July 14, 1931. G. R. TARBOX 1,814,868

GUARD RAIL

Filed June 5, 1928

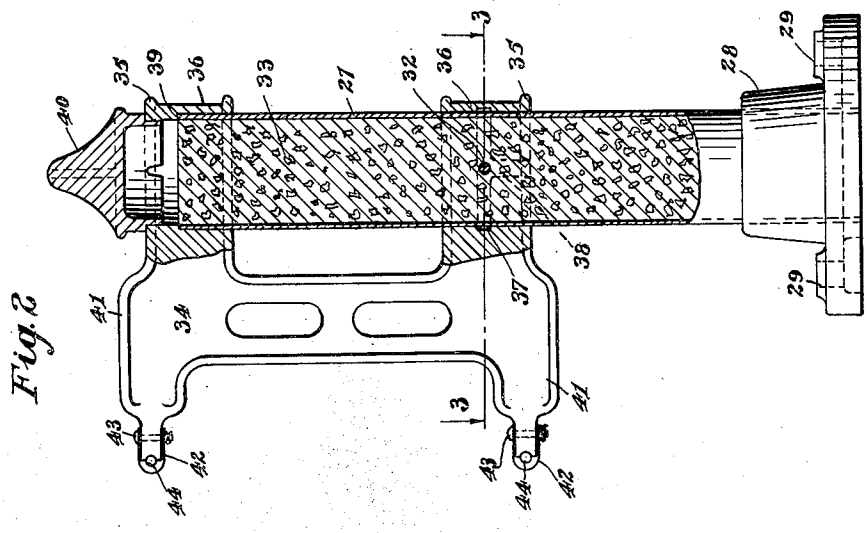

Fig. 2

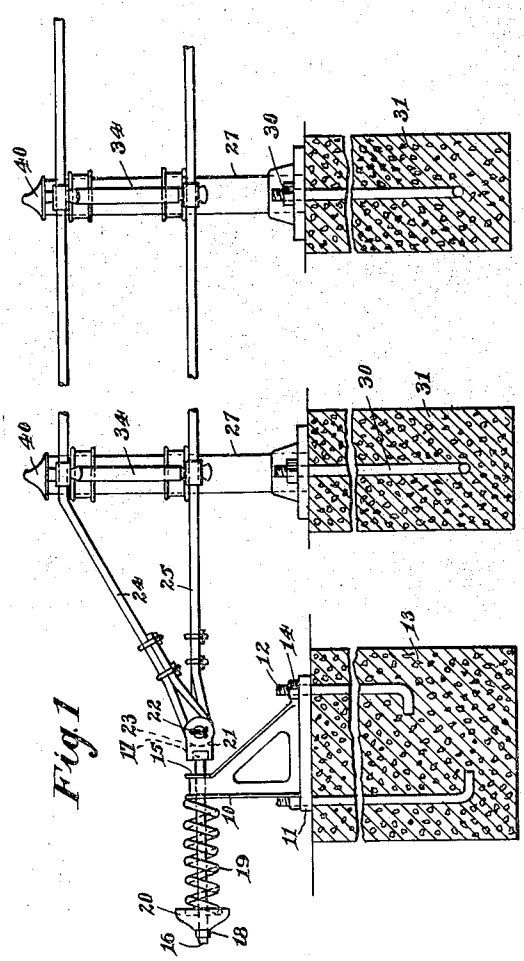

Fig. 1

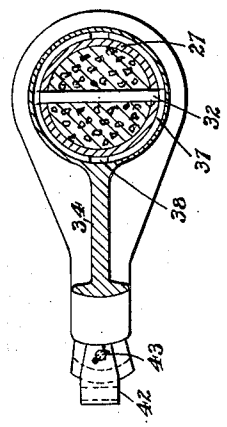

Fig. 3

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UNITED STATES PATENT OFFICE

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GUARD RAIL

Application filed June 5, 1928. Serial No. 282,913.

