

[54] **HIGHWAY GUARD TRAP DEVICE**

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404/2, 4; 52/102, 174

[56] **References Cited**

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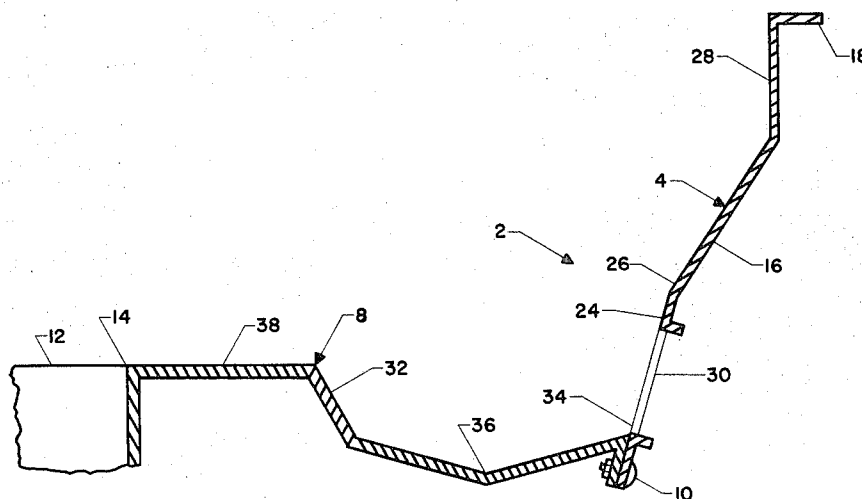
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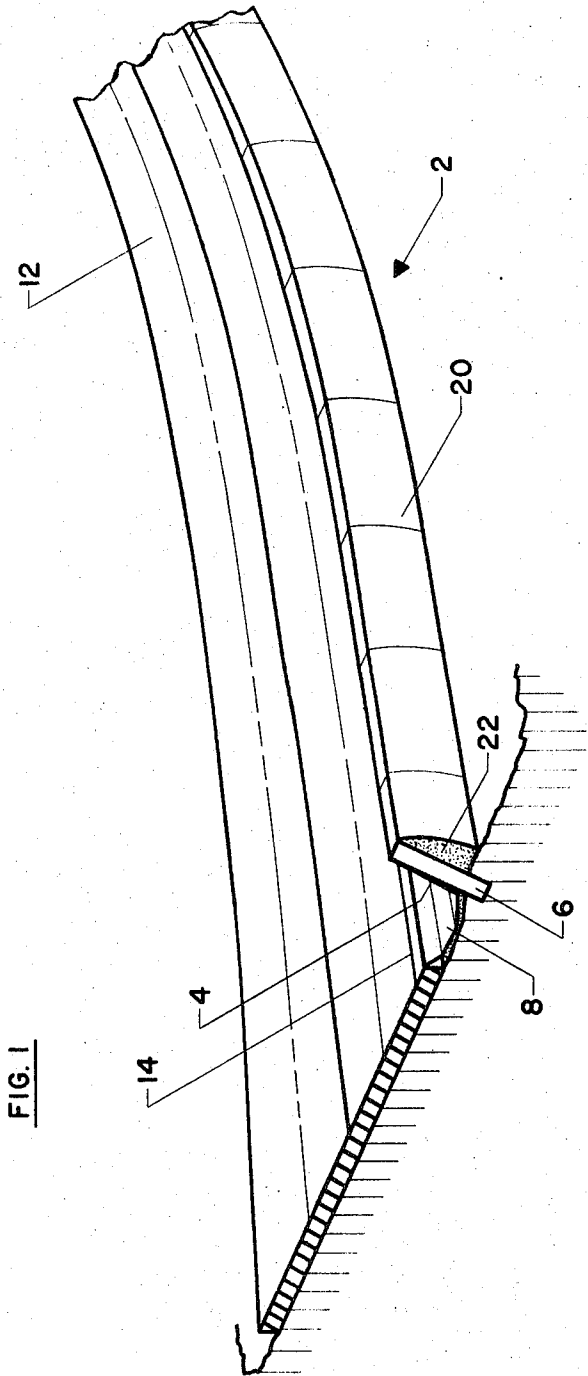
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[57] **ABSTRACT**

