June 25, 1929. J. H. RAMSEY 1,718,875

SAFETY GUARD RAIL SUPPORT

Filed Dec. 11, 1926

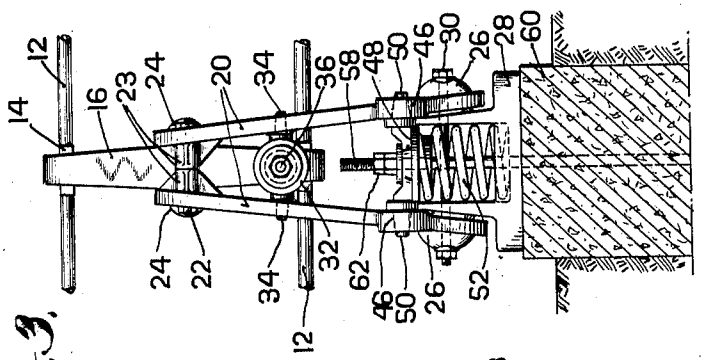


Fig. 3.

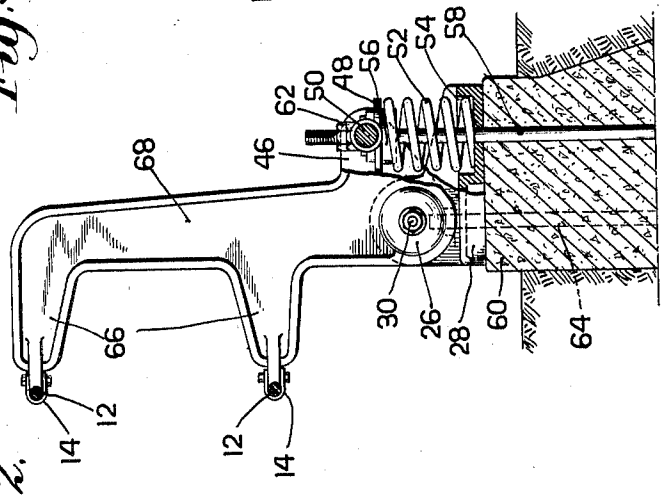


Fig. 2.

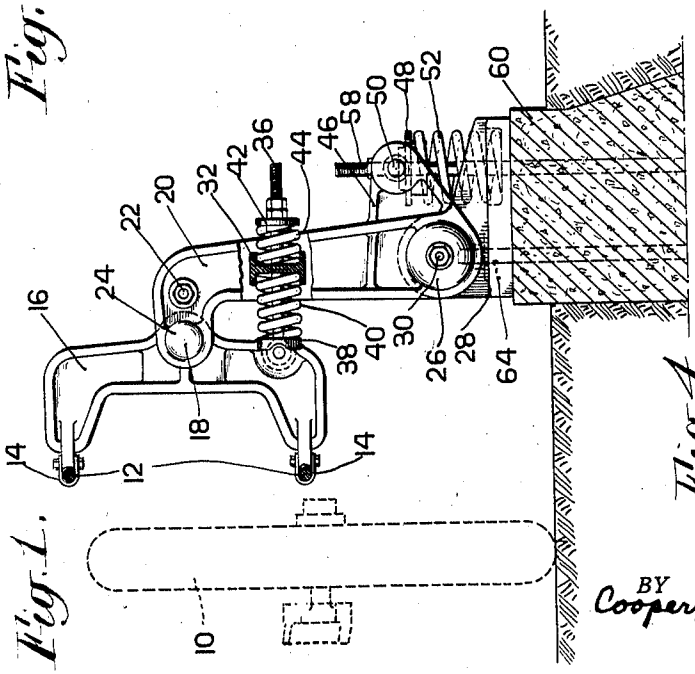


Fig. 1.

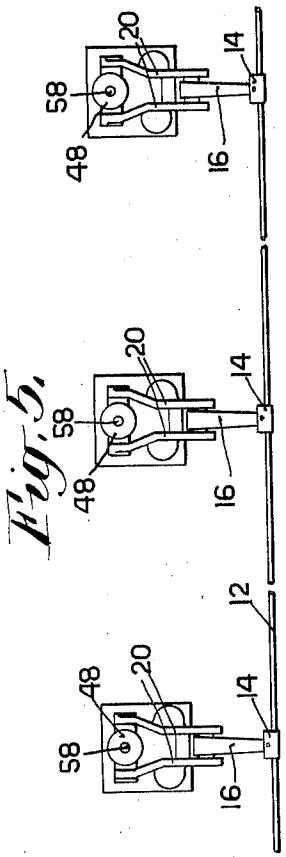


Fig. 5.

