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Peterson

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[45] **Oct. 23, 1973**

[54] **FOOT WORN TWO-WHEELED VEHICLE**

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[52] **U.S. Cl.** **280/11.2,** 280/11.23, 280/11.36

[51] **Int. Cl.** **A63c 17/14**

[58] **Field of Search** ..... 280/11.2, 11.23, 280/11.22, 11.37, 11.11, 11.19, 11.1 R, 11.1 BT, 11.21, 11.25, 11.36

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Assistant Examiner—Milton L. Smith
Attorney—Roger W. Erickson

[57] **ABSTRACT**

A two-wheeled vehicle adapted to be worn on a person's feet in the standup position so that they can be maneuvered like snow skis on a slope. Each vehicle is comprised of a frame supporting a pair of wheels at opposite ends and shaped so that the user's feet are located close to ground level. Toe and heel clamp means support the user's boot in the position that affords maximum stability and contol and movable calf support means pivotally connected to the heel clamp means includes a movable brake means for engaging the rear wheel when the user alters his position. Both wheels have relatively large low pressure tires with wide tread and provide a shock absorbing affect and at least one wheel has a one-way clutch hub to enable the user to climb slopes without rolling back.

6 Claims, 8 Drawing Figures

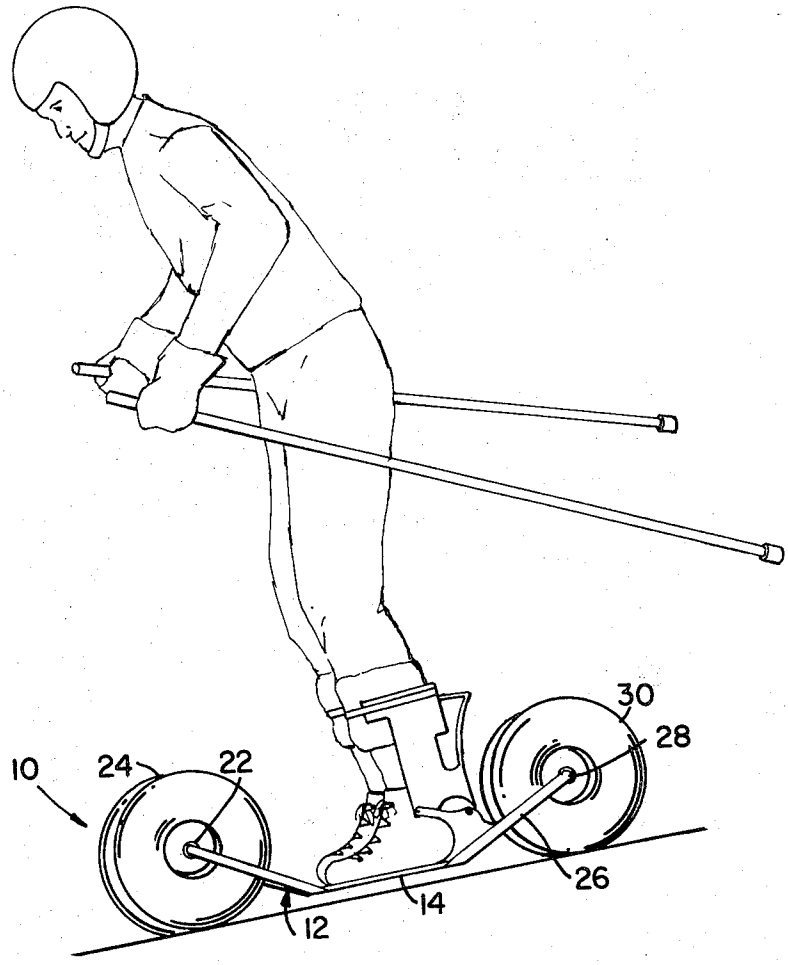


FIG_2

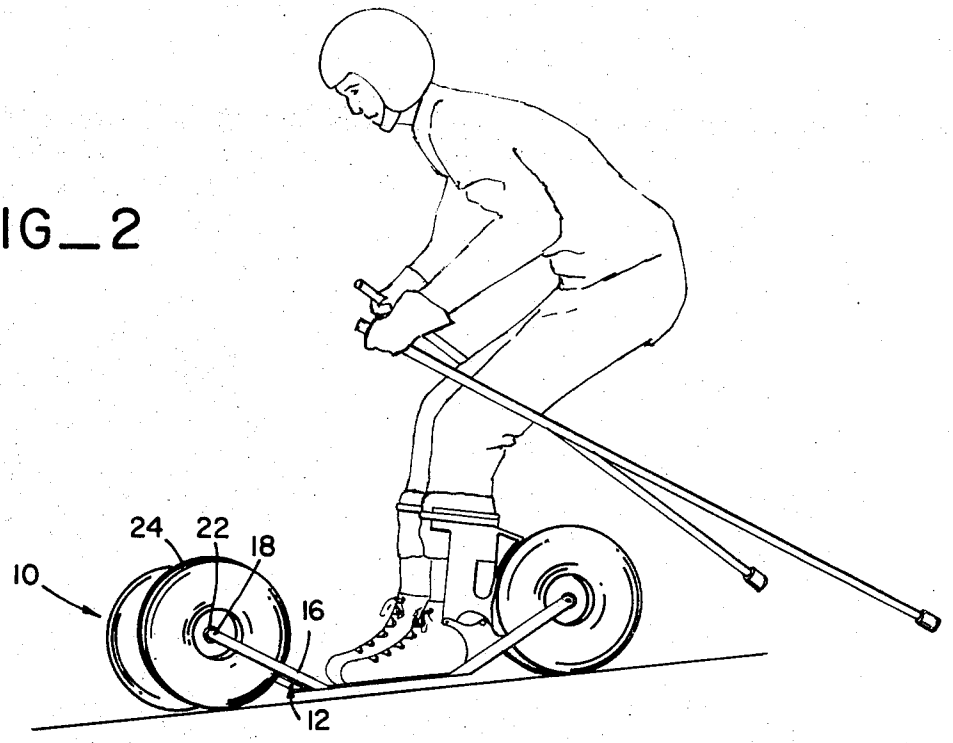
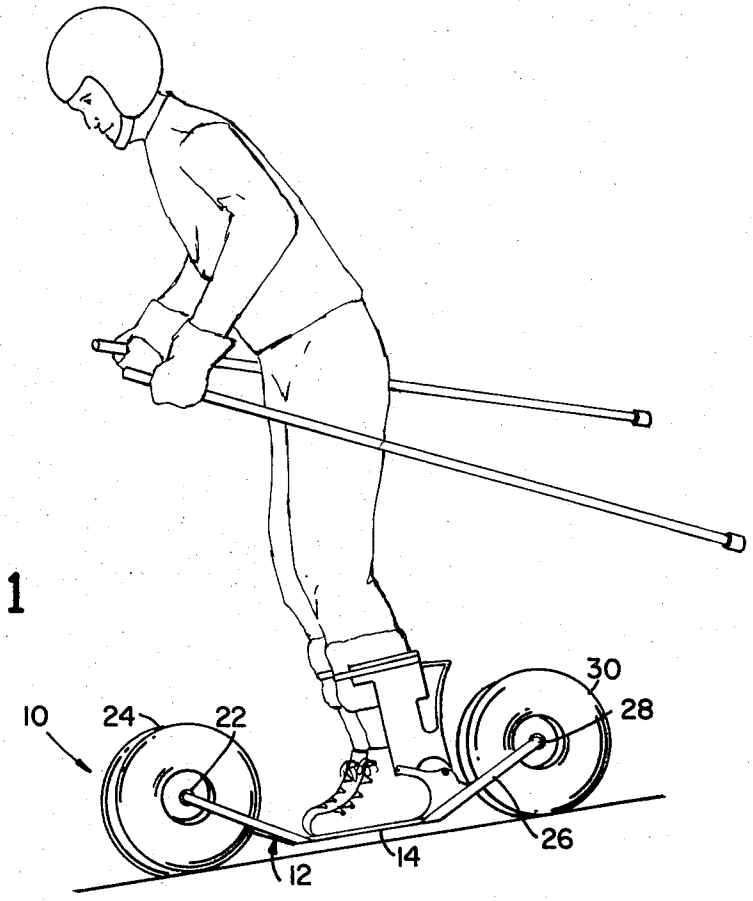


