Nov. 14, 1939. R. R. ROEMER 2,180,286

ROAD GUARD

Filed April 10, 1936 2 Sheets-Sheet 1

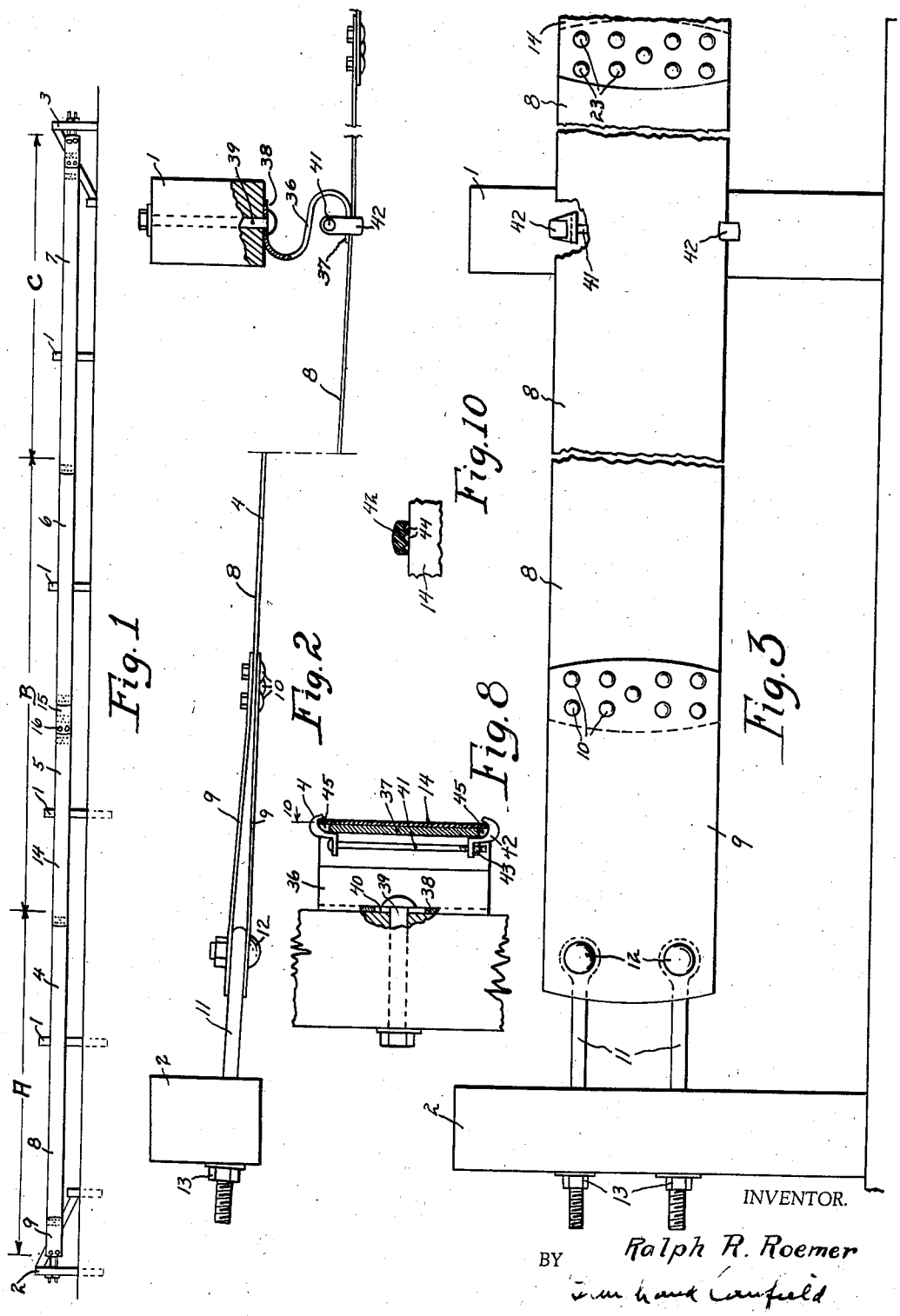


Fig. 1

Fig. 2

Fig. 10

Fig. 8

Fig. 3

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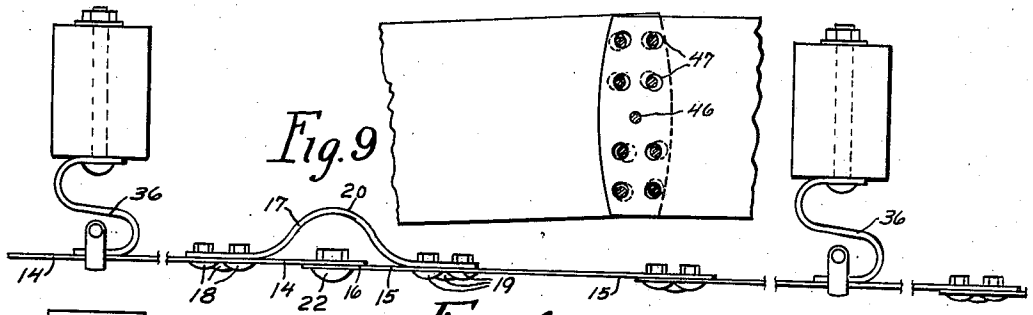


