cushioning means of the posts connected by resilient fence rails which are so positioned with respect to the side of the road that they serve to direct a vehicle which has run off the side of the road back onto the road.

Another object of the invention is the production of a road guard fence wherein the fence posts are provided with cushioning means, and wherein the cushioning means of adjacent fence posts are connected together by resilient rail members directed diagonally between the adjacent posts and at an angle with respect to the side of a road, on the shoulder of which the improved guard fence is located.

It is furthermore an object of this invention to provide a road guard fence adapted to be mounted on the shoulder adjacent the side of a road at dangerous locations or at curves in the road, said guard fence being constructed to afford a resilient obstruction for vehicles which are misdirected against it with the effect that the inclined rails which connect the cushioning collars on the fence posts serve to prevent binding of the vehicle wheels against the guard rails due to the inclined offset relationship of the guard rails with respect to the fence posts and with respect to the side of the road.

It is still a further object of this invention to provide an improved type of highway guard fence adapted to be mounted on the shoulder of a road at dangerous locations or at curves, said guard fence including spaced posts having spring controlled cushioning collars shiftably supported thereon with the cushioning collars of adjacent posts connected by means of resilient fence rails disposed between the posts and at an angle with respect to the side of the highway, to provide a cushioning means for lessening impacts of motor vehicles which are misdirected against the guard fence, the construction of which permits freeing of the vehicle from the guard rails at intervals thereby affording an arrangement for directing the vehicle back onto the highway away from the guard fence.

It is an important object of this invention to provide a highway guard fence adapted to be mounted on the shoulder of a road at dangerous locations or at curves in the road, said guard fence including posts having spring-controlled collars shiftably mounted thereon with the collars of adjacent posts connected by means of resilient fence rails positioned diagonally between the posts and diagonally with respect to the sides of the highway thereby affording a construction which, when accidental struck by a misdirected vehicle running off the side of the road, will obviate binding of the vehicle against the guard fence rails and will furthermore direct the vehicle back onto the road, thereby obviating serious accidents and reducing damage.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

The invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a fragmentary top plan view of a portion of a concrete road on the shoulder of which an improved guard fence embodying principles of this invention, is built.

Figure 2 is a side elevation of the guard fence shown in Figure 1.

Figure 3 is an enlarged fragmentary horizontal sectional view taken on the line III—III of Figure 2.

Figure 4 is an enlarged fragmentary vertical

section taken on the line IV—IV of Figure 3, with the bolts shown in elevation.

Figure 5 is an enlarged fragmentary detail section taken on the line V—V of Figure 3.

As shown on the drawing:

Referring to Figure 1, the reference numeral 1 indicates a fragmentary portion of a concrete road or highway illustrating a portion of the outer edge of the road adjacent the road shoulder 2. Constructed upon the shoulder 2 of the road adjacent the side of the concrete road is an improved guard fence adapted to be located at selected dangerous locations along the road or at road curves. The improved guard fence is provided for the purpose of obviating accidents by preventing vehicles, which may accidentally run off the road, from plunging over the shoulder of the road. The accidents are prevented or materially reduced, in the severity of the same, due to the cushioning rebound action produced by the guard fence when the same is contacted by a moving vehicle, and by the further action of the guard fence which is so constructed that the same acts to direct vehicles, contacting the same, back onto the road and therefore away from the direction in which calamitous results would ensue if the improved cushioning and guide type of guard fence were not provided on the shoulder of the road.

As clearly illustrated in Figures 1 and 2, the improved guard fence is mounted on the shoulder 2 adjacent the side of the road at a selected location, and each of the guard fences comprises a plurality of upright posts 3 and a lead post 4 constructed of wood, steel or other suitable material. The posts 3 are set at spaced intervals adjacent the side of the road upon the shoulder 2 in a line substantially parallel to the side edge of the road 1. As illustrated in Figure 1, the lead post 4 is spaced farther away from the side edge of the road 1 than the posts 3.

The construction of the post 4 is identical with the construction of the posts 3. Each of the posts is provided with a plurality of diametric passages 5 and 6 which are disposed at right angles with respect to one another, as clearly illustrated in Figure 4, and located at different elevations. Slidably projecting through each of the diametric passages or openings 5 is a bolt 7 provided with a head 8 at one end and having the opposite end threaded for the reception of a washer 9 and a nut 10.

As illustrated in the drawing, each post 3 is provided with a plurality of sets of bolts 7, each set comprising two bolts positioned at right angles with respect to one another. While only two sets of bolts are shown on each of the posts in the drawing, it will, of course, be understood that any number of said bolts may be provided, depending upon the height of the posts and the number of fence rails which are to be supported by the posts.