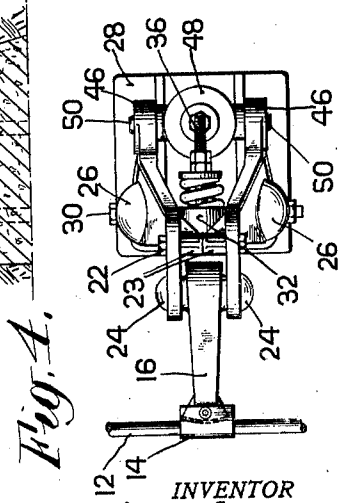


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SAFETY GUARD-RAIL SUPPORT.

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This invention covers a safety guard rail support designed for the purpose of replacing the ordinary well known rigid fence post, in fences or guards placed along the sides of the roads, especially at curves, for the purpose of preventing automobiles from running or skidding off the road. No adequate means has yet been provided for that purpose, although many attempts have been made.

The first development in this line was to provide rather heavy wooden fences along the sides of the highway, but experience soon demonstrated that the life of such fences is of comparatively short duration; they are not strong enough to withstand the impact of a skidding automobile, and furthermore, in case of accident they are often more a source of danger than of protection, on account of splinters from the fence, which may cause severe injury to the occupants of the car.

The next development was to provide concrete fence posts supporting wooden bars. This construction has very little advantage over the all-wood construction except that the fence is more substantial. There are almost as many splinters, and the impact of an automobile against the concrete post and wooden bars frequently results in great damage to fence and vehicle, and injury to occupants of the car.

Then came the substitution of wire cables in place of wooden bars in connection with concrete posts. This construction often provides sufficient strength to prevent the automobile from leaving the road, but the impact of the car against the concrete posts results, in many cases, in very bad wrecks with attendant casualties and property loss. Even when the wire cables are attached to the front sides of the posts the wheel hubs strike the posts, causing broken wheels, axles, and other parts, with disastrous results.

Attempts have been made to solve the problem by equipping rigid posts of wood, concrete, or iron with devices supporting resilient fencing material at sufficient distance in front of the posts in an endeavor to prevent contact of the vehicle with the posts. In one particular development of that idea the resilient fencing material is supported at each post by a framework pivoted on the post and arranged to swing like a gate thereon, the fence being attached to the free edge of the gate.

One of the principal faults of the latter construction is that when a vehicle strikes such a fence and slides along towards a post, the fencing material bends backwardly in pocket-like form and when the automobile approaches the post the strain on the fencing material has turned the gate-like supporting member towards the oncoming automobile so that, when the automobile finally reaches the post there is a head-on collision between the edge of the gate and the automobile, the result being practically the same as if no pivotal support had been provided at the post.

Another practical difficulty with such a design is the fact that after a car has run into the fence there is always a portion of the fencing material that has been permanently stretched out of shape, and no practical means is provided for repairing such damage and restoring the injured portion of the fence to its original shape and condition.

Other attempts to solve the problem have taken the form of metallic plates extending lengthwise of the road and supported from rigid posts by springs. Such a structure has little or no resiliency, the plates themselves being in effect as rigid as a solid wall. The construction is also very high in first cost and prohibitive in cost of repairs after collision.

The present invention is designed to overcome all the above enumerated defects and shortcomings of previous devices, and to disclose a safety guard rail support which is thoroughly practical from every point of view.

As distinguished from previous designs, I provide in place of the rigid fence post a support which is in itself shock absorbing and resilient, and which functions to adequately protect the car and occupants.

To this and other ends the invention comprises the novel features hereinafter described and shown in the drawings, which by way of illustration show what is now considered to be the preferred embodiment of the invention.

Fig. 1 shows a side view of the invention in its preferred form.

Fig. 2 is a side view of a simplified form of the invention.

Fig. 3 is a view of Fig. 1, taken from the right.

