

**DIVISIÓN DE NUEVAS CREACIONES**

RADICACIÓN EXPEDIENTE No. 03 036742

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **544** DE

FECHA **30 DE SEPTIEMBRE DE 2004** EL TÉRMINO HÁBIL SEÑALADO POR

LA LEY EXPIRA EL **29 DE DICIEMBRE DE 2004**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

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NO       X



US006109597A

**United States Patent** [19]

Sicking et al.

[11] Patent Number: **6,109,597**[45] Date of Patent: **Aug. 29, 2000**[54] **ANCHOR CABLE RELEASE MECHANISM FOR A GUARDRAIL SYSTEM**[75] Inventors: **Dean L. Sicking; John D. Reid; John R. Rohde**, all of Lincoln, Nebr.[73] Assignee: **Safety By Design, Inc.**, Lincoln, Nebr.[21] Appl. No.: **09/063,910**[22] Filed: **Apr. 21, 1998****Related U.S. Application Data**

[62] Division of application No. 08/832,422, Apr. 2, 1997, Pat. No. 5,775,675.

[51] Int. Cl.<sup>7</sup> ..... **E01F 15/00**[52] U.S. Cl. .... **256/13.1; 256/1; 248/548; 248/900; 404/6**

[58] Field of Search ..... 256/1, 13.1; 404/6, 404/7, 8, 9; 411/383, 546, 535, 536; 248/548, 549, 900