A highway guard rail-wheel trap device to aid in stopping vehicles leaving a highway and brought into contact with the guard rail along the edge of the highway. This highway device is designed to aid in stopping the vehicle with a minimum amount of occupant and vehicle body damage. The guard rail and wheel trap are held in a fixed relationship to one another. The highway device is positioned generally parallel to the edge of the adjacent highway. The highway guard rail includes a deflecting wall, sized and shaped to control an impacting vehicle wheel in order to direct and place the wheel in the wheel trap. The impacting vehicle is thereby positioned for generally relative parallel movement from the initial impact position to the point of termination of travel of the impacting vehicle.

4 Claims, 2 Drawing Figures





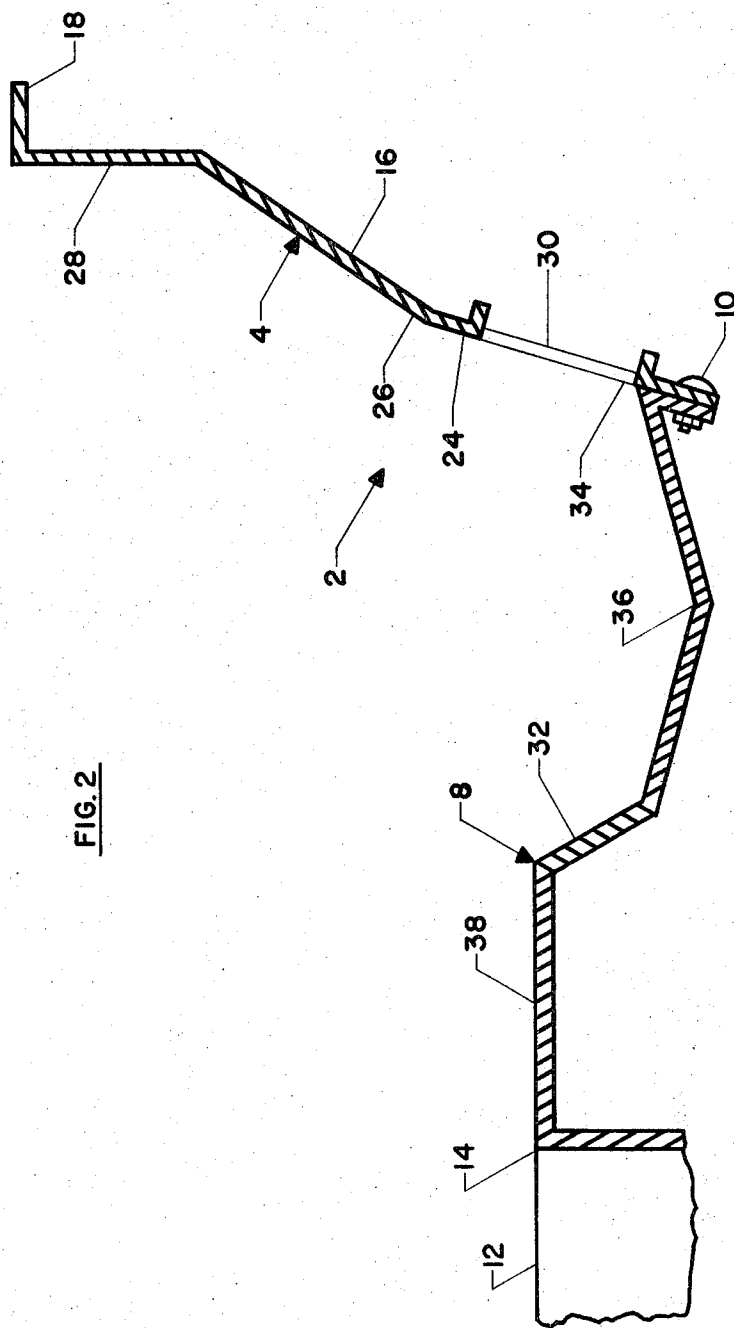


FIG. 2

HIGHWAY GUARD TRAP DEVICE

BACKGROUND OF THE INVENTION

In the past, road guards have been constructed to automatically guide or assist in guiding a vehicle after it passes beyond the edge of a road bed. Abrupt upstanding guard posts and rails or fencing have been placed beyond the road shoulder to stop a vehicle leaving the roadway. Such upstanding guard posts, rails and fence are generally the direct cause of more serious damage to life and property rather than of protective influence.

