Jan. 2, 1968 V. E. WILLIAMS 3,361,436

SKIING DEVICE

Filed Oct. 20, 1965 4 Sheets-Sheet 1

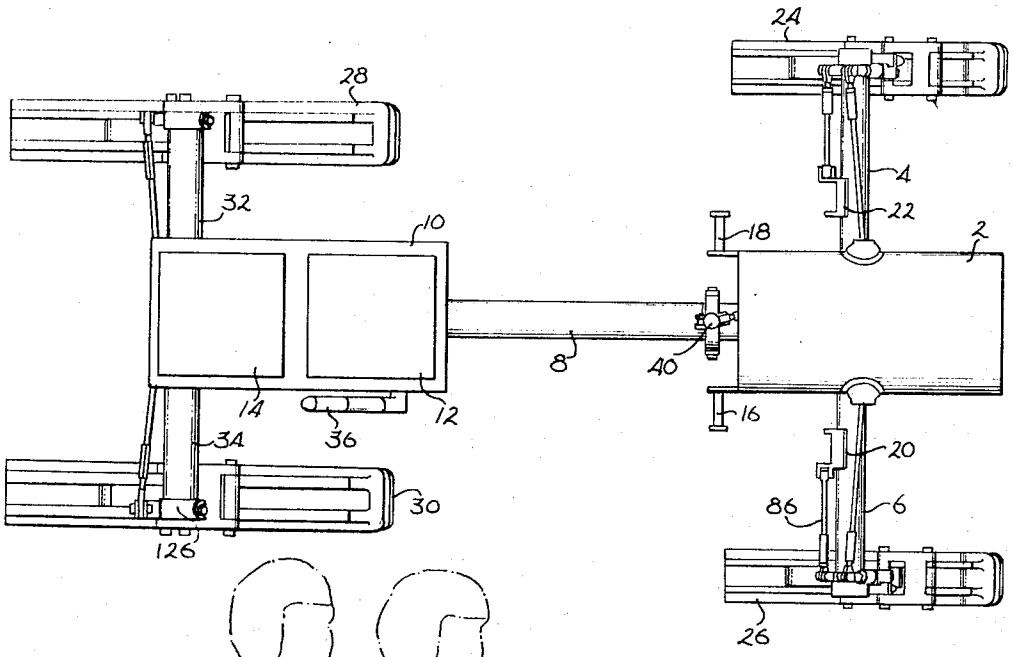


FIG. 1

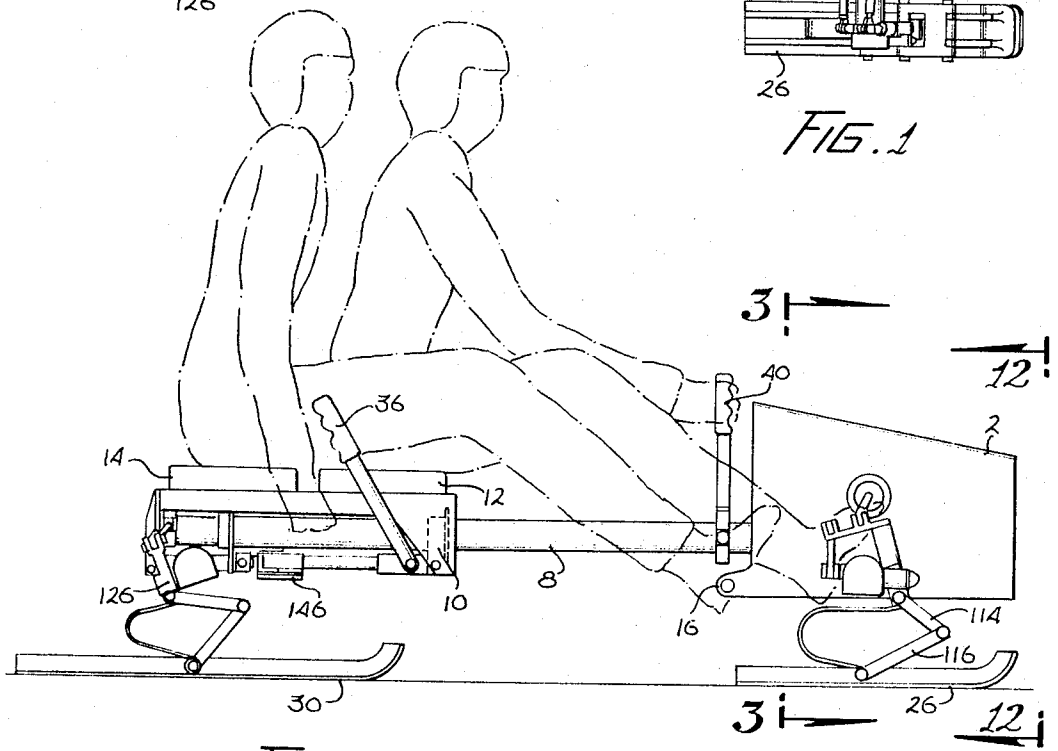


FIG. 2

VERRIL E. WILLIAMS,
INVENTOR.

