Sept. 23, 1930. C. H. MACDONALD 1,776,517

HIGHWAY GUARD

Filed Feb. 18, 1929 2 Sheets-Sheet 1

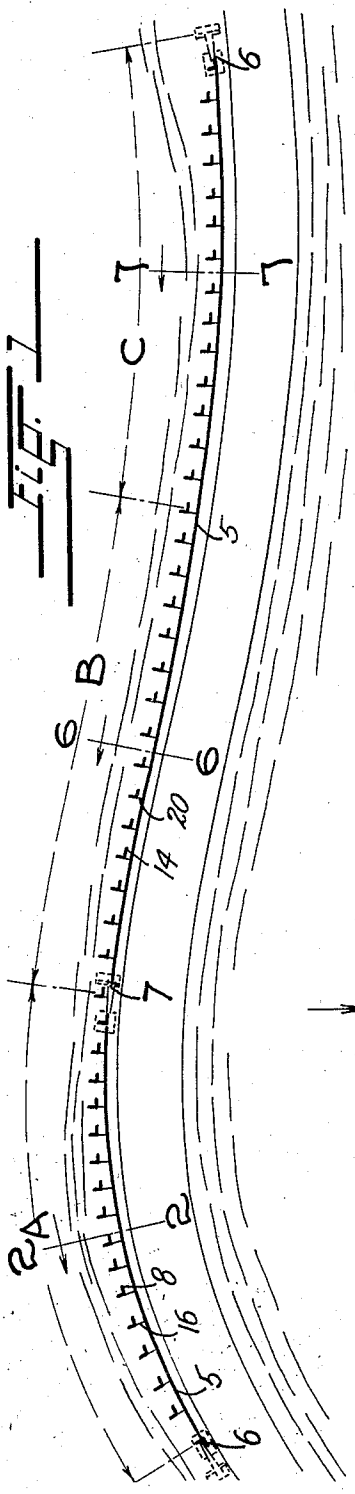


FIG. 1

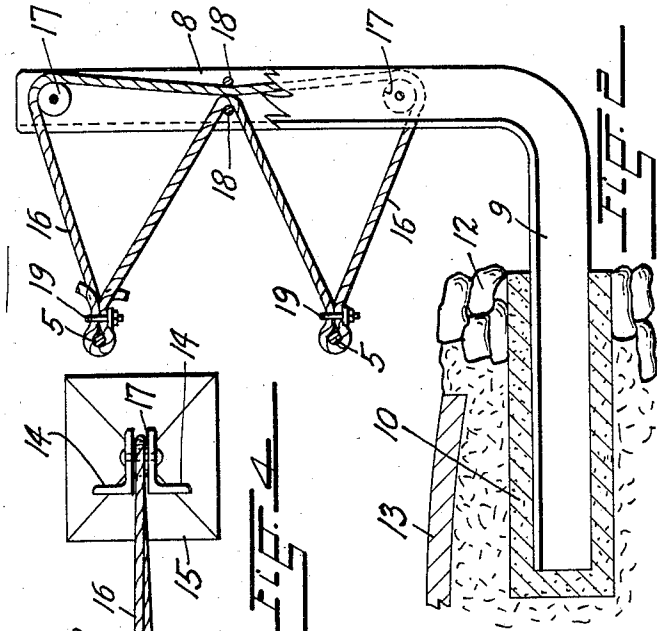


FIG. 2

FIG. 4

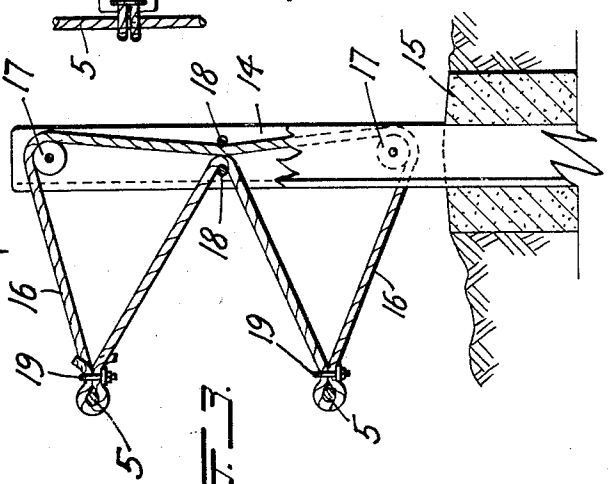


FIG. 3

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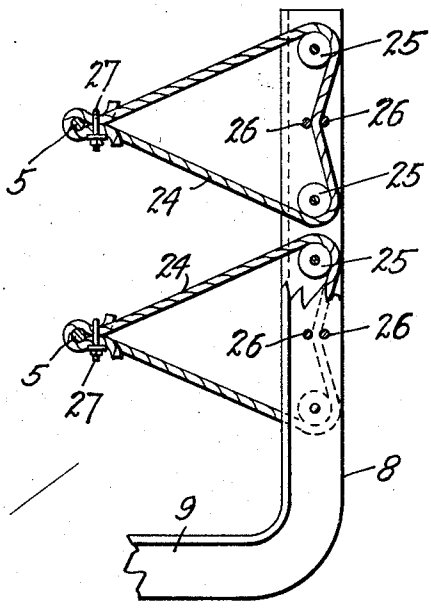


Fig. 5.