Various types of directional guards have also been provided along the edge of a road bed. Such directional guards usually include a ribbon of material paralleling the roadway with a generally triangular cross-section area. The upper surface, adjacent the edge of the roadway, rises at an appropriate inclination for the particular width of the ribbon of material. The crest position is materially above the plane of the road bed. Although such devices do not provide an abrupt obstruction to an impacting vehicle, and are designed to turn the vehicle's wheel to direct the impact vehicle back on to the roadway from which it came, in practice, such devices tend to throw the impacting vehicle back onto the roadway. The impacting vehicle usually cross all the lanes of traffic, thereby greatly increasing the danger of multiple vehicle accidents.

Another prior art device is the resilient or movable upstanding guard rail. Such guard rails are usually in the form of a steel ribbon paralleling the highway. The guard rail is designed to absorb some of the impact of a vehicle travelling beyond the edge of the road bed and to contact the body of the vehicle in order to hold it as it travels in a generally parallel path along the guard rail. The frictional contact or impact between the guard rail and the body of the vehicle usually results in the vehicle being brought to an abrupt stop. Such devices have greatly increased the amount of damage to the body of the impacting vehicle and to the occupants.

BRIEF DESCRIPTION OF THE INVENTION

A highway guard trap device including a guard rail and a wheel trap to aid in stopping vehicles brought into contact with the guard rail with a minimum amount of damage to the body of the impacting vehicle and gradual deceleration to minimize injury to the occupants. The guard rail and wheel trap are held in a fixed relationship to one another and they extend generally parallel to the edge of the adjacent roadway. The roadway guard rail includes a deflecting wall, sized and shaped to place a wheel of an impacting vehicle in the wheel trap without abruptly stopping the vehicle and to position the impacting vehicle for generally relative parallel movement from the initial impact position to the point of termination of travel of the impacting vehicle. The wheel trap includes a pathway below the road bed and an inner and outer wall to steer the wheel of the impacting vehicle along the pathway to a termination point. The guard rail is designed to absorb kinetic energy for turning the vehicle and fixing the vehicle's position relative to the deflecting wall for a free run to the termination point. The guard rail also includes backup material to turn and stop vehicles impacting the highway guard trap device at angles of forty degrees or more.

It is an object of this invention to provide a new and improved highway guard rail-wheel trap device.

It is another object of this invention to provide a highway guard trap device that will prevent a vehicle leaving a road bed from continuing its original direction of travel and to aid in bringing the impacting vehicle to a gradual halt without greatly damaging the occupants or the body of said vehicle.

An additional object of this invention is to provide a guard rail that will direct the wheel of the impacting vehicle into an adjacent wheel trap that will hold said wheel for generally parallel movement of the vehicle in relation to the guard rail until the vehicle comes to a halt.

In accordance with these and other objects, which will be apparent hereinafter, the instant invention will now be described with particular reference to the illustrated embodiment in the accompanying drawings. The particular illustrated embodiment is not to limit the breadth of the claimed subject matter in this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1, is a perspective view of the guard trap device along the edge of a road bed; and