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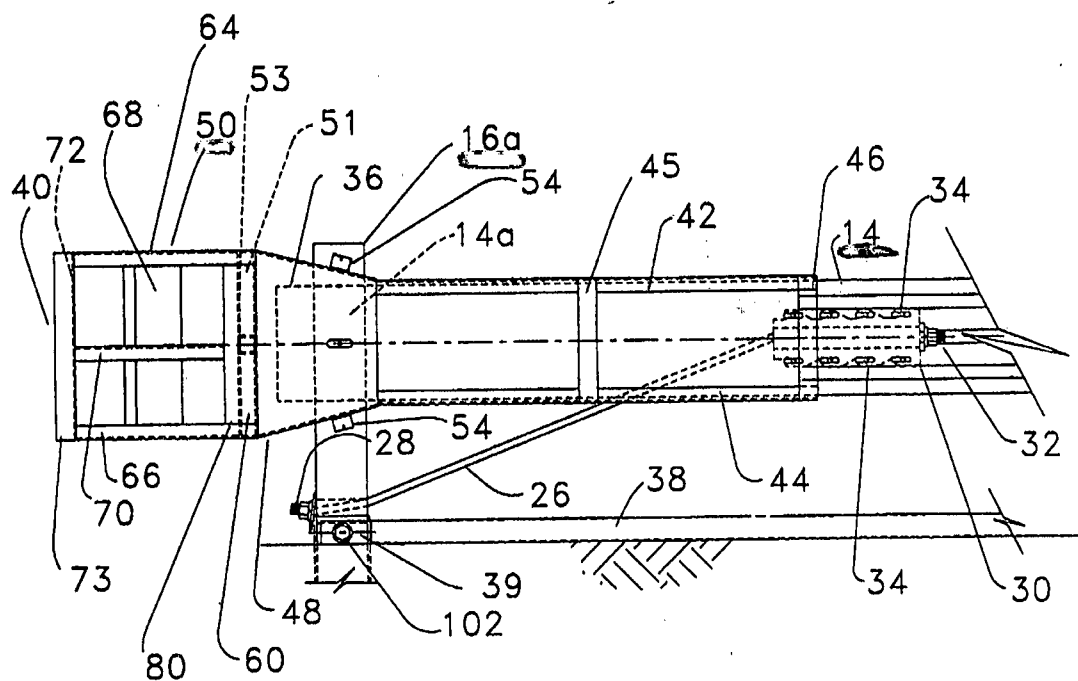
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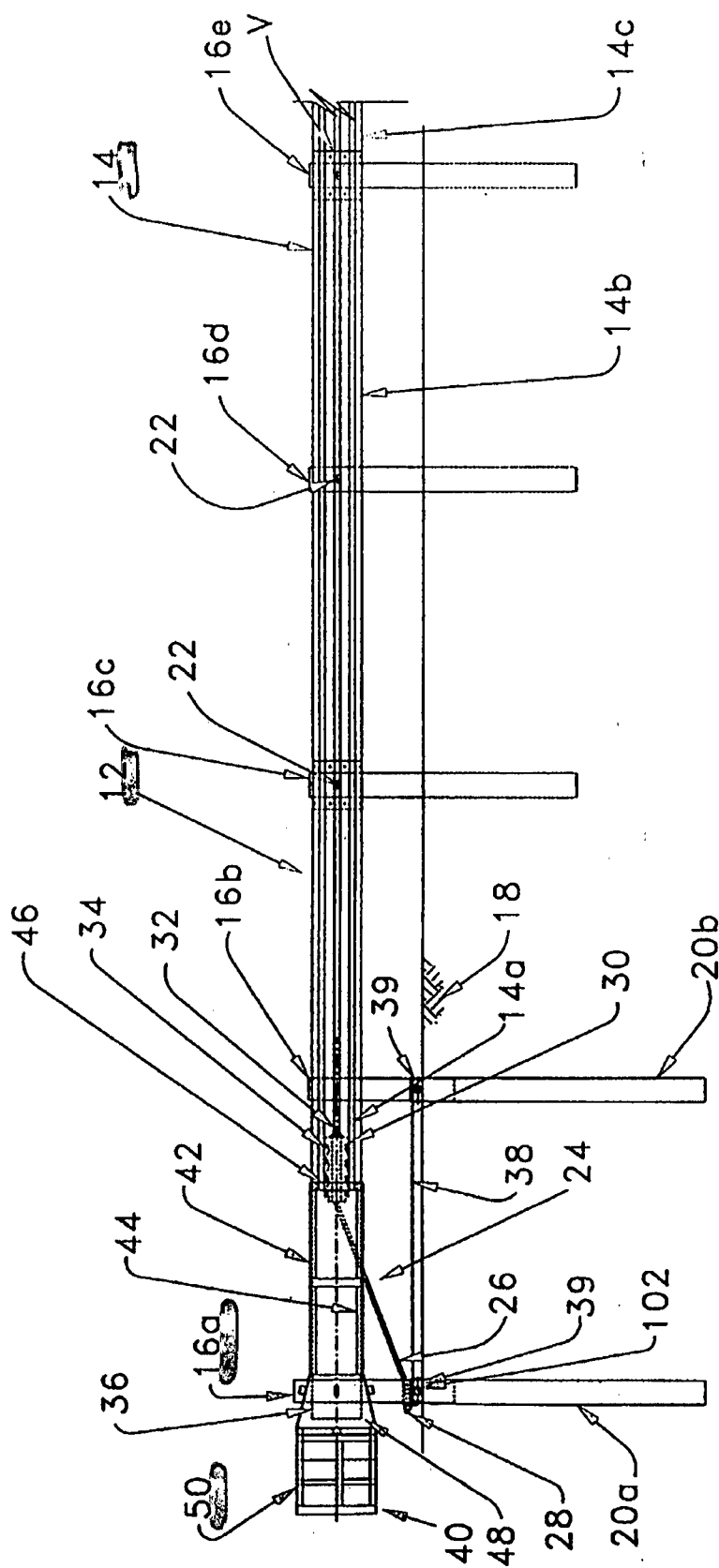
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*Primary Examiner*—Lynne H. Browne*Assistant Examiner*—John Cottingham*Attorney, Agent, or Firm*—Jackson Walker L.L.P.[57] **ABSTRACT**

A highway guardrail terminal system having horizontally extending guardrail elements mounted on a plurality of posts. An anchor cable release bracket attached to a rail element by sleeved mounting bolts has an arrangement of slots and openings to quickly release an anchor cable system from the guardrail.

**2 Claims, 5 Drawing Sheets**

FIG. 1

6,109,597

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## ANCHOR CABLE RELEASE MECHANISM FOR A GUARDRAIL SYSTEM

This application is a divisional application of U.S. patent Ser. No. 08/832,422 filed Apr. 2, 1997, now U.S. Pat. No. 5,775,675 patented on Jul. 7, 1998 and incorporated herein by reference for all purposes.

### BACKGROUND OF THE INVENTION

The present invention relates to an improved anchor cable release mechanism for a guardrail system.

Existing highway guardrail end treatment systems include: the breakaway cable terminal (BCT), the eccentric loader terminal (ELT), the modified eccentric loader terminal (MELT), the vehicle attenuating terminal (VAT), the extruder terminal (ET), and the slotted rail terminal (SRT).