BY R. E. Beaupre

ATTORNEY

Jan. 2, 1968 V. E. WILLIAMS 3,361,436

SKIING DEVICE

Filed Oct. 20, 1965 4 Sheets-Sheet 2

FIG. 3

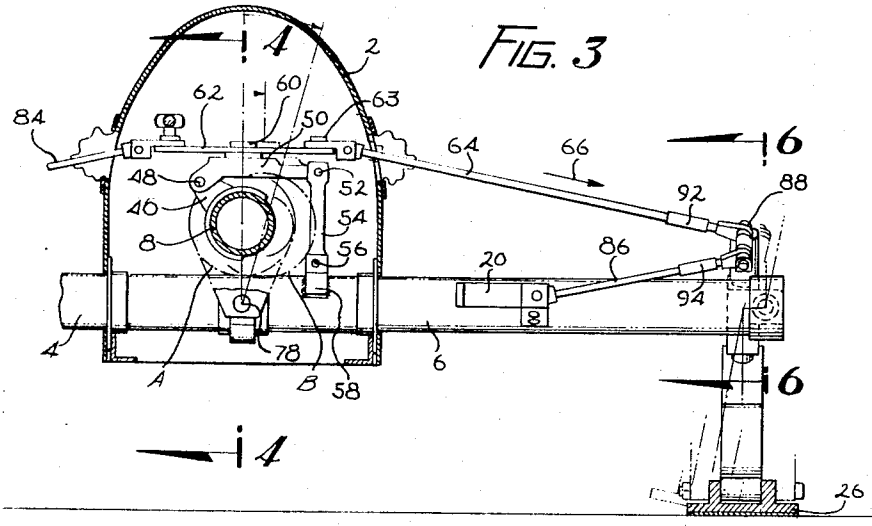


FIG. 4

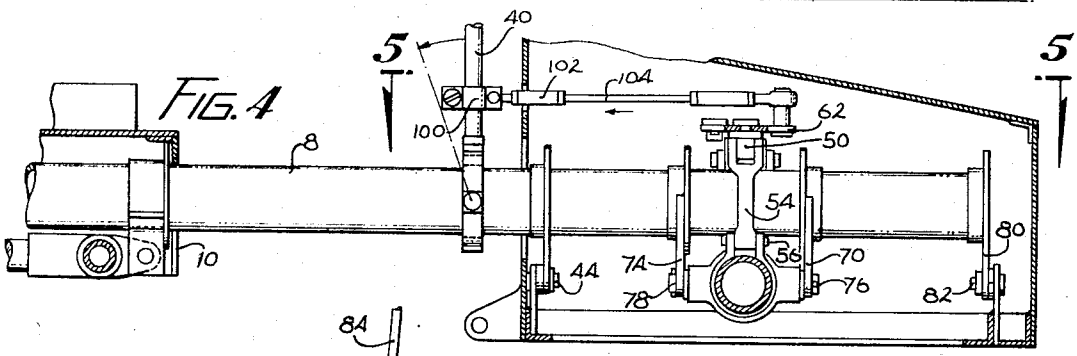


FIG. 5

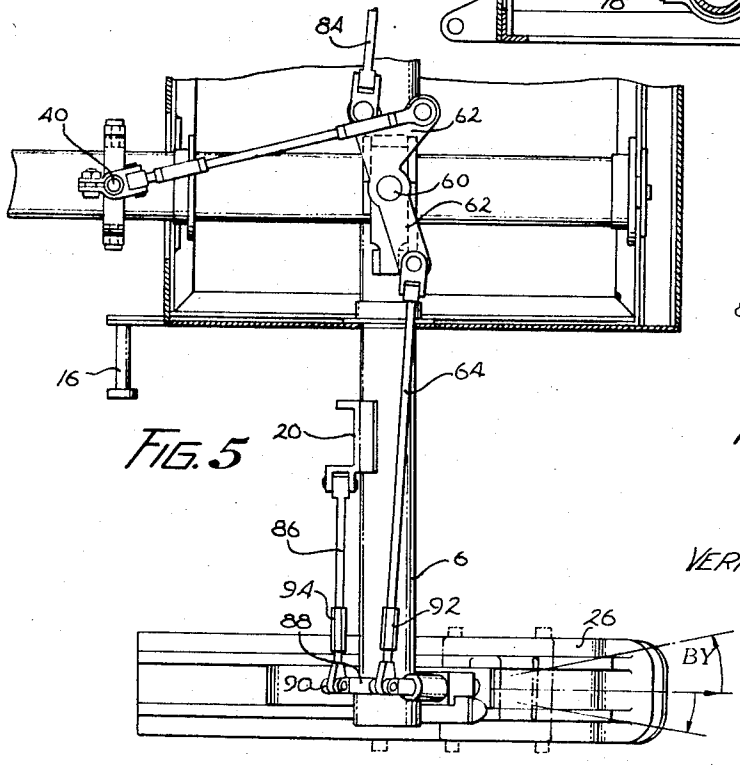
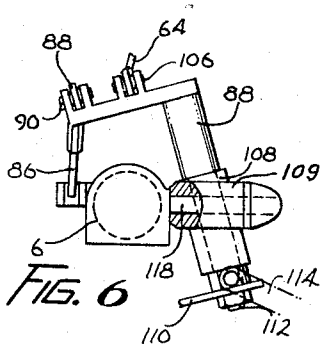


FIG. 6



VERRIL E WILLIAMS,
INVENTOR.