FIG. 2, is a cross-sectional view of FIG. 1, illustrating the guard rail deflecting wall connected to the wheel trap.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawings, wherein an embodiment of the invention is shown, and referring particularly to FIGS. 1 and 2, the highway guard trap device, generally designated by numeral 2, includes a guard rail 4, a plurality of upstanding guard post as illustrated at 6, connected to the guard rail 4, and a wheel trap 8 connected to the guard rail 4 by connector 10. The road bed, generally shown by numeral 12, has one edge designated by numeral 14 lying parallel to the highway guard trap device 2. The plurality of upright guard posts are positioned in the ground along a line generally parallel to the road bed edge 14. The guard rail includes a deflecting wall 16 of a resilient deflectable material, such as plastic or aluminum, or metal, having its upper end connected by a connecting means through opening 18 to the post 6. The foot end of the deflecting wall is connected by a connecting means 10 to the wheel trap 8. The deflection wall 14 may be connected to a rear wall 20 in order to contain hard soil cement 22. The soil cement positioned between the deflection wall 4 and the rear wall 20. The deflection wall 4 includes a generally steep initial wall face portion 24, an intermediate sloping surface portion 26, and an upper sharply sloping face 28. The lower face of the deflection wall includes a plurality of drain holes, one of which is shown at 30. The drain holes allowing water to drain out of the wheel trap 8. The wheel trap 8 includes at least one wall 32. The second wall 34 is part of the deflecting wall 16 of the guard rail. The wheel trap also includes a base pathway 36 of generally v-shaped cross-section. The base pathway 36 is positioned below the level of the road bed 12. The wheel trap 8 may include an entry plate portion 38 between the road bed 12 and the first or roadway wall 32. The first wall 32 of the wheel trap 8 has a sloping surface generally equal to the sloping surface 24 of the deflection wall.

In use, when a vehicle is directed toward the guard rail at a small acute angle, its wheel will pass through the wheel trap 8 against the sloping surface 20. If surface 20 does not turn the wheel to direct it back into the wheel trap 8, the wheel will climb surface 20 to intermediate surface 26. Surface 26 will turn the wheel away from the guard rail 4, back toward the base 36 of the wheel trap 8. The wheel will gradually move back into the wheel trap 8. The first wheel trap wall 32 will keep the wheel on the base 36. The v-shaped base will center the wheel in the wheel trap 8. The vehicle will align itself generally parallel to the guard rail and thereafter travel along the guard rail until it comes to a halt. The deflection wall 16 is shaped to keep the body of the vehicle away from the guard rail to reduce body damage. When a severe impact condition occurs or the vehicle engages the guard rail at a large acute angle, the strength of the buttressed guard rail will move the vehicle body in a position generally parallel to the guard rail, as well as directing the wheel into the wheel trap. The wheel trap will prevent the vehicle from moving back into the traffic on the roadway.

It should be noted that on new construction or where guard rails do not exist, the device as shown in FIGS. 1 and 2 may be installed with rail posts to support deflection wall 4 and rear wall 20. Also, two deflection walls 4 may be placed back to back in the center of a highway with a wheel trap projecting toward opposite lanes of traffic. Also, said two deflection walls 4 and wheel traps 8, or a deflection wall, rear wall and trap may be held in position, creating a form in which concrete may be poured to provide a solid concrete guard trap. Such forms may be used to pour Portland cement, as well as asphaltic concrete.

The instant invention has been shown and described herein in what is considered to be the most practical and preferred embodiment at the present time. It is rec-

ognized, however, that departures may be made therefrom within the scope of the invention and that obvious modifications will occur to persons skilled in the art and that the illustrations herein do not limit the scope of the claimed subject matter.

What I claim is:

1. A device for arresting a moving vehicle which departs a roadbed comprising:

a tire receiving channel connected along and disposed below the surface of said roadbed, means connected to one end of said tire receiving channel connecting said channel to one side edge of said roadbed;

a vehicle deflecting wall disposed substantially perpendicularly adjacent said roadbed lying parallel to said direction of said roadbed, said tire receiving channel being disposed between said roadbed and said vehicle deflecting wall; and

an outwardly inclined planar surface connected between said deflecting wall and one side of said tire receiving channel disposed on the opposite side away from said roadbed, said outwardly inclined planar surface having a lower portion connected to said opposite end of said tire receiving channel and said inclined planar surface having an upper portion disposed parallel to said side edge of said roadbed, said upper portion being connected to said deflecting wall.

2. A device, as in claim 1, said tire receiving channel being substantially V-shaped.

3. A device, as in claim 1, said deflecting wall being resilient.

4. A device, as in claim 3, wherein:
said deflecting wall includes a mass of kinetic energy absorbing material disposed thereon to absorb the kinetic energy of an impacting vehicle.

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