United States Patent

[11] 3,618,970

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[54] **VEHICLE STEERED BY TILTING THE BODY**
4 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** ..... **280/87.01,** 280/87.04 A
[51] **Int. Cl.** **B62b 11/00**
[50] **Field of Search** ..... 280/87.01, 87.04, 87.04 A, 87.02, 87.03

[56] **References Cited**

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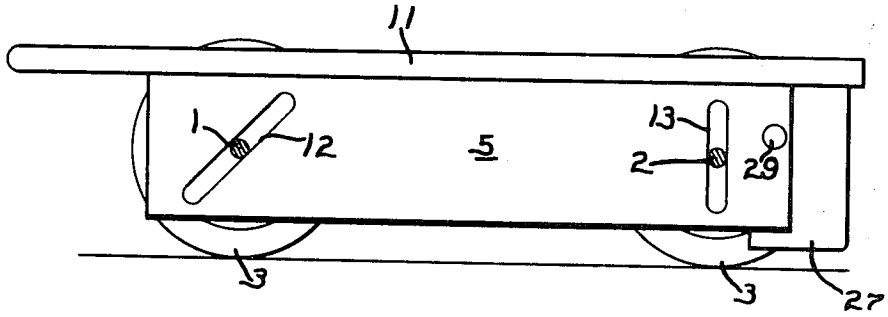
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Primary Examiner—Leo Friaglia
Attorney—Wells, St. John and Roberts

ABSTRACT: A vehicle has spaced-apart front and rear transverse axles each supported by a pair of wheels journaled thereon at its ends. A body is extended lengthwise of the vehicle over the axles and has side portions adjacent to the wheels. The body also has central rib structure hinged thereto and secured to and supported by the axles. The side portions have upright slots receiving the axles, the front pair of slots sloping forwardly from top to bottom to cause turning of the front axle upon lateral tilting of the body. The tilting of the body is opposed by resilient members connecting the rib structure to the side portions. A platform for a rider is provided on the body. A rear extension of the body behind the rear axle includes braking skids for engaging the surface beneath the vehicle upon raising of the front end of the body. The central rib structure is connected to the front axle by a member secured to the front axle and hinged to turn on an upright axis with respect to the rest of the rib structure.



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SHEET 1 OF 3

Fig - 1

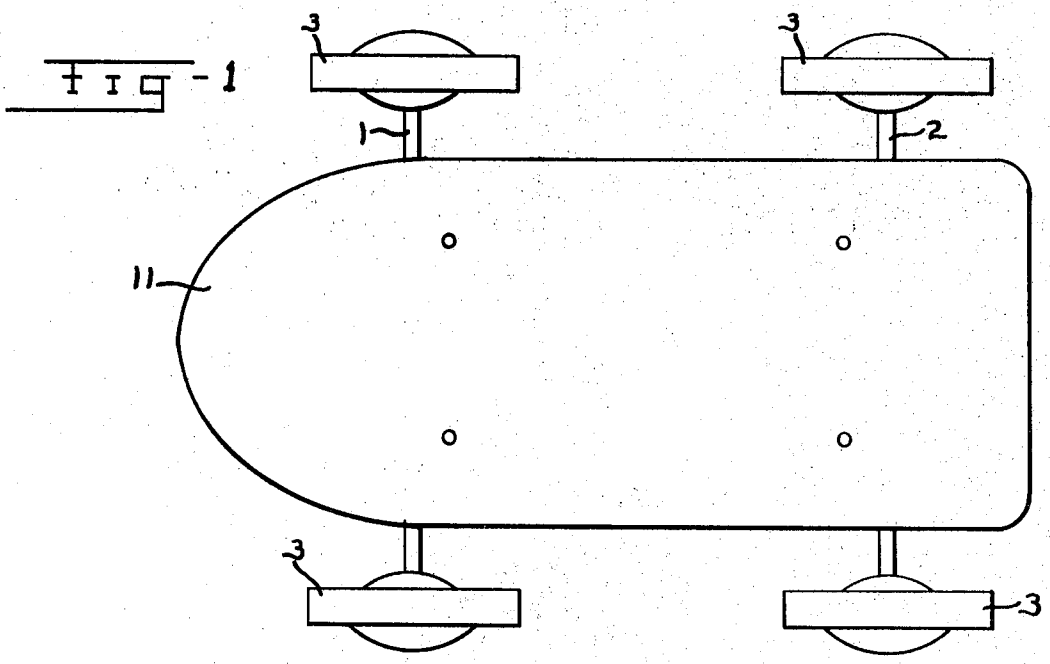
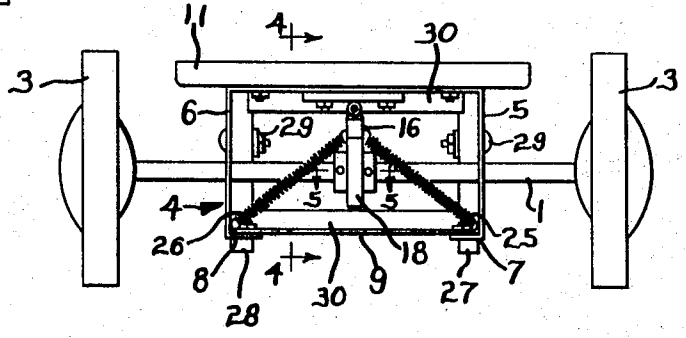