Fig. 4 is a top plan view of Figs. 1 and 3.

Fig. 5 is a top plan view, largely diagrammatic, in reduced scale, of an installation comprising three of the devices shown in Figs. 1, 3 and 4.

In Fig. 1 the dotted outline 10 represents the wheel of an automobile. The fencing material, with which the wheel and other parts of the automobile might come into contact, comprises a pair of guard rails 12. The rails are preferably steel cables attached by clips 14 to the forward projecting extremities of equalizing member 16 so that the two cables are supported in spaced relationship, one above the other. The cables are slidable in the clips 14. Each cable extends past a plurality of supports and has its ends anchored to a deadman or other fixed object so that the tension of the cable in a whole section of a fence may be adjusted at its ends.

Equalizing member 16 is pivoted at 18 so as to rock on a horizontal axis in the upper end of upright member 20. Member 20 is composed of two similar plates clamped together at their upper ends by bolt 22 through spacer bosses 23 in such manner that a semi-spherical concave seat 24 in each plate engages a cooperating convex bearing surface on member 16, thereby providing a very substantial bearing on which member 16 may rock relatively to member 20.

The lower ends of the side plates are pivoted in a similar manner by semi-spherical concave seats 26 cooperating with suitable convex surfaces on base plates 28. A bolt 30 passes horizontally through the center of the cup-shaped bearings to lock them in place. It will be noted that plates 20 are much further apart at the bottom than at the top thereby imparting lateral rigidity to the structure.

Between plates 20 at about the same height as the bottom of member 16 is the circular swivel plate 32, provided with trunnions 34 projecting through holes in plates 20 as indicated in Fig. 3. Pivotally connected to the lower end of member 16, opposite plate 32, is the eye bolt 36, projecting horizontally through the center of plate 32. Surrounding bolt 36 between a suitable seat 38 on member 16, and plate 32, is a resilient compression member, which may be of rubber but is preferably in the form of a coil spring 40. Between plate 32 and washer 42 on the free end of bolt 36 is a similar resilient member or coil spring 44. By means of the nuts on bolt 36 any desired pressure may be maintained on springs 40 and 44. It will be appreciated that by the above arrangement member 16 is resiliently held in vertical position, and if it be moved from that position it will automatically return to normal position as soon as released.

Each plate 20 is provided near its bottom with a rearwardly projecting arm 46. Between arms 46 is a swivel plate 48 from which projects trunnions 50 through holes in arms 46. Between plate 48 and base plate 28 is a resilient cushion preferably in the form of a coil compression spring 52 which is aligned in operative position by a socket 54 in plate 28 and a boss 56 on plate 48. Passing vertically through plate 48 and spring 52 is the bolt 58. The lower end of bolt 58 is anchored preferably in foundation 60, set into the ground to support the whole structure. The upper end of the bolt passes through plate 48 and is fitted with nuts 62 by means of which the proper pressure may be applied to spring 52. Another anchor bolt 64 serves to hold base plate 28 in position on foundation 60.

By adjusting nuts 62 the upper ends of the structure may easily be moved back or forth to properly align the fence.

It will be appreciated that when an automobile contacts with fence rails or cables 12, the blow will be cushioned by the resilient supporting structure above described.

If the blow or pressure is not equally distributed between the two cables, member 16 will resiliently adapt itself, within wide limits, to equalize the pressure and at the same time cushion it. If the pressure is too great to be entirely absorbed by springs 40 and 44, the support formed by plates 20 will pivot about bolt 30 against spring 52 until a position of equilibrium is reached. When the pressure is removed from the cables the whole structure will resume its normal position, urged by springs 40, 44 and 52.

If the vehicle slides along the cables there is nothing to obstruct wheel hubs, fenders, etc., except the very thin clips 14, which will impart practically no injury to the car.

Although cables or guard rails 12 are preferably free to slide in clips 14, the action of the above described resilient support is not dependent upon that point, and if desired, rails 12 may be gripped tightly by clips 14.

A simplified modification of the invention is shown in Fig. 2 in which the equalizing member 16 is omitted, the rails 12 being carried directly at the extremities of arms 66 projecting forwardly from a member 69 which corresponds to members 20 of the previously described structure. Although this simplified form is not as efficient as the more preferable arrangement shown in Fig. 1, it is less expensive, and provides a structure of more practical utility than any previously known guard rail support.

