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France

[11] **3,807,699**

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[54] **SAFETY GUARD RAIL FOR HIGHWAY MEDIANS**

[76] Inventor: **William Henry Getty France,** 714 John Anderson Dr., Ormond Beach, Fla. 32074

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[52] **U.S. Cl.** **256/13.1,** 404/6, 256/1

[51] **Int. Cl.** **E01f 15/00**

[58] **Field of Search** ..... 256/13.1; 404/2, 6, 7, 404/8, 9, 71, 4; 340/114 B, 51, 61

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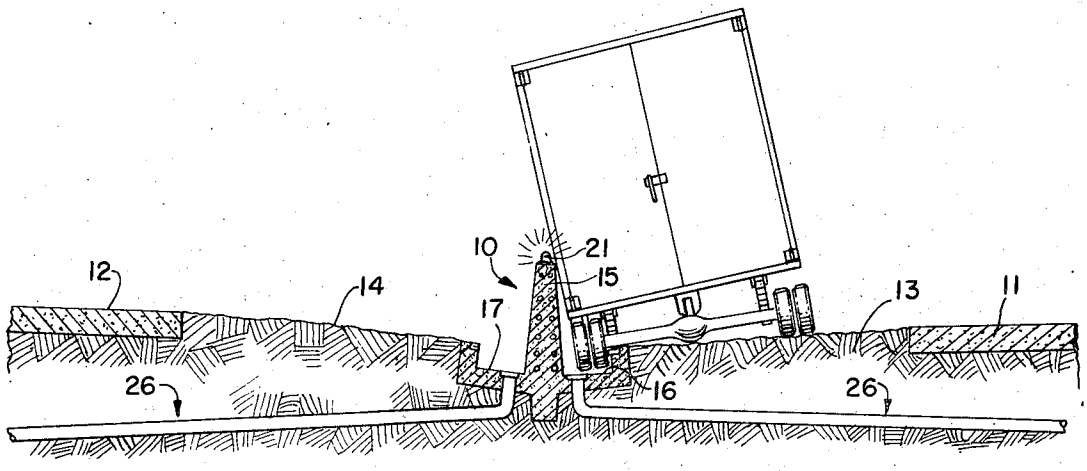
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Primary Examiner—James R. Boler
Assistant Examiner—Conrad L. Berman
Attorney, Agent, or Firm—Morton, Bernard, Brown, Roberts & Sutherland

[57] **ABSTRACT**

A barrier or guard rail on a highway median which has a gutter on each side sufficiently deep and wide so that wheels of vehicles which collide with the barrier fall into the gutter and their axles or under carriages drag on the upper edge of the gutter. Warning lights or beacons, which are either automatically or manually operated, may be placed on the barrier to warn oncoming vehicles of a possible mishap. The barrier or gutter may also contain electronic sensing devices which alert highway personnel of the location of a vehicle in trouble.