Fig. 9

Fig. 4

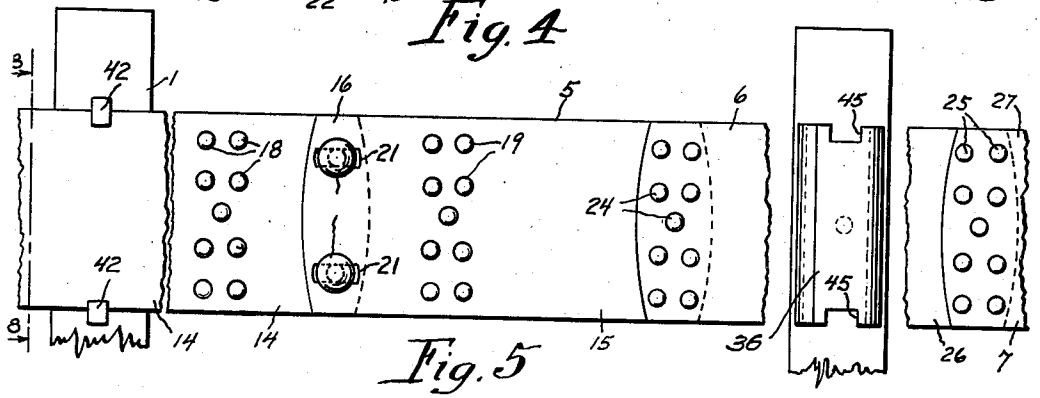


Fig. 5

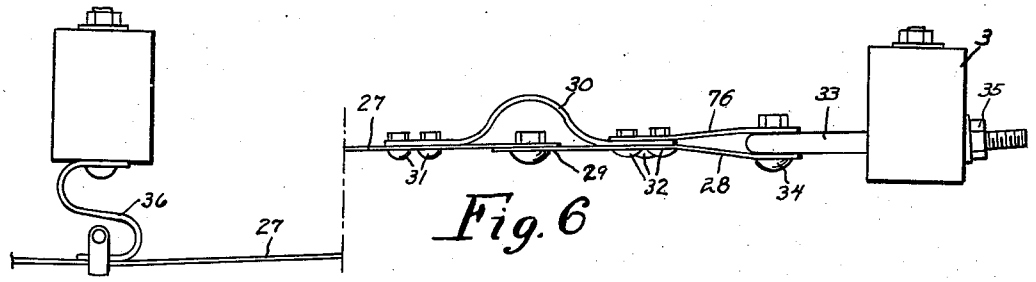


Fig. 6

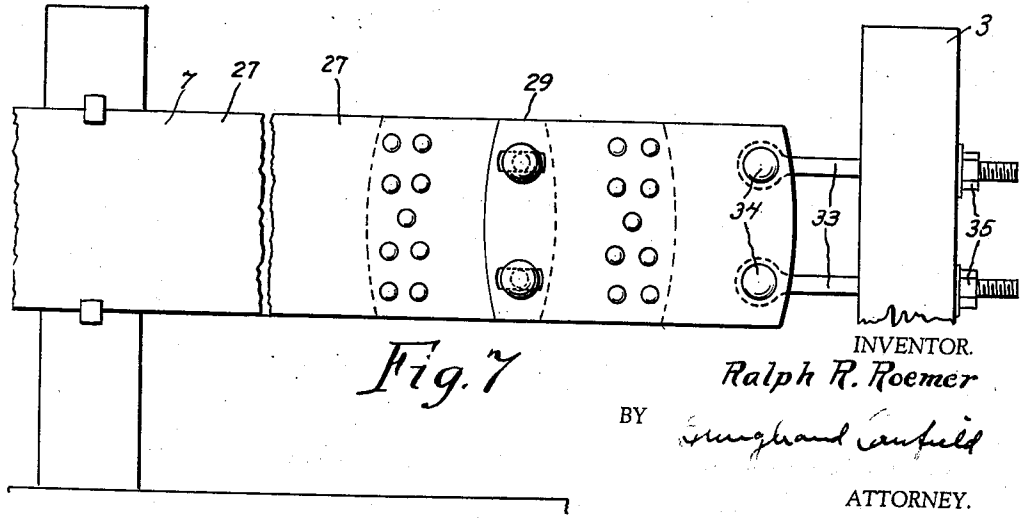


Fig. 7

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ROAD GUARD

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Application April 10, 1936, Serial No. 73,734

5 Claims. (Cl. 256—13.1)

This invention relates to road guards of the type comprising a sheet metal rail supported on a row of posts at the side of a roadway to prevent vehicles from leaving the roadway in case of skidding or other accident, particularly at sharp turns or where the roadway runs along the edge of a steep declivity, a deep ditch, a culvert, etc.

In road guards of this class heretofore proposed, there have been serious disadvantages. In some such guards it has been necessary to very accurately space the supporting posts to prevent slackness and looseness in the flexible sheet metal rail commonly employed. In others the rail has been loosely connected to the posts, so that upon impact of a vehicle with the rail, the entire resistance to yielding must be supplied by the end posts alone. In others, suitable provision for longitudinal thermal expansion and contraction has not been made, resulting in looseness and sagging of the rail in warm weather after contraction in cold weather. In some the collision of a vehicle with the guard rail necessitates expensive and difficult repairs, such for example as renewing and resetting the supporting posts.

It is an object of this invention to provide a road guard construction which will overcome the disadvantages above mentioned.

Other objects are:

To provide generally an improved road guard construction;

To provide improved means for supporting a length of flexible sheet metal guard rail upon a row of posts;

To provide an improved means for securing a flexible guard rail to a row of posts;

To provide an improved rail guard construction having an improved mode of operation upon impact therewith of a vehicle;

To provide a guard rail construction adapting it, in an improved manner, to changes in the grade or inclination of the roadway.