FIG_1



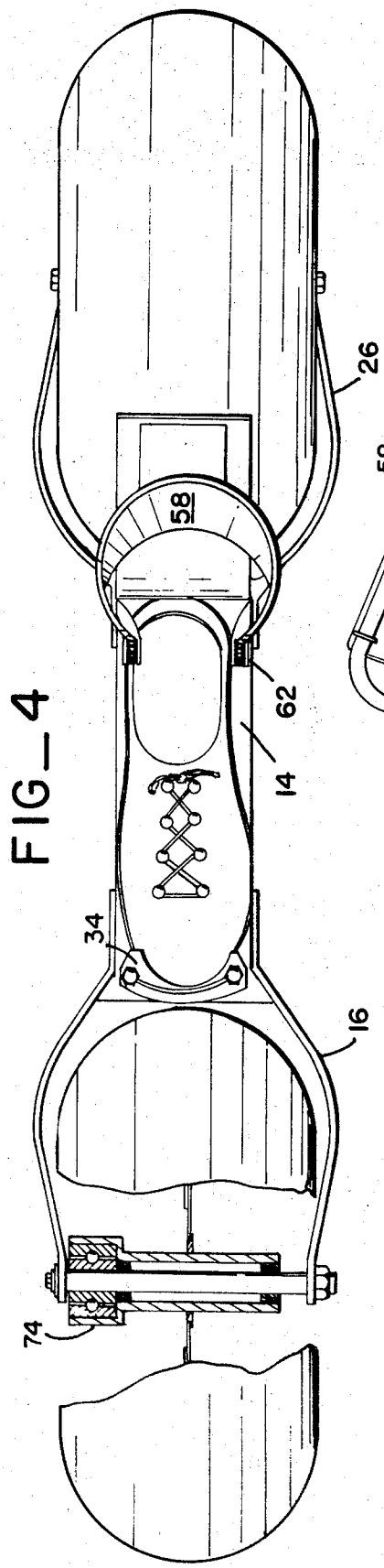

26
58
62
14
34
16
74

FIG_4

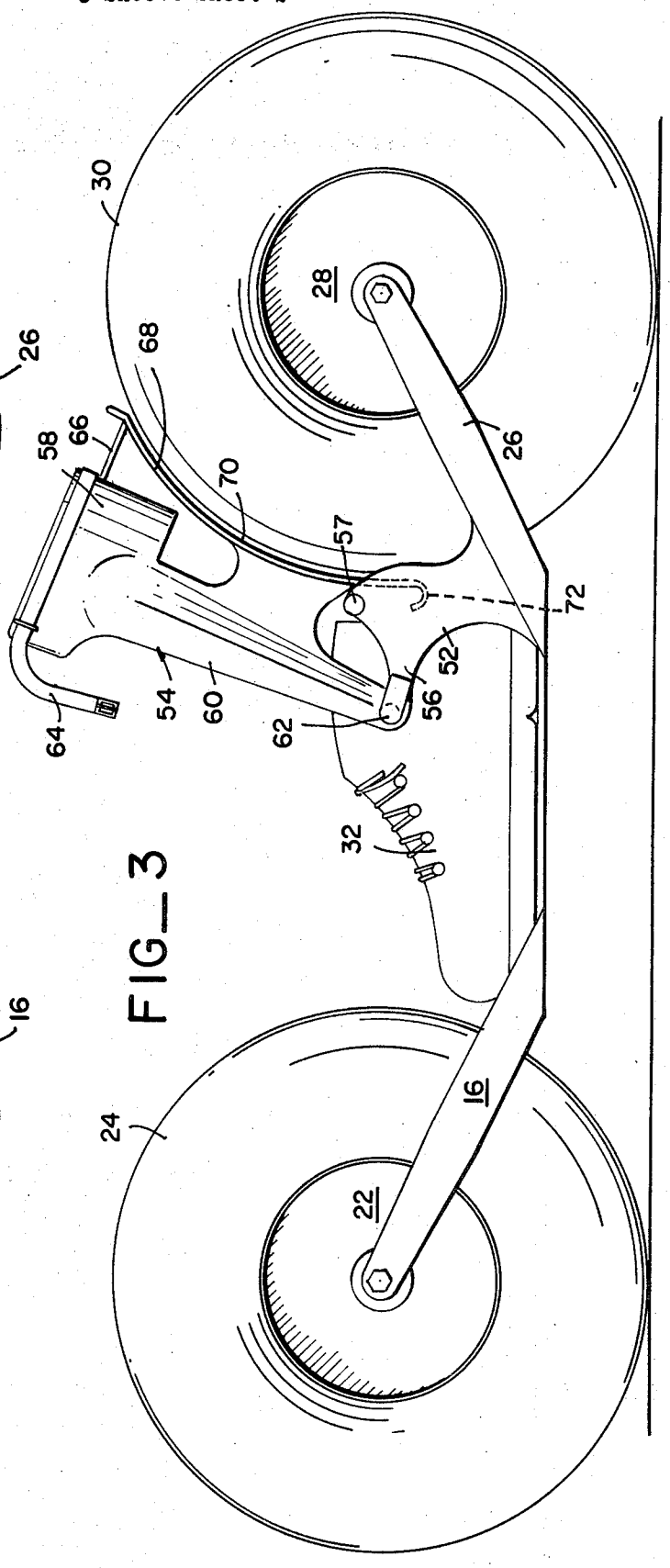

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FIG_3

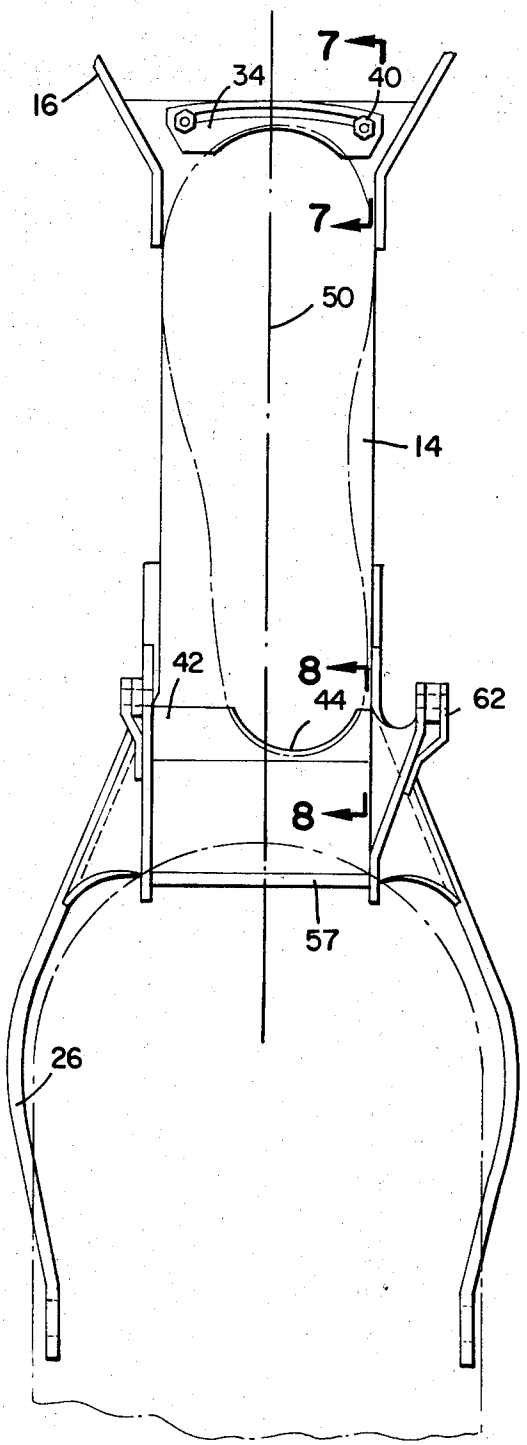


FIG_5

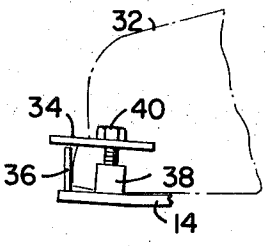


FIG_7

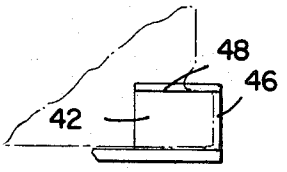


FIG_8

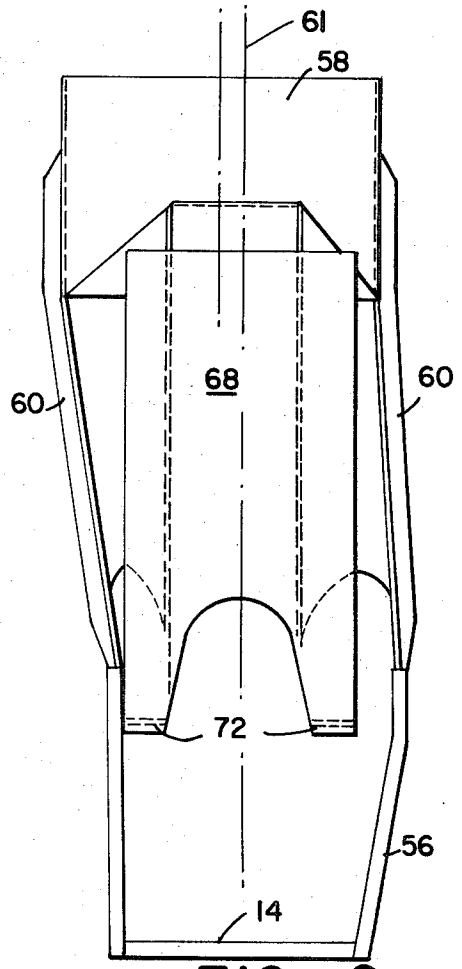


FIG_6

FOOT WORN TWO-WHEELED VEHICLE

This invention relates to foot-worn vehicles which, when worn in pairs on a person's feet, enables the user to maneuver on slopes of dirt, grass, snow or other surfaces much in the same manner as a person on conventional snow skis.

One general object of the present invention is to provide an improved foot-worn vehicle that will enable the user to attach one vehicle to each foot and perform ski-like maneuvers on slopes at relatively high speed, if desired, and yet with a high degree of comfort, stability and safety. Heretofore, foot-worn vehicles when used on slopes, particularly on relatively rough, unpaved terrain were difficult to control both as to direction and speed. This was caused by the relatively large amount of violent vibrations which were produced and had to be absorbed by the wearer's leg, a certain amount of imbalance and instability created by the lack of proper positioning of the user's feet with respect to the vehicle's wheels; and lack of adequate and responsive braking means.

Accordingly, it is another object of my invention to provide foot-worn vehicles which will solve the aforesaid problems of stability and control.

Another object of the present invention is to provide a foot-worn vehicle that is strong, durable and yet particularly well adapted for ease and economy of manufacture.