Supported on each pair or set of bolts 7 (Figure 4) is a cushioning collar or ring 11 constructed of a band or strap of springy sheet steel of a selected gauge and width. Each collar 11 is provided with longitudinally disposed slots or openings 17 through which the ends of the bolts 7 project. As clearly illustrated in Figures 3 and 5, the ends of each of the collars 11 preferably overlap one another. Secured to one end of the collar 11 is a transversely disposed guide loop 12 formed of heavy wire or strap metal. The guide loop 12 has slidably projecting therethrough the other end of the collar 11, thereby affording a spring-like collar construction with the ends of the collar slidably overlapping one another to permit variations in the diameter of the collar when the same is compressed.

Engaged on each of the supporting bolts 7 on opposite sides of the posts 3 are heavy coil springs 13. The springs 13 are positioned between the posts and the inner walls of the collars 11, with the ends of the springs contacting against washers 14 engaged on the bolts. The action of each of the springs 13 acts to hold the washers 14 spaced apart and in contact with the posts and the inner faces of the collars 11.

The fence is completed by the use of a plurality of fence rails 15 which are provided in the form of sheet steel straps or plates of a selected gauge and width. The metal rails 15 span the space between the fence posts, as clearly illustrated in Figure 2, and are spaced one above the other, depending upon the number of cushioning collars 11 provided on said posts.

As clearly illustrated in Figure 3, each of the metal fence rails 15 has one end thereof secured by means of rivets or other suitable means to the outer periphery of a cushioning collar 11, while the opposite end of the rail is riveted or otherwise secured to the end portion of another collar 11 mounted on an adjacent post. Each of the fence rails 15 projects diagonally between the two posts to which it is connected by means of the cushioning collars 11. It will be noted that each of the diagonally positioned fence rails has one end thereof connected to one end of a collar 11, where it slidably projects through the loop 12, while the opposite end of the diagonally positioned rail is connected to the outer face of another collar 11 diametrically opposite from the attachment of the other rail 15 connected to the same collar.

This arrangement positions the fence rails in substantially parallel relation between the posts 3 diagonally between the posts and at an angle with respect to the side of the road, as clearly illustrated in Figure 1. Attention is called to the fact that the fence rails between the lead post 4 and the first post 3 are positioned at a greater angle with respect to the side of the road than are the rails which connect the respective posts 3. This arrangement provides a suitable guard for directing vehicles striking the first of the fence rails back towards the road.

In case a vehicle which is misdirected or accidentally run off the road onto the shoulder 2, should strike against any of the rails between the posts 3, the inclined positions of the rails will act to direct the vehicle back onto the road. Under ordinary circumstances, when a vehicle runs off the road and strikes a protecting fence of the ordinary type, the front and rear wheels on the side of the vehicle adjacent the fence normally run along the side of the fence and are bound in such a manner that they cannot be properly steered so that the vehicle can be directed back onto the road. This binding of the vehicle striking the guard fence is obviated in this device by the inclined position of the various sets of guard rails connecting the posts 3.

With reference to the guide rails 15, it will be noted that the ends of adjacent rails are offset with respect to one another, so that when the wheels at one side of a vehicle run along one set of rails and come to a post, they are allowed a sufficient space to permit the wheels to be turned so that the vehicle can be directed back onto the road. The offset position of the guard rails at

the respective posts thus affords an arrangement for obviating the binding of vehicles running along the side of the guard fence and permits turning of the steering wheel for directing the vehicle back onto the road 1 without much difficulty.

Attention is called to the construction of the posts of the fence wherein the respective posts are each encircled or enclosed by cushioning collars controlled by the coil springs engaged on the supporting bolts which hold the collars on the posts. This construction is such that when a vehicle running along the road 1 is accidentally misguided off the road and off the shoulder 2 into contact with the guard fence, the impact of the vehicle against the fence will be cushioned whether the vehicle strikes the resilient rails 15 or contacts the post collars 11. The contact of the vehicle against the guard fence will tend to compress the cushioning collars 11 and at the same time cause an axial movement of the bolts with respect to the supporting posts. The compressional and shiftable movements of the collars on the posts when the fence is contacted by a vehicle serves to reduce the impact force and produce a rebound of the vehicle from the fence, permitting the vehicle to be directed along the fence and be guided back onto the road by the inclined positioning of the fence rails 15 which are diagonally positioned between the posts. By constructing the cushioning collars with slidably overlapping ends, a contraction and expansion of the collars is permitted. The mounting of the cushioning collars upon the posts and the connecting of the collars by means of the inclined or diagonally positioned rails 15 affords a construction wherein the cushioning collars on the posts act as retrieving means, after impacts, for returning the deflected guard rails back into their normal inclined positions between the posts.

It will thus be noted that the improved guard fence is of the cushioning type for the purpose of reducing the seriousness of accidents and in some cases obviating accidents which ordinarily would take place if a solid or non-cushioning fence were contacted by a vehicle which was misdirected or accidentally driven off the road into a fence. The improved fence furthermore acts as a means for guiding the misdirected vehicle back onto the road and also obviates the binding of vehicles against the side of the fence due to the offset relation of the guard rails where they are connected to the resiliently supported collars which encircle the posts.