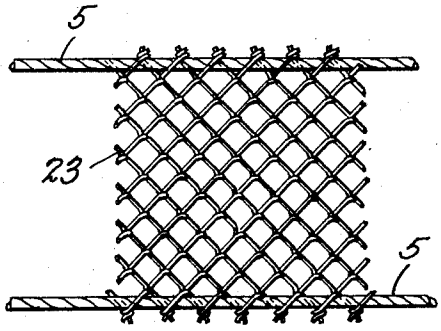


Fig. 6.

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UNITED STATES PATENT OFFICE

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HIGHWAY GUARD

Application filed February 18, 1929. Serial No. 340,897.

This invention relates to guard fences for highways and more particularly to guard fences of the general type shown and described in my application for patent Serial No. 284,442, filed June 11, 1928.

It is an object of the present invention to provide in a guard fence for highways, in which a yieldingly supported barrier is composed of laterally tensioned cables, a novel means for supporting the cables on the posts of the fence, the said means being differentiated from other similar means by greater simplicity, ready adjustability and increased practicability in use.

Further objects reside in details of construction and novel arrangements of parts as will be brought out in the course of the following description.

In the accompanying drawings,

Figure 1 represents a diagrammatic plan view of a guard fence constructed according to the present invention, in its operative position at a side of a winding highway,

Figure 2, a section taken on the line 2—2, Figure 1, and drawn to an enlarged scale, showing the cables constituting the yielding barrier, as supported on a post set beyond a side of the road or highway by means of a laterally projecting integral foot,

Figure 3, a similar section showing the cables in connection with a straight post set at the side of the road or highway,

Figure 4, a top view of the post shown in Figure 3, and

Figure 5, a fragmentary elevation of a post similar to that shown in Figure 2, illustrating a modified method of supporting the cables thereon,

Figure 6, a fragmentary view of two cables of the barrier in connection with a wire netting stretched between them.

Similar reference characters designate corresponding parts throughout the views.

The guard fence comprises a series of posts set at substantially equal distances apart at a side of a road or highway and a flexible barrier supported forward of the posts to yield laterally or horizontally when accidentally engaged by vehicles moving upon the road.

The barrier is essentially composed of one or more cables 5 firmly secured at their ends as at 6, or if necessary at intermediate points as at 7, and laterally tensioned by yielding supports.

At right hand curves, such as indicated at A in Figure 1, the supports consist of cables such as shown in Figures 2, 3 and 5, and hereinafter to be described; at tangents, shown at B in Figure 1, or at reverse curves indicated at C in Figure 1, the supports must be longitudinally rigid to hold the cables in a laterally tensioned condition at the proper distance from the posts, but they may be laterally flexible to give under impacts upon the fence, in relatively slanting direction.

On narrow roads built on a grade, it is often impossible to set the posts at the edge of the road without narrowing the driveway to an impractical extent. Under such conditions, posts of the type illustrated in Figures 2 and 5 are used to support the barrier at the extreme edge of the road. The construction of the post shown in Figure 2 has been claimed in a divisional application, Serial No. 411,033.

The posts 8, as shown, are provided with laterally projecting integral feet 9 that are driven into the ground at the grade beyond the road, and secure the posts in an upright position at the proper distance from the edge of the road at which the yielding barrier is disposed.

In order to rigidly secure the posts and prevent them from breaking or bending in the ground, their laterally projecting feet may be imbedded in plastic material 10 such as concrete or cement, reenforced, if necessary, by riprap, as indicated at 12 in Figure 2.

On paved roads, it is desirable that the feet of the posts extend beneath the paving 13 to further secure the posts against lateral displacement.

When the road is of sufficient width to permit of setting the posts at a side thereof, straight posts 14 of the character shown in Figure 3, may be used, the posts being preferably set in a concrete foundation 15.

The posts may be made of any suitable material and in any desired shape, but it is pre-

ferred to compose each post of two members of angle section set conjointly in the ground in spaced and parallel relation to each other. This construction is best shown in Figure 4 of the drawings.