Other objects will be apparent to those skilled in the art to which my invention appertains. My invention is fully disclosed in the following description taken in connection with the accompanying drawings in which,

Fig. 1 is a front elevational view of a road guard embodying my invention, and illustrating one each of four different kinds of road guard rail sections, which may be used in different combinations and in different number to compose any practical length of rail for any particular class of installation;

Fig. 2 and Fig. 3 are respectively top plan and front elevational views of one of the sections of Fig. 1 and drawn to a larger scale; and including a fragment of an adjoining section;

Figs. 4 and 5 are respectively top plan and front elevational views of the remainder of said adjoining section, and drawn to a larger scale, and including also a third complete section of another kind and a fragment of the next section;

Figs. 6 and 7 are respectively top plan and front elevational views of the remainder of the said next section; drawn to the same enlarged scale;

Fig. 8 is a side elevational view, partly in section, taken from the plane 8—8 of Fig. 5;

Fig. 9 is a view similar to a fragment of Fig. 3 or of Fig. 5, illustrating a detail of the rail construction, the view being partly in section, and certain parts thereof being of exaggerated size for clearness;

Fig. 10 is a fragmentary sectional view taken from the plane 10 of Fig. 8.

Referring to the drawings, a row of posts 1—1 and end posts 2 and 3 which may be of wood, concrete or other suitable material, support in a manner to be described, different kinds or constructions of guard rail sections 4, 5, 6 and 7, all connected together longitudinally to form a guard rail. In Fig. 1, the guard rail is divided into three parts for convenience, indicated by the letters A, B and C; and these parts of the rail are illustrated to larger scale, respectively, in Figs. 2 and 3, 4 and 5, and 6 and 7, in connection with which they will now be more fully described.