In all of these systems, a cable anchor assembly is used to transmit tensile forces from the rail element to the anchor or foundation in impacts with the sides of the guardrails. For end-on impacts into the terminal, the cable anchor assembly must be able to release from the anchor or the rail element. Otherwise, the cable anchor assembly will impede the forward movement of the impacting vehicle, resulting in excessive deceleration and damage to the vehicle. The prior art systems release the cable anchor assembly through breaking of the end post or disengagement of the cable attachment from the rail element. The present invention provides a unique improved anchor cable release mechanism that facilitates quick release of the cable anchor attachment from the rail element.

### SUMMARY OF THE PRESENT INVENTION

The present invention cooperates within a highway guardrail or crash attenuation system which comprises a horizontally extending guardrail mounted on a plurality of vertically extending rail posts. The guardrail is mounted, along a vertical axis, to the posts. An impact head terminal member is slidingly positioned at a first end over the guardrail. The back end of the impact head is provided with an engaging plate which is designed to generally receive the engagement of an impacting vehicle. At the front end of the impact head, an inlet is provided to receive the leading end of the guardrail. A guide tube is attached to the inlet to guide the guardrail into the inlet. Further, attached at the inlet is a kinker beam which cooperates with a kinking deflector plate rigidly attached within and extending transversely across the head to generate kinks, or plastic hinges, in the rail element at discrete locations along the guardrail. The deflector plate is provided with a multiplicity of discrete, intersecting, angular faces upon which the rail element impacts as the impact head is horizontally displaced along the guardrail upon engagement of an impacting vehicle.

An anchor cable release bracket of the present invention has tapered slots along a first side and enlarged openings along an opposite side. The bracket is attached to the rail element by sleeved mounting bolts. The bracket is shifted laterally and one side is forced away from the rail element and off of the mounting bolts upon impact of the guide tube.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description of the preferred embodiments. Such description makes reference to the annexed drawings wherein:

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FIG. 1 illustrates a side elevation view of a first embodiment of the present inventive highway guardrail terminal system.

FIG. 2 illustrates a side elevation view of the impact head, guide tube, and cable release mechanism of the present invention.

FIG. 3 illustrates a top view of the impact head, guide tube, and cable release mechanism of the present invention.

FIG. 4 illustrates a cable release bracket of the present invention.

FIG. 5 illustrates an end view of a cable release bracket of the present invention.

FIG. 6 illustrates a side elevation view of the quick release sleeved mounting bolt of the present invention.

FIG. 7 illustrates an alternative embodiment of a cable release bracket of the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and more particularly to FIG. 1, the reference numeral (12) generally represents an energy dissipating guardrail terminal using the sequential kinking concept. The terminal which is adapted to be connected to the upstream side of a conventional guardrail (14) consisting of standard W-beam guardrail sections, either approximately 12'6" or 25' in length. The guardrail sections or rail elements (14a-14c) are attached along their vertical axes (V) by bolts (22) to a plurality of vertical breakaway posts (16a-16e) spaced apart approximately 6'3" from each other. It should be understood that the sequential kinking terminal is effective with other spacing distances. Any suitable number of posts may be used depending upon the expanse of the guardrail run. FIG. 1 illustrates five wooden breakaway posts. Wooden posts (16c-16e) are shown embedded directly into the soil (18). Lead post (16a) and second post (16b), which are shorter in length than the other posts, are shown inserted within unique foundation sleeves (20a and 20b) which will be further described below.

FIG. 1 further illustrates the anchor cable mechanism (24) of the present invention which includes an anchor cable (26), lower anchor cable bolt (28), a unique and novel anchor cable release bracket (30), an upper anchor cable bolt (32), and eight unique and novel sleeved bolts (34). The anchor cable mechanism is provided to allow the terminal (12) to withstand angular vehicle impacts downstream of its upstream end (36). FIGS. 4 and 5 show the detail construction of the quick release bracket which is held in tension on rail element (14a) by the sleeved bolts (34) (FIG. 6). In addition, a ground strut (38) having a U-shaped yoke (39) on each end extends between the first and second posts and is provided for additional support for the anchor cable forces. A bolt or fastener (102) extends through the yoke and the post to secure the strut in place.

It is intended that a vehicle will impact the guardrail (14) downstream of its upstream end (36); however, a collision with the end (36) requires the provision of an end treatment designated by reference numeral (40) to reduce the extent of injury to the impacting vehicle and its occupants. The purpose of the end treatment (40) is to dissipate impact energy of the vehicle.

FIG. 2 illustrates a side view of the end treatment (40). The end treatment (40) includes top guide rail (42), bottom guide rail (44), center guide rail strap (45), end guide rail straps (46), guide tube (48), impact head (50) and kinker beam (51). The impact head (50) is attached on the upstream