June 25, 1929. J. H. RAMSEY 1,718,877

HIGHWAY FENCE

Filed Dec. 10, 1928

FIG. 1.

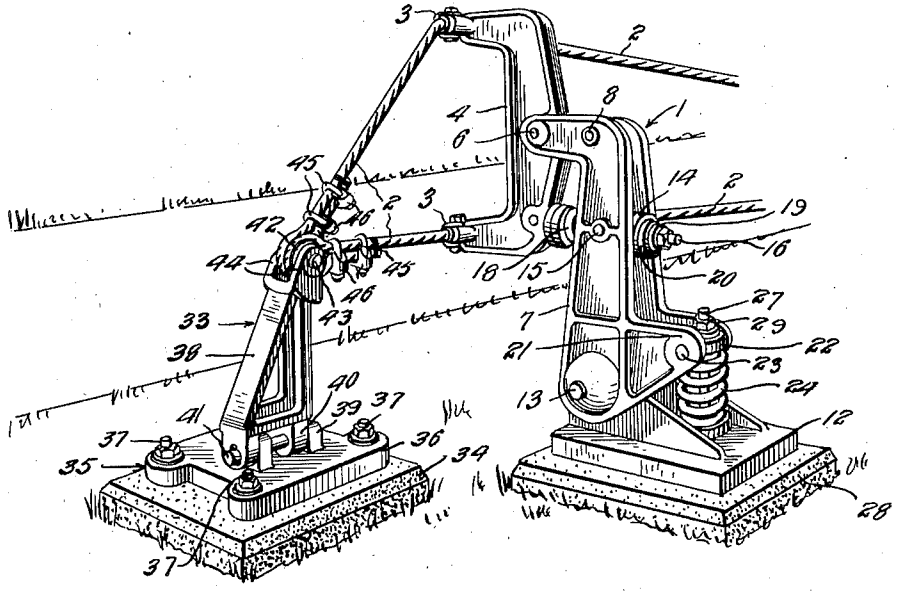
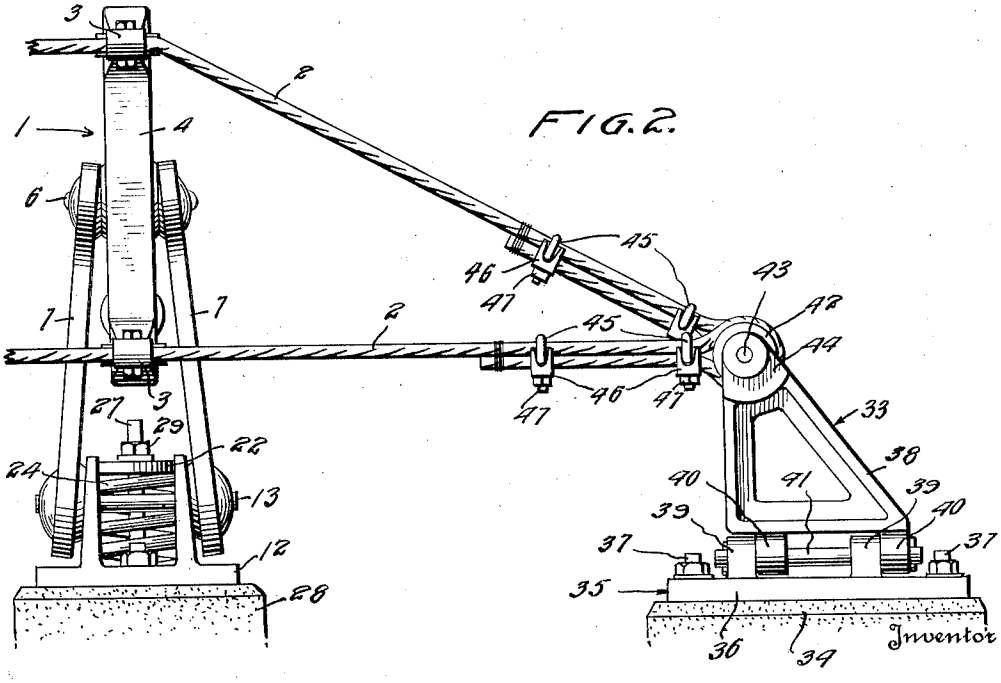


FIG. 2.



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UNITED STATES PATENT OFFICE.

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HIGHWAY FENCE.

Application filed December 10, 1928. Serial No. 325,002.

This invention relates to protection barriers, and more particularly to highway fences.

For some years it has been recognized that traffic conditions necessitated the construction of barriers for maintaining vehicles upon the highway, in the event that the person responsible for the locomotion thereof lost control of the same. The lack of such barriers has, in many accidents, permitted vehicles which wandered from the highway to strike immovable objects on adjacent land, and has permitted many other vehicles to fall into depressions or down embankments.