Fig - 2



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Fig. 3

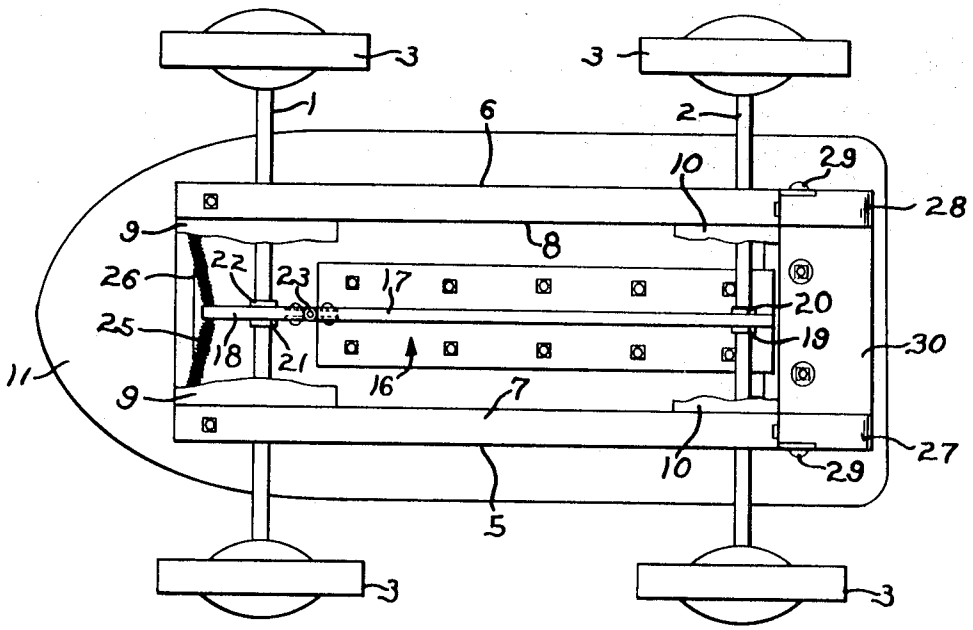


Fig. 4

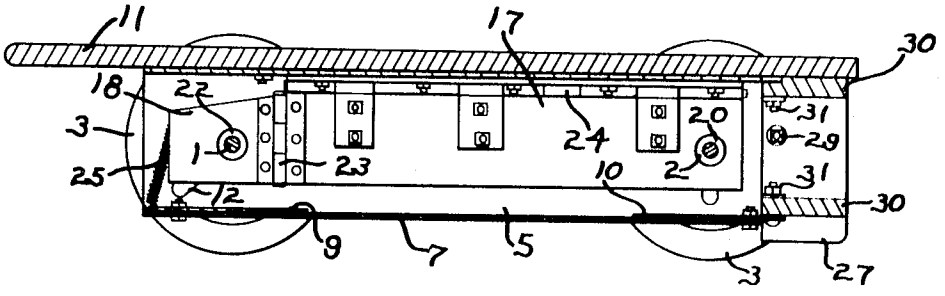
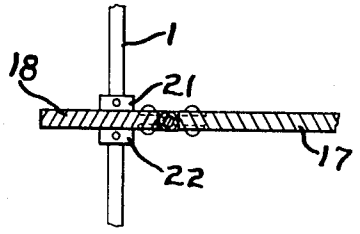