R. E. Krampe
ATTORNEY

Jan. 2, 1968 V. E. WILLIAMS 3,361,436

SKIING DEVICE

Filed Oct. 20, 1965 4 Sheets-Sheet 3

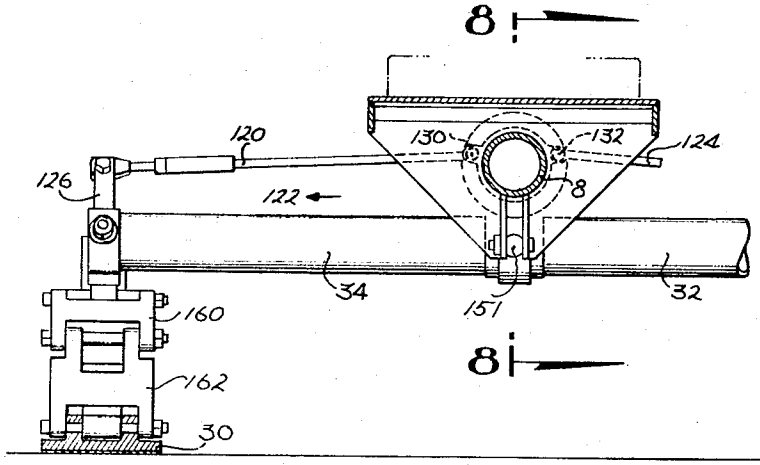


FIG. 7

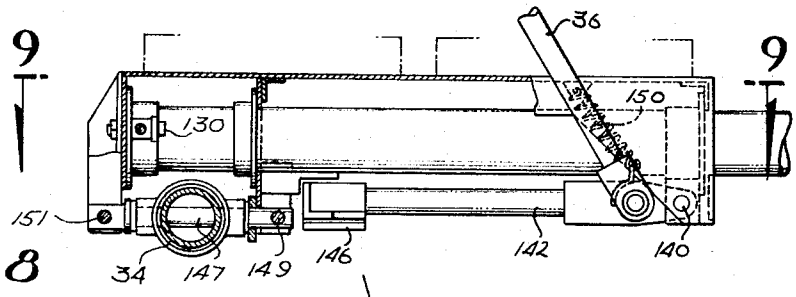


FIG. 8

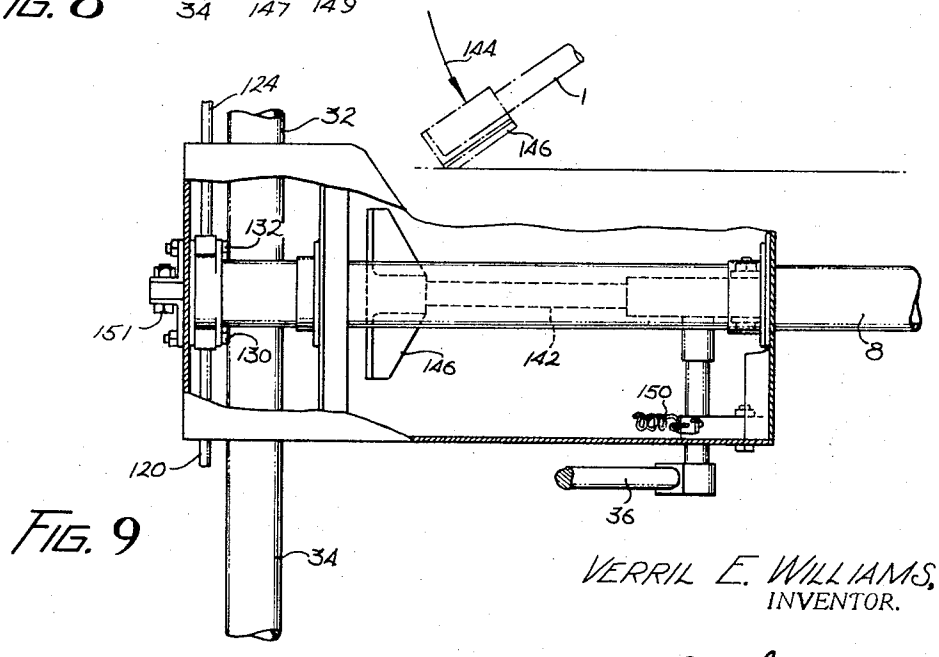


FIG. 9

VERRIL E. WILLIAMS,
INVENTOR.