The necessity for placing barriers along dangerous portions of highways has become more apparent in recent years because of the astounding increase in the number of such accidents as previously referred to, for it has been found that the construction of smooth and wider roadbeds and the improvements in the construction of motor vehicles, has resulted in a greatly increased average speed of travel. The highways, although improved by being widened and given a better surface, largely follow the same general courses as they followed in the days when highway travel was at a relatively low speed, which courses necessitate the presence of various turns or curves in the roadbeds; and it has been found that numerous accidents occur especially at such bends, these accidents quite often being attributed to skidding of the vehicle due to the failure of the operator to reduce the speed of travel sufficiently to permit the traversing of the bends.

In order to protect the operators of motor vehicles and to eliminate property damage as far as possible, attempts have been made to prevent vehicles skidding from the roadways at the bends and in dangerous passes, by the construction of rather heavy fences formed of rigid posts with stringers arranged between them. Much difficulty has developed as the result of the employment of this type of highway fence for the reason that the speed of a motor vehicle, together with its weight, created such a forcible impact between the fence and the skidding vehicle that portions of the fence were broken away, thereby permitting the passage of the vehicle through the same. While, in some instances, the momentum of a vehicle has been checked upon engaging such a fence, nevertheless in a large number of instances a fence of this construction proved to be of little value. Furthermore, the tendency of a fence thus constructed to splinter often resulted in severe injury to occupants of the vehicle.

Many improvements upon highway fences constructed entirely of rigid supports and stringers have been made with the view of providing a fence strong enough to meet the utmost demands to be placed upon it, but so far as I am aware such attempts have resulted in the production of fences which have proven to be inefficient. Among the numerous types of fences which have been constructed, are those having concrete post supports and wooden stringers and those having concrete posts and cables extending throughout the length of the fence, the cables being anchored at their ends. The concrete posts proved dangerous in use because of the lack of resiliency, and when employed with wooden stringers, the stringers were easily broken away from the remainder of the structure and, too, the stringers splintered in the same manner as when employed with other rigid posts. Aside from the objection to the concrete posts, the fence employing such posts in connection with wire cables stretched between the same, proved somewhat more efficient than the structures which had preceded them; but as the fences were not continuous, the anchorage for the ends of the cables presented obstacles which were not readily overcome. Such anchorage is necessary to take the strain to which the cables are subjected when they are struck by a vehicle. In structures heretofore used, the anchors have been crude and unsightly. They have a low visibility, deteriorate rapidly, have little resiliency and are often destroyed by theft of the parts. Thus a common form of anchorage consists of twisted cables secured to the end post of the fence and to a log or timber which is buried in the ground. To provide the necessary tension, the cables are twisted with a bar of wood or metal after they are connected to the post and log or timber. In such a structure the cables rust where they enter the ground and the wood rots, so that the life of the structure is relatively short. The structure has comparatively little strength and resiliency, low visibility to the driver of a vehicle and is unsightly.

A modified form of this anchorage struc-

ture employs metal rods with turn-buckles to provide tension. The rods are connected to the end posts and to buried posts or concrete anchors, but these structures, like those above referred to, have many disadvantages and have not proven very satisfactory.

The present invention contemplates a construction which will overcome the difficulties encountered in previous barrier constructions, and it is an object of the invention to provide a highway fence having a resilient effect which will tend to cushion or absorb the shock which would normally result from a collision of a vehicle with a barrier.

Another object of the present invention is to provide an improved highway fence which is permanent and sightly, and is so constructed that no parts thereof can be removed or adjusted readily after the structure has been completed.

It is a further object of the present invention to construct a fence having uprights or supports for a cable which are adapted to be moved transversely to the roadway, including in combination therewith means for anchoring the ends of the cable, such anchoring means being adapted to function with the supports and be movable transversely to the roadway to thereby eliminate stretching of the cable to a minimum degree, and to avoid a breakage of the anchoring means.

The invention further contemplates the construction of a highway fence employing a plurality of cables, whereby upon collision the cables, due to their manner of support, effect automatic adjustment with respect to each other in opposite directions transverse to the highway, or in the same direction, and movable anchorage means for the cables which tend to equalize the strain placed thereon.

Other objects and advantages will be apparent upon a consideration of the following detailed description when taken in connection with the accompanying drawings, wherein

Fig. 1 is a view of an end support showing the cables in position and the adjacent anchorage means in combination therewith; and

Fig. 2 is an elevational view of a highway fence embodying the present invention.

As the detailed fence including the support is illustrated and claimed in my copending application Serial 154,138, and as the detailed anchorage construction is illustrated and claimed in my copending application Serial No. 243,805, it is only necessary to describe these elements in sufficient detail in this application to illustrate the manner in which both constructions combine to form the fence of the present invention.

In referring to the drawings in detail, the numeral 1 designates generally the supports which are adapted to sustain a plurality of guard rails 2. The guard rails are preferably steel cables attached by clips 3 to the forward projecting extremities of equalizing members 4, so that the guard rails are supported in spaced relationship one above the other. The guard rails or cables 2 are slidably mounted in the clips 3, the cables being passed first through a clip on one support and then through the clip of an adjacent support throughout the length of the fence. The ends of the cables are fixed to anchorage mechanism designated at 5 so that the cables can be maintained under tension throughout the whole section of fence.