The section 4 may be called a non-expansion end section, and is employed at an end of the road guard rail, which, because expansion is provided for elsewhere along the rail, may be secured directly to or rigidly to the end post. A sheet metal rail 8, which may suitably be formed from No. 12 gauge spring steel 12 inches wide, is joined to a pair of like reversed anchor elements 9—9, which may be made of the same material as the rail 8, by a plurality of bolts 10—10 projected through aligned perforations in the rail and in the anchor elements disposed on opposite sides of the rail. A pair of eye bolts 11—11 are connected to and between the anchor elements 9—9 by bolts 12—12 projected through aligned perforations in the anchor elements and through the eyes of the bolts.

The assembly of the rail 8, the anchor elements 9—9 and the eye bolts 11—11 just described comprise the non-expansion end section and it may be connected to an end post by projecting the shanks of the bolts 11—11 through

holes in the post; and nuts 13—13 on the bolts may be drawn up to tension the rail.

The section 5 may be called an expansion rail section, and sections of this kind may be placed in the rail at suitable distances apart, such as say every one hundred feet of rail to provide for expansion and contraction due to changes of temperature. Two pieces of the rail material above described, 14 and 15, overlap each other at adjacent ends as at 16, and are connected together by a resilient bridging member 17 having end portions bolted to the pieces 14 and 15 by bolts 18 and 19 respectively, and a laterally extending loop portion 20 bridging the overlap 16. The overlapping ends at 16 have aligned slots 21—21 through which bolts 22—22 are projected to hold the ends of the pieces 14 and 15 in juxtaposition and to limit longitudinal extension of the bridging member 17. The opposite end of the piece 14, which is shown in Figs. 2 and 3, is joined by bolts 23 to the end of the next longitudinally adjacent section. The opposite end of the piece 15 is similarly joined to the end of a section by bolts.

The section 6 may be called a simple rail section and it consists of a length of the rail material above referred to perforated at opposite ends so as to be attached by bolts 24 and 25 to adjacent sections, as shown in Figs. 4 and 5 for the rail piece or section 26 attached to the sections 5 and 7.

The section 7 may be called an expansion end section. This section is made up of a piece of the rail material 27, an anchor element 28 overlapping the piece 27 as at 29, a bridging member 30 which may be like the bridging member 17 above described and which is bolted to the piece 27 and element 28 by bolts 31 and 32 respectively and bridges the overlap 29, and a second and shorter anchor element 76 secured at one end by the bolts 32 to the piece 28 and member 30; and a pair of eye bolts 33—33 between the anchor elements are secured thereto by bolts 34—34 projected through aligned perforations in the anchor elements and through the eyes of the bolts. The shanks of the bolts may be projected through holes in an end post 3 and drawn up by nuts 35—35 to tension the rail.

The rails of road guards are, as is well known, of different lengths from a few feet to thousands of feet. Each guard will in every case, when the construction here described is used, comprise two end sections and intermediate rail sections. Whether the expansion is to be provided at an end section or only in the intermediate sections or not at all, will be determined by the circumstances in each case. In long rails, there may be a series of non-expansion simple rail sections interspersed with expansion rail sections at suitable spaced intervals according to the amount of linear expansion wanted per foot.

In this way by using the sections above described, rails of any desired length may be built up having any desired amount of expansion and contraction.

To support the rail on the posts, I provide a hanger on each post comprising a sheet spring metal S-shaped spring 36 of approximately the same height on the post as the width of the rail and having flat end portions 37 and 38 for engagement with the rail and post respectively the portion 38 having a vertical slot 40 therein whereby, by means of a bolt 39 projected through the slot and through a bore in the post, the hanger may be secured to the post with some vertical adjustment, to aid in longitudinally aligning the sections of the rail, and with rotative adjustment around the bolt 39, to dispose the hanger in suitable position transversely of the rail.

To secure the rail to the hanger in each case a clamp device is provided comprising a bolt 41 behind the flat portion 37 of the hanger at the opposite ends of which are hooks 42—42 adapted to hook over the upper and lower edges of the rail and to grip it to rigidly attach it to the hanger when the bolt is tightened by its nut 43 to draw the hooks toward each other. The hooks may have one or more teeth 44 on their under sides to bite into and firmly grip the thin edge of the rail to lock the rail to the hanger. In order to prevent the hooks from moving longitudinally with the rail, they are seated in notches or aperture 45—45 in the flat portion 37 of the hanger, and held therein by the bolt 41 and the walls of the apertures as indicated in Fig. 8.