BY R. E. Beaugue

ATTORNEY

Jan. 2, 1968 V. E. WILLIAMS 3,361,436

SKIING DEVICE

Filed Oct. 20, 1965 4 Sheets-Sheet 4

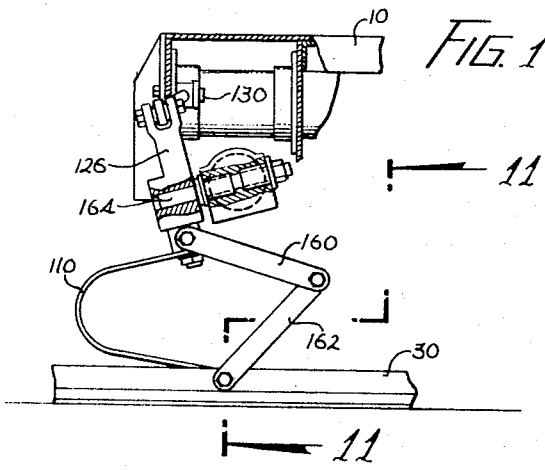


FIG. 10

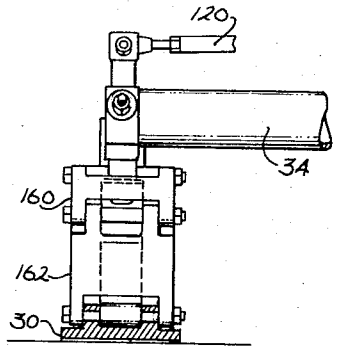


FIG. 11

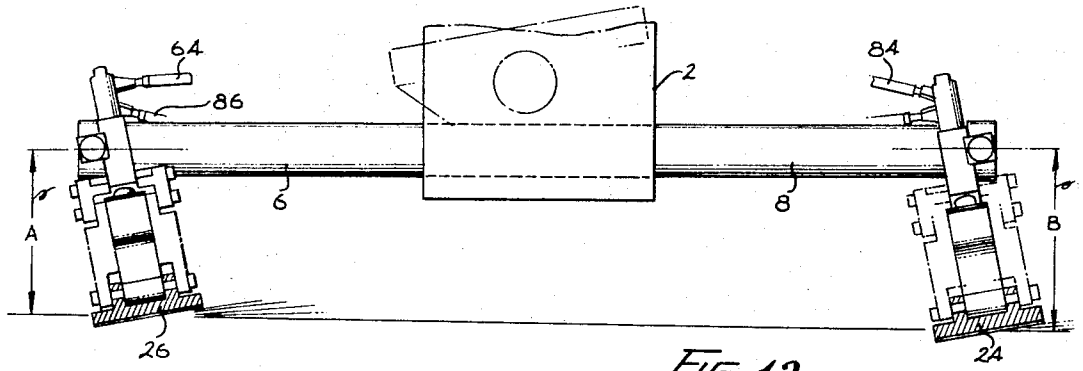


FIG. 12

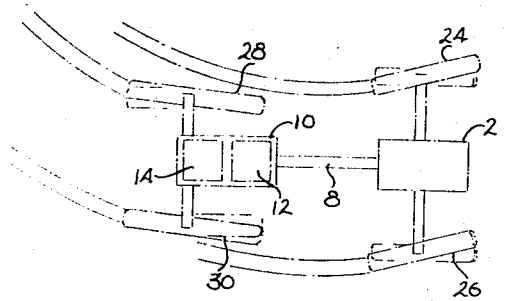


FIG. 13

VERRIL E. WILLIAMS,
INVENTOR.

BY R. E. Beaugue

ATTORNEY

United States Patent Office

3,361,436

Patented Jan. 2, 1968

3,361,436

SKIING DEVICE

Verril E. Williams, Los Angeles, Calif. (4923 Escobedo Drive, Woodland Hills, Calif. 91364)

Filed Oct. 20, 1965, Ser. No. 498,403
12 Claims. (Cl. 280—16)

ABSTRACT OF THE DISCLOSURE

A ski sled having a pair of transverse frames disposed fore and aft, each supported at its ends by runners, and a longitudinally extending control member linked to and movable laterally with respect to the transverse frames, which movement is effected by a unitary control lever. Each runner is connected to its frame by means providing for tilting movement about a substantially horizontal axis and turning movement about a substantially vertical axis and is connected by linkage to the control member so that lateral movement of the member causes simultaneous tilting and turning of the runners for steering and banking the sled. The unitary control lever is pivoted to the control member for swinging movement in a longitudinal plane and is linked to the linkage of the front runners for turning each of them oppositely to effect a braking action.

This invention relates to a skiing device.

More particularly this invention relates to a skiing device whereupon one or more persons can sit and emulate the action of a person on skis whereby the skis or runners of the device will tilt to bank the skiing device around the corner while at the same time steering the device.

While skiing on a pair of skis, the individual will normally approach a downwhill run on a pair of runners with the runners faced forwardly and parallel to each other with the surface of the runners parallel to the ground. When it is necessary to turn or traverse a corner, the skier normally will lean into the skis and at the same time turn the legs so as to effectuate a turning action. This results in both skis being parallel together about the vertical axis and turning toward the direction of the desired turn and with the plane of each ski runner being approximately the same but tilted about a horizontal axis so as to "bank."