Fig. 5



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Fig - 6

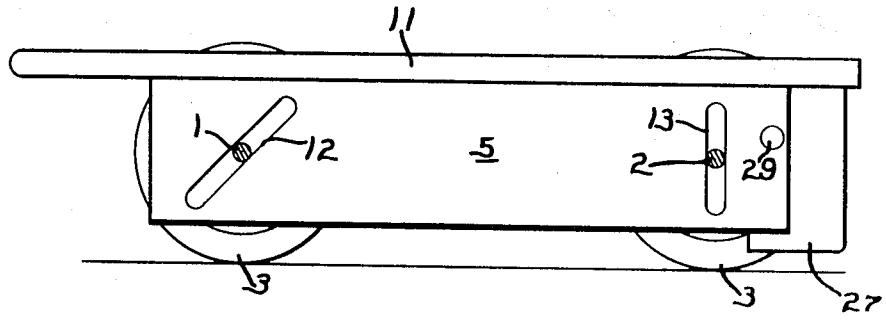


Fig - 7

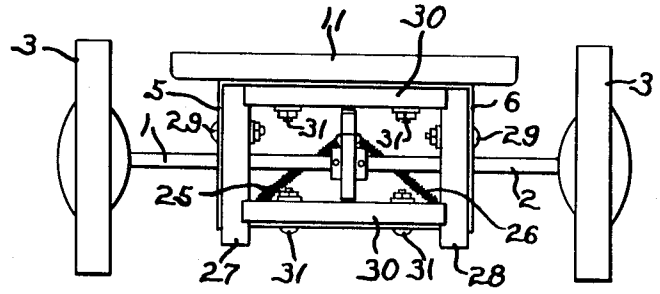
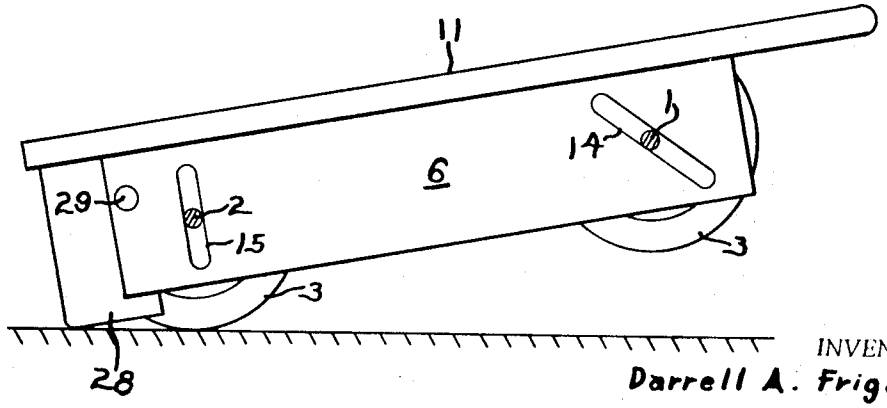


Fig - 8



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VEHICLE STEERED BY TILTING THE BODY

BACKGROUND OF THE INVENTION

The concept of using slotted sides upon a body of a vehicle such as the present invention shows is well known. The U.S. Pats. to Wooley & McKean No. 1,387,091 and to Tietge U.S. Pat. No. 3,331,612 are example of prior devices having this feature. Other prior U.S. Pats. of interest to show the state of development in this field are the following:

To Henley U.S. Pat. No. 1,070,468, To Gass U.S. Pat. No. 2,994,545, to La Chall U.S. Pat. NO. 1,150,773, to Rodriques U.S. Pat. No. 2,330,147, to Walker U.S. Pat. No. 1,145,342, to Kinslow U.S. Pat. No. 2,474,946, to Vogt U.S. Pat. No. 2,027,254, to Sakwa U.S. Pat. No. 3,288,251.

PURPOSE OF THIS INVENTION

The purpose of this invention is to provide, in a vehicle of the character described using slotted sidewalls as a means to turn the vehicle axle to steer the vehicle by tipping of the body, a novel body to axle connecting structure whereby adequate strength and stability is obtained by hinging a central rib structure to the body, locating the hinge immediately below the top platform of the body, and securing the wheel axles to this rib structure.

A further specific purpose of the invention is to provide in the central rib structure a connection from the central rib structure to the axle that is turned to guide the vehicle that increases the stability of the vehicle by moving the support point for the turning axle in the direction of leaning of the body.

A further purpose of the invention is to provide in a vehicle of the character described a novel braking skid structure for slowing the vehicle when the weight of the rider shifts too far rearwardly.