The end posts or the intermediate posts to which the cables are rigidly secured, may be made of somewhat heavier material than the intermediate posts on which the cables are supported to yield under impact in lateral direction.

The yielding supports which hold the cables under tension at incurving edges of a road, as at A in Figure 1, consist of an endless cable 16 turned around two plate washers or small sheaves 17, disposed in the space between the members of which the post is composed, and having its intermediate side portions held together between bolts 18 that are secured to the post at a point intermediate of the washers.

The bolts 18 hold the supporting cable frictionally against longitudinal movement, but permit of its adjustment to vary the elevation of the cables of the barrier. The cable 16 supported on the post as hereinabove described, provides two forwardly projecting arms of triangular form and at the apexes of these arms the cables are secured by U-clamps 19.

One of these clamps may be employed to also connect the lapping ends of the cable so that its continuity may be produced without splicing or without the use of separate fastenings.

The barrier may be composed of one or more parallel cables. If more than one cable is used, a wire netting 23 may be stretched between them as shown in Figure 6, but the use of such netting is not essential and in fact, it is detrimental in regions subjected to drifting snows which if banked against the barrier might obstruct the driveway.

If more than one cable is used to form the barrier, the cables may be individually supported by endless cables 24 as has been illustrated in Figure 5.

Each cable is passed around a pair of washers or sheaves 25 as before, and it is held frictionally against undue longitudinal motion by lock bolts 26. Each cable forms a single forwardly projecting arm of triangular form at the apex of which the respective barrier-cable is secured by a U-clamp 27, and, as in the first described construction, this clamp may also function to fasten the lapping ends of the cable together.

In both forms of cable-support the elevation of the cables constituting the barrier may be varied to satisfy different requirements and conditions.

What I claim and desire to secure by Letters Patent is:

1. In a highway guard fence, a post, an endless cable projecting forwardly therefrom, and a barrier supported at the end of the forwardly projecting portion of the cable.

2. In a highway guard fence, a post, a flexible element projecting forwardly therefrom in angular form, and a barrier supported at the apex of the angle.

3. In a highway guard fence, a post, a flexible element projecting forwardly therefrom in angular form, and a barrier-cable clamped between the sides of the angle adjacent the apex thereof.

4. In a highway guard fence, a post, a endless cable held on the post to be longitudinally adjustable and projecting forwardly therefrom, and a barrier supported on the forwardly projecting portion of the cable.

5. In a highway guard fence, a post, an endless cable supported on the post and held frictionally in a position to which it is adjusted by longitudinally movement, a portion of the cable projecting forwardly from the post, and a barrier supported at the end of said forwardly projecting portion.

6. In a highway guard fence, a post, a flexible element supported on the post and projecting forwardly from the same in a plurality of angular portions, and a barrier supported at the apexes of said portions.

7. In a highway guard fence, a post, an endless flexible element supported thereon and formed to provide a plurality of forwardly projecting portions, and a barrier supported at the ends of said portions.

8. In a highway guard fence, a post, cable-supports on the post, a continuous cable passed around said supports and projecting forwardly from the post, means between the supports to hold the cable in a position to which it is adjusted by longitudinal movement, and a barrier supported at the end of the forwardly projecting portion of the cable.

9. In a highway guard fence, a post, cable-supports on the post, a continuous cable passed around said supports and projecting forwardly from the post, means between the supports to frictionally hold the cable in a position to which it is adjusted by longitudinal movement, and a barrier supported at the end of the forwardly projecting portion of the cable.

10. In a highway guard fence, a post, cable-supports on the post, a continuous cable passed around said supports and projecting forwardly from the post, a pair of bolts between which the cable extends to be held frictionally in a position to which it has been adjusted by longitudinal movement, and a barrier supported at the end of the forwardly projecting portion of the cable.

11. In a highway guard fence, a post, cable-supports on the post, a cable passed around the supports and having opposite portions brought together and held between

the supports to provide two forwardly projecting arms, and a barrier supported at the ends of said arms.

12. In a highway guard fence, a post, cable-supports on the post, a cable passed around the supports and having opposite portions brought together and held between the supports to provide two forwardly projecting arms of triangular form, and a barrier supported at the apexes of said arms.

13. In a highway guard fence, a post, cable-supports on the post, a cable passed around the supports and having opposite portions brought together and held between the supports to provide two forwardly projecting arms, and barrier-cables clamped between the sides of said arms adjacent the apexes thereof.

14. In a highway guard fence, a post, a cable supported on the post and projecting forwardly from the same in angular form, the ends of the cable lapping adjacent the apex of the angle, a barrier cable between the sides of the angle at the apex thereof, and a clamp securing the barrier-cable and the lapping ends of the other cable.

In testimony whereof I have affixed my signature.

CHARLES HARVEY MACDONALD.