Each of the equalizing members 4 is pivoted at 6 so as to rock on a horizontal axis in the upper end of an upright member 7. It will, of course, be understood that the horizontal axis will in each instance extend parallel to the edge of the roadbed at that particular point. The upright member 7 is composed of two similar plates clamped together at their upper ends by bolt 8, thereby providing a bearing on which member 4 may rock relatively to member 7.

The lower ends of the side plates of the member 7 are pivoted in a similar manner by a bolt 13 passing horizontally through the center of the cup-shaped bearings formed by convex and concave surfaces to lock them in place. It will be noted that the plates of the upright member 7 are spaced much wider apart at the bottom than they are at their upper ends, which imparts lateral rigidity to the structure.

Between the plates of the upright member 7, substantially at the same plane as the bottom of the equalizing member 4, is a circular swivel plate 14 provided with trunions 15 projecting through holes in the plates of the upright member 7. Pivotally connected to the lower end of the member 4, opposite the swivel plate 14, is a bolt 16 projecting horizontally through the center of plate 14. Surrounding the bolt 16 between a suitable seat on member 4 and plate 14, is a resilient compression member, which may be of rubber but is preferably in the form of a coiled spring 18. Between plate 14 and washer 19 on the free end of bolt 16 is a similar resilient member or coiled spring 20. By means of nuts on bolt 16, any desired pressure may be maintained on spring 18 and 20. It will be appreciated that by the above arrangement member 4 is resiliently held in vertical position, and if it be moved from that position it will automatically return to its normal position as soon as it is released.

Each of the plates of the upright member 7 is provided near its bottom with a rearwardly projecting arm 21. Between these arms 21 is a swivel plate 22 from which

projects trunnions 23 through holes in arms 21, while between plate 22 and base plate 12 is a resilient cushion preferably in the form of a coiled compression spring 24, which is aligned in operative position by a socket in plate 12 and a base on plate 22. Passing vertically through plate 22 and spring 24 is a bolt 27, the lower end of which is anchored preferably in foundation 28, set into the ground to support the whole structure. The upper end of the bolt 27 passes through plate 22 and is fitted with nuts 29 by means of which the proper pressure may be applied to spring 24.

By adjusting nuts 29 the outer end of the structure may easily be moved back or forth transversely to the highway for properly aligning the fence.

It will be appreciated that when an automobile contacts with the guard rails or cables 2, the blow will be cushioned by the resilient supporting structure as described.

Adjacent each end support 1 of the fence is an anchor to which all the guard rails or cables 2 are secured. Each of these anchors which are indicated by the numeral 33, consists of a base 34 of concrete or other suitable material and a bracket 35. The bracket may be made of cast iron, for example, and may consist of a foot 36 adapted to be secured by bolts 37 to the base 34 and an upright member 38. The foot and upright member may have lugs 39 and 40 thereon to receive a pin 41, whereby a pivotal connection is provided. Sheaves 42 may be mounted on a pin 43 extending through and secured in spaced lugs 44 on the upright member. The guard rails or cables 2 extend about the sheaves and the upper ends thereof are secured by clamps 45 consisting, for example, of U-bolts adapted to straddle the strands of the cable. The U-bolts may be held by keepers 46 and nuts 47.

From the foregoing description it will be understood that should a vehicle skid or otherwise be thrown against the guard rails 2, the force of the impact will cause the upright members to rock upon their pivots with a resulting tendency to cause a deformation of the guard rails. Such a deformation of the guard rails tends to produce an elongation of the same, but as the bracket 35 of the anchor to which the ends of the rails are connected is mounted to swing on an axis extending parallel to the rails, the elongation thereof will, to a large extent, be eliminated by the bracket 35 swinging on its pivot to follow generally the direction of deformation. It will also be apparent that should the entire force of the impact of the vehicle be directed against only one of the guard rails, the equalizing members will oscillate on their respective pivots and thereby transmit a portion of the strain to the other guard rail. The tendency of the bracket 35 of the anchor to assume an intermediate position with respect to the two rails readily permits the equalization of the strain.

I claim:

1. A highway fence construction comprising a barrier extending along the highway, a support for the barrier mounted to yield in a direction transverse to the highway, and anchoring means for at least one end of said barrier, said anchoring means including an element to which said barrier is secured, said element being movable about an axis extending substantially parallel to the barrier at that point.

2. A highway fence construction comprising a barrier extending along the highway, a pivoted support therefor adapted to yield upon the imposition of a force against the barrier, and an anchoring means for the ends of the barrier, said anchoring means including an element to which said barrier is secured, said element being pivoted to permit movement in a direction transversely of the barrier at that point.

3. A highway fence construction comprising a barrier extending along the highway, a support therefor pivoted on an axis substantially parallel to the barrier, and anchoring means including a base member and a bracket pivoted thereto on an axis extending substantially parallel to the barrier at that point, said barrier being secured to said bracket.

4. A highway fence construction comprising a pair of flexible guard rails, an equalizing member by which the rails are carried, a pivoted upright member for supporting the equalizing member and anchoring means for the pair of guard rails, said anchoring means including an element pivoted on an axis extending substantially parallel to said rails at that point and to which the rails are secured.

In testimony whereof I affix my signature.

JOSEPH H. RAMSEY.