While the turning and banking action of a pair of runners becomes natural to a skier who has had lots of practice, such movement is difficult for the novice. This difficulty also arises in trying to use a mechanical device designed to accomplish the same purpose as a pair of skis on an accomplished skier. For example, on the ordinary sled upon which children ride, the runners are often connected to a framework by which the direction of travel of the runners when twisted will result in a change in the direction of travel. Ordinarily, however, the common sled, not being subjected to extremes of centrifugal forces satisfactorily performs without a loss of lateral travel. In other words, there is no need to provide for banking of the runners.

There is a need for a vehicle by which not only an efficient steering action is provided for travelling over snow or the like but also some means to prevent lateral movement during the turning action. This lateral movement is prevented by a tilting action of the runners of the ski device so as to provide a banking action. In addition, effective means for braking the ski device or the like is necessary without additional complex structure.

An example of devices which have been devised for braking a vehicle or slowing it down can be found in U.S. Patent No. 1,510,560 as well as in U.S. Patent No. 1,695,901.

Examples of a device which provides steering of a ski

device in snow or the like can be found in the U.S. Patent to Redling, No. 2,353,501.

Examples of banking ski devices which provide a means for steering a vehicle by tilting these runners or the like can be found in U.S. Patents Nos. 2,589,764, 2,700,427 and 2,905,479. All of these devices have their applicability in situations wherein it is desired to steer the vehicle either by turning the runners in the direction of travel or by tilting the runners in the direction of travel. The other examples given provide a braking means whereby the vehicle can be slowed down by the application of a force to toe in the skis or the like. However it is not known in the prior art to provide a means whereby both a tilting and steering action can be provided in a common control mechanism and in addition to these aforementioned functions to provide a means whereby a braking action be provided in the same control mechanism.

In its briefest aspects, this invention can be described as a skiing device where, by the use of a single control means, a tilting, steering and braking action can be applied to the runners so as to effectively steer the vehicle by a common control mechanism about steep corners at high speeds. This mechanism, which is controlled by a single control lever, operates to both tilt the runners of the skiing device as wall as turn them so as to effectively more about the corner. By a simple movement, the control devices can also actuate a braking system so as to stop the vehicle.