My invention relates to improvements in safety guard rails or highway fences designed to be erected along the side of State roads, especially along the sides of curves and dangerous places in the road, with a view of functioning as a resilient guard to prevent vehicles from going off the road.

The purpose of the invention is to provide a form of guard rail which will be sufficiently strong to prevent automobiles or trucks from crashing through it and yet sufficiently resilient to be compressed and absorb the shock and cause the automobile to re-bound and be deflected back onto the roadway with comparatively little damage to the guard rail or vehicle.

A further object of the invention is to employ a series of longitudinally stretched wire cables to form the rail, and to include improved means for yieldably supporting said cables, one above the other at desired intervals, in a manner to form a continuous guard or fence. Also to particularly provide a novel form of post, supports and anchorage, which will permit the structure to be set up in either a straight or curved line, in stretches of considerable length or if preferred in shorter lengths, the end portions of which could be arranged to overlap each other or at least positioned closely adjacent to each other.

The invention further includes automatic tightening devices whereby tension at all times retains the cables tight and especially to provide for thermal changes and variable conditions of the atmosphere.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangements of parts, as hereafter more fully described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several figures:

Fig. 1 shows a front elevation of a broken line of the guard rail together with required footings therefor as embodied in my invention;

Fig. 2 is a sectional elevation of one of the fence posts and its movable supporting arm for carrying the cables; and

Fig. 3 shows a sectional plan view taken on line 3—3 of Fig. 2.

The more common form of guard rails employed today along state highways are made of wood, and in the majority of instances comprise heavy wood posts set in the ground, and to which planks are secured, in a way to form a strong durable fence of pleasing appearance. While these fences or guard rails are usually attractive, yet as a result of several years of use, it has developed that they are more or less objectionable, since under certain conditions when they are struck the rails have been known to break and stick into a car in a manner to seriously damage the machine and injure the occupants.

It is therefore generally considered that a wood form of rail, put up in most any manner, is not the safest and best construction and is obviously not as desirable as a post and cable structure, since a cable when properly supported and anchored, affords an ideal buffer and under no ordinary conditions would break, as does a wooden rail. It will yield more or less according to the blow received and the form and construction of the anchorage, thereby causing a car to re-bound back on the road.

Should these end anchorages give or pull out of the ground, they would not allow the cables to pull back very much, probably only enough to hold the car on the embankment.

Knowing the advantages of the use of the cables in this connection over wood rails, I have devised what I feel are desirable and practical forms of supporting posts for the cables and also reliable anchors for yieldably connecting the ends of the cables thereto.

In this connection it will be observed that the guard rail, aside from the cables and springs, is of relatively heavy construction, and designed to be made of malleable iron, thus insuring strength and durability. Concrete is preferably used as a filling for the

posts in order to render them heavier, more solid and rigid, and is also preferably used as a ground footing for the anchorage of bolts used to secure the posts and end cable anchors in position.

The guard rail may obviously be made up in any desired lengths thus employing a variable number of posts or supports, at suitable distances apart, for supporting the cables at intermediate points. The single end anchorage employed at the ends for the attachment of the cables are of like construction, and like the posts are suitably secured to concrete footings. The posts like the anchorages may be of like construction, and are preferably formed of malleable iron, thus adapting them to the construction of a guard rail of any desired length.

Referring in detail to the characters of reference marked upon the drawings, 10 represents the end anchors which as before suggested may be of like construction, and include a suitably proportioned upright having a flanged base 11 with holes therethrough to receive the anchor bolts 12 secured within the concrete footing 13. The upper threaded end portion of these bolts which extends through the holes of the flanged base of the cable anchors 10 receive nuts 14 by means of which the cable anchors are firmly secured to the footing.

A longitudinal hole 15 is provided in the upper end portion of these cable anchors to accommodate a horizontally positioned and longitudinally movable bolt 16 having a head 17 upon one end and a nut 18 upon the other. A spiral spring 19 is positioned upon this bolt with one end seated against the anchors and the other end against a collar 20 mounted upon the bolt and against the nut 18 whereby the collar is rendered movable against the action of the spring for providing the required tension.