6 Claims, 5 Drawing Figures



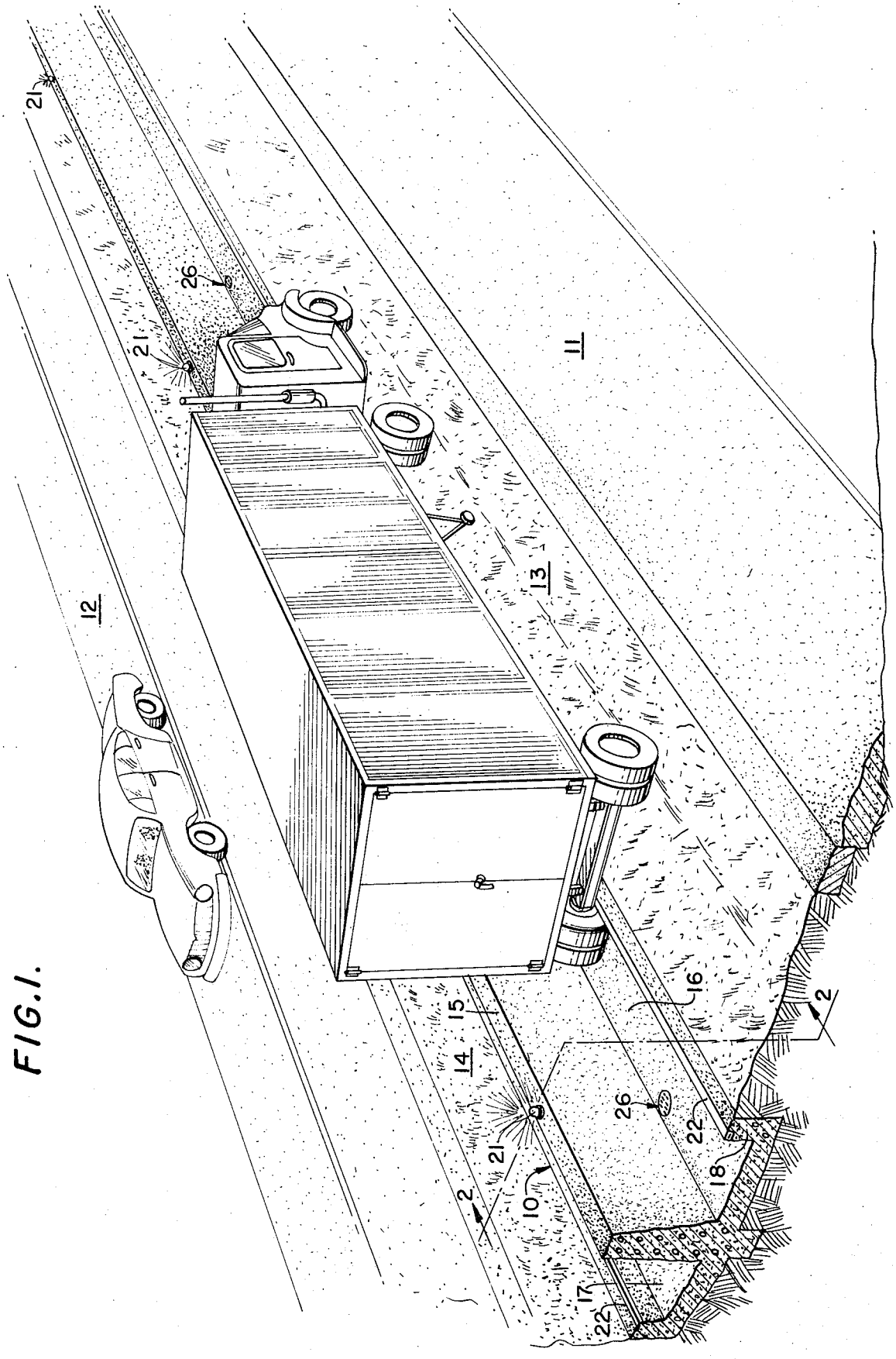


FIG. 1.

FIG. 2.

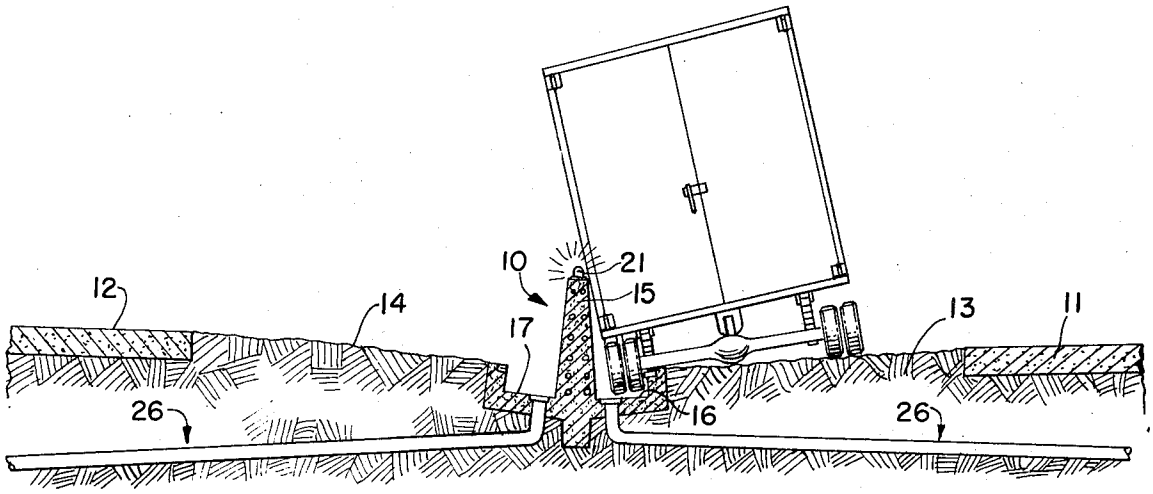


FIG. 3.