GENERAL DESCRIPTION

The preferred form of the invention is illustrated in the accompanying drawings wherein:

FIG. 1 is a plan view of a vehicle embodying the invention;

FIG. 2 is a front end view of the vehicle;

FIG. 3 is a bottom plan view of the vehicle;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is a fragmentary sectional view taken on the line 5—5 of FIG. 2;

FIG. 6 is a side view of the vehicle;

FIG. 7 is a rear end view of the vehicle shown in FIG. 6; and

FIG. 8 is a side view partly in section showing the vehicle tipped up in front to bring the braking means into braking position.

Referring now in detail to the drawings, the invention is shown as having a front axle 1 and a rear axle 2. Each axle has two wheels 3 journaled on its ends. The axles support a body 4 which has sidewall portions 5 and 6 with turned in flanges 7 and 8 at their bottom edges. Plates 9 and 10 connect the flanges 7 with the flanges 8 at the front and rear ends of the body 4. A platform 11 is bolted to the top of the body 4 and extends beyond the body 4 at both ends.

The sidewall portion 5 has two slots 12 and 13 through which the axles 1 and 2 extend. The front slot 12 slopes forwardly with respect to the vertical from top to bottom. The sidewall portion 6 has axle receiving slots 14 and 15 therein like the slots 12 and 13. The slot 14 slopes forwardly with respect to the vertical from top to bottom. These slots in the sidewall portions of the body 4 provide guide means, keeping the shafts positioned transversely of the body as the body is tilted to right or left. The sidewall portions do not support the shaft. The sloping front slots 12 and 14 do act to turn the axle 1 and its front wheels toward the lower sidewall portion when the body 4 is tilted out of position parallel to the surface on which the vehicle moves.

The body hangs upon a central rib structure 16 which is secured to and supported by the axles 1 and 2. The rib structure comprises a longitudinally running member that is secured to the axles. The member is in two portions 17 and 18. The rear portion 17 has the axle 2 extended through it and is clamped between two collars 19 and 20 on the axle 2. The front portion 18 is clamped in a like manner by collars 21 and 22 to the axle 1. The portions 17 and 18 are pivoted together by a hinge 23 so that, as the axle 1 is turned, the portion 18 can turn to right or left out of alignment with the portion 17. The portion 17 is connected to the body 4 by a hinge 24 that extends along the longitudinal center line of the top wall of the body 4. Thus the load on the body 4, including the weight of the rider is transmitted through the hinge 24 to the portion 17. Part of the weight is borne by the rear axle 2 and part of it is transmitted to the portion 18 through the hinge 23 and borne by the axle 1.

One advantage of the structure just described is that, upon turning the front axle 1 by tilting the body 4, the front portion 18 moves toward the low side of the body and away from the high side of the body to offer greater resistance to the tendency of the body to tip further.

Two resilient members 25 and 26 are connected under tension between the top front end of the portion 18 so as to exert equal pull when the portion 18 is perpendicular to the top of the body 4 and the platform 11. If the body 4 tilts in either direction, then the resilient members tend to restore the body to the position where their force is equal.

The rear end of the vehicle is provided with braking skids 27 and 28 affixed to the rear end of the body 4 by a series of bolts 29 and cross frame members 30, also bolted to the body 4 by bolts 31. If the rider's center of gravity gets behind the rear axle 2, the body will tip as shown in FIG. 9 to bring the braking skids 27 and 29 into contact with the surface on which the vehicle is supported. This contact opposes advance of the vehicle and thus enables the rider to slow down the vehicle at any time.

The embodiment of the invention in which an exclusive property is claimed are defined as follows:

1. In a vehicle having spaced-apart front and rear axles; each supported by a pair of wheels journaled thereon at its ends, and having a body extended lengthwise over the axles with a top platform to receive a rider, the improvement comprising:

depending sidewalls on said body adjacent to said wheels having upright slots therein receiving the axles;

the slots receiving one of said axles sloping away from the other axle from top to bottom of the slots whereby that axle is turnable to right or left by tilting of the body;

a central rib structure secured to said axles at their mid points and projecting upwardly therefrom between said sidewalls; and

hinge means pivotally connecting the top of said rib structure to the body whereby the body is carried on said rib structure immediately below the platform and can be tilted on the rib structure.

2. The device defined in claim 1 wherein the central rib structure is connected to the turnable axle by an upright member secured to the front axle and hinged to turn on an upright axis with respect to the rest of the central rib structure.

3. The device defined in claim 1 wherein the body has affixed thereto a pair of rearwardly extending braking skids, the lower surfaces of which are below the body and rearwardly of the rear axle.

4. The device defined in claim 1 wherein resilient means connect the lower portions of the sidewalls to the upper portion of said rib structure and resist tilting of the body on the rib structure.

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