A suitable U-shaped yoke 21 is mounted upon the head end of the bolt 16 and between said head and a side of the cable anchor. This yoke accommodates a suitable pin 22 upon which a pair of rollers 23 may be mounted between the arms of the yoke and for the attachment of the cables 24 and 25. Any number of cables may of course be used, in which case it would simply be necessary to provide a wider yoke and additional rolls.

27 represents the posts which are originally formed hollow, preferably round or pipe-like and supported in a cast base 28, the flange of which is provided with holes 29 to receive bolts 30 embedded in the concrete 31 which would be poured in suitable openings in the ground. The posts may obviously be of any desired height and are each provided with a supporting pin 32 that is positioned crosswise through the center of the posts with its end portions projecting slightly from the peripheral face. The inside of the pipe may next be filled with concrete as indicated by 33.

Bracket 34 having horizontally disposed arms 35 that are provided with vertical holes 36 to fit the posts, are hingedly supported upon the post. The inner wall of the lower arm of the bracket is provided with an annular groove 37 to receive the projected ends of the pin and to permit the arm to turn upon the post. This arm is also provided in its opposite walls with vertical grooves 38 which intersect with the annular groove and permit the arm to slip down upon the post and the ends of the pins to pass up into the annular groove after which the arm may be swung around at a right angle to the position shown in Figs. 4 and 5. This obviously forms an interlocking engagement of the post and arm which prevents the latter from being removed except when the cable is not connected.

The upper arm of the bracket is provided with a bore of two diameters, the larger one to receive the end portion of the post and whereby the end proper forms a support for the annular shoulder 39 formed within the upper arm, this serves as the principal support for the bracket upon the arm. A cap 40 includes a shouldered flanged portion to fit into the smaller bore of the upper arm of the bracket and to set upon the annular top edge thereof.

The bracket 34 further includes a pair of outwardly disposed arms 41 to which yokes 42 are attached by means of pins 43. The said arm and yoke forming an eye 44 to receive the cable which is supported therein.

In erecting this fence these arms carried upon the posts should be projected at a right-angle and in alignment one with the other so that the cables would extend direct from one support to another and at equal distances apart.

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

1. In a safety guard rail of the class described, a series of round posts each having a pin therein, a bracket for each post, each bracket having a hole to receive the post and having a groove to receive the pin in a way to permit of interlocking rotatable connection of bracket to post.

2. In a safety guard rail of the class described, a round post, a bracket having an upper and lower opening to receive the post and forming a swinging connection therewith, one of said openings including an annular shoulder to rest upon a shoulder of the post in a way to support the bracket thereon, and means for attaching cables to said bracket.

3. In a safety guard rail of the class described, a round post having a pin projecting therefrom, a bracket having an opening

to receive the post, a slot disposed longitudinally of the bracket to receive the pin, an inner annular groove within the bracket and intersecting said slot to receive the pin in a way to form an interlocking rotatable connection of bracket to post.

4. In a safety guard rail of the class described, the combiantion with a round post having a pin therein, a bracket having an upper and lower opening to receive the post and to form a swinging connection therewith, said bracket including an annular shoulder in one of said openings to rest upon the top of the post in a way to support the bracket thereon, said bracket also having a groove in the other of said openings to receive the pin in a way to form an interlocking rotatable connection of the bracket to the post.

5. In a safety guard rail of the class described, a post comprising a base, a pipe mounted therein, a filling of concrete within the pipe, a bracket having an upper and lower arm each with an opening to receive the post and forming a swinging connection therewith, the upper one of said arms including an annular shoulder to rest upon the top end of the pipe, a cap to cover the opening in the upper arm, and an interlocking rotatable connection between the lower arm of the bracket and the post.

Signed at Troy, in the county of Rensselaer and State of New York, this 31st day of May, A. D. 1928.

GEORGE R. TARBOX.