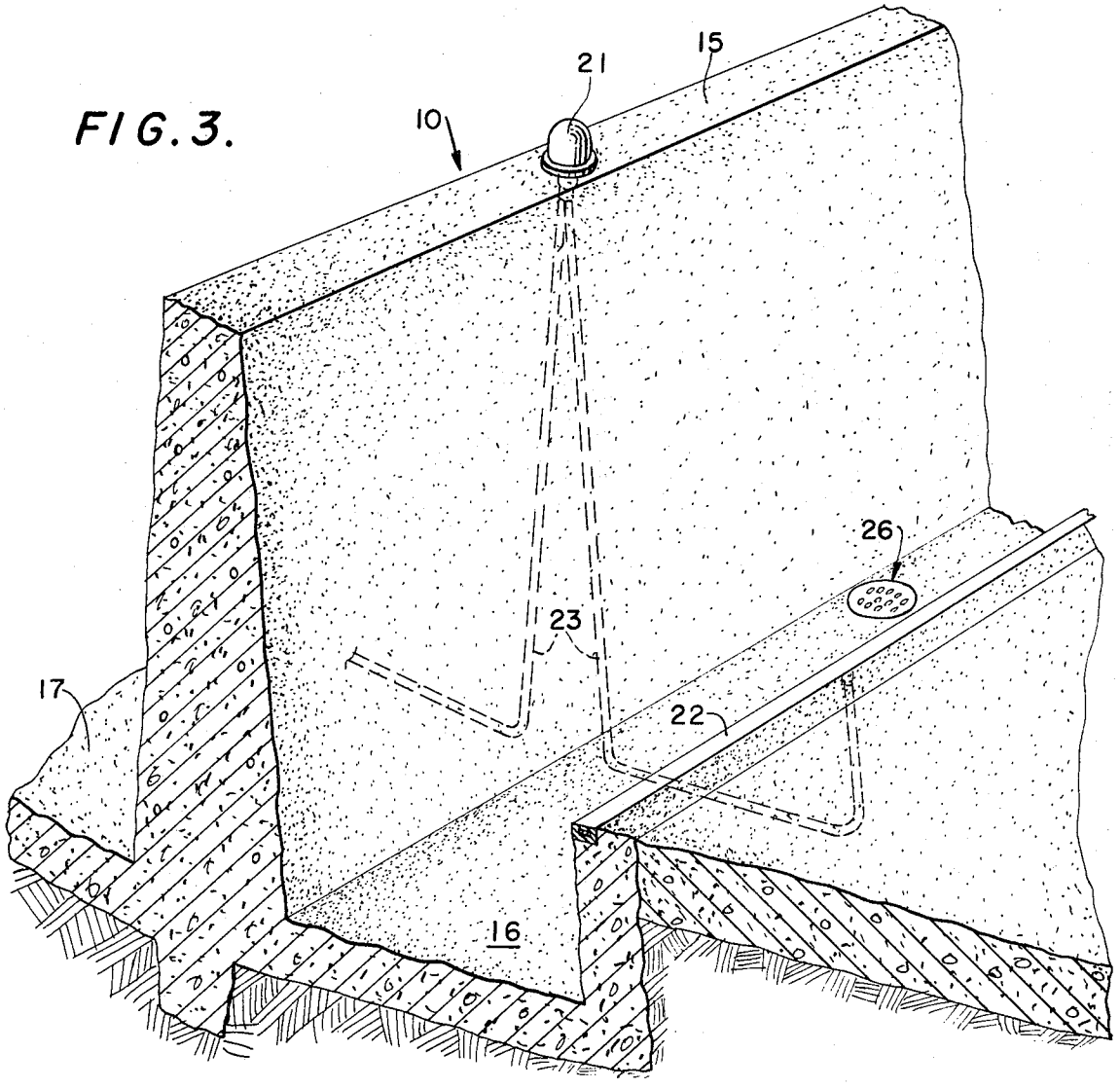


FIG. 4.