Yet another object of the present invention is to provide a foot-worn vehicle with an articulated leg holding means that holds the user's feet and legs firmly in a stability enhancing position relative to the vehicle while allowing him a considerable degree of movement to facilitate maneuvering.

The aforesaid objectives are accomplished by a two-wheeled foot-worn vehicle which generally comprises a frame or chassis with a center section for supporting the user's boot. Sloping upwardly from each opposite end of this center frame section are a pair of members forming a fork, the ends of which support an axle for one wheel. At least one of the wheels has a hub which includes a one-way clutch that prevents any backward rotation and thereby enables the user to "walk" up a slope without rolling back. On each wheel is a fairly large air filled tire having a wide tread and preferably of the type that utilizes a relatively low air pressure (e.g. 3 to 5 psi). Toe and clamp means are provided for holding the user's boot in place on the chassis center section and at a slight angle with it. A pivotal calf support is connected to the chassis near the heel clamp having a pivot axis which is substantially aligned with the natural foot-ankle joint axis of the wearer so that movement between the wearer's foot and calf can be normal. The calf support is adapted to be secured to the wearer's leg just below the knee so as to support the leg firmly in the position relative to the vehicle chassis that affords maximum stability. The calf support also comprises structure forming a braking member which can engage the rear wheel of the vehicle when the user simply alters his position. The elements of the vehicle structure are simple but uniquely combined in a cooperative arrangement to provide unusual stability and control for the user.

Other objects, advantages and features of the invention will become apparent from the following detailed description of one preferred embodiment thereof, presented in conjunction with the accompanying drawings, in which:

FIG. 1 is a view in perspective of a pair of vehicles according to my invention showing the user in the normal stance for free running down a slope;

FIG. 2 is a view similar to FIG. 1 showing the vehicle as they appear when the user is applying brakes

FIG. 3 is an enlarged view in side elevation of my foot-worn vehicle;

FIG. 4 is a plan view of the vehicle shown in FIG. 3 with portions of the front wheel broken away to show its hub in detail;

FIG. 5 is an enlarged fragmentary plan view of my vehicle;

FIG. 6 is a view in section of FIG. 5;

FIG. 7 is a view taken along line 7—7 of FIG. 5; and

FIG. 8 is a view taken along line 8—8 of FIG. 5.

With reference to the drawing, FIGS. 1 and 2 show a pair of two-wheel vehicles 10 embodying the principles of the present invention as they appear when worn by a person for amusement or sport activity by rolling down a sloped ground surface. These vehicles, worn on the user's feet are easily maneuvered in much the same manner as conventional skis are on snow slopes. The user maintains the vehicles parallel with his legs as close together as possible and he can follow either a straight line path or make turns and transverse from side to side when coming down a hill. Contrary to conventional skis, the vehicles are provided with means for braking which is operable by the user by simply changing his position, as shown in FIG. 2.

In general, each vehicle 10 is comprised of a frame 12 having central platform 14 formed of a rigid material such as a suitable metal and having a length and width that are great enough to accommodate a good sized boot that may be similar to but not necessarily identical with a conventional ski boot. Extending upwardly at an acute angle (e.g. 15°–25°) from the forward end of the central platform and from the opposite sides thereof are a pair of forward fork members 16. These fork members are also preferably made from a rigid metal and at their outer ends 18 they are journalled to support an axle 20 for a front wheel 22 and its tire 24.

A similar pair of fork members 26 are fixed to the rear end of the central platform 14 and extend rearwardly and upwardly therefrom at substantially the same angle as the front fork members. These rear fork members are also journaled at their outer ends to support a rear axle for a rear wheel 28 and its tire 30. Thus, as seen in FIGS. 1 and 2, the boat supporting platform 14 is considerably lower and closer to the ground than the axes of the wheels.