It is to be understood that the invention is not limited to the construction herein

specifically illustrated and described but can be embodied in other forms without departure from its spirit.

I claim—

1. In a device of the class described, in combination, a base, a resilient structure arising from and supported by said base, a pair of highway guard rails, and a device mounted on said resilient structure for the purpose of equalizing between said rails the force of an impact thereon.

2. In a device of the class described, in combination, a base, a structure arising from and supported by said base, a pair of highway guard rails, and a resilient device mounted on said structure for the purpose of equalizing between said rails the force of an impact thereon.

3. In a device of the class described, in combination, a base, a resilient structure arising from and supported by said base, a device resiliently mounted on said resilient structure, and a pair of guard rails carried by said device, said device being arranged to equalize between said rails the force of an impact thereon.

4. In a device of the class described, in combination, a base, a member pivoted on said base for resilient movement relatively thereto, a guard rail, and a resilient device pivoted on said pivoted member to support said guard rail for the purpose set forth.

5. In a device of the class described, in combination, a base, a member pivoted on said base for resilient movement relatively thereto, a pair of guard rails, and a resilient equalizing device pivoted on said member for supporting said guard rails.

6. A highway fence comprising in combination a plurality of spaced stationary bases, a structure arising from and pivotally supported by each of said bases, fencing material stretched past said structures and supported thereby, means at opposite ends thereof to adjust the tension of the fencing material, said structures being capable of lateral displacement when said fencing material is struck by a vehicle and means to resiliently limit the displacement of the structures.

7. A highway fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports within a range sufficient to constitute an effective barrier and a guard rail mounted on the supports and adapted to cause pivotal movement of the supports when struck by a vehicle.

8. A fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports, an arm on each support projecting therefrom and a guard rail mounted on the arms and held thereby in spaced relation to the supports.

9. A fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports, brackets pivotally mounted on the supports to swing on axes substantially parallel to the line of the fence, resilient means to hold the brackets normally in upright position and guard rails mounted on the brackets.

10. A fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports, brackets pivotally mounted on the supports to swing on axes substantially parallel to the line of the fence and having projecting arms, resilient means to hold the brackets normally in upright position and guard rails mounted on the arms.

11. A fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports, equalizing brackets pivotally mounted on substantially horizontal axes on the supports, resilient means to resist deflection of the brackets and guard rails mounted on the brackets above and below the horizontal axes thereof.

12. A fence comprising a plurality of stationary bases, supports pivotally mounted thereon to swing on axes substantially parallel to the line of the fence, means to resiliently limit the swinging movement of the supports, equalizing brackets pivotally mounted on substantially horizontal axes on the supports, resilient means to resist deflection of the brackets and guard rails mounted thereon above and below the horizontal axes thereof, the guard rails being loosely held to permit movement relatively to the brackets.

13. A highway fence comprising in combination a stationary base, a structure arising from the base, a highway guard rail mounted thereon, the structure being pivotally supported to permit lateral displacement thereof when struck by a vehicle, and means to limit the displacement of the structure within a range sufficient to constitute an effective barrier.

14. A highway fence comprising in combination a stationary base, a structure arising from the base, a highway guard rail mounted thereon, the structure being supported to permit lateral displacement thereof when struck by a vehicle and consisting

of a member pivoted on the base for movement relative thereto, and means to limit the displacement of the structure within a range sufficient to constitute an effective barrier.

15. A highway fence comprising in combination a plurality of spaced stationary bases, a structure arising from each of said bases, fencing material stretched past said structures and supported thereby, said structures being pivotally supported on the bases and capable of lateral displacement when the fencing material is struck by a vehicle, and means to limit the displacement of the structure within a range sufficient to constitute an effective barrier.

16. A highway fence comprising spaced fixed bases along the side of the roadway, brackets pivotally mounted thereon and capable of movement away from the highway, the movement being limited within a range sufficient to constitute an effective barrier, cushioning means interposed between the bases and the brackets, and fencing material supported on the brackets and adapted to cause pivotal action of the brackets when struck by a vehicle.

In testimony whereof I hereto affix my signature.

JOSEPH H. RAMSEY.