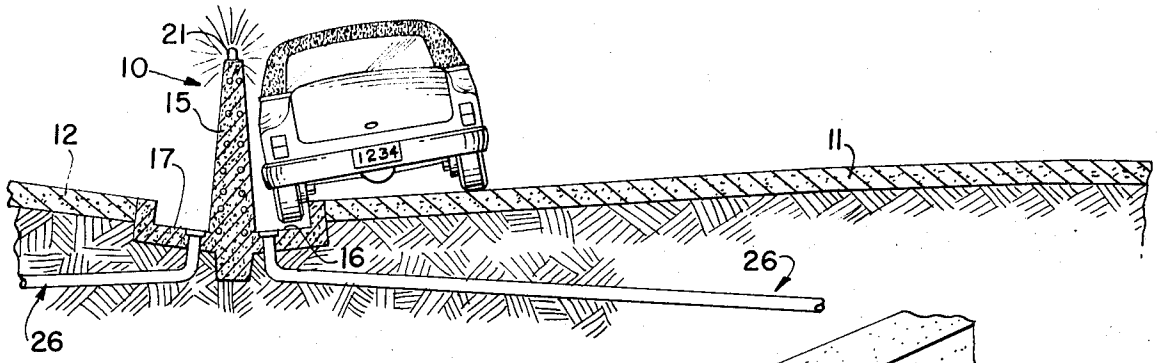
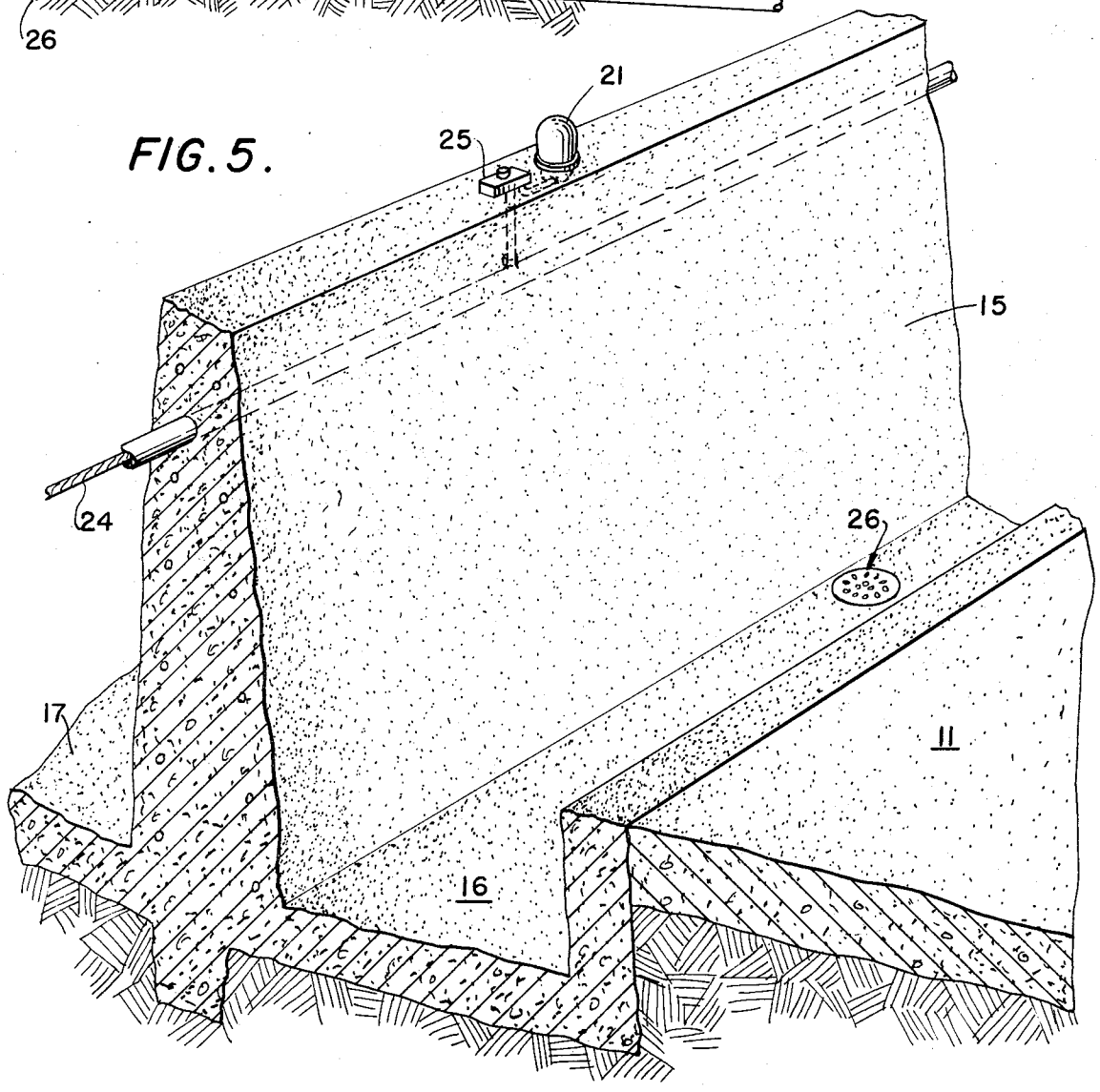