The front and rear wheels 22 and 28 are fairly small in diameter, but in accordance with my invention the tires 24 and 30 have a wide tread that may be 1-½ to two times greater than the width of the platform 14. These tires are preferably of the type that operate at relatively low pressure (e.g. less than 5 psi). Thus, the tires have a fairly large ground contact area or foot print of the size of the vehicle to provide good traction and they are relatively soft so that they can readily absorb small shocks or vibrations during running when small ground irregularities and/or rocks are encountered. In order for the front and rear fork members to accommodate the large wide tires they are curved out-

wardly from their inner ends that are fixed to the central platform **14.**

On the central platform suitable binding means are provided as shown in FIGS. 4 – 7 for holding the user's boot **32** firmly in position without allowing it to move. A toe binding means comprises an arcuate plate **34** that is supported along one edge by a curved upright stop member **36** extending between a pair of bosses **38,** all of which are fixed to the central platform. A pair of bolts **40** extend through openings near opposite ends of the plate and are threadedly secured in the bosses. When the welt of user's boot is under the edge of the plate **34** with the front edge of its sole against the stop member, the bolts can be tightened to hold it firmly in place.

A heel binding means for the user's boot comprises a transverse stop member **42** fixed to the central platform having a substantially semi-circular curved portion **44** within which the boot heel can fit. This stop member may be strengthened and supported by a rearward transverse member **46** and a top plate **48** adapted to fit over the welt of the boot sole, all of which are welded together and fixed to the central platform. As shown in FIG. **5,** the heel binding means, and more particularly its curved portion **44** on both vehicles are oriented on their respective central platforms so as to cause the user's boots to toe outwardly a slight amount from the longitudinal vehicle axis through the two wheels designated by the numeral **50.** I have found that this provides a stability and control factor which enhances the safe maneuverability of my foot-worn vehicles.

Now, attached to the rear fork members **26** and to the rear end of the central platform on each vehicle are bracket means **52** for a combined calf-supporting and brake member **54.** This bracket means has a pair of similar portions connected to each rear fork member, each one of which has a forwardly projecting bearing member **56.** Extending rearwardly and above these bearing members are tapered bracket portions to which are journaled a transverse cylindrical bar **57** that serves as a forward position stop.

The calf supporting member **54** for each vehicle is made of some suitable rigid material such as aluminum and comprises an open, substantially semi-circular cuff portion **58** and integral side portions **60** that extend downwardly therefrom. A suitable pin **62** pivotally connects a lower end of each side portion with a bracket bearing member **56** and this pin is located so that it will be substantially aligned with the axis of the user's foot and ankle joint. The cuff portion **58** has a strap **64** for securing it to the user's leg. As shown in FIG. **8,** the side portions **60** extending downwardly from it are bent slightly outwardly a few degrees with respect to a centerline (**61**) that is perpendicular to the central platform. This places the cuff portion **58** and thus the user's knees outwardly from the axial center line of the vehicles, thereby causing the vehicle to tilt slightly towards each other as the user brings his knees together. I have discovered that this further enhances the stability and controllability of the vehicles when worn, particularly when the user maintains his knees close together during downhill runs.

Attached to the cuff portion **58** and the downwardly extending leg portions **60** of each calf supporting member by means of rearwardly extending brackets **66** is a brake member **68** on each vehicle **10.** Essentially, this brake member is a curved piece of rigid metal having approximately the same radius of curvature as the outside tire diameter. A lining **70** of a suitable brake material is preferably bonded to the concave side of the brake member. At its bottom end, the brake member has curved integral hook portions **72** that are positioned to engage the transverse bar **57** so as to limit the forward inclination of the user as he is rolling down a slope (See FIG. **1**).

As shown in the broken portion of FIG. **4,** at least one of the wheels is provided with a hub **72** having a clutch **74** that provides only forward rotation of the wheel. Such non-reversible clutches are well known in the art and therefore will not be described in detail here. The use of such a one-way mechanism on the wheels enables the vehicle user to climb up a slope easily without rolling backward between forward "steps."