In erecting a guard of this construction, the posts are first set up at equal distances apart, determined by the predetermined length of the sections above described, and the end posts are anchored in any well known manner. The posts are then drilled for the hanger bolts 39. The hangers are then mounted and by the adjustment above described are adjusted to the grade of the roadway. The end section at one end is then secured to the end post and then one section after another is bolted to the preceeding section. The lower edge of the rail at each hanger is set in the lower hook 42 and the upper hook hooked over the upper edge and the bolt 41 drawn up enough to hold the rail in the hooks but not enough to grip the rail. The end bolts 11 and 33 on the opposite ends or on one end only are drawn up to draw the entire length of rail under tension. The bolts 41 are then drawn up tight to grip the rail.

An expansion joint or section can be put into the rail every one hundred feet or so depending upon the amount of expansion provided for in each section.

Upon impact with the rail of a vehicle out of control, blows directly upon the post will be absorbed by the spring hangers 36, and if the hanger should yield it will put the rail under more tension and exert a longitudinal pull thereon which will be taken up and absorbed by the entire series of hangers to which the rail is secured. If the impact is upon a section of rail between posts, the rail will be similarly tensioned and as the rail cannot slip on the hangers, they will all resiliently aid to absorb the blow.

Repairs can be readily made since any section can be taken out of the rail and another replaced; and accuracy of post setting and spacing is not necessary because the rail is secured to the hangers after it is in place.

As illustrated, the sections are connected together by five bolts in a symmetrical pattern with one bolt at the center. It has been found that five bolts can carry all of the load which the rail can carry without rupture and without in turn unduly weakening the rail. The holes for the center bolt have a close fit with the bolt as shown at 46 Fig. 9. The holes for the other bolts, are, in each of the pair of joined sections, made larger than the bolt as shown at 47. In assembling, the center bolt is put in first and then the other bolts put in loosely. The two parts of the rail can then be rocked in vertical planes about the center bolt to adapt them to the grade

of the roadway and then all of the bolts can be tightened. Although theoretically this puts all of the rail tension load on the center bolt, in practice the clearance between the outer bolts and their holes may be small and as soon as any great amount of load comes on the rail the metal of the bolts and of the rail will yield enough to distribute the load among all of the bolts.

The bolts 22 in the slots 21 while holding the two ends of the rail together are not drawn up tight enough to interfere with the sliding of one rail section end over the other during expansion and contraction of the rail sections.

My invention, as will now be apparent is not limited to the exact construction illustrated and described. Many changes and modifications may be made within the scope of the appended claims.

I claim:

1. In a hanger for supporting a road guard rail, a sheet metal spring bent in horizontal planes and having substantially parallel ends spaced apart, one end having a perforation for receiving a post bolt, the other end having recesses in the upper and lower edges thereof for receiving parts of a rail edge clamping device.

2. A hanger as described in claim 1 and in which the spring is reversely bent and is S form in horizontal sections.

3. In a support for a sheet metal road guard rail, a resilient sheet metal spring adapted to be secured to a post and having a forward portion extending generally longitudinally of the rail for disposal adjacent the inner face of the rail and provided with vertically spaced apertures, a pair of confronting clamp devices spaced apart, drawing means to draw them forcibly toward each other to clampingly grip the opposite edges of a rail therebetween and the clamp devices being loosely mounted in said apertures so that at least one of them is movable relative to the forward spring portion.

4. In a road guard construction a series of posts, a hanger on each post, a sheet metal guard rail secured to the hangers, each hanger being formed from resilient sheet metal and of S-form in horizontal sections, and extending forwardly between the post and rail, and the S having substantially parallel opposite end portions and the loops of the S being substantially semi-circular whereby impact on the rail forwardly of the post will compress the spring toward the post substantially without lateral bending of the spring in the longitudinal direction of the rail.

5. A support for a strip form sheet metal road guard rail comprising a post, a sheet metal spring of S-shape with opposite substantially parallel planar portions, one portion secured to the post and the other portion secured to the rail by means gripping the upper and lower edges of the rail.

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