FIG. 5.



SAFETY GUARD RAIL FOR HIGHWAY MEDIANS

BACKGROUND OF THE INVENTION

The field of this invention is highway barriers and guard rails for use on medians which serve to prevent collisions between traffic going in opposite directions. On multi-lane highways, there is a manifest danger of vehicles crossing the median into lanes of oncoming traffic. This danger has increased in recent years as the nation's highways have become morecrowded and cars have become faster. The widening of highways by changing part or all of a once safely wide median into additional traffic lanes has increased the likelihood of these dangerous accidents.

To prevent these dangers, the art has developed and built barriers, often of reinforced concrete, which are strong enough to prevent a car from crashing through them. While these barriers have thus prevented any collision with oncoming traffic, they often throw the crashing vehicle back into its own highway lane, causing disastrous collisions with vehicles traveling in its direction. The prior art has also addressed the problem of vehicles rebounding into the stream of traffic as for instance the disclosure of U.S. Leters Pat. No. 3,288,440.

SUMMARY OF THE INVENTION

My invention is a barrier, designed to prevent traffic crashing through it into other lanes of traffic, with gutters next to the barrier which are sufficiently wide that when a vehicle crashes against it, the wheels of the vehicle on the side near the barrier fall into the gutter. The sides of the gutter of my invention are sufficiently deep that, once the wheels are in it, (1) the vehicle is not likely to rebound off the barrier back into traffic and (2) the axle or undercarriage of the vehicle will scrape along the upper edge of the gutter, thus acting to slow the vehicle.

A car may crash out of control into a barrier due to a failure of the steering or brakes or due to a heart attack or other incapacity of the driver. This invention is designed to protect the driver and occupants and occupants of other vehicles from further injuries.

The barrier may have beacons on it, either manually or automatically operated, which will warn traffic that a vehicle has hit the barrier or is in the gutter. The barrier or gutter may have electronic sensing devices imbedded in them to notify highway personnel of the location where a vehicle is in the gutter. The gutter would have drains built into it of sufficient size to handle rain water or melting snow from the highway. This invention eliminates the present form of highway gutter. The whole structure may be built adjacent to the highway road bed or be separated from it, by an area of grass for example.

While I have discussed my invention in the context of a divider between two streams of traffic going in opposite directions, my structure can also be built on a side of a roadway with no traffic on the other side of the barrier or it may separate two streams of traffic both traveling in the same direction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of my invention, made of concrete with reinforcing bars, in use with a tractor trailer lodged safely against the barrier with wheels of the vehicle in the gutter and signals turned on.