It is therefore an object of this invention to provide a skiing device whereby a tilting and steering action can be controlled by a single control lever.

It is another object of this invention to provide an improved ski device.

Other objects and advantages of this invention will become apparent as this description proceeds taking in conjunction with the drawings in which:

FIGURE 1 is a top view of the ski device according to this invention,

FIGURE 2 is a side view of the skiing device according to this invention with an indication of the positons of two passengers thereon,

FIGURE 3 is a view partially in cross section along line 3—3 of FIGURE 2 looking toward the rear of the front portion of the skiing device,

FIGURE 4 is a view partially in cross section taken along line 4—4 of FIGURE 3 looking at one side of the skiing device,

FIGURE 5 is a view partially in cross section taken along line 5—5 of FIGURE 4 of a plan view of a portion of the skiing device according to this invention,

FIGURE 6 is a side view partially in cross section of the front turning crank assembly taken along line 6—6 of FIGURE 3 according to this invention,

FIGURE 7 is a view of the rear end of the device partially in cross section looking from the front,

FIGURE 8 is a view of the device shown in FIGURE 7 along the lines 8—8.

FIGURE 9 is a view of the device as viewed along the lines 9—9 of FIGURE 8,

FIGURE 10 is a view partially in cross section of a detail of the turning crank and linkage assembly of the rear of the vehicle,

FIGURE 11 is a view of the apparatus shown in FIGURE 10 as viewed along the lines 11—11.

FIGURE 12 is a front view of the vehicle shown in FIGURE 1, and,

FIG. 13 is a view of the position of the runners as the skiing according to this invention goes around a corner.

Referring to FIGURE 1, there is shown a body member 2 which has extending on both sides therefrom frame members 4 and 6. A torque tube 8 extends from the interior of body 2 and passes through rear body member 10.

Mounted on body 10 are seats 12 and 14 accommodation of passengers as more particularly shown in FIGURE 2. Footrests 16 and 18 are shown which accommodate the rear passenger while footrests 20 and 22 which also form part of the bracket mechanism as more fully explained later accommodate the front passenger.

The ski sled device has four runners shown at 24, 26, 28 and 30. Runners 28 and 30 are supported by rear frame members 32 and 34 respectively. Brake handle 36 when actuated applies braking mechanism 146 which is shown in more detail in FIGURE 8. Front handle 40 operates a linkage which will both tilt and steer the vehicle and in addition can apply a braking action to the front runners.

Referring to FIGURE 3, torque tube 8 is shown in cross section. Handle 40 is attached to torque tube 8 as shown in FIGURE 4 with torque tube 8 pivoted about pivot pin 44. Thus, movement of handle 40 to the left or to the right will move or roll the torque bar laterally as shown in dotted lines in FIGURE 3. Connected to torque tube 8 is a bracket 46 which is hinged by means of pin 48 to a turntable platform 50 which in turn is pinned by pin 52 to leveling arm 54 which is pinned at 56 to support member 58. When torque tube 8 is rolled or moved laterally to the right from the position shown in dotted line A to the position shown at B, turntable platform 50 remains level and likewise moves to the right. Attached by pin 60 to turntable platform 50 is a turntable 62. Pinned at 63 is tie-rod 64 which will move to the right in the direction of arrow 66 when the torque bar 8 is rolled to the right.

As shown in FIGURE 4 torque bar tubes in addition to being pivoted to pivot pin 44 has located thereon supporting members 70 and 74 which pivot about pins 76 and 78 respectively with another support frame 80 which is pivoted about pin 82 in a similar manner. Thus, movement of handle or "joy stick" 40 to the left or right will cause rotation and lateral or torque tube 8 about the re-respective pivot points thus causing tie-rods 64 and 84 to move laterally, one of the tie-rods moving to the right and the other tie-rod likewise moving to the right. Attached to footrest or bracket 20 is a snubbing rod 86 which is attached at the other end to turning crank 88. This attachment is made by pin 90 (see FIGURE 6). Adjustment of both tie-rod 64 and snubbing rod 86 is accomplished by turnbuckles 92 and 94. Similar mechanisms are employed on the remaining snubbing rods and tie-rods for the other runners. Referring again to FIGURE 4, control handle 40 by means of bracket 100 and turnbuckle 102 is attached to rod 104 and thence to the turntable 62. Tie-rod 64 (see FIGURE 6) is attached to turning crank 88 by means of pin 106. Turning crank 88 passes through and is rotatable relative to bushing or bearing 108 substantially vertically disposed and having a sleeve 109 rigid therewith which is journaled on a horizontally disposed rod or spindle 118 rigid with the end of the frame (FIGURE 6). Runner 26 is connected to a knee action assembly which is made up of arms 114 and 116 and spring member 110 and provides torsional rigidity, the assembly being secured to crank 88 as at 112 (FIGURES 2, 5 and 6). Thus, the runner is mounted for tilting movement about the substantially horizontal axis of rod 118 and for turning in the substantially vertically disposed bearing 108.