Under normal conditions, when a vehicle is being driven along the road, the inclined positioning of the rails 15 of the guard fence is such that the psychological effect upon the driver is such that he will naturally tend to guide the vehicle away from the fence to keep the vehicle on the road.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A guard fence comprising a plurality of spaced posts, spring cushioning means on the posts, means for supporting said spring cushioning means on the posts, and rail members positioned diagonally between the posts and supported under tension by the spring cushioning means.

2. A guard fence comprising a plurality of posts, rail tensioning means thereon, and rail members connecting the tensioning means, with the ends of the rail members offset on opposite sides of the posts to position the rails diagonally between the posts.

3. A guard fence comprising a plurality of spaced posts, spring cushioning means mounted on said posts to encircle the same, and rail members positioned diagonally between the posts in offset relation on opposite sides of the spring cushioning means.

4. A road guard fence comprising a plurality of spaced posts, guard rails disposed diagonally between the posts, and spring means connecting the rails and surrounding said posts.

5. A road guard fence comprising spaced posts, guard rails disposed diagonally between the posts, supporting members slidably projecting through the posts, and cushioning collars around the posts movably supported on the supporting members and connected between the guard rails.

6. A road guard fence comprising spaced posts, guard rails disposed diagonally between the posts, supporting members slidably projecting through the posts, cushioning collars around the posts movably supported on the supporting members and connected between the guard rails, and springs engaged around the supporting members between the posts and the cushioning collars.

7. A road guard fence comprising spaced posts, flexible guard rails disposed diagonally between the posts and offset with respect thereto, bolt members slidably projecting through the posts, compressible and expansible collars engaged around the posts and connected to said rails, said collars having slots therein through which the bolt members project, and cushioning springs on said bolts between the posts and said collars.

8. A road guard fence comprising spaced posts having openings therethrough, flexible metal rails disposed diagonally between the posts and offset with respect thereto, bolts slidably projecting through the post openings, slotted metal bands bent to encircle the posts and supported on said bolts, said bands having the ends thereof slidably overlapping one another to form the bands into cushioning collars to which the rails are attached, and coil springs engaged around the bolts between the posts and said collars to hold the collars spaced from the posts.

9. A road guard fence comprising a plurality of spaced posts disposed in a line, a lead post offset from the line of posts, a plurality of flexible rails disposed diagonally between the posts and between the lead post and the first post in the line of posts, collars supported on said posts and connecting the rails in offset relation to one another at the posts, and resilient cushioning means between the posts and the collars engaged thereabout.

10. A guard fence comprising a row of posts, coiled collars supported on the posts and enclosing the same, said coiled collars having the ends thereof slidably overlapping one another, cushioning springs between the posts and the collars surrounding the same, and resilient rails connected to opposite sides of the collars on adjacent posts to hold the rails supported in offset relation at the posts and inclined with respect to the plane of the fence.

11. A guard fence comprising spaced posts, spring controlled collars shiftably supported on the posts, and rails between the posts, each of said rails having one end thereof secured to one

side of a collar on one post and the opposite end secured to the opposite side of a collar on an adjacent post.

12. A road guard fence including a plurality of spaced posts, a plurality of rails disposed between the posts and at an angle to the side of the road, and tensioning means on the posts and connected to the rails for holding the adjacent ends of ther ails offset with respect to one another on opposite sides of the tensioning means and out of contact with the posts.

13. A road guard fence including spaced posts enclosed by cushioning means, and rail members connecting the cushioning means for adjacent posts and disposed diagonally between the posts and in inclined relation with the side of the road.

14. A road guard fence including a row of spaced posts, a lead post positioned further away from the side of the road than the row of posts, main fence rails disposed diagonally between the posts in said row and at an angle with respect to the side of the road, lead rails disposed diagonally between the lead post and the first post in said row and disposed at a greater angle to the side of the road than the main fence rails, and cushioning units supported on all of the posts and enclosing the same, said cushioning units having the fence rails supported thereon.

15. A guard fence comprising in combination a series of spaced posts, supports slidable therein, slotted cushioning means supported thereon, and rail members connected to opposite sides of the cushioning means and shiftable in opposite directions with respect to the posts when the cushioning means are actuated resulting from stresses applied to one of the rail members.

16. A road guard fence including in combination a post, bolt members slidably projecting therethrough, collars engaged around the post and supported on the bolt members, and springs on said bolt members between the post and said collars.

17. A road guard fence including in combination a rigid post, collars surrounding the same, supports therefor shiftably projecting through the post, and cushioning means on said supports between the post and said collars.

18. A road guard fence including in combination a post, shock collars enclosing the same, means shiftably projecting through the post and supporting the shock collars, and springs between the post and said shock collars.

19. A guard fence comprising spaced posts, rail members disposed diagonally between the posts, and supports movably mounted on the posts permitting substantially axial movement of the rail members between the posts.

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