FIG. 2, a vertical transverse sectional view taken substantially along line 2-2 in FIG. 1, shows the trailer wheels in the gutter and the axle and undercarriage resting on the pressure sensitive switching strip and the upper edge of the gutter. In this embodiment, the wheels of the truck do not contact the bottom of the gutter.

FIG. 3 is a fragmentary enlarged perspective view of my invention as shown in FIGS. 1 and 2, but with the roadway built up to the gutter's edge.

FIG. 4 is a cross-sectional view similar to FIG. 2, but with an automobile lodged safely in the gutter.

FIG. 5 is similar to FIG. 3, but shows a manually actuated distress beacon.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In its preferred embodiment, the guard rail **10** is separated from adjoining roadways **11, 12** by grass areas **13, 14** about one vehicle wide. The center barrier **15** and the gutters **16, 17** are made of reinforced concrete. The top of the center barrier is approximately 6 feet above the bottom of the gutter, the gutter is approximately 3 to 4 feet wide (wide enough to accommodate large dual truck and bus wheels and tires), and the upper edge of the side **18** of the gutter and the surrounding ground are approximately 18 inches above the bottom of the gutter. The surface of the bottom of the gutter is approximately parallel to the grade of the highway and the angle of the wall of the gutter to its bottom, and of the barrier to the bottom of the gutter, are each about 90°. The gutter has adequate drains **26**; and beacons **21** are placed at reasonable intervals. When a vehicle tire lodges in the gutter, sensing means are triggered, for instance sensing strips **22.** This actuates through electric connector **23, 24** the beacons **21** for a sufficient distance in front of and to the rear of the vehicle to warn oncoming traffic. For example, strip **22** may be segmentized into quarter mile sections with each section connected to a different radio frequency transmitting device which can broadcast to highway personnel at a central location when the sensing strip for a particular quarter mile is triggered, thus identifying the location of the lodged vehicle as being within that particular one-quarter mile interval. The sensing strip itself or auxiliary electronic means may also alert highway personnel of the location of the lodged vehicle. Beacons **21** may also be manually actuated by switches **25.**

The beacons **21** may be mounted on poles to prevent them being obscured by snow on the barrier top. Also on top of the barrier may be headlight reflecting fences where road contours make oncoming headlights visible.

The bottom of the gutter will have drains **26** which will replace the present drainage system of highways.

An automobile which is heading off a roadway will usually be skidding sideways and either the front or rear wheel will lodge in the gutter. Inertial forces will then usually carry the other wheel into the gutter. With both wheels in the gutter the center of gravity is lowered thus lessening the chance of the car flipping.

Having described the preferred embodiment of my invention as required by law and desiring not to be limited thereby but only by the following, I claim:

1. A system for controlling the path of vehicles accidentally leaving a roadway and for restraining the vehicles from rebounding into the roadway comprising

a. a roadway having a generally horizontal, hard surface,

b. a vehicle having an axle, tires and undercarriage,

c. vertical barrier means disposed parallel and adjacent to said roadway for restraining the vehicle from leaving the road,

d. said vertical barrier means adjoining and forming the outer wall of a generally horizontal gutter,

e. said gutter having a depth in excess of the vertical distance between the bottom of said tires and the undercarriage and axle,

f. said vertical barrier means having a height from said gutter in excess of the diameter of a vehicle tire,

g. means comprising the upper surface of an inner wall of said gutter, cooperating with the axle or undercarriage of said vehicle for decelerating said vehicle and preventing the rebounding back onto said roadway of said vehicle,

h. said upper surface disposed below the level of the roadway,

i. the bottom of said gutter being below the level of the roadway,

j. means for drainage located in said gutter,

k. said drainage means disposed below the level of the roadway.

2. The structure of claim **1** in which manually actuated warning beacons are mounted on the barrier.

3. The structure of claim **1** in which automatically-actuated warning beacons are mounted on the barrier.

4. The structure of claim **1** in which warning signals are actuated in connection with said vehicle's lodging in the gutter.

5. The structure of claim **1** in which electronic sensing devices, embedded in the barrier or gutter, transmit signals responsive to the location of said vehicle on the roadway.

6. The combination of claim **1** in which the barrier means is the median of a divided two way highway and said gutter means adjoin both sides of said barrier.

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