When the control stick is actuated to the right as shown in FIGURE 3, tie-rod 64 moves to the right thus exerting an outwardly directed force on turning crank 88. This force results in a horizontal movement about pivot pin 118 resulting in a tilting of runner 26 as shown in dotted lines in FIGURE 3. At the same time, there is rotation about a substantially vertical axis through bearing member 108 causing the front of runner 26 to move to the right thus directing the runners in the desired direction of travel. It can be seen therefore that by one simple movement, both a tilting and steering action is accomplished. In addition, the riders, by leaning toward the direction of turn will change the center of gravity toward the inside of the curve.

Another feature of this invention includes the provision for a braking action upon movement of the control lever 40 rearwardly. This is most clearly brought out in FIGURE 5. When control lever 40 is pulled rearwardly, turntable 62 will pivot about pin 60 forcing both tie-rods 64 and 84 inwardly toward body 2. This will cause both runners to be turned inwardly to effectuate a braking action much the same manner as the accomplished skier using ski brakes.

The rearward runners are actuated in much the same manner as the front runners except that no snubbing bar is used. With this arrangement, movement of the control handle 40 will cause tilting of rear runners 30 and 28 in the same direction as front runners 24 and 26 except that they will be steered in the opposite direction in the manner shown in FIGURE 13. This increases the steering action and allows the rearward portion of the vehicle to be steered as well as the front portion. A view from the front looking toward the rear portion of the vehicle is shown in FIGURE 7. Thus, rotation of torque bar 8 to the right (as viewed in FIGURE 7) will force tie-rod 120 to the right as shown by arrow 122 and tie-rod 124 will likewise be moved to the right as torque bar 8 rotates and moves laterally to the right. This will exert forces on the respective rear turning cranks such as 126 thus tilting ski or runner 30. The arrangement is slightly different than that shown from the front end of the vehicle since the braking action caused by toeing in of the front runner is not needed. Thus a simple hinge or pivoting arrangement such as shown at 130 and 132 is all that is necessary to move tie-rods 120 and 124. Although a snubbing bar is not used, the rear runners will not only tilt but will steer in a direction opposite to that of the front runners. This is due to the slight vertical angle of pin 164 (see FIGURE 10).

In FIGURE 8 there is shown a braking mechanism for the vehicle which is in addition to that caused by the toeing in of the front runners. A brake handle 36 when moved to the rear and downwardly in the direction of arrow 144 will pivot about pin 140 to cause movement of bar 142 from the position shown in FIGURE 8 as horizontal to that shown in the direction of arrow 144 to cause shoe member 146 to dig into the snow or ice as the case may be, thus to slow the vehicle down. Handle 36 and bar 142 is normally biased in a direction opposite that of arrow 144 by spring 150. A view of the braking mechanism looking down thereon is shown in FIGURE 9.

FIGURE 10 is a detail of one of the rear runners 30 and in many respects is similar to the front runners. Thus torsion bars 160 and 162 are provided to lend torsion stability to spring 110 and runner 30. In a like manner turning crank 126 can move about a substantially horizontal axis represented by pin 164 and about a slight vertical axis to cause the required tilting and steering action in a direction opposite that of the front runners. In other respects, the action of the rear turning crank assembly is substantially similar to that of the front turning crank assembly. Thus it can be seen that movement of torque bar 8 about pivot points 44 and 82 will cause the rear runners to tilt in the same direction as the front runners and will steer as shown in FIGURE 13.

To aid in turning and to afford a banking action for the riders, rear body member 10 will tilt in response to the steering action. This is accomplished by body member being pivoted about pin 147 (see FIGURE 8) which passes through tubes 34 and 32 (which may comprise a single tube). Pin 147 is in turn held by pins 149 and 151. Thus, as torque bar 8 is shifted, body member 10 will shift with it to provide a rotation about pin 147. Preferably, pin 147 would be in line with pins 44, 76, 78 and 82.

Thus it can be seen that by this device a skiing assembly has been provided by which riders can ride on the skiing device and by a simple movement of control lever cause both a tilting and steering action to occur much in the same manner as the professional skier on skis changes direction. In addition, the single control lever by a different manipulation acts as a brake.

Having described this invention, it is to be understood that the scope of the invention is to be limited only by the claims appended hereto.

What is claimed is:

1. A ski sled device comprising:

a frame having a longitudinal axis; a plurality of longitudinal runners adapted to support said frame and each attached thereto by connecting means providing for tilting movement about a substantially horizontal axis and turning movement about a substantially vertical axis;

control means on said frame including laterally movable means and a unitary control lever for effecting such lateral movement; and

linkage means connected to said laterally movable means and said runners, said laterally movable means being adapted to move said linkage means for tilting said runners in the same direction about their respective horizontal axes and simultaneously turning said runners in the same direction about their respective vertical axes.

2. A ski sled device according to claim 1 wherein said connecting means includes a member individual to each runner and supported for tilting movement on said frame, said member having a substantially vertical axis and journaling its respective runner for turning movement.

3. A ski sled device according to claim 1 and further including second linkage means connected between said unitary control lever and said first-named linkage means for turning said runners in opposite directions about their respective vertical axes whereby to act as a brake.

4. A ski sled device according to claim 1 wherein there are two front runners and further including at least one back runner; and

third linkage means connecting said back runner to said laterally movable means;

said laterally movable means being adapted to move said third linkage means for turning said runner about a vertical axis in a direction opposite to said front runners.

5. A ski sled device according to claim 4 wherein said back runner tilts in the same direction as said front runners when said laterally movable means is moved.

6. A ski sled device comprising:

a body;

a frame member attached to said body and extending at a direction normal to the direction of travel;

a pair of runners, one of said runners being attached to said frame member at one end thereof by a turning crank, the other runner being similarly attached to said frame member at the other end thereof each of said cranks being pivotable about a substantially horizontal axis and an axis substantially vertical, one end of each of said cranks being attached to one of said runners respectively, the other end of each of said cranks being substantially immovable with respect to its respective end of said frame member;

control means on said body;

linkage means attached to said control means and to each of said turning cranks;

whereby actuation of said control means will move said turning cranks through said linkage means to tilt each of said runners about the horizontal axis of its respective crank and to rotate each of said runners about the vertical axis of its respective crank in substantially the same direction

7. A ski sled device according to claim 6 and further including second linkage means connected to said control means adapted to rotate each of said runners about the vertical axis of its respective crank in opposite directions whereby to brake said ski sled device.

8. A ski sled device according to claim 6 wherein said control means include a torque bar extending substantially normal to said frame, said linkage means being attached to said torque bar, whereby rotation of said torque bar will actuate said linkage.

9. A ski sled device according to claim 7 wherein movement of said control means in a direction normal to said direction of travel will cause tilting and simultaneous rotation of said runners in the same direction and movement of said control means in the direction of travel will cause rotation of said runners in a direction opposite to each other.

10. A ski sled device according to claim 6 and further including:

a second frame member extending at a direction normal to the direction of travel;

a second pair of runners, each of said second pair of runners being attached to said second frame member at opposite ends thereof.

11. A ski sled device according to claim 10 wherein each of said second runners is attached to said second frame member by second turning cranks, each of said second cranks being pivotable about a substantially horizontal axis and an axis substantially in the vertical direction, one end of each said second turning cranks being attached to one of said second pair of runners;

second linkage means attached to said control means and to each of said second turning cranks;

whereby actuation of said control means will move said second turning cranks through said second linkage means to tilt each of said second runners about the horizontal axis of its respective crank and to rotate each of said second runners about the vertical axis of its respective crank in substantially the same direction.

12. A ski sled device according to claim 11 wherein actuation of said control means will rotate said front runners in a direction opposite to rotation of said second runners and said first and second runners will tilt in the same direction.

References Cited

UNITED STATES PATENTS

1,510,560	10/1924	Schultz	180—8
2,525,833	10/1950	Schiffbauer	280—16

FOREIGN PATENTS

173,615	1/1953	Austria.
1,032,750	7/1953	France.

BENJAMIN HERSH, *Primary Examiner.*

L. D. MORRIS, *Examiner.*