In operation, my foot-worn vehicles are controlled on downhill slopes much like conventional snow skis. The vehicles are kept essentially parallel, and as they roll forward the relatively soft tires absorb the shock of minor bumps, ruts or small ground obstructions. Turns are made by shifting the user's weight and tilting the vehicles to one side or the other.

From the foregoing it should be apparent that the present invention comprises a foot worn vehicle capable of providing recreation much like conventional skis on gentle or even relatively steep slopes with ease and safety. Moreover, the arrangement and construction of components is such that my vehicles can be manufactured at relatively low cost and will be long lasting and relatively free of expensive maintenance.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. A vehicle adapted to be worn with a similar vehicle on a person's feet for recreational use comprising:

a central platform;

frame means fixed to and extending upwardly at an angle from opposite ends of said platform;

front and rear wheel means supported by the ends of said frame means so that their axes are above said platform, and a tire on each said wheel means;

means on said central platform for securing the user's footwear; and

a combined calf supporting member and brake means comprising a pair of elongated side members pivotally journalled at their lower ends to bearing means attached to said platform adapted to be substantially aligned with the wearer's foot and ankle joint, a cuff portion fixed to the upper ends of said side members, and an arcuate brake member fixed to said side members and said cuff portion and pivotal therewith with respect to said platform to engage the rear tire by movement of the user's legs thereby enabling control of the vehicle on a downhill slope.

2. The vehicle as described in claim **1** including a transverse member fixed to said bearing means and stop means on the lower end of said arcuate brake member to engage said transverse member and limit

the forward pivotal range of said calf supporting member.

3. The vehicle as described in claim 2 wherein said tranverse member is a fixed rod extending between said bearing means and said stop means comprises a hooked portion at the ends of said brake member.

4. A vehicle adapted to be worn on a person's foot for recreational use comprising:

a central platform;

a pair of curved fork members fixed to opposite ends of said platform and extending upwardly therefrom at a small angle;

front and rear wheel means supported by the ends of said pairs of fork members, and a relatively large low pressure tire on each said wheel means;

means on said central platform for securing the user's footwear including toe clamp means and heel clamp means on said central platform spaced inwardly from said toe clamp means with respect to a longitudinal axis perpendicular to the axes of rotation of the front and rear wheels, whereby the user's feet are automatically toed outwardly when vehicles are attached to both feet; and

a combined calf supporting member and brake means pivotally connected to said central platform, said brake means being engageable with said rear wheel by movement of the user's legs thereby enabling control of the vehicle on a downhill slope.

5. A vehicle adapted to be worn on a person's foot for recreational use comprising:

a central platform;

a pair of curved fork members fixed to opposite ends of said platform and extending upwardly therefrom at a small angle;

front and rear wheel means supported by the ends of said pairs of fork members, and a relatively large low pressure tire on each said wheel means;

means on said central platform for securing the user's footwear; and

a combined calf supporting member and brake means pivotally connected to said central platform, said calf-supporting member comprising a curved, open cuff portion adapted to retain the rear portion of the user's calf muscle and a front strap member and downwardly extending leg portions on said cuff portion pivotally attached to said central platform, said leg portions being bent at a slight angle from their lower ends with respect to a line perpendicular to the platform so that said cuff portion is not located directly above the platform, said brake means being engageable with said rear wheel by movement of the user's legs thereby enabling control of the vehicle on a downhill slope.

6. A vehicle adapted to be worn on a person's foot for recreational use comprising:

a central platform;

a pair of curved fork members fixed to opposite ends of said platform and extending upwardly therefrom at a small angle;

front and rear wheel means supported by the ends of said pairs of fork members, and a relatively large low pressure tire on each said wheel means;

means on said central platform for securing the user's footwear; and

a combined calf supporting member and brake means pivotally connected to said central platform, said brake means including a curved metallic member having substantially the same outer diameter as said rear tire and a lining material bonded thereto, said metallic member being fixed to said calf-supporting member, said brake means being engageable with said rear wheel by movement of the user's legs thereby enabling control of the vehicle on a downhill